มหาวิทยาลัยหาดใหญ่
HATYAI UNIVERSITY

“รายงานสืบเนื่องจากการประชุม”
“การประชุมหาดใหญ่วิชาการ ระดับชาติและนานาชาติ ครั้งที่ 15”

“The 15th Hatyai National and International Conference Proceeding”

“17 พฤษภาคม 2567”

รายงานสืบเนื่องจากการประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15

The 15th Hatyai National and International Conference Proceeding

วันศุกร์ที่ 17 พฤษภาคม 2567

รูปแบบการประชุม: Online และ Onsite Conference

จัดโดย

มหาวิทยาลัยหาดใหญ่

อำเภอหาดใหญ่ จังหวัดสงขลา

@ข้อความและบทความในเอกสารการประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15
เป็นแนวคิดของผู้เขียนมิใช่เป็นความคิดเห็นของคณะผู้จัดทำ และมิใช่ความรับผิดชอบ
ของมหาวิทยาลัยหาดใหญ่ @ไม่สงวนสิทธิ์การคัดลอก แต่ให้อ้างอิงแสดงที่มา

คำนำ

มหาวิทยาลัยหาดใหญ่ ร่วมกับ สำนักงานปลัดกระทรวงการอุดมศึกษา วิทยาศาสตร์ วิจัย และนวัตกรรม (สป.อว.) สำนักงานการวิจัยแห่งชาติ (วช.) และสมาคมสถาบันอุดมศึกษาเอกชนแห่งประเทศไทย ในพระราชูปถัมภ์ สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี (สสอท.) จัดการประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15 ในวันศุกร์ที่ 17 พฤษภาคม 2567 โดยมีวัตถุประสงค์เพื่อเป็นเวทีทางวิชาการให้กับ คณาจารย์ นักวิจัย นักวิชาการตลอดจนนักศึกษา ได้มีโอกาสเผยแพร่ผลงานวิจัย การถ่ายทอด และแลกเปลี่ยนองค์ความรู้ ตลอดจนการสร้างประสบการณ์ด้านการวิจัย สร้างแรงกระตุ้นให้เกิดแนวคิดในการพัฒนาองค์ความรู้ด้านการวิจัย และสร้างเครือข่ายความร่วมมือด้านการวิจัยระหว่างมหาวิทยาลัยกับหน่วยงานภายนอก

การประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15 ยังคงดำเนินการจัดในรูปแบบ Hybrid โดยมีการนำเสนอผลงานใน 2 รูปแบบ คือ Onsite และ Online เพื่อให้สอดรับกับความต้องการของผู้เข้าร่วมประชุม โดยการประชุมครั้งนี้มีคณาจารย์ นักวิจัย นักวิชาการ และนักศึกษา ทั้งจากภาครัฐและเอกชน ส่งบทความร่วมนำเสนอ จำนวนทั้งสิ้น 136 บทความ ประกอบด้วยบทความที่นำเสนอในรูปแบบ Onsite จำนวน 48 บทความ และรูปแบบ Online จำนวน 88 บทความ ซึ่งบทความทุกฉบับได้ผ่านการคัดเลือก ประเมินคุณภาพทางวิชาการ และแก้ไขตามคำแนะนำจากผู้ทรงคุณวุฒิในแต่ละสาขา

คณะผู้ดำเนินการจัดการประชุมหาดใหญ่วิชาการระดับชาติ และนานาชาติ ครั้งที่ 15 ขอขอบคุณคณาจารย์ นักวิจัย นักวิชาการ และนักศึกษา ที่ส่งบทความวิจัยร่วมนำเสนอ ตลอดจนแขกผู้มีเกียรติที่เข้าร่วมประชุม และขอขอบคุณ ผู้ทรงคุณวุฒิ และคณะกรรมการดำเนินโครงการทุกท่าน ที่ช่วยให้การประชุมหาดใหญ่วิชาการฯ ครั้งนี้ สำเร็จลุล่วงตามวัตถุประสงค์ของโครงการด้วยดี หากมีข้อผิดพลาดประการใดต้องขออภัยมา ณ โอกาสนี้

สารจากอธิการบดี

ตลอดระยะเวลา 27 ปีที่ผ่านมา มหาวิทยาลัยหาดใหญ่ ได้มุ่งเน้นการผลิตผลงานวิจัยควบคู่กับการพัฒนาชุมชนท้องถิ่น ที่สามารถช่วยยกระดับศักยภาพชุมชนให้พร้อมรับมือต่อการเปลี่ยนแปลงทั้งทางด้านเศรษฐกิจ สังคม และสิ่งแวดล้อม เพื่อให้ชุมชนสามารถพึ่งพาตนเองได้อย่างยั่งยืน ตลอดจนสามารถนำผลงานวิจัยนั้นไปเผยแพร่สู่กลุ่มผู้ใช้ประโยชน์ในวงกว้างได้

การประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15 เป็นเวทีวิชาการที่ช่วยสนับสนุนให้นักวิจัย นักวิชาการ ได้เผยแพร่ผลงานวิจัยสู่กลุ่มผู้ใช้ประโยชน์ ในนามของมหาวิทยาลัยหาดใหญ่ ขอขอบคุณสำนักงานปลัดกระทรวงการอุดมศึกษา วิทยาศาสตร์ วิจัยและนวัตกรรม (สป.อว.) สำนักงานการวิจัยแห่งชาติ (วช.) และสมาคมสถาบันอุดมศึกษาเอกชนแห่งประเทศไทย ในพระราชูปถัมภ์สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี (สสอท.) ที่ให้เกียรติร่วมจัดการประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติอย่างต่อเนื่องด้วยดีเสมอ รวมถึงผู้ทรงคุณวุฒิจากหลากหลายสถาบันที่ร่วมประเมินคุณภาพทางวิชาการของบทความวิจัย กรรมการห้องประชุมกลุ่มย่อยที่ให้ข้อเสนอแนะ และผู้เข้าร่วมนำเสนอผลงานทุกคน ที่มีส่วนร่วมให้การประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15 สำเร็จลุล่วงตามวัตถุประสงค์ที่กำหนดไว้ทุกประการ และหวังเป็นอย่างยิ่งว่าบทความที่นำเสนอในการประชุมครั้งนี้จะเป็นประโยชน์ต่อการพัฒนาต่อยอดผลงานวิจัยในอนาคตต่อไป

(ผู้ช่วยศาสตราจารย์ ดร.วิทวัส ดิษยะศริน สัตยารักษ์)
อธิการบดีมหาวิทยาลัยหาดใหญ่

การประชุมหาดใหญ่วิชาการระดับชาติและนานาชาติ ครั้งที่ 15
วันศุกร์ที่ 17 พฤษภาคม 2567
ณ ห้องประชุม Blue Ocean Hall อาคารคณะบริหารธุรกิจ
มหาวิทยาลัยหาดใหญ่ อำเภอหาดใหญ่ จังหวัดสงขลา
Onsite และ Online Conference

08.15 - 08.30 น.	ผู้เข้าร่วมประชุมแบบ Onsite ลงทะเบียนเข้าร่วมพิธีเปิด ณ ห้องประชุม Blue Ocean ผู้เข้าร่วมประชุมแบบ Online ร่วมรับชมพิธีเปิดผ่าน Page Facebook: https://www.facebook.com/rdofhu
08.30 - 08.40 น.	พิธีเปิด - กล่าวรายงาน โดย รองศาสตราจารย์ทัศนีย์ ประธาน ผู้ช่วยอธิการบดีฝ่ายวิจัย - กล่าวต้อนรับและกล่าวเปิด โดย ผู้ช่วยศาสตราจารย์ ดร.วิทวัส ดิษยะศริน สัตยารักษ์ อธิการบดีมหาวิทยาลัยหาดใหญ่
08.40 - 08.50 น.	รับชมวิดีทัศน์ผลงานวิจัยมหาวิทยาลัยหาดใหญ่
08.50 – 08.55 น.	รับชมวิดีทัศน์เส้นทางการสร้างความร่วมมือระหว่างประเทศ ระหว่างมหาวิทยาลัยหาดใหญ่ และ Universitas Muria Kudus, Indonesia
08.55 - 09.10 น.	การลงนามความร่วมมือทางวิชาการระหว่าง Universitas Muria Kudus, Indonesia และ มหาวิทยาลัยหาดใหญ่
09.10 - 11.10 น.	บรรยายพิเศษ เรื่อง "Soft Power ไทยกับการท่องเที่ยว" โดย ศาสตราจารย์ ดร.เทิดชาย ช่วยบำรุง ผู้อำนวยการหลักสูตรปรัชญาดุษฎีบัณฑิต คณะการจัดการการท่องเที่ยว สถาบันบัณฑิตพัฒนบริหารศาสตร์
11.10 - 11.20 น.	การยกระดับศักยภาพความเข้มแข็งของชุมชนนวัตกรรม จังหวัดสงขลา โดย ผู้ช่วยศาสตราจารย์ ดร.ปกรณ์ ลิ้มโยธิน รองอธิการบดีฝ่ายวิชาการ
11.20 - 12.00 น.	รับชมการนำเสนอผลงานวิจัยภาคโปสเตอร์
12.00 - 13.00 น.	รับประทานอาหารกลางวัน
13.00 น. เป็นต้นไป	นำเสนอผลงานวิจัยภาคบรรยายแบบ Onsite และภาคบรรยายแบบ Online ***(ระดับชาติ)* จำนวน 114 บทความ** - มนุษยศาสตร์ - สังคมศาสตร์ - การศึกษา - บริหารธุรกิจและการท่องเที่ยว - วิทยาศาสตร์ - รัฐศาสตร์และสังคมศาสตร์ (ระดับปริญญาตรี) ***(ระดับนานาชาติ)* จำนวน 35 บทความ** - Education - Social Science

หมายเหตุ กำหนดการอาจมีการเปลี่ยนแปลงตามความเหมาะสม

ผู้ทรงคุณวุฒิพิจารณาบทความ

ผู้ทรงคุณวุฒิระดับนานาชาติ

Prof. Dr. Mohd Sofian Bin Omar Fauzee		Universiti Putra Malaysia
Prof. Dr. Purwo Susongko M.Pd		Universitas Pancasakti Tegal
Prof. Amnuay	Yussayotha	Songkhla Rajabhat University (Retired)
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Assoc. Prof. Dr. Dien Noviany Rahmatika SE, MM, Ak, CA		Universitas Pancasakti Tegal
Assoc. Prof. Dr. Ahmad Hanfan, M. M.		Universitas Pancasakti Tegal
Asst. Prof. Dr. Nattapong	Jantachalobon	Rangsit University
Asst. Prof. Dr. Sansanee	Chanarnupap	Thaksin University
Asst. Prof. Dr. Thuanthong	Krutchon	Thaksin University
Asst. Prof. Dr. Ema Nurmaya S.E., M.M		Universitas Ahmad Dahlan
Asst. Prof. Dr. Woralak	Bancha	Prince of Songkla University
Asst. Prof. Dr. Montri	Luengchavanon	Prince of Songkla University
Asst. Prof. Dr. Jakkree	Boonlakhorn	Thaksin University
Asst. Prof. Solihah	Hayeesama-ae	Fatoni University
Dr. Natika	Chaiyanupong	Prince of Songkla University
Dr. Ekkapon	Phairot	Songkhla Rajabhat University
Assoc. Prof. Dr. Praman	Tepsongkroh	Hayai University
Dr. Chadchom	Ratsameemonthon	Hayai University
Dr. Farida	Sasha	Hayai University

ผู้ทรงคุณวุฒิระดับชาติ

รศ.ดร.ปานใจ	จุฬาพันธุ์	จุฬาลงกรณ์มหาวิทยาลัย
รศ.ดร.ปรารถนา	ปรารถนาดี	มหาวิทยาลัยเกษตรศาสตร์
รศ.ดร.ทองฟู	ศิริวงศ์	มหาวิทยาลัยเกษตรศาสตร์
รศ.ดร.กฤตพา	แสนชัยธร	มหาวิทยาลัยขอนแก่น
รศ.ดร.รัชดาภรณ์	เบญจวัฒนานนท์	มหาวิทยาลัยขอนแก่น
รศ.ดร.บุญรอด	โชติวชิรา	มหาวิทยาลัยเชียงใหม่
รศ.ดร.นฤมล	กิมภากรณ์	มหาวิทยาลัยเชียงใหม่
รศ.ดร.ขวัญชีวัน	บัวแดง	มหาวิทยาลัยเชียงใหม่
รศ.ดร.เจษฎา	นกน้อย	มหาวิทยาลัยทักษิณ
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รศ.ดร.บัณฑิต	สุขสวัสดิ์	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ

รศ.ดร.ชูพันธุ์	รัตนโภคา	มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
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รศ.ดร.พัชรินทร์	สุภาพันธ์	มหาวิทยาลัยแม่โจ้
รศ.ดร.วิวรรธน์	ดำรงค์กุลนันท์	มหาวิทยาลัยแม่ฟ้าหลวง
รศ.ดร.ภูสิทธ์	ภูคำชะโนด	มหาวิทยาลัยราชภัฏสวนสุนันทา
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รศ.ดร.สินีนุช	ครุฑเมือง แสนเสริม	มหาวิทยาลัยสุโขทัยธรรมาธิราช
ผศ.ดร.ขนบพร	แสงวณิช	จุฬาลงกรณ์มหาวิทยาลัย
ผศ.ดร.ธีรศักดิ์	สร้อยคีรี	มหาวิทยาลัยเกษตรศาสตร์
ผศ.ดร.วิทัศน์	ฝักเจริญผล	มหาวิทยาลัยเกษตรศาสตร์
ผศ.ดร.ปริณ	ทนันชัยบุตร	มหาวิทยาลัยขอนแก่น
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Hu-049	เรื่อง	การศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า "ปลา" กับสำนวนจีนที่มีคำว่า "鱼" *โดย* Li Lin และ พรรณธร ครุธเนตร	438 - 450

Hu-057	เรื่อง	ชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลา กับความเชื่อเทพเจ้าฉีเทียนต้าเซิ่ง *โดย* ณัฏฐนันท์ สิงหกฤตพิศาล	451 - 461
Hu-065	เรื่อง	ศึกษาเทคนิคการบรรเลงกีตาร์ในบทเพลง Being With You ของ George Benson *โดย* วรัญญา ศรีวรบุตร, สมพล แก้วแทน, ภราดร ตั้งชุ้น และ พัชรสกนธ์ โพธิ์	462 - 472
Hu-071	เรื่อง	งานวิจัยสร้างสรรค์บทเพลง: “ลมจากทิศใต้” *โดย* พงษ์สกร รัตนภัทรกุล, จุฑาภัทร ถินรัตน์ และ สิริรัฐ พงษ์อารี	473 - 480
Hu-076	เรื่อง	แคปชั่นเสี่ยวเกี่ยวกับกีฬา: การใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ *โดย* สุรเชษฐ์ คูหาเลิศ และ ปนัดดา หุ่นศิลป์	481 - 494
Hu-092	เรื่อง	สัจนิยมมหัศจรรย์กับการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินในละครแนวการแพทย์ไทย เรื่อง รักฉุดใจนายฉุกเฉิน *โดย* ธงชัย แซ่เจี่ย	495 - 507
Hu-099	เรื่อง	นิทานพื้นบ้านไทลื้อ : การศึกษาบทบาทหน้าที่มีต่อชาวไทลื้อสิบสองปันนา *โดย* Yantao He และ ภาณุพงศ์ อุดมศิลป์	508 - 523
- กลุ่มสังคมศาสตร์			
So-008	เรื่อง	การปรับเปลี่ยนวัฒนธรรมสู่การเป็นสินค้าทางวัฒนธรรมสมัยนิยมของวิถีอเมริกันคาวบอย *โดย* ธนา มณีพฤกษ และ นุกูล ชิ้นฟัก	524 - 538
So-009	เรื่อง	รูปแบบการป้องกัน แก้ไข และบำบัดผู้ติดยาเสพติดภายใต้การมีส่วนร่วมของชุมชน และภาคีเครือข่ายในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา *โดย* กศิณ์การ์ ชูศรี	539 - 552
So-019	เรื่อง	ถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา *โดย* ทรงพล ทองผ่อง และ ปองพชร ธาราสุข	553 - 567
So-020	เรื่อง	การทดสอบเทคโนโลยีใช้ปุ๋ยที่เหมาะสมสำหรับผลิตปาล์มน้ำมัน กรณีศึกษาชุมชนชะแล้จังหวัดสงขลา *โดย* กลอยใจ คงเจี้ยง, ศยามล แก้วบรรจง, บัวบูชา รอดชีพ และ เป็นหนึ่ง บุญถนอม	568 - 581

So-026	เรื่อง	การพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตสละของชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหารในจังหวัดพัทลุง อุษา ชูรักษ์	582 - 596
So-031	เรื่อง	การรับข้อพิพาทนอกศาล: ศึกษากรณีศูนย์ดำรงธรรมหาดใหญ่ *โดย* วันเฉลิม ว่องสนั่นศิลป์ และ อุไรนะห์ คาเน็ง	597 - 605
So-032	เรื่อง	มาตรการทางกฎหมายในการควบคุมการเลี้ยงสุนัข *โดย* เชิดพงศ์ จินดาสุวรรณ์ และ สิรินาฏ เพ็ชรรัตนมุณี	606 - 612
So-033	เรื่อง	มาตรการทางกฎหมายเกี่ยวกับปัญหาการกำหนดฐานความผิดของ ผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครองตามพระราชบัญญัติยาเสพติด พ.ศ.2564 มาตรา 145 วรรคแรก *โดย* จิระพงค์ แก้วบัว, วรา บุญพันธ์ และ วันฟาติน หะยีมะปีเยาะ	613 - 625
So-034	เรื่อง	ปัญหาการปฏิบัติหน้าที่ของเจ้าหน้าที่ตำรวจผู้มาปฏิบัติในศาลจังหวัดสุราษฎร์ธานีหลังภายหลังใช้บังคับพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ.2565 *โดย* วรา บุญพันธ์ และ กัญญาพัชร์ เมืองสุข	626 - 639
So-050	เรื่อง	การศึกษาภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา *โดย* นาอามร์ หมอเต๊ะ และ เกษตรชัย และหีม	640 - 647
So-056	เรื่อง	การศึกษาปัจจัยความสำเร็จของการดำเนินนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในประเทศไทย *โดย* สิริรดา คงจีระ และ รุสตั้ม หวันสู	648 - 661
So-058	เรื่อง	แนวทางการจัดการขยะเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา *โดย* สุทธิชัย รักจันทร์, ณัฐวุฒิ ชีวพิทักษ์ผล และ ธนกร โหรา	662 - 677
So-066	เรื่อง	การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดี (GAP) ของเกษตรกร อำเภอคลองลาน จังหวัดกำแพงเพชร *โดย* ฤทธิรงค์ เกาฏีระ และ หวานใจ หลำพรม	678 - 692
So-070	เรื่อง	การพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ในอำเภอหาดใหญ่ จังหวัดสงขลา โดยใช้วิธีวิเคราะห์อนุกรมเวลา	693 - 703

		โดย พงศ์พัฒน์ ฉายศิริพันธ์, เดชานุชิต กตัญญูทวีทิพย์, ณรงค์ฤทธิ์ สุคนธสิงห์ และ อรรณพ กางกั้น	
So-075	เรื่อง	ไร่ข้าว: ความหมาย ความสัมพันธ์ และอัตลักษณ์ความเป็นปกาเกอะญอ *โดย* พสุนิต สารมาศ, จิรวัฒน์ รักชาติ, อิทธิพงษ์ ทองศรีเกตุ, พงษ์ศักดิ์ รวมทรัพย์ และ ธณิยาภรณ์ ศรีหาตา	704 - 721
So-079	เรื่อง	พฤติกรรมการใช้ แอปพลิเคชัน TikTok กับบริบททางความคิดของคนในสังคมกลุ่ม เจเนอเรชั่น Y และ เจเนอเรชั่น Z *โดย* นฤมล อินสว่าง, บงกชกร ทองสุก และ นลินีวรรณ ประพันธา	722 - 733
So-089	เรื่อง	การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร จังหวัดยะลา *โดย* สมลักษณ์ วงษ์ตานี, จิตรานุช เรืองกิจ, ชัชญ์นนท์ เต็มนา, จิตรา อินเกตุ, รัตนพรรณ คงสุวรรณ, ศยามล แก้วบรรจง และ ธัชธาวินท์ สะรุโณ	734 – 748
So-090	เรื่อง	การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดปัตตานี *โดย* นูรอาดีลัฮ เจะโด, ขวัญเรือน สุวรรณรัตน์, ศยามล แก้วบรรจง และ ธัชธาวินท์ สะรุโณ	749 - 763
So-097	เรื่อง	ผลกระทบของฐานความผิดบัญชีม้าต่อสิทธิเสรีภาพของเหยื่ออาชญากรรมหลอกรักออนไลน์ *โดย* คณาธิป ทองรวีวงศ์ และ ปราชญา อ่อนนาค	764 - 774
So-100	เรื่อง	สาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี *โดย* สุกรี บุญเทพ, เจตน์สฤษฎ์ สังขพันธ์ และ อามานี หะมะ	775- 785
- กลุ่มการศึกษา			
Ed-001	เรื่อง	ผลการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพตามแนวทฤษฎีคอนตรัคติวิสต์ เรื่องสถิติเบื้องต้นของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 *โดย* สุพัตรา จันทบูลย์	786 - 779
Ed-002	เรื่อง	การพัฒนาผลสัมฤทธิ์ทางการเรียน วิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิตของนักเรียนระดับ	800 - 809

		ประกาศนียบัตรวิชาชีพปีที่ 1 โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) *โดย* พัชรี สุขทอง	
Ed-005	เรื่อง	ทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ *โดย* จอมใจ บุญกาญจน์, เสาวรส ยิ่งวรรณะ และ วัลลยา ธรรมอภิบาล อินทนิน	810 - 821
Ed-014	เรื่อง	การพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวันสำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 *โดย* เกียรติภูมิ สุขชม และ นฤมล เทพนวล	822 - 837
Ed-017	เรื่อง	การพัฒนาแผนการจัดการเรียนรู้วิชาภาษาไทย ตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐานหน่วยการเรียนรู้เสภาขุนช้างขุนแผน ของนักเรียนชั้นมัธยมศึกษาปีที่ 6โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก *โดย* อดิศร ขาวสะอาด	838- 851
Ed-021	เรื่อง	การพัฒนาผลสัมฤทธิ์การอ่านจับใจความวิชาภาษาอังกฤษโดยใช้เทคนิค 5W1H ของนักเรียนชั้นประถมศึกษาปีที่ 3 *โดย* สวรรณญา ศรีสุวรรณ, ชฎาพร เพชรนิล, ชนิกานต์ ศรีอินทร์ และ พล เหลืองรังษี	852 - 863
Ed-024	เรื่อง	การศึกษาผลสัมฤทธิ์ทางการเรียนและความพึงพอใจในการเรียนวิชาทัศนศิลป์ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ของนักเรียนชั้นประถมศึกษาปีที่ 4 *โดย* พฤตินันทร์ ดำนิ่ม, กัญญารัตน์ จันทร์เพชร, ปรีดา เช่งลอยเลื่อน, พล เหลืองรังษี และ เชษฎา ดำเกลี้ยง	864 - 875
Ed-025	เรื่อง	การศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์และผลสัมฤทธิ์ทางการเรียนจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดของนักเรียนชั้นมัธยมศึกษาปีที่ 3 โรงเรียนภูเก็ตวิทยาลัย จังหวัดภูเก็ต *โดย* ธนภรณ์ วิเศษ, อนุวัตร จิรวัฒนพาณิช, อนุรักษ์ วีระประเสริฐสกุล และ สายใจ จันทร์พูล	876 - 888
Ed-027	เรื่อง	การศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาของนักเรียนชั้นมัธยมศึกษาปีที่ 4 โรงเรียนสตรีภูเก็ต	889 - 901

		โดย ชนนท์ ปุ่นเจ้า, อนุวัตร จิรวัฒนพาณิช และ ภานุพงศ์ อึ่งสืบเชื้อ	
Ed-028	เรื่อง	ผลของการจัดการเรียนรู้โดยใช้ทีมเป็นฐานต่อความรู้และความพึงพอใจในการจัดการเรียนรู้ เรื่อง “ปวดท้อง” ในรายวิชาการบำบัดโรคเบื้องต้น *โดย* ช่อทิพย์ จันทรา และ ศักดา ไชยวงค์	902 - 913
Ed-030	เรื่อง	การศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์ โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โรงเรียนสตรีภูเก็ต *โดย* ปานัสตา ทองขาว, อนุวัตร จิรวัฒนพาณิช และ จุฑามาศ ชูจันทร์	914 - 925
Ed-035	เรื่อง	การพัฒนาทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 *โดย* อภิศักดิ์ ยีเกษม, อัญชิสา ไชยเภท, ธิดารัตน์ ตัดสายชล และ พล เหลืองรังษี	926 - 939
Ed-036	เรื่อง	การพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกต โดยวิธีการจัดการเรียนรู้แบบโครงการ ของนักเรียนชั้นอนุบาล 1 *โดย* กนกพิชญ์ รัตนแก้ว, ณัฐวรรณ หลิมประดิษฐ, ญาดารัตน์ บุญยอดสี และ พล เหลืองรังษี	940 - 948
Ed-037	เรื่อง	การพัฒนาผลสัมฤทธิ์การเขียนคำควบกล้ำที่มักเขียนผิด โดยใช้แบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5 *โดย* ชัญญา ช่างเรือ, ทิพย์สุดา พันบล, โอมา ดายามา และ พล เหลืองรังษี	949 - 985
Ed-038	เรื่อง	การพัฒนาทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 *โดย* ฟิรฮานา อุปมา, อัสมาร์ วงศาชนัท, กัญจน์วฤน เลาหบุตร, พล เหลืองรังษี และ เชษฎา ดำเกลี้ยง	959 - 970
Ed-039	เรื่อง	การพัฒนาผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่องการสร้างสรรค์สูตรอาหาร โดยใช้วัตถุดิบท้องถิ่น นักเรียนชั้นมัธยมศึกษาปีที่ 5 *โดย* อัจรพร บุญรุ่ง, ธนาธิป คล้ายเถาว์, อับดุลฮาฟิซ ปูเต๊ะ, พล เหลืองรังษี และ เชษฎา ดำเกลี้ยง	971 - 983

Ed-040	เรื่อง	การพัฒนาทักษะศิลปะการพูดด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด *โดย* เหล็กกล้า วิไลลักษณ์, บุษยา อาษาวิมลกิจ, สิปปกร มันทรานนท์ และ พล เหลืองรังษี	984 - 992
Ed-042	เรื่อง	การพัฒนาผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ โดยใช้แบบฝึก ของนักเรียน ชั้นประถมศึกษาปีที่ 4 *โดย* พริมสุดา แก้วทอง, ปกาพันธ์ เพชรน้อย, เพชรภรณ์ บุญเลิศ และ พล เหลืองรังษี	993 - 1000
Ed-048	เรื่อง	การพัฒนาผลสัมฤทธิ์ทางการเรียน เรื่องการบวก ลบ คูณ หารระคน โดยใช้วิธีการจัดเรียนรู้แบบเกม *โดย* ภานุวัฒน์ แสงทอง และ พล เหลืองรังษี	1001 - 1009
Ed-054	เรื่อง	การพัฒนาความสามารถด้านการอ่านจับใจความสำคัญโดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา *โดย* อัจฉรา เทศขำ, อาวฟา บือราเฮง และ เสนีย์ ชอบงาม	1010 - 1019
Ed-061	เรื่อง	ผลการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม เพื่อพัฒนาความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 *โดย* วลิดา ลายทอง และ ธัชทฤต เทียมธรรม	1020 - 1029
Ed-062	เรื่อง	การพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ *โดย* คุณากร ภู่ประดิษฐ และ ธัชทฤต เทียมธรรม	1030 - 1040
Ed-063	เรื่อง	ผลการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ที่มีต่อสมรรถนะด้านผู้เรียนรู้ในรายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตรของนักเรียน ชั้นประถมศึกษาปีที่ 3 *โดย* อัษฎายุธ สมพมิตร และ ธัชทฤต เทียมธรรม	1041 - 1051
Ed-064	เรื่อง	การพัฒนาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์เรื่องเศษส่วน โดยใช้บาร์โมเดล ของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด *โดย* จงธิป โทธกานันท์ และ ธัชทฤต เทียมธรรม	1052 - 1061

Ed-067	เรื่อง	การเปรียบเทียบผลสัมฤทธิ์ด้านการอ่านและการเขียนคำศัพท์พื้นฐานวิชาภาษาไทย โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน ของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา *โดย* ชนิตา ลาวัลย์, สายสุดา สุขแสง, ฐานันท์ ตั้งรุจิกุล, เจริญ รุ่งกลิ่น และ จักรกฤษณ์ หมั่นวิชา	1062 - 1074
Ed-068	เรื่อง	การพัฒนาทักษะการออกเสียงคำศัพท์ภาษาอังกฤษโดยใช้ชุดฝึกอ่านคำศัพท์ ของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี อำเภอหาดใหญ่ จังหวัดสงขลา *โดย* นูรมา บีรู, สายสุดา สุขแสง และ ฐานันท์ ตั้งรุจิกุล	1075 - 1088
Ed-069	เรื่อง	การพัฒนาผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่องการหาร โดยใช้ชุดแบบฝึกทักษะการหารของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา *โดย* ปิยดา บัวสม, สายสุดา สุขแสง และ ฐานันท์ ตั้งรุจิกุล	1089 - 1101
Ed-073	เรื่อง	การประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอน ระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก *โดย* ธัชทฤต เทียมธรรม, ทรงศักดิ์ สุริโยธิน และ ธวชินี โรจนาวี	1102 - 1114
Ed-082	เรื่อง	การพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนพะตงประธานศีรีวัฒน์ *โดย* นูรีน อิบบราเฮง, รุ่งทิพย์ ปราโมทย์พันธุ์ และ นูรลี โส๊ะขาว	1115 - 1127
Ed-091	เรื่อง	การสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญเรื่องยำสายสหายสองเลสำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ จังหวัดพัทลุง *โดย* สัจพจน์ เหมือนจันทร์ และ พิชญา สุวรรณโน	1128 - 1138
- กลุ่มบริหารธุรกิจและการท่องเที่ยว			
Bu-006	เรื่อง	ปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ จังหวัดสงขลา	1139 - 1151

		โดย นาตยา โชติกุล, สาลิหา เหตุหาก, จันติมา ช่วยขุน, จิตรพงษ์ เจริญจิตร และ วรรณะ วิจิตร	
Bu-010	เรื่อง	การคัดเลือกพนักงานขับรถโดยใช้กระบวนการลำดับชั้นเชิงวิเคราะห์และวิธีประเมินระดับความสำคัญของปัจจัย กรณีศึกษาบริษัทให้บริการรถรับส่งพนักงาน จ.พระนครศรีอยุธยา	1152 - 1163
		โดย เกษรินทร์ สมนอก และ ชยากานต์ บำรุงบุตร	
Bu-012	เรื่อง	การลดความสูญเปล่าในการดำเนินงานของแผนกวางแผนจัดซื้อ: กรณีศึกษาบริษัทผู้ประกอบกิจการอุตสาหกรรมอิเล็กทรอนิกส์	1164 - 1177
		โดย วรรธนัย ดิษฐปาน และ มัธยะ ยุวมิตร	
Bu-016	เรื่อง	ความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ของกำไรต่อหุ้น มูลค่าตามบัญชีต่อหุ้น และค่าความนิยมต่อหุ้นหลักฐานจากตลาดหลักทรัพย์แห่งประเทศไทย	1178 - 1188
		โดย พิเชษฐ์ สิทธิโชคสกุลชัย, สุวิทย์ ไวยทิพย์ และ พัทรียา เห็นกลาง	
Bu-018	เรื่อง	กรอบแนวคิดทฤษฎีสมการโครงสร้างปัจจัยเชิงสาเหตุของการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขันและผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ	1189 - 1201
		โดย จรูญ จารุรัชตานนท์ และ เจษฎา วงศ์แสนสุขเจริญ	
Bu-029	เรื่อง	สาเหตุของการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร จากสถานการณ์ Covid-19 ในปี 2021	1202 - 1216
		โดย วรพล ธิติธนาตร์ และ สิทธิชัย เจริญเศรษฐศิลป์	
Bu-043	เรื่อง	แนวทางการเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสินเขตภูเก็ต	1217 - 1231
		โดย ปวินทร์ ต่อวงศ์	
Bu-046	เรื่อง	วิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร	1232 - 1249
		โดย ณัฐพัชร์ วิเศษพานิช	

Bu-047	เรื่อง	ปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี *โดย* สุวิชา วิทยาคม	1250 - 1265
Bu-052	เรื่อง	การสื่อสารวัฒนธรรมอาหารท้องถิ่นเพื่อส่งเสริมการท่องเที่ยว: กรณีศึกษาหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง *โดย* นธี เหมมันต์ และ ชญาน์ทัต เอี่ยวเรืองสุรัติ	1266 - 1278
Bu-072	เรื่อง	การปรับปรุงประสิทธิภาพโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์โคนม: กรณีศึกษา *โดย* กนกวรรณ บัวคีรี และ นิกร ศิริวงศ์ไพศาล	1279 - 1292
Bu-077	เรื่อง	ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ *โดย* กรรณาภรณ์ ชุรี	1293 - 1309
Bu-078	เรื่อง	การจัดการท่องเที่ยวเชิงวัฒนธรรมอุทยานประวัติศาสตร์ จังหวัดสุโขทัยกับบูโรบูดูร์ (บุโรพุทโธ) จังหวัดชวากลางประเทศอินโดนีเซีย *โดย* บงกชกร ทองสุก, ณภัทร วุฒธะพันธ์ และ กาญจน์สิริรักษา บุญเอี่ยม	1310 - 1325
Bu-081	เรื่อง	การเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังของร้านเครื่องมือช่าง กรณีศึกษา: ร้านพรโลหะภัณฑ์ *โดย* ชัชฎาภรณ์ นาคแก้ว, ชนนิกานต์ เรืองเพชร, ชวนฝัน เกตุแก้ว, ฐิตินันท์ แซ่หลี, ณรินทร์ ภู่สุวรรณ, อัสมา ทิ้งทอง, อาทิตย์ เส้งเนตร, วรพงษ์ เพ็ชร์ขาว และ จิราวรรณ ชาปง	1326 - 1341
Bu-083	เรื่อง	การปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ กรณีศึกษาห้างหุ้นส่วนจำกัดตัวอย่าง อำเภอหาดใหญ่ จังหวัดสงขลา *โดย* อนันต์ ศรีมุกข์, ปิยวรรณ มานะ, สุภาพร ทองราช และ ชนินทร ศิริกาศ	1342 - 1354
Bu-085	เรื่อง	ความสัมพันธ์ระหว่างดัชนีค่าระวางเรือกับราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย *โดย* คณิน เพชรสกุล และ อนุพงศ์ ทิ่งในธรรม	1355 - 1366
Bu-086	เรื่อง	ปัจจัยที่ส่งผลต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ (Google Analytics) *โดย* คณาพจน์ วงษ์เฉลียง	1367 - 1376

Bu-087	เรื่อง	ความต้องการและความคาดหวังของผู้ใช้บัณฑิตในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย *โดย* วรพงษ์ เพ็ชร์ขาว, ภาณุพร เต็มพระสิริ, จิราวรรณ ชาปง, ชัชฎาภรณ์ นาคแก้ว และ บุสรินทร์ คูนิอาจ	1377 - 1387
Bu-093	เรื่อง	ผลิตภัณฑ์เพื่อสิ่งแวดล้อม การทดสอบการยอมรับผู้บริโภคต่อการพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์สครับจากกากชาเขียว *โดย* ธนพร แก้ววิเชียร, อารอฟะฮ์ คงเลิศผล, ชลธิชา สมหวัง และ ชุติมา หวังเบ็ญหมัด	1388 - 1394
Bu-094	เรื่อง	การพัฒนาผลิตภัณฑ์สบู่เหลวสมุนไพรแก้โรคผิวหนังจากรางจืด *โดย* วัชรพงศ์ สมณกฤษ, นิกาญจน์ เจริญสุข, ดำรงค์ ดำแก้ว และ ชุติมา หวังเบ็ญหมัด	1395 - 1401
Bu-095	เรื่อง	การศึกษาพฤติกรรมผู้บริโภคและแนวทางในการพัฒนาผลิตภัณฑ์สบู่สครับสมุนไพร *โดย* ปุณณภา ยาพันธ์, กาญจนา ศรีสวัสดิ์, อรนุช แซ่อึ่ง และ ชุติมา หวังเบ็ญหมัด	1402 - 1411
Bu-096	เรื่อง	การเพิ่มมูลค่าทางการตลาดผลิตภัณฑ์เทียนหอม *โดย* ดนุสรณ์ แก้วประสมวงศ์, เจนจิรา แสงจันทร์ และ ชุติมา หวังเบ็ญหมัด	1412 - 1423
- กลุ่มวิทยาศาสตร์			
Sc-004	เรื่อง	ประสิทธิผลผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา *โดย* ณัฏฐณิชา วรรณมณี และ ศุภมาส อยู่อริยะ	1424 - 1440
Sc-011	เรื่อง	พฤติกรรมการใช้พลาสติกครั้งเดียวทิ้งของผู้บริโภคจากธุรกิจจัดส่งอาหารในช่วงการระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 *โดย* ณัฐริณีย์ บุญประคอง, สุกัญญา เสรีนนท์ชัย, นพพล อรุณรัตน์ และ อัจฉรา อัศวรุจิกุลชัย	1441- 1453
Sc-013	เรื่อง	การประเมินการปลดปล่อยแอมโมเนียที่เป็นสารตั้งต้น PM 2.5 ทุติยภูมิจากการใช้ปุ๋ยเคมีไนโตรเจนและการจัดการปศุสัตว์ในพื้นที่ภาคกลางของประเทศไทย *โดย* จิราพัชร ธีระนันท์ และ จิรทยา เริ่มมนตรี	1454 - 1468

Sc-022	เรื่อง	ภาวะปากแห้งของผู้ที่เคี้ยวใบกระท่อม: การศึกษาในพื้นที่ อำเภอจะนะ จังหวัดสงขลา *โดย* ดุจฤดี พรสมิทธิกุล, หัชชา ศรีปลั่ง และ ดวงพร เกิดผล	1469 - 1483
Sc-023	เรื่อง	การแสดงออกของรอยโรคช่องปากในโรคติดเชื้อไวรัสโคโรนา 2019 (โควิด-19) ในระดับที่มีอาการน้อย: การศึกษาแบบตัดขวาง *โดย* ปิยณัฐ อินทะเสม, หัชชา ศรีปลั่ง และ ดวงพร เกิดผล	1484 - 1498
Sc-041	เรื่อง	การปนเปื้อนไมโครพลาสติกในหอยนางรมธรรมชาติบริเวณป่าชายเลนของจังหวัดระยอง *โดย* ธนภูมิ กลัดสุวรรณ, ภานุช หงษ์สวัสดิ์ และ พนิดา ปรารัตน์	1499 - 1518
Sc-045	เรื่อง	คุณสมบัติของไม้อัดไม้ยางพาราจากไม้บางที่ผ่านกระบวนการเทอร์โมวู้ด *โดย* วรทัตตา สุทธิภาค, ทรงกลด จารุสมบัติ และ ดำรง พิพัฒนวัฒนากุล	1519 - 1533
Sc-051	เรื่อง	การคัดเลือกแบคทีเรียผลิตสารพอลิไฮดรอกซีบิวทิเรทโดยใช้วัสดุเหลือทิ้งทางการเกษตร *โดย* สุณิษา คำเบิก, สุทธิชา ณ ระนอง ธรรมสิทธิรงค์ และ อานนท์ ธรรมสิทธิรงค์	1534 - 1546
Sc-053	เรื่อง	การวิเคราะห์ทางนิติวิทยาศาสตร์ของลิปสติกด้วยเทคนิค ATR-FTIR และการวัดสี *โดย* ชนิกานต์ กองแก้ว และ ศิริรัตน์ ชูสกุลเกรียง	1547 - 1558
Sc-055	เรื่อง	ประสิทธิภาพของผงก้านบอนและใบบอนต่อการบำบัดสังกะสีในน้ำเสียจากกระบวนการวิเคราะห์ซัลไฟด์ *โดย* รุ่งทิวา บุญสังข์, สุดารัตน์ กอเดช, สง่า ทับทิมหิน และ ปวีณา ลิมปิทีปราการ	1559 - 1569
Sc-059	เรื่อง	การเปรียบเทียบประสิทธิภาพวิธีหาความเหมือนของคำอธิบายรายวิชาเพื่อเทียบโอนหน่วยกิตด้วยการแปลงเชิงปริมาณ *โดย* กมลรัตน์ สมใจ และ แสงดาว นพพิทักษ์	1570 - 1582
Sc-060	เรื่อง	ความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา *โดย* ลักษมี สุภัทรา, อภิญญา สุราวุธ และ จักรกฤษณ์ หมั่นวิชา	1583 - 1592

Sc-074	เรื่อง	การพัฒนากรรมวิธีตรวจหาสารพันธุกรรมไวรัสอหิวาต์แอฟริกาในสุกรด้วยเทคนิคลูปมิเดเอเตดไอโซเทอร์มอลแอมพลิฟิเคชั่นเปลี่ยนสี *โดย* ดลพรรณ พูลเพิ่ม, รุ้งดาวรรณ วงค์สามารถ, ศุภชัย เนื้อนวลสุวรรณ, อนุศักดิ์ เกิดสิน, ฐปณัฐ สงคสุภา และ นราพร สมบูรณ์นะ"	1593 - 1606
Sc-080	เรื่อง	ความสัมพันธ์ของค่าปริมาณเมฆกับค่ารังสีอาทิตย์รวมในจังหวัดชุมพร *โดย* สุวิทย์ เพชรห้วยลึก	1607 - 1616
Sc-084	เรื่อง	การวิเคราะห์การเปลี่ยนแปลงสีของคราบเลือดในสถานที่เกิดเหตุเพื่อประยุกต์ใช้ทางนิติวิทยาศาสตร์ *โดย* ชาลินี เวชอินทร์, ศิริรัตน์ ชูสกุลเกรียง, ศุภชัย ศุภลักษณ์นารี และ อรทัย เขียวพุ่ม	1617 - 1628
Sc-088	เรื่อง	ผลของชนิดวัสดุที่ใช้ทำคู่อิเลคโตรดต่อการผลิตไฟฟ้าชีวภาพในเซลล์เชื้อเพลิงจุลินทรีย์แบบห้องคู่ของแบคทีเรียสังเคราะห์แสง *โดย* ชัยวัฒน์ บรรใดเพ็ชร, นรินทร์ โพธิ์แฉล้ม, อภิเชษฐ์ คำนับภา, ประไพ บางเชย, สมรักษ์ พันธุ์ผล และ ชัยยงค์ เตชะไพโรจน์	1629 - 1644

(ระดับนานาชาติ)

Education Group

The Digital Technology in the Online High School Mathematics Classroom

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Abstract

The research objectives were to 1) develop a quality digital technology in the online high school mathematics classroom, 2) compare the pre-test and post-test score of students after learning via the digital technology in the online high school mathematics classroom, and 3) study the satisfaction of students who learned via the digital technology in the online high school mathematics classroom. The samples of this study were 20 students in high school mathematics class who selected from students registered for the subject mathematics. The instruments consisted of digital technology, an evaluation form regarding the quality of media and contents, the pre-test and post-test assessment form, and an evaluation form regarding student's satisfaction towards the digital technology. Statistics used for data analysis were mean, standard deviation, and t-test for dependent samples. The results showed that 1) the digital technology achieved in media at an excellent level with the average score of 4.57 and quality of contents at an excellent level with the average score 4.93; 2) the students who learned via digital technology had an average the pre-test score of 64.75 points and post-test scores 79.70 points, respectively, when comparing the pre-test and post-test scores, so that the post-test scores were higher than pre-test scores with statistical significance at the level. 05; and 3) the students were satisfied with digital technology overall the students' satisfaction was found to be at a high level with the average score of 4.44.

Keywords: Digital Technology, Online Classroom, High School Mathematics

Introduction

In today's knowledge economy era, mathematics is moving from behind the scenes to the forefront. The combination of mathematics and computer technology has directly created value for society in many aspects and promoted the development of social productivity (Annie, Stoker, & Murray-Ward, 1996). Mathematics is an important component of human culture and has become a fundamental quality that citizens must possess. Mathematics plays a unique and irreplaceable role in the formation of human rational

thinking (Smith & Jones, 2000). Since the new curriculum reform, various aspects of high school mathematics teaching have undergone significant changes, but there are still some problems in many aspects. As an important discipline for measuring a person's abilities, many excellent elementary and middle school mathematics students will encounter difficulties in mathematics when entering high school, gradually evolving into a fear of high school mathematics (Brown, 2015). This phenomenon is quite common and should be taken seriously. Countermeasures for this phenomenon. The main manifestations are:

1. Many students have not mastered the learning initiative after entering high school. If you don't decide, you sit and wait for class. There is no preview before class. You don't understand what the teacher is going to teach. You are busy taking notes in class and don't really understand what you have learned.

2. In class, teachers should generally explain the context of knowledge, analyze the connotation of concepts, analyze key and difficult points, and highlight the way of thinking. After class, they couldn't consolidate, summarize, and find the connection between knowledge points in time. They just rushed to do homework, randomly set up questions, knew only a little about concepts, rules, formulas, and theorems, mechanically imitated them, and memorized them by rote.

3. Some students who feel good about themselves often belittle the learning and training of basic skills and methods. They often know how to do it, but don't pay attention to the calculation and writing. It is easy to have high vision and low skill. When they arrive at the regular homework or exam, either they make mistakes in the calculation, or they get stuck halfway.

4. Compared with junior high school mathematics, senior high school mathematics is a leap in depth, breadth and ability of knowledge. This requires mastering basic knowledge and skills to prepare for further study. There are many places in high school mathematics with great difficulty, new methods and high requirements for analytical ability. For example, the maximum problem of quadratic function on closed interval, real root distribution and parametric equation, the deformation and flexible application of trigonometric formula, the formation of spatial concept, permutation and combination problems and practical application problems. Therefore, these foundations must be well prepared for your next step of learning.

5. Teachers only pay attention to teaching, students can only passively receive relevant information, and the flow of information is unidirectional. The central activity of the whole class is "teaching" rather than "learning". Teachers are the theme of the class, and students are just the objects of classroom teaching. This unipolar tendency tends to make students become receivers of knowledge, but they have little opportunity to question and think, and ultimately their understanding of knowledge is superficial.

6. The effect of individualized teaching is poor. Through the survey, it is found that the current teaching plan of high school mathematics teachers focuses on the teaching content, such as teaching focus, teaching difficulties, teaching objectives, etc. Teachers should take these different needs of students into consideration and make corresponding adjustments in the arrangement of teaching content and the choice of teaching strategies. However, it is a pity that the current high school mathematics teachers generally do not make efforts in this regard. In the actual teaching process, they often teach courses at the same level as all students.

7. Effective teaching should be the teaching in which students actively participate and easily achieve the teaching objectives. Specifically, an effective teaching classroom should have the following three characteristics: first, students get cognitive development in teaching, second, students' subjective initiative can be fully mobilized in teaching, and finally, students can creatively apply the knowledge they have learned. But now the high school mathematics teaching is generally centered on teaching.

Under the background of the new curriculum reform, these problems in senior high school mathematics teaching should attract educators' extensive attention. All high school mathematics teachers should take active action to change teaching centered into learning centered, highlight students' dominant position, stimulate students' motivation for independent learning, play their leading role, and effectively improve the effectiveness of high school mathematics teaching.

Objectives

1. To develop quality digital technology in the online High School Mathematics classroom.
2. To compare the pre-test and post-test score of students after learning via digital technology in the Online High School Mathematics Classroom.
3. To study the satisfaction of students who learned via digital technology in the Online High School Mathematics Classroom.

Literature, Theories

Digital Technology

When computers first appeared in school mathematics classes in the 1970s the emphasis was, rightly, on how they might be used to improve student learning. In more recent years there has been a subtle shift of emphasis on how to improve learning. This has been informed by research, such as the statistical meta-analysis of Hattie (2003), which has found clear evidence that of all the factors influencing student activity it is the teacher who most influences learning. This has been recognized by others, such as Kieran, Krainer

and Shaughnessy (2013) who stated, “it is the teacher who can affect to the greatest extent the achievement of one of the main purposes of the research enterprise, that is, the improvement of students’ learning of mathematics”. In addition, in the last two decades the range of digital technology available has expanded considerably and their facilities and power have also greatly increased. In the light of these changes, the research focus of many has moved from how computers can help with learning to how teachers can make practical use of different types of digital technology to provide students with activities that will enhance their mathematical learning (Clark-Wilson, Robutti, & Thomas, 2020). The digital technology is an application which is named DingTalk. DingTalk is an enterprise communication and collaboration platform developed by Alibaba Group. It was founded in 2014 and headquartered in Hangzhou. By 2018, it was one of the world's largest professional communication and management mobile apps in China with over 100 million users. International market intentions were announced in 2018.DingTalk provides iOS and Android apps as well as Mac and PC clients.

Online Teaching

Online learning has been on the increase in the last two decades. In the United States, though higher education enrollment has declined, online learning enrollment in public institutions has continued to increase and so has the research on online learning. There have been review studies conducted on specific areas on online learning such as innovations in online learning strategies, , quality in online education, , accessibility in online higher education, synchronous online learning, meaningful learning research in e-learning and online learning environments, problem-based learning in e-learning and online learning environments, self-regulated learning in online learning environments and , game-based learning in online learning environments. (Martin, Sun, and Westine, 2020).

Online teaching is to take advantage of the network platform as the carrier of teachers' teaching and students' learning, transcend space constraints, and carry out bilateral teaching activities. With the upgrading of communication technology, teaching activities are accurately monitored and recorded. During the teaching process, the learning content is presented in the form of multimedia. The teaching activities are carried out on the network, and the learning track is presented on the network. Students realize the teaching purpose and plan through online learning and communication. Compared with traditional teaching, online teaching has the characteristics of more flexibility, repetition, small number of restrictions, and higher requirements for learners' self-consciousness. At present, online teaching mainly includes live teaching and recorded teaching. Live teaching has the advantage of timely interaction and adjustment, while recorded teaching has the advantage of free learning time.

Duval's Geometric Cognitive Theory

Geometric cognitive theory posits those solid figures aid in the acquisition of abstract knowledge in geometry learning (Duval, 1995). Raymond Duval, a prominent French mathematics education scholar, introduced four concepts of cognitive understanding in 1995: perceptual understanding, sequential understanding, discursive understanding, and operational understanding (Duval, 1995).

Perceptual understanding involves the perception of a figure's appearance (shape, size, etc.), allowing for the distinction of subgraphs, although these may not fully align with the original figure. Sequential understanding refers to the presentation of different unit components of a figure in a specific order during the composition process. Discursive understanding emphasizes that geometric concepts should stem from the naming and hypothesizing about figures, and the identification of geometric properties should be based on discussion. Operational understanding enables students to derive solution ideas by manipulating the figure while observing it (Duval, 1995).

Duval's theory focuses on the understanding process of geometric problems, particularly in presenting geometric figures for geometric reasoning and proof, providing a theoretical basis for solving geometric problems (Duval, 1995).

Mathematics

The online classroom teaching content mainly focuses on learning the knowledge points related to the chapter of "line plane parallelism" in solid geometry and training classroom exercises. The knowledge points mainly include the recognition of the spatial position of line plane parallelism, the determination and property theorems of line plane parallelism (Smith, 2021). Then, through various classroom training, students can fully understand the methods and skills of using judgment and property theorems (Jones & Brown, 2020). In this process, the stimulation and exercise of spatial imagination ability is particularly important (Johnson, 2019). Taking the judgment of parallel lines and planes as an example, in the teaching stage of new courses, it is necessary to first set teaching objectives, such as knowledge points and key and difficult points, processes and methods, emotional attitudes and values, etc. (Clark, 2018). In online classrooms, educational media is also very important, especially in the chapter on solid geometry, which is crucial for cultivating students' spatial imagination ability (Miller, 2017). In the online classroom, CAD modeling software has been introduced, which can directly generate very intuitive and visible spatial three-dimensional structures, helping students understand various spatial positional relationships (Garcia, 2019). Of course, the setting of teaching methods is also crucial. Throughout the process, students can use the online classroom platform to listen to classes and receive after-school assignments from teachers, in order to consolidate and

strengthen their understanding and application of knowledge points through practice after class (Robinson, 2020).

Academic achievement

Study.com (2022) mentions that academic achievement or academic performance is the extent to which a student, teacher or institution has attained their short or long-term educational goals. Completion of educational benchmarks such as secondary school diplomas and bachelor's degrees represent academic achievement.

Annie, Stoker and Murray-Ward (1996) give meaning of Academic achievement is commonly measured through examinations or continuous assessments but there is no general agreement on how it is best evaluated, or which aspects are most important—procedural knowledge such as skills or declarative knowledge such as facts.

In addition, Ziedner & Mosche (1998) further note that there are inconclusive results over which individual factors successfully predict academic performance, elements such as test anxiety, environment, motivation, and emotions require consideration when developing models of school achievement.

Student Satisfaction

Satisfaction according to Giese and Cote (2000) comprises of three crucial elements which are first, a general affective response that varies in its intensity, secondly a focus on the choice of product, purchase or consumption and lastly, the moment of determination that varies according to different situations and duration in time. The term satisfaction itself creates a vast diversity within industry and societal perspectives and varies with regard to the object focus and level of specificity.

Harvey, Plimmer, Moon, and Geall (1997) also indicate that student satisfaction is a quality enhancement tool which is designed to improve the quality of student experience. In addition, Bailey, Bauman and Lata (1998) study shows that student satisfaction can be viewed in a way of associating various multiple factors such as campus community, advertising services, and faculty in the educational environment accounted for the variance in students' satisfaction.

Concept Framework

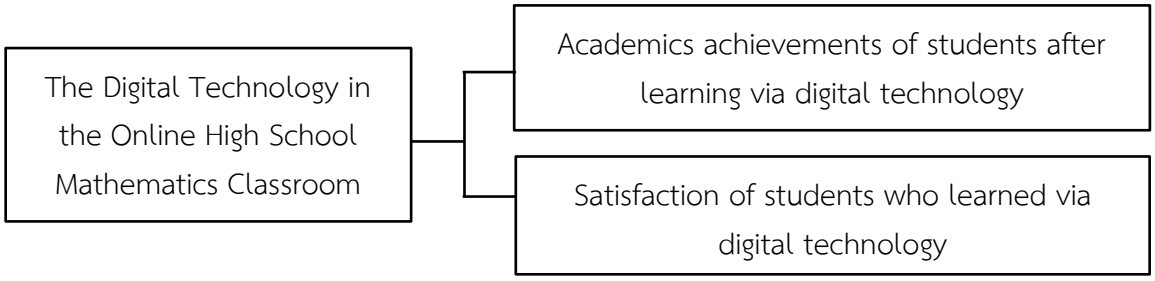

Figure 1: Concept Framework

Research Questions and Hypothesis

Students who study via digital technology in the Online High School Mathematics classroom can increase their academic achievement.

Research Methodology

Population Scope and Sample

1. The population of this study is 70 students at Shunde No.1 Middle School.

2. The sample of this study was 20 students at Shunde No.1 Middle School. They were selected by using purposive sampling who selected from students registered for the subject mathematics.

Research Instruments

The instruments consisted of

1. The digital technology

The digital technology is an application which is named DingTalk. DingTalk is an enterprise-level intelligent mobile office platform created by Alibaba Group. It will lead a new generation of working methods in the future and will accompany the growth of every enterprise. It is a collaborative office and application development platform for enterprise organizations in the digital economy era and a new productivity tool. The following sentences are the steps to use Dingtalk for an online class:

Figure 1: Home page of Dingtalk program

Step 1. Preparation for live broadcast

Step 2. Initiate a group live broadcast

Step 3. After-class work

2. An evaluation form regarding the quality of media and contents

Create an Evaluation form regarding the quality both content and media were on a 5-level scale and taken to 3 measurement and evaluation experts to check the suitability and consistency of content with objectives and obtain an index of item objective congruence of content of 1.00 and media of 1.00.

3. The pre-test and post-test assessment form

Create the pre-test and post-test assessment form and go to a team of 3 evaluation experts to check the appropriateness and consistency of the content and objectives. The index of item objective congruence of content was 1.00 and take the pre-test and post-test assessment form to let's check the score to find the difficulty value (p) and the discriminatory power value (r) for each item. The pre-test and post-test assessment form has a difficulty value between 0.50-0.63 and a discriminatory power value between 0.25-0.50 and is taken to find Reliability using the formula. Finding the Reliability value of the test using the KR-20 method (Kuder Richardson Formular 20) obtained a Reliability value of 0.94.

3. An evaluation form regarding student's satisfaction towards the Digital Technology

Create An evaluation form regarding student's satisfaction towards the Digital Technology. It is a 5 - level rating scale questionnaire, and the created satisfaction questionnaire was given to 3 evaluation measurement experts to consider and check its suitability, and the consistency of the questions with each objective with an index of item objective congruence value of 1.00.

Results

The results of the experiment by following the structure below.

1. Results of evaluating the quality of digital technology in the online High School Mathematics classroom.

1.1 The digital technology quality assessment results from three media experts as shown in Table 1.

Table 1: The digital technology quality assessment results from three media expert

Option	$\bar{X}$	SD.	Meaning
1. Easy of use of the system.	4.67	0.22	Excellent
2. The order in which information is displayed is appropriate.	4.67	0.22	Excellent
3. Easy and convenient access.	4.67	0.22	Excellent
4. The overall screen design is appropriate.	4.67	0.22	Excellent
5. Presentation control buttons are appropriate.	4.67	0.22	Excellent
6. The font style is easy to read and clear.	4.67	0.22	Excellent
7. The font size is appropriate.	4.67	0.22	Excellent

8. Interesting, inviting you to follow the content.	4.00	0.67	Good
9. Choosing the color of the font and background color	4.67	0.22	Excellent
10. The lessons are interesting.	4.33	0.22	Good
Total	**4.57**	**0.27**	**Excellent**

Form table 1 presented the results of the digital technology in the online High School Mathematics classroom. Overall, it was found that the quality of the digital technology is at an excellent level with the average score of 4.57.

1.2 Content quality assessment results from three content experts as shown in Table 2

Table 2: The content quality assessment results from three content experts

Option	$\bar{X}$	SD.	Meaning
1. The content is easy to read and understand.	5.00	0.00	Excellent
2. The amount of content is appropriate.	4.67	0.22	Excellent
3. The difficulty of the content is appropriate to the student's level.	4.33	0.22	Good
4. The test is appropriate.	4.33	0.22	Good
5. Assessment and evaluation are appropriate.	5.00	0.00	Excellent
6. The font style is easy to read and clear.	5.00	0.00	Excellent
7. The font size is appropriate.	5.00	0.00	Excellent
8. Provide content knowledge just like the teacher.	5.00	0.00	Excellent
9. The sequence of steps in the presentation is appropriate.	5.00	0.00	Excellent
10. Accuracy of the language used.	5.00	0.00	Excellent
Total	**4.93**	**0.07**	**Excellent**

From table 2 presents the results of content quality assessments, overall, it was found that the quality of the digital technology is at an excellent level with the average score of 4.93.

2. Results of compare the pre-test and post-test scores of students after learning via the digital technology in the Online High School Mathematics Classroom.

Table 3: Compare the pre-test and post-test score of students after learning via the digital technology of students

Items	n	$\bar{X}$	SD.	t-test	Sig. (2-tailed)
Pre-test	20	64.75	11.63	6.67	.000
Post-test	20	79.70	12.26		

**p< .05

From table 3 the results of the pre-test and post-test tests of the students had an average score of 64.75 points and 79.70 points, respectively. When comparing the pre-test and post-test scores, it was found that the post-test scores were higher than pre-test scores, with statistical significance at the level. 05

3. Results of study the satisfaction of students who learned via the digital technology in the Online High School Mathematics classroom.

Table 4: The satisfaction of students who learned via the digital technology in the online High School Mathematic Classroom.

Option	$\bar{X}$	SD.	Meaning
1. Easy to use, not complicated	4.54	0.71	Highest
2. There is appropriate positioning of various information on the screen.	4.39	0.86	High
3. Easy and convenient access	4.46	0.81	High
4. The test is appropriate.	4.43	0.70	High
5. Presentation control buttons are appropriate.	4.49	0.74	High
6. The font style is easy to read and clear.	4.50	0.81	Highest
7. The font size is appropriate.	4.49	0.69	High
8. Choosing the color of the font and background color	4.48	0.71	High
9. The difficulty of the content is appropriate to the student's level.	4.46	0.81	High
10. The lessons are interesting.	4.12	1.30	High
Total	**4.44**	**0.81**	**High**

From table 4 presents the results of study the satisfaction who studied in the online High School Mathematic Classroom, overall, it was found that the quality of the students' satisfaction is at a high level with the average score of 4.44.

Conclusions and Discussion

The research conclusions can be discussed as follows.

1. The Results of evaluating the quality of digital technology in the online High School Mathematics classroom; the digital technology quality assessment results from three media experts were at an excellent level with the average score of 4.57. Different from the research of She Haiyan (2020) the application research of schivo whiteboard in high school mathematics teaching. n the application research of schivo whiteboard in high school mathematics teaching, the author collects media usage and usage feedback in the same form in the form of a questionnaire survey. However, the author's questionnaire is

set in the form of multiple-choice questions for the questions in the questionnaire, and the author will calculate the selection proportion of each option in the questionnaire, mainly through the selection proportion to reflect what the author of each type of question wants to know. Regarding the use of media. The author will also conduct a reasonable analysis based on the proportion of each option in each question collected and collect media usage and usage feedback in the form of a questionnaire survey, but the difference is that each question in the questionnaire adopts a scoring mechanism of 1 to 5 points, and each score has its own separate meaning. There will be explanations at the beginning of the questionnaire. What this kind of questionnaire collects is the score of each function of the media. There are very direct numerical results that can directly reflect the quality of each function of the media, and the author will also make corresponding result analysis based on the score of each question. The results of content quality assessments overall, it was found that the quality of the digital technology is at an excellent level with the average score of 4.93. Different from Shao Zhen (2021) the research of teaching research on"six questions and mind map" in senior high school mathematics. In teaching research on "six questions and mind map" in senior high school mathematics, the author uses the method of showing instructional design cases as an example, here using exponential functions and their properties. The content mainly includes:

1.1 Teaching materials and academic situation analysis.

1.2 Teaching objectives: knowledge and skills, processes and methods, emotions, attitudes and values.

1.3 Analysis of key points and difficulties.

1.4 Teaching methods: combination of lecture and practice, cooperative learning, inquiry teaching.

1.5 The teaching process, including a rough process design for the entire lesson, and marking the design intent where necessary. This part is the most meticulous part in the entire teaching design. The role of each step, time-consuming and other factors must be taken into consideration.

1.6 If media application is involved in class, it must also be noted.

2. Results of compare the pre-test and post-test scores of students after learning via the digital technology in the online High School Mathematics classroom.

The results of the pretest and post-test tests of the students had an average score of 64.75 points and 79.70 points, respectively. When comparing the pretest and post-test scores, it was found that the post-test scores were higher than pretest scores, with statistical significance at the level. 05. Consistent with the research of Qiao Rui (2021) the application of geometer's sketchpad in mathematics teaching in high school and She

Haiyan (2020) the application research of Schiavo whiteboard in high school mathematics teaching. For example, in the application research of Schiavo whiteboard in high school mathematics teaching, the author used the method of controlled experiment to study the students in Class 10 and Class 11 of a high school in Hefei Economic Development Zone. Both classes had 47 students. Class 11 was an experimental class and class 10 is a control class. Both classes are ordinary classes. They are evenly divided according to their high school entrance examination scores. There is not much difference in the average math scores in the school entrance examination. To ensure the reliability of the experiment, both classes used the People's Education Press version of high school mathematics textbooks. They had the same mathematics teachers, the same homework, teaching content and teaching progress. Students were not told any relevant information about the experiment before the experiment, thereby improving the efficiency of the experimental validity and reliability.

This comparison method uses a pretest and post-test there are some differences in details, the overall core idea is to explore the effect of a single variable on another variable while ensuring that other factors are not affected as much as possible, also conducted t-test and sig significance tests on the two sets of experimental data, which is also of high reference value for determining the use value of the data.

3. The Results of study the satisfaction of students who learned via the digital technology in the online High School Mathematics classroom were overall satisfied via digital technology overall; it was found that the quality of the students' satisfaction is at a high level with the average score of 4.44. Different from the research of Qiao Rui (2021) the application of geometer's sketchpad in mathematics teaching in high school.

In the application of geometer's sketchpad in mathematics teaching in high school by the collection of student satisfaction in the form of a questionnaire survey. However, the author's questionnaire is set in the form of multiple-choice questions for the questions in the questionnaire, and the author will calculate the selection ratio of each option in the questionnaire, mainly through the selection ratio to reflect what the author wants to know for each type of question. Regarding student satisfaction and other student attitudes. The author will also conduct a reasonable analysis based on the proportion of each option in each question collected. Based on this result, the author analyzed that most teachers do not pay enough attention to class speed when teaching using geometric sketchpads, ignore the difference between online teaching and offline teaching, and basically display knowledge entirely through software, replacing traditional writing on the blackboard. This seriously leads to students' note-taking efficiency being reduced and their knowledge mastery not being proficient. The geometric sketchpad is only an indispensable electronic technology in teaching. The purpose is to better improve learning efficiency,

not to replace writing on the blackboard with media. The geometric sketchpad should be appropriately introduced in the teaching process, rather than relying entirely on this media.

The method of collecting student satisfaction is in the form of a questionnaire survey, but the difference is that each question in the questionnaire uses a scoring mechanism of 1 to 5 points. Each score has its separate meaning. This is stated at the beginning of the questionnaire. There will be explanations. What this kind of questionnaire collects is the score of each function of the media. There are very direct numerical results that can directly reflect the quality of each function of the media, and the author will also make corresponding result analysis based on the score of each question.

Recommendations

Significant recommendations or research findings useful for mathematics teachers:

1. Utilization of digital technology in teaching mathematics: Teachers can utilize various applications and computer programs to enhance students' learning experiences in the classroom. Emphasis should be placed on making learning more engaging and effective.
2. Use of data and data analysis: Teachers can use data obtained from digital technology usage in teaching to improve their teaching methods. This data can be used to adjust lesson plans and respond to students' needs effectively.
3. Creation and sharing of learning content: Teachers can use digital technology to create engaging and effective learning content. They can also share this content with other teachers to serve as references and share best teaching practices within the mathematics teaching community.
4. Enhancement of technology skills for teachers: Teachers should receive training and support in using digital technology for teaching. Focus should be on developing skills and fostering creativity in using these technologies for teaching mathematics in the classroom.

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Exploring English Learning Preferences among Chiang Rai Rajabhat University Students: A Research Inquiry

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Abstract

This study explores the dynamics of learners' learning styles in Chiang Rai Rajabhat University (CRRU) English language courses. Employing qualitative techniques such as surveys and interviews, it identifies common learning styles, differences in English proficiency levels, and efficient teaching approaches. The thematic analysis highlights connections between language proficiency and learning styles, revealing illuminating patterns about student preferences. The findings have applications for educators, emphasizing the necessity of customized strategies to address the heterogeneous nature of the learning environment. Furthermore, by providing comprehensive insights into learning patterns, this study significantly enhances English language instruction at CRRU. These discoveries can be leveraged by educators to craft inclusive and adaptable teaching methodologies that cater to diverse student preferences. The research underscores the necessity for Chiang Rai Rajabhat University to embrace a more efficient and responsive English language instruction paradigm which recognizing the importance of accommodating various learning styles.

Keywords: Non-Native English Language Learners, Identifying Learning Styles, Learning Style Student Habits, Strategies Impact of Culture Cross-Cultural Communication

Introduction

In the dynamic tapestry of our contemporary global context, education assumes a pivotal role, orchestrating the metamorphosis, progression, and transmission of knowledge across generations. Yet, this journey is not without its hurdles, and the rich diversity inherent in our global community has birthed language barriers amidst the ongoing march of globalization. Responding to this challenge, the English language has ascended as a lingua franca, traversing cultural and geographical borders to serve as a global conduit for communication in realms such as politics, education, and cultural exchange. The insights shared by David Crystal in 2019 underscore the intricate interplay of historical, political, and imperial factors, illuminating the path that led English to its current global prominence.

This research delves into the intricate realm of language acquisition, focusing explicitly on the experiences of Non-Native English Learners (NNEL) who navigate the complex journey of acquiring English as a second or third language. The epicenter of this exploration lies within the international student community enrolled in the English for International Communication (EIC) program at Chiang Rai Rajabhat University (CRRU), Thailand. In accordance, Shneyderman (2023) states that language acquisition is very difficult on the other hand there is a preference for the learning technique in each of the students. By honing in on this diverse group, the study aims to unravel the distinct learning styles, challenges, and barriers confronted by non-native English learners. Employing a comprehensive mixed-methods approach that amalgamates questionnaires and in-person interviews, the research aspires to yield nuanced insights that contribute to a broader understanding of language education. Beyond the confines of this specific study, the ultimate goal is to foster inclusivity and support for non-native English learners globally, nurturing collaborative efforts and mutual comprehension within the expansive domain of language acquisition and education.

Research Questions

1. What are the key factors influencing the perceptions of Chinese transfer students regarding the educational system at Chiang Rai Rajabhat University?

This research question guides us in identifying key factors including language barriers, cultural differences, teaching methods, faculty-student interactions, and support services.

2. How do Chinese transfer students experience the academic and social aspects of the university environment in Chiang Rai?

This research question gives Chinese transfer students varying experiences in academic settings, ranging from satisfaction with course content to difficulties in academic integration.

3. What strategies and support mechanisms can be identified to improve the integration and academic success of Chinese transfer students within Chiang Rai Rajabhat University?

This research question would guide us to identify strategies including the provision of language support programs, cultural orientation workshops, academic advising services, and peer mentorship initiatives.

Literature Review

This literature review explores factors influencing student learning styles in English language learning, addressing practices, perceptions, and effectiveness. The focus extends

to non-native English learners, identifying gaps and analyzing obstacles. The study considers learning styles, obstacles, habits, and cultural backgrounds, emphasizing classroom preferences. An example study by Wang (2007) reveals diverse learning style preferences among Chinese students studying English as a foreign language. The study emphasizes the need for varied teaching strategies and highlights the importance of English as a Foreign Language for students pursuing diverse degrees, offering insights into the relationship between learning styles and language acquisition.

Gokalp and Murat (2013) explored the impact of students' learning preferences on academic performance, revealing disparities in grade improvement based on the presence of a study plan. However, the study's limitation of using only one data collection method and neglecting factors like study time and methods employed hindered a comprehensive understanding of teaching strategies and developmental gaps. In 2017, Sawetsunthornpan focused on gender variations in learning styles in English classrooms, emphasizing auditory learning preferences among participants. Despite highlighting the superiority of auditory learning, the study's reliance on a single data collection tool posed a limitation. In summary, effective learning styles for non-native English learners involve interactive language use, necessitating study plans and incorporating visual, sensing, and auditory styles. Despite these findings, further exploration is required to understand the nuanced effectiveness of these styles among non-native English learners in educational settings.

Learning styles encompass individuals' preferred approaches to acquiring and processing information, involving cognitive, affective, and physiological dimensions (Coffield, 2004). These styles inform how learners perceive and engage with educational materials, and recognizing them can guide tailored instructional strategies. Models like VARK categorize learners based on visual, auditory, reading/writing, or kinesthetic preferences, while Kolb's Experiential Learning Theory identifies distinct learning modes. Despite widespread discussion and application in education, criticism exists regarding the conclusive evidence of improved outcomes through personalized instruction based on learning styles (Pashler, 2008). Exploring learning styles among Shan and Chinese students at Chiang Rai Rajabhat University in Thailand, drawing on VARK and Kolb's theories, contributes insights into cultural influences on language acquisition. This research aims to identify factors impacting language skill development, informing inclusive instructional approaches for students with diverse linguistic and cultural backgrounds in the dynamic landscape of language learning.

The journey of learning a new language is intricately shaped by individual learning styles, encompassing preferences for analytical or global thinking and auditory or visual approaches. These inherent inclinations, as described by Cornett (1983), offer overarching patterns guiding learning behavior. Dunn, R., Griggs, S. A., Olson, J., Beasley, M., & Gorman,

B. S. (1988) highlighted that learning styles are biologically and developmentally imposed characteristics that render teaching methods effective for some and ineffective for others. Learning strategies, as outlined by Scarcella and Oxford (1992), involve specific actions students take to enhance their learning, with six categories organizing these strategies. The existence of learning styles is nuanced, falling on a continuum rather than a binary scale. Understanding these multifaceted frameworks is crucial in language acquisition, emphasizing the need for personalized approaches in education. By acknowledging and accommodating diverse methodologies, both educators and learners can optimize the language learning experience, fostering engagement and efficacy.

This research project focuses on understanding the learning styles of Chinese students studying English at Chiang Rai Rajabhat University in Thailand and Shan students from Myanmar. The investigation is guided by Kolb's Experiential Learning Theory, which emphasizes learners' preferences for specific modes of learning, and the VARK model, categorizing learners based on visual, auditory, reading/writing, and kinesthetic modalities. Cultural aspects are considered, recognizing the influence of a person's cultural background on language acquisition. Additionally, Phillip (2010) investigated multiple intelligences, drawing from Howard Gardner's theory, which provides an additional theoretical foundation, acknowledging various intelligences beyond traditional metrics. Integrating Gardner's focus on linguistic, musical, interpersonal, and spatial-visual intelligence offers a holistic perspective in line with the multicultural student body. This approach, combined with Kolb's experiential learning model, aims to comprehensively analyze language learning approaches among the target population, informing tailored pedagogical strategies for successful English language instruction in a multicultural educational setting.

Holliday and Amadasi (2019) emphasize the evolving landscape of English language education, particularly regarding teacher identity and control over English, intertwined with cultural considerations. The dominance of national cultures is challenged by critical cosmopolitan perspectives, advocating for refraining from dictating cultural and linguistic norms and allowing educators and learners from peripheral regions to define English and English language education on their terms. The integration of mobile technologies, examined by Kacetl and Kimova (2019), underscores its significance in language learning, offering advantages such as enhancing cognitive capacity, motivating learners, fostering autonomy, and facilitating personalized learning. In China, English language education policies have undergone dynamic changes, with various supportive measures introduced over the years. However, a comprehensive understanding of these policies is lacking, and recent adjustments in testing requirements have significantly impacted English language instruction in the nation. Additionally, parental involvement is recognized as a significant

factor influencing students' academic outcomes, with research highlighting its correlation with children's achievements across different nations, emphasizing the need for teacher training on involving parents in language development.

In the realm of English language education, understanding cross-cultural communication skills is crucial for unraveling the nuances that shape language learning experiences. According to Huang (2015) study on students majoring in English for International Communication at Chiang Rai Rajabhat University reveals diverse perceptual learning styles, emphasizing the importance of navigating cultural intricacies within the learning environment. This literature review delves into the rich tapestry of cross-cultural communication skills, categorizing it as a fundamental pillar alongside motivation and technology integration. It explores the impact of cultural diversity on language learning preferences and practices, aiming to provide insights for educators, researchers, and policymakers. The review emphasizes the multifaceted understanding of English language learning styles, encompassing cross-cultural communication skills, language learning motivation, and technology integration. By acknowledging both visible and invisible cultural elements, the review seeks to unravel the complexities of cross-cultural communication, ultimately contributing to effective teaching strategies for non-native English speakers.

In their 2016 study, Aguila and Harjanto explored the dual impact of anxiety on the learning process, focusing on foreign language anxiety among university students and its effects on speaking proficiency. The study highlighted the potential negative influence of anxiety, causing intellectual and psychological disturbances that could lead to deterioration in the overall quality of the learning experience. Conversely, anxiety was identified as a potential motivator in certain situations, driving students to enhance their learning due to perceived pressure. Conducted with participants in an English Conversation Class, the study utilized tools such as the Foreign Language Class Anxiety Scale questionnaire and interviews. Classroom observations revealed a slightly elevated level of anxiety among students, indicating an inverse relationship between anxiety levels and speaking scores. The findings emphasized that anxiety significantly impacted students' communicative and interactive abilities, identifying key factors contributing to foreign language anxiety.

Language anxiety, a complex set of self-perceptions and behaviors, can either encourage or hinder language learning. Studies have explored its causes, effects on academic performance, and coping mechanisms. The finding of Kianinezhat (2024) investigated foreign language anxiety in education; it shows the challenges of the learners in the acquisition of a new language. The finding was investigated on the connection between anxiety and language acquisition among the students in the Islamic Azad

University. Defined as a complex set of self-perceptions, beliefs, feelings, and behaviors related to language learning, foreign language anxiety (FLA) can either facilitate or impede learning depending on its nature. Encouraging anxiousness can motivate learners to be more driven and committed, while crippling anxiety may lead to avoidance behaviors and hinder language acquisition outcomes. Numerous studies have explored the causes of anxiety, its effects on academic performance, and the coping mechanisms employed by students.

In conclusion, studies by Aguila and Harjanto (2016) provide a comprehensive understanding of language anxiety dynamics and its implications for the language learning process. Aguila and Harjanto highlight anxiety's dual nature, acting as both an impediment and a motivator, impacting learners' communicative abilities. Trang and Karen-Baldauf establish a clear link between anxiety and academic performance, particularly in oral communication. The examination of internal and external factors contributing to anxiety enriches comprehension of its pervasive influence on language learners, crucial for educators and researchers addressing and alleviating language anxiety's impact on language education.

Methodology

To comprehensively explore the learning styles and experiences of students majoring in English for International Communication at Chiang Rai Rajabhat University, the research adopts a multifaceted methodology incorporating both quantitative and qualitative approaches. The study encompasses three distinct participant groups: Shan students transitioning from Myanmar, Chinese students arriving from China, and Thai students attending Chiang Rai Rajabhat University. This inclusion of diverse nationalities, with 20 participants per group for online questionnaires and five participants per group for interviews, ensures a rich and varied dataset. The research aims to capture the unique background and cultural contexts of each participant, fostering a comparative analysis within the same academic program and university setting.

The research employs a mixed-methods approach, utilizing online questionnaires for quantitative insights and in-person interviews for qualitative perspectives. Online surveys, distributed electronically, feature adapted versions of established learning style inventories to quantitatively assess the dominant learning styles of participants. In-depth, semi-structured interviews are conducted to explore individual experiences, preferences, and perceptions related to English language learning, providing qualitative depth to complement the quantitative data. The flexibility of incorporating phone calls for interviews adds a personalized touch, accommodating participants' preferences and potential logistical challenges. The comprehensive data collection procedures aim to

provide a nuanced understanding of learning styles among Shan, Chinese, and Thai students, addressing potential challenges while ensuring a robust research process.

The data analysis unfolds in two distinct phases. For quantitative data from online surveys, descriptive analysis and quantitative assessments using appropriate statistical tests will be employed. Comparative analysis will explore differences or similarities in learning styles among the three student groups. Qualitative data from in-person interviews will undergo thematic analysis, identifying common themes and variations in individual experiences related to English language learning. Coding and categorization will systematically organize qualitative data, ensuring a nuanced understanding of diverse perspectives within each group. The integration of qualitative and quantitative findings aims to yield a comprehensive and holistic understanding of learning styles among the different student populations in the English for International Communication program.

In outlining the methodology, meticulous attention is given to ethical considerations, participant selection, and data limitations. The research methodology acts as a collaborative roadmap, ensuring transparency and reliability while acknowledging potential constraints. This approach aligns with the research's overarching goal of providing a nuanced and authentic exploration of the learning styles and experiences of Shan, Chinese, and Thai students at Chiang Rai Rajabhat University.

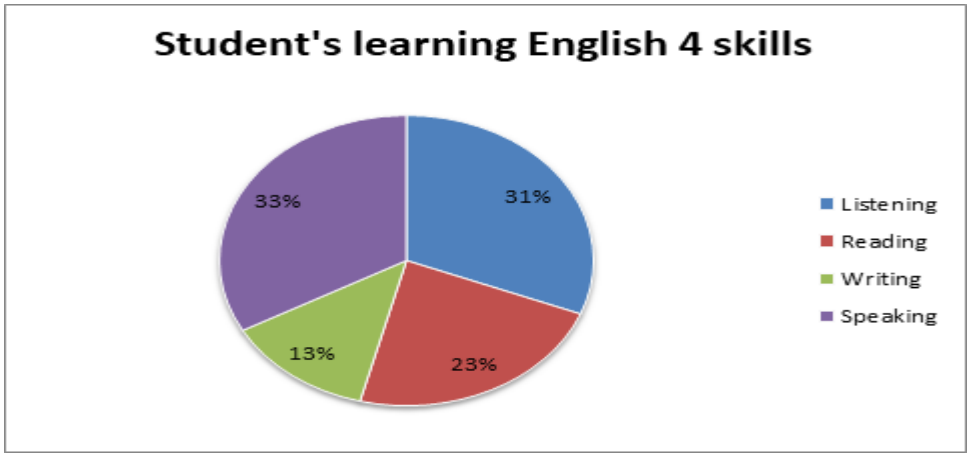
Results

This research project examines the diverse learning styles of students from Myanmar, Thailand, and China at Chiang Rai Rajabhat University, focusing on English language acquisition. The study aims to understand the interplay between cultural contexts and individual learning preferences, providing insights for educators, curriculum developers, and policymakers. The data collected will be used to compare students' adaptation and resilience to the English language, with an average learning duration of 14 years. The research contributes to existing literature on cross-cultural research in education, examining factors such as educational systems, language of instruction, and prior exposure to English.

The other study explores diverse learning preferences in English language acquisition, focusing on students from China, Shan, and Thailand. Analyzing the provided data, the research investigates the favored learning styles among these groups, emphasizing the commonality and variation in their approaches. The findings reveal a strong inclination toward speaking due to the examination of English language learning styles among degree-seeking students from Myanmar, Thailand, and China at Chiang Rai Rajabhat University. It aims to understand cultural contexts and individual learning preferences, providing insights for educators, curriculum developers, and policymakers.

The study will use data to compare students' adaptation and resilience to English, considering local communities' impact.

Exploring diverse learning styles has become essential in the evolving landscape of global education. This study focuses on students from Myanmar, Thailand, and China, aiming to uncover insights into their nuanced preferences and approaches to learning English. According to Kolb's Experiential Learning Theory, the students are shown the learning process through experiential skills such as the models of the VARK through the visual, auditory, reading, and writing skills. The cultural, linguistic, and educational diversity within these countries offers a valuable context to understand how students' learning styles are influenced by their unique backgrounds. As the world becomes increasingly interconnected, cross-cultural research in education gains significance. By shedding light on how students from these countries engage with and comprehend the English language, this research aims to contribute to the existing literature. Examining educational backgrounds, including factors such as educational systems, language of instruction, and prior exposure to English, forms a crucial part of this exploration. The research endeavors to provide insights into the dynamic relationship between students' educational backgrounds and their learning styles in English, anticipating implications for educational practices in our interconnected world.



Student learning English 4 skills (preferences)

As seen in the table, this passage addresses the various learning styles of pupils from China, Shan, and Thailand. It highlights how important it is to comprehend these preferences, which are influenced by things like cultural background and educational history, to properly meet the unique demands of each student. The study demonstrates that all three groups have a significant desire to learn English, with speaking abilities being the most prevalent desire (33%), even though there are disparities in preferred learning approaches. According to the study, speaking-style learning is greatly preferred, which may

have been impacted by the focus placed in schools on speaking abilities. Among all groups, listening exercises came in second place (31%) in terms of preference, demonstrating their significance for language development.

The text highlights similarities and differences in preferred learning methods, highlighting the necessity for educators to take these results into account when developing effective language teaching strategies. The statement from a participant emphasizes how speaking English is preferred over grammar because it places less stress on it. Based on the statistics presented, it appears that students' choices for language learning are influenced by the differing degrees of effort required to handle English grammar and structure across different learning modalities. Preferences for reading (23%) and writing (13%) show similarities and differences that underscore the influence of cultural and educational variables. To adapt successful language teaching strategies that meet the demands of students from a variety of backgrounds and needs, educators must have a thorough understanding of these preferences. The study's conclusion highlights the value of individualized learning strategies in English language acquisition by giving participants perspectives on an individual basis.

Deciphering the factors contributing to effective language acquisition involves understanding the habits cultivated by students in their pursuit of learning the English language. This exploration focuses on students at Chiang Rai Rajabhat University, revealing a mosaic of habits shaping their English language learning experiences. According to the study, 27.5% of students find value in the custom of taking notes in English classes, demonstrating their dedication to recording important information. Furthermore, 12.8% place a high priority on routinely reviewing English texts, highlighting the significance of revision for mastering. Seeking support from instructors (7.8%) or working together with peers (13.8%) promotes a feeling of community, whilst 24.1% establishing clear objectives and 14% following a regular timetable demonstrate a methodical approach to English language learning. In conclusion, the diverse learning habits among Chiang Rai Rajabhat University's students reflect a conscientious and thoughtful stance toward mastering the English language, emphasizing the need for educators to acknowledge and support these varied approaches for a dynamic and effective learning experience.

Starting with an investigation of the many approaches taken by students at Chiang Rai Rajabhat University to improve their proficiency in the English language, this study exposes a complex tapestry of techniques that support an all-encompassing and immersive instruction. According to the respondents, 28.4% of students use online resources, highlighting the importance of technology in offering interactive opportunities for skill development. Furthermore, 19.5% actively assess their learning, exhibiting independence in tracking language development, and 14.5% dedicate themselves to self-

reflection, exhibiting attention toward personal advancement. Participating in extracurricular English language activities (21.2%) demonstrates a commitment to practical application, and 16.4% of students say that asking teachers for feedback strengthens a guided and cooperative learning environment.

These practices signify a positive shift towards student-centered learning, aligning with contemporary pedagogical trends and fostering a dynamic, interactive, and real-world-applicable language learning journey (Weimer, 2013). Recognizing and supporting these approaches can enhance language education, encouraging a proactive and dynamic learning stance beyond traditional classroom boundaries.

This study explores the nuanced relationship between motivation and language learning among international students at Chiang Rai Rajabhat University, concentrating on Shan students from Myanmar, Chinese students from China, and Thai students. Regarding Aguila and Harjanto (2016) there is an impact on the student's adaptation to the learning process due to the anxiety in the acquisition of the new language. The research delves into factors driving motivation and the dynamics of language acquisition within a multicultural academic environment. Participants highlighted the importance of understanding diverse English usage, particularly through exposure to various accents, reflecting proactive efforts to navigate global communication intricacies. One Shan participant emphasized the significance of comprehending linguistic variations to overcome communication barriers, while a Thai participant shared a transformative journey, recognizing the institution's role in fostering inclusivity and a globally aware perspective. The findings contribute valuable insights into the intersections of motivation, cultural diversity, and language acquisition, shedding light on the multifaceted nature of English learning in the global higher education landscape.

This exploration delves into the intricate effects of language anxiety on students' learning and communication, emphasizing the multifaceted nature of this construct. Stemming from fears of making mistakes and potential ridicule, language anxiety significantly impacts students' linguistic and emotional dimensions. Regarding this, the respondents have shown agreement in the learning process which makes it not very usual to use the language and leads to the anxiety of being scared to make mistakes. It is matched with the findings of Aguila and Harjanto (2016) which figured out the impact of anxiety in the learning process. On the other hand, the respondents also made comments on the learning process that it is very necessary to be confident and speak the language so that they can overcome the fear of using the new language.

The results highlight the significance of teachers addressing the linguistic and emotional dimensions of language acquisition to establish safe spaces that reduce embarrassment. Furthermore, the study contrasts the learning techniques of Thai, Chinese,

and Shan pupils, exposing a variety of cultural impacts on language learning. In 2019, Holliday and Amadasi made the argument that the growth of the student's learning process might be impacted by the community's variety in terms of culture, identity education (teaching methods), and consideration of cultural differentiation during the learning process. Similar findings to those of Yurtsever and Ozel (2021) indicate that while learning techniques vary due to cultural quirks and educational frameworks, there are also commonalities. This underscores the necessity for nuanced understanding to promote successful language instruction in various cultural contexts.

Conclusions and Discussion

The findings from this research project offer valuable insights into the diverse learning styles of students from Myanmar, Thailand, and China at Chiang Rai Rajabhat University, particularly focusing on English language acquisition. By examining the interplay between cultural contexts and individual learning preferences, this study contributes to the existing literature on cross-cultural research in education.

One significant aspect highlighted in this study is the strong inclination toward speaking as a preferred learning style among degree-seeking students from these countries. When comparing with the model of VARK from Kolb theories by Pashler (2008), this preference for speaking skills, emphasized by 33% of participants, underscores the importance placed on oral communication in language learning, potentially influenced by educational practices that prioritize spoken English proficiency. Additionally, the preference for listening exercises, ranking second at 31%, emphasizes the crucial role of auditory comprehension in language development.

Additionally, the study reveals both similarities and differences in preferred learning methods among the three groups, indicating the influence of cultural and educational variables. For example, the preference for speaking over grammar suggests that students may prioritize practical communication skills over formal language structure. Similarly, while reading and writing are recognized as important components of language learning, their relative preferences vary across cultural backgrounds.

The research also emphasizes the profound impact of cultural backgrounds on students' learning styles, echoing broader literature that acknowledges historical and traditional influences in education. According to Huang (2015), the data have confirmed that there is a difference in the acquisition of a new language due to cultural diversity. Drawing parallels with the entrenched traditional structure of the French educational context, the study reveals the pervasive role of cultural traditions in shaping learning preferences. Participants value storytelling as a means of preserving cultural narratives, highlighting the intertwining of language acquisition with cultural identity, similar to the

French classroom's emphasis on a unified Republic. This underscores the need for educators to incorporate cultural aspects into teaching methodologies.

As we delve into the comparative analysis of learning styles among Shan, Chinese, and Thai students, the study provides a nuanced understanding of cultural influences on language acquisition. While there are similarities in common practices for learning English, the research underscores variations due to cultural nuances and educational frameworks. The comprehensive examination demonstrates distinct approaches embraced by these student groups, contributing not only to linguistics but also to the broader discourse on cross-cultural education (Huang, 2015). The findings highlight the importance of recognizing diverse approaches taken by students from different cultural backgrounds across speaking, reading, writing, and listening, paving the way for inclusive and tailored language education practices (Gokalp, Murat, 2013). These findings underscore the necessity for educators to tailor language teaching strategies to meet the diverse needs and preferences of students from different cultural backgrounds. By recognizing and accommodating these varied approaches, educators can create more dynamic and effective learning experiences for their students.

Despite the valuable insights gained, the research acknowledges limitations, such as potential constraints posed by the availability of time for face-to-face interviews and the complexity of comparing and categorizing differences in learning backgrounds. However, the broader significance of the study extends beyond Chiang Rai Rajabhat University, offering a global perspective on English language education. The research serves as a guide for creating student-centered, engaging, and effective language learning experiences, influencing educational discourse beyond the local context. It emphasizes the need for dynamic and adaptable approaches, calling for inclusive pedagogies that acknowledge and celebrate the diversity of students' backgrounds and preferences. Overall, this study offers valuable insights into the dynamic nature of language learning among international students, emphasizing the importance of cultural sensitivity and personalized approaches in language instruction. By recognizing and accommodating the diverse learning styles and preferences of students, educators can foster more inclusive and effective language learning environments in multicultural academic settings.

In conclusion, our study at Chiang Rai Rajabhat University highlights the complex interactions between cultural circumstances and personal preferences to offer a comprehensive view of students' English learning patterns. Students from China, Thailand, and Myanmar exhibit a wide variety of techniques, which highlights the necessity for specialized teaching approaches. Gupta (2023) highlights that the increasing demand for practical, communicative language skills, coupled with the evolving landscape of technology-driven learning, underscores the necessity for English language education to

adopt a flexible and inclusive approach. According to DeCapua and Wintergerst (2016), effective cross-cultural education relies on an understanding of how cultural backgrounds influence learning, thereby providing crucial context to discussions surrounding inclusive language learning environments.

Furthermore, our comprehensive examination of the educational backgrounds of the students has revealed significant insights into the factors influencing their learning preferences. Our findings demonstrate that students from diverse nations possess varied cultural, linguistic, and educational backgrounds, which serve as crucial determinants in shaping their approaches to language acquisition. Building upon prior literature, our analysis underscores the importance of recognizing and understanding these differences to inform the development of effective instructional strategies.

Drawing on the thematic results derived from our study, we observe a spectrum of learning styles among students. This variation underscores the necessity for educators and policymakers to tailor instructional approaches to accommodate diverse learning preferences. By integrating insights from previous research, we substantiate the argument that acknowledging and addressing these differences is paramount for creating inclusive and effective language learning environments.

Moreover, our analysis contributes to the field of linguistics by highlighting the significance of adopting flexible and dynamic instructional methods. By synthesizing existing literature with our empirical findings, we advocate for the implementation of inclusive pedagogical practices that cater to the diverse needs of students. This academic discourse serves to enrich the discussion surrounding the optimization of language learning settings at Chiang Rai Rajabhat University. In conclusion, our study underscores the imperative for educators to identify and promote a range of learning practices to foster proactive and thoughtful learning habits among students. By embedding our findings within a robust academic framework, we enhance the scholarly value of our paper and provide actionable insights for advancing English language education in culturally diverse contexts.

Recommendation

Chiang Rai Rajabhat University should adopt flexible pedagogical strategies to accommodate diverse learning preferences among students from Myanmar, China, and Thailand. This includes incorporating practical and communicative language skills into the curriculum, tailoring teaching methods to individual needs, and integrating cultural awareness and sensitivity into language education programs. Adopting dynamic approaches in language education, valuing diverse strategies across speaking, reading, writing, and listening skills, and creating a supportive atmosphere are also recommended. This aligns with proactive habits like online resources and extracurricular activities.

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Graduation Probability Among Undergraduates at Ramkhamhaeng University: Using Data Analytics to Settle the Age-Old Question "*Is [Insert Program Here] A Hard Major?*"

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Abstract

Undergraduate education enrollment is growing worldwide, and the question of "Is [insert field here] a "difficult" major?" still does not have a reliable answer. The objective of this study is to compare the difficulty of 4-years undergraduate programs at Ramkhamhaeng University, using the graduation rate as a proxy measure. The author extracted open-access data on enrollment of the 2017 cohort and the number of graduates in the 2021 commencement from the University's website and analyzed data using descriptive statistics. The author found that more than 32,000 enrolled in the 2017 cohort of undergraduates at Ramkhamhaeng University, with the highest enrollment in the Faculty of Political Science (nearly 10,000). At the 2021 commencement, there were more than 11,000 graduates (overall graduation probability = 36%). The Faculties of Science and Economics had the lowest graduation probabilities (less than 15% each), whereas the Faculty of Political Science had the highest graduation probability (approximately 54%). The low enrollment in the Faculty of Science might have reflected a gap in STEM education in Thailand. Science and Economics could be considered as the faculties with higher levels of difficulty within Ramkhamhaeng University, whereas the Faculty of Political Science could be considered as the opposite. However, the system for program transfers could have introduced bias to the study findings, and the unique context of Ramkhamhaeng University limits the generalizability of the study findings.

Keywords: Major, Field of study, Student graduation, Higher education, Thailand

Introduction

Undergraduate education enrollment is growing worldwide. In 2021, there were approximately 220 million students enrolled in formal post-secondary education worldwide, and the number is projected to grow to 380 million by 2030 (Murthi & Bassett, 2022). With this growth in enrollment, stakeholders in higher education are increasingly pressured to answer the following questions from students who may be uncertain with regard to their choice of discipline: *Is [insert field here] a "difficult" major*?

Difficulty is an inherently subjective construct with no standard approach to its measurement. Previous authors have used measures such as average self-reported hours of study and class preparation (Muniz, 2019), students' ratings of professors (Novik, 2022), or even subjective perception (Conlin, 2023). These findings have been inconsistent, and the academic program difficulty remains an open question.

Four-year graduation rates are often used to measure the performance of universities based on the notion that the higher graduation rate reflects the higher accountability of institutions (Gold & Albert, 2019). The author hypothesizes that four-year graduation rate can also be used to measure the difficulty of academic programs, particularly when the undergraduate education system is flexible and enables enrollment and degree completion at one's own pace. Ramkhamhaeng University is an open university in Thailand with a relatively low-cost and flexible enrollment system, where there is no academic probation or dismissals, students are awarded their degree upon completion of all required coursework, but are also free to change their major at any time after having enrolled for more than one semester (Ramkhamhaeng University, 2017a).. Students who are enrolled in programs where classes generally have low probability of passing may decide to disenroll from the University or change to programs where classes generally have higher probability of passing. Thus, the number of graduates in a given commencement divided by the number of enrolled students four years prior can serve as a rough estimation of the four-year graduation rates, which then can serve as a proxy for the "difficulty" of an academic program. Such findings may be of interest to stakeholders in higher education and social-economic development (Hammoudi Halat et al., 2023; Leonhardt & Chinoy, 2019; Silver, 2023).

Objectives

The objective of this study is to compare the difficulty of 4-years undergraduate programs at Ramkhamhaeng University, using the graduation rate as a proxy measure, based on enrollment data of the 2017 cohort and the number of graduates in the 2021 commencement.

Conceptual / Theoretical Framework

The conceptual framework for this analysis is presented as Figure 1.

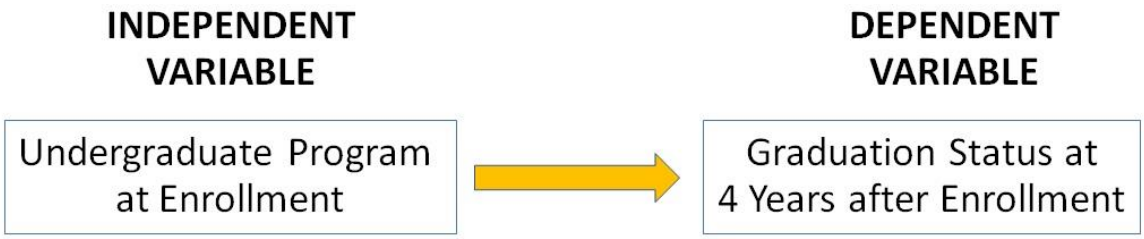

Figure 1: Conceptual Framework

Materials and Methods

Study Design

This study is a cross-sectional study using secondary data from the Office of Academic Services and Assessments at Ramkhamhaeng University.

Study Setting: About Ramkhamhaeng University

Ramkhamhaeng University is a public, knowledge market university with open-door policy in Thailand. The flagship campus is located in Bangkok, Thailand. The main academic faculties of the University include Law, Business Administration, Humanities, Education, Science, Political Science, Economics, Mass Communication, and Human Resource Development(Ramkhamhaeng University, 2019). The author excluded the Faculty of Education from the analyses due to changes in admission procedures and curriculum being offered during the 2017 academic year. Undergraduate education at Ramkhamhaeng University differs from other universities with relatively low tuition fees, optional class enrollment, lack of academic probation or dismissal, and policy for credit transfer and re-enrollment (Table 1). In addition to the programs at the Main (Bangkok) campus, the University also offers distance education at regional campuses although with only four majors available (Law, Management, Political Science, and Mass Communication). Graduation data did not disaggregate for Main vs. regional campus status. Thus, the author decided to include enrollment data from all regional campuses in this analysis.

Table 1: Features of Ramkhamhaeng University vs. Selected Higher Educational Institutions Offering 4-Years STEM Degrees in Thailand

Domain	Kasetsart University	Thammasat University	Mahidol University	Ramkhamhaeng University
Tuition Fees for students in regular programs	12,900 to 17,300 THB per semester	13,800 to 21,100 THB per semester	20,000 to 50,000 THB per semester	25 THB per semester hour. Total approximately

Domain	Kasetsart University	Thammasat University	Mahidol University	Ramkhamhaeng University
				1,000 to 1,500 THB per semester
Enrollment spaces	Limited	Limited	Limited	No limit
Lecture and Lab Participation	Mandatory	Mandatory	Mandatory	Optional
Secondary education background	STEM programs open only to those who studied science and mathematics in high school	STEM programs open only to those who studied science and mathematics in high school	STEM programs have high school GPA and admission test scores requirements	Applicant with high school or equivalent qualification can apply to any program
Procedures for Changing Majors	Permission required from Deans of outgoing and incoming faculties	Permission required from Deans of outgoing and incoming faculties	Permission required from Deans of outgoing and incoming faculties	Possible with a routine visit to the Office of Academic Services and Assessments
Class assignments	Given, graded as part of the overall grade for a given class	Given, graded as part of the overall grade for a given class	Given, graded as part of the overall grade for a given class	Given in some classes, but not graded and submission is optional.
Academic Probation and Dismissal	Probation in case of GPA of less than 2.00. Dismissal in case of GPA of less than	Probation in case of GPA of less than 2.00. Dismissal in case of GPA of less than	Probation in case of GPA of less than 2.00. Dismissal in case of GPA of less than	No probation or dismissal. Failures (F) grades not included in the final transcript

Domain	Kasetsart University	Thammasat University	Mahidol University	Ramkhamhaeng University
	1.50, or GPA of less than 1.75 for 2 consecutive semesters	2.00 for 3 consecutive semesters	1.80 for one academic year, or 2 consecutive academic years with GPA of less than 2.0	
Re-examination	At the instructor's discretion	At the instructor's discretion	At the instructor's discretion	Available for every registered class
Credit Transfer from other Post-Secondary Institutions	At the discretion of the program committee chairperson with approval by the Dean of the Faculty	At the discretion of the Dean through the Faculty Board's approval	Requires approval from the Program Committee as well as the Rector	Yes. Standard policy exists with regard to credit transfer
Re-enrollment for students who do not complete degree within 8 years	Provision available. No standard procedures exist.	No standard procedures exist	No standard procedures exist	Yes. Standard procedures exist with regard to credit transfer

Sources: (Kasetsart University, 2020, 2023; Mahidol University, 2021; Ramkhamhaeng University, 2017d, 2017a; Thammasat University, 2018)

Data Collection

The author accessed publicly-available data from the Office of Academic Services and Assessments at Ramkhamhaeng University(Ramkhamhaeng University, 2024b) regarding number of registrations at the Main (Bangkok) and regional campuses during the first semester of the 2017 academic year(Ramkhamhaeng University, 2017b, 2017c). The author also accessed data on graduation of the class of 2021(Ramkhamhaeng University, 2024a).

These data were reported as aggregates and published each semester by the Office of Academic Services and Assessments. Permission was not required to access the study data.

Data Management

All available data from the source were in PDF format, thus the author developed a spreadsheet for data entry and perform data entry manually with no double entry due to lack of time and available human resource. All sums in the original PDF document were double-checked with manual calculation on spreadsheet during data cleaning as both a way to verify the sums and to detect possible data entry errors.

Data Analysis

After data cleaning, the author excluded programs that did not accept enrollment by students in the 2012 cohort from the analyses. The author also excluded programs with fewer than two enrollments by the 2012 cohort throughout the 2012 to 2015 academic years from the analyses. The author used univariate descriptive statistics, calculated by spreadsheet. All analyses were disaggregated by faculty, subject major, and semester.

Ethical Consideration

This study did not involve any personally-identifiable information at the individual level, and thus likely does not fall under the criteria for human subject research. The author nonetheless requested and received permission to conduct this secondary analysis from the Human Research Ethics Unit, Faculty of Medicine, Prince of Songkla University (REC.64-141-18-2).

Results

In the 2017 cohort at Ramkhamhaeng University, more than 32,000 students enrolled, three-fourths of whom were at the Main Campus in Bangkok (*Table 2*), the vast majority in the social sciences and humanities (Law, Political Science, Mass Communication, Humanities) and just over 3 percent at the Faculty of Science. At the 2021 commencement, there were more than 11,000 graduates, thus the overall graduation probability was 36 percent. There were wide variations in graduation probability by Faculty, as well as within each faculty. Science and Economics were the faculties with the lowest graduation probabilities, whereas Political Science was the faculty with the highest graduation probability.

Table 2: Number of Registered Students in the 2017 Cohort and Number of Degree Recipients in the Class of 2021 at Ramkhamhaeng University's Main and Regional Campuses

Faculty and Programs	Main, Semester 1/2017	Regional, Semester 1/2017	Total Semester 1/2017	Grads, Class of 2021	Four-year graduation probability
Faculty of Law (all majors)	**5,518**	**3,070**	**8,588**	**3,025**	**35.2%**
Faculty of Business Administration (all majors)	**5,405**	**1,604**	**7,009**	**1,571**	**22.4%**
Management	1,104	1,604	2,708	675	24.9%
Finance and Banking	345	-	345	54	15.7%
Marketing	993	-	993	274	27.6%
Accounting	1,637	-	1,637	355	21.7%
Advertising and Public Relations	93	-	93	9	9.7%
Service Business Management	439	-	439	32	7.3%
Human Resources Management	233	-	233	79	33.9%
International Business	345	-	345	55	15.9%
Tourism	216	-	216	38	17.6%
Faculty of Humanities (all majors)	**3,776**	**-**	**3,776**	**849**	**22.5%**
English	1,918	-	1,918	399	20.8%
Thai	322	-	322	124	38.5%
History	142	-	142	58	40.8%
French	34	-	34	10	29.4%
German	50	-	50	8	16.0%
Philosophy	40	-	40	21	52.5%
Sociology and Anthropology	163	-	163	91	55.8%
Information Studies	46	-	46	6	13.0%
Spanish	25	-	25	9	36.0%
Russian	10	-	10	2	20.0%

Faculty and Programs	Main, Semester 1/2017	Regional, Semester 1/2017	Total Semester 1/2017	Grads, Class of 2021	Four-year graduation probability
History for Tourism	133	-	133	11	8.3%
Chinese Language	440	-	440	64	14.5%
Japanese	453	-	453	46	10.2%
Faculty of Science (all majors)	**768**	**-**	**768**	**78**	**10.2%**
Mathematics	73	-	73	3	4.1%
Statistics	12	-	12	-	0.0%
Chemistry	48	-	48	7	14.6%
Physics	35	-	35	7	20.0%
Biology	62	-	62	11	17.7%
Computer Science	251	-	251	9	3.6%
Operations Research	3	-	3	1	33.3%
Materials Technology	4	-	4	6	150.0%
Food Technology	50	-	50	11	22.0%
Electronics Technology	31	-	31	3	9.7%
Biotechnology	9	-	9	4	44.4%
Environmental Science	52	-	52	5	9.6%
Agricultural Technology	41	-	41	10	24.4%
Information Technology	97	-	97	1	1.0%
Faculty of Political Science (all majors)	**7,106**	**2,752**	**9,858**	**5,329**	**54.1%**
Faculty of Economics (all majors)	**328**	**-**	**328**	**41**	**12.5%**
Faculty of Mass Communication Technology (all majors)	**1,390**	**374**	**1,764**	**714**	**40.5%**
Mass Communication	1,390	374	1,764	714	40.5%
Faculty of Human Resources Development (all majors)	**307**	**-**	**307**	**83**	**27.0%**
TOTAL	**24,598**	**7,800**	**32,398**	**11,690**	**36.1%**

Conclusions and Discussion

In this secondary data analysis, the author extracted data on enrollment and graduation at Ramkhamhaeng University, an open university and one of the largest universities in Thailand. The author analyzed the data using descriptive statistics to gain insights on the difficulty of academic programs as measured by graduation probability. The findings of this study should yield insights for stakeholders in higher education, and social and economic development.

Using graduation probability as a proxy measure for program difficulty, it is possible that the Faculties of Political Science and Mass Communication had majors with the lowest level of difficulty within the 2017 cohort at Ramkhamhaeng University, whereas the Faculties of Science and Economics had majors with the highest level of difficulty. However, the graduation probability reported in this study could have been confounded. Ramkhamhaeng University's graduating class is based on the year of graduation conferral and not enrollment. Thus, the number of graduates did not include only members of the cohort that enrolled four years prior, but also members of earlier cohorts who graduated late and members of later cohorts who graduated early. This issue may be particularly common in programs with relatively low number of enrolled students and graduates. For example, if the BS (Statistics) program graduated just one student instead of none for the 2017 commencement, the graduation probability would have risen from 0 percent (0/12) to approximately 8 percent (1/12). Similarly, had 50 students enrolled in the BA (Spanish) program instead of 25, the graduation probability would have changed from 36% (9/25) to just 18% (9/50), i.e., from among the "easier" programs to among the "more difficult" programs at the Faculty of Humanities. Future studies should consider aggregating data from multiple years into a period cohort spanning a range of enrollment years and graduation years, which may help to partially account for this delayed and early graduation effect

One additional issue that should be considered is the overall low number of enrollment and graduates in the Faculty of Science, which offered programs in STEM (science, technology, engineering, and mathematics) fields. Enrollment and retention of STEM students at the tertiary level have been a chronic issue in both developed and developing economies (Graham et al., 2013; Toven-Lindsey et al., 2015). The undergraduate education system at Ramkhamhaeng University can be regarded, to an extent, as a natural experiment in education when barriers to STEM education were removed. The system at Ramkhamhaeng should have overcome the traditional barriers regarding financial concerns (Casanova et al., 2023; Costello et al., 2023), grade-related issues (Casanova et al., 2023), demographic and socioeconomic characteristics (Costello et al., 2023), and lack of academic opportunities (Costello et al., 2023). Yet just over three

percent of the students chose a science program. The existing gaps could be either competition from other disciplines (Wernick & Ledley, 2020) or additional social-psychological factors that are unique to STEM fields (Xie et al., 2015). Future studies should consider in-depth primary data collection and analyses of STEM students who remained in their program, transferred to other programs, or disenrolled from Ramkhamhaeng University to gain further insights, which can be potentially useful to relevant stakeholders.

The strength of our study is the approach in combining separate registration and graduation data to yield insights on graduation probability. However, a number of limitations should be considered in the interpretation of our study findings. Firstly, we did not take faculty transfer during the course of study into account due to lack of program-specific data. This could have led to over-estimated graduation probability for certain Faculties and under-estimated probability at others. Secondly, Ramkhamhaeng University tends to attract non-traditional students compared to other institutions, students are known to engage in full-time work in parallel with their studies, and those who do not finish their degree on the first attempt may re-enroll and continue their studies at a later date. This specific context may limit the generalizability of the study findings.

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Using 5E Teaching Method to Improve Mathematics Learning Ability for Primary School Students

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Abstract

The objectives of this study were 1) to use 5E teaching method to improve mathematics learning ability for primary school students; 2) to compare mathematics learning ability before and after the implementation base on 5E teaching. The sample group consists of 50 students from 3/1 class of third grade students of Heyuan No. 4 Primary School, who were selected through the whole cluster random sampling method. The research instruments included 1) lesson plans for using the 5E teaching model and 2) mathematics learning ability measurement scales. The data were statistically analyzed using mean, standard deviation and t-test for dependent samples. The results showed that: 1) the study found that the 5E teaching method can improve mathematics learning ability; 2) after adopting the 5E teaching method, the mathematics learning ability of primary school students was significantly higher than before class, with statistical significance reaching the 0.01 level.

Keywords: 5E Teaching Method, Mathematics Learning Ability, Primary School Students

Introduction

Teaching method is a strategy to develop learners' skills to match the demands of a changing society. According to the Outline of Curriculum Reform of Basic Education, teachers should actively interact and develop with students in the teaching process, properly handle the relationship between implanting knowledge and cultivating ability, pay attention to cultivating students' creativity and independent learning ability, guide students to have critical thinking and initiative in the learning process, and deeply understand knowledge through questioning, investigation and analysis. At the same time,

it is also necessary to combine learning with practice, so that students can master and use knowledge in practice, to improve the learning effect. (Cheng Xiaomeng ,2022).

Mathematics curriculum standards point out that mathematics learning should be an active and in-depth way of learning and cannot rely solely on imitation and memorization. On the contrary, students should truly understand and master the basic knowledge and skills of mathematics through hands-on practice, independent analysis and cooperative communication, and develop mathematical ideas and methods(Chen Mohua,2021).

Wei Chi. (2015) believes that good mathematics learning ability is related to a person's comprehensive quality. It is the need for students to improve their comprehensive ability, the need to further deepen the reform of mathematics education, and the need to overcome obstacles to mathematics learning.

Primary school is a key period to cultivate students' learning ability, including students' learning motivation, perseverance and ability, and students' learning efficiency, learning results and comprehensive quality are closely related. Adopting effective teaching methods is very important to improve students' learning ability in mathematics, and it is an important prerequisite to cultivate students' good learning habits, increase their knowledge and improve their learning quality. (Yue Chuan, 2020) Primary school mathematics isa basic subject teaching, which has a wide range of application and practice. From the perspective of primary school students' mathematics learning psychology, students' learning process is not a passive absorption process, but a reconstruction process based on existing knowledge and experience. From the perspective of our educational goal, while imparts knowledge, we should pay more attention to cultivating students' comprehensive ability of observation, analysis and application, so that students can independently carry out research-based learning in mathematics learning and further improve their learning ability (Hu Jian, 2018).

At present, the law of physical and mental development of primary school students has certain particularity, and the current teaching content and teaching method of primary school mathematics cannot adapt to this particularity. This leads to a lack of enthusiasm and interest in learning mathematics, and poor learning results. In order to improve this situation, teachers need to pay more attention to the law of physical and mental development of primary school students, adjust the teaching content and teaching methods appropriately, so as to stimulate students' learning enthusiasm and interest and improve their learning effect (Qiao Hong,2021).

The predecessor of 5E teaching model is the "learning loop" model proposed by two scholars in Berkeley University, which is based on Piaget's genetic epistemology. The "learning loop" model includes three links: exploration, concept introduction and concept

application. With the development of science education reform and the penetration of learning theories such as constructivism, the "learning loop" model has gradually developed into the 5E teaching model that we are familiar with today. The 5E is the five levels of learning: Engagement, Exploration, Explanation, Elaboration, and Evaluation. The setting of these five stages not only conforms to the law of students' cognitive development, but also conforms to the theme of the new curriculum reform(Huang Ruocheng,2022).

Summarizing the 5E teaching mode, these five-teaching links are relatively independent and interrelated, constituting a closed loop of classroom teaching. Each link has its own unique educational ideas and values, such as the stimulation link pays attention to the setting of inspiring questions, the explanation link emphasizes the process and method of students' understanding of new knowledge, and the expansion link pays attention to the cultivation of students' independent learning and innovative ability.

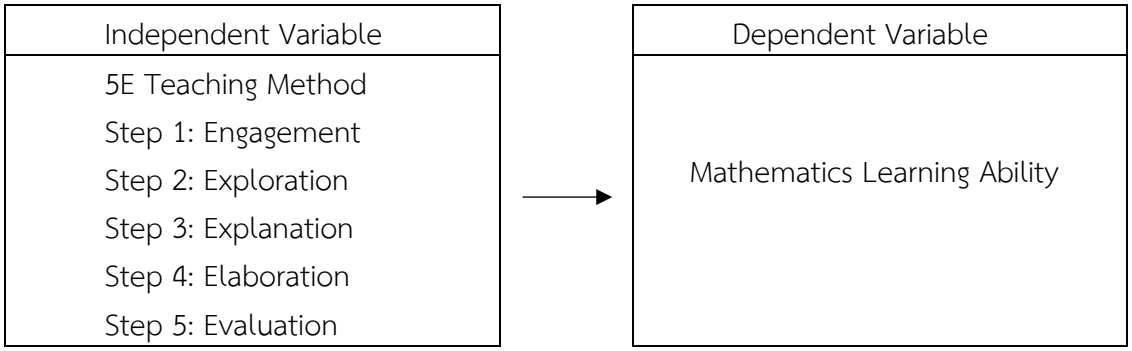
To sum up, the adoption of 5E Teaching Method has a significant promoting effect on improving the Mathematics Learning Ability of primary school students. Through this teaching method, students can better grasp knowledge and improve their learning initiative and problem-solving skills. Therefore, I choose "Using 5E Teaching Method to improve Mathematics Learning Ability for Primary School Students" as my research topic. Our goal is not only to improve student learning ability, but also to have a positive impact on the future teaching of mathematics in the classroom.

Objectives

1. To use 5E Teaching Method to Improve Mathematics Learning Ability for Primary School Students.
2. To compare Mathematics Learning Ability before and after the implementation base on 5E Teaching.

Concept theory framework

Using 5E Teaching Method to improve Mathematics Learning Ability for Primary School Students. The research concept framework is as follows:



Research Methods

1) Lesson plans for using the 5E teaching model and Mathematics Learning Ability measurement scales.
2) The data were statistically analyzed using mean, standard deviation and t-test for dependent samples.

Population and samples

Population

There are 300 third grade students in Heyuan No. 4 Primary School, with 6 classes of room 3/1, room 3/2, room 3/3, room 3/4, room 3/5,room 3/6 and 50 students in each class.

The Sample Group

Through the cluster random sampling method, by considering from classes with grades mixed of high level, medium level and low level. 50 students with classes in room 3/1 from third grade students of Heyuan No. 4 Primary School.

Research Instruments

The research Instruments is as follows:

1. Lesson plan according to the 5E Teaching Method.

The researchers used 5E teaching theory to design 3 Chapters, 12 hours in total.

1.1 Used as a guide for developing learning objectives, content, and for organizing measurement and evaluation of course activities.

1.2 To conduct an index analysis based on the core learning content of a group, we need to set learning objectives, determine the learning content, and estimate the teaching time.

1.3 Learn relevant concepts and theories from literature, books, textbooks, and related research, and develop corresponding study plans.

1.4 The researcher's teaching curriculum for using 5E Teaching Method to improve Mathematics Learning Ability for Primary School Students consisted of three chapters. Chapter 1: Understand the meaning of Area, 4 hours; Chapter 2: Understanding the origin of Area units, 4 hours and Chapter 3: Converting Area Units, 4 hours, for a total of 12 hours. Each chapter was developed based on 5E Teaching Method: 1) Engagement; 2) Exploration; 3) Explanation; 4) Elaboration; 5) Evaluation.

1) Engagement: This session is designed to stimulate students' interest in participation and inquiry.

2) Exploration: Students engage in authentic and effective inquiry, experience and learn key concepts, acquire new skills, and gain the experience of researching, inquiring and questioning.

3) Explanation: Group members exchanged speeches and group representatives

exchanged reports.

4) Elaboration: Students are able to make full use of previously learned knowledge and concepts to apply, explain and solve problems in new and approximate situations.

5) Evaluation: A variety of evaluation methods, such as teacher evaluation, student self-evaluation, group mutual evaluation, etc., are used to discover whether students have mastered the knowledge and concepts.

Validity and Reliability of the Instrument

1.5 Study the process of developing an instrument quality checklist.

1.6 Measurement and evaluation of learning outcomes.

1.7 Submit the completed teaching plan to the tutor, check the consistency and applicability of the content, and make modifications based on the suggestions from the tutor's reply.

1.8 Submit the revised teaching plan to three experts for review to verify the accuracy and applicability of the teaching content, and the consistency of learning objectives, content, learning activities, teaching media, and measurement and evaluation. Find the IOC (Index Target Consistency).

Table 1: Evaluation Results of Chapter

Using 5E Teaching Method to improve Mathematics Academic Performance for student primary school	hours	IOC	Evaluation results
chapter 1: Understand the meaning of Area	4	1.00	accept
chapter 2: Understanding the origin of Area units	4	1.00	accept
chapter 3: Converting Area Units	4	1.00	accept

1.9 Each curriculum activity plan had a consistency index greater than or equal to 0.50 and was considered suitable for use in research. The analysis result of the IOC (Index Objective Congruence) is that each chapter is 1.00.

Data Analysis

2. Mathematics Learning Ability measurement form

2.1 Analyze the content of Mathematics Learning Ability consistent with the curriculum activity plans.

2.2 Learn theories and methods of Mathematics Learning Ability assessment from the literature and relevant research.

2.3 Determine the scoring criteria for the aptitude test: 1 point for a correct answer to a multiple-choice question, 0 points for a wrong answer, 1 point for a correct answer to a judgment question, 0 points for a wrong answer, 3 points for a correct answer to the first point of an applied question, 1 point for a correct answer to the second point, and 1 point for a correct answer to the third point. A point is worth 1 point, all correct answers are worth 5 points, and all wrong answers are worth 0 points

2.4 Submit the designed Mathematics Learning Ability evaluation criteria to the thesis supervisor, check their accuracy, and make modifications.

2.5 Submit the Mathematics Learning Ability evaluation criteria created to three experts for measurement and inspection. Experts check the Content Validity and calculate the Index of Item Objective Congruence (IOC). The consistency indicator of each evaluation content is greater than or equal to 0.50 and is considered suitable for research. The IOC (Index of Item Objective Congruence) value for each item in this evaluation standard is 1.00.

2.6 Revise and improve the scoring criteria, then try out with students who were not the sample to ensure the quality of the assessment.

2.7 Check the reliability of measurement standards using Cronbach's α Coefficients is 1, which can be used for research.

Symbol and Abbreviations

Represent data analysis results based on symbols and semantics**.** The details are as follows**:**

$\bar{X}$	means	average value
SD.	means	standard deviation
n	means	number of students
D	means	scores of differences between pre and post test
df	means	degree of freedom
t	means	statistical data for t-test value
**	means	statistical significance at level .01

Results

The study using 5E Teaching Method to improve Mathematics Learning Ability for undergraduates**.** The researchers conducted research in the following order:

Part 1**:** Using 5E Teaching Method, the teaching curriculum is designed to improve Mathematics Learning Ability for student primary school.

Firstly, the researcher analyzed the content, background, importance, purpose and significance of 5E Teaching Method through literature research, understood the current status of research on 5E Teaching Method, clarified the constituent elements, necessity and methodological content of teaching Mathematics Learning ability through the teaching

purposes and requirements of the current curriculum system, as well as the current status of research in the current context. Finally, the development of a teaching curriculum based on 5E Teaching Method was identified to improve Mathematics Learning ability of student primary school.

Secondly, the instructional course was conducted through 5E Teaching Method in order to improve Mathematics Learning ability of student primary school, and this instructional course was divided into the following 3 parts, totaling 12 hours. This course consists of 3 chapters. Chapter 1: Understand the meaning of Area, 4 hours; Chapter 2: Understanding the origin of Area units, 4 hours; Chapter 3: Converting Area Units, 4 hours. Each lesson plan was developed based on 5E Teaching Method: 1) Engagement 2) Exploration 3) Explanation 4) Elaboration 5) Evaluation.

Thirdly, from the specifics of the teaching course mentioned above, the researcher through the random cluster sampling method, by considering from classes with grades mixed of high level, medium level and low level. 50 students with classes at room 3/1 from third grade students of Heyuan No. 4 Primary School.

Part 2**:** To compare student's Mathematics Learning ability before and after implementation base on 5E Teaching Method.

In this section, we aim to evaluate the effectiveness of 5E Teaching Method of teaching, the researcher tested and analyzed Understand the meaning of Area, Understanding the origin of Area units and Converting Area Units of 50 students in primary school student before and after participating in a 12 hours instructional course in an instructional class. presentation was tested and analyzed. The teaching effectiveness of the instructional course was analyzed as follows.

The researcher analyzed using 5E Teaching Method to compare Mathematics Learning Ability before and after implementation. In this research, 50 students in primary school were selected as experimental subjects in this study, including 30 female students (60.00%) and 20 male students (40.00%). The evaluation standard of Mathematics Learning Ability consists of 32 evaluation items. Each evaluation item is worth 1-3 points, totaling 40 points. The results are summarized in Table 2 below.

Table 2 score on Mathematics Learning Ability before and after implementation through 5E Teaching Method. As can be seen in Table 2, through the application of teaching theory based on 5E teaching method, Mathematics Learning Ability scores for primary school student before and after the class averaged 17.80 before the class and 33.94 after the class, with a difference of 16.14 points in the average scores, which indicates that the scores of after the class were higher than those of before the class.

The researcher conducted data analysis using the mean, standard deviation, and dependent t-test based on the students' Mathematics Learning Ability scores before and after the class. The results of the data analysis are presented in Table 2.

Table 2: Mathematics Learning achievement score between before and after learning

Student ID	Pre-test Scores (Full Score=40)	Post-test Scores (Full Score=40)	Difference Scores (D)
1	18	29	11
2	14	31	17
3	12	33	21
4	13	34	21
5	14	30	16
6	16	35	19
7	17	37	20
8	14	32	18
9	14	30	16
10	15	33	18
11	14	31	17

Table 2: Mathematics Learning achievement score between before and after learning (continue)

Student ID	Pre-test Scores (Full Score=40)	Post-test Scores (Full Score=40)	Difference Scores (D)
12	13	32	19
13	24	35	11
14	16	36	20
15	20	37	17
16	21	38	17
17	19	33	14
18	16	31	15
19	18	34	16
20	22	36	14
21	17	32	15
22	15	33	18
23	24	35	11
24	19	31	12
25	16	31	15
26	25	36	11
27	15	37	22
28	19	38	19
29	18	33	15
30	13	31	18
31	16	34	18
32	16	36	20
33	20	32	12
34	21	33	12
35	19	35	16
36	18	31	13

Table 2: Mathematics Learning achievement score between before and after learning (continue)

Student ID	Pre-test Scores (Full Score=40)	Post-test Scores (Full Score=40)	Difference Scores (D)
37	18	30	12
38	19	35	16
39	17	37	20
40	15	32	17
41	24	39	15
42	23	33	10
43	14	31	17
44	23	32	9
45	18	31	13
46	21	36	15
47	16	37	21
48	17	38	21
49	17	34	17
50	19	35	16
$(\bar{X})$	17.80	33.94	16.14
SD	3.57	2.62	3.37

Table 3: Comparison of students' Mathematics Learning Ability before and after the Implementation of the Instructional Program through 5E teaching method

Mathematics Learning Ability	n	full scores	$\bar{X}$	SD.	t	p
Pre-test	50	40	17.80	3.57	33.88**	.00
Post-test	50	40	33.94	2.62		

**Statistically significant at the level .01($p<.01$)

According to Table 3, through the implementation of 5E teaching method with the students, their Mathematics Learning Ability post-class significantly improved compared to their ability before the class. This supports the research hypothesis and demonstrates a statistically significant improvement at the level .01.

Conclusions and Discussion

Conclusion

According to the research topic, the summary of the research on development of Mathematics Learning Ability in Area course using 5E Teaching model of grade 3 students was as follows:

1. The development of learning achievement in Area course using 5E Teaching model which includes five steps: Step 1. Engagement: This session is designed to stimulate students' interest in participation and inquiry. Step 2.Exploration:Students engage in authentic and effective inquiry, experience and learn key concepts, acquire new skills, and gain the experience of researching, inquiring and questioning. Step 3. Explanation: Group members exchanged speeches and group representatives exchanged reports. Step 4. Elaboration: Students are able to make full use of previously learned knowledge and concepts to apply, explain and solve problems in new and approximate situations. Step 5. Evaluation: Through teacher evaluation, student self-evaluation, group mutual evaluation and other evaluation methods, find whether students have mastered the knowledge and concepts. This method can improve the learning effect of the third-grade students in the Area course and reach the goal of the research.

2. The comparing students' Mathematics Learning Ability before and after teaching with the 5E Teaching model, the average score for primary school students in pre-class assessments was 14.52 of full score 30 , and in post-class assessments, it was 24.64. The post-class assessment scores were significantly higher than pre-class assessment scores at a statistical significance level of .01. This aligns with the research hypothesis.

Discussion

The objective of this study is to empower primary school students to improve their Mathematics Learning Ability through 5E Teaching model. The results of this research can be discussed as follows:

1. Using the 5E model to develop the learning outcomes of the "Primary School Mathematics - Area" course, the researchers divided lesson plan writing into five steps according to the 5E teaching model: 1) classroom introduction, 2) independent exploration, 3) scientific explanation, 4) In-depth exploration and problem solving, 5) evaluation. Academic performance is evaluated through examinations. Data analysis: Three experts evaluated the quality of the teaching plans based on the 5E teaching model. The results were evaluated by the experts on the quality of the teaching plans. It is necessary to use the 5E teaching model to improve academic performance. The 5E teaching model provides an active and interactive learning environment, stimulating students' enthusiasm for learning and cultivating their cooperation and problem-solving abilities. This teaching model helps students actively participate in the learning process, thereby improving their

academic performance. The research results are consistent with Deng Haimei(2021) research on the application of the 5E teaching model in the teaching of "Graphics and Geometry" in primary school mathematics. The application of the 5E teaching model in the teaching of "Graphics and Geometry" in primary school mathematics has improved students' enthusiasm and initiative in learning to a certain extent, and stimulated students' interest in learning. In particular, the exploration and explanation links have established a good foundation for students' cooperation and communication. The platform can effectively improve students' communication and collaboration skills and improve students' classroom participation. The use of the 5E teaching model in the teaching of "Graphics and Geometry" in primary school mathematics is beneficial to improving students' performance. It can be seen that this model is a feasible and effective teaching model. Therefore, advocating and implementing the 5E teaching model is particularly important in the field of education.

2. Comparison of Mathematics Learning Ability before and after the implementation of the 5E teaching model. The researcher reviewed a large number of literature and research related to the 5E teaching model and conducted research based on the 5E teaching model. The research results show that in the primary school mathematics-area course, the use of the 5E teaching model can promote the improvement of students' Mathematics Learning Ability. The results showed that the average score before learning was 17.80 points, and the average score after learning was 33.94 points, with an average difference of 16.14 points. The results showed that students scored an average of 17.80 points (SD = 3.57) in the pre-course assessment and 33.94 points (SD = 2.62) in the post-course assessment. The post-course assessment scores were significantly higher than the pre-course assessment scores, and the difference was statistically significant (0.01). The 5E teaching model brings new possibilities to traditional classroom teaching. This teaching model has shown good results in improving Mathematics Learning Ability and stimulating students' interest in learning and achieved the purpose of the research.

To sum up, the 5E teaching method provides a positive and effective mathematics learning environment for primary school students with its gradual, exploratory and participatory characteristics. It helps students establish a solid foundation in mathematics and develops their logical thinking, problem-solving and innovation abilities, enabling them not only to master mathematical knowledge, but also to apply the knowledge they have learned to real life. Therefore, the 5E teaching method is considered a successful teaching strategy and is of great significance to the improvement of primary school students' mathematics learning ability.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Teachers should receive the necessary training to learn how to make the most of this teaching method.

2. In addition to teacher training and learning, schools and educational institutions should also provide high-quality learning materials to assist teaching.

3. Under the 5E Teaching Method, students should be encouraged to actively participate in discussions and exchanges, ask questions, and share their opinions. This engagement helps build a learning community among students and promotes deep learning.

4. Under the 5E Teaching Method, class time mainly focuses on in-depth discussion, group cooperation and communication analysis. Teachers should design interesting and challenging activities to promote student interaction and discussion.

5. Under the 5E Teaching Method, teachers should regularly collect feedback from students to understand their learning progress and needs, and adjust teaching strategies accordingly.

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Using Proprioceptive Neuromuscular Facilitation Stretching Method to Improve the Flexibility of Hip Joint of Amateur Rhythmic Gymnastics Students

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Abstract

The purposes of this study are 1) to improve the flexibility of hip joint of amateur rhythmic gymnastics students by PNF stretching method and 2) compare the flexibility of students' hip joints before and after PNF stretching teaching. The sample group includes 30 amateur rhythmic gymnastics students from Xi 'an Art Power Club. Research tools include: 1) Teaching plan based on PNF stretching method and 2) Flexibility test of hip joint. The relevant samples were statistically analyzed by means of mean, standard deviation and t test. The results show that the use of PNF stretching method can effectively improve the flexibility of hip joint of rhythmic gymnastics students. The course content includes Chapter 1 Adaptation and mastery period, Chapter 2: Proficiency and Application Period, and Chapter 3 consolidation and improvement period. The course consists of 3 chapters, totaling 12 hours. It is found that PNF stretching method can improve the flexibility of hip joint of rhythmic gymnastics students. After PNF stretching teaching, the flexibility of students' hip joint is obviously higher than that before teaching, and the statistical significance reaches 0.01 level.

Keywords: PNF Stretching, Rhythmic Gymnastics, Hip Flexibility

Introduction

In recent years, China has attached great importance to the construction of a healthy China. In the Opinions of the State Council on Implementing the Healthy China Action issued in the State Council on July 15, 2019, one of the main tasks is to maintain the health of the whole life cycle, including the implementation of health promotion actions in primary and secondary schools (Xinhua News Agency, 2019). The opinions suggest that primary and secondary school students are in a critical period of growth and

development, and families, schools and society should be mobilized to jointly safeguard the physical and mental health of primary and secondary school students. Guide students to develop healthy living habits and exercise healthy physique from an early age. It points out the direction for the implementation of Healthy China Action. The importance of primary and secondary school students' physical health has been clarified.

For most children, rhythmic gymnastics teaching can improve children's bad body posture and shape beautiful body lines and figure; It plays a promoting role in improving physical quality and physical function; At the same time, it can effectively improve children's mental health level and improve their psychological problems such as "learning anxiety" and "loneliness tendency"(Cao Xinyue, 2023). Because of its unique and rich functions, such as fitness, mental health, aesthetic education, economic value and competitive value, today, countless people take part in the study and competition of rhythmic gymnastics. Under this upsurge, some primary and secondary schools all over the country also popularize rhythmic gymnastics as the learning content of class exercises.

Childhood is the initial stage of learning rhythmic gymnastics and the best time for children to develop flexibility (Mary, 2017). If we actively develop the flexibility of hip joint at this time, it will not only conform to the current law of children's physical development, but also lay a solid foundation for rhythmic gymnastics teaching in the future. The traditional flexible teaching method of rhythmic gymnastics is relatively simple, although the effect is good, but the pain is strong, which leads to the loss of many children with certain artistic gymnastics talent because they can't stand the pain of flexible teaching. To improve this situation, teachers need to pay more attention to the law of rhythmic gymnastics students' physical and mental development, and adjust the teaching content and teaching methods appropriately, to enhance students' interest in learning and reduce unnecessary physical injuries. PNF stretching method was founded and developed by Herman Kabat, MaggieKnott and Dorothy Voss in the United States in the 1940s. This technique was invented for patients with neuromuscular paralysis, and then it was used by more and more people in the flexibility training of the human body. PNF stretching method is an effective stretching method, which can effectively improve flexibility in a short time by constantly resisting resistance and enhancing the neuromuscular response.

To sum up, using PNF stretching method can significantly promote the flexibility of hip joint of rhythmic gymnastics students. Therefore, I chose "using PNF stretching method to improve the flexibility of hip joint of amateur rhythmic gymnastics students" as my research topic. Our goal is not only to improve the flexibility of students' hip joints, but also to have a positive impact on rhythmic gymnastics teaching in the future classroom. The main problem of this paper is to verify the effectiveness of PNF stretching method to improve the flexibility of hip joint of amateur rhythmic gymnastics students, and to explore

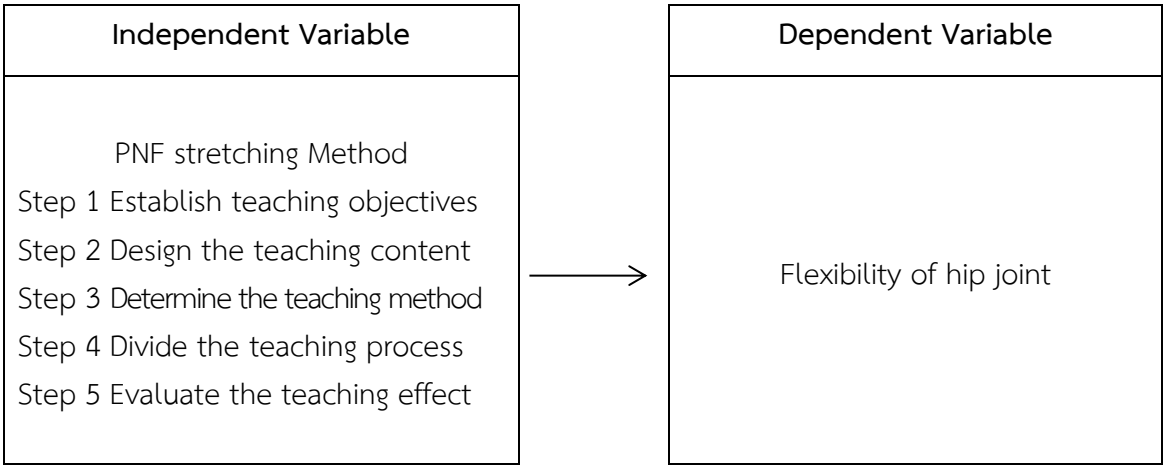
the teaching method of rhythmic gymnastics with good teaching effect and easy acceptance by children.

Objectives

1. To use PNF stretching method to improve the flexibility of hip joint of amateur rhythmic gymnastics students in Xi 'an Art Power Club.
2. To compare students' flexibility of hip joint before and after the implementation based on the PNF stretching method.

Concept theory framework

Using PNF stretching method to improve the flexibility of hip joint of amateur rhythmic gymnastics students.The research concept framework is as follows:



Theory

1. The theory of human genesis and development.

"Human Genesis and Development" proposes that there are two types of embryonic cells, namely, the process of autonomy and gradual specialization. Cell development is the basis of human embryo formation, and human nerve formation and development play an important role in the whole embryonic development. It is considered that the nervous system is an important guarantee to maintain the stability of human internal environment, and it unifies and coordinates human internal environment and external environment. The functions of human organs and systems are all controlled by the coordination of the nervous system. The muscles and tissues of the human body are not independent, and they cooperate with each other, while the nervous system dominates, leads and regulates various organs. When the receiver obtains stimulation (internal and external stimulation), the receptor transmits the collected information to the

central nervous system through afferent neurons, and the central nervous system makes judgments according to the functions and properties of each organ, and transmits "commands" to the effector through efferent neurons, and the effector responds according to the outgoing information. The whole process is called "reflex arc".

2. Emotional activation theory

The Theory Of Emotion Activation was put forward by Lindesler in 1951. It is believed that emotions are produced by different degrees of activation, high arousal produces strong emotions, and low arousal produces mild emotions. The degree of awakening includes excitement, attention, relaxation, drowsiness, etc. until death. Effective information can only be generated after nerves are activated, so the theory of emotional activation emphasizes that people should be in two States: "excitement" and "attention" when transmitting information efficiently, and the state after "relaxation" can not transmit real-time information efficiently.

3. Event group training theory

The theory of event group training was put forward by Chinese sports expert tian maijiu and his team. The theory of event group training is based on the similarities and differences between events caused by the essential attributes of different events, and a group of sports with similar competitive characteristics and training requirements are put together for comparative study. According to the classification standard of event group theory, rhythmic gymnastics belongs to the event group of "expressing difficulty in beauty", and the basic requirements of changing event group are that the figure is symmetrical to express the beauty of posture, the basic skills are strong to express the beauty of action, and various shapes, novel arrangements and difficulty changes.

The population and sample group

This paper mainly adopts the experimental method, with 90 students in Xi 'an Art Club, 3 classes and 30 students in each class as the research population, and 30 students randomly selected from a specific group as the sample group.

Methods

Using PNF stretching method to improve the flexibility of hip joint of rhythmic gymnastics students. The research tools used by researchers include curriculum plan and hip flexibility scoring standard. The research tools are as follows:

1. Make teaching plans according to PNF stretching method. The researchers designed three chapters using the theory of PNF stretching method, which lasted for 12 hours.

1.1 Used as a guide to formulate learning objectives, contents and organize the measurement and evaluation of curriculum activities.

1.2 According to the core learning content of a group, it is necessary to set learning objectives, determine learning content and estimate teaching time.

1.3 Learn related concepts and theories from literature, books, teaching materials and related research, and make corresponding learning plans.

1.4 The teaching course of using PNF stretching method to improve the flexibility of hip joint of amateur rhythmic gymnastics students includes three chapters.Chapter 1: Adaptation and mastery period, 4 hours; Chapter 2: profitability and application period, 4 hours; Chapter 3: consolidation and improvement period, 4 hours, 12 hours in total. Each chapter is made according to PNF stretching method: 1) establishing teaching objectives; 2) designing teaching content; 3) determine the teaching method; 4) dividing the teaching process; 5) Evaluate the teaching effect.

1) Establish teaching objectives. According to the teaching principles and research priorities of rhythmic gymnastics, the teaching objectives are set.

2) Design the teaching content. According to the characteristics of rhythmic gymnastics teaching content and the content of rhythmic gymnastics, this paper analyzes and finds feasible teaching strategies and makes specific teaching design.

3) Determine the teaching methods. According to the characteristics and requirements of PNF stretching, different teaching methods are adopted to facilitate the implementation of PNF stretching method.

4) Divide the teaching process. According to students' cognitive development ability and physiological development characteristics, training is carried out and the teaching process is divided.

5) Evaluate the teaching effect and objectively evaluate the flexibility of students' hip joints.

1.5 Study the process of making instrument quality checklist.

1.6 Measurement and evaluation of the flexibility of hip joint.

1.7 Submit the completed teaching plan to the tutor, check the consistency and applicability of the content, and modify it according to the suggestions in the tutor's reply.

1.8 Submit the revised teaching plan to three experts for review, to verify the accuracy and applicability of the teaching content, and the consistency of learning objectives, contents, learning activities, teaching media, measurement and evaluation. Find IOC (Index Target Consistency).

Table 1: Evaluation Results of Chapter

Using PNF stretching method to improve hip joint flexibility of amateur rhythmic gymnastics students	hours	IOC	Evaluation results
Chapter 1: Adaptation and mastery period	4	1.00	accept
Chapter 2: Profitability and application period	4	1.00	accept

Chapter 3: Consolidation and improvement period	4	1.00	accept

1.9 Each curriculum activity plan had a consistency index greater than or equal to 0.50 and was considered suitable for use in research. The analysis result of the IOC (Index Objective Congruence) is that each chapter is 1.00.

2. Hip Flexibility Measurement Table

2.1 The content of analyzing the flexibility of hip joint is consistent with the curriculum activity plan.

2.2 Learn the theory and method of evaluating the flexibility of hip joint from literature and related research.

2.3 Determine the scoring standard of hip joint flexibility test: All 10 evaluation points have established scoring standards and corresponding scores: 1, 2 and 3. The perfect score is 30. Different scores represent different degrees of hip flexibility. 27-30 points means strong; 23-26 points represent relative strength; 18-22 points represent average; 14-17 points means relatively weak; A score of 10-13 means weak.

2.4 Submit the designed evaluation standard of hip joint flexibility to the thesis supervisor, check its accuracy and modify it.

2.5 Submit the established evaluation standard of hip flexibility to three experts for measurement and inspection. Experts check the effectiveness of the content and calculate the project objective consistency index (IOC). The consistency index of each evaluation content is greater than or equal to 0.50, which is considered suitable for research. The IOC (objective consistency index of projects) value of each project in this evaluation standard is 1.00.

2.6 Revise and improve the grading standards, and then conduct experiments on non-sample students to ensure the quality of evaluation.

2.7 Cronbach's α coefficient is 0.81 to check the reliability of the measurement standard, which can be used for research.

Symbols and Abbreviations

Represent data analysis results based on symbols and semantics. The details

$\bar{X}$	Means	average value
SD.	Means	standard deviation
n	Means	number of students
D	Means	scores of difference between pre and post class
Df	Means	degree of freedom
t	Means	statistical data for t-test value
**	Means	statistical significance at level .01

Results

The study process of 30 rhythmic gymnastics students in Xi 'an Art Power Club was analyzed by using PNF stretching method. The researchers conducted their studies in the following order:

Part 1. The study process of 30 rhythmic gymnastics students in Xi 'an Art Power Club was analyzed by using PNF stretching method.

Firstly, the researcher analyzed the important role of hip flexibility in rhythmic gymnastics teaching and the function of PNF stretching method through literature research, and expounded the constituent elements, necessity and method content of PNF stretching method teaching through the current teaching purpose and requirements of rhythmic gymnastics and the current research situation under the current background. Finally, the teaching course based on PNF stretching method is developed to improve the flexibility of hip joint of amateur rhythmic gymnastics students.

Secondly, to improve the flexibility of hip joint of amateur rhythmic gymnastics students, PNF stretching method is adopted in this teaching course. This teaching course is divided into the following three parts, with a total of 12 class hours. This course consists of three chapters. Chapter 1: adaptation period and mastery period, 4 hours; Chapter 2: Design the teaching content, 4 hours; Chapter 3: Learning content: consolidation and improvement period, 4 hours. Each lesson plan is made based on PNF stretching method: 1) establishing teaching objectives; 2) designing teaching content; 3) determining the teaching method; 4) dividing the teaching process; 5) Evaluate the teaching effect.

Thirdly, based on the specific situation of the above-mentioned teaching courses, the researcher conducted a research experiment on 30 rhythmic gymnastics students in Xi 'an Art Power Club by random grouping sampling. This paper compares and analyzes the flexibility of students' hip joints before and after PNF stretching teaching class to understand the changes of students' hip joint flexibility. Observe students' performances before and after teaching, and record students' changes and performances.

Part 2. The PNF stretching method was used to implement pre-class teaching, and the flexibility of hip joint was tested after class.

The second part. According to PNF stretching method, the flexibility of students' hip joints before and after implementation was compared. In this section, we aim to evaluate the effectiveness of the PNF stretching method. The researchers tested and analyzed the hip flexibility of 30 amateur rhythmic gymnastics students before and after attending a 12-hour teaching course. The teaching effect of the teaching course is analyzed as follows. The researchers used the PNF stretching method to analyze the flexibility of hip joint before and after implementation. In this study, 30 rhythmic gymnastics students were selected as experimental subjects. The evaluation standard of hip flexibility consists of 10 evaluation items. 1-3 points for each evaluation item, totaling 30 points. The results are summarized in Table 2 below.

As can be seen from Table 2, by applying the teaching theory based on PNF stretching method, the average score of hip joint flexibility of amateur rhythmic gymnastics students before and after

class is 18.7 points, and the average score after class is 23 points, with an average difference of 4.3 points, indicating that the hip joint flexibility after class is higher than before class. According to the students' hip joint flexibility scores before and after class, the researchers used mean value, standard deviation and dependence T test for data analysis. The data analysis results are shown in Table 2.

Table 2: Students' Hip Flexibility before and after PNF Stretching Teaching

Student lD	Pre-test Scores (Full Score=30)	Post-test Scores (Full Score=30)	Difference Scores (D)
1	16	23	7
2	18	24	6
3	17	25	8
4	22	25	3
5	24	27	3
6	16	23	7
7	27	28	1
8	26	27	1
9	19	22	3
10	15	21	6
11	16	21	5
12	18	22	4
13	22	25	3
14	18	23	5
15	20	24	4
16	15	22	7
17	10	18	8
18	15	20	5
19	18	21	3

Table 2: Students' Hip Flexibility before and after PNF Stretching Teaching (Continue)

20	18	22	4
21	19	21	2
22	19	23	4
23	17	20	3
24	16	21	5
25	19	22	3
26	21	22	1

27	26	27	1
28	20	24	4
29	18	22	4
30	16	25	9
$\bar{X}$	18.70	23.00	4.30
SD.	3.70	2.62	0.24

Table 3: Comparison of Flexibility of Hip Joint

Flexibility of hip joint	n	full score	$\bar{X}$	SD.	df	t	p
Pre-test	30	30	18.70	3.70	29	12.56**	.00
Post-test	30	30	23.00	2.62	29		

** Statistically significant at the level. 01 (p <.01)

The purpose of this paper is to improve the flexibility of hip joint of amateur rhythmic gymnastics students in Xi 'an Art Club by using PNF stretching method, and to compare the flexibility of hip joint of students before and after the implementation of PNF stretching method. Table 4 compares the flexibility of students' hip joints before and after the implementation of PNF stretching method. The comparison results show that the flexibility of students' hip joints after class is higher than the average level before class, which is statistically significant at the level of ($P < 0.01$), indicating that PNF stretching method can effectively improve the flexibility of students' hip joints and verifying the research purpose of this paper.

The flexibility of hip joint in rhythmic gymnastics teaching is very important for students' performance and achievement, and it is one of the key factors to achieve excellent performance. The common stretching method is based on the mutual inhibition of muscles, and the inhibition of antagonistic muscles on stretching muscles is inevitable in stretching, while PNF stretching method can relax antagonistic muscles through resistance, and the target muscles can be further stretched, thus achieving better stretching effect. In this study, the researchers used PNF stretching method to teach. According to the working principle of PNF stretching method and the characteristics of rhythmic gymnastics course, a teaching scheme of the influence of PNF stretching method on hip flexibility of rhythmic gymnastics students was constructed. The scheme includes establishing teaching objectives, designing teaching content, determining teaching methods, dividing teaching process and evaluating teaching effect, to achieve better teaching effect of PNF stretching method.

Through the pre-evaluation process, the students' hip joint flexibility is tested before class, so that students and teachers can understand the actual situation of hip joint flexibility, and then

strengthen learning, optimize students' motor skills, stimulate students' interest in learning and improve hip joint flexibility. After-class tests improved the flexibility of hip joint.

Conclusions and Discussion

Conclusion

According to the research topic, the research summary of amateur rhythmic gymnastics students using PNF stretching method to improve the flexibility of hip joint is as follows:

1. Using the PNF stretching method to improve the flexibility of hip joint includes five steps: step 1: establishing teaching objectives, according to the teaching principles and research priorities of rhythmic gymnastics, The teaching objectives are set. Step 2: Design the teaching content. According to the characteristics of rhythmic gymnastics teaching content and the cons. tent of rhythmic gymnastics, this paper analyzes and finds fearful teaching strategies and makes specific teaching design. Step 3: Determine the teaching methods. According to the characteristics and requirements of PNF stretching, Different teaching methods are adopted to facilitate the implementation of PNF stretching method. Step 4: Divide the teaching process. According to the students. cognitive development ability and physiological development characteristics, Training is carried out and the teaching process is divided. Step 5: Evaluate the teaching effect and objectively evaluate the flexibility of students' hip joints.

2. Comparing the hip flexibility of students before and after PNF stretching teaching, the average score of students in pre-class evaluation is 18.70 (out of 30), and the average score in after-class evaluation is 23.00. The score of after-class evaluation was significantly higher than that of before-class evaluation, and the statistical significance level was 0.01. This is consistent with the research hypothesis.

Discussion

Using PNF stretching method, the research results of improving the flexibility of hip joint of 30 amateur rhythmic gymnastics students in Xi 'an Art Power Club are discussed as follows:

1. The PNF stretching method of rhythmic gymnastics is based on the theory of human development, emotional activation and event group training, and the scientific stretching teaching method based on the special sports characteristics of rhythmic gymnastics is superior to the traditional teaching method to some extent. The reason is that the PNF stretching method combines the advantages of static stretching and dynamic stretching. The hip joint soft tissue of rhythmic gymnastics students has been stretched for a long time in the process of static stretching, and students will not feel tired as long as they keep still during the training process, but the pain will be very strong. Then dynamic stretching just makes up for this deficiency. Students relax and stretch the soft tissue of hip joint rhythmically again and again under dynamic conditions, so that it has achieved better stretching.

Therefore, PNF stretching method has a certain effect on the training effect of students' hip joint flexibility quality.Guo Zhenfang (2017) thinks that PNF stretching method can improve flexibility and muscle strength, relax muscles and eliminate fatigue more effectively than static stretching method and elastic stretching method. This is because Gorky golgi tendon organ in the tendon of the target muscle group or the antagonistic muscle of the target muscle group, after receiving the dangerous signal, releases the signal to inhibit its activity, thus relaxing the target muscle group and increasing the motion range of the hip joint.Xiong Haixiu (2022) thinks that PNF stretching method can develop students' flexibility and arouse students' enthusiasm more than traditional stretching method. The PNF stretching method requires close cooperation between peers, which makes this training process more interesting. Stretching teaching no longer makes students feel too monotonous and boring, and at the same time, it can effectively avoid muscle injuries during stretching, reduce muscle pain during flexible training, reduce fatigue and speed up the repair of muscle minor injuries.

2. The researcher studied many documents related to PNF stretching method, and according to the characteristics of PNF stretching method, it was integrated into five steps to formulate the teaching plan for amateur rhythmic gymnastics students. The PNF stretching teaching scheme of rhythmic gymnastics is mainly constructed from five aspects: training objectives, training contents, training methods, training process and effect evaluation. Among them, the training goal is the basic point, the training content is the core, the training method is the key, the training process is the guarantee, and the effect evaluation is the result. Data analysis is to evaluate the quality of classroom teaching plan by three experts according to PNF stretching method, and the evaluation results reflect the quality of classroom teaching plan by experts; Generally speaking, the suitability of research objectives is the most appropriate. This is because the learning plan is consistent with the concept of PNF stretching teaching method, and the curriculum plan contains the key elements of the curriculum plan. PNF stretching method can better improve the flexibility of students' hip joints. Wei Xiaomei (2021) thinks that PNF stretching method combines the advantages of traditional stretching method to some extent and will also adopt the static stretching characteristics of static, but at the same time it also emphasizes muscle confrontation and conforms to the dynamic stretching characteristics. The combination of the two features enables people to do stretching exercises with less pain and make muscles stretch for a longer time. This method can effectively reduce the sensitivity of proprioceptors, reduce the stretching reflex of muscles during stretching, and then improve the ductility of muscles and promote the development of hip flexibility.Ge Tianlun (2019) believes that the physiological theoretical basis of PNF is to use anti-stretch reflex to achieve the purpose of muscle relaxation. Muscle isometric contraction will produce strong stimulation to muscles, and tendon spindles in muscles will transmit signals to the central nervous system, which is reflective to muscle relaxation, leading to the generation of anti-stretch reflex. That is to say, the active contraction of the pulled muscle can offset the generated stretching emission, and its relaxation increases after contraction.

3. After using PNF stretching method, the average score of students' hip flexibility before teaching is 18.7, and after teaching it is 23, with an average difference of 4.3. The flexibility of hip joint after teaching is higher than that before teaching. The results showed that the flexibility of hip joint after PNF stretching teaching was significantly higher than that before teaching, which was statistically significant at the level of ($P < 0.01$), which was consistent with the hypothesis. This is because PNF stretching method can change the flexibility by changing the state of nervous system dominating skeletal muscle, improve the coordination between antagonistic muscle and target muscle during stretching, and make the antagonistic muscle relax enough to achieve the stretching effect and improve the flexibility of hip joint. The appearance of teaching effect also proves that the teaching scheme and experimental design constructed before teaching are reasonable, scientific and feasible.

At present, many studies at home and abroad have confirmed that PNF stretching is an important training means to increase flexibility. Previous studies mainly focused on competitive sports and athletes and adults. There is not much research on PNF stretching method in rhythmic gymnastics. Yu Yunzhen (2020) took 27 rhythmic gymnastics students as the research object and found that after 12 weeks of PNF stretching intervention, the effect of PNF stretching method was obviously higher than that of static and dynamic combined training method and traditional static stretching flexible training method. Zhang Feng (2021) took 24 female children's Latin dance students aged 7-10 in Aiwu training institution as the experimental object and conducted an experimental intervention on 12-week hip joint flexibility quality training. The PNF stretching method was compared with the traditional flexible training method. After 12 weeks of PNF stretching intervention, the stretching method had a positive impact on the special technical ability of children Latin dancers. The above results suggest that PNF is an important training method to improve the flexibility of students' hip joint. This study confirmed that 12 weeks of PNF stretching can obviously improve the flexibility of hip joint of amateur rhythmic gymnastics students. Compared with before the intervention, after the intervention, the flexibility of the subjects such as supine hip flexion, lateral abduction, prone hip extension, ground horizontal fork, ground vertical fork, standing and moving legs has been improved, which is consistent with the research of Yu Yunzhen (2020). PNF stretching training can be used as an important training method to improve the flexibility of hip joint of rhythmic gymnastics students.

To sum up, PNF stretching method can effectively improve the flexibility of hip joint of amateur rhythmic gymnastics students. In the resistant stretching stage of PNF stretching method, the effect of resisting muscle can be inhibited by antagonistic muscle contraction, which makes the stretched muscle more easily stretched to a larger range and increases the flexibility of hip joint.

Recommendations

Suggestions on the application of research results

1. In order to better popularize the PNF stretching method, it is suggested that relevant schools or institutions strengthen the training of teachers, establish a perfect

professional training system and provide systematic training courses for teachers. The training content should include the principle, skills and safety precautions of PNF stretching method, to ensure that teachers have professional knowledge and skills, deepen teachers' understanding of PNF stretching method and make it better applied to amateur rhythmic gymnastics teaching. It is suggested that teachers should revise the teaching plan in time according to the actual teaching and competition needs and combine PNF stretching method with other stretching methods to create more effective and targeted flexible quality training methods, so as to give full play to the advantages of PNF stretching method and ensure the best teaching effect.

2.As a new stretching method, the principle and mechanism of PNF stretching method are quite different from those of ordinary stretching methods. Based on the painless principle, PNF stretching method has a strong advantage in stretching practice and is more easily loved by students. If this stretching method can be popularized in amateur rhythmic gymnastics teaching, it may improve the flexibility of students' hip joints. Therefore, in daily teaching, we should make full use of the PNF stretching method and give full play to its advantages. This method can be applied to warm-up before exercise, relaxation after exercise and special flexibility teaching, to better improve the flexibility quality of athletes. In the future, with the accumulation of students' learning, when their hip joint flexibility reaches a certain level, more complex PNF stretching technology can also be applied to improve students' hip joint flexibility.

3.Studies have confirmed that PNF stretching method can effectively improve the flexibility of hip joint of amateur rhythmic gymnastics students. However, the PNF stretching method is a teaching method based on the traditional static stretching method, which is a supplement and extension to the traditional static stretching method. Therefore, in the future teaching, it should be combined with the traditional static stretching method and the existing traditional flexible quality teaching method in amateur rhythmic gymnastics teaching, to enrich the teaching method of hip flexibility in rhythmic gymnastics and popularize PNF stretching method reasonably and effectively.

4.When using the PNF stretching method, the partner's operation is very critical. Whether amateur rhythmic gymnastics teachers or peers, we must control the strength and time of stretching to avoid injury and achieve better stretching effect. The teaching of hip joint flexibility should be organically combined with other physical quality teaching, and complement each other, to make students develop in an all-round way and contribute to the national sports cause. Teachers should always put the safety of students first in the teaching process. Avoid injuries caused by overstretching or improper operation, pay attention to students' feedback and adjust the teaching intensity in time to ensure the

safety and effectiveness of teaching. Teachers should have relevant safety knowledge and skills to ensure that students are well protected in the learning process.

5.At present, the traditional static stretching method and dynamic stretching method are still the main flexibility training methods in amateur rhythmic gymnastics teaching, and there are few teaching methods using PNF stretching method, so we should increase the publicity of PNF stretching method. The practice of this method often needs the cooperation of peers, which enriches students' interest in class, improves their enthusiasm in class, and enables them to use it in preparation and warm-up activities, so that students can understand PNF stretching method and popularize this technology in flexibility.

Recommendations for future research

1.Further promote the PNF stretching method in rhythmic gymnastics teaching, and at the same time, fully consider the differences of students, teach students in accordance with their aptitude, and make a reasonable PNF stretching method teaching plan according to the different conditions of students.

2.In the future, PNF stretching method can be combined with other teaching methods (such as strength teaching and balance teaching) in amateur rhythmic gymnastics teaching to explore the effect of comprehensive teaching on improving flexibility.

3.This experiment was influenced and limited by the number of experimenters, time and economic ability, and only the flexibility quality of the hip joint was tested. In the 12-week flexibility quality teaching, only the contraction and relaxation technology in the special technology of PNF stretching teaching method was selected. The experiment has certain limitations. It is suggested that relevant scholars and experts can further study other key parts such as knee joint and shoulder joint in future teaching and explore other technologies of PNF.

4.Because this study is short, it is suggested that a long-term follow-up study can be conducted in the future to observe the long-term changes of hip flexibility of amateur rhythmic gymnastics students after using PNF stretching method. It can be designed as a long-term experiment for several months or one year to evaluate the lasting effect of PNF stretching method on flexibility more comprehensively.

5.Compare the changes of hip flexibility of rhythmic gymnastics students of different ages after using PNF stretching method. Students can be divided into different age groups, and their responses to PNF stretching method can be observed, to better understand the flexibility teaching needs of students of different age groups.

6.Analyze the factors that affect the effect of PNF stretching method, such as training frequency, duration and tensile strength. By systematically investigating the

influence of these factors on the improvement of flexibility, it can provide a basis for the design of future training programs.

7.Combined with biomechanical analysis method, the mechanism of PNF stretching method on the flexibility of hip joint was deeply studied. Through biomechanical analysis, we can clearly understand the ways and effects of PNF stretching on the flexibility of hip joint.

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Using Situational Teaching Method to Improve Reading Comprehensive Ability of Chinese Language Courses for Undergraduate Students

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Abstract

The purposes of this research were 1) to use situational teaching method to improve reading comprehensive ability of Chinese language courses for undergraduate students; 2) to compare reading comprehensive ability of students in Chinese language courses before and after class based on situational teaching method. The sample group included 30 first-year college students majoring in e-commerce, at Yunnan College of Tourism Vocation, obtained by cluster random sampling. Research instruments included 1) course plan based on situational teaching method and 2) reading comprehensive ability of Chinese language courses Test. Data were statistically analyzed for standard deviation and t-test for dependent samples. The results show that using situational teaching method to understand students' reading comprehensive ability of Chinese language courses, the students' abilities have improved; after adopting the situational teaching method, students' reading comprehensive ability of Chinese language courses were significantly higher at. 01.

Keywords: Situational Teaching Method, Reading Comprehensive Ability, Chinese Language Courses, Undergraduate Students

Introduction

Chinese reading class is an important Chinese language learning course aim to help students improve their Chinese reading ability. By learning Chinese reading skills and strategies, students can better understand the meaning and content of Chinese articles, improve reading speed and accuracy. Meanwhile, Chinese reading courses can also help students improve their cognitive, comprehension, and summarize abilities, making them an important course for enhancing their Chinese reading and academic literacy (Guo

Yanling, 2022). Through systematic learning and training, students can improve their reading comprehension ability, expand their vocabulary, cultivate reading thinking and skills (Li Dan, 2023). I hope that students can actively participate in this course, strive to improve their Chinese reading ability, lay a solid foundation for future academic research and attention to Chinese cultural history, enhance their understanding and appreciation of Chinese, and other comprehensive Chinese reading abilities.

The Ministry of Education and the National Language Commission of China issued several opinions on comprehensively improving the quality of higher vocational education teaching on November 16, 2006, indicating that the Chinese reading course is a quality education course that integrates instrumental, foundational, cultural, humanistic, and aesthetic aspects, which is related to the quality of talent cultivation and the cultural construction of the Chinese nation. As a fundamental course of higher vocational education, the Chinese reading course provides students with language literacy education, improves their cultural and professional basic qualities, and enables them to receive rich mother tongue education in the process of reading and understanding literary works, effectively improving their reading comprehension and expression abilities, enhancing their thinking quality and aesthetic comprehension abilities (Zhu Shujuan, 2018). It occupies an important position in the vocational education curriculum system, playing a supporting and guaranteeing role in improving students' professional abilities, enriching their professional emotions, and promoting their career development.

Situational teaching method is a teaching method that conforms to the thinking habits of students, combines classroom teaching with student life experiences, and makes the teaching process richer and more interesting. Therefore, applying situational teaching method to Chinese reading teaching can optimize the atmosphere of Chinese language classrooms, achieve efficient Chinese reading classroom teaching effects, and conform to the development trend of modern educational teaching concepts (Wang Jue ,2018). The situational teaching method provides an effective way to improve students' comprehensive Chinese reading ability. Researcher aim to improve reading comprehensive ability of Chinese language courses for undergraduate students through situational teaching method, which involves five teaching Step 1: Scenario Design, Step 2 : Situational presentation , Step 3 : student experience , Step 4 : Analysis and Summary Step 5 : Evaluation feedback . student-centered teaching to stimulate their interest in learning, thereby enhancing their cognitive reading, comprehension analysis, summarize and expansion abilities in Chinese reading courses.

In summary, researchers have introduced situational teaching method into classroom teaching in order to enhance students' interest in learning in college Chinese reading teaching, effectively improve their self-learning ability, change the traditional

teaching mode of teachers teaching students listening, fully tap into students' subjective initiative, and encourage them to actively participate in course teaching. In teaching practice, teachers use diverse teaching methods to create authentic teaching situations, encourage students to actively participate in teaching activities, effectively improve their cognitive reading ability, analytical comprehension ability, and summarizing and expanding ability, and promote their learning outcomes. According to the requirements of the current new curriculum reform, teachers should actively use situational teaching method in Chinese reading teaching, better reflecting the subject status of students in teaching, and aiming to improve reading comprehensive ability of Chinese language courses for undergraduate students.

Objectives

1. To use situational teaching method to improve reading comprehensive ability of Chinese language courses for undergraduate students.
2. To compare reading comprehensive ability of Chinese language courses for undergraduate students.

Concept theory framework

The researchers conducted teaching based on situational teaching method, with teaching steps divided into: Step 1: Scenario Design, Step 2 : Situational presentation , Step 3 : student experience , Step 4 : Analysis and Summary Step 5 : Evaluation feedback. Aiming to improve the comprehensive Chinese reading ability of undergraduate students, including three aspects: Cognitive Reading, Understanding Analysis and Summary and Expansion. The research conceptual framework is as follows:

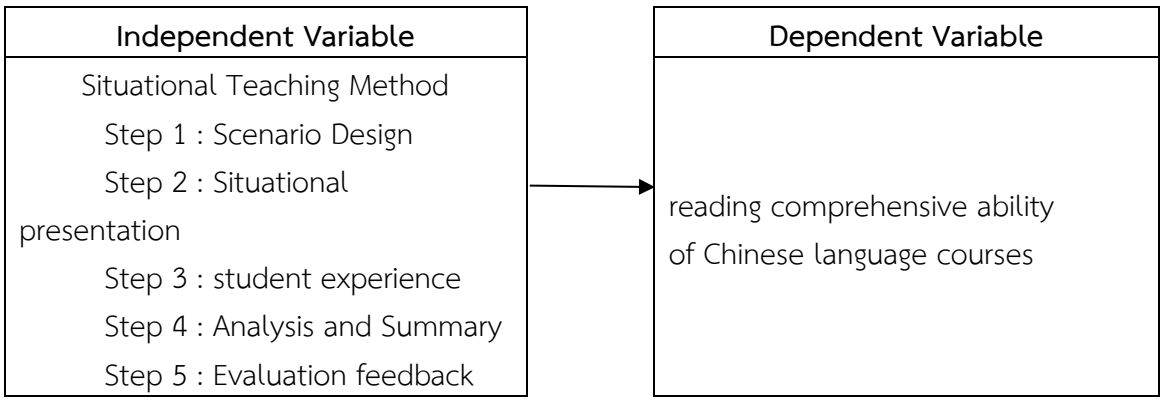

Figure 1.1: Research Framework

Materials and Methods

Using situational teaching method to improve reading comprehensive ability of Chinese language courses. The research conducted using experimental research methods involves the following steps.

1. The population / the sample Group

The Population

There are 90 first-year students majoring in e-commerce at Yunnan College of Tourism Vocation.

The Sample Group

Through the random cluster sampling method, by considering from classes with grades mixed of high level, medium level and low level. Class 3, Grade 1, E-commerce major, Yunnan College of Tourism Vocation, with 30 students.

2. Research Instruments

Using situational teaching method to improve reading comprehensive ability of Chinese language courses for undergraduate students. The research instruments are as follows:

2.1 Course plan according to the Situational Teaching methods

Created the development process and course plan for the course plan, based on situational teaching method. The form of effectiveness evaluation is as follows:

2.1.1 Exploring the methods of curriculum planning and the forms of evaluating the effectiveness of curriculum planning, based on situational teaching, this study starts from the perspective of books, textbooks, articles, and related research.

2.1.2 Using situational teaching method to Improve reading comprehensive ability of Chinese language courses for undergraduate students. There are three chapter in total duration of 12 hours:Chapter 1: Three Poems of the Book of Songs , 4 Hours,Chapter 2: Tang Poetry, Spring River Flower Moonlight, 4 Hours , Chapter 3: Song Ci, Hairpin Head Phoenix ,4 Hours.

2.1.3 Develop a learning management plan based on literature, textbooks, and related research.

2.1.4 Develop three study plans based on the learning content, totaling 12 hours. By using situational teaching method to design course plans, each class has a plan. Teaching steps: Step 1: Scenario Design. In this step, the teacher needs to divide learning groups based on the student's learning ability, gender ratio, communication ability, and other factors. Create teaching scenarios and arrange pre class learning for students. Step 2: Situational presentation. In this step, the teacher raises new questions to stimulate deep thinking among students. Step 3: Student experience. In this step, students showcase their learning outcomes as required and complete collaborative discussions. Step 4: Reflection

summary. In this step, students and teachers understand and analyze the text, and summarize the knowledge learned. Step 5: Evaluation feedback. In this step, students need to complete after-school exercises and expand their knowledge.

2.1.5 Teaching Media/Learning Resources

2.1.6 Measurement and evaluation of learning outcomes

2.1.7 Submit the completed course plan to the thesis supervisor to verify the applicability and consistency of the content. The possibility of aligning goals with learning activities, and then making improvements based on suggestions.

2.1.8 Submit the revised course plan to 3 experts for verification to verify the accuracy, appropriateness and completeness of the course plan content, and the consistency of learning objectives, content, learning activities, teaching materials, measurement and evaluation. And find out the IOC Consistency Index (Item Objective Consistency Index).

Table 1: Evaluation results of chapter

Using situational teaching method to Improve reading comprehensive ability of Chinese language courses for undergraduate students	hours	IOC	Evaluation results
Chapter 1: Three Poems of the Book of Songs	4	1.00	accept
Chapter 2: Tang Poetry, Spring River Flower Moonlight	4	1.00	accept
Chapter 3: Song Ci, Hairpin Head Phoenix	4	1.00	accept

2.1.9 Each curriculum activity plan had a consistency index greater than or equal to 0.50 and was considered suitable for use in research. The analysis result of the IOC (Index Objective Congruence) is that each chapter is 1.00.

2.2 Reading comprehensive ability of Chinese language courses test

The development process of reading comprehensive ability of Chinese language courses and the effectiveness evaluation table of Chinese reading ability test are as follows.

2.2.1 Research on the principles of creating the reading comprehensive ability of Chinese language courses Test and the effectiveness evaluation form of the reading comprehensive ability of Chinese language courses Test from the perspectives of books, textbooks, articles, and related research.

2.2.2 Create a reading comprehensive ability of Chinese language courses test and an effectiveness evaluation form for the reading comprehensive ability of Chinese language courses test.

The situational teaching method evaluation framework proposed by Li Jilin (2019) is a systematic classification of students' abilities to enhance their learning abilities,

which can be divided into the following categories:1) Scenario Design , 2) Situational presentation , 3) Student experience , 4) Reflection summary, 5) Evaluation feedback. Referring to scholar Zhu Shujuan's (2018) research on the application of situational teaching method in college Chinese language teaching, an evaluation test scale was designed based on this.

2.2.3 Hand over the tool to three experts to verify the effectiveness of the evaluation form and the consistency indicators of project objectives. Test the consistency indicators to be between 0.67 and 1.00.

2.2.4 Determine the scoring standard of the aptitude test: 1 point for a correct answer and 0 points for an incorrect answer.

2.2.5 Suggest a proficiency test to the thesis advisor. Check for accuracy and make improvements as suggested.

2.2.6 Submit the Mathematics Learning Ability evaluation criteria created to three experts for measurement and inspection. Experts check the Content Validity and calculate the Index of Item Objective Congruence (IOC). The consistency indicator of each evaluation content is greater than or equal to 0.50 and is considered suitable for research. The IOC (Index of Item Objective Congruence) value for each item in this evaluation standard is 1.00.

2.2.7 Improve and revise tests that have been verified by experts.Then take it to try out with 30 students, who were not the sample to ensure the quality of the assessment.

2.2.8 Check the quality of each item test. The results were analyzed for difficulty (p) and a discriminating power (r) of the test. Tests were selected with difficulty in the range of 0.20 - 0.80 and discriminating power of 0.20 or higher.

Criteria for interpreting the difficulty value (p) of the test

Test Difficulty Value	Meaning
0.81 – 1.00	Very easy (should be improved or eliminated)
0.60 – 0.80	Fairly Easy (Good)
0.40 – 0.59	Moderately difficult (very good)
0.20 – 0.39	Quite Difficult (Good)
0.00– 0.19	Very difficult (should be improved or eliminated)

Criteria for interpreting the discriminant power (r) of the test

Rating power of the test (r)	Meaning
0.60 – 1.00	Very good classification
0.40 – 0.59	well classified
0.20 – 0.39	Classified
0.10 – 0.19	Hardly distinguishable (Should be improved or eliminated)

-1.00– 0.09 Not distinguishable at all (Should be improved or eliminated).

The analysis results showed that difficulty (p) was in the range of 0.41-0.68, and discrimination (r) was in the range of 0.20-0.80.

2.2.9 The confidence level was measured bythe coefficient method, and the basic music course test was tested. The test value is 0.70 or higher, this confidence value .The test result is 0.91. So it's good for research

2. 2.10Apply the finalreading comprehensive ability of Chinese language courses .test to sample students

3. Data Collection

The data collection is as follows:

3.1. Data collection and verification for test tools:

1) Coordinate with 3 experts dispense official document from Bansomdejchaopraya Rajabhat University professional scholars experts and give information about the data collection process and research tools: instructional model and checklist form about quality of instructional model for consideration (IOC: Index Objective Congruence).

2) Collect data from 3 professional scholars experts and analyze data for consideration (IOC: Index Objective Congruence).

3) This research is experimental .One Group Pretest – Posttest .Design was used with the following experimental design:

Table 2: Experimental design.

Group	Pretest	Experimental	Posttest
R	O_1	X	O_2

The meaning of the symbols used in the experimental design.

R means Random Sampling

X means experimental

O_1 means Pretest

O_2 means Posttest

4 Data Analysis

The data analyzed as follows:

4.1 Quantitative data were analyzed through descriptive statistics; means, and standard deviation.

4.2 Quantitative data were analyzed by inference statistical method; Then calculate the difference in the reading comprehensive ability of Chinese language courses of students before and after using situational teaching method and conduct t-

test analysis on the relevant samples.

Results

This study aims to use situational teaching method to improve the reading comprehensive ability of Chinese language courses of undergraduate students and compare the comprehensive ability of Chinese language courses for undergraduate students. before and after using situational teaching method. The data analysis results are as follows:

Results of data analysis

Using the situational teaching method to improve the reading comprehensive ability of Chinese language courses of undergraduate students, researchers conducted research in the following order:

Part 1: The effect of using situational teaching method to Improve the reading comprehensive ability of Chinese language courses of undergraduate students.

This study used the situational teaching method to conduct three teaching classes on 30 first-year e-commerce students at Yunnan Tourism Vocational College, including scenario design, scenario demonstration, student experience, analysis and summary, and evaluation feedback. Researcher analyzed the comprehensive Chinese reading abilities of students before and after class using scenario-based teaching, scenario-based teaching method can improve the reading comprehensive ability of Chinese language courses of undergraduate students. The average score before the study was 14.87 points, and the score after the study was 17.03 points, with an average difference of 2.16 points. The score after learning is higher than the score before learning. The changes in student behavior indicate that their 1) Cognitive Reading, 2) Understanding Analysis, 3) Summary and Expansion and reading comprehensive ability of Chinese language courses are gradually improving throughout the entire learning process. Using situational teaching method to improve reading comprehensive ability of Chinese language courses for undergraduate students.The following includes 5 steps:

1) Scenario Design: At this stage, teachers need to design a context suitable for students' age and cognitive level based on their learning goals and content. Teachers should assign relevant teaching tasks in advance, and students should collect and organize relevant materials before class.

Teacher operations: The teacher provided the students with basic information about the course content, and before class, the students developed a desire to explore and ask

questions for active learning. During the learning process, group members cooperate with each other and leverage their respective strengths. Collect and organize relevant learning materials, and ultimately form PPT or video files. Teachers are responsible for answering questions that students encounter in their studies.

Student operation: Students will conduct pre-class learning based on the information provided by the teacher. They will independently complete the reading of the text and preliminary search for learning materials and share the materials with study group members. They will also collaborate to complete PPTs and organize learning materials. Students can learn before class through books, the internet, and videos.

Through the design of this section, the teacher's goal is to inspire students to actively learn interest and cultivate their hands-on ability and thinking awareness. Students are more motivated to explore and learn new concepts through group meetings. This learning method can enhance students' initiative and learning effectiveness.

2) Situational presentation: The second step of situational teaching method is to present the situation. Teachers need to present the situation to students and allow them to enter the situation. Context presentation can be achieved through various methods, such as videos, images, simulators, etc.

Teacher operations: Teachers will act as guides to complete the introduction of basic knowledge, guide students into learning situations, and clarify the learning content of this lesson. The teacher will present learning materials to students in the order of study groups, allowing them to complete the preliminary perception learning of the article.

Student operation: Students will be guided by the teacher to enter the classroom learning context and present learning materials in the order required by the teacher. According to the division of labor in the group, students can be divided into 1) textual material presentation, 2) PPT presentation, 3) video presentation, and 4) audio presentation.

Through the design of this section, the teacher's goal is to test the pre class learning outcomes of students, understand their initial perception and cognitive understanding of the text. Enable students to fully showcase their learning outcomes, promote teamwork and communication among group members, and improve their learning efficiency.

3) Student Experience: The third step of situational teaching method is student experience. Students need to practice and experience the learning process in a context. Teachers can help students' complete tasks through guidance, prompts, and other methods, enabling them to master knowledge and skills in practice.

Teacher operations: Teachers will act as assistants, inspiring students to understand and analyze the article, guiding them towards deeper issues or knowledge that students have not explored, guiding them to gradually approach the core issues of reading comprehension, and accurately grasp the key and difficult points of the text.

Student operation: Students will engage in learning and exploration through the sharing of materials from the previous stage. Through teacher-student communication, group cooperation, or independent thinking, they will gradually identify the key and difficult points of learning. Through the guidance of the teacher, students will discover problems, sort out clues, and come up with answers.

Through the design of this section, the teacher's goal is to test students' self-learning ability, guide them to deeply explore problems, discover and solve them, cultivate their reasoning, comprehension, and analytical abilities, and improve their logical thinking ability.

4) Analysis and Summary: Analyze and summarize. Students need to analyze and summarize the learning process, analyze the collection and organization of their own learning materials. Teachers can guide students to analyze and summarize through questioning, discussion, and other methods, so that students have a deeper understanding of the learning content.

Teacher operations: Teachers help students sort out the clues of the article, summarize the knowledge points, guide students to summarize the key and difficult points of the text, and try to analyze and summarize the writing characteristics of the article. Assist students in summarizing the core ideas of the article and supplement and improve the learning materials collected by students.

Student operation: Students will be guided by teachers to improve the organization of article clues, identify the key points and difficulties of the article, and independently or through group cooperation, summarize the writing characteristics and artistic characteristics of the article.

Through the design of this section, the teacher's goal is to help students complete the learning of the text. Through teacher-student interaction, problems that students have can be identified in a timely manner, which facilitates the teacher's timely improvement and supplementation of knowledge points and cultivates students' summarizing ability.

5) Evaluation feedback: The final step of situational teaching method is to evaluate feedback. Teachers need to evaluate students' learning outcomes and provide feedback. Evaluation feedback can be achieved through exams, assignments, oral evaluations, etc.,

allowing students to understand their learning achievements and shortcomings, and prepare for the next step of learning.

Teacher operations: Teachers will observe students' learning progress through their classroom performance, teacher-student interaction, and homework assignments, and evaluate and summarize the course. Based on students' classroom performance and homework assignments, teachers will promptly identify and solve problems.

Student operation: Students will summarize and provide feedback on the course, including improving materials, answering questions in class, expanding knowledge, and completing homework assigned in the classroom. Based on feedback from teachers, identifying their own shortcomings in learning is beneficial for students to improve and correct in a timely manner.

Through the design of this section, the goal of the teacher is to test the teaching results, reflect on the teaching in a timely manner, and provide feedback on the teaching evaluation results to students, so that students can discover their own shortcomings and improve them in a timely manner.

Part 2: Comparison of Comprehensive Chinese Reading Abilities of Undergraduate Students before and after the Application of Situational Teaching Method.

Researchers analyzed the data by using the pretest and post test scores obtained using the admission method. They used indicators such as mean, standard deviation, and t-tests for related samples for data analysis.

There are 19 females, accounting for 63.33%, and 11 males, accounting for 36.67%. Subsequently, researchers analyzed the comprehensive Chinese reading abilities of students before and after class using scenario-based teaching, scenario-based teaching method can improve the reading comprehensive ability of Chinese language courses of undergraduate students. The average score before the study was 14.87 points, and the score after the study was 17.03 points, with an average difference of 2.16 points. The score after learning is higher than the score before learning. The researchers analyzed the data and used means and standards. Dependent on sample variance and t-test to analyze students' previous grades and after completing three Chinese reading courses. The data analysis results are shown in Table 3.

Table 3: Compare reading comprehensive ability of Chinese language courses of undergraduate students before and after adopting situational teaching method.

compare reading comprehensive ability of Chinese language courses	n	Full Score	$\bar{X}$	SD.	df	t	p
Pre-test	30	20	14.87	3.53	29	7.32**	0.00
Post-test	30	20	17.03	3.66			

**Statistically significant at level .01(p <.01)

Table 3 shows that the average score of the first-grade students' reading comprehensive ability of Chinese language courses after class is higher than the average score before class, indicating that their reading comprehensive ability of Chinese language courses after class is higher than before class P<.01 indicates statistical significance at the .01 level. By implementing scenario-based teaching methods for students, their overall Chinese reading ability after class is significantly higher than before class. This is consistent with the research hypothesis.

Conclusions and Discussion

Conclusion

According to the research topic, the summary of the study on improve reading comprehensive ability of Chinese language courses for undergraduate students through situational teaching method is as follows:

1. By using situational teaching methods to observe students' learning behavior, it is found that their self-learning ability, course understanding feedback ability, knowledge summarizing and internalizing. ability have been improved.

2. Using scenario-based teaching method, the average score of reading comprehensive ability of Chinese language courses for undergraduate students after class is higher than the average score before class, and the reading comprehensive ability of Chinese language courses after class is significantly higher than before class, with a statistical significance of 0.01 level.

Discussion

The purpose of this study is to enable first-year undergraduate students to improve their reading comprehensive ability of Chinese language courses through scenario-based teaching methods. The results of this study can be discussed as follows:

1.Develop cognitive learning theory and improve the reading comprehensive ability of Chinese language courses among college students. According to the five steps of the

teaching process, this plan includes the following steps: Step 1. Create a situation. Step 2. Scenario demonstration. Step 3. Student experience. Step 4. Reflection and summary. Step 5. Evaluate feedback. After learning, the overall reading comprehensive ability of Chinese language courses of the students has significantly improved. Positive effects were observed in at least three aspects of reading skills. 1) Cognitive reading, 2) comprehension analysis, 3) summary and expansion, as well as cultural background knowledge and social experience. Therefore, the application of cognitive learning theory in college Chinese reading teaching is crucial for improving students' reading comprehensive ability of Chinese language courses. Due to the significant improvement of students' abilities in these areas, there is a significant difference in the average scores of the posttest and pretest of the 01-level exam.

2.The results of this study are consistent with previous studies. Especially Zhang Lei. (2022) Effective Application of Situational Teaching Method in Primary School Chinese Reading Classroom: Overview [J] The use of Situational Teaching Method In order to improve student learning outcomes, research on the application of learning modes is consistent, and the results of this study are consistent. Research has found that students significantly improve their overall Chinese reading ability and learning outcomes after completing the course ($p<0.01$). In addition, the research results are consistent with Yang Jianxun's (2020) Selected Journal of Young Writers. A Preliminary Study on the Application of Situational Teaching Method in Junior High School Chinese Reading Teaching [J] Wang Liuzhi's (2015) research results are consistent. Contemporary Education Practice and Teaching Research. It involves the influence of reading comprehensive ability of Chinese language courses. The study found that students who adopted problem-based learning methods significantly improved their comprehensive ability in reading ancestral texts, and the difference was statistically significant ($p<0.01$). In addition, the study also found that compared to students who used traditional teaching methods, students who used situational teaching methods showed higher progress in reading comprehension, with statistical significance ($p<0.01$).

This learning method encourages students to independently explore knowledge, utilize different scenarios, align with their needs, stimulate interest in Chinese reading, promote independent research-based learning, participate in group cooperative learning, and express opinions, so that students can fully demonstrate their potential. Therefore, this method improves students' comprehensive ability in Chinese reading, enabling the acquired knowledge to be applied in the real world. This is consistent with Liu Li (2021).

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Using Creative Based Learning to Improve the Innovative Skill for Nursing Students

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Abstract

The objectives of this study were 1) to use creative based learning to improve the innovative skills for Nursing students and 2) to compare students' innovative skills before and after the implementation using creative based learning. The simple group of this study consisted of 50 nursing students at Wei fang Nursing Vocational College and were sampled through random cluster. The research instruments included 1) lesson plan based on creative based learning and 2) innovative skills test. The assessment questions aim to assess four sub-variables within the dependent variable including: 1) nursing and society innovation, 2) professional standards, 3) individuals and teams, and 4) project management. AThe data were analyzed by mean, standard deviation and t-test for dependent sample. The results revealed the following. 1. Lesson to improve the innovative skill of nursing students includes Four steps: 1) planning stage, 2) implementation stage, 3) inspection stage, and 4) action stage; 2) comparing their innovative skills before and after implementation, the average score in pre-test evaluation was 58 of full score 80, and in post-test evaluation was 71 of full score 80. It was found that after learning was higher than before learning by statistically at the 0.01 level. That was consistent with the research hypothesis.

Keywords: Creative based learning, Innovative skill, Nursing Students

Introduction

This paper studies the influence of classroom teaching mode under the category of innovative learning methods on the achievement of "innovative skills" of first-year nursing students in higher vocational colleges. Research motivation mainly includes the following two aspects.

One is the need of teaching practice. The primary task of teachers' classroom teaching mode is to set teaching objectives. Teachers need to set corresponding teaching goals in advance no matter how they impart knowledge to students in class, such as text, language, images, video, etc. (Gan, Principles of teaching Design, 1999, p51).

The second is inspired by innovative learning theory. In the classroom model, teachers observe and design the classroom model from a comprehensive perspective, which is also conducive to improving students' innovation ability, constantly integrating skills into it, and forming a classroom model with innovation ability as the goal (Li Hailin, Some reflections on Teaching Objectives, 2003, p. 28).

In short, creative learning is enhanced through innovative education; It requires teachers to strengthen the cultivation of their own innovative ability, so as to enhance the innovative ability of nursing students more effectively.

Objectives

1. To use creative based learning to improve the innovative skill for Nursing students.
2. To compare students' innovative skills before and after the implementation is using creative based learning.

Concept theory framework

The conceptual framework of the study, using creative based learning to improve the invention skill course for Nursing students, was as follows:

Independent Variable		Dependent Variable
Creative Based Learning	▼	Innovative skill of Nursing students

Materials and Methods

The purpose of the lesson plans was to improve the innovative skills of nursing students. The lesson plan was divided into the following four learning units:

1. unit 1: Nursing and Society Innovation (3 hours)
2. unit 2: Professional Standard (3 hours)
3. unit 3: Individuals and Teams (3 hours)
4. unit 4: Project Management (3 hours)

There are four units in the innovation and entrepreneurship education lesson.

The development process of creating Lesson plan according to the innovative skills using creative based learning and assessment form for validity of lesson plan were

followed as.

1. Studying the principles of creating Lesson plan according to the innovative skills and assessment form for validity of lesson plan from books, textbooks, articles, and related research.

2. Creating a Lesson plan according to the innovative skills and assessment form for validity of lesson plan, 4 plans as this above.

3. Drafting the assessment form for validity of lesson plan at the end of each section, there was a space for experts to write suggestions that could be helpful in improving students' innovative skills.

4. Taking the instruments to 3 experts to verify the validity. The test consistency the index of congruency was between 0.60-1.00, the level of consideration was as follows:

Rating was +1 There was an opinion that “Corresponds to definition/measurement objectives.”

Rating was 0 There was an opinion that “Not sure it corresponds to definition /measurement objectives.”

Rating was -1 There was an opinion that “Inconsistent with definition/measurement objectives.”

5. Modifying assessment form for validity of lesson plan according to suggestion.

6. Taking the research instruments to collect data with the research samples.

In this research, the innovative skills were achievement of knowledge that divided into three sub-competencies, including: 1) Nursing and Society Innovation, 2) Professional Standards, 3) Individuals and Teams, and 4) Project Management.

The test questions were designed for these three sub-competencies to evaluate students' innovative skills. The paper consists of 20 multiple-choice questions in each part, totaling 80 questions for a total of 80 points.

The development process of creating the innovative skills test and assessment form for validity of the test of innovative skills were followed as.

1. Studying the principles of the test of innovative skills and assessment form for validity of the test of innovative skills from books, textbooks, articles, and related research.

2. Creating innovative skills test and assessment form for validity of the test of learning achievement.

3. Taking the instruments to 3 experts to verify the content validity and index of items objective congruence (IOC) of the assessment form innovative skills test consistency the index of congruency was between 0.67-1.00.

4. Modifying assessment form for validity of lesson plan according to suggestion.

5. Taking research instrument to innovative skills test and the result of reliability was 0.93.

6. Taking the research instruments to collect data with the research samples.

Table 1: Evaluation quality standards

Score Range	Quality Level
100-120	Strong
86-100	Relatively strong
71-85	General
56-70	Relatively weak
0-55	Weak

The data collection is as follows:

1. Data collection and verification for test tools:

1.Coordinate with 3 professional scholars experts dispense official document from Bansomdejchaopraya University professional experts and give information about data collection process and research tools: instructional model and checklist form about quality of instructional model for consideration (Index of Objective Consistency: IOC).

2. Collect data from 3 professional experts and analysis data for consideration (Index of Objective Consistency: IOC)

Data collection and validation for research work:

1. Relevant literature research: Collect literature related

2. Determination of the research time: the formal research will be carried out in May 2023, and the research data will be collected after the experimental research is completed.

3. Before and after teaching test: This research is experimental research. One Group Pretest – Posttest Design was used with the following experimental design:

Results

The study using creative based learning to improve the invention skill course for Nursing students**.** The researchers conducted research in the following order:

Part 1**:** Results of using creative based learning to improve the innovative skills for Nursing students

The effectiveness of the lesson plan aimed at using creative-based learning to improve innovative skills among nursing students can be assessed through several critical

indicators. Offer valuable insights into the course's impact on enhancing their creativity and innovation, as well as identifying opportunities for further development.

The effectiveness of creative learning is demonstrated through targeted assessments that measure improvement in creative skills before and after class. The level and participation rate of the course reveals its appeal and relevance to nursing students. Observing post-application test scores of innovative skills in a clinical setting or project helps teachers assess their impact on students' professional practice. Provides insights into the development of students' creativity, problem-solving abilities, and readiness to implement innovative solutions in healthcare environments.

The study targeted 50 nursing students from Weifang Nursing Vocational College, aiming to improve their innovative skills through the lesson based on creative-based learning. The detailed outcomes of the pre-test and post-test assessments, which measured the improvement in students' innovative abilities as a result of the course, were presented in Table 2.

Table 2: Learning score between pre-test and post-test

Learning Content	n	Full Scores	Pre-test		Post-test		D
			$\underline{X}$	SD.	$\underline{X}$	SD.	
1. Nursing and Society Innovation	50	20	12	0.642	18	0.346	6
2. Professional Standard	50	20	14	0.436	17	0.412	3
3. Individuals and Teams	50	20	10	0.874	19	0.342	9
4. Project Management	50	20	13	0.576	18	0.432	5
Total		80	49		72		23

According to Table 3, through the implementation of 5E teaching method with the students, their Mathematics Learning Ability post-class significantly improved compared to their ability before the class. This supports the research hypothesis and demonstrates a statistically significant improvement at the level .01.

Part 2: Result of comparing students' innovative skill before and after the implementation using creative based learning

The researcher collected and analyzed data from pre-test and post-test of a lesson focused on using creative-based learning to enhance the innovative skills of nursing students. The data analysis included statistical measures such as mean, standard deviation, and a dependent t-test for correlated samples to assess the effectiveness of the course in improving innovation. The findings were presented in Table 3.

Table 3: Comparison of career planning competency by pre-test and post-test with training course

Learning content		n	Full Point	$\underline{X}$	SD.	t	p
Total score	Pre-test	50	80	58	1.962	9.98**	.00
	Post-test	50	80	71	1.118		

**Statistically significant at level .01 (p <.01)

From the Table 4.2, it could be observed that the career planning competency post-scores were higher than pre-scores, which was statistically significant at the 0.01 level. The average score of students before learning training course was 58 points, and after learning training course, it increased to an average of 71 points, with an average difference of 13 points. The results indicate that after learning training course is better.

Conclusions and Discussion

Conclusion

According to the research topic, the study on improving the innovative skills of nursing students is summarized as follows:

1. Lesson using creative based learning to improve the innovative skills of nursing students which includes Four steps: 1) planning stage, 2) implementation stage, 3) Inspection stage, and 4) Action stage. By using creative based learning, it is found that students have improved the innovative skills of nursing students, including application of knowledge in novel situations, problem-solving and critical thinking, creativity and originality, and adaptability and flexibility to meet the research objectives.

2. Comparing of their innovative skills and abilities before and after implementation, the average outcome in pre-test evaluation was 58 of full score 80, and in post-test evaluation was 71 of full score 80. It was found that after learning was higher than before learning by statistically at the 0.01 level. That was consistent with the research hypothesis.

Discussion

Research on the using creative based learning to improve innovative skill of nursing students was conducted in the first semester of the 2023 academic year. It involved the study of innovative skill for 50 nursing students in Weifang Nursing Vocational College using creative based learning.It is very important to cultivate the innovative thinking, method and ability of nursing students

First-year students are in the golden stage of innovative thinking, and their learning ability, methods, exploration desire and innovation ability are in a flourishing period.

Therefore, to carry out innovative course teaching in the education of first-year students is an important way for colleges and universities to carry out comprehensive education reform and train innovative talents. The study shows the importance of teaching creative learning methods. Nursing students learn the basic knowledge of innovation in school, gradually realize the significance of innovation and innovation, and get some innovative thinking training. They also master some innovative methods in the course learning, and apply relevant knowledge to participate in new projects, which improves their innovation ability and teamwork ability. Creative learning can effectively solve the problems existing in the whole learning and enhance the professional identity; At the same time, the exploration of clinical real problems or cases can stimulate nursing students' interest in innovative learning and practice, and further improve their innovative ability. Studies have shown that 80% of medical innovation skills come from nurses, and nursing students' innovation can help improve nursing quality and work performance, enhance the sense of achievement in the profession, and thus promote the sense of professional identity.

General recommendation

1. Pay attention to the cultivation of nursing students' innovation skills and build a sound innovation skills training system. Innovation skills are considered as the basic core competence of nursing students, and innovative courses through creative learning methods should be incorporated into nursing courses to help students solve existing problems through innovative methods. We should pay attention to the construction of interdisciplinary knowledge system and interdisciplinary integration, and combine innovative theoretical teaching, practical training and innovative education. In addition, the establishment of innovative thinking and the improvement of innovative ability is a gradual process, so it is very important to pay attention to the early training of innovative ability of nursing students and establish a set of systematic training system to improve their innovative skills.

2. Strengthen the construction of innovative teachers in colleges and universities and improve the level of innovative teaching. Students' creativity can be improved through innovation and education, and teachers play a vital role in the development of students' creativity. Therefore, it is very important to strengthen the cultivation of teachers' innovation ability, and colleges and universities should strengthen the guidance and training of teachers' innovation ability. The research points out that only teachers with a certain innovation ability can show a positive attitude towards the cultivation of students' innovation ability and play a positive role in guiding them

3. Strengthen the reform of effective integration of innovative practice teaching of nursing students and innovative education in universities. Clinical practice of nursing students is an important period to improve students' comprehensive ability, and plays a

crucial role in cultivating students' innovative consciousness and improving their innovative ability. Therefore, joint teaching mode can be carried out to improve the innovative ability of nursing students, providing a comprehensive and multi-channel innovative practice platform for nursing students, and effectively improving their innovative ability.

4. Actively create an innovative atmosphere to stimulate nursing students' enthusiasm for innovation. Studies have pointed out that a good creative atmosphere in school is positively correlated with the creativity of nursing students, and having a creative atmosphere is a positive predictor of college students' creativity. Therefore, to further stimulate students' enthusiasm for innovation, exercise innovative thinking and innovative skills in various learning activities, thus enhancing the confidence of nursing students, more likely to engage in innovative activities, more stimulate the initiative and enthusiasm of nursing students to innovate, and improve their innovative skills.

Suggestions for further research

Further research into the using creative based learning to improve the innovative skill of nursing students is crucial for continuous improvement and adaptation to changing healthcare environments. Here are some suggestions for areas of focus:

1. Comparative Studies: Conduct comparative studies to evaluate the effectiveness of creative-based learning versus traditional learning methods in improving innovative skills among nursing students.

2. Longitudinal Research: Undertake longitudinal research to track the career progression of nursing graduates who have undergone creative-based learning, assessing the long-term impact on their innovative capabilities and career success.

3. Interdisciplinary Research: Explore interdisciplinary research opportunities that examine the integration of creative-based learning principles from other fields into nursing education and its impact on student outcomes.

4. Barriers and Enablers: Identify barriers to and enablers for the adoption of creative-based learning in nursing education, providing insights for educators and policymakers to overcome challenges.

5. Impact on Patient Care: Research the direct impact of nurses' innovative skills, nurtured through creative-based learning, on patient care outcomes, healthcare efficiency, and the adoption of innovative healthcare solutions.

By addressing these recommendations and suggestions for further research, nursing education can evolve to better prepare students for the challenges of modern healthcare, equipping them with the innovative skills necessary to lead change and improve patient care outcomes.

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Using Constructivism Theory to Improve Sculpture Creation Ability for Undergraduates

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Abstract

The objectives of this research were to 1) study the factors that improve sculpture creation ability for undergraduates and 2) examine the effects of implementing constructivism theory. The sample group consisted of 30 undergraduates at Inner Mongolia Minzu University in China. They were selected through cluster random sampling. The research instruments were 1) three lesson plans using constructivism theory, totaling 12 hours, and 2) sculpture creation ability. Data were analyzed using frequency, percentage, interpretation, mean, and standard deviation for confirmation of the instructional model. The main findings showed that the students' sculpture creation ability was significantly improved. Furthermore, after implementing constructivism theory, all students who enrolled in the sculpture course were at a good level. As a result, it could be concluded that the constructivism theory was successful in enhancing undergraduates' sculpture creation abilities.

Keywords: Constructivism Theory, Sculpture Creation Ability, Undergraduates

Introduction

With the continuous growth of China's economy, the scale of cities continues to expand. People's demand for spirit has been increasing, and art education has ushered in a fresh spring, and sculpture education has also flourished. The demand for sculpture in society is increasing, and numerous comprehensive universities have also begun to offer the major related to sculpture. More sculpture graduates have entered the fields of art, decoration, urban planning, etc.

The Ministry of Education (2018) issued the Opinion for the Ministry of Education on Strengthening the Construction of High-level Undergraduate Education and Improving the Ability of Talent Cultivation in an All-round Way, which pointed out that universities

promoted classroom teaching revolution, took student development as the center, enhanced learning revolution through teaching reform, selected classroom teaching methods according to class conditions, and continually improved the quality of classroom teaching. Teachers actively guided students to self-manage, stimulated the desire for knowledge, improved learning efficiency and the ability of independent learning (The Ministry of Education, 2018).

According to the statistics from 2010 to 2023 for the employment destination of graduates in the university that author has been working, 44.1% of the graduates have chosen art teachers in primary and secondary schools as their careers, 38.7% of the graduates have engaged in other professions unrelated to sculpture, and only 17.2% of the graduates have engaged in the professions related to sculpture. It can be seen that if teachers cultivate sculpture professionals who could better meet the needs of society, university courses should pay more attention to the self-learning ability and creative ability for learners.

There is also a lot of domestic research in this field. Han (2023) pointed out that in the traditional structure of art education, the core of education was focused on the transmission of knowledge as the primary goal. With the development of the times, the concept of education has changed, from emphasizing students' mastery of basic knowledge in the past to focusing more on students' creativity and aesthetic interests, which required a new teaching approach in the art classroom. Zhao (2022) proposed that in order to maximize the role and value of constructivism art teaching, as well as to improve the overall quality of art teaching, this paper provided an in-depth analysis of the formation of the constructivism art teaching model and pointed out the key principles that should be followed when designing this teaching model such as the principle of simplicity, the principle of gamification, the principle of appropriateness, the principle of authenticity and the principle of three-dimensional evaluation. Based on this, the constructing art classroom teaching model was proposed, and the application of the method was studied in terms of constructing harmonious teacher-student relationships. In the actual teaching process, teachers should create a relaxing learning environment in order to stimulate students' enthusiasm for learning; master the key and difficult points during the art course in order to enhance the practicality of students in the learning process; and use a variety of assessment means to ensure that students' learning results meet expectations. Cao (2021) proposed that the pedagogical philosophy of constructivism emphasized the enhancement of teacher-student collaboration in the educational process, aiming to nurture students' independent exploratory skills in art learning and to guide them more effectively in forming new perceptions based on what they already know. In art education research, the focus of constructivism has centered on a number of areas,

such as educational approaches to meaning construction, the philosophy of constructivism, social and cultural perspectives, and theoretical learning and practical application. In the focus areas of research, there were four main directions of development: the emphasis on constructivist teaching improvement and the importance of color teaching; the increasing attention to the cultivation of students' social and cultural concepts in art education; the higher importance given to the teaching method of constructing meaning in art education; the increasing professionalization of art teachers, the constant updating of educational concepts, and the diversification of teaching methods, and so on. In the teaching process of art, the importance of interaction has been gradually recognized. Hu (2021) proposed that interdisciplinary teaching methods had become a trend in the modern educational research. As an indispensable part of quality education in schools, art education was not only conducive to improving students' and creativity, but also helps to enhance their sense of social responsibility. Art education and labor education were complementary to each other, for integrating labor education into art education helped students grow in all aspects. As comprehensive art discipline, the main contents of art included aesthetic knowledge, skills and techniques, emotional attitude and values, etc.

The practice of the above research showed that integrating constructivism method into teaching reform could enhance students' learning interest, thus mobilizing students' learning initiative and helping students to master corresponding knowledge points. These practices also showed that teaching reform based on constructivism could improve students' inquiry ability and cooperation ability. In a word, the researchers applied the task-driven teaching method to the teaching practice during the sculpture course, and achieved favorable teaching results, to provide students with independent learning and practice opportunities to enhance students' creativity. However, the task-driven teaching model was not static. It would continue to improve with the development of society and the renewal of culture. Teacher should try their best to learn educational theory and professional knowledge, improve teaching ability and master more teaching skills.

Objectives

1. To study the factors that improve sculpture creation ability for undergraduates.
2. To examine the effects of implementing constructivism theory.

Concept theory framework

This study about “Using Constructivism Theory to Improve the Sculpture Creation Ability for Undergraduates”, the researcher studied the concepts and principles of constructivism theory, analyzed the method of constructivism theory and introduced the

research framework 5 steps: 1) Construct knowledge, 2) Stimulate interests and curiosity, 3) Provide appropriate learning opportunities, 4) Encourage learners' participation, 5) Emphasize the relative and subjective of knowledge. The evaluation criterion consisted of three aspects. The items were as follow:

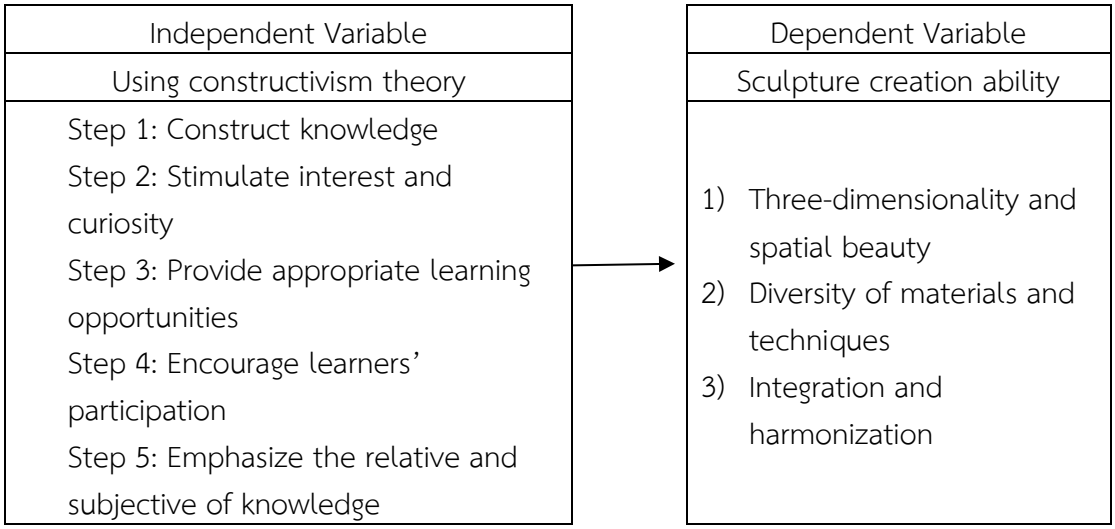

Figure 1: Research framework

Teaching methods

The researcher developed constructivism teaching steps and evaluation factors affecting sculpture creation ability. Teachers applied the teaching mode based on constructivism theory to university sculpture professional courses. This study focused solely on the creative skills training for third-grade sculpture majors. The course was divided into three lesson plans, every plan consisted of 5 steps, totaling 12 hours.

Lesson Plan 1

Objectives

Students have the knowledge and abilities related to expressing ideas through clay works: 1. Three-dimensionality and spatial beauty. 2. Diversity of materials and techniques. 3. Integration and harmonization.

Instructional media

1. China higher education press textbooks and PowerPoint
2. Open online courses
3. Video on the web platform

Contents: Clay sculpture

Skill 1: Three-dimensionality and spatial beauty

The three-dimensional beauty of clay sculpture is reflected through modelling. Through the skillful use of the shaping properties of soil, the student transforms the flat imagination into a three-dimensional three-dimensionality form. This transformation of modelling not only makes the work more vivid and lifelike, but also enhances the viewer's perception and experience, making people feel as if they are in a real three-dimensional world.

In addition to three-dimensional beauty, clay sculptures also show the beauty of space. In the creation of clay sculptures, students need to use spatial thinking and composition skills to cleverly combine elements of different forms to form a harmonious and unified integrality. This spatial combination not only makes the work more hierarchical and three-dimensional, but also creates a sense of space and perspective. When the viewer appreciates the clay sculpture works, the spatial beauty of the works can be understood.

Skill 2: Diversity of materials and techniques

1) Types of clay

Clay is the cornerstone of clay sculpture works, and it has a decisive influence on the final effect of the work. Common clays are as follows:

Ordinary clay: It is the most basic type of clay, easy to shape, suitable for beginners.

China clay: It is high fire resistance and shrinkage rate, suitable for high temperature firing, often used to make fine ceramic art.

Industrial clay: It is not dry easily after being shaped and is suitable for making large or complex structures.

2) Diversity of techniques

Shaping tools: The diversity of shaping tools provides students with a wealth of creative means. The basic tools are knives, scrapers, rollers, etc., as well as more professional molds and engraving tools, which help students to create delicate details and complex forms.

Firing process: Firing is an important step in the production of clay works, and the process varies according to the type of clay and the needs of the work. From low temperature firing to high temperature sintering, each firing method affects the texture and color of the work.

Glazing technology: Glazing can add luster and protection to clay works. From traditional glazes to modern spray glazing techniques, glazing methods are varied, and different glazes and processes can be selected according to the needs of students.

Skill 3: Integration and harmonization

1) Integration.

Shape design and conception: Shape is the most direct expression form of clay

sculpture works, and its design and conception have decisive significance for the success of the works. On the basis of in-depth understanding of clay characteristics and shaping techniques, students need to convey the theme and emotion of the work to the audience through clever shape design. At the same time, students also need to consider the coordination and unity between form and material to create harmonious and beautiful works.

Structural stability analysis: Clay works need to have a certain structural stability to ensure that they are not easily damaged during production and display. In the process of creation, students need to conduct in-depth analysis and research on the structure of the work, and take reasonable support and fixing measures to ensure the stability and security of the work. At the same time, the student also needs to consider the balance and coordination between structural stability and morphological design in order to create works that are both beautiful and practical.

2) Harmonization

The overall style is unified. The unity of the overall style is one of the important factors for the success of clay sculpture works. Students need to keep the overall style of the work consistent during the creation process to ensure coordination and harmony between various parts. Through the unified style expression, the overall sense and artistic appeal of the work can be enhanced, so that the audience can feel the theme and emotion conveyed by the work more deeply.

Aesthetic and cultural integration. As an art form, clay sculpture works need to carry and express specific aesthetic and cultural connotations. In the process of creation, students need to combine their personal aesthetic concepts with traditional culture to show their unique cultural charm through their works. Through the integration of aesthetics and culture, clay sculpture works can be endowed with deeper meaning and value, and enhance their influence and inheritance in contemporary society.

The lesson plan consisted of 5 teaching steps:

Step 1: Construct knowledge

Individuals continuously constructed new knowledge by interacting with the environment and using their existing knowledge and experience. Individuals communicated, cooperated, and negotiated with each other to construct knowledge together.

Step 2: Stimulate interest and curiosity

Teachers stimulated students' interest and curiosity and encouraged their active exploration and discovery of knowledge. Teachers created a challenging and encouraging environment that promoted interaction between students.

Step 3: Provide appropriate learning opportunities

Teachers provided a variety of learning opportunities that were appropriate for teachers such as experimentation, observation, communication, and collaboration.

Step 4: Encourage students' participation

Teachers encouraged learners to participate in the process of knowledge construction such as asking questions, sharing experiences, and providing feedback.

Step 5: Emphasize the relative and subjective of knowledge

Teachers helped students understand the relative of knowledge and encouraged them to respect and accept different views and opinions. Teachers gave timely feedback on students' performance and progress, and continuously improved and refined their knowledge framework.

At last, the researcher submitted the revised lesson plans to 3 experts for review to assess the validity of factors that could enhance sculpture creation ability for undergraduates.

+1 = Sure that the contents are related to the topics

0 = Not sure that the contents are related to the topics

-1 = The contents are not related to the topics

Table 1: The assessment result and suggestion from experts

No.	Questions	Assessment results			suggestion
		+1	0	- 1	
1	Its content is related to the learning objectives.				
2	Learning objectives and themes are aligned.				
3	The learning activities are related to the learning model of constructivism method.				
4	Assignment of work related to the topic of study.				
5	There are a variety of assessments related to learning objectives.				
6	Measurement and evaluation related to learning objectives.				

Sculpture creation ability measurement form and criteria

1.1 Analyze the contents of sculpture creation ability consistent with the course arrangement.

1.2 Be familiar with theories and methods on sculpture creation ability through the research.

1.3 According to the dimensions of sculpture creation ability, the sculpture creation ability evaluation standard was planned. The scoring criteria and scores had been set up for 30 points in all. Different scores represented degrees.

Rank 1: 27-30 points represents strong;

Rank 2: 23-26 points represents relatively strong;

Rank 3: 18-22 represents general;

Rank 4: 14-17 represents relatively weak;

Rank 5: 10-13 represents weak.

1.4 Submit the designed evaluation criteria to the thesis supervisor, check their accuracy, and make modifications.

1.5 Submit sculpture creation ability assessment evaluation criteria created to three experts for measurement and inspection. Experts check the content validity and calculate the Index of Item Objective Congruence (IOC). The consistency indicator of each evaluation content is greater than or equal to 0.50 and is considered suitable for research. The IOC (Index of Item Objective Congruence) value for each item in this evaluation standard is 1.00.

1.6 Revise and improve the scoring criteria, then try out with students who were not the sample to ensure the quality of the assessment.

1.7 Check the reliability of measurement standards using Cronbach's α Coefficients is 1.00., which can be used for research.

Table 2: The measurement form and criteria of sculpture creation ability

Evaluation items	Evaluation contents	Score and criterion		
		3	2	1
Three-dimensionality and spatial beauty	1. Emphasis on contours and forms	Through the fine portrayal of the outline of the object, highlighting its morphological characteristics in space, making the sculpture image more distinctive and three-dimensional accurately.	By intricately depicting the object's contour, accentuating its spatial morphological features, the sculpture's image becomes moderately unique and three-dimensional.	By delicately depicting the object's contour, the spatial features of the object are rarely accentuated, making the sculpture's image less unique and stereo.
	2. Using of light and shadow effects	Through the rational use of light and shadow, it is the most possible to create a relationship between light and dark on the surface of the sculpture.	By strategically employing light and shadow, the student moderately forget a balance between brightness and shadow on the sculpture's surface.	By judiciously employing light and shadow, the student can’t keep a balance between brightness and shadow on the sculpture's surface.

Table 2: (Continued)

Evaluation items	Evaluation contents	Score and criterion		
		3	2	1
Three-dimensionality and spatial beauty	3. Treatment of depth levels	By creating a hierarchical relationship between front and back, up and down in the sculpture, a sense of depth is accurately formed so that the audience can feel the three-dimensional spatial characteristics of the sculpture.	Establishing a tiered arrangement of the sculpture's front and back, as well as its top and bottom, students create moderately an impression of depth, enabling viewers to experience the sculpture's three-dimensional spatial features.	Establishing a tiered arrangement of the sculpture's front and back, as well as its top and bottom, students hardly create an impression of depth, enabling viewers to experience the sculpture's three-dimensional spatial features.
	4. Consideration of environmental factors	Sculpture should echo with the surrounding environment to form accurately a harmonious and unified integrality.	Sculptures ought to resonate with their environment to create moderately a cohesive and unified entity.	Sculptures barely resonate with their environment to create a cohesive and unified entity.

Table 2: (Continued)

Evaluation items	Evaluation contents	Score and criterion		
		3	2	1
Diversity of materials and techniques	1. Diversity of materials	Students accurately choose the right material according to the theme, style and function of the work.	Students moderately select appropriate materials based on the work's theme, style, and purpose.	Students barely select appropriate materials based on the work's theme, style, and purpose.
	2. Diversity of techniques	Students accurately use the traditional sculpture process, including carving, casting and forging, while the modern sculpture process incorporates more technological elements.	Students moderately use the traditional sculpture process, including carving, casting and forging, while the modern sculpture process incorporates more technological elements.	Students barely use the traditional sculpture process, including carving, casting and forging, while the modern sculpture process incorporates more technological elements.

Table 2: (Continued)

Evaluation items	Evaluation contents	Score and criterion		
		3	2	1
Integration and harmonization	1. Integration of elements	By organizing and arranging the elements, students accurately make the work more layered and three-dimensional, and improve the visual impact of the work.	Structuring and organizing components moderately enhance the work's complexity and three-dimensional nature, thereby boosting its visual appeal.	Structuring and organizing components barely enhance the work's complexity and three-dimensional nature, thereby boosting its visual appeal.
	2. Harmonization of materials	Different materials have different textures and expressive power, and students accurately choose appropriate materials according to the theme and aesthetic needs.	Students moderately select suitable materials based on their unique textures and expressive capabilities.	Students barely select suitable materials based on their unique textures and expressive capabilities.

Table 2: (Continued)

Evaluation items	Evaluation contents	Score and criterion		
		3	2	1
	3. Integration of processes	Students accurately combine the processes of carving, casting, forging, and 3D printing.	Students integrate moderately carving, casting, forging, and 3D printing techniques.	Students integrate barely carving, casting, forging, and 3D printing techniques.
Integration and harmonization	4. Harmonization of environmental factors	Students accurately consider the space, light, color and other environmental factors, so that the work and the environment complement each other and form a harmonious and unified integrality.	Students moderately take into account the spatial, lighting, color, and environmental elements surrounding their work.	Students barely take into account the spatial, lighting, color, and environmental elements surrounding their work.

Results

The study used constructivism method to improve sculpture creation ability for undergraduates.

Part 1: To study the factors that improve sculpture creation ability for undergraduates.

Firstly, internal factor. 1) Innovative thinking: Innovative thinking is the foundation of creation ability, which involves unique insights into problems and novel solutions. During the process of sculpture creation, innovative thinking can help students break through the shackles of traditional concepts and create works with unique beauty and artistic value. 2) Imagination ability: Sculpture creation requires students to have rich imagination ability to construct the form, structure and spatial relationship of sculpture through imagination. The ability of imagination can help students to explore more possibilities in their creation and make their works more personalized and innovative. 3) Practical ability: Practical ability is the key to translating innovative thinking and imagination into practical work. Students need to exercise their skills and techniques through continuous practice in order to better transform their ideas into sculptures with artistic beauty. 4) Observation ability: Observation ability is an important means for students to obtain creative inspiration. By observing things and phenomena around them, students can discover elements of beauty and sources of inspiration and incorporate them into their works. At the same time, the ability to observe can also help the students better understand and grasp the form and structure of the sculpture, so that the work is more accurate and vivid.

Secondly, external factor. 1) Education system: The education system plays a crucial role in cultivating the innovative ability of sculpture. Excellent art education can provide students with rich knowledge and skills so as to stimulate their creative potential. However, if the education system pays too much attention to the teaching of traditional skills and theories, while ignoring the cultivation of students' personality and creativity, then this education may limit students' innovative sculpture ability. 2) Development of science and technology: The development of science and technology has also had an important impact on sculpture creation. For example, the emergence of new materials and technologies provides students with more creative means and ways of expression. At the same time, the popularity of digital technology has also made the process of sculpture creation more convenient and efficient. However, relying too much on science and technology may cause students to lose their deep understanding and mastery of traditional techniques, thus affecting their innovative ability. 3) Market demand: Market demand also has a certain impact on sculpture creation. If the market demand is too focused on commercialization and practicality, students may be forced to abandon their

artistic pursuit and innovative spirit to meet the needs of the market. However, if market demand and individual artistic pursuits can be balanced, then market demand may also become an important driving force for sculpture innovation.

Part 2: To examine the effects of implementing constructivism theory.

In this section, the researcher aimed to evaluate the effectiveness of constructivism theory during the process of teaching sculpture professional courses. This study focused solely on the creative skills training of third-grade undergraduates majoring in sculpture. The course was divided into three units, totaling 12 hours:

The researcher compared 30 students' sculpture creation ability before and after the implementation of constructivism theory. The teaching effectiveness of the instructional course was analyzed as follows. 1) study the factors to improve sculpture creation ability for undergraduates, and 2) examine the effects of implementing the constructivism theory. The sample group consisted of 30 undergraduates, at Inner Mongolia Minzu University in China, who were selected through the cluster random sampling. In the research, 30 juniors were selected as experimental subjects in the study, including 10 male students (33.33%), and 20 female students (66.66%). The evaluation standard of sculpture creation ability consisted of 10 evaluation items. Each evaluation item is worth 1-3 points, totaling 30 points.

The researcher conducted data analysis by using the mean, standard deviation, and dependent t-test based on the students' sculpture creation ability scores before and after the implementation of constructivism theory. The results of the data analysis were presented in Table 3.

Table 3: Scores on sculpture creation ability before and after the implementation of constructivism theory

Number of students	Before class score (Pretest)	After class score (Posttest)	Differences between scores (D)
1	20	25	5
2	25	28	3
3	26	28	2
4	24	24	0
5	27	30	3
6	24	28	4
7	23	27	4
8	25	28	3
9	26	26	0
10	22	27	5
11	26	29	3
12	29	30	1
13	19	22	3
14	22	28	6
15	25	27	2
16	16	20	4
17	27	28	1
18	25	29	4
19	26	24	-2
20	30	30	0
21	20	23	3
22	22	27	5
23	26	29	3
24	27	24	-3
25	26	26	0

Table 3: (Continued)

Number of students	Before class score (Pretest)	After class score (Posttest)	Differences between scores (D)
26	22	26	4
27	26	29	3
28	27	24	-3
29	27	22	-5
30	24	24	0
Average score			
$\bar{X}$	24.47	26.40	1.93
SD	3.048	2.660	2.677

As can be seen in Table 3, through the application of teaching theory based on constructivism method, average scores of sculpture innovation ability of juniors was 24.47 before experiment, 26.40 after the experiment, with a difference of 1.93 in the average scores, which indicated that the scores had been improved significantly before and after the experiment.

The researcher conducted data analysis by using the mean, standard deviation, and dependent T-test based on the students' sculpture creation ability scores before and after the experiment. The results of the data analysis are presented in Table 4.

Table 4: Comparison of students' sculpture creation ability before and after the implementation of constructivism theory

Sculpture creation ability	n	full score	$\bar{X}$	SD.	df	t	p
pretest	30	30	24.47	3.05	29	3.96	.000
posttest	30	30	26.40	2.66			

**Statistically significant at the level .01(p<.01)

According to Table 4, through the implementation of constructivism method, students' sculpture creation ability significantly improved. This result supported the research hypothesis and demonstrated a statistically significant improvement at the level .01.

Conclusions and Discussion

Part 1: To study the factors that improve sculpture creation ability for undergraduates.

1. Students' subjectivity and participation: Constructivism emphasizes the central position of students, and students' subjectivity and active participation are crucial to the teaching effect. Students are the main body of learning, and teachers should respect and play their leading role in teaching. Students' passion, interest and drive for sculptural innovation directly determine their investment and results in this area (Bai, 2018).

2. Educational environment and resources: In order to achieve innovation in sculpture, teachers need a quality teaching atmosphere and sufficient resources, including sculpture studios, relevant sculpture materials, tools and digital sculpture software. In the digital age, colleges and universities can make full use of new technologies to transform and update sculpture information. The growth of students' learning experience and innovation ability is directly affected by the configuration of these hardware and software resources (Deng, 2017).

3. Course contents and course design: Whether the design of course content is compatible with the teaching philosophy of constructivism and whether it can stimulate students' innovative thinking and practical skills is also a key factor affecting the cultivation of innovative ability. Therefore, it is necessary to adjust and arrange the teaching contents according to the professional characteristics through the reality and the development of the subject. In addition, the scientific and rational designs of the course, as well as whether it can guide students to master sculpture skills in a step-by-step manner, are the core elements that determine the learning effectiveness of students (Gao, 2021).

4. Evaluation and feedback mechanism: In the constructivist teaching model, this mechanism plays a crucial role in the cultivation of students' academic progress and innovative ability. Through proper assessment of students, teachers can make them clear their own strengths and weaknesses and problems that need to be solved, and then adjust their teaching strategies. Through timely and effective assessment and feedback, students can better understand their own learning progress, identify shortcomings, and seek corresponding improvement measures, so as to continuously enhance their ability in sculpture innovation (Zhang and Xiao, 2021).

In general, there are many factors that affect constructivism theory in the process of cultivating sculpture innovation ability, including students' subjectivity, teachers' roles and methods, teaching environment and resources, curriculum contents, evaluation and feedback mechanism, and social and cultural background. Among them, the learning subject and teaching mode, the teacher-student interaction mode, the teaching situation design, the choice of teaching content and its presentation form, the teaching method,

the teaching strategy and the teaching mode all have direct or indirect effects on the innovation ability of sculpture. In order to better implement the constructivism theory and stimulate students' innovative talent in sculpture, teachers need to consider various factors comprehensively and implement targeted optimization.

Part 2: To examine the effects of implementing constructivism method.

As can be seen in Table 3, through the application of teaching theory based on constructivism theory, average scores of sculpture innovation ability of juniors was 24.47 before experiment, 26.40 after the experiment, with a difference of 1.93 in the average scores, which indicated that the scores had been improved significantly before and after the experiment.

The researcher conducted data analysis by using the mean, standard deviation, and dependent T-test based on the students' sculpture creation ability scores before and after the experiment.

Through the implementation of constructivism theory, students' sculpture creation ability significantly improved. This result supports the research hypothesis and demonstrates a statistically significant improvement at the level .01.

In summary, after the implementation of constructivism theory, students' sculpture creation ability will be enhanced.

Part 1: To study the factors that improve sculpture creation ability for undergraduates.

Apply the teaching mode based on constructivism theory to enhance students' sculpture creation ability in university sculpture courses. This study focuses solely on the creative skills training of third-grade sculpture majors. The course is divided into four units, totaling 12 hours. The researcher, having examined various studies and literature on constructivism theory from multiple scholars, has consolidated these findings into a five-step framework for crafting lesson plans tailored to constructivism theory. Analysis of the data involved evaluating the lesson plan's quality through constructivism by three specialists, the research goals' appropriateness was the most fitting.

Part 2: To examine the effects of implementing constructivism theory.

Table 4 illustrated that when applying teaching theory -based on constructivism theory, juniors' sculpture innovation scores averaged 24.47 pre-experiment, and 26.40 post-experiment, showing a 1.93 difference in average scores.

The researcher conducted the data analysis by using the mean, standard deviation, and dependent T-test, centering on the students' performance in sculpture creation during the process of pre-experiment and post-experiment. Utilizing constructivism theory significantly improved the students' sculpture creation ability. The results support the research theory and demonstrate a statistically significant improvement at the .01 level.

Recommendations

1. Constructivism method holds that learning is an active construction process rather than a passive acceptance of knowledge.

In the cultivation of sculpture innovation ability, attention should be paid to stimulating the initiative and creativity of students, encouraging them to actively participate in sculpture creation practice, and constructing their own knowledge and skills through personal experience and practical operation.

2. Constructivism method emphasizes the interaction between students and the environment.

In the sculpture creation, students need to constantly interact and communicate with sculpture materials, tools and environment, and constantly optimize and adjust their creative ideas and methods. This kind of interaction and communication not only helps to improve students' sculpture skills, but also helps to cultivate their innovative thinking and practical ability.

3. Constructivism method pays attention to the sociality and cooperation of learners.

In the cultivation of sculpture innovation ability, students should be encouraged to cooperate and communicate with others, share each other's experience and results, and learn from each other. This kind of cooperation and communication not only helps to expand students' vision and ideas, but also helps to cultivate their teamwork and communication skills.

To sum up, constructivism method provides some useful guidance for the development direction of sculpture innovation ability. By stimulating the initiative and creativity of students, emphasizing the interaction between students and the environment, and paying attention to the social and cooperative efforts of students, teachers can better cultivate and develop the innovative ability for students, and make contributions to the development of art and the progress of society.

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The Development of Practical Skills through Robot Experiment Training Activity for Undergraduate Students

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Abstract

The objectives of this research were 1) to develop of robot experiment training activity to improve the practical skills of undergraduate students and 2) compare students' practical skills before and after the implementation of robot experiment training activity. The sample group includes 50 second-year students majoring in computer application technology who were selected as the sample group. The research instruments included 1) lesson plans robot experiment training activity, and 2) evaluation criteria for robot practical skills. Data was statistically analyzed by mean, standard deviation, and t-test for dependent samples. The results were found that 1) developing robot experiment training activity for undergraduate students, the course includes module1 problem-solving process using Triz theory, module 2 MSP430 microcontroller hardware basics, module 3 MSP430 microcontroller control software writing fundamentals, and module 4 adjusts MSP430 microcontroller control program parameters according to the actual scenario, 13 hours in total. And measure students' practical skills before and after the course, it was found that students' practical skills have been improved; 2) using the robot experiment training activity, the practical skills of the second-year students majoring in computer application technology of the Information Technology Branch of Zhejiang Yuying Vocational and Technical College were higher after class than before class, with a significance level of .01.

Keywords: Robot Experiment Training Activity, Practical Skills, Undergraduate Student Students

Introduction

Since the 21st century, the competition among countries is mainly the competition of science and technology, and the competition of science and technology is essentially the competition of innovation. As the new industrial and technological revolution continues to evolve, the spillover effect of innovation is gradually emerging, becoming an important engine for economic and social development and a strong weapon for national security (State Council 2017). In the report of the 20th National Congress of the Communist Party of China, President Xi Jinping stressed that "we must insist that science and technology is the first productive force, talent is the first resource and innovation is the first driving force, implement the strategy of developing the country through science and education, the strategy of strengthening the country through talent and the strategy of innovation-driven development, open up new fields and tracks for development, and constantly shape new momentum and advantages for development" (State Council 2022).

Therefore, promoting the deep integration of innovation and entrepreneurship education with professional education, infiltrating innovative and entrepreneurial ideas, 2 cultivating students' creative thinking, and inspiring innovation and entrepreneurship have gradually become the new trend of professional curriculum education in major universities. In order to further guide the students of colleges and universities to actively participate in the trend of "mass entrepreneurship and innovation", combined with the national development strategy and economic and social demand for talent training, to enhance the innovation and practical ability of college students as the core, to improve the quality of college training as the goal. Adhering to the operation mode of "taking students as the main body, oriented by national strategic needs, and supported by the participation of industry enterprises", the Department of Education has created a number of competition platforms with college students' robotics practice as the carrier. The participating schools support the use of competition to promote education and integrate the content of the competition into the curriculum to better improve the innovation and practice of students. The robotics experimental course is a practical course that goes along with the basic course "Microcontroller Principles and Applications" of the College's electronic information engineering major. The microcontroller is equivalent to the brain of an intelligent robot.

The problem of learning and application is that students find it difficult to find innovative ideas and methods for solving problems in robotics experiments, and group 3 experiments are mostly simple repetitions of previous cases, lacking the application of innovative thinking. In general, the original robotics laboratory course does not integrate teaching, learning, and application, and is not very effective in improving students'

innovation and practical skills. Since its inception in 1946, TRIZ theory has gone through different stages of development. It has gradually evolved from classical TRIZ theory to modern TRIZ theory, and has developed many powerful tools for problem analysis, such as functional analysis, causal analysis, and tailoring, which have basically overcome the shortcomings of classical TRIZ theory (Altshuller 1999). The typical process of solving practical problems in modern TRIZ theory is "problem identification", "problem-solving" and "concept verification". In the "Problem Identification" stage, the focus is on a comprehensive analysis of the problem; in the "Problem-Solving" stage, the key problems analyzed in the previous stage are first transformed into problem models in TRIZ theory, then TRIZ tools are used to find strategies and models for solving the problem, and finally into concrete solutions. In the "proof of concept" phase, the main objective is to evaluate the feasibility of the specific solutions obtained in the previous phase (Livotov, 2008). The integration of TRIZ theory into the implementation of robotics experimental courses helps students to improve their sense of independent innovation, find problems and seek solutions on their own initiative, and gain a better and deeper understanding of what they have learned in the classroom, which can only be applied if they master the knowledge themselves.

Compared with other innovation methods, TRIZ theory has a well-developed theoretical system and problem-solving process, which is an efficient problem-solving methodology with strong regularity and easy to promote. The students will learn TRIZ theory systematically and applying it to robotics experimental courses will help them improve their practical skills, realize the transformation from "being able to manipulate like this" to "willing to manipulate like this", and grow into excellent talents with the ability to improvise. Kyle Wagner believes that practical skills are the ability to solve practical problems, and the definition of practical skills is not the same in different fields (Kyle Wagner 2018). Schachterle in the field of engineering, engineering practice ability is considered to be the comprehensive ability to solve practical engineering problems. Based on the understanding of the engineering practice process, engineering design ability, and engineering operation ability are generally regarded as important aspects of engineering practical skills, and other more frequently mentioned abilities include communication ability, teamwork ability, organization and management ability, etc., and a few scholars have included systematic thinking ability in the scope of engineering practical skills (Schachterle 1996). Kolmos Engineering's practical skills are the ability to consider all aspects of the social factors to design according to the needs of the client (Kolmos 2018).

Overall, although different scholars have different understandings of practical skills,

they still highlight the key 4 competencies necessary for the engineering practical. With the changes in the elements and their connections within the modern engineering system as well as the internal and external relationships, the traditional connotation and extension of engineering practice competence need to be deepened and expanded, highlighting the modern features of interdisciplinary characteristics and social dependence that engineering practice has. Taking into account the global trend of engineering education reform, engineering practical skills can be defined as "a comprehensive ability including engineering design ability, engineering operation ability, engineering communication ability, teamwork ability and organizational management ability necessary for solving practical engineering problems.

Objectives

1. To develop robot experiment training activity to improve the practical skills of undergraduate students.
2. To compare students' practical skills, before and after the implementation is robot experiment training activity.

Research Framework

The development of practical skills through robot experiment training activity for undergraduate students. The research concept framework is as follows.

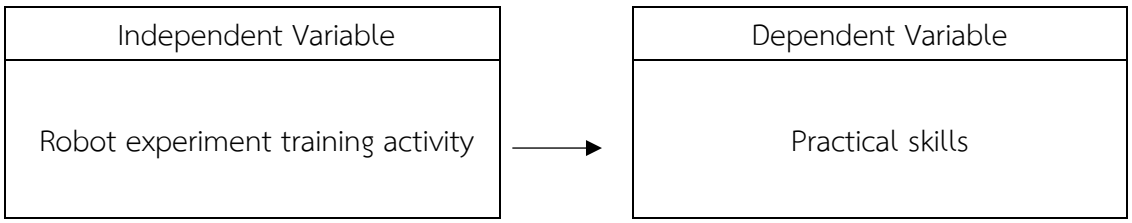

Figure 1: Research Framework

Materials and Methods

The development of practical skills through robot experiment training activity for undergraduate students. The research Instruments are as follows.

Creating and checking the quality of research instruments is shown as follow.

1. Robot experiment training activity and Practical skills test.

1) Studied the concept of Robot experiment training activity and development process of checklist form.

2) Drafted the checklist form. At the end of each section, there is a space for experts to write suggestions that can be helpful in improving the Robot experiment training activity.

3) Experts verified the validity of the checklist concept and development process. Taking the instrument to 3 experts to consider. The test consistency index of congruency is between 0.60-1.00, the level of consideration is as follows:

Rating is +1. There is an opinion that "Corresponds to definition/ measurement objectives.

Rating is 0. There is an opinion that "Not sure it corresponds to definition/measurement objectives."

Rating is -1. There is an opinion that "Inconsistent with definition/ measurement objectives."

4) Modify the checklist form according to suggestions.

Here's a simplified summary of each teaching content and steps:

Teaching Content 1: Problem-solving process using TRIZ theory

1. Analysis of the Problem: Initial student engagement was low; few students completed pre-class readings or participated actively in initial discussions.

2. Identify the Conflict: Students showed limited initiative in constructing and analyzing system diagrams, with little interactive discussion.

3. Principle Resolution: Some groups managed to develop conceptual solutions using TRIZ tools, though overall student engagement was moderate.

4. Comparative Evaluation: A few groups completed solution evaluation within the time limit; overall student participation in this step was not high.

5. Implementation: Limited student teams described the final solution completely; hands-on participation remained weak.

Teaching Content 2: MSP430 microcontroller hardware basics

1. Analysis of the Problem: There was a noticeable improvement in student preparation and engagement compared to the first content.

2. Identify the Conflict: More active discussions and better understanding in drawing and analyzing the system's functional structure.

3. Principle Resolution: Increased number of groups obtaining multiple conceptual solutions; students showed better grasp and use of TRIZ tools.

4. Comparative Evaluation: More groups engaged in the solution marking process, showing improved discussion and interaction.

5. Implementation: All teams completed the textual description of the final solution; student-initiated participation increased notably.

Teaching Content 3: MSP430 microcontroller control software writing fundamentals

1. Analysis of the Problem: A significant improvement in student initiative and readiness; high engagement in pre-class activities.

2. Identify the Conflict: Improved analysis and understanding of system problems with lively discussions among most groups.

3. Principle Resolution: All groups achieved multiple conceptual solutions, indicating a better understanding and application of TRIZ.

4. Comparative Evaluation: Enhanced group discussions during solution evaluations, indicating deeper student involvement.

5. Implementation: Complete solutions from all teams with increased student-led hands-on practice; classroom dynamics shifted towards student-centered learning.

Teaching Content 4: Adjust MSP430 microcontroller control program parameters according to the actual scenario

1. Analysis of the Problem: Total engagement from students in pre-class materials; high levels of active participation in discussions.

2. Identify the Conflict: Comprehensive analysis and discussion on system problems, exceeding expectations in diagramming and critical thinking.

3. Principle Resolution: All groups demonstrated the ability to generate multiple solutions, showing significant improvement in the TRIZ application.

4. Comparative Evaluation: Detailed and professional evaluation of solutions by all groups, indicating a deepened understanding and critical assessment skills.

5. Implementation: Complete and practical final solutions from all teams; enhanced display and operational capabilities, with some groups utilizing advanced technologies.

Symbol and Abbreviations

Represent data analysis results based on symbols and semantics**.** The details are as follows**:**

$\bar{X}$	means	average value
SD.	means	standard deviation
n	means	number of students
D	means	scores of differences between pre- and post-test
df	means	degree of freedom
t	means	statistical data for t-test value
**	means	statistical significance at level .01

Results

To explore the positive impact of a robotics lab course developed based on TRIZ theory on enhancing the practical skills of college students, the researchers conducted the following two studies:

Part 1**:** The results of the impact of a laboratory course based on TRIZ theory on students' learning behavior and learning emotion.

Learning behavior refers to a series of behavioral activities that students perform in a specific environment in order to acquire certain knowledge or skills. These behavioral activities usually include observation, imitation, practice, feedback, etc., which is the process of individuals actively acquiring knowledge and skills. Learning behavior is characterized by initiative, practice, interaction, etc. It not only includes the acceptance and processing of external information by individuals, but also includes the regulation and integration of internal psychological activities of individuals. Learning emotions, on the other hand, refer to a variety of emotional experiences produced in the learning process. These emotional experiences may come from the learning behavior itself, or from the learning environment, learning content, and other factors. Learning emotions have diversity and complexity, which include not only positive emotional experiences, such as interest, curiosity, and satisfaction, etc. but also negative emotional experiences, such as anxiety, stress, boredom, and so on. Learning emotions have an important impact on learning behaviors and learning effects. Positive emotional experiences can promote the occurrence and continuation of learning behaviors and improve learning effects, while negative emotional experiences may lead to inhibition or interruption of learning behaviors and reduce learning effects.

By analyzing students' learning behaviors and learning emotions it is possible to assess the subjective willingness to learn and motivation shown by students in a course, thus effectively evaluating the teaching effectiveness of the course. In the traditional classroom, the data collection of students' learning behaviors and learning emotions mainly relies on teachers' observation in the classroom and teaching reflection records after class, which is limited by teachers' own attention and energy, and it is difficult to analyze and record the learning behaviors and learning emotions of all students in the class in a more complete way. Therefore, in this study, the researcher used the hardware conditions of the school's smart classroom to record the whole process of the robotics experimental course with 44 high-definition cameras, and made use of the accompanying learning situation collection and analysis software to record and visualize the learning

behavior and learning emotions of the students in the classroom, which is an important supplement to the teacher's own learning situation recording and analysis.

The learning condition collection and analysis software has four main functions:

1. Data collection. The learning situation collection system collects data on students' learning situations through various data sources, such as class attendance, classroom interaction, classroom feedback, etc.

2. data processing. The learning situation collection system analyzes multi-dimensional student learning situations through big data processing technology, obtains accurate learning behavior characteristics, and constructs learning behavior models.3. Data analysis. Through machine learning and deep learning technology, the system analyzes students' learning situations in depth and analyzes student's learning characteristics.4. Data visualization. Through charts, reports, and other means, the learning situation data is visualized, which makes it easy for teachers to understand the students' learning situation more intuitively. The learning situation collection system applies big data processing, machine learning, deep learning, and other technologies, which can collect students' learning situations in real time, extract students' learning behavior data, and accurately analyze students' learning situations.

In this study, a total of 50 students from the Computer Application Technology 1 class of the Information Technology Branch of Zhejiang Yuying Vocational College were selected for teaching practice. Among the 50 students in this class, there were 27 male students (54% of the total number) and 23 female students (46% of the total number). The content of the teaching is divided into four modules in total, the first part is the introduction to the application of TRIZ theory; the second part is the hardware system of the MSP430 microcontroller; the third part is the software system of the MSP430 microcontroller; and the fourth part is the comprehensive debugging of the robot based on MSP430 microcontroller. Through the collection of data on the learning behavior and learning emotions of the students participating in the teaching of this experimental course in the classroom and the teacher's teaching feedback, it can be clearly found that the positive learning behavior and positive learning emotions of the students show an upward trend as the course continues to deepen, 45 and the observation of the learning behavior and learning emotions of the specific course modules are as follows

Part 2**:** The results of The Comparison of Students' Practical Skills Before and After Taking the Robotics Lab Course.

In this study, a total of 50 students from the Computer Application Technology 1 class of the Information Technology Branch of Zhejiang Yuying Vocational College were

selected for teaching practice. Among the 50 students in this class, there were 27 male students (54% of the total number) and 23 female students (46% of the total number). The researcher organized the students in the sample group to take the pre-test and post-test, and the results of the quizzes were compiled and calculated as shown in Table 1.

Table 1: Pre-test and Post-test Scores of the Sample

Student ID	Before class scores Pre-test	After class scores Post-test	Different scores (D)	SD
1	10.00	11.00	1.00	0.647
2	15.00	25.00	10.00	0.369
3	17.50	22.50	5.00	0.875
4	16.00	21.00	5.00	0.426
5	17.00	24.00	7.00	0.221
6	10.00	16.50	6.50	0.356
7	22.00	29.00	7.00	0.325
8	17.00	25.00	8.00	0.759
9	11.00	17.00	6.00	0.687
10	13.00	18.00	5.00	0.667
11	16.00	22.00	6.00	0.542
12	14.00	19.00	5.00	0.687
13	12.00	15.00	3.00	0.571
14	11.00	20.00	9.00	0.547
15	10.00	17.00	7.00	0.896
16	13.00	19.50	6.50	0.647
17	10.00	15.00	5.00	0.567
18	13.00	18.00	5.00	0.258
19	11.00	19.00	8.00	0.479
20	12.00	18.00	6.00	0.674
21	14.00	22.00	8.00	0.647
22	15.00	24.00	9.00	0.675
23	11.00	21.00	10.00	0.356
24	17.00	24.00	7.00	0.875
25	12.00	21.00	9.00	0.896
26	12.00	22.50	10.50	0.356

27	14.00	20.50	6.50	0.896
28	11.00	16.00	5.00	0.258
29	16.00	24.00	8.00	0.647
30	12.00	16.00	4.00	0.356
31	16.00	23.00	7.00	0.675
32	10.00	15.00	5.00	0.875
33	16.00	24.00	8.00	0.647
34	14.00	18.00	4.00	0.567
35	10.50	14.50	4.00	0.647
36	10.00	17.00	7.00	0.675
37	10.00	17.00	7.00	0.896
38	10.00	15.00	5.00	0.356
39	11.00	18.00	7.00	0.412
40	13.00	20.00	7.00	0.357
41	12.00	17.00	5.00	0.356
42	11.00	21.00	10.00	0.458
43	17.00	19.00	2.00	0.794
44	14.00	22.00	8.00	0.745
45	12.00	21.00	9.00	0.647
46	14.00	20.00	6.00	0.896
47	16.00	23.00	7.00	0.357
48	11.00	20.00	9.00	0.794
49	13.00	20.00	7.00	0.458
50	10.00	19.50	9.50	0.356
Average scores (X)	13.26	19.93	6.67	0.845

From Table 1, Practical skill level scores of undergraduate students in the ample group participating in the teaching experiment before and after taking a laboratory course on robotics based on TRIZ theory, the average score for the pre-test was 13.26, while the average score for the post-test after learning was 19.93, and the mean difference was 6.67. The after-learning score was found to be higher than the before-learning score.

The researcher conducted a paired-sample t-test on the sample data using SPSS software, which showed that the sample difference was significant, indicating that the student's performance improvement was very obvious after the robotics laboratory course developed based on TRIZ theory, as shown in the results of the specific data analysis

Table 2: Data analysis table of pre-test and post

Practical Skills	n	Full Score	x	sd	df	P	T
Pre-test	50	30	13.26	2.64	50	0.000**	22.88
Post-test	50	30	19.93	3.42			

**Statistically significant at the level .01 ($p < .01$)

From Table 2, the practical skill level scores of undergraduate students in the sample group participating in the teaching experiment before and after taking a laboratory course on robotics based on TRIZ theory, the average score before learning was 13.26, and the average score after learning was 19.93. The standard deviation before learning was 2.64, and the standard deviation after learning was 3.42. The results were found that the practical skills of students after learning higher than before learning statistically significant at the level .01.

Conclusions and Discussion

Conclusion

In this research of developing a robotics laboratory course with TRIZ-based theory to enhance the practical ability of college students, after the process of theoretical research, classroom practice, and data analysis, the conclusions of the specific research are as follows:

1. Applying TRIZ theory to build a robotics laboratory course can enhance students' desire to explore knowledge, cultivate a problem-oriented way of thinking, and significantly improve students' learning behaviors. Through classroom observation, it was found that as the course progressed, the learning behaviors of the participating students, such as teamwork, communication, pre-study before class, review after class, and questioning and speaking, were positively changed.

2. The robotics experimental course constructed by using Triz theory can obviously improve the students' performance of practical robotics skills. The T-test shows that there

is a very significant difference between the pre-test and post-test scores, and the enhancement effect is very significant.

Discussion

In this study of developing a robotics laboratory course for enhancing the practical skills of college students, all of the pre-set research objectives have been achieved, the research hypotheses have been positively justified, and the findings are specifically discussed as follows:

1. The robotics experimental course developed based on TRIZ theory allows students to be problem-oriented, fully stimulates their desire to explore, discovers the root causes of problems, clarifies the contradictory keys to solving problems, and through structured tools allows students to quickly gain inspiration for solving contradictory conflict and obtaining innovative solutions, and in this way of learning, allows students to continuously accumulate solutions that This enables students to continuously obtain positive feedback, thus improving students' learning behavior. From the viewpoint of the whole teaching experiment process, as students become more and more adapted to the teaching process based on the TRIZ theory, their learning performance in the areas of pre-course preparation, cooperative learning, self-driven, communication learning, etc., has a very big improvement, which is helpful for promoting the development of the student's practical ability in the operation of robots. There is an obvious role in promoting the development of students' practical skills in robot operation.

2. In this study, a teaching framework divided into five steps was constructed based on the TRIZ theory and applied in the robotics experimental teaching course to theorize and standardize the teaching process. In the problem discovery and analysis link, the key points and difficulties of the teaching content are skillfully embedded, and students are guided to recognize and discover the key points of learning by themselves and visualize them. In the conflict definition and solution comparison session, the TRIZ invention problem-solving tool is introduced to help students quickly form structured solutions, and students' learning confidence is enhanced through continuous positive feedback. Finally, in the implementation session, through teamwork, communication, and mutual assistance, students' comprehensive practical skills are all greatly practiced. By comparing the students' scores in the pre-test and post-test, there is a significant improvement in the student's level of practical robotics skills before and after the course.

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Using Hierarchical Teaching Method to Improve Middle School Students English Reading Comprehension Abilities

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Abstract

The objectives of this study were 1) to development of English reading comprehension ability using Hierarchical teaching method of middle school students and 2) to compare students' English reading comprehension before and after the implementation Hierarchical teaching method. The simple group of this study consisted of 30 samples from the first-year middle school students of the middle school affiliated to Yunnan College of Business Management. The research instruments included 1) lesson plans and 2) English reading comprehension ability test. The assessment questions aim to assess five sub-variables within the dependent variable including: comprehension ability, reading ability, language knowledge, decoding ability, cultural awareness. The data were analyzed by mean, standard deviation and t-test for dependent sample. The results were found that 1) by employing the hierarchical teaching method to improve middle school students' English reading comprehension, their academic performance showed marked improvement. This suggests that the hierarchical teaching method effectively tailors instruction to meet the varying levels and needs of students, thereby significantly enhancing their English reading comprehension. In other words, the hierarchical teaching approach aids teachers in better addressing the individualized needs of students, ultimately leading to improved learning outcomes. 2) Before and after the implementation of the hierarchical teaching method, the pre-test average score for English reading comprehension ability was 67.80 points, while the post-test average was 75.07 points, showing an average difference of 7.27 points. Post-study scores were higher than pre-study and statistically significant at the 0.1 level. This aligns with the research hypothesis.

Keywords: Hierarchical Teaching Method, English Reading Comprehension Ability, Middle School Students

Introduction

The advent of globalization, English, as the most widely used language in the world, plays an important role in communication among people worldwide, learning English has profound practical significance. The Chinese government attaches great importance to English education and teaching, and English teaching begins at the primary school stage. English is also an important part of the middle school, high school, and university curriculums (Yao YanRu, 2019). For most Chinese middle school students, English reading is one of the main ways to learn English, and reading comprehension is also a significant part of English tests, which requires students to have a high level of English vocabulary accumulation, reading comprehension ability, and spoken English proficiency. It can be said that cultivating English reading ability is the key to improving and cultivating students' overall English proficiency (Zhao ZhiLing, 2017).

Hierarchical teaching is a teaching method that makes school education adapt to the differences of students and fully embodies the subjectivity of students by constructing a diversified curriculum and teaching, Is a strategy to provide students with suitable teaching materials and methods to help them develop better (Hallam, 2016). Hierarchical teaching is a teaching method, which emphasizes the combination of students' learning and teachers' teaching, the concept of Hierarchical teaching: teachers divide classes into two or three layers according to students' intelligence level and different grades, and set teaching objectives in Hierarchical teaching, consider students' different needs in teaching and try to strengthen the cooperation between teachers and students, many schools in China have gradually begun to implement Hierarchical teaching(Hua Guodong, 2017).

Hierarchical teaching aligns with the differentiated instruction theory, which emphasizes that students learn differently and therefore require varied teaching approaches. By catering to individual learning styles, hierarchical teaching can significantly improve students' reading comprehension abilities. Introduced by Lev Vygotsky, the ZPD refers to the gap between what a learner can do independently and what they can do with assistance. Hierarchical teaching aims to bridge this gap by providing scaffolded support, gradually releasing responsibility to the student as their comprehension skills improve. In the classroom, hierarchical teaching can be implemented through grouped reading sessions, where students are grouped based on their reading levels. Each group can then work on texts and activities tailored to their abilities, ensuring optimal learning and comprehension. Teachers can also use tiered assignments, providing different levels of challenge and complexity based on students' reading proficiency.

Numerous studies have shown the effectiveness of hierarchical teaching in enhancing reading comprehension. For instance, a study conducted by Johnson and colleagues (2016) found that students who received differentiated instruction in reading

showed significant improvements in their comprehension skills compared to those who did not. Another study by Smith and Brown (2018) concluded that hierarchical teaching not only improves reading comprehension but also boosts students' confidence and engagement in reading activities.

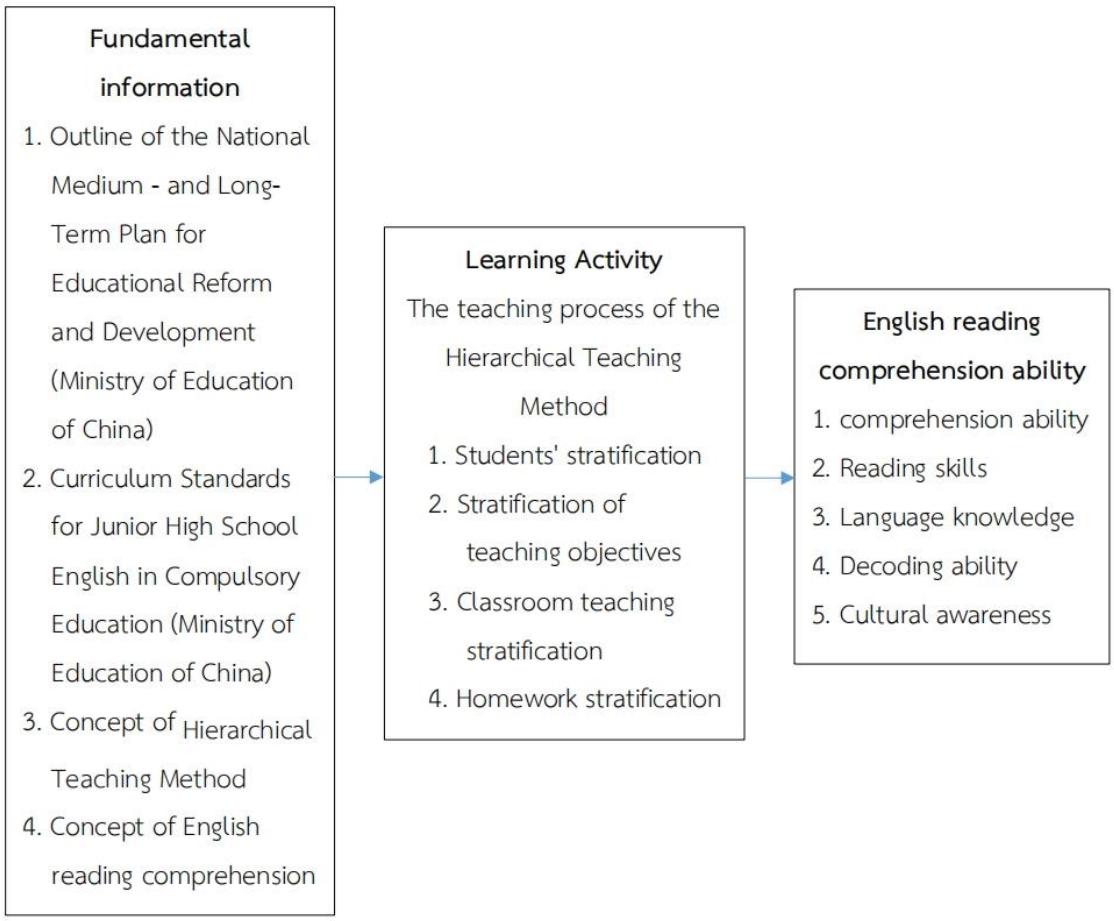
In summary, the hierarchical teaching strategy aligns with differentiated instruction theories and the concept of the Zone of Proximal Development. Relevant studies have demonstrated its effectiveness in improving reading comprehension abilities, making it a valuable tool for educators seeking to enhance their students' reading skills.

Objectives

1. To develop of English reading comprehension ability using hierarchical teaching method of middle school students.
2. To compare students' English reading comprehension ability before and after the implementation hierarchical teaching method.

Concept theory framework

The conceptual framework of the study, the development of English Reading comprehension Ability using Hierarchical Teaching Method of middle school students, was as follows:



Materials and Methods

The development of English reading comprehension ability using Hierarchical teaching method of middle school students, the research Instruments were as follows:

1. Lesson plan according to the Hierarchical Teaching Method.

The purpose of lesson plans was to improve the English reading comprehension ability by applying the Hierarchical teaching method. The lesson plan was divided into the following four learning units. spanning a total of 12 hours:

(1). Unit 1: Usage of modal verb “can” (3 hours)

(2). Unit 2: Correct expression of time (3 hours)

(3). Unit 3: The Time and Cultural Differences between China and the West (3 hours)

(4). Unit 4: Accurately describe the weather (3 hours)

The development process of creating Lesson plan according to the Hierarchical teaching method and assessment form for validity of lesson plan were followed as.

1.1 Studying the principles of creating Lesson plan according to the Hierarchical teaching method and assessment form for validity of lesson plan from books, textbooks, articles, and related research.

1.2 Creating a Lesson plan according to the Hierarchical teaching method and assessment form for validity of lesson plan, 4 plans as this above.

1.3 Drafting the assessment form for validity of lesson plan at the end of each section, there was a space for experts to write suggestions that could be helpful in improving students' English reading comprehension ability.

1.4 Taking the instruments to 3 experts to verify the validity. The test consistency the index of congruency was between 0.60-1.00, the level of consideration was as follows:

Rating was +1 There was an opinion that "Corresponds to definition/ measurement objectives."

Rating was 0 There was an opinion that "Not sure it corresponds to definition/measurement objectives."

Rating was -1 There was an opinion that "Inconsistent with definition/ measurement objectives."

1.5 Modifying assessment form for validity of lesson plan according to suggestion.

1.6 Taking the research instruments to collect data with the research samples.

2. English Reading comprehension Ability test

In this research, the English reading comprehension ability was achievement of knowledge that divided into five sub-competencies, including: 1) comprehension ability 2) reading ability 3) language knowledge 4) decoding ability 5) cultural awareness.

The test questions were designed for these five sub-competencies to assess students' English Reading comprehension. The paper consists of 20 subjective questions, with each question worth 5 points, for a total of 100 points.

The development process of creating English Reading comprehension Ability test and assessment form for validity of the test of English Reading comprehension were followed as.

2.1 Studying the principles of the test of English Reading comprehension Ability and assessment form for validity of the test of English Reading comprehension Ability from books, textbooks, articles, and related research.

2.2 Creating English Reading comprehension test and assessment form for validity of the test of English Reading comprehension Ability.

2.3 Taking the instruments to 3 experts to verify the content validity and index of items objective congruence (IOC) of the assessment form English Reading comprehension Ability test consistency the index of congruency was between 0.67-1.00.

2.4 Modifying assessment form for validity of lesson plan according to suggestion.

2.5 Taking research instrument to English reading comprehension ability test and the result of reliability was 0.96.

2.6 Taking the research instruments to collect data with the research samples.

Results

Symbol and Abbreviations

Represent data analysis results based on symbols and semantics**.** The details are as follows**:**

$\bar{X}$	means	average value
SD.	means	standard deviation
n	means	number of students
D	means	scores of differences between pre and post test
df	means	degree of freedom
t	means	statistical data for t-test value
**	means	statistical significance at level .01

This study concluded through experimental design that the English Reading comprehension Ability based on the Hierarchical Teaching Method is reasonable and effective, and the following conclusions were drawn:

Table 1: English Reading comprehension Ability score between before and after learning

English Reading comprehension Ability	n	Full Scores	Pre-test		Post-test		D
			$\bar{X}$	SD.	$\bar{X}$	SD.	
1. Comprehension ability	30	25	17.17	2.63	19.60	2.69	2.43
2. Reading skills	30	25	16.73	2.63	18.80	2.86	2.07
3. Language knowledge	30	20	12.57	2.30	13.70	2.73	1.13
4. Decoding ability	30	15	10.90	1.37	11.50	1.41	0.6
5. Cultural awareness	30	15	10.43	1.17	11.23	1.41	0.8
total		100	67.8	10.1	74.83	11.1	7.03

As can be seen from Table 1, the scores of the five sub-abilities of middle school students who adopt the hierarchical teaching method change as follows:1) Comprehension ability: the average score before study is 17.1, and the average score after study is 19.6 with an average difference of 2.43. 2) Reading skills: the average score before school is 16.7 points, and the average score after school is 18.80 points, with an average difference of 2.07 points. 3) Language knowledge: the average score before school is 12.57, and after school it is 13.70, with an average difference of 2. 4) Decoding ability: the average score before learning is 10.90, and the average score after learning is 11.50, with an average difference of 0.6 points. 5) Cultural awareness: the average score before study is 10.43

points, and the average score after study is 11.23 points, with an average difference of 0.8 point. After stratified teaching, the scores of students' comprehension, reading skills, language knowledge, decoding ability and cultural awareness are higher than those before learning. Therefore, the hierarchical teaching method can improve the reading comprehension ability of middle school students and achieve the research purpose.

Table 2: Comparison of English Reading comprehension Ability before and after class by implementing the Hierarchical teaching

English Reading comprehension Ability		n	Full Point	$\bar{X}$	SD.	t	p
Total score	Pre-test	30	100	67.8	9.32	-11.267	0.000
	Post-test	30	100	75.07	10.22		

From Table 2, it could be observed that the students' post-learning scores were higher than their pre-learning scores, which was statistically significant at the 0.01 level. The average score of students before employing the hierarchical teaching method was 67.80 points, and after the implementation, it increased to an average of 75.07 points, with an average difference of 7.27 points. The results indicate that after adopting the hierarchical teaching method, students' learning achievement has improved compared to before. The findings were statistically significant.

Table 3: Comparison of learning achievement before and after Using Hierarchical Teaching Method to improve English Reading comprehension Ability of middle school students

Student id	Pre-School score (Pre-Test)	After school score (Post-Test)	Difference between points(D)
1	62	72	10
2	70	75	5
3	67	69	2
4	82	90	8
5	65	68	3
6	58	65	7

7	73	78	5
8	69	80	11
9	73	75	2
10	55	63	8
11	60	67	7
12	71	79	8
13	68	69	1
14	63	75	12
15	66	73	7
16	75	84	9
17	85	93	8
18	64	70	6
19	59	60	1
20	53	61	8
21	64	70	6
22	77	89	12
23	74	85	11
24	57	67	10
25	80	94	14
26	69	73	4
27	86	95	9
28	79	83	4
29	53	60	7

30	57	70	13
$\bar{x}$	67.80	75.06	7.26

Conclusions and Discussion

Conclusion

According to the research topic, the research on the development of middle school students' academic performance in English courses by using hierarchical teaching mode is summarized as follows:

1. Results of developing of English reading comprehension ability using hierarchical teaching method of middle school students. after stratified teaching, the scores of students' comprehension, reading skills, language knowledge, decoding ability and cultural awareness are higher than those before learning. Therefore, the hierarchical teaching method can improve the reading comprehension ability of middle school students and achieve the research purpose.

2. Results of comparing students' English reading comprehension ability before and after the implementation hierarchical teaching method. students' post-learning scores were higher than their pre-learning scores, which was statistically significant at the 0.01 level. The average score of students before employing the hierarchical teaching method was 67.80 points, and after the implementation, it increased to an average of 75.07 points, with an average difference of 7.27 points. The results indicate that after adopting the hierarchical teaching method, students' learning achievement has improved compared to before. The findings were statistically significant.

Discussion

Research on development of English reading comprehension ability using hierarchical teaching method of middle school students was conducted in the second semester of the 2023 academic year. It involved the study of academic performance cultivation for 30 first-year of class 3 middle school students of Yunnan University of Economics and Management using hierarchical teaching method. This research can be discussed from two aspects:

1. The developing of English reading comprehension ability using hierarchical teaching method of middle school students, the researchers divided the lesson plan writing into four steps according to hierarchical teaching method: 1) Students' stratification, 2) Stratification of teaching objectives, 3) Classroom teaching stratification, 4) Homework stratification. The assessment of learning achievement performance was tested through five sub-skills: 1) comprehension ability 2) reading ability 3) language knowledge 4) decoding ability 5) cultural awareness. Data analysis was conducted by three experts who

evaluated the quality of lesson plans based on hierarchical teaching method, with the results presented by experts evaluating the lesson plan quality. Using hierarchical teaching method to improve English reading comprehension ability was necessary. Through the analysis of students' reading scores before and after hierarchical reading teaching, this study finds that hierarchical teaching has a positive impact on students' reading scores. Specifically, after the implementation of hierarchical teaching, students' reading scores before and after the test are significantly different, and their reading scores are obviously improved. At the same time, hierarchical teaching has a significant effect on improving students' English reading scores at all levels, which is conducive to narrowing the polarization of students' reading scores. This result is consistent with that of Huang Weiqiang (2019) and Chen Danping (2020). This study adopts the hierarchical reading teaching based on the theory of teaching students in accordance with their aptitude, the nearest development area and the optimization of teaching. Zhao Dongping (2018) believes that teaching is the most effective and promotes students' development to the maximum extent only when teaching happens to fall into the students' nearest development area. The hierarchical teaching method's success in enhancing students' English reading comprehension abilities can be attributed to several factors: Tailored Instruction: The hierarchical approach respects individual differences and tailors instruction to students' specific needs and abilities. This ensures that students are challenged appropriately, fostering greater engagement and achievement. Differentiation of Learning Goals: By setting differentiated learning goals for students at various levels, hierarchical teaching ensures that each student has a clear path to improvement, tailored to their individual capabilities. Encouragement of Higher-Order Thinking: Hierarchical teaching encourages students to engage in critical thinking and problem-solving, not just rote memorization. This cultivates a deeper understanding of the material. Cultivation of Learning Habits: By focusing on reading comprehension strategies and techniques, hierarchical teaching fosters good reading habits that benefit students beyond the classroom. Promotion of Cooperative Learning: The heterogeneous grouping of students encourages cooperation and collaboration, leading to knowledge sharing and mutual support among peers. Zhao Dongping (2018) believes that teaching is the most effective and promotes students' development to the maximum extent only when teaching happens to fall into the students' nearest development area. In the process of stratified teaching, students' individual differences are respected, and students' recent development areas are attached importance. According to students' reading scores and their non-intellectual factors, students are divided into three levels: basic level, improvement level and development level. Set a reading teaching goal for students at each level that is suitable for the nearest development zone. At the same time, the arrangement of reading

tasks in teaching activities also meets the needs of students at each level in the nearest development zone. The design and selection of reading objectives, reading tasks and extracurricular reading materials are always higher than the learners' knowledge level, but not too high, so that students at different levels can get further development through their own efforts or with the help of teachers and peers, so as to stimulate their curiosity, mobilize their enthusiasm for participating in classroom activities, and enable students to gain a sense of accomplishment, self-confidence and improve their reading performance. Reading objectives, reading activities or tasks, reading materials, etc. are no longer limited to meeting the needs of some students. Instead, they are designed in layers considering the individual differences of students, giving students at different levels the same attention. I believe that students at each level have the potential for development, so that students at each level can develop on the original basis. Combine the hierarchical evaluation, formative evaluation and summative evaluation of students, and give feedback in time. At the same time, students at three levels, A, B and C, are combined in a heterogeneous way, and cooperative learning is carried out in groups to make common progress, so as to mobilize students' subjective initiative and cultivate their team spirit and sense of responsibility. In summary, the hierarchical teaching method's effectiveness in improving middle school students' English reading comprehension abilities lies in its ability to tailor instruction to individual students' needs, providing appropriate challenges and support, and fostering a learning environment that encourages critical thinking, cooperation, and the development of lifelong learning habits.

2. The comparing students' English reading comprehension ability before and after the implementation hierarchical teaching method. Researchers studied many literatures and research related to the hierarchical teaching method and conducted research based on the middle school students hierarchical teaching method. According to the research results, adopting the hierarchical teaching method can promote middle school students to improve their English reading comprehension ability. The results showed that the average score before learning was 67.8 points, and the average score after learning was 75.07 points, with an average difference of 7.27 points. The results show that, the average score of undergraduate students in pre-class assessments was 67.8 (SD = 9.32), and in post-class assessments, it was 75.07 (SD = 10.22). The post-class assessment scores were significantly higher than pre-class assessment scores at a statistical significance level of 0.01. This result is consistent with the results of "Applied Research on Stratified Teaching of English Reading in Junior Middle School" conducted by Zhao Danqi (2021). Zhao Danqi believes that after a period of stratified reading teaching, the English reading learning effect of junior middle school students has been optimized. According to the average results of students' scores in the first and second tests and the results of paired sample T-test, the

average scores in the two tests are 29.52 points and 32.07 points respectively. The T distribution value of post-test and pre-test paired samples was 3.854, which reached the significance level. This shows that after four months of stratified reading teaching, students' reading learning effect has been greatly improved. The experimental research of layered reading teaching shows that layered reading teaching can indeed promote the improvement of students' reading performance, and in the long run, it can promote a virtuous cycle, so that students' interest in reading can be gradually improved, so that students gradually love reading. The results show that using hierarchical teaching method can improve middle school students English reading comprehension ability, achieving the research objective.

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Cost Analysis on Hydrogen Production from Biomass Gasification: Simulation Study on Rice Straw and Wood Pellet Conversion

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Abstract

This work studied the process of hydrogen production from biomass in Thailand, for instance, rice straw and wood pellet. The biomass gasification plant was simulated using the process simulation software Aspen Plus v.12.1. The sensitivity analysis was focused on the effects of significant operating conditions: gasification temperature and steam to biomass ratio (S/B ratio) on hydrogen production. The results were used to indicate the operating conditions that yielded the maximum amount of hydrogen production for each feedstock. The results revealed that 97.63 kg-H_2/hr was produced at gasification temperature of 700°C and S/B ratio of 1 for rice straw, while 83.33 kg-H_2/hr was produced at gasification temperature of 650°C and S/B ratio of 1 for wood pellet. Additionally, the cost analysis was studied and the results showed that the unit production costs of hydrogen production from rice straw and wood pellet gasification were 2.77 USD/kg-H_2 and 4.07 USD/kg-H_2, respectively.

Keywords: Aspen Plus, Biomass, Cost Analysis, Gasification, Hydrogen

Introduction

Around 34% of the Thailand population in 2023 was employed in the agricultural sector. Subsequently, a lot of agricultural residues is available as by-products and eliminated by open burning. Compared to burning, converting residues into renewable energy will be an opportunity to develop waste management systems within the concept of sustainable development, and reduce CO_2 emission from open burning (Dangprok et al., 2023).

Thai Government has adopted the Bio-Circular-Green Economic (BCG) model to promote sustainable development for economic development plan of 2021–2026, in which bioenergy was considered as one of targeted sectors (Edyvean et al., 2023).

Agricultural wastes are regarded as biomass, which can be used to produce hydrogen and biofuels. Unlike carbon-containing biofuels, hydrogen is a carbon-free molecule with no carbon emission from its combustion (Wilkinson et al., 2023). Based on the massive amount of agricultural waste and residues in Thailand, hydrogen production from biomass will act as a potential BCG model to support Thai economic development plans.

Moreover, the potential of economic and financial feasibility of hydrogen production from biomass gasification in Thailand should be evaluated. Therefore, cost analysis will be investigated to reveal the potential competitiveness of biomass-to-energy in an industrial-scale operation. In this study, hydrogen production from biomass gasification process model was developed via Aspen Plus simulation. The results from this study will be useful to support the development of renewable energy in Thailand.

Objectives

This study aimed to investigate the hydrogen production from biomass gasification process using Aspen Plus simulation, a chemical process simulator used in a large number of simulation study. The effects of biomass feedstock types and operating conditions on the amount of hydrogen yield were determined to identify the optimum operating conditions. Subsequently, the cost analysis of hydrogen production at optimum operating conditions was evaluated.

Concept Theory Framework

1. Biomass Gasification

Biomass gasification is a technology of thermochemical conversion of biomass. The basic principle is to heat the biomass feedstock under incomplete combustion conditions to produce syngas, which mainly consists of H_2 and CO (Wang, 2023). The reactions involved in the biomass-based gasification process are shown in Table 1.

Table 1: Reactions involved in the biomass-based gasification process (Rizvi et al., 2023)

Reaction name	Reaction	Standard heat of reaction, kJ/mol
Boudouard	$C+CO_2 \leftrightarrow CO$	+172.0
Char Partial Oxidation	$C+½O_2 \longrightarrow CO$	−111.0

Reaction name	Reaction	Standard heat of reaction, kJ/mol
Hydrogasification	$C+2H_2 \leftrightarrow CH_4$	−74.8
Steam Methane Reforming	$CH_4+H_2O \leftrightarrow CO+3H_2$	+206.0
Water-Gas	$C+H_2O \leftrightarrow CO+H_2$	+131.0
Water-Gas Shift	$CO+H_2O \leftrightarrow CO_2+H_2$	−41.0

2. Cost Analysis

The total capital investment (TCI) consists of installed direct equipment costs, indirect costs, tax and working capital. The operating costs include raw material, utilities, labor, and maintenance costs. The software Aspen Process Economic Analyzer (APEA) is used to estimate the capital cost and operating costs for the process plant. APEA is integrated to Aspen Plus simulation and used to estimate costs of the designed model. The annuity techno economic assessment method is used to estimate the unit production cost using the equation as follows (Fivga & Dimitriou, 2018). The unit production cost will be considered as the key financial indicator to compare the feasibility of each feedstock. Cost analysis is conducted based on the assumption of the exception of transportation and storage cost (Fivga & Dimitriou, 2018 and AlNouss et al., 2020).

$$ACI = TCI \times \frac{r \times (1 + r)^N}{(1 + r)^N - 1}$$

$$\text{Unit production cost (USD/kg)} = \frac{ACI + \text{Operating cost (USD/yr)}}{\text{Annual hydrogen production (kg/yr)}}$$

where ACI is the annuity of the capital investment, r the interest rate and N the lifetime of the plant.

Materials and Methods

To study the operating conditions of the gasification process and the characteristics of different biomass feedstocks, Aspen Plus v.12.1 was used to design and optimize the gasification process. The process flowsheet of the biomass gasification was presented in Fig. 1. Proximate and ultimate analysis of biomass were entered for the stream BIOMASS

component attributes as presented in Table 2. The non-conventional stream of biomass was pyrolyzed by the DECOMPOS block (RYield reactor). Biomass gasification was simulated by the GASIFIER block (RGibbs reactor) where the gasifying agent was added to the reactor as stream STEAM1. Gasification temperature was varied between 600℃ - 1000℃ and mass flow rate of gasifying agent was varied depending on the steam to biomass (S/B) ratio between 0.4 - 1. Separator were used for hydrogen purification to obtain hydrogen gas as the final product. The system was operated under atmospheric pressure and the mass flow rate of BIOMASS was 1000 kg/hr.

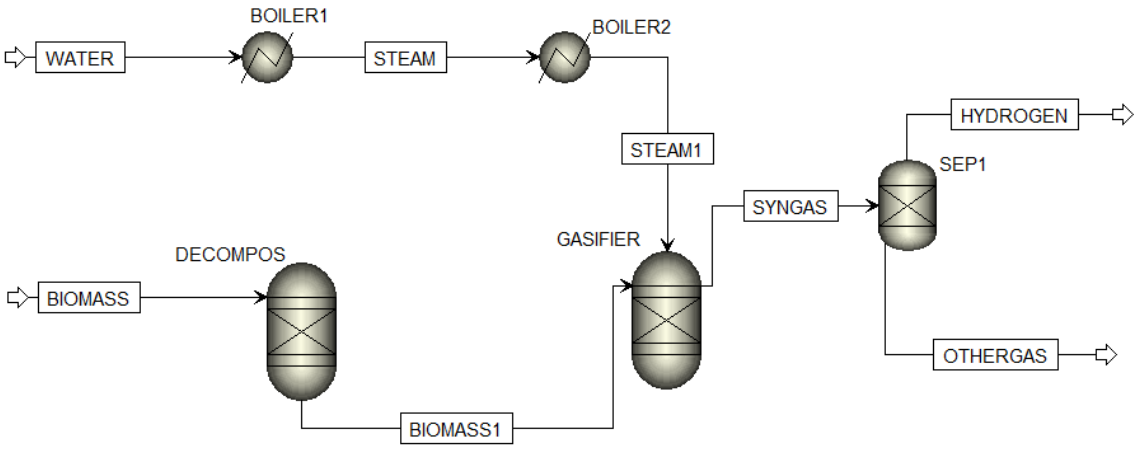


Figure. 1: Aspen Plus model flowsheet for hydrogen production from biomass gasification

Table 2: Proximate and ultimate analysis of rice straw (Luque & Speight, 2014) and wood pellet (Charis, Danha, & Muzenda 2019)

Biomass	Moisture	FC	VM	ASH	C	H	O	N	S
Rice straw	14.10	16.90	77.30	5.80	49.31	8.52	22.12	12.42	1.83
Wood pellet	3.79	19.21	76.78	4.01	41.47	5.15	52.15	1.23	0

To study the feasibility of biomass gasification in large industrial scale, the preliminary cost of the biomass gasification plant was evaluated using Aspen Process Economic Analyzer (APEA). The cost analysis was performed at optimum conditions which maximize the mass flow rate of hydrogen. The cost estimation for the production with different feed types (rice straw and wood pellet) was conducted and the feasibility among

the two feed types can be compared. Critical parameters and their values for this economic analysis were presented in Table 3.

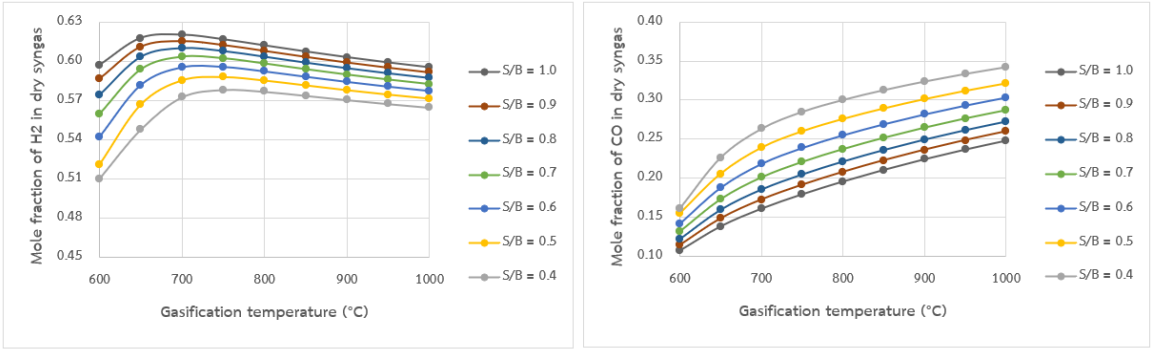
Table 3: Critical parameters and their values for cost analysis

Parameters	Values	Parameters	Values
Plant Economic Life	20 years	Operating hours per period	8766 hr/year
Construction Period	1 year	Biomass flowrate	1000 kg/hr
Starting Year of Construction	2024	Price of rice straw	0.042 USD/kg
Interest rate	20 %	Price of wood pellet	0.106 USD/kg

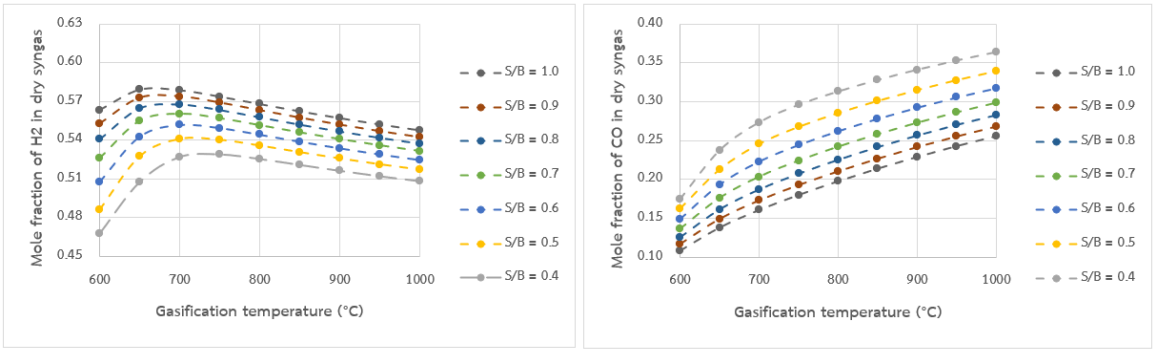
Results

1. Gasification: Effect of Operating Conditions on Hydrogen Production

The parametric study was performed to determine the effects of operating conditions on the performance of the gasifier. The gasification temperature and steam to biomass ratio (S/B ratio) were evaluated. The results of the mole fraction of dry syngas composition were analyzed. The outputs were the syngas composition of H_2 and CO as shown in Fig. 2.



(a) Rice straw



(b) Wood pellet

Figure. 2: Effects of operating conditions on syngas composition (a) rice straw and (b) wood pellet

In this study, the gasifier temperature was varied from 600°C - 1000°C. The temperature has caused a significant effect on the chemical reactions' equilibrium state. As the increase in temperature, the endothermic reactions e.g. water-gas reaction ($C + H_2O \leftrightarrow CO + H_2$ +131.0 kJ/mol) was enhanced, led to an increase in molar concentration of H_2 and CO. However, the shift the chemical equilibrium according to Le Chatelier's principle affected the molar concentration of H_2 differently from CO. The molar concentration of H_2 initially increases before decreasing as the temperature rises from 600°C to 1000°C. This trend was observed in both types of biomass feedstocks. Furthermore, rice straw produced hydrogen at the highest mole fraction between 700°C and 750°C while wood pallet produced hydrogen at the highest mole fraction between 650°C and 700°C, which is slightly lower than rice straw.

Additionally, the effect of S/B ratio on syngas composition was investigated. As an increase in the amount of gasifying agent, steam (H_2O), the water-gas reaction ($C + H_2O \leftrightarrow CO + H_2$) and water-gas shift reaction ($CO + H_2O \leftrightarrow CO_2 + H_2$) were enhanced. An increase in S/B ratio led to an increase in molar concentration of H_2 due to water-gas reaction. On the other hand, an increase in S/B ratio led to a decrease in molar concentration of CO due to water-gas shift reaction. This trend was observed in both types of biomass feedstocks. Therefore, the optimum S/B ratio that led to the maximum molar fraction of H_2 for rice straw and wood pellet gasification was considered to be S/B ratio = 1. The effect of operating conditions on hydrogen and syngas composition from the simulation study were compared with the results from the biomass gasification in laboratory scale (Song et al., 2012). It was found that, the results of both studies were in an agreement.

Since, the cost analysis was required for assessing the feasibility of biomass gasification and the hydrogen production rate was one of the significant values that affected the annual hydrogen production of the process. In Fig. 3, the mass flowrate of hydrogen (kg-H_2/hr) was presented to indicate the operating conditions that yielded the highest amount of hydrogen production for each feedstock types. For rice straw, the optimum condition was at gasification temperature of 700°C and S/B ratio of 1 produced 97.63 kg-H_2/hr. For wood pellet, the optimum condition was at gasification temperature of 650°C and S/B ratio of 1 produced 83.33 kg-H_2/hr. The amount of annual hydrogen production would be calculated based on the basis operating hours of 8766 hr/yr.

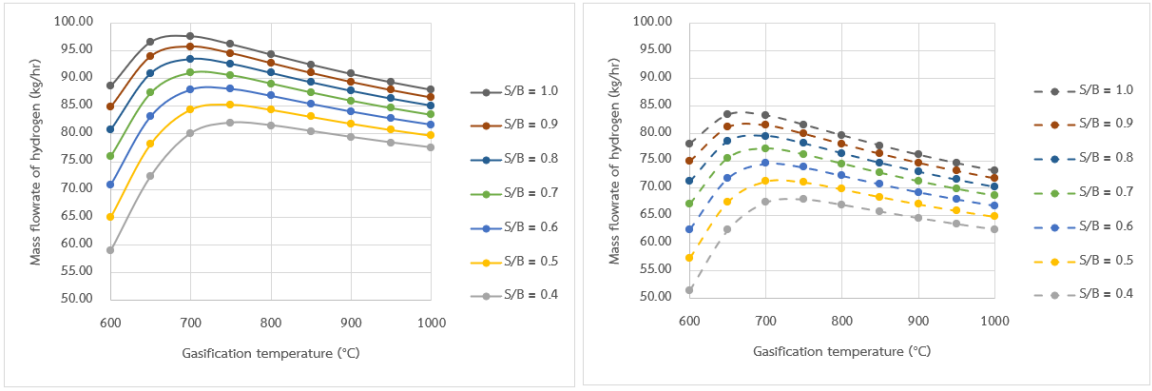


Figure. 3: Effects of operating conditions on mass flow rate of hydrogen (a) rice straw and (b) wood pellet

2. Cost analysis of Hydrogen Production from Biomass Gasification

To determine the feasibility of biomass gasification on a large industrial scale, the cost estimation was performed at the optimum condition which maximized the mass flow rate of hydrogen. The detailed of cost analysis was shown in Table 4. Annual capital investment (ACI), operating costs and annual hydrogen production was determined in order to evaluate the unit production costs for each feedstock. The unit production cost was considered as a key financial indicator for comparing with product market prices in order to preliminarily assess the financial feasibility of the project. In this study, cost analysis is conducted based on the assumption of previous studies of Fivga & Dimitriou, (2018) and AlNouss et al., (2020). So, transportation cost, storage cost and inflation price of raw material, utilities, and labor costs are not considered in the calculation.

Table 4: Cost analysis for hydrogen production from (a) rice straw and (b) wood pellet gasification

	(a) Rice Straw	(b) Wood Pellet
Feedstock price (USD/kg)	0.042	0.106
Operating conditions		
Gasification Temperature (°C)	700	650
S/B Ratio	1.0	1.0
Operating hours (hr/yr)	8766	8766
Mass Flowrate of Hydrogen (kg/hr)	97.63	83.33
Annual Hydrogen Production (kg/yr)	8.56×10^5	7.30×10^5
Cost analysis		
Total Capital Cost (USD)	4.00×10^6	3.99×10^6
Total Operating Cost (USD/Year)	1.55×10^6	2.16×10^6
Total Raw Materials Cost (USD/Year)	3.71×10^5	9.35×10^5
Total Utilities Cost (USD/Year)	2.15×10^5	2.12×10^5
Annual capital investment (USD/Year)	8.21×10^5	8.20×10^5
Key Financial Indicator		
Unit production cost (USD/kg)	2.77	4.07

The results showed that the unit production costs of hydrogen from rice straw and wood pellet gasification were 2.77 USD/kg-H_2 and 4.07 USD/kg-H_2, respectively. This revealed that the unit production costs were significantly influenced by the difference in annual hydrogen production and operating costs of each feedstock, which the operating costs were affected by total raw material cost and total utilities cost. Since the total raw material cost for rice straw gasification was lower than the wood pellet gasification, then the operating costs for rice straw gasification were also lower than wood pellet gasification. Furthermore, the annual hydrogen production rate of rice straw gasification was higher than wood pellet gasification. Therefore, the unit production cost can be reduced by either the decrease of raw materials cost or the increase in annual hydrogen production rate.

Conclusions and Discussion

This work studied the potential of using biomass in Thailand as a feedstock for hydrogen production from biomass gasification. Rice straw and wood pellet were selected as the potential feedstocks. The simulation results indicated that the optimum operating

conditions of rice straw gasification was a production rate of 97.63 kg-H_2/hr at gasification temperature of 700°C and S/B ratio of 1. And, the optimum operating condition of wood pellet gasification was a production rate of 83.33 kg-H_2/hr at gasification temperature of 650°C and S/B ratio of 1. Cost analysis for each feedstock was evaluated at the optimum operating condition. The results showed that the unit production costs of hydrogen from rice straw and wood pellet gasification were 2.77 USD/kg-H_2 and 4.07 USD/kg-H_2, respectively. Additionally, the unit production cost can be reduced by manipulated the technical factor as the hydrogen production rate and economic factor as raw materials cost.

To enhance the validation of the cost analysis model, factors such as plant location, transportation costs, and the availability of other feedstocks on hydrogen production from biomass gasification should be considered in further study. Since the agricultural waste and residues was differed based on regional geographic and the unit production cost was affected by the feedstock price, the appropriate selection of low-priced feedstock with high availability will improve the competitiveness of hydrogen price.

Since Thailand's highest career proportion is in the agricultural sector and a lot of agricultural residues, there is a potential to launch the hydrogen production from biomass gasification in Thailand. Furthermore, the open burning of agricultural residues, which leads to environmental effect as massive CO_2 emission, can be migrated by converting residues into feedstocks for hydrogen production from biomass gasification. Subsequently, converting residues into renewable energy will be an opportunity to develop waste management systems within the concept of sustainable development along with BCG model.

Acknowledgement

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Using Experiential Learning to Improve Basketball Skills of Nursing Students

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Abstract

The objectives of this study were 1) to use experiential learning to improve basketball skills of nursing Students and 2) to compare students' basketball skills, before and after implementation experiential learning is used. The simple group of this study consisted of 30 first-year nursing students of Wei fang Nursing Vocational College were sampled through random cluster. The research instruments included 1) lesson plan based on experiential learning and 2) basketball skills test. The assessment questions aim to assess four sub-variables within the dependent variable including: 1) experience, 2) share, 3) summarize, and 4) application. The data were analyzed by mean, standard deviation and t-test for dependent sample. The results revealed the following: 1. lesson to improve the basketball skill of nursing students which includes four steps: 1) experience, 2) share, 3) summarize, and 4) application; 2. the comparison of their innovative skills before and after implementation, the average score in pre-test evaluation was 66.27 of full score 100, and in post-test evaluation was 86 of full score 100. It was found that after learning was higher than before learning by statistically at the 0.01 level. That was consistent with the research hypothesis.

Keywords: Experiential Learning, Basketball Skills, Nursing Students

Introduction

With the popularization of higher education and the rapid development of national sports, the importance of physical education is increasingly recognized by people. However, nursing students have heavy learning tasks, high learning pressure, and long hours of classroom learning and practice, which can bring certain burdens to their bodies. Therefore, physical exercise can promote the physical and mental health of

nursing students, improve their physical fitness, and lay a good foundation for their future learning and work. Basketball, as a sport that can comprehensively exercise the body and teamwork ability, has become increasingly popular among nursing students (Yoo, M. S., & Kim, M. J., 2020).

With the popularization of higher education and the rapid development of national sports, the importance of physical education is increasingly recognized (Wurdinger & Carlson, 2010; Gentry & Dooley, 2014; Boud, Keogh, & Walker, 1985; Brookfield, 2017; Kuswandi et al., 2018). However, due to the lack of opportunities and time for physical exercise in nursing education and the lack of basketball skills, the quality of basketball among nursing students is uneven. Therefore, how to improve the basketball skills of nursing students has become an urgent problem. As future nursing professionals, nursing students need to have good health and physical fitness to cope with rigorous studies and future work. Basketball, as a comprehensive sport, can help nursing students improve their physical fitness, teamwork ability, and promote a healthy lifestyle.

Experiential learning methods have been shown to be effective in various educational contexts, including physical education. Wurdinger and Carlson (2010) provided five effective approaches to experiential learning, including problem-solving, project-based learning, collaborative learning, reflection, and action research. These methods can be applied in different disciplines and environments to enhance learning outcomes. Similarly, Gentry and Dooley (2014) highlighted the importance of integrating theory and practice in experiential learning through case studies and teacher experiences.

Research has demonstrated the benefits of experiential learning in enhancing students' understanding and application of knowledge. Liu, Lin, and Tsai (2016) found that field exploration and observation helped college students better understand complex scientific concepts. Lindgren and Johnson-Glenberg (2013) showed that using virtual reality could help elementary students learn new knowledge through personal experience. In medical education, Kolb and Kolb (2017) found that real-world experiences and practical activities significantly improved students' ability to apply their learning in practice.

These literature sources provide extensive information on the history, theory, and practice of experiential education, guiding educational practitioners in applying experiential teaching methods more effectively. Therefore, incorporating experiential learning methods, such as basketball, into nursing education can enhance nursing students' physical and mental health, improve their physical fitness, and lay a solid

foundation for their future learning and work.

The research would integrate of physical education, particularly basketball, into nursing education is increasingly recognized for its importance in promoting the physical and mental well-being of nursing students. Due to the heavy academic and practical workload, nursing students often lack opportunities for physical exercise, leading to varying levels of basketball skills. Addressing this, experiential learning methods, which include problem-solving, project-based learning, collaborative learning, reflection, and action research, have been identified as effective in enhancing educational outcomes across various disciplines.

Objectives

1. To use experiential learning to improve basketball skills of Nursing Students.
2. To compare students' basketball skills, before and after implementation experiential learning is used.

Research Framework

Using experiential learning to improve basketball skills of Nursing Students. The research concept framework is as follows.

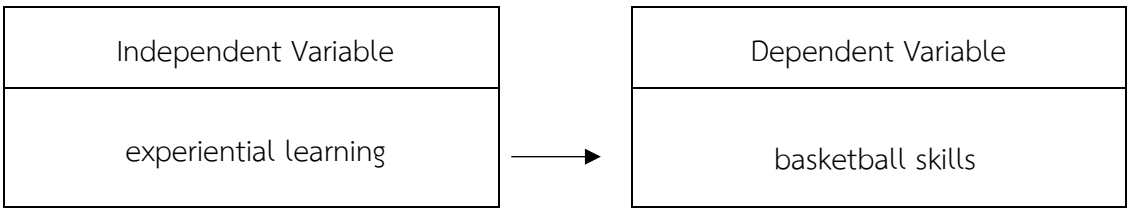

Figure 1: Research Framework

Methods

Research approach, population and samples

The methodology of this research was experiential learning to basketball skill with 1) lesson plan according to experiential learning and 2) basketball skills test.

There are 150 first-year nursing students at Weifang Nursing Vocational College, 5 classes with 30 students in each class.

And through random cluster sampling, 30 first-year nursing students at Weifang Nursing Vocational College were sampled.

Research instruments

The development of practical skills by robot experiment training activity for

undergraduate students. The research Instruments is as follows:

Creating and checking the quality of research instruments is shown as following.

1. Lesson plan according to experiential learning.

1.1 Introduction: The lesson starts with an introduction that helps the students understand the objective of the lesson, the importance of the topic, and how it relates to their previous learning. The introduction should grab the students' attention and engage them in the learning process.

1.2 Learning activities: The experiential learning lesson plan includes activities that are designed to engage students in hands-on learning experiences. These activities may include simulations, experiments, field trips, group work, role-play, or other activities that require active student participation. The activities should be structured to allow students to explore and discover new concepts and ideas.

1.3 Reflection: After the learning activities, students are given time to reflect on their experiences. Reflection activities can include group discussions, personal journaling, or other activities that help students process what they have learned and connect it to their previous knowledge.

1.4 Generalization: In this stage, the lesson plan helps students connect their experiences to broader concepts and theories. This stage includes discussion and analysis of the learning activities and how they relate to the larger topic of study.

1.5 Application: The final stage of an experiential learning lesson plan involves applying the newly learned concepts to real-world situations. Students should be encouraged to apply what they have learned to their lives, their work, or other contexts.

Overall, the experiential learning lesson plan is designed to be student-centered and hands-on, allowing students to explore new concepts and ideas through experiential learning activities. The lesson plan encourages students to reflect on their experiences, generalize what they have learned, and apply their new knowledge to real-world situations.

2. Basketball Skills Test

The Basketball Skills Test is an assessment tool used to evaluate a player's fundamental skills and abilities in basketball. The test is typically used by coaches, trainers, and scouts to assess a player's strengths and weaknesses and to determine how well they can perform on the court. The following are the steps to design the Basketball Skills Test Form:

2.1 Determine the skills to be tested: The first step is to determine the skills that will be evaluated. These can include shooting, dribbling, passing, rebounding, and defensive skills. The test should be designed to assess both the player's ability to

execute the skill and their accuracy and consistency.

2.2 Define the testing criteria: Once the skills have been identified, the testing criteria should be defined. This includes the number of repetitions or attempts required, the time limit for each skill, the scoring system, and the minimum standards for each skill.

2.3 Create the test form: The test form should include the following sections:

1) Player information: This includes the player's name, age, and other relevant information.

2) Testing instructions: This section provides the instructions for each skill to be tested, including the number of attempts, time limits, and scoring criteria.

3) Scoring sheet: This section includes a scoring sheet for each skill, where the evaluator can record the player's performance and calculate their score.

4) Overall assessment: This section provides space for the evaluator to provide an overall assessment of the player's skills, including their strengths and weaknesses.

2.4 Pilot test the form: Before using the test form, it's important to pilot test it with a small group of players to ensure that the instructions are clear and that the scoring system is accurate.

2.5 Administer the test: Once the test form has been finalized, it can be administered to the players. It's important to ensure that the testing environment is suitable and that the players have adequate time to perform each skill.

2.6 Evaluate the results: After the test has been completed, the results should be evaluated to determine the player's strengths and weaknesses. The results can be used to develop a personalized training plan to help the player improve their skills.

In summary, designing the Basketball Skills Test Form involves determining the skills to be tested, defining the testing criteria, creating the test form, pilot testing the form, administering the test, and evaluating the results. By following these steps, coaches, trainers, and scouts can assess a player's skills accurately and develop a plan to help them improve.

The development process of Checklist form about quality of Research Instruments:

1) Studied the concept and development process of checklist form.

2) Drafted the checklist form. At the end of each section, there is a space for experts to write suggestions that can be helpful in improving students' basketball skills.

3)Experts verified the validity of checklist concept and development process. Taking the instrument to 3 experts to consider. The test consistency the index of congruency is between 0.60-1.00, the level of consideration is as follows:

Rating is +1 There is an opinion that "Corresponds to definition/measurement

objectives."

Rating is 0 There is an opinion that "Not sure it corresponds to definition/measurement objectives."

Rating is -1 There is an opinion that "Inconsistent with definition/measurement objectives."

4) Modify checklist form according to suggestion.

Results

Symbol and Abbreviations

Represent data analysis results based on symbols and semantics**.** The details are as follows**:**

$\bar{X}$	means	average value
SD.	means	standard deviation
n	means	number of students
D	means	scores of differences between pre and post test
df	means	degree of freedom
t	means	statistical data for t-test value
**	means	statistical significance at level .01

Part 1 Results of development of Basketball Skills of Nursing Students by using

Experiential learning is an educational theory and method that emphasizes acquiring knowledge and skills through firsthand experiences and practical activities. Students engage in real projects, on-site observations, and hands-on activities, directly confronting problems and challenges to deepen their understanding through reflection.

In the context of basketball teaching, experiential learning proves to be an effective instructional approach. Students participate in actual basketball games, observe matches of proficient teams, or apply basketball skills and tactics through simulated games and project-based learning. Such direct experiences not only enhance students' profound understanding of the sport but also cultivate their decision-making and problem-solving abilities during matches.

Within basketball education, experiential learning underscores the importance of students' reflective processes. By reviewing their performances in games, students gain a comprehensive understanding of their strengths and weaknesses, while simultaneously improving communication and collaboration skills within team cooperation. This practice-oriented learning approach enables students to integrate theoretical basketball

knowledge with actual gameplay, preparing them to tackle various match scenarios and opponent challenges.

The implementation of experiential learning in basketball education can take diverse forms, such as organizing real matches, conducting simulated tactical drills, and participating in team projects. This diversity caters to the different learning needs of students, sparking their interest and making basketball education more engaging and effective. Overall, integrating experiential learning into basketball teaching enhances students' basketball skills, tactical awareness, and team collaboration, ultimately making them more competitive in actual matches.

This study focused on 30 first-year nursing students from the Weifang Nursing Vocational College as research subjects, aiming to improve the first students' learning skills using the experiential learning. The detailed results of the pre-test and post-test applying the experiential learning to the Basketball course were shown in Table 1.

Table 1: Learning skills score between pre-test and post-test

Learning achievement	n	Full Scores	Pre-test		Post-test		D
			$\bar{X}$	SD.	$\bar{X}$	SD.	
1. Basic rules of basketball	30	15	8.97	0.836	13.1	1.248	4.13
2. Basic movement of basketball	30	10	6.5	0.764	8.53	0.884	2.03
3. Basketball holding	30	10	7.03	0.657	8.6	0.554	1.57
4. Basketball dribbling	30	10	7.43	0.559	9.03	0.657	1.6
5. Basketball shooting	30	10	7.03	0.795	8.73	0.772	1.7
6. Basketball passing	30	10	6.03	0.752	8.33	0.745	2.3
7. Basketball rebounding	30	10	5.53	0.562	7.77	0.667	2.24
8. Basketball defensive skill	30	25	17.73	0.772	21.9	1.165	4.17
Total		100	66.27	1.97	86	2.160	19.73

As could be seen from Table 4.1, the changes in the scores of eight basketball skills of nursing students using the experiential learning were as follows: 1) basic rules of basketball: The average score before learning was 8.97 points, and the average score after learning was 13.1 points, with an average difference of 4.13 point. 2) Basic

movement of basketball: The average score before learning was 6.5 points, and the average score after learning was 8.53 points, with an average difference of 2.03 points. 3) Basketball holding: The average score before learning was 7.03 points, and the average score after learning was 8.6 points, with an average difference of 1.57 points. 4) Basketball dribbling: The average score before learning was 7.43 points, and the average score after learning was 9.03 points, with an average difference of 1.6 point. 5) Basketball shooting: The average score before learning was 7.03 points, and the average score after learning was 8.73 points, with an average difference of 1.7 points. 6) Basketball passing: The average score before learning was 6.03 points, and the average score after learning was 8.33 points, with an average difference of 2.3 points. 7) Basketball rebounding: The average score before learning was 5.53 points, and the average score after learning was 7.77 points, with an average difference of 2.24 points. 8) Basketball defensive skills: The average score before learning was 17.73 points, and the average score after learning was 21.9 points, with an average difference of 4.17 points. After learning, the scores for each item were higher than before learning. Therefore, adopting experiential learning could improve the basketball skills of undergraduate students, achieving the research objective.

Part 2: Results of comparing students' learning basketball skills before and after using experiential learning

The analyzed data collected by researcher from the pre-test and post-test of learning basketball skills. It conducted data analysis using measures like mean, standard deviation, and the t-test dependent for correlated samples. The results of this analysis were presented in Table 2.

Table 2: Comparison of basketball skills by pre-teat and post-test with experiential learning

Learning achievement		n	Full Point	$\bar{X}$	SD.	t	p
Total score	Pre-test	30	100	66.27	1.965	9.98**	.00
	Post-test	30	100	86	2.16		

**Statistically significant at the level .01 ($p < .01$)

From Table 2, it could be observed that the students' post-test scores were higher than their pre-test scores, which was statistically significant at the 0.01 level. The average score of students before using experiential learning was 66.27 points, and after using

experiential learning, it increased to an average of 86 points, with an average difference of 20.27 points. The results indicate that after adopting experiential learning, nursing students' basketball skills has improved compared to before. The findings were statistically significant.

Learning Behavior

It used experiential learning to improve nursing students' basketball skills. To validate the result, it would be observed the throughout the teaching and students learning process. The study shows that the researcher taught nursing student basketball course from 5 classes with 30 first-year students in each class in Weifang Nursing Vocational College, the students' behaviors were observed and recorded during the four teaching process of Experience, Share, Summarize, and Application. The changes in student behavior indicate that throughout the learning process, the students' learning basketball skills consequently improved. The record of students' learning behavior during the teaching activities was as follow:

Step 1, Experience

At this stage, in the experiential learning approach to a basketball course, the initial step involves guiding students to experience the fundamental rules and basic movements firsthand. This includes activities such as positioning, passing and receiving the ball, basic dribbling, shooting, and rudimentary defensive maneuvers. Through practical engagement, students directly sense the application of rules and the execution of actions, laying a foundation for subsequent learning. Simultaneously, in the realm of basketball skills, students personally execute skills like ball handling, dribbling, shooting, passing, rebounding, and defensive techniques, gaining a profound understanding of each skill's application and operational details.

Step 2, Share

In this stage, students have the opportunity to share their experiences and insights from the activities. This includes their understanding of basic rules and movements and their reflections on skill execution. Through group discussions and team feedback, students can examine basketball's foundational elements from different perspectives, learning from each other and gaining new insights. The collective learning atmosphere during the sharing process promotes a deeper level of understanding.

Step 3, Summarize

In this stage, regarding the basic rules and movements of basketball, either the teacher or students summarize key points, emphasizing the important concepts learned during the activities. Providing summaries of rule overviews and action techniques helps ensure that students understand and can retain this crucial information. In terms of

basketball skills, students and teachers jointly summarize the essential steps and considerations for each skill, reinforcing the students' comprehension of these skills.

Step 4, Application

In this stage, students are encouraged to apply the acquired knowledge to new situations. For basic basketball rules and movements, students apply rules and actions to practical game scenarios, solidifying their understanding. In the context of basketball skills, students apply ball handling, dribbling, shooting, passing, rebounding, and defensive skills in simulated games, real-life situations, or problem-solving activities, cultivating their ability to translate skills into operational competence during actual games. Through a continuous cycle of experience, sharing, summarizing, and application, students progressively deepen their understanding and mastery of basketball skills and tactics.

In summary, the application of experiential learning to a basketball course involves four key steps: Experience, Share, Summarize, and Application. In the Experience step, students actively engage in basketball activities, gaining firsthand experience with basic rules, movements, and skills. The Share step encourages students to exchange insights and reflections, fostering a collaborative learning environment. Summarizing key points in the third step solidifies the understanding of rules, movements, and skills. Finally, in the Application step, students are prompted to apply their acquired knowledge to new situations, enhancing their ability to translate theoretical concepts into practical actions on the basketball court.

This approach not only emphasizes practical engagement and personal experience but also promotes collaborative learning through sharing and summarizing. By cyclically repeating these steps, students gradually deepen their understanding and proficiency in basketball, ensuring a well-rounded learning experience. In conclusion, the incorporation of experiential learning into a basketball course proves effective in developing practical skills, critical thinking, and teamwork among students, ultimately enhancing their overall competence in the sport.

Conclusions and Discussion

Using experiential learning to improve basketball skills of Nursing students was experimental research that has the research objective as follows:

1. To using experiential learning to improve basketball skills of Nursing students.
2. To compare students' basketball skills, before and after the implementation of experiential learning is used.

The research instruments were used in this study which were 4 lesson plans

based on the basketball skills with 1) basic rules of basketball, 2) basic movement of basketball, 3) basketball holding and dribbling skills, and 4) basketball shooting, dribbling, passing, rebounding, and defensive skills.

Conclusion

According to the research topic, the study on improving the basketball skills of nursing students through experiential learning is summarized as follows:

1. Using experiential learning to improve basketball skills of Nursing Students which includes four steps: 1) Experience, 2) Share, 3) Summarize, and 4) Application. By using experiential learning and observing students' learning behaviors, it is found that students have improved in clarifying the purpose of the basketball course, explaining basic rules of basketball, doing the basic movement of basketball, and basketball holding, dribbling, shooting, passing, rebounding, and the defensive skills to meet the research objective.

2. Comparing of basketball skills of nursing students before and after learning with the experiential learning, the average score of first-year students in pre-test evaluation was 66.27 of full score 100, and in post-test evaluation was 86 of full score 100. It was found that after learning was higher than before learning by statistically significant at the .01 level. This was consistent with the research hypothesis.

Discussion

Research on using experiential learning to improve basketball skills of Nursing Students was conducted in the first semester of the 2023 academic year. It involved the study of academic performance cultivation for 30 first-year nursing students in Weifang Nursing Vocational College using the experiential learning method. This research can be discussed from two aspects:

1. Using experiential learning to improve basketball skills of Nursing Students, the researchers divided the lesson plan writing into four steps according to the flipped classroom teaching model: 1) Experience, 2) Share, 3) Summarize, and 4) Application. The assessment of learning achievement performance was tested through eight sub-skills: 1) Basic rules of basketball, 2) Basic movement of basketball, 3) Basketball holding, 4) Basketball dribbling, 5) Basketball shooting, 6) Basketball passing, 7) Basketball rebounding, and 8) Basketball defensive skill. Data analysis was conducted by three experts who evaluated the quality of lesson plans based on the experiential learning, with the results presented by experts evaluating the lesson plan quality. Using the experiential learning model to improve basketball skills was necessary. Under this teaching model, students become the main body of learning, with teachers acting as

guides and helpers. Through mutual assistance and cooperation, this learning was conducive to students' basketball skills, enhancing basketball basic rules, basic movement of basketball, basketball holding, dribbling, shooting, passing, rebounding and defensive skill. According to the research findings, the experiential learning model (Kolb, D. A., 1984) has demonstrated significant effectiveness in enhancing the basketball skills of nursing students. Students, engaging in four sequential steps of experiential learning—namely, Experience, Share, Summarize, and Application—manifested comprehensive progress in the realm of basketball. This affirms the positive impact of the student-centric learning model, underscoring the pivotal role of guiding teachers in facilitation and assistance (Bonwell, C. C., &N Eison, J. A, 1991).

2. The Comparison of students' basketball skills before and after the implementation experiential learning model. Researchers studied many literatures and research related to the experiential learning model and conducted research based on the nursing students experiential learning model. According to the research results, adopting the experiential learning can promote nursing students to improve their learning achievement in basketball course. The results showed that the average score before learning was 66.27 points, and the average score after learning was 86 points, with an average difference of 20.27 points. The results show that, the average score of nursing students in pre-class assessments was 66.27 (SD = 1.965), and in post-class assessments, it was 86 (SD = 2.16). The post-class assessment scores were significantly higher than pre-class assessment scores at a statistical significance level of 0.01. This aligns with the research hypothesis. In this study, three experts were engaged to assess the curriculum plans implemented under the experiential learning model, aiming to enhance the basketball skills of first-year nursing students.

This comprehensive approach to curriculum evaluation, guided by established educational theories, contributes not only to the effectiveness of the experiential learning model but also to the broader discourse on enhancing teaching quality. The utilization of expert assessments rooted in these foundational works ensures a rigorous and systematic evaluation process, reinforcing the significance of clarity, appropriateness, and alignment within the instructional design of the experiential learning model.

By implementing these recommendations, it could be comprehensively integrated the experiential learning model into the basketball course for nursing students, enhancing their practical skills, teamwork, and overall capabilities. This holistic learning experience contributes to providing students with a richer and more meaningful education.

Suggestions for further research

In addition to the suggestions, here are some further recommendations to better leverage the experiential learning model in teaching basketball courses for nursing students:

Integrating experiential learning into the basketball training of nursing students can significantly enhance their practical skills and teamwork abilities. Emphasizing practical skill training, such as first aid, emergency response, and teamwork during basketball activities, allows students to practice responding to different situations in tense environments, thereby enhancing their operational skills. Utilizing role-playing to simulate real nursing scenarios, where students assume roles as nurses, patients, and doctors, can further cultivate communication and collaboration skills. An interdisciplinary approach that integrates basketball courses with nursing-related fields, such as sports medicine and rehabilitation, promotes collaboration and knowledge exchange.

Field observations at medical institutions or sports medicine centers provide students with a deeper understanding of real working environments, igniting their interest in the field. Project-based learning, where students design and test rehabilitation plans for sports injuries, fosters teamwork and problem-solving skills. Engaging students in community sports projects to provide medical support strengthens practical skills and instills a sense of community responsibility.

Encouraging reflection and sharing through group discussions, written tasks, or presentations helps students internalize their experiences. Personalized learning plans that cater to individual learning styles and interests increase engagement and learning effectiveness. Collaborations with professional basketball coaches and healthcare professionals offer valuable industry insights and inspire student interest in both nursing and basketball.

By implementing these recommendations, it could be comprehensively integrated the experiential learning model into the basketball course for nursing students, enhancing their practical skills, teamwork, and overall capabilities. This holistic learning experience contributes to providing students with a richer and more meaningful education.

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Implementing the Portfolio-Based Timed-Handwriting Model (PBTHM) for Teaching Writing: An Approach Utilized in the English Education Department at Universitas Muria Kudus, Indonesia

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Abstract

This work is describe the implementation of the Portfolio-Based Timed-Handwriting Model (PBTHM) with its distinctive features, i.e. handwriting mode, time limit, assigned topic, no assistance mode, and fair play mode for teaching writing. The PBTHM procedure includes the followings: (1) warming up, ice-breaking, schemata activation, (2) giving a topic to develop just before the timed handwriting, (3) doing a fifteen-minute timed handwriting session without access to any help, such as discussion with a peer, notes, literature, and internets (4) scanning the original composition sheet, (5) retyping (computerized) for easier word counting, grammar and vocabulary checking, and self-scoring, (6) doing reflections; telling experiences/reflection while the students do timed-writing with handwriting mode, the strengths and weaknesses of the initially handwritten composition, efforts to improve the initial compositions, words counting and self-scoring, (7) revising by referring to the scoring rubrics, doing self-revision, peer/group revision, discussion, offline and online literature support, instructor revision/feedback, (8) doing final revision, (9) Submission/the process of writing in the portfolio. All works for the semester are revised and compiled into a digital portfolio. Future research on PBTHM may address participants from different disciplines, geographic regions, proficiency levels, genders, and ages. A study on PBTHM as a brainstorming techinque should provide a perspctive new research. It is also important to mention that both cross-sectional and quasi-experimental research studies should be undertaken in the near future to evaluate the effectiveness of the newly implemented PBTHM procedure. There is a need for identifying socio-cultural factors influencing PBTHM outcomes, alternative methodologies to enhance the effectiveness of PBTHM interventions, examining long-term sustainability and scalability of PBTHM initiatives, integrating innovative technologies to improve data collection and analysis processes, and developing robust frameworks for evaluating the impact of PBTHM programs.

Keywords: Portfolio, Timed-Writing, Handwriting, Teaching Writing

Introduction

This paper aims to introduce and describe the procedure for implementing the Portfolio-Based Timed Handwriting Model, hereinafter referred to as PBTHM. Its application needs to be socialized more widely to encourage the implementation of PBTHM procedures not only at the English Language Education Department of Muria Kudus University but also in the wider use of the model in terms of regions and educational strata, so that the external validity of the model can be increased (Findley, et al, 2021; Kusmaryani and Ramli 2023).

PBTHM has theoretical support related to handwriting, time-limited writing, portfolio-based assessment and soft skills. Previous empirical studies also support the implementation of PBTHM (Syafei, 2008, 2010; 2012; 2014; 2019, Syafei et al., 2020; 2021a; 2021b; 2022, Syafei et al., 2023). PBTHM has also been implemented and used as experience and best practice in teaching writing in the English Language Education Study Program of Universitas Muria Kudus, especially in the *Paragraph Writing* course (2010, 2014, 2015, 2016, 2017, 2018, and 2020), and the *EssayWriting* course (2017, 2018, 2019, 2021, 2022, and 2023). The Portfolio-Based Timed-Handwriting Model (PBTHM) consists of distinctive features, i.e. time limit, assigned topic, no assistance mode, handwriting mode, and fair play mode. However, efficacy measurement of PBTHM implementation should be more scrutinised to secure its effectiveness for teaching writing.

Existing investigations (Syafei, 2008, 2010; 2012; 2014; 2019, Syafei et al., 2020; 2021a; 2021b; 2022, Syafei et al., 2023) suggest that while PBTHM has made significant progress in addressing certain issues, however, there remain critical gaps that need attention. These gaps include the need for a more comprehensive understanding of the socio-cultural factors influencing PBTHM outcomes, the exploration of alternative methodologies to enhance the effectiveness of PBTHM interventions, the examination of long-term sustainability and scalability of PBTHM initiatives, the integration of innovative technologies to improve data collection and analysis processes, and the development of robust frameworks for evaluating the impact of PBTHM programs. Additionally, implementing the nine procedures of PBTHM are strongly recommended to deal with these shortcomings effectively.

Objectives

This work introduces and presents the procedure of the Portfolio-Based Timed-Handwriting Model (PBTHM) implementation to teach writing from students' perspectives using relevant theories, previous qualitative investigations, teaching experience, and best practices. It is to provide a typical procedure for implementing PBTHM to improve teaching paragraph and essay writing, for the portfolio application has some benefits.

Concept Theory Framework

Implementing the Portfolio-Based Futures Handwriting Model (PBTHM) combines the positive aspects of handwriting practice, timed writing sessions, portfolio assessment, and the writing process. There are several reasons for implementing PBTHM in teaching writing. Initially, timed handwriting removes students' doubts and allows them to write with confidence. Timed handwriting can also improve thinking in L2, thereby reducing L1 and L2 translation errors (Ayotte, 2009). The implementation of PBTHM is also motivated by the development of a more individualized assessment paradigm. PBTHM is more student-centred and can motivate students' independence and self-initiated learning for better and more learning (Lam, 2018).

Handwriting

Handwriting is considered a good opportunity to reflect on language and language use because it has a slower pace than speaking and leaves permanent notes (Williams, 2012). Handwriting is automatic, so students can focus on organizing the ideas needed for effective composition (Berninger, 2012). According to Silver (2018), handwriting is brain-friendly. Bounds (2010) also maintains that some brain regions are activated when writing by hand but not while typing or texting. Handwriting is still being done and is used as a tool for ELT learning (Lund, 2015). Students who take notes on laptops perform worse on conceptual questions than students who take notes by hand, whereas taking more notes can be beneficial (Mueller & Oppenheimer, 2014). Syafei (2010) found that students are still fond of handwriting assignments.

Lund (2015) maintains that handwriting is an important tool for learning in English language education. Syafei (2010) showed that timed handwriting had driven students to have high motivation and interest in writing. Most students also maintained that timed handwriting was difficult initially, but it would be easier, better, and more fluent after some sessions. Copy-paste modus also systematically disappears in their composistions.

Timed-Writing

Timed writing refers to exercises in which students write in a certain amount of time (Datchuk, 2016; Rogers, 2018). Timed handwriting improves one's mental agility, promotes thinking in the L2, and increases confidence as students become aware of their writing capabilities with practice, collaboration, revision, and feedback (Ayotte, 2018). The finding also aligns with Rogers (2018) in that using timed practice with repeated writing promotes sentence-writing fluency since students with fluency problems can find writing demanding cognitively.

Portfolio Assessment

Students generally prefer portfolio assessment to traditional assessment (Yesim, 2011) because it reflects the holistic nature of language development (Moya & Malley, 1994). A qualitative investigation shows positive backwash effects of portfolio assessment (Syafei, 2012). Delgoshaei & Talkhabi (2012) also identified the superiority of the portfolio method over the conventional scoring method. Portfolio assessment encourages independent learning (Mak & Wong, 2018).

Process Writing

The process approach is defined as a writing activity that includes several stages. These stages involve drafting, collecting feedback from peers or teachers, and revising (Kroll, 2001 in Hasan & Akhnan, 2010). Process writing has dominated teaching writing and may involve some steps of activities. Harmer (2004) suggests that process writing has four main elements. They are planning, drafting, editing (reflecting and revising), and writing the final version.

Materials and Methods

This work is to descriptively present the procedure of The Portfolio-Based Timed-Handwriting Model (PBTHM) implementation to teach writing from students' perspectives with relevant theories, previous qualitative investigations, teaching experiences, and best practice to teach writing at the English Education Department of Universitas Muria Kudus from which the permission to present and publish them in the conferences and/or journals was granted.

Results

The Procedure of PBTHM Implementation

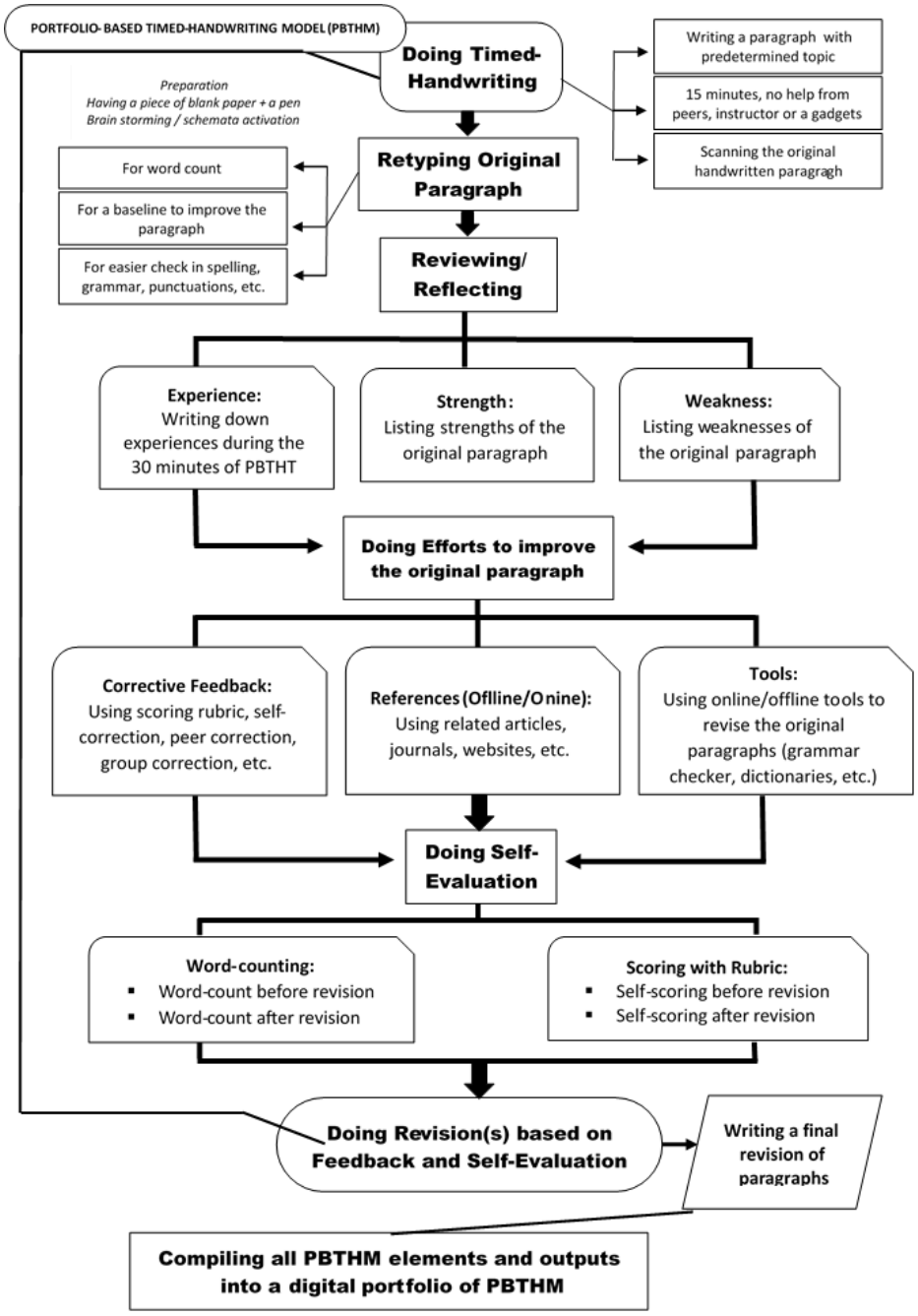
In implementing PBTHM, participants must individually write a piece of writing on a blank sheet of paper within the specified time duration, without having access to discussion and assistance from peers, teachers, textbooks, notes, dictionaries, smartphones (gadgets), and laptops.

In the procedures for implementing PBTHM, students are asked to do the following: (1). Warming up and ice breaking, activating schemata and preparing paper and stationery. (2) Get writing topics from the teacher. (3). Handwriting has a time limit (e.g. 20 minutes) to write based on a specified topic and is notified when the writing activity will begin. Topic is not previously known, (4) Scan or photograph the original handwriting produced. (5) Retyping (with a computer) (6) Reflection: recounting experiences/reflections when students wrote time using handwriting mode, including counting the number of words they

produced and self-evaluating the quality of their initial writing. Participants expressed the strengths and weaknesses of their original writing as well as the efforts they made to improve the writing. Help from applications and literature, discussions with peers, groups and teachers, as well as internet access can be done at this stage, (7) Revision: This revision stage can be repeated more than once. Participants make revisions to improve their writing by referring to the assessment rubric (Oshima and Hogue, 2006) and based on self-reflection, input friends, groups, lecturers, teachers, discussions, and online and offline literature support. Counting the number of words and self-evaluation after revision must also be done again (8) Carrying out Final Revision. (9) Preparation of a Complete Portfolio. All writings (beginning to end), documents, and processes in one learning period (can be semester, quarterly, or according to program duration) are compiled in a complete digital portfolio of the PBTHM project in word or pdf format.

The procedure for implementing PBTHM can be traced in the following chart (Syafei, 2023).

Table 1: The Diagram of PBTHM Implementation (Syafei, 2023)



An example of a student's outcome in for implementing PBTHM can be seen in the following Table 2:

THE MIDTERM PORTFOLIO FOR ESSAY WRITING

Week One to Eight (Third Semester 2023/2024)

by Vania Calista Setiawan (EED-3C)

Supporting Lecturer: Dr. Muh Syafei, M.Pd

The Portofolio Components (Portfolio-Essay-Writting)		a. Original/ Handwritten composition b. Computerized Retyping		Efforts to improve your compositions in the paragraphs. Put a cross (X) on the Feedback/ Correction that you get 1. Scoring Rubrics 2. Self Check 3. Peer Check 4. Group Check 5. Instructor 6. Literature: Online/Offline	Computerized Revision (300 to 1000 words)	
		Number of Words	Self-Scoring (1-6)		Number of Words	Self-Scoring (1-6)
	Titles of the Compositions					
1	My Beloved Hometown	146	2	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	517	4
2	My FOMO Experience	61	1	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	481	4
3	My Autonomy In Learning English	331	3	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	662	4
4	My Bestfriend	390	3	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	510	5
5	An Ideal English Teacher In My Opinion	364	3	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	481	5
6	My Favorite English Teacher	399	2	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	887	5
7	Online Application and AI to Learn English	309	3	1(x), 2(x), 3(x), 4(x), 5(x), 6(x)	1.392	6
8	Learning Freedom – Midterm Tasks (2 pieces of Essay)	Make A Summary 'The English Teacher' (2020)				196
		IISMA (Indonesian International Student Mobility Award)				1.761
MID SEMESTER EVALUATION						
8		The Several Techniques in Singing				724

Conclusions and Discussion

The Portfolio-Based Timed-Handwriting Model (PBTHM) combines the benefits of handwriting, timed writing, and portfolio-based assessments. The application of PBTHM to teach writing presents difficulties and worries at the beginning but gradually provides a pleasant experience after several implementations. This study suggests that the Portfolio-Based Futures Handwriting Model (PBTHM) is highly recommended in teaching writing and other relevant skills.

Positive soft skills were visible and identified in relation to the participant's project portfolio. The implementation of PBTHM also contributes to participants regarding focus

and attention, concentration, self-confidence, honesty, solution, actions, copy-paste, and training to deal with pressure. However, a further investigation should overcome the weakness of this procedure in that its efficacy measurement need to be administered in a quasy-experimental study.

The PBTHM is in line with relevant previous studies (Syafei, 2010; 2012; 2014; 2019; Syafei et al., 2020; 2021a; 2021b; 2022; 2023). Further studies on the implementation of PBTHM need to be carried out for broader and deeper pedagogical aspects. The use of PBTHM as a brainstorming technique might be an interesting investigation. Future research may address participants from different disciplines, geographic regions, proficiency levels, genders, and ages. It is also important to mention that both cross-sectional and quasi-experimental research studies should be undertaken in the near future to evaluate the effectiveness of the newly implemented PBTHM procedure. There is a need for an identification of socio-cultural factors influencing PBTHM outcomes, alternative methodologies to enhance the effectiveness of PBTHM interventions, the examination of long-term sustainability and scalability of PBTHM initiatives, the integration of innovative technologies to improve data collection and analysis processes, and the development of robust frameworks for evaluating the impact of PBTHM programs. Moreover, there is a call for greater collaboration and knowledge-sharing among stakeholders to foster a more holistic and integrated approach to PBTHM implementation.

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Cultivating Students' Participation through Online Learning Media in EFL Classroom

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Abstract

The purpose of this research was to examine how online learning media were utilized to facilitate learning and instruction in EFL class. This investigation employed a qualitative methodology. The population of this research was the English Education Department students, while the sample were the students who joined Basic English Grammar class. The instruments of this study were observation and interview. The observation and interview were analyzed to explore the students' activity and the strengths and the weaknesses of the online learning media. The results underscored that student actively engaged in the course by developing interactive and innovative online learning materials and demonstrated strong collaborative skills. Furthermore, students viewed the utilization of online learning media in the classroom favorably. The students' optimistic outlook was stimulated by the following factors: self-directed learning, approachability, engagement, inspiration, and the chance to develop diverse proficiencies. Online learning resources can facilitate students' comprehension of the English language, specifically grammar, in the classroom, on the condition that instructors are flexible and willing to provide hands-on materials.

Keywords: Students' Participation, Online Learning Media, EFL Classroom

Introduction

Learning and instructing English becomes more engaging if the teacher and the students are involved in the class. It is interesting when the class atmosphere supports the teaching process as well as learning strategies. In the past, traditional methods have been applied in the classroom by teachers. They apply a variety of methods to attract students' attention. In fact, the students have to find sources that will assist them in improving their abilities and skills during that time. Frequently, teachers instruct that students fulfill projects through offline methods. Typically, students accomplish this by composing on paper. The current era is the modern period. Technology utilization in the classroom is linked to education. Technology offers opportunities for pedagogy, learning,

and instruction in various contexts (Meihami & Alexander, 2024). Ensuring the optimal utilization of technological resources is advantageous for teaching and learning. Both learners and teachers could gain from using technological tools regarding academic acquisition.

In addition, it could be beneficial for English language learners. Both learners and teachers can explore offline and online modes. Additionally, the theoretical assumptions underlying the simulation of e-learning strategies is very effective to be applied in the class (Bailey et al., 2021). Nowadays, E-learning has grown rapidly (Mutambik, 2018). However, e-learning has challenges in the EFL context (Alfallaj, 2020; Mohammed, 2020). The teachers need to follow the requirements at all stages of learning. Adults and children might require different methods of instruction. The classroom must focus on the main basis of information at the college. Students at colleges are frequently unique and intelligent. They are capable of imparting their abilities to the class. The role-playing of the teacher is crucial for managing the class in this context. This research solves the students' problems in participation in learning grammar.

Objectives

This study primarily examines the use of online learning media. Online learning media refers to a type of media created by students to enhance the process of teaching and learning. The objective of this research was to examine how online learning media were utilized to facilitate learning and instruction in EFL class.

Concept theory framework

Managing the class is not an easy process. Students and teachers need to collaborate. Each student is afforded an equitable chance to participate in the instructional processes. Integration of the subject matter becomes the principal aim of the study. Students attain a sense of autonomy when teachers tend to provide information through the use of online learning media (Muhammad, 2020). A variety of instructional materials can be incorporated by teachers into the learning environment. Among them is the application of technology.

Online learning media is a fundamental and crucial component of contemporary existence. With the rise of technological advances and the internet, more and more people are using the internet as a fast and dependable means of communication and information sharing. In addition to its increasing popularity as a means for online interaction, the internet has the purpose for communication and educational resource for studying languages in classrooms.

Online learning media is an extensive system which has transformed our daily lives, careers, and learning. It allows for global communication with people. Online learning material can be classified into two categories: asynchronous and synchronous. In addition, Sauro (2009) argued that written synchronous computer-mediated communication can be beneficial for students in learning complex or restricted forms in the class. This is due to the visual clarity of these aspects at written interaction, the wide range of time available for managing and getting ready in synchronous interaction, and the tangible presence of turns rather than an illusion.

The improvements in online learning media have provided additional opportunities in the class. Online learning media becomes an important media that is extensively and effectively used for various purposes, such as social communication, information sharing, and education. Integrating technology in the classroom is expected to yield numerous advantageous outcomes of learning (Zhao & Wang, 2024).

Proficiency in English communication is considered crucial for pupils of the current generation to effectively participate in an increasingly more interconnected global society. Furthermore, modern schools have been recognized for their crucial role in helping students develop into proficient intercultural communicators who have a significant impact on English language fluency and fostering connections with others. Research on English education systems in non-English speaking countries has uncovered a significant disparity between the increasing importance placed on teaching EFL and the recognized ineffectiveness of teaching.

The rapid expansion of online learning media technologies affects students' activities. Many professionals employ technology to promote continuous students' engagement and assessment. Effective communication plays a crucial factor in the classroom. Effective communication between the teacher and the students is necessary for the successful delivery of the instruction. The exponential expansion of knowledge and communication technology is intricately connected to the advancement of online learning platforms. In the current digital age, many individuals are engaging in communication through online platforms. Through the utilization of online learning platforms, students can engage in global communication with individuals from all parts of the world. It serves as a means of communication between individuals.

Online learning media is commonly considered an alternate kind of media. It is often favoured as a solution due to its ability to provide a conducive environment for practicing English. The use of Internet learning resources in grammar lesson is necessary for students to effectively grasp the materials. Online learning media offers advantages by enhancing the classroom environment. Online learning media is highly pertinent to the

digital era. It enables the exchange of messages and interaction between individuals and machines. In addition, online learning platforms provide advancements in the development of communication technologies.

Materials and Methods

This investigation employed a qualitative methodology. It investigated the projects done by the students in EFL class. Students created online learning media in groups. The research was carried out at one of the private universities in Indonesia. The population of this study were the students of English Education Department in the 2023/2024 academic year. The students who enrolled Grammar class were selected as study participants. The participants of the study were 34 English Education Department students. The writer focused on one class. The instruments utilized in this study were gathered by the author via observation checklist and interview form. The data were analyzing using manually. Display and reduction of data constitute the phases of data analysis for this study. The instruments of this study were observation and interview. The observation and interview were analyzed to explore the students' activity and the strengths and the weaknesses of the online learning media.

Results

The utilization of online media in the classroom is highly beneficial. It may be utilized as an e-learning material for teachers as well as students. The internet provides a wide range of activities through online media. Optimally, teachers should optimize online media as studies have demonstrated that integrating technology in the educational setting significantly enhances academic performance. During the learning process, teachers and students organize materials in online media. Students can utilize online media to comprehend the instructional materials.

In addition, teachers may examine the information available in online media. Actually, the students' engagement with the lesson is influenced by online media. The author of this study highlights the significance of using online material in English Grammar classes. She analyzed online media as a form of e-learning to enhance the process of teaching and learning. The teacher and the students utilized online media to facilitate communication during the entire process of teaching and achieving proficiency in English grammar. Students were required to create online media.

The activity of Grammar class is described in the following Table 1.

Table 1: The activity of Grammar class

Activities/Resources	Notes
Topic	1. Tenses 2. Parts of Speech 3. Sentence Pattern 4. Active and Passive Sentence
Platform	1. Youtube 2. Gdrive 3. Instagram
Response	1. The students enjoyed learning grammar 2. The students enjoyed doing the task in group 3. The students' knowledge improved due to the online learning media 4. The students felt more confident in learning grammar

After that, the writer interviewed some students to know the use of Online Learning Media in grammar lesson. The interview aimed at investigating the student's perceptions of the strengths and weaknesses of Online Learning Media. The description of the interview results is presented in Table 2.

Table 2: The Strengths and Weaknesses of Online Learning Media

The strengths	The weaknesses
Easy to use	Low level of student participation
Autonomous learning	Additional characteristics are required for discussion
Engaging, and collaborative to interact	
Providing instructional resources	
Ability to send links or videos	
Low internet connection	

Conclusions and Discussion

Discussion

Based on the observation's findings, the lecturer and students used Online learning media for certain purposes, such as activities and resources. There are three categories of topic, platform, and response. Online learning media can be utilized for group, whole-class, and individual student collaboration on assignments. Technological advances can be implemented in the class, which has pedagogical implications for foreign language acquisition (Rafiee & Abbasian-Naghneh, 2021). One way to help students improve their critical thinking and cooperation skills is through collaboration. Collaborative assignments could aid students in building stronger relationships and abilities (Ng, P. M., Chan, J. K., & Lit, 2022). Students cooperate with all of their peers and in small groups, according to the observations.

Grammar instruction might move forward efficiently with assistance through Online learning media as demonstrated by the highly motivated students. In addition to academic contexts, the speaker inspired and supported the students in non-academic ones. In an academic setting, for example, the lecturers gave rewards to students who participated fully in the classroom. In non-academic contexts, however, students frequently assisted their peers in remaining optimistic during a pandemic.

Students were commonly welcomed by the lecturer in every class session. Almost all students provided positive responses. The lecturer was motivated to allow student participation in the learning process by the lecturer and students' attendance in the classroom. Facilitating discussions between lecturers and students, as well as among students themselves, provides an ideal platform for students to support and motivate one another. It can be done through the exchange of information and the expression of the academic environment and a positive life. Furthermore, students are permitted to share their current situations.

Furthermore, both the lecturer and the students employed online learning platforms to exchange insights regarding the subject matter. The exchange of resources and information is important for facilitating learning activities. In addition, the lecturer and students in grammar class displayed good interaction, which fostered a constructive academic atmosphere. Moreover, by exchanging videos and links between the lecturer and students, other students could provide feedback in English, thus improving their proficiency in the language.

The writer asked a number of students questions while observing the class. Students evaluated the strengths and weaknesses of using digital learning media. The ease of use and interactive and communicative nature of online learning materials are among

their benefits. Both lecturers and students use online learning media to present lessons. They believe that learning English through online resources is an effective method. Mobile phones and computers can be used to access online learning media from any location. Students could converse throughout class because of the ease of use of the online learning media. During the interview, the majority of students said, "Online learning media are easy to use." It can be utilized in grammar class as a learning instruction.
Grammar could be learned effectively through online learning media. Students' participation in responding to and discussing the topics indicated this. Students were motivated to learn the topics of grammar. The students said, "Learning through online learning media encouraged me to improve my skills in English." Another student added, “I am able to interact with my lecturer and friends in an active manner”.

The lecturer and the students might employ online learning resources to master grammar. The lecturer could give the students an explanation or upload it as a presentation. One benefit of online learning media was its reduced bandwidth usage. It didn't take extra access to the internet for the lecturer and the students to comprehend the grammatical materials. Learning became more active since they could participate and communicate right away with online learning media. The most common opinion among students was that "online learning media does not consume a large amount of internet data."

Nevertheless, limited student involvement is one of the challenges of using online learning media. In order to increase student participation and build a positive class atmosphere, the lecturer has to use innovative instructional media. One type of media that can be used is online learning media. Lack of internet connectivity causes challenges for both students and lecturers. Students cannot take part in class if they do not have access to the internet.

Conclusions

Based on the results of the research, the students discuss about tenses, parts of speech, sentence pattern, and active and passive sentence. They uploaded their online learning media via YouTube, drive, and Instagram. They have positive responses toward the use of online learning media in the class. The students created online material that can be utilized in the classroom to facilitate grammar learning. Online media is user-friendly and easy to understand, which makes it an excellent choice to bring into an educational setting. Online media facilitates an easy connection between the teacher and the students. The presence of online media, which can facilitate the activity of understanding grammar, is highly advantageous for teachers as well as students in learning environments focused on grammar. Online media collaborates with students to help them

improve their knowledge of English skills and components.

Moreover, it has been created to have a stimulating educational encounter and enable successful interaction between the teacher and the students. Due to the benefits of online media, e-learning is highly beneficial in educational settings as it aids students in gaining knowledge. Students positively embraced the utilization of online media, suggesting that the incorporation of fundamental technology can contribute to the creation of a successful and enjoyable learning atmosphere. Consequently, the present study suggests that the teachers utilize online media projects from the students. This simple activity enables students to be involved as the experiences as well as exercises when learning grammar.

Recommendations

This study suggests the further researchers could investigate a similar topic but in a different context. Further researchers have the option to address the remaining subjects. By engaging in learning media projects offered, students can acquire comprehensive knowledge and proficiency in every element of English knowledge. In order to minimize the shortcomings of online learning media, it is necessary to offer students supplementary projects and tasks.

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(ระดับนานาชาติ)

Social Science Group

The Impact of Green Hotel Operation Effected to the Community Surrounding Area in Koh Lanta, Krabi Province

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Abstract

The purpose of this work is to study the impact of green hotel operations effected to the community surrounding area in Koh Lanta, Krabi province. The qualitative research methodology and the semi-structured interview was the research instrument to collect data. The key informants were the executive and the staff of the hotel who were responsible for green hotel standards. Purposive sampling was used to select the sample. The content analysis was used to analyze the data. The result of the study found the green hotel standard generates a positive impact in every dimension (environmental, social, economic), it's not beneficial only to the hotel but also to the local community surrounding area. The environmental impact is the most effect on the local community, the hotel effort to cooperate with the local community, educate, and raise awareness of protecting the community and environments through the activity or project. Meanwhile, the green hotel standard also generates positive social impact and economic impact to the local community such as the local authority cooperating with the hotel to organize the activity to reduce pollution in the area and also the private sector that cooperates to promote sustainable tourism in Koh Lanta. However, the green hotel standard also generates income for the local community such as earning income from selling reusable trashes and souvenir and tourism activity.

Keywords: Green Hotel, Green Hotel Standard, Community Impact

Introduction

The tourism industry is one of the industries that generate more income for the economy from local to global. The report from the World Tourism and Travel Council (WTTC) and the World Economic Forum (WEF) show that the tourism industry could be impacted by the global economy. In 2022, the tourism industry all around the world was affected by the Coronavirus 2019, as a result, the world GDP decreased by around 50.4 % the tourism industry loss of revenue around USD 4.5 billion, and around 60 million people lost their jobs. After the situation was improved the world economy's GDP increasing more

than 20%. (WTTC, 2022; WEF 2022) Even the tourism industry impacts the world economy but on the other hand, it is another because that generates carbon dioxide (CO2) which impacts global warming and climate change. (www.sustainabletravel.org, n.d.) It is compliant with the report of the United Nation World Tourism Organization (UNWTO) expect that between 2016-2030 carbon dioxide emission will increase by 25% from the logistic of tourism. (UNWTO, 2019)

Thailand one of the famous tourist destinations even the business in tourism industry affected by Covid-19. However, Thailand still the top destination that the tourist chooses to visit after Covid-19. (Macus Lu, 2022) The information from trip advisor shows the popular cities in Thailand are Bangkok, Chiang Mai, Pataya, and Krabi. (tripadvisor, 2023) It's consistent with the data of tourist arrival in Krabi show there were 288,375 tourists visit Krabi in February 2023 increase 41.66% from January. In Krabi there are famous tourist destinations such as Koh PiPi, Ao Nang Beach, Rairey Beach, Maya Bay, and Koh Lanta. (NNT, 2023)

Koh Lan, one of the famous islands in Krabi province, there are two small islands namely Koh Lanta Noi and Koh Lanta Yai. In order that, Koh Lanta Yai is the place where popular to the tourist, but the people refer to it simply as "Koh Lanta". (Wikitravel, 2023) There are many nature attractions such as Aow Nui, Tanod Cape Viewpoint, Kor Kwang beach, Khlong Dawn beach, especially Koh Ngai, Koh Kradan, and Koh Muk which are offer equally stunning beaches and snorkeling. Moreover, the tourist also can learn the way of life of the Moken at Baan Sriraya and Sea Gypsy at Baan Sangka U. (tourismthailand, 2023) However, the tourism can generate more income to Koh Lanta but in other hand also create the negative impact such as waste pollution, waste water pollution, and cost of living. The hotels were established to accommodate the tourist as well as the restaurant, tour operator and other facilities. According to the report of Caribbean Hotel Energy Efficiency Action Program (CHENACT) show the hotel business contributing 6% of carbon dioxide emission. (Caribbeanhotelandtourism, 2012) To reduce the pollution which is generated from hotel, the green hotel standard was implemented to operate and promote sustainable tourism in the area. Therefore, the researcher is interesting to find out the impact of green hotel operation effected to the community surrounding area in Koh Lanta, the action of the hotel, the impact which is generated by the green hotel standard as well as the impact affected to the local community.

Objective

To study the impacts of green hotel standard operation effected to the community surrounding area.

Literature review

The Green Hotel

The hotel business is considered one of the important chains in the tourism industry. However, the hotel industry is an industry that depends on energy from natural resources to operate. The energy consumption depends on the size of the hotel. (Bechen & Patterson, 2006; Kasim, 2007) Green hotels refer to hotels that are managed with consideration to the impact on the environment. Consider energy saving and use resources for maximum efficiency Reduce the generation of garbage, wastewater, recycling, and use environmentally friendly materials and equipment. Promoting a healthy environment and various activities that have a negative effect on the ecosystem and environment including purchasing environmentally friendly raw materials. (Ecomall, 2000; Green Hotels Association, 2002) An increase in the number of hotels that have implemented environmental management systems or various innovations used to demonstrate the operation of a hotel business that is environmentally friendly including receiving the environmental standard mark to increase the number of customers who value the environment. (Han and Chan, 2013; Verma and Chandra, 2016) The Global Sustainable Tourism Council (GSTC) is considered a prototype of green hotel standards that various organizations or agencies can use to develop further, such as Centara Earth Care, Green Globe Standard, Green Star Hotel Standard, etc. In summary, the Green Hotel Standard is considered a standard that is established to certify the standards of operating a hotel or accommodation that can be managed. and use resources most efficiently to reduce negative impacts and create positive impacts that occur in the area with assessment criteria covering all 3 dimensions, namely environmental, social, and economic dimensions, including sustainable management plans Environmental management Promotion and public relations human resource development, and participation with local communities.

Tourism impact

Tourism impacts refer to the impact of tourism operations that affect the tourist destinations both positively and negatively such as employment, investment in tourism in the area, cultural exchange, and environmental deterioration. Natural resources are destroyed, change of traditional culture, or crime. (GSTC, 2022) For sustainable tourism development, it was found that tourism can create different impacts on tourist destinations under 3 dimensions, namely the social dimension, environmental dimension,

and economic dimension. (Confente & Scarpi, 2020; Kim et al., 2013) In the social dimension, it causes development or enhances the development of infrastructure and facilities including the opportunity to meet new people. for learning and cultural exchange. In the economic dimension, employment occurs, income of people in the area has increased. A new career including creating the value of resources in the area. In the environmental dimension, tourism can create awareness of the sustainability of natural resources including encouraging the local community to focus on the importance of protecting and preserving the beauty of resources. (Amuquandoh, 2010; Kim et al., 2013; Lin et al., 2017; Kim et al., 2015) Therefore, it can be concluded that tourism impact means positive impact and negative impacts caused by tourism development or travel activities. Those impacts will affect tourist attractions covering 3 dimensions, including social impacts, economic impacts, and environmental impacts.

Materials and Methods

Semi-structured interviews were employed as the research instrument to gather data for this study, which followed a qualitative approach. Two executives and four employees who were in charge of the green hotel standards are among the key informants from two hotels that certified the Green Hotel Standard. Purposive sampling was used to select the sample. The content analysis was used to analyze the data.

Results

The result of the study shows that there are two hotels in Koh Lanta that certified the green hotel standard in both national and international certification such as the Green Hotel Standard, and the Green Globe International Standard for Sustainable Tourism. In summary, the indicators for sustainability criteria are consisting of sustainable management policy, community cooperation, environmental and energy management, green purchasing, and human resource development. Moreover, the result also shows that the vision of the green hotel is not only business and taking care of their guest but also concerned with preserving the environment surrounding the area and sharing benefits with the local community. Sustainability management was the main policy to operate the hotel such as setting a team to respond to any sustainable activities of the hotel, staff training, and promoting and cooperating with the sustainability policy to the guest and staff. At the same time, the hotels are using the innovation for a part of environmental and energy management such as the electricity system control in the room, wastewater system, solar energy, and waste management system. However, the green hotel standard is not only focused on hotel management but the social dimension is one of the criteria that the

hotel needs to support and cooperate with the local community located surrounding area. The hotels launched many projects to support the local community as follows:

Waste Management Program: The hotel is concerned about waste pollution in Koh Lanta; thus, the waste management program has been launched by inviting the local schools to join weekly garbage pickup. The hotel uses this event to strengthen their bond between the hotel and local communities. They educate on waste management such as waste separation, making souvenirs from trash, and giving separate trash bins to local schools so that children will learn to separate trash, as a result, the children start to learn the habit of cleaning up their community and earn the income from selling reusable trashes and souvenir. In 2019, the hotel and local authority launched the trash sculptures contest to increase the value of trash and create awareness of waste pollution among the local people and tourists.

The Little Scientist House: Little Scientist House is Princess Sirinthorn's project to encourage Thai students to study more sciences through science experiments since there was research confirmed that cultivating positive attitude in scientific learning skills and scientific process to children since primary level (age 3-6 years old) will help to increase learning capability and recognizing. The hotels became a local network leader in 2014 and invited 11 schools in Koh Lanta to join the Little Scientist House program. All 11 schools will have to pass Her Royal's Assessment which includes completing at least 20 scientific activities and 1 scientific project per year in order to receive Her Royal Trophy.

Support local business: The green hotel in Koh Lanta also supports local businesses such as encouraging our guests to visit the community surrounding area visit Old Town Lanta, visit the Lanta Community Museum to learn ways of traditional living on Lanta Island, buy souvenirs and have local food. Extensively promote mangrove forest tour on a gondola boat, a tour is organized by Tung Yee Peng Villagers as well as cooperate with Koh Lanta's Sheriff and Koh Lanta Travel Association to create a day tour package for fishing and squidging on Koh Por, which is a small island near Koh Lanta.

Rak Lanta Project: After Koh Lanta became a famous tourist destination, the increasing number of tourists arriving has affected waste management and waste pollution become a major problem. The Rak Lanta project has been launched to raise awareness of the local community to protect their hometown by reducing waste pollution both on land and sea.

According to the result above, the green hotel standard generates a positive impact in every dimension (environmental, social, economic), it's not beneficial only to the hotel but also to the local community surrounding area. The environmental impact is the most effect on the local community, the hotel effort to cooperate with the local community,

educate, and raise awareness of protecting the community and environments through the activity or project. Meanwhile, the green hotel standard also generates positive social impact and economic impact to the local community such as the local authority cooperating with the hotel to organize the activity to reduce pollution in the area and also the private sector that cooperates to promote sustainable tourism in Koh Lanta. However, the green hotel standard also generates income for the local community such as earning income from selling reusable trashes and souvenir and tourism activity.

Conclusions and Discussion

The green hotel in Koh Lanta has launched many activities and projects to achieve the green hotel standard criteria. The operation of green hotel standards it's not only beneficial to the hotel but also sharing with the local community. The hotel activities and projects are generating positive impacts including environmental impact, social impact, and economic impact to the local community. The social impact is the most effective for the local community, most of the projects create a relationship between the local community with the hotel and also harmony in the community. However, education on waste management is raising awareness in the local community to protect their hometown. Moreover, the Project Green Hotel also generates income from selling reusable trashes and souvenir and tourism activities. Therefore, the green hotel standard will not be achieved without cooperating with the local community, the positive impact which is generated from the green hotel operation is the factor that confirms it's the right tool to reduce pollution from tourism and make it sustainable.

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Factors Affecting the Business Operational Income of Agricultural Cooperatives in Kalasin Province, Thailand

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Abstract

The research objective was to examine the factors affecting the business operational income of Agricultural Cooperatives in Kalasin province, Thailand. The secondary data were collected from the Cooperative Auditing Department database from 2010 to 2023 of 44 Agricultural Cooperatives. The total numbers accounted for 572 observations. The data were analyzed by econometric methodology to examine the factors affecting the business operational income of Agricultural Cooperatives in Kalasin Province, Thailand. Multiple linear regression analysis with the remove technique. The findings were factors that had a positive influence on business operational income which comprised of 4 factors, cash and bank deposits, net short-term receivables, net long-term receivables, and total funds of the cooperative. On the other hand, factors that had a negative influence on business operational income comprised of 8 factors, inventories, other current assets, long-term investment, other non-current assets, trade accounts payable, other cooperative deposits, long-term loan, and share capital. Agricultural Cooperatives in Kalasin province would take their consideration all 4 factors that would lead to an increase in their business operational income. Since business operational income expressed a financial status.

Keywords: Business Operational Income, Agricultural Cooperatives, Kalasin Province

Introduction

Kalasin is a province with abundant fertility in the northeastern region of Thailand. Archaeological evidence suggests that it was once inhabited by the Lawa tribe, which prospered culturally around 1600 years ago. Historically, it became a city during the reign of Rattanakosin. It is located on the left bank of the Mekong River (www.wordpress.com).

In the overall economic scenario and Gross Domestic Product (GDP) of Kalasin province in the year 2022, it was noted that the average income per capita was $ 1222. The primary source of income stemmed from agriculture constituting 23.37 percent, with a calculated value of $289 million (www.wordpress.com).

Agriculture is the main source of income for the people of Kalasin province, Thailand. Farmers gathered them to form their business operation as “Agricultural Cooperatives” which has been encouraged and supported by the Cooperatives Promotion Department, The Ministry of Thailand. Agricultural cooperatives are formed by a group of individuals engaged in agricultural activities who come together, register as a legal entity with the cooperative registrar, and aim to collectively conduct activities and provide mutual assistance. The primary objective is to address challenges in the members' professional pursuits, fostering collaborative efforts to enhance the well-being and living standards of the cooperative members (www.cpd.go.th).

Agricultural cooperatives operate to promote collaborative business activities among members, providing mutual assistance and collective support. They strive to uphold principles of morality and ethical conduct, rooted in the fundamental values of humanity, aiming to generate benefits for both individual members and the collective. The goal is to enhance the overall quality of life for members, encompassing improvements in both economic and social aspects (www.cpd.go.th).

According to the Cooperative Promotion Department (2023), establishing agricultural cooperatives is crucial due to various significant challenges farmers commonly face in their professions, as stipulated in cooperative regulations: 1) Price Volatility, Farmers often encounter uncertainties in agricultural commodity prices, leading to potential losses or financial distress. Cooperatives can help mitigate this instability by collectively selling products or purchasing inputs in larger quantities to enhance the economic well-being of their members, 2) Access to Capital: Forming cooperatives assists farmers in accessing the necessary capital quickly. Members pool resources to fund various activities collectively, facilitating the smooth operation of their agricultural ventures, 3) Knowledge and Technology Gap: Agricultural cooperatives serve as platforms for the exchange of knowledge and technology among farmers. This fosters the sharing of experiences and the development of skills within the profession, 4) Operational Complexity: Some farmer groups may struggle to manage complex business activities independently. Cooperatives efficiently handle intricate operations, promoting effective and streamlined business practices, 5) Market Considerations: Market dynamics significantly impact agricultural product prices. Cooperatives play a vital role in helping farmers analyze markets, enabling them to plan production that aligns with market demands. Also, the establishment of agricultural cooperatives is a beneficial measure to address challenges and promote sustainability in agricultural activities (Cooperative Promotion Department, 2023).

According to the Cooperative Promotion Department (2023), addressing the general challenges faced by farmers, as mentioned earlier, is a complex task for individual farmers.

The successful resolution of these issues requires collaborative efforts, and one effective approach is for farmers to join forces by forming cooperatives and registering them following the Cooperatives Act of 1999. This is because cooperatives can assist in solving various problems, including:

1) Purchasing Business: Through cooperative efforts, farmers can collectively procure agricultural materials and equipment, such as fertilizers, pesticides, seeds, and essential supplies. The cooperative, after assessing the members' needs, becomes the entity responsible for procuring and supplying these items. Collective purchasing in large quantities allows for lower prices, and any profits at the end of the year can be distributed back to the members (Cooperative Promotion Department, 2023).

2) Sales or Harvest Collection Business: Establishing a cooperative for the sale or collection of produce empowers farmers in negotiation. This ensures that the agricultural products are sold at fair prices, and members are not exploited by traders in terms of weighing, measuring, or pricing. The formation of agricultural cooperatives provides a practical avenue for farmers to collectively address and resolve challenges. It enables them to pool resources, negotiate better terms, and create a more sustainable and equitable agricultural environment (Cooperative Promotion Department, 2023).

3) Financial Business (Credit) of (1) Loan Services: Agricultural cooperatives, when farmers come together as a cooperative, can build trust with financial institutions, government agencies, and the public. The cooperative can secure low-interest loans for its members to invest in agriculture. The cooperative evaluates loan requests based on members' business plans or utilization plans. For instance, loans may be provided to members for purchasing agricultural materials, essential family expenses, land improvement, or acquiring agricultural land. This is particularly beneficial for members who do not own sufficient land for farming. (2) Deposit Services: To promote financial awareness and encourage capital accumulation within the cooperative, the cooperative accepts deposits from its members. There are two types of deposits: savings deposits and fixed deposits. The cooperative pays interest at rates comparable to commercial banks, aiming to demonstrate the benefits of saving. (3) Occupational Promotion and Cooperative Services Business, the cooperative may establish a dedicated team of experts in agriculture to provide knowledge and advice on agricultural practices. Alternatively, collaboration with other government agencies can be sought to offer consultation services. This aims to ensure that members have a good understanding of new agricultural techniques and can plan their production to meet market demands. Additionally, the cooperative may promote supplementary income-generating activities for household groups, empowering them to enhance their family income (Cooperative Promotion Department, 2023).

4) Education and Training: The cooperative will organize educational and training programs for its members, the cooperative board, and staff consistently. This initiative aims to ensure that stakeholders are informed about the principles, methods, rights, duties, and responsibilities within the cooperative. By providing knowledge and skills, the cooperative contributes to improving the quality of life and well-being of farmers within the community or society. It aspires to create a happier society where the children and grandchildren of the cooperative members receive higher education and enjoy better health due to the improved living standards of the farmers (Cooperative Promotion Department, 2023).

According to the Cooperative Auditing Department database from 2010 to 2023, there are 44 Agricultural Cooperatives in Kalasin province, Thailand expressing their business operational income in Table 1:

Table 1: The Business income, Growth Rate and Trend from 2010 to 2023

Year	Business Operational Income ($)	Growth Rate (%)
2010	1,046,686.33	
2011	787,327.74	-24.779
2012	1,347,419.21	71.138
2013	1,505,908.96	11.762
2014	1,549,812.27	2.915
2015	1,122,000.00	-27.604
2016	973,506.16	-13.235
2017	1,481,996.27	52.233
2018	573,553.52	-61.299
2019	1,132,125.98	97.388
2020	1,653,207.75	46.027
2021	1,588,403.55	-3.920
2022	1,321,935.86	-16.776
2023	1,567,769.19	18.596
Maximum	1,653,207.75	97.39
Minimum	573,553.52	- 61.30
Range	1,079,654.24	36.09
Average	1,260,832.34	11.73
Standard Deviation	330,500.94	44.44

Source: [1] Cooperative Auditing Department Database, 2023

[2] Calculation

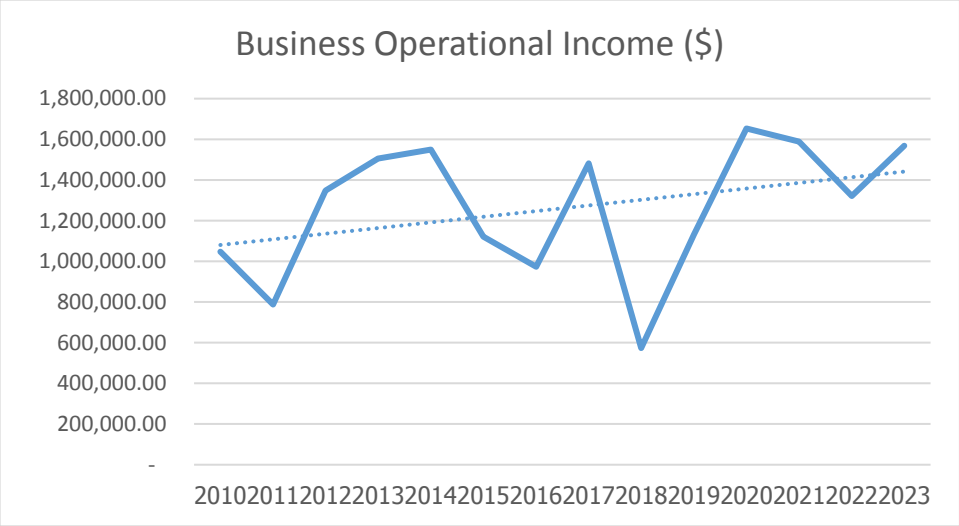


Figure 1: Business Income and Trend of Agricultural Cooperatives in Kalasin Province, Thailand

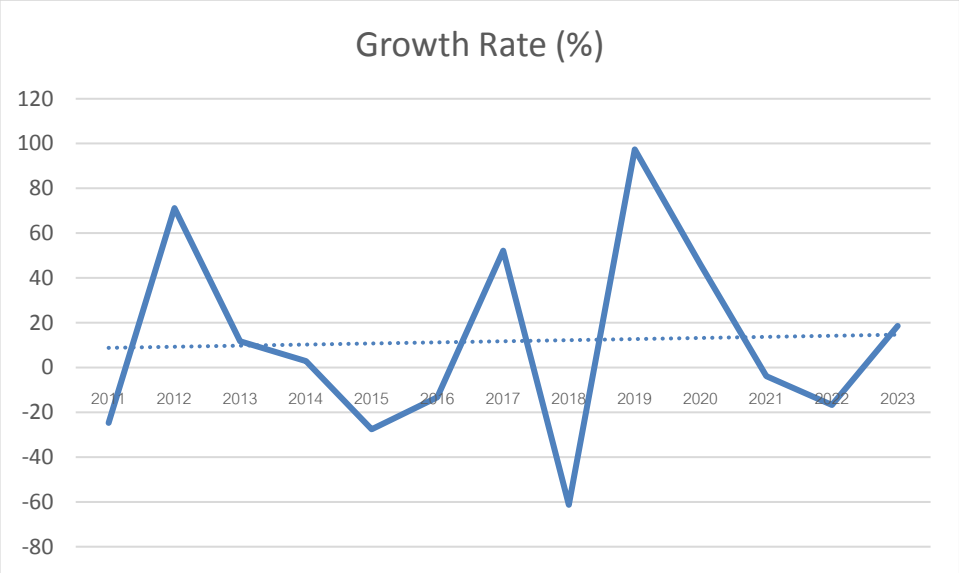


Figure 2: The Growth Rate of Business Income and Trend of Agricultural Cooperatives in Kalasin Province, Thailand

According to Table 1 and figure 1 and 2, from 2010 to 2023, the business income of Agricultural Cooperatives in Kalasin province showed a maximum value of $1,653,207.75 and a minimum value of $573,553.52 with a range of $1,079,654.24. The average and standard deviation of $1,260,832.34 and $330,500.94 respectively. It obviously showed that there was a big gap between the maximum and minimum value of business income over 13 years. Also, the growth rate of agricultural cooperatives' business income has been

fluctuating from the maximum rate of 97.39 percent and minimum rate of - 61.30 percent. There has been a big difference in the growth rate of business income in the last 13 years of Agricultural Cooperatives in Kalasin province, Thailand. The business operational income is a vital instrument for business proprietors to evaluate their capacity to generate profits, whether by boosting revenues, reducing costs, or employing a combination of both strategies. Additionally, it offers valuable insights into the effectiveness of the business's implemented strategies at the commencement of a financial period.

In this research work, with the fluctuation of business income of Agricultural Cooperatives, the research addressed this problem and attempted to find out what factors affect the business operational income of Agricultural Cooperatives in Kalasin Province, Thailand.

Literature Review

1. Brief Overview of Cooperatives and Their Historical Significance

Cooperatives are autonomous associations of individuals united voluntarily to meet common economic, social, and cultural needs through jointly owned and democratically controlled enterprises. They operate based on the values of self-help, self-responsibility, democracy, equality, equity, and solidarity. The history of cooperatives dates to the 19th century, emerging as a response to the economic challenges and social inequalities brought about by the Industrial Revolution (Holyoake, G. J. 1906).

The concept of cooperatives gained prominence through the efforts of pioneers such as the Rochdale Society of Equitable Pioneers, founded in 1844 in Rochdale, England. This cooperative, recognized as the birthplace of the modern cooperative movement, established principles that form the foundation of contemporary cooperative enterprises. The Rochdale Principles include open membership, democratic control, distribution of surplus in proportion to transactions, and concern for the community (Holyoake, G. J. 1906). Cooperatives have played a crucial role in addressing economic and social challenges globally. In the late 19th and early 20th centuries, agricultural cooperatives emerged to empower farmers, enabling them to collectively market their produce and access resources. The cooperative movement expanded across various sectors, including banking, housing, and consumer goods, contributing to community development and poverty alleviation (Foner, P. S, 1994).

During the Great Depression, cooperatives provided a lifeline for many communities, offering stability and resilience in times of economic downturn. In the developing world, cooperatives became instrumental in promoting sustainable development, empowering marginalized groups, and fostering local economies (Foner, P.

S, 1994). Cooperatives continue to be relevant in the 21st century, addressing contemporary challenges such as income inequality, environmental sustainability, and social inclusion. As hybrid models that blend economic success with social responsibility, cooperatives remain a viable and influential force in shaping more equitable and sustainable societies (Birchall, J, 2003).

Agricultural cooperatives are collective enterprises formed by farmers to address common challenges, enhance their bargaining power, and promote sustainable agricultural practices. This form of cooperation dates to the late 19th century when farmers recognized the need to organize for mutual benefit (Danbom, D. B, 1981). One of the earliest and influential examples of agricultural cooperatives is the "Grange Movement" in the United States during the 1860s. The Grange, officially known as the Patrons of Husbandry, established cooperatives to provide farmers with a unified voice in the face of economic injustices. This movement laid the groundwork for the development of various agricultural cooperatives globally (Danbom, D. B, 1981).

According to the World Bank. (2008), Agricultural cooperatives play a crucial role in improving the economic conditions of farmers. By pooling resources, farmers can collectively purchase inputs, access credit, and efficiently market their produce. Research indicates that agricultural cooperatives contribute significantly to the income and livelihoods of their members, fostering economic sustainability in rural communities. Following Defourny, J., & Develtere, P. (1999), Agricultural cooperatives are instrumental in promoting social cohesion and community development in rural areas. Through shared ownership and democratic governance, these cooperatives empower farmers, particularly smallholders, by providing them with a platform to voice their concerns and participate in decision-making processes. Agricultural cooperatives often embrace sustainable farming practices. By promoting organic farming, resource conservation, and environmentally friendly production methods, these cooperatives contribute to long-term ecological balance and resilience in agriculture (Sexton, R. J., & Lavoie, N, 2001).

Despite their numerous benefits, agricultural cooperatives face challenges such as management issues, market access, and policy support. Ongoing research explores innovative solutions and policy recommendations to strengthen the resilience and effectiveness of agricultural cooperatives in the face of evolving agricultural landscapes (Fulton, M., & Gibbons, A, 2001). Agricultural cooperatives stand as dynamic entities that not only contribute to the economic well-being of farmers but also play a pivotal role in fostering social cohesion and environmental sustainability in rural communities. Ongoing research continues to shape the policies and practices supporting the growth and resilience of agricultural cooperatives globally.

2. Agricultural Cooperatives in Thailand: Catalysts for Rural Development

Agricultural cooperatives in Thailand have played a vital role in fostering rural development, empowering farmers, and enhancing the overall sustainability of the agricultural sector. This overview delves into the historical context, economic impact, and challenges faced by these cooperatives, drawing on relevant research and literature (Sorajjakool, S, 2002).

Following Sorajjakool, S. (2002), the cooperative movement in Thailand has roots dating back to the mid-20th century, with early initiatives aiming to improve the economic conditions of farmers. The establishment of agricultural cooperatives gained momentum, particularly during the 1960s and 1970s, as the government recognized the potential of cooperatives in uplifting rural communities. According to Pananond, P., & Hahn, K. H. (2017), their research indicates that agricultural cooperatives in Thailand contribute significantly to the economic well-being of farmers. These cooperatives enable smallholder farmers to pool resources, access credit, and collectively market their produce, resulting in increased income and improved livelihoods.

Tanasupawat, W., & Trueblood, M. A. (2001) stated that Agricultural cooperatives serve as agents of social cohesion and community development. Through democratic governance structures, these cooperatives empower farmers, particularly in decision-making processes. This inclusive approach helps build resilient and self-reliant rural communities. Despite their positive impact, agricultural cooperatives in Thailand face challenges, including management issues, market access, and external support. Ongoing research explores solutions to these challenges, emphasizing the need for effective policies and capacity-building initiatives (Ito, J, 2016). In addition, Government policies have played a crucial role in shaping the landscape of agricultural cooperatives in Thailand. Research highlights the importance of supportive policies that facilitate the growth and sustainability of these cooperatives (Pholsena, S, 2010).

Following the work of Supasri, A., & Trueblood, M. A. (2001), Agricultural cooperatives in Thailand stand as integral components of rural development, contributing to economic growth, social empowerment, and environmental sustainability. Ongoing research and strategic policy interventions are essential to address challenges and further enhance the impact of these cooperatives on the Thai agricultural landscape.

3. Business Operational Income

Operational income, often referred to as operating income or operating profit, is a key financial metric that reflects a company's profitability from its core operations. It is calculated by subtracting operating expenses from gross profit. Operating income excludes non-operating items such as interest and taxes, providing a clearer picture of a company's

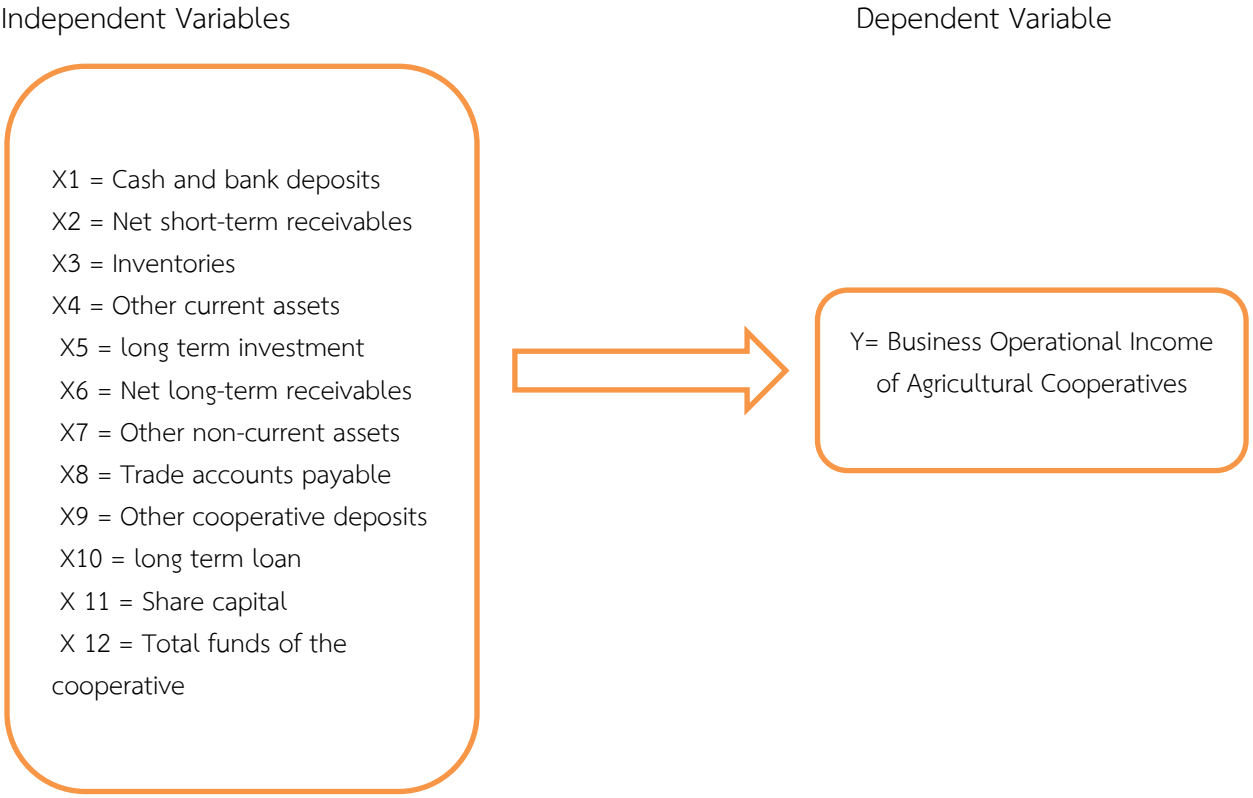
ability to generate profit from its main activities (Brigham, E. F., & Houston, J. F, 2009). Following Gitman, L. J., & Zutter, C. J. (2015), the component of operational Income was Gross Profit: The difference between revenue and the cost of goods sold (COGS). It represents the direct profit from the production of goods or services. Operating Expenses: These include expenses related to day-to-day business operations, such as salaries, rent, utilities, and marketing. Operating Income: Calculated by subtracting operating expenses from gross profit, this figure represents the profit generated from a company's core operations.

Ross, S. A., Westerfield, R. W., & Jordan, B. D. (2015) stated that profitability assessment: operational income is a key indicator of a company's profitability and efficiency in managing its core business functions. Investors often use operational income to evaluate a company's operational efficiency and its ability to generate profit before considering non-operational factors. Comparative analysis of operational income over different periods allows for assessing business performance trends. Following Horngren, C. T., Datar, S. M., & Rajan, M. V. (2015), understanding operational income is essential for businesses to make informed decisions, attract investors, and ensure sustainable profitability. The provided sources offer a foundation for further exploration into this critical financial metric. Controlling operating expenses is crucial to maintaining and improving operational income. External factors, such as changes in market conditions, can impact operational income.

Objective

The research objective was to examine the factors affecting the business operational income of Agricultural Cooperatives in Kalasin province, Thailand.

Concept theory framework



Materials and Methods

Methodology

The methodology was quantitative research applying the econometric methodology to examine the factors affecting the business operational income of Agricultural Cooperatives in Kalasin Province, Thailand. The presentation of the research methodology study and its details unfolded in the following manner:

1. Data Collection

The secondary data were collected from the Cooperative Auditing Department database from 2010 to 2023 comprised of 1) Cash and bank deposits, 2) Net short-term receivables, 3) Inventories, 4) Other current assets, 5) long-term investment, 6) Net long-term receivables, 7) Other non-current assets, 8) Trade accounts payable, 9) Other cooperative deposits, 10) long term loan, 11) Share capital, 12) Total funds of the cooperative, and business operational income of 44 Agricultural Cooperatives in Kalasin province, Thailand. With 13 years and 44 Agricultural Cooperatives, the total numbers accounted for 572 observations.

2. Data Analysis

The data were analyzed by econometric methodology to examine the factors affecting the business operational income of Agricultural Cooperatives in Kalasin Province, Thailand. Multiple linear regression analysis with the remove technique.

Results

Following the research objective, factors affecting the business operational income of Agricultural Cooperatives in Kalasin Province, Thailand will be expressed in table 2 as follows:

Table 2: Factors Affecting the Business Operational Income of Agricultural Cooperatives in Kalasin province, Thailand

n. = 572

Dependent Variable: Business Operational Income of Agricultural Cooperatives (Y)			
Independent Variables (X)	Description	Coefficients	T-value
X1	Cash and bank deposits	0.081	14.27**
X2	Net short-term receivables	0.148	22.65**
X3	Inventories	-0.111	19.87*
X4	Other current assets	-0.209	23.67**
X5	long term investment	-0.22	25.46**
X6	Net long-term receivables	0.777	32.48**
X7	Other non-current assets	-0.948	31.23**
X8	Trade accounts payable	-0.222	24.45**
X9	Other cooperative deposits	-0.283	16.57*
X10	long term loan	-0.113	18.63*
X11	Share capital	-0.284	19.59*
X12	Total funds of the cooperative	0.002	22.46**
$\bar{R}^2$	.86		
F	142.64		

Source: Calculation

** Statistically significant level of 99 percent

* Statistically significant level of 95 percent

According to Table 2, factors affecting the business operational income of Agricultural Cooperatives in Kalasin Province, Thailand showed 2 ways of influences which were:

1) factors that had a positive influence on business operational income which comprised of 4 factors, cash and bank deposits, net short-term receivables, net long-term receivables, and total funds of the cooperative with their coefficients of 0.081, 0.148, 0.777, and 0.002 respectively. The net long-term receivables and the biggest positive influence on the business operational income of Agricultural Cooperatives with the coefficient of 0.777. This meant that when the increase in the net long-term receivables by 1 percent led to the increase of business operational income of Agricultural Cooperatives by 0.77 percent. Likewise, the increase of cash and bank deposits, net short-term receivables, and total funds of the cooperatives by 1 percent led to the increase in business operational income of Agricultural Cooperatives by 0.081, 0.148, and 0.002 respectively.

2) factors that had a negative influence on business operational income which comprised of 8 factors, inventories, other current assets, long-term investment, other non-current assets, trade accounts payable, other cooperative deposits, long-term loan, and share capital with their coefficients of -0.111, -0.209, -0.22, -0.948, -0.222, -0.283, -0.113, and -0.284 respectively. This meant that an increase in inventories, other current assets, long-term investment, other non-current assets, trade accounts payable, other cooperative deposits, long-term loan, and share capital by 1 percent led to a decrease in business operational income by 0.111, 0.209, 0.22, 0.948, 0.222, 0.283, 0.113, and 0.284 percent respectively.

With theoretical explanation of factors had a negative influence on business operational income as follow:

Inventories, Inventory management involves converting cash into goods, which reduces the amount of cash on hand, affects liquidity, or involves using funds elsewhere. Additionally, it involves evaluating the value of remaining inventory compared to income. Increasing in inventory of agricultural cooperatives may lead to the decreasing in business operational incomes of agricultural cooperatives.

Other current assets, when agricultural cooperatives invest more in current assets, it typically means they're holding higher levels of liquid assets or those easily convertible to cash, often within a year. However, increasing investment in current assets may lead to a decrease in the cooperative's income in the form of reduced cash flows.

Long-term investment involves investing in various assets with the aim of obtaining returns in the future, typically over a period longer than one year. When agricultural cooperatives increase their investment in long-term assets, it may result in a decrease in

income from business operations.

Other non-current assets, also known as fixed assets, are assets that cannot be quickly converted into cash and typically have low liquidity. Generally, if an asset cannot be converted into cash within one year, it is considered a non-current asset. Therefore, when agricultural cooperatives increase their investments in non-current assets, it may have an impact on reducing the income of the agricultural cooperative business.

Trade accounts payables refer to transactions where a business purchases goods or services from another company, receives the goods or services, but has not yet paid for them. This creates an obligation for the business to settle the payment owed to the supplier within an agreed-upon timeframe. Increased trade payables for agricultural cooperatives may lead to a decrease in the cooperative's business income because a portion of the income must be used to repay the debts owed to the suppliers.

Other cooperative deposits refer to when an agricultural cooperative place its funds as deposits with another cooperative. While the agricultural cooperative may earn interest on these deposits, it simultaneously loses the opportunity to invest the funds in other business activities. This can result in a decrease in income from the agricultural cooperative's business operations.

Long-term loans are loans with a repayment period of approximately 5 years or more. The borrowers typically include large-scale investors who require a significant amount of capital, such as for purchasing large machinery or durable goods with high value, like real estate properties. Besides having a lengthy loan term, this type of credit also often involves a higher loan amount and requires a longer evaluation period. When agricultural cooperatives take out long-term loans, it affects their interest payments, which are considered expenses in business operations, and consequently reduces the income of the agricultural cooperative.

Share capital, member shares or monthly savings from cooperative members, which the cooperative collects from them every month by deducting from their salaries. These payments for shares or monthly savings are eligible for dividend payouts during the year. When agricultural cooperatives have increased member shares, they must pay out more dividends, which affects the cooperative's income from business operations, reducing it.

As a business unit and operational organization, Agricultural Cooperatives in Kalasin province would consider the increasing factors affecting business operational income as positive influence of Agricultural Cooperatives in Kalasin province which were the net long-term receivables, cash and bank deposits, net short-term receivables, and total funds of the cooperatives. The research results were consistent with the works of Supaphol, S., Tudjuntuk, A., Preechasin, T., & Manee-in, A. (2022) who studied the Agricultural

Cooperatives in Suphanburi Province, Thailand.

On the other hand, Agricultural Cooperatives would take their consideration factors affecting business operational income in the negative influence. This meant that all of the 8 factors that had a negative influence on business operational income would be reduced to increase the business operational income. This research outcome was consistent with the work of Sala-Ríos, M. (2023) who studied the determinants affecting cooperatives' profitability. Evidence from Spain.

Conclusions and Discussion

According to research outcomes, some factors influenced the business operational income of Agricultural Cooperatives in Kalasin province, Thailand. There were 4 out of 12 factors that had a positive influence on the business operational income which were the net long-term receivables, cash and bank deposits, net short-term receivables, and total funds of the cooperatives. Agricultural Cooperatives in Kalasin province would take their consideration all 4 factors that would lead to an increase in their business operational income. Since, business operational income expressed a financial status that presents Agricultural Cooperatives revenues and expenses, indicating whether the Agricultural Cooperatives have incurred a profit or a loss during a specific period. The business operational income assists Agricultural Cooperatives in determining the feasibility of generating profits through strategies such as revenue enhancement, cost reduction, or a combination of both In addition all of Agricultural Cooperatives would consider all of these 4 factors to put in the strategic plan of their business strategy to make their implementation finally. It was consistent with the works of Mahazril Aini Y., Hafizah H.A.K, & Zuraini Yc (2012). Who studied factors affecting Cooperatives performance in relation to strategic planning and members' participation in Malaysia. Also, it was consistent with the work of Wittayakorn-Puripunpinyoo, A. (2022). Who studied the measurement of technical efficiency and factors affecting the operational efficiency of Savings Cooperatives in Kalasin province, Thailand.

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The Measurement of Technical and Cost Efficiency of Savings Cooperatives of Loei Province, Thailand Based on the Malmquist Data Envelopment Analysis

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Abstract

The research objectives were 1) to measure the technical efficiency of Savings Cooperatives, and 2) to measure the cost efficiency of Savings Cooperatives in Loei Province, Thailand by the Malmquist Data Envelopment Analysis. The secondary data were collected from the Cooperative Auditing Department database from 2018 to 2022 comprised of 8 savings cooperatives with 5 years. The total numbers were accounted for 40 observations. The data were analyzed by Malmquist Data Envelopment Findings showed that 1) there were 6 savings cooperatives in Loei Province had a technological efficiency index greater than 1. This indicated an improvement in technological efficiency for these 6 savings cooperatives in Loei Province, and 2) savings cooperatives in Loei Province were currently under consideration. They had an average technical efficiency of 43%, an average cost efficiency of 32%, and an overall average efficiency of 52%. Savings cooperatives in Loei Province were currently overusing input factors, they also lack efficiency in managing and organizing these factors to achieve an appropriate balance. Thus, there was a need for these cooperatives to improve their management practices to achieve a more balanced and efficient use of resources at the same level.

Keywords: Technical Efficiency, Cost Efficiency, Savings Cooperatives, Data Envelopment Analysis

Introduction

Savings cooperatives, also known as savings and credit cooperatives, function as member-owned financial institutions with a pivotal role in advancing financial inclusion and community development. This research essay investigates the organizational structure, advantages, and impact of savings cooperatives on individual members and local communities. Typically formed by individuals who share a common bond, these cooperatives involve the collective pooling of members' savings to provide financial

services within the community. This cooperative setup ensures democratic governance, granting each member an equal voice in decision-making processes (Mitchell, 2019). The combined savings of members serve as a funding reservoir for extending affordable loans and diverse financial products to fellow members.

In Thailand, the savings cooperatives known as the formation of organization aims to provide mutual support among its members. Members consistently deposit their earnings into the cooperative, contributing through shareholding and regular savings. Moreover, in instances of financial distress, the cooperative helps by providing loans at interest rates lower than those of conventional financial institutions. All members of the cooperative are part of the same entity and receive a steady monthly income (The Federation of Savings and Credit Cooperative of Thailand Limited, 2023).

According to the Federation of Savings and Credit Cooperative of Thailand Limited. (2023), Savings cooperatives have legal entity status according to cooperative laws, and the Ministry of Finance has declared that savings cooperatives can calculate interest on loans, like financial institutions, as per the Ministry of Finance announcement dated November 21, 1983.

In Overall of Thailand, the operation of the cooperative is funded through share capital and deposits from members, including both regular and savings deposits, without borrowing funds from foreign sources. Currently, there are a total of 1,227 savings cooperatives, and the total savings system (share capital and deposits). These funds are used to provide loans to members in need. The total assets of the cooperatives amount to more than 63.53 percent being allocated for member loans.

To ensure regular contributions and loan repayments, cooperatives utilize a deduction system at the payment location, ensuring a consistent cash flow every month. This operational approach contributes to the stability of the cooperative business, particularly when assessing the financial soundness of assets. The entire savings cooperative system had a provision for doubtful debts regarding member loans and potential doubtful debts for member loans at only 0.021 percent and 0.075 percent, respectively. This percentage is significantly lower compared to other types of financial institutions (Cooperative Auditing Department, 2023).

Loei is situated in the Isan region of upper northeastern Thailand and stands out as one of the less densely populated provinces in the country. It shares borders with Nong Khai, Udon Thani, Nong Bua Lamphu, Khon Kaen, Phetchabun, and Phitsanulok, while to the north, it adjoins Xaignabouli and Vientiane provinces of Laos (https://en.wikipedia.org/wiki/Loei_province).

Characterized by its mountainous terrain, Loei features a provincial capital, Loei, nestled in a fertile basin surrounded by mist-covered peaks and diverse flora. Notable mountains in the area include Phu Kradueng, Phu Luang, and Phu Ruea. The Loei River, a tributary of the Mekong, flows through the province, marking part of its northern boundary with Laos. Phu Thap Buek, the highest peak in the Phetchabun Range, is also found in Loei. Additionally, Phu Kradueng is situated within Phu Kradueng National Park. The western part of the province extends to the southern tip of the Luang Prabang Range within the Thai highlands. Forest coverage in Loei spans 3,382 km^2, accounting for 32.2 percent of the province's total area (https://en.wikipedia.org/wiki/Loei_province).

Like other provinces in Thailand, people in Loei Province are coming together to establish a savings cooperative means the gathering or meeting of individuals or members with a common objective. This is done to create a conducive environment for establishing a cooperative that will provide various savings and financial services to the members within that group. The phrase "coming together" implies the pooling of resources, energy, or capabilities of the members to create strength and sustainability in establishing the savings cooperative. This process emphasizes cooperation and the mutual benefits of members in managing the cooperative being formed.

The primary objectives of savings cooperatives typically revolve around promoting financial well-being, community development, and member empowerment. While specific goals may vary, common objectives. The main objectives of savings cooperatives center on fostering financial inclusion, community development, and member-centric financial services, guided by the principles of cooperation and mutual benefit.

Table 1: Number of Members, Total Revenue and Total Expenses of Savings Cooperatives in Loei Province, Thailand

Name of Cooperatives in Loei Province	Number of Members (people)	Total Revenue ($)	Total Expenses ($)
Teachers' Savings Cooperative of Loei Province Limited	7,753	590,303.23	414,507.96
Police Savings Cooperative of Loei Province Limited	1,566	66,284.94	31,131.27
Hospital Savings Cooperative of Loei Province Limited	1,155	42,869.32	7,130.18

Savings Cooperative of Loei Province Limited	378	9,261.52	9,708.06
Military Savings Cooperative of Sri Song Rak Limited	640	10,001.31	4,862.51
Teachers' Savings Cooperative of the Department of General Education, Loei Province Limited	1,742	144,837.34	205,764.08
Public Health Savings Cooperative of Loei Province Limited	2,080	121,344.42	47,094.87
Army Department Savings Cooperative No. 21 Limited	789	2,317.04	576.24
Total	16,103	987,219.13	720,775.16

Source: Cooperative Auditing Department, 2023

According to table 1, there were 8 Savings Cooperatives in Loei Province, Thailand with the total of cooperatives' members of 16,103 persons, total revenue, and total expenses of $ 987,219.13, and $ 720,775.16 respectively.

Table 2: Total Assets, Share Capital, Total Funds of the Cooperatives and Total Debt of Savings Cooperatives in Loei Province, Thailand

Name of Cooperatives in Loei Province	Total Assets ($)	Share Capital ($)	Total Funds of the Cooperatives ($)	Total Debt ($)
Teachers' Savings Cooperative of Loei Province Limited	338,589,270.73	94,971,425.71	116,482,962.81	222,106,307.92
Police Savings Cooperative of Loei Province Limited	37,439,559.15	12,316,190.57	15,705,615.64	21,733,943.50
Hospital Savings Cooperative of Loei Province Limited	28,228,999.48	15,746,083.71	18,428,744.60	9,800,254.88
Savings Cooperative of Loei Province Limited	2,936,713.00	1,358,382.86	1,727,348.34	1,209,364.67
Military Savings Cooperative of Sri Song Rak Limited	5,378,174.51	1,959,716.86	2,425,480.61	2,952,693.90
Teachers' Savings Cooperative of the Department of General Education, Loei Province Limited	62,223,294.51	22,137,796.57	8,919,705.31	71,142,999.83
Public Health Savings Cooperative of Loei Province	72,412,006.50	32,032,112.86	37,533,659.99	34,878,346.50

Limited				
Army Department Savings Cooperative No. 21 Limited	1,454,302.33	1,123,754.29	1,227,270.79	227,031.55
Total	548,662,320.21	181,645,463.43	202,450,788.09	364,050,942.74

Source: Cooperative Auditing Department, 2023

According to table 2, there were 8 Savings Cooperatives in Loei Province, Thailand with total assets, share capital, total funds of the cooperatives of $548,662,320.21, $181,645,463.43, $202,450,788.09, and $364,050,942.74 respectively.

From past to present, based on the information provided, it seems that there are numerous research studies related to savings cooperatives in the Loei Province, focusing on financial status and operational aspects. However, there appears to be no prior research specifically addressing the "Technical and Cost Efficiency of Savings Cooperatives of Loei Province, Thailand Based on the Malmquist Data Envelopment Analysis."

Considering conducting such research, it could potentially contribute valuable insights into the technical and cost efficiency of savings cooperatives in Loei Province using the Malmquist Data Envelopment Analysis method. This approach assesses changes in productivity over time and could shed light on the effectiveness of these cooperatives in terms of technical efficiency and cost management.

Literature Review

1. Savings cooperatives

Savings cooperatives, also known as savings and credit cooperatives, are member-owned financial institutions that play a pivotal role in promoting financial inclusion and community development. This research essay explores the structure, benefits, and impact of savings cooperatives on both individual members and local communities.

Savings cooperatives are typically formed by individuals with a shared bond, pooling their savings to provide financial services within the community. This cooperative structure ensures democratic governance, where each member has an equal say in decision-making processes (Mitchell, 2019). Members' pooled savings become a source of funds for providing affordable loans and other financial products to fellow members.

Benefits of Savings Cooperatives consisted of 1) Financial Inclusion: Savings cooperatives act as a bridge to financial services for individuals who might face barriers to access in traditional banking systems (Johnson et al., 2020). 2) Low-Cost Financial Services: Cooperative members often enjoy more favorable terms on loans and higher interest rates on savings compared to commercial banks (Smith & Brown, 2018). 3) Community

Development: Profits generated by savings cooperatives are often reinvested in local communities, supporting various development initiatives such as infrastructure projects, education, and healthcare (Roberts, 2017).

Research has shown that the presence of active savings cooperatives positively impacts local economies. A study conducted by Thompson et al. (2016) found that communities with well-established savings cooperatives experience increased financial stability, improved access to credit, and a boost in entrepreneurial activities. While savings cooperatives provide substantial benefits, they also face challenges, such as regulatory constraints and technological limitations (White, 2019). Addressing these challenges opens up opportunities for innovation, especially in leveraging technology to enhance financial services delivery (Johnson, 2021).

Savings cooperatives serve as crucial agents of financial inclusion and community development. Their member-centric structure, coupled with a focus on reinvesting in the local community, makes them powerful tools for economic empowerment. While challenges exist, the potential for positive impact on individuals and communities suggests that savings cooperatives remain a viable and valuable component of the financial landscape.

2. Savings Cooperatives in Thailand

Savings cooperatives in Thailand have emerged as vital components of the country's financial landscape, contributing significantly to financial inclusion and community development. This research essay aims to delve into the structure, benefits, challenges, and overall impact of savings cooperatives in Thailand, shedding light on their multifaceted role.

In Thailand, savings cooperatives, often referred to as "Sahakol" or "Kasikorn," are member-owned financial institutions that operate on cooperative principles. Members, typically with a common bond like occupation or residence, pool their savings to provide accessible and affordable financial services (Sombat, 2020). The cooperative structure ensures democratic governance, with each member having an equal say in decision-making processes.

Savings cooperatives in Thailand play a pivotal role in providing financial services to individuals who might otherwise face barriers in accessing traditional banking services (Boonchai et al., 2018). These cooperatives contribute to local economic development by reinvesting profits in the community, supporting initiatives such as education, healthcare, and small-scale entrepreneurship (Supachai, 2019). While Thai savings cooperatives bring significant advantages, they also face challenges such as regulatory constraints and the need for technological advancement (Prapapan, 2021). Addressing these challenges

presents opportunities for innovation, especially in leveraging digital technologies to enhance service delivery and accessibility.

Research indicates a positive impact of savings cooperatives on local communities in Thailand. A study by Kasikorn Research Center (2020) found that communities with active savings cooperatives experienced increased financial literacy, improved livelihoods, and a strengthened sense of community.

The regulatory environment significantly influences the operations of savings cooperatives in Thailand. The Bank of Thailand, through the Cooperative Promotion Department, plays a crucial role in overseeing and regulating these financial institutions (Bank of Thailand, 2017).

Savings cooperatives in Thailand stand as key contributors to financial inclusion and community development. Their member-centric approach, combined with a commitment to reinvesting in the local community, positions them as essential players in Thailand's financial landscape. While challenges persist, particularly in regulatory compliance and technological adaptation, the overall impact of savings cooperatives on individuals and communities in Thailand underscores their importance.

3. Technical Efficiency

Operational efficiency is a critical aspect of organizational performance, and technical efficiency serves as a key metric in evaluating the effectiveness of production processes. This research essay aims to provide a thorough examination of technical efficiency, exploring its definition, measurement, factors influencing it, and its implications for various industries.

Technical efficiency refers to the ability of an organization or system to produce maximum output using the minimum amount of input resources (Farrell, 1957). It is a fundamental concept in production economics and management studies, focusing on optimizing the production process.

Measurement of Technical Efficiency: Various methodologies exist for measuring technical efficiency, with Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) being commonly employed (Coelli et al., 2005). DEA assesses efficiency by comparing the performance of similar units, while SFA estimates a production frontier and evaluates how close each unit comes to that frontier.

Factors Influencing Technical Efficiency: Several factors contribute to the level of technical efficiency within an organization. These include technology adoption, employee skills and training, managerial practices, and the quality of input resources (Charnes et al., 1978). External factors like market conditions and regulatory environments can also impact technical efficiency.

Implications for Industries: High levels of technical efficiency have significant implications for industries. Efficient production processes can lead to cost savings, increased competitiveness, and improved product quality. In sectors such as manufacturing and agriculture, where efficiency is directly tied to resource utilization, enhancing technical efficiency is crucial for sustainable practices (Färe et al., 1994).

Despite its importance, achieving and maintaining high levels of technical efficiency can be challenging. Factors such as outdated technology, inadequate infrastructure, and resistance to change within organizations can impede progress (Kumbhakar & Lovell, 2000). Identifying and addressing these challenges are integral to enhancing efficiency.

Technical efficiency is a vital concept in understanding and improving operational performance. Its measurement provides insights into how effectively organizations convert inputs into outputs. Industries that prioritize and invest in enhancing technical efficiency stand to gain not only in terms of cost-effectiveness but also in terms of competitiveness and sustainability.

4. Data Envelopment Analysis (DEA)

Data Envelopment Analysis (DEA) is a powerful mathematical technique employed in operations research and management science to assess and compare the relative efficiency of decision-making units (DMUs) within a set. This research essay explores the fundamentals of DEA, its application, and its significance in evaluating efficiency across various sectors.

DEA, developed by Charnes, Cooper, and Rhodes in the late 1970s, is a non-parametric method that evaluates the relative efficiency of DMUs based on multiple inputs and outputs (Charnes et al., 1978). Unlike parametric methods, DEA does not require specific functional forms or assumptions about the underlying production process.

The basic DEA model assesses each DMU's efficiency by comparing its output to input ratios with those of other units. The model identifies a benchmark, called the efficient frontier, representing the most efficient units. Units lying on the frontier are considered fully efficient, while those insides are deemed less efficient and potentially have room for improvement (Coelli et al., 2005).

DEA is versatile and can be applied to various contexts, including manufacturing, service industries, and public services. Inputs and outputs are defined based on the specific goals of the analysis. For instance, in a manufacturing setting, inputs might include labor and raw materials, while outputs could be the quantity and quality of produced goods.

DEA has seen several extensions and variations, accommodating different perspectives and complexities. These include models for handling multiple stages of production, incorporating environmental variables, and addressing undesirable outputs.

Radial and non-radial models offer flexibility in assessing pure technical efficiency and scale efficiency separately.

DEA has found applications in diverse fields, such as banking, healthcare, education, and agriculture. In the banking sector, DEA helps assess the efficiency of branches or financial institutions, considering inputs like capital and labor and outputs like loans and deposits. In healthcare, it aids in evaluating hospital performance based on inputs such as beds, staff, and outputs like patient services.

While DEA is a valuable tool, its application is not without challenges. Sensitivity to outliers, the choice of inputs and outputs, and the potential for bias in small sample sizes are considerations that researchers and practitioners must navigate (Coelli et al., 2005).

Data Envelopment Analysis stands as a robust methodology for evaluating and improving operational efficiency across various industries. Its non-parametric nature and flexibility make it a preferred choice for assessing relative performance, providing insights for organizational enhancement and resource optimization.

5. Cost Efficiency

Cost efficiency is a paramount consideration for organizations seeking to optimize resource allocation and enhance competitiveness. This research essay aims to delve into the intricacies of cost efficiency, exploring its conceptualization, measurement methodologies, influential factors, and implications for diverse industries.

Cost efficiency refers to the ability of an organization to achieve its objectives or deliver its products and services at the lowest possible cost. It involves optimizing the utilization of resources to minimize expenses while maintaining or improving the quality and effectiveness of operations (Freeman & Cunha, 2004).

Measurement of Cost Efficiency: Measuring cost efficiency involves assessing the relationship between inputs and outputs in production processes. Various methodologies exist, including the Cost Efficiency Index, which compares actual costs to the best achievable costs, and the Data Envelopment Analysis (DEA), which evaluates relative efficiency among decision-making units (Coelli et al., 2005; Farell, 1957).

Several factors contribute to the level of cost efficiency within an organization. Technological advancements, economies of scale, skilled workforce, and effective supply chain management are recognized as influential determinants (Diewert, 1992). External factors, such as market competition and regulatory environments, also impact cost efficiency.

High levels of cost efficiency translate into improved competitiveness, increased profitability, and better financial sustainability for industries. Sectors like manufacturing,

where production costs significantly impact profit margins, and service industries, where operational costs affect service pricing, are particularly sensitive to cost efficiency considerations (Banker & Natarajan, 2008).

Cost efficiency assessment methodologies vary based on industry characteristics and objectives. Activity-Based Costing (ABC), Total Cost Assessment (TCA), and Benchmarking are common tools used to identify and analyze cost drivers, allowing organizations to streamline processes and minimize unnecessary expenditures (Cooper & Kaplan, 1992).

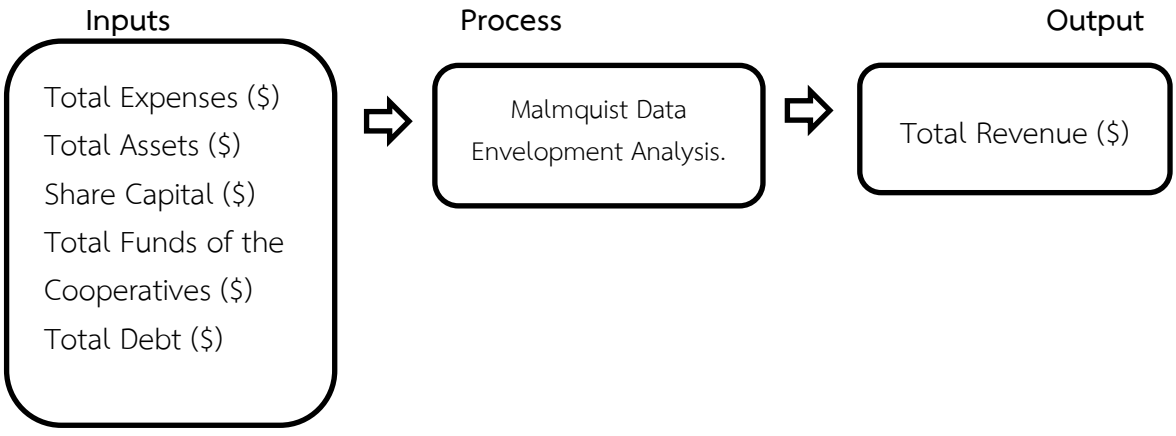
While achieving cost efficiency is a strategic goal, organizations often face challenges in implementation. Resistance to change, inadequate technology adoption, and market uncertainties are common impediments. Balancing cost-cutting measures with the need for innovation and quality improvement poses a delicate challenge (Dess & Beard, 1984). Cost efficiency remains a critical aspect of organizational success. Its measurement and enhancement contribute not only to financial sustainability but also to the overall competitiveness and adaptability of organizations in dynamic business environments.

Objectives

The research objectives were: 1) to measure the technical efficiency of Savings Cooperatives in Loei Province, Thailand and 2) to measure the cost efficiency of Savings Cooperatives in Loei Province, Thailand by the Malmquist Data Envelopment Analysis.

Concept theory framework

Following Coelli, T., Rao, D. S. P., & Battese, G. E. (2005). The concept theory framework would be expressed as:



Materials and Methods

Methodology

The methodology was quantitative research applying the Malmquist Data Envelopment Analysis to measure the technical efficiency of Savings Cooperatives in Loei Province, Thailand and the cost efficiency of Savings Cooperatives in Loei Province, Thailand by the Malmquist Data Envelopment Analysis. The presentation of the research methodology study and its details unfolded in the following manner:

1. **Data Collection**

The secondary data were collected from the Cooperative Auditing Department database from 2018 to 2022 comprised of 8 savings cooperatives in Loei Province which comprised of 1) total expenses, 2) total assets, 3) share capital, 4) total funds of the cooperatives, 5) total debt, and 6) total revenue. With 5 years and 8 savings cooperatives, the total numbers were accounted for 40 observations.

2. **Data Analysis**

The data were analyzed by Malmquist Data Envelopment Analysis to measure the technical efficiency of Savings Cooperatives in Loei Province, Thailand and the cost efficiency of Savings Cooperatives in Loei Province, Thailand. The inputs were total expenses, total assets, share capital, total funds of the cooperatives, and total debt. The output was total revenue shown in the concept theory framework.

Results

Following the research objectives, the measurement of technical and cost efficiency of savings cooperatives of Loei Provinces, Thailand Based on the Malmquist Data Envelopment will be expressed as follows:

Part 1. The technical efficiency of savings cooperatives of Loei Provinces, Thailand would be expressed in table 3.

Table 3: The Technical Efficiency of Savings Cooperatives in Loei Province, Thailand

Savings Cooperatives Name	effch	techch	pech	sech	tfpch
Teachers' Savings Cooperative of Loei Province Limited	1.080	1.824	1.000	1.080	1.971
Police Savings Cooperative of Loei Province Limited	1.395	1.989	1.392	1.002	2.774
Hospital Savings Cooperative of Loei Province Limited	1.511	2.597	1.488	1.015	3.925
Savings Cooperative of Loei	1.000	1.909	1.000	1.000	1.909

Savings Cooperatives Name	effch	techch	pech	sech	tfpch
Province Limited					
Military Savings Cooperative of Sri Song Rak Limited	3.450	1.979	3.330	1.036	6.828
Teachers' Savings Cooperative of the Department of General Education, Loei Province Limited	1.000	1.834	1.000	1.000	1.834
Public Health Savings Cooperative of Loei Province Limited	4.288	2.161	4.281	1.002	9.269
Army Department Savings Cooperative No. 21 Limited	1.400	2.232	1.000	1.400	3.125
Mean	1.619	2.053	1.527	1.06	3.323

Source: Calculation

Noted:

Effch = The Change of Technical Efficiency under the condition of Constant Return to Scale (CRS)

techch = The Change of Technology

pech = The Change of Technical Efficiency under the condition of Varible Return to Scale (VRS)

sech = The Change of Scale Efficiency

tfpch = The Change of Total Factor Productivity (TFP)

According to table3, the analysis of changes in efficiency and technology using the Malmquist DEA method reveals that 6 savings cooperatives in Loei Province had a technological efficiency index greater than 1. These cooperatives included the Teachers' Savings Cooperative of Loei Province Limited, the Police Savings Cooperative of Loei Province Limited, the Hospital Savings Cooperative of Loei Province Limited, the Military Savings Cooperative of Sri Song Rak Limited, the Public Health Savings Cooperative of Loei Province Limited, and the Army Department Savings Cooperative No. 21 Limited. This indicated an improvement in technological efficiency for these 6 savings cooperatives in Loei Province.

The analysis indicates that 2 savings cooperatives in Loei Province have a technological efficiency index equal to 1, signifying no change in technological efficiency. These cooperatives were the Savings Cooperative of Loei Province Limited and the Teachers' Savings Cooperative of Loei Province Limited. This suggested that these two savings cooperatives had maintained a constant level of technological efficiency without improvement or deterioration.

When considering changes in technology, it was found that all 8 savings cooperatives in Loei Province had improved their management technology. This was evident from the technological change index values exceeding 1 for each cooperative. This suggests that all the savings cooperatives in the province have undergone positive technological advancements in their management practices.

While examining the Total Factor Productivity Change (TFPC) for all savings cooperatives in Loei Province, it was observed that the TFPC values for each cooperative are greater than 1. This indicated that all 8 savings cooperatives in the province had experienced an increase in efficiency in managing their operations. The Total Factor Productivity Change considered changes in both technical efficiency and technological progress, suggesting an overall improvement in the productivity and management practices of the savings cooperatives in Loei Province.

Part 2. The cost efficiency of savings cooperatives of Loei Provinces, Thailand would be expressed in table 4.

Savings Cooperatives Name	TE	AE	CE
Teachers' Savings Cooperative of Loei Province Limited	0.7340	0.7000	0.5130
Police Savings Cooperative of Loei Province Limited	0.2640	0.5090	0.1340
Hospital Savings Cooperative of Loei Province Limited	0.1920	0.1240	0.0240
Savings Cooperative of Loei Province Limited	1.0000	0.8810	0.8810
Military Savings Cooperative of Sri Song Rak Limited	0.0070	0.5190	0.0040
Teachers' Savings Cooperative of the Department of General Education, Loei Province Limited	1.0000	1.0000	1.0000
Public Health Savings Cooperative of Loei Province Limited	0.0030	0.3180	0.0010
Army Department Savings Cooperative No. 21 Limited	0.2600	0.1360	0.0350
Mean	0.4320	0.5230	0.3240

Source: Calculation

Noted

TE = Technical Efficiency

AE = Allocative Efficiency = CE/TE

CE = Cost Efficiency

According to table 4, the 8 savings cooperatives in Loei Province are currently

under consideration. They had an average technical efficiency of 43%, an average cost efficiency of 32%, and an overall average efficiency of 52%. Remarkably, only one savings cooperative, namely the Teachers' Savings Cooperative of Loei Province Limited, was found to be efficient across all three types (with TE, CE, and AE values equal to 1). Additionally, it is noted that, on the whole, the savings cooperatives in Loei Province under consideration, totaling 7, exhibit higher levels of technical efficiency compared to cost efficiency. This suggests that these cooperatives tend to use input factors more than necessary.

Given the specified levels of input and output prices, it was recommended that the 7 savings cooperatives currently under consideration in Loei Province should reduce their use of input factors, as indicated by the technical efficiency index values lower than one.

Apart from the fact that these 7 savings cooperatives in Loei Province were currently overusing input factors, they also lack efficiency in managing and organizing these factors to achieve an appropriate balance. Thus, there was a need for these cooperatives to improve their management practices to achieve a more balanced and efficient use of resources at the same level.

In summary, the results obtained from the calculations indicate which savings cooperatives were less efficient in terms of technical efficiency, cost efficiency, and overall efficiency. Specifically, cooperatives with technical efficiency index values below one may be considered less efficient in utilizing input factors to produce outputs. Additionally, those cooperatives that exhibit a higher level of technical efficiency compared to cost efficiency suggest that they use input factors more than necessary. The overall efficiency reflects the combined performance in managing input factors and production outputs. Therefore, the analysis helped identify areas where savings cooperatives in Loei Province may need to improve their operational efficiency and resource management.

Conclusions and Discussion

Savings cooperatives, functioning as member-owned financial institutions, play a vital role in enhancing financial inclusion and supporting community development. An examination of efficiency and technological changes using the Malmquist Data Envelopment Analysis (DEA) method uncovered noteworthy findings in Loei Province, Thailand. The analysis revealed that six savings cooperatives in Loei Province exhibited a technological efficiency index greater than 1, indicating an enhancement in technological efficiency for these entities. On the other hand, two savings cooperatives had a technological efficiency index equal to 1, implying a stable level of technological efficiency

with no discernible improvement or decline. Examining the Total Factor Productivity Change (TFPC) for all savings cooperatives in Loei Province, it was observed that the TFPC values for each cooperative surpassed 1. This suggests that all eight savings cooperatives in the province experienced an upswing in efficiency in managing their operations. The TFPC considers changes in both technical efficiency and technological progress, pointing towards an overall improvement in the productivity and management practices of savings cooperatives in Loei Province.

Eight savings cooperatives currently under consideration in Loei Province exhibited certain efficiency metrics. On average, these cooperatives demonstrated a technical efficiency of 43%, a cost efficiency of 32%, and an overall efficiency averaging 52%. The overall efficiency metric encompasses the collective performance in handling input factors and producing outputs. These findings from the analysis shed light on specific areas where savings cooperatives in Loei Province might benefit from enhancing their operational efficiency and resource management. The breakdown of technical and cost efficiency provides valuable insights into the areas that may require attention for improvement, offering a targeted approach to optimize the overall performance of these financial institutions. The research results were consistent with the work of Sreethon, P. and Thoraneenitiyan, N. (2021). Who studied the measure of technical efficiency of large saving and credits cooperatives in Thailand. Purmiyati, A., Handoyo, R. D., and Wisudanto, A. (2022). Who studied technical efficiency analysis: management factor as determinants of saving and credit cooperatives' health in Indonesia. In addition, the research outputs were constent with Kimutai, C. J., Jagongo, A. and Kenyatta, O. (2019). Who studied technical efficiency of deposit taking savings and credit cooperative societies in Kenya.

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The Art of the Occult and Hermeneutics According to Philosophy of Paradigm

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Abstract

The objective of the research was to hermeneutics the art of the occult according to the philosophy of paradigm. The method of studying philosophy was qualitative research by collective main data from documents data for lead all information to Gadamer's philosophical hermeneutics with fusion horizon by the reader. The result was shown that the art of the occult could be interpreted into 5 paradigms that are; 1) primitive paradigm, the art of occult is the tool to communicate to the On-High and ask for the kindness for the benefit of themselves, 2) ancient paradigm, the art of the occult is the instrument with precise laws that if follows accurately thus get the require outcome, 3) medieval paradigm, the art of the occult is the strange thing out of the religious domains, it is the wrong pathway, mystics and wrong way that not lead us to the good afterlife, 4) modern paradigm, the art of the occult is the fool of the people which persuaded by the occults, it is the obstacle to the progression of the world, and 5) postmodern paradigm, the art of the occult is the curiosity, strangeness but if utilized thus got the outcome, it is good. The result could be the perspective of the people on the art of the occult, and we could guide the correct understanding to the art of the occults.

Keywords: Art of the occult, Paradigm, philosophy

Introduction

The belief in the occult is regarded an element of Thai culture (Kumdee, 1991), and it varies depending on basic education, family, society, culture, tradition, politics, and economy. Even as information technology and the internet become more widely available, people continue to be interested in the occult. However, they escape accusations of ignorance by following those who they believe to be knowledgeable. They did, however, choose it because of the reputation that had been passed down. There was no relationship with such knowledge, whether genuine or not. Believe without any research, by word of mouth, or and believe according to the belief that person is wizard. Without himself diving in to understand more about his beliefs. This is consequently regarded as the region of

actual credulity. Wisdom is valued today as a means of removing intellectual darkness. In the modern world in truth, we've been living in the virtual world for a long time, but most people still believed the occult when they experienced hardship, they were unable to find a way out of the wrongdoing they had committed. Humans are quick to believe anything in the virtual world if they are told by someone they can trust. This is evidenced by the fact that people are eager to purchase totem based on those legends to overcome their dread of evil, they must acknowledge that the wrongs they have committed will come back to haunt them. And if it happens, the conviction in being free of bad karma will be multiplied. But who will receive the karma that has been done? The karma remains the same (Sangthong, 2021). Ancient traditions are simply being expressed in modern ways. The goal could be personal development through the learning and application of esoteric teachings. Some are true and some are false. As a result, it is a very popular item in today's market. People House is full of talismans, and they do the worship daily (Phawakhunworakit, 2015), because it is thought to be reliable. However, some are effective, while others are ineffectual, some are good, some are poor results (Raynolds, 2015).

Not only the interesting by the old but it was happened with the new generation who born in the technology in hand era. Normally to presume that they do not believe in superstition (Rojanaprapa, 2018), but the mutelu (an informal term for superstition practice today) was fashion to the new generation and they are major consumer of the spiritual totems and Buddhist amulets, and interesting in the divine/spiritual ceremony (Otto, 2023). Even though they are not certain believe in spirit or gods exist, they still join and hopefully for the good outcome to their life.

In the media discourse on occult and spiritual-related items and services presented on television, the terms "faithful" and "effectiveness" are constructed. According to Jean Baudrillard's "Simulacra and Simulation" ideas, customers' purchasing decisions may not be driven by their needs, but rather by the power of discourse, which constructs some meanings that appear to need their existence. It stimulates customers' spiritual influence, and they may eventually become victims of advertising (Thumrongsanta, 2019).

As a result, the researcher is interested in interpreting the occult through a philosophical lens based on Bunchau's philosophy of paradigm of thought (Bunchua, 2003), which categorizes the philosophical concept of thought of the human intellectual era into five paradigms of thought ranging from primitive thoughts to postmodern thoughts to reflect people's views on the occult today.

Objective of the research

To hermeneutics the art of the occult according to philosophy of paradigm

Research Scope

This research is qualitative research using the collective main data from documents. Data is limited to the extent researchers have access to it until December 31, 2023.

Research Methodology

This research is the qualitative research employed a philosophical research method, Gadamer's philosophical hermeneutics by the reader, based on the theory of fusion of horizons, to find common concepts to increase understanding and explain meaning (Gadamer, 1976), as well as to classify the concept of the occult according to the philosophical paradigm.

Results

The term "occult" comes from the Latin word "occultus", translated from the French “occulte” into English, “occult”, meaning is made mysterious, secret, concealed, and understood as something that cannot be accessed, apprehended by thinking, mind, beyond understanding. This includes knowledge and practice of supernatural matters such as divination, magic, alchemy, astrology, witchcraft etc.

It's important to note that the term "occult" does not always have a bad or ominous meaning. While some historical and fictional depictions may link occult practices to evil or dark powers, many people who study the occult view it as a means of pursuing spirituality, self-improvement, and a greater comprehension of life's mysteries. As with any subject, there are broad variations in views on the nature and importance of the occult among people and cultural traditions, as well as in beliefs and behaviors related to it.

The status of the art of occult as above can be interpreted into 5 perspectives as follows:

1. Primitive paradigm perspectives, people believed in spirits, deities, and supernatural power that had an impact on their daily lives, they wanted to know how to appease the divine. Their conceptions of the natural, spiritual, and paranormal domains were frequently entwined with occult ideas. The practice of occultism is a means of requesting favours from On-High and interacting with them to achieve desired goals.

2. Ancient paradigm perspectives, individuals try to discover the law of nature that will make their lives happier. The term "occult," which refers to knowledge that is hidden or esoteric and is frequently connected to mystical or supernatural components, was

mixed with philosophical concepts concerning transcendent reality, such as Neoplatonism. Occultism is the mystical search for secret knowledge (Melvin-Koushki, 2020), or gnosis, to achieve spiritual redemption. We 'll achieve the intended outcomes if we apply these insights.

3. Medieval paradigm perspectives, society was characterized by the intricate interaction of mystical, intellectual, and theological concepts. Religion possessed considerable power over the arts, and different esoteric activities were frequently found on the periphery of officially recognized orthodoxy. On the other hand, many try to live virtuous religious lives in order to enter heaven in the hereafter. Occult art is something else than religion (Fallon, 2023) but people perceived that it is incorrect. It leads to a bad afterlife and is a mystery and vice.

4. Modern paradigm perspectives, people value the knowledge obtained from the scientific process and aspire to dominate nature in order to live happy lives. The scientific method will confirm and validate hidden esoteric information as authentic knowledge (Debus, 1982 and Ferguson, 2022). Fiction and entertainment are associated with the remnants of the esoteric occult. People with low levels of education continue to be duped by occultists, which is impeding global progress.

5. Postmodern paradigm perspectives, People reject other paradigms' frameworks. They are interested in subjects that have historically been disregarded or prohibited from studying because they wish to completely rethink the way that people think. The fascinating knowledge found in the occult arts such as the New Age Movement, which combined astrology, alternative healing modalities, Eastern spirituality, and other occult traditions. The New Age movement placed a strong emphasis on investigating esoteric knowledge, holistic well-being, and individual spiritual development. The contemporary pagan movements incorporate aspects of ceremonial magic, nature worship, seasonal cycle celebration, and a wide range of occult practices (Strube, 2023). Popular culture has included elements of the occult into works of art, music, film, and literature. Lastly, the development of the internet has made it easier for occult knowledge to spread, giving people access to a plethora of material about alternative spirituality, magic, and divination, as well as the ability to study esoteric teachings and connect with like-minded societies.

Conclusion and Discussion

The theory and process of interpretation known as hermeneutics can be used to justify the use of the art of occult. By applying Gadamer's hermeneutics to the occult, people can gain insight into the hidden meanings and the fusion of their personal worldview with the philosophical paradigm, as well as the relevance that the occult has

for life. There is a noticeable shift towards a more varied and pluralistic interpretation of occultism, with differing levels of acceptance in mainstream society.

But rather than being fueled by the contemporary paradigm, the hyper-reality of the occult is pushed by our postmodern worldview and its new generation. The Occult had a significant influence on popular culture (Hodge, 2023), including music, art, movies, literature, and even daily life. Within the new capitalist culture of consumption, there has arisen a desire for the purchase of products and services associated with occult trade. Ingenious and captivating storytelling techniques are used to combine products and services in advertising, which ultimately raises customer awareness and instills a demand for the items and services through symbolic consumption. This is consistent with Sanont et al. (2017)'s research, which showed that Thailand's business direction on belief-related goods and services is showing strong and greater growth. Businesses should use niche marketing techniques to sell occult-related goods and services in order to add value by utilizing Thai culture (Wongphut, Sungsuman, and Chaiwanichya, 2016), intellectual property (Prateepavanich, 2015), and identity.

Suggestions

The study's findings can be used to shape people's opinions about the occult; by using hermeneutics to study the occult, practitioners can engage in a deliberate and introspective process that reveals levels of meaning that deepen our understanding of esoteric practices and knowledge and assisting in various ways to further direct accurate comprehension of the art of the occult.

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The Literature Review for Implementing Competency Based Training and Assessment (CBTA) for Thai Pilots

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Abstract

Competency-based training and assessment (CBTA) is a framework developed for pilot training requirements, aligning seamlessly with the rigorous benchmarks the International Civil Aviation Organization (ICAO) sets. This complete exploration delves into the nuanced dimensions of the Pilot CBTA Framework. The discourse navigates through its foundational evaluation and extends to the labyrinth of capacity challenges predicted through implementation. Furthermore, it sheds light on strategic pointers tailored to the aviation industry, unveiling pathways for overcoming impediments. Ultimately, insights converge to articulate a comprehensive angle on the vitality of CBTA integration, presenting a roadmap for effective assimilation into the tricky fabric of pilot training methodologies. Despite the revolutionary strides presented through Competency-Based Training and Assessment (CBTA) within the realm of pilot training, the implementation for Thai pilots stands at a crossroads, beset by challenges entrenched in operational intricacies and cultural issues. Integrating CBTA into Thai pilots' education cloth requires nuanced information on the operational panorama and a keen awareness of the cultural dynamics influencing training methodologies. Navigating this intersection needs greater than remote fixes; it necessitates holistic, industry-extensive answers that cope with the multifaceted nature of these challenges. Crafting a successful direction ahead requires a strategic orchestration of resources, cultural sensitivities, and collaborative efforts to recalibrate the trajectory of pilot training in Thailand closer to a CBTA-centric paradigm.

Keywords: CBTA, Pilots, Training and Assessment, Competency, ICAO, Thailand

Introduction

Within the scope of the ICAO Annex 1 and the study's focus, it's commendable to emphasize the higher place of the DOC 9868, 3rd edition - Procedures for Air Navigation Services [PANS] – Training (ICAO, 2020). The DOC is complementary to the SARPs in Annex 1 and contains specified material and provisions for implementing the training for pilot licenses, ratings, and other provisions. It was primarily used by the study on the following aspects:

Understanding of the ICAO competency framework; Considerations of the CBTA approach to pilot's training and assessment; Development and implementation of competency-based activities; Considerations of the available Instructional Systems Development [ISD] methodology to design CBTA contents and materials; Considerations on the instructor's and developer's course competencies; and Possible suggestions of the use of CBTA methodology applied to other licenses.

Simultaneous with DOC 9868, the study used the DOC 9941 AN/478, 1st edition - Training Development Guide Competency-based Training Methodology (ICAO, 2011). This DOC presents the proposed methodology to develop instructional materials for competency-based courses according to ICAO's TRAINAIR PLUS program. The DOC also provides an ISD methodology and a further systematic approach to carry out TRAINAIR PLUS procedures to develop what is known as Standardized Training Packages [STPs] for competency-based courses according to the TRAINAIR PLUS Operations Manual [TPOM] (ICAO, 2013). The study also used the ICAO DOC 9841 AN/456, 2nd edition - Manual on the Approval of Flight Crew Training Organizations. According to the ICAO (2012), the DOC focuses on "the provision of information and guidance to licensing authorities and training organizations on the implementation of Annex 13 and other Annex Standards related to the approval of training organizations". Despite the theme of the study, the DOC carries relevant information about the approved training organization [ATO] approval process, competency-based course delivery, and authority approval issues.

In parallel with all the international organisms' literature reviews, the study also considered various scientific papers related to competency-based education in general and aviation training. The papers also stated the associated benefits of the methodology in subsequent subjects related to the pilot's performance enhancement – which commonly covers the application of human factors, threat, error management and other specific approaches and concepts used on the pilot's qualification. The initiative ratified the research's efforts as aligned with what is considered the forefront of the study's theme and both methodologies used. The results of the literature review and content analysis appeared in the following sections of this paper.

Competency-Based Training and Assessment Concepts

Components of a Competency-Based Training and Assessment Programme (ICAO, 2016)

1) A training specification describes the purpose of training, the task list and the requirements that shall be fulfilled when designing the training.
2) An adapted competency model is a group of competencies with their associated

description and performance criteria adapted from an organization's competency framework to develop competency-based training and assessment for a given role.

3) An assessment plan provides the process and tools for gathering valid and reliable evidence at different stages during training.
4) A training plan describes the training required to achieve the competencies. It includes but is not limited to a syllabus (including knowledge, skills, and attitudes (KSA), milestones, lesson plans and schedules). See 1.2.10 for a description of KSA.
5) Training and assessment materials and resources (i.e. human, material, and organizational resources) include everything needed to implement training and assessment plans.

Training Specification	+	Adapted competency model	+	Assessment plan Training plan	=	Training and assessment materials

Figure 1: illustrates the components needed to build a competency-based training and assessment program.

Competency Framework for Aeroplane Pilots

With advancements in aircraft technology and growing demands for more effective pilot evaluation methods, the International Commercial Aviation Organization (ICAO) has, since 2020, introduced a competency-based training and assessment approach. A competency combines knowledge, skills, and attitudes required to perform a task to the prescribed standard (ICAO 2018). The ICAO has defined 9 competencies as follows:

Competency Description

Competency	Description
1. Application of Procedures (PRO)	Identifies and applies appropriate procedures following published operating instructions and applicable regulations
2. Communication (COM)	Communicates through appropriate means in the operational environment, in both normal and non-normal situations

Competency	Description
3. Flight Path Management, Automation (FPA)	Controls the flight path through automation
4. Flight Path Management, Manual (FPM)	Controls the flight path through manual control
5. Leadership & Teamwork (LTW)	Influences others to contribute to a shared purpose. Collaborates to accomplish the goals of the team
6. Problem Solving & Decision Making (PSD)	Identifies precursors, mitigates problems, and makes decisions
7. Situation Awareness (SAW)	Perceives, comprehends and manages information and anticipates its effect on the operation
8. Workload Management (WLM)	Perceives, comprehends and manages information and anticipates its effect on the operation
9. Application of Knowledge (KNO).	Maintains available workload capacity by prioritising and distributing tasks using appropriate resources

Competency-based training aims to ensure pilots develop required competencies to carry out their assigned duties and responsibilities safely, efficiently, and effectively at the workplace Defalque 2017). In competency-based training, each task is associated with specific competencies, typically three. Rather than grading individual tasks, instructors assess each competency based on the pilot's overall performance during the training session. This method allows aviation employers to construct assessments under the ICAO competency framework, ensuring the content is relevant to the job's requirements. Furthermore, it optimizes the utilization of training tools and methodologies, leading to a more holistic and applicable assessment of pilot abilities.

Challenges of the CBTA Implementation for Thai Pilots

Training Challenges

Access to affordable training and the sufficiency of training ability are pivotal factors shaping the panorama of CBTA implementation for Thai pilots. Thailand's geographical, financial, and infrastructural realities contribute to the complexity of these demanding situations. Thailand's diverse topography and the distribution of pilot training facilities pose challenges for aspiring aviators living in remote or economically deprived regions. The fees associated with the journey, accommodation, and training costs are prohibitive. This lack of accessibility perpetuates socio-monetary disparities, hindering talented people from pursuing an aviation career. According to Ziakkas et al. (2022), by following the lean process, businesses

can eliminate excessive training costs and underutilize talent in order to increase the overall efficiency of the business process. To cope with this, stakeholders must strategies on decentralizing training centers, setting up scholarship programs, and leveraging generation for far-off mastering.

The demand for pilot training in Thailand exceeds the availability of training, creating a situation where current systems may struggle to accommodate an influx of aspiring pilots. This imbalance results in long waiting times and complications in the talent process, hindering the airline industry's growth. Meeting this challenge requires better planning, such as expanding and upgrading existing training facilities. According to Ziakkas et al. (2022), to increase a business's overall efficiency, using the lean process can reduce wasteful operations such as training, underutilized training, and training costs. Collaborative efforts with international training organizations can also reduce capacity. Furthermore, a forecasting approach to anticipate future demand and enhance training capacity is essential to ensure sustainable and robust growth of the airline sector in Thailand. Effectively addressing these capacity challenges is necessary to meet prospective pilots' growing demands and develop a resilient regional airline.

Skills, Knowledge, and Attitude

Navigating skills improvement within the Competency-Based Training and Assessment (CBTA) framework affords multifaceted demanding situations for Thai pilots. CBTA places a premium on practical, hands-on skills, necessitating access to modern simulation technologies and real-international situations. A skill, as described by ICAO, is the ability of a person to perform an activity or action (ICAO, 2019). Moreover, skills also involve motor abilities and cognitive competencies (Knez et al., 2022). Ensuring Thai pilots have access to modern training facilities will become vital for fostering the skill sets demanded using CBTA. The integration of state of affairs-primarily based mastering, where pilots confront diverse and challenging situations, needs a curriculum and training methodologies recalibration. Continuous tracking mechanisms for talent progression and focused comment loops are crucial components in the adventure to supply relatively professional and adaptable aviators in the CBTA framework.

Knowledge

The acquisition of theoretical competence, the cornerstone of CBTA, faces challenges in Thai aviation. As defined by Knez and colleagues, knowledge is an understanding of a concept(s) (Knez et al., 2022). The CBTA requires a curriculum that reflects the latest aviation technology and law developments. Ensuring that training materials are also relevant to today's aviation environment will be necessary. (ICAO, 2019). Continuous professional development programs, partnerships with industry experts, and integration of e-learning platforms are essential for knowledge acquisition.

Furthermore, language skills need to be addressed. If a multilingual approach to language is adopted, diversity can improve learning outcomes in the CBTA program. As Thai pilots navigate these challenges, they can emerge technically competent and gain a comprehensive understanding of the dynamic aviation environment.

Attitude and Proficiency

CBTA underscores the importance of cultivating the proper mindset and proficiency ranges in pilots, emphasizing trends including selection-making, teamwork, and flexibility. However, instilling these traits within the cultural context of Thai aviation poses challenges. Tailoring training programs to comprise cultural nuances will become pivotal for instilling the desired attitudes. Fostering a robust, safe way of life embedded in the training material is essential for cultivating the right attitude (Knez et al., 2022). Integrating mentorship packages that draw upon experts in the Thai aviation network can further contribute to developing well-rounded aviators. Regular assessments and reviews that move past technical proficiency end up integral additives in the CBTA framework, ensuring Thai pilots not only meet but exceed the requirements of mindset and skill demanded with the support of contemporary aviation.

Conclusions and Discussion

Guiding airline stakeholders in addressing the challenges of implementing a Competency-Based Training and Assessment Program (CBTA) for Thai pilots is needed. First, stakeholders should consider providing training areas of deployment that have increased and have increased progress in response to training challenges. A scholarship program could reduce budget constraints and encourage a more diverse pool of aspiring pilots. Also, using technology for distance learning, according to Giaccas et al. (2022), can increase efficiency and reduce costs in the training process. Adopting a lean process approach can help businesses eliminate excessive training costs and improve talent utilization, contributing to the system's overall efficiency.

In addressing the capacity challenge, industries should prioritize expanding and developing existing training. Working with international training organizations can complement capacity, providing innovation and knowledge. Ziakkas et al. (2022) proposed that adopting the lean process can streamline operations, reduce wasteful practices, and contribute to overall efficiency. Forecasting methods to anticipate future demand and active training capacity are essential to sustain the growth of the airline sector in Thailand. In addition to these recommendations, focusing on knowledge, skills, and attitude training (KSA) is essential. KSA training ensures a holistic approach to competency, including technical skills and knowledge and the attitudes and behaviors necessary for effective performance in flight (Knez

et al., 2022). Integrating KSA training into the CBTA program will help harmonize the comprehensive development of Thai pilots with the CBTA program's comprehensive nature and enhance the airline's overall efficiency.

A comprehensive method is necessary regarding abilities, expertise, and attitude-demanding situations. Investing in contemporary simulation technology and real-world eventualities is vital to foster the practical, hands-on capabilities demanded via CBTA. Continuous monitoring mechanisms for talent progression and targeted remarks loops can ensure the manufacturing of tremendously skilled and adaptable aviators (de Montalk, 2008). Continuous expert development applications, partnerships with enterprise professionals, and integration of e-learning platforms are encouraged for knowledge acquisition. A multilingual approach to language can decorate diversity and improve knowledge of the effects of the CBTA program.

Furthermore, cultivating the proper attitude and proficiency ranges calls for tailoring training applications to incorporate cultural nuances precise to the Thai aviation context. Fostering a solid safety culture in training materials and integrating mentorship packages with professionals from the Thai aviation network can contribute to developing well-rounded aviators. Regular assessments beyond technical ability are vital additives of the CBTA framework, ensuring that Thai pilots no longer meet but exceed the mindset and ability requirements demanded with the aid of contemporary aviation.

Implementing the Competency-Based Training and Assessment (CBTA) framework for Thai pilots is a transformative yet complicated endeavor. While CBTA gives a paradigm shift in raising the standards of pilot education, the demanding situations embedded in the Thai operational landscape and cultural context necessitate a comprehensive and adaptive technique. Addressing capability-demanding situations, each in training accessibility and application scalability, calls for strategically orchestrating assets and collaboration with training entities. The integration of generation can play a pivotal function in enhancing performance and decreasing barriers to access. Additionally, the guidelines emphasize the importance of Knowledge, Skills, and Attitude (KSA) training, ensuring a holistic development that aligns with the nuanced demands of CBTA.

Furthermore, the businesses' dedication to addressing skills, understanding, and mindset challenges is paramount. Investments in modern simulation technologies, continuous tracking of ability progression, and tailor-made education programs considering cultural nuances are vital for producing well-rounded and adaptable aviators. The multilingual method of language and the integration of mentorship applications contribute to a robust aviation ecosystem. As the aviation industry in Thailand navigates these challenges, a collaborative and forward-thinking technique, informed by using the concepts of CBTA, is essential for

fostering a resilient and proficient cadre of Thai pilots able to meet the dynamic needs of the aviation landscape.

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Risks in Managing Savings Groups for Production in Ratchaburi Province Amidst the Economic Recession

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Abstract

The purpose of this study is to study the risks in managing savings groups for production in Ratchaburi Province amidst the economic recession. with qualitative research methods Using a case study research method. It is a study from related documents. and a group of 18 people involved. Data were collected using in-depth interview techniques. and group discussion Data were analyzed using Content analysis approach and present information using descriptive methods. The research results found that Risks in managing savings groups for production in Ratchaburi Province amidst the economic recession can be summarized into 8 important elements: Internal environment Objective setting Risk identification Risk assessment Response to risks Activities for control Information and communication and monitoring results Consistent with the concept of risk management according to COSO's standard guidelines, production savings groups should adhere to these operating principles in developing management models going forward.

Keywords: Risk Management, COSO Standards, Production Savings Group

Introduction

Thailand first started to establish financial funds called "cooperatives" at the end of King Rama V in the Mueang District, Phitsanulok Province, named "Wat Chan Unlimited Assets Cooperative" registered on February 26, 1916. Later in the year 1968, the fundraising cooperative was transformed into an agricultural cooperative until the present (Nakhon Pathom Public Health Savings Cooperative Limited, 2021) and in during the year 1974, the Department of Community Development encouraged and supported rural people to join together to raise savings to establish community funds in the form of “Production Savings Group” for saving money Help yourself and each other by borrowing to invest in your career. The first established on March 8, 1974, at Khua Mung Subdistrict, Saraphi District,

Chiang Mai Province under the philosophy of "Using the principle of savings as a tool for human development" to develop the 5 virtues: honesty, sacrifice, responsibility, sympathy and trust among members (Phachi District Community Development Office, 2021)

Ratchaburi Province is a province in the central region. There are a total of 148 groups established, with 25,038 members and a total of accumulated truth money, 242,122,623.70 baht. However, from the report of the Ratchaburi Provincial Community Development Office (2023), it was found that during the epidemic situation of infectious diseases from 2020 onwards, it has greatly affected the management of the group. The overall economic system of the country is in crisis economic recession which the group cannot control good management. In other words, this situation is risky, and it is very necessary that the production savings group adopt a risk management process. It will help as collateral for various operations, whether there will be action to achieve the goals set or not and how due to risk management. It is the direction of predicting the future with reason, having principles and finding ways to reduce or prevent damage that may occur. To work in each step in advance or various unexpected events, the chance of encountering problems is less than other organizations that do not use risk management processes. Because of the preparation for various events fully in advance, while other organizations do not use the concept of risk management processes when a crisis occurs, those organizations will face problems and damages as a result. Therefore, the risk management process helps in management and will help achieve the various objectives set forth and prevent the possibility of loss (Thon Suntharayuth, 2011).

From the reasons mentioned above, the researcher is interested in studying the risks in managing savings groups for production in Ratchaburi Province amidst the economic recession. To present as policy recommendations and operations that will lead to prevention and resolution of operational problems of the savings group for production in the future.

Research Objective

The objective of the study is to explore the risk aspects in managing saving groups for production.

Literature review

The word "risk" means opportunities or events that are uncertain or that cause the current work plan to not achieve the stated objectives or goals. It will cause an impact or damage to the organization. Either in terms of money or the image and reputation of the organization (The Stock Exchange of Thailand, 2011). The Bank of Thailand has classified

risk into 5 main areas: strategy, market, operations, liquidity and credit aspect. The details (Bank of Thailand, 2003) are as follows.

Strategic risk means risk arising from the formulation of strategic plans, operational plans and implementation that is inappropriate or inconsistent with internal factors and the external environment which affects capital income or the existence of the business.

Market risk refers to the risk arising from movements in interest rates, foreign currency exchange rates and instrument prices in the money market and capital market that have a negative impact on the income and capital of financial institutions.

Operational risk means the risk of damage resulting from a lack of good corporate governance or lack of good governance in an organization, and lack of good control, which may be related to internal operating processes, staffs, work systems, external events which affect income and capital funds of financial institutions.

Liquidity risk refers to the risk that arises from the inability of financial institutions to pay debts and obligations when due. This is due to the inability to convert assets into cash or the inability to obtain sufficient funds or being able to find money to pay, but at a cost that is higher than acceptable levels, which may affect the financial institution's income and capital funds.

Credit risk refers to the chance or probability that a counterparty will not be able to meet its agreed upon obligations, including the possibility that the counterparty will have its credit risk rating downgraded. This may affect the income and capital of financial institutions.

Risk management therefore plays a role and is extremely important to organizations such as commercial banks, including savings cooperatives. This is so that those risks do not cause damage to the organization, whether in monetary or non-monetary terms (the image and reputation of the organization). The risk management refers to the process performed by the committee, all executives, and personnel in the organization to help determine strategies and operations. The risk management process is designed to be able to identify events that may occur and have an impact on the organization and to be able to manage risks to a level that is acceptable to the organization to gain reasonable confidence in achieving the objectives set by the organization. (Stock Exchange of Thailand, 2011)

The currently popular risk management concept is risk management according to COSO standards (The Committee of Sponsoring Organizations of the Tread way Commission) (Curkovic et al., 2013; Kasim and Hanafi, 2012; Gjerdrum and Peter, 2011; King Mongkut's Institute of Technology Ladkrabang, 2012; Jirarat Teeravarapruk and Ducharutai Wongpaiboonwatana, 2011) whose details are summarized as follows.

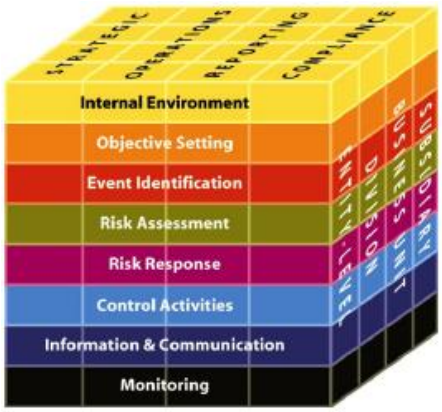

Figure 1: Risk management according to COSO standards
Source: The Committee of Sponsoring Organizations of the Tread way Commission, 2004

The environment within an organization is the basis of the organization's risk management because it determines the goal, structure strategy and business operations including assessment and risk management.

Objective setting: The organization must determine the objectives of its business operations before identifying risk events that may affect the achievement of those objectives.

Risk identification is the identification of risk events that may occur by considering factors both inside and outside the organization. Internal factors such as processes, technology, human resources, etc. and external factors such as economic conditions, political conditions, technological changes, and environmental changes, etc.

Risk assessment is an assessment of how the identified risk events will affect the achievement of the organization's stated objectives.

Risk response is the management of assessed risks to a level acceptable to the organization, such as, risk avoidance, acceptance of risk, risk reduction and risk distribution.

Control activities are steps to help ensure that specified risk responses are carried out correctly and completely in the relevant departments.

Information and communication: Information is essential for an organization, that is, it helps identify events, assess risk and manage risks that occur. The information related to the organization is both internal and external sources within the organization. This should be recorded and communicated appropriately, helping relevant people respond to risky events that occur quickly, efficiently and effectively.

Monitoring: the process that ensure that risk management is carried out quickly, efficiently and effectively, including revising risk management as appropriate.

From past research results, it was found that the study of using COSO's internal

control concept to help design internal connections was studied from a case study in the accounting and finance department, in sales and cost division. The result found that the new connection can reduce the work process and be able to use existing information to its full potential. This results in related information being more reliable and secure. (Jirarat Theeravarapruek and Ducharutai Wongpaiboonwat, 2011) In addition, Worsamon Santisiri, Akkaranan Kitsom and Siripak Siritho (2013), studied the assessment of personal loan risk management, a case study comparing commercial banks and savings cooperatives found that 1) results from in-depth interviews following the COSO standard guidelines in all 8 aspects found that the commercial bank group has risk management according to the COSO standard guidelines, no different from the savings cooperative group.

Research Methods

This research is qualitative research, a case study research method. It has its intellectual roots in the constructivism paradigm, collected data related documents (documents study) and studies from related groups of key informants (Yin, 2003; Yajai Phongboriboon, 2010; Ong-at Naiyapat, 2011). The details are as follows:

1. key informants

For obtaining 18 key informants, the researcher used a purposive selection method (Chai Pothisita, 2011), which are committee members of the production savings group who has knowledge and understanding about the management of the production savings group, amidst the economic recession crisis. All of them volunteered to provide information.

2. Research instruments

The research instruments include in-depth interviews, consist of interview questions that have been developed according to the conceptual framework and theories used in research to get the essence and a set of knowledge from the experiences of key informants.

3. Data collection

The processes of data collection are collection of both primary and secondary data, studying information from documents, participatory observation and in-depth interview by following steps: 1) setting research questions, 2) reviewing related documents, 3) building preliminary relationships with key informants before going to collect data, 4) go to the data collection, and 5) check the completeness of the information before leaving.

4. Data analysis

Data analysis employed content analysis processes which are divided into 5 steps

(Suphang Chanthawanich, 2011; Moser & Korstjens, 2017; Power & Hubbard, 1999) : 1) check the completeness of the data using the triangulation principle, 2) classify the data according to the research objectives, 3) analyze the data according to the theoretical framework, 4) interpret the data, and 5) summary compiled with descriptive analysis.

Results

The study of risks in managing savings groups for production, during an economic recession, in Ratchaburi Province, can be explained according to the analytical framework as follows.

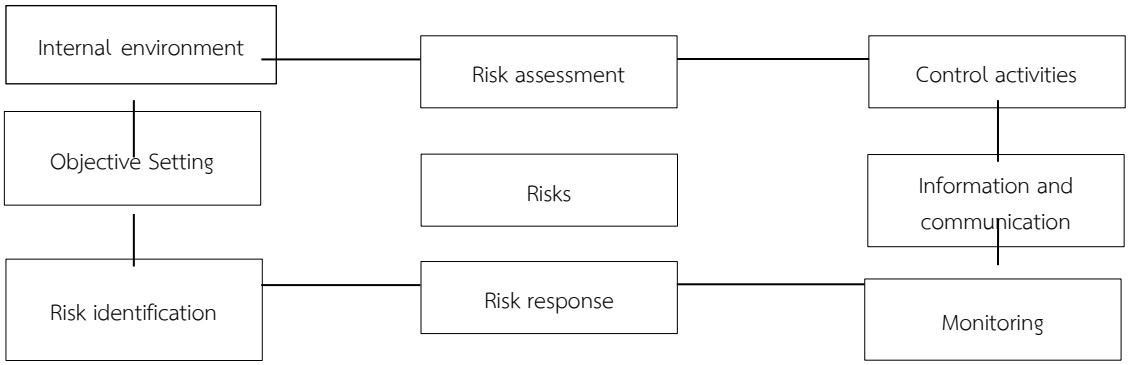

Figure 1: Showing risks in group management.

1. Internal environment

Internal environment is something that the savings group for production in Ratchaburi Province can be designed to drive the group's work to achieve its goals. It consists of group structure, authority, duties, and responsibilities. This is from a study of representatives of savings groups in urban and rural areas which have 3 levels of operating characteristics: good, medium, and improved. All 3 levels have a clear operating structure; however, it was found that the responsibility for group activities usually rests with the group president. The operations in the savings group are volunteer activities. Some groups do not provide compensation to the committee, some groups have small returns when compared to working according to the general labor market system.

2. Objective setting

Purposes of savings for production in Ratchaburi Province, having in any groups. It is often found that there is a clearly defined purpose, main goal and could measure results. Normally, the saving for production savings groups is to support promote the development of the quality of human life in the communities by using money for mediation to organize learning. In addition, it can be said that such groups help each other among the people in

the community and lead to the provision of community welfare according to the needs and appropriateness according to the context of the area.

3. Risk identification

Overall, for identifying risks in the operations of savings groups for production in Ratchaburi Province. Most of the groups have not yet organized a clear action plan. But there are often adjustments to the operating model according to the immediate situation that arises, such as during the epidemic situation of the COVID-19 disease. The group has adjusted the credit management method by means of a repayment moratorium. To help provide relief to members who were affected by the incident and there is no lending to prevent financial risks, etc.

4. Risk assessment

The production savings group in Ratchaburi Province regularly assesses risks through monthly meetings of the committee, with the agenda being to follow up on past performance of the group. To report progress of operations and adjust the operational plan to be appropriate for the situation that arises and be able to manage and solve operational problems that cause risks in a timely manner.

5. Risk response

Savings groups for production in Ratchaburi Province have no clear assessment of risk factors that may occur in the information system. But it is carried out in practice through meetings and acting on the issues that arise, using a compromise method of working with the communities.

6. Control activities

The production savings group in Ratchaburi Province has clearly established an operating policy, especially the member recruitment policy, lending and various types of welfare arrangements to be used as a standard for the group's operations. The groups will issue regulations and consider them through the annual general meeting forum to create awareness participation in creating rules among each other within the groups.

7. Information and communication

Savings group for production in Ratchaburi province set a form of communication through the monthly meeting forum and communication via online systems by setting up a line group for the operations of the groups. They prepare a monthly performance report whether it is financial performance, members, committees, and other matters according to the community situation for the group executive committees to use as information for decision making. creating operational plans that are appropriate and up to date in accordance with the changing situation.

8. Monitoring

Overall, the production savings group in Ratchaburi Province has evaluated the results of monitoring risk management by requiring the committee to sign off on the accuracy of the financial reports and will be responsible if it is found that there was an error in this operation. The group also meets monthly to consider operational risks.

Conclusion and discussion

Research on risks in managing savings groups for production in Ratchaburi province amidst the economic recession. The researcher summarized the results and discussed each issue according to the research objectives as follows.

Risks in managing savings groups for production in Ratchaburi Province amidst the economic recession on 8 important elements include the internal environment, objective setting, risk identification, risk assessment, response to risks, activities for control, Information and communication and monitoring; conforming the concept of risk management according to the standard guidelines of COSO (The Committee of Sponsoring Organizations of the Tread way Commission) (Curkovic et al., 2013; Kasim and Hanafi, 2012; Gjerdrum and Peter, 2011; King Mongkut's Institute of Technology Ladkrabang, 2012; Jirarat and Ducharutai, 2011) like to the research of Klai Rung Krasae Sin and Rung Arun Krasae Sin (2019), studying the evaluation of the effectiveness of COSO-ERM risk management, a case study of the credit underwriting process of Thai Commercial Bank's Small Business Office, found that the bank has a good level of risk management in the loan approval process which consistent with risk management principles according to all 8 COSO-ERM elements, demonstrate the ability to consider credit efficiently. Demonstrates the ability to consider credit efficiently. Jirarat Theerawarapruk and Ducharutai Wongpaiboonwattana (2011) studied the use of COSO's internal control concept to help design internal connections by studying from a case study of one in the accounting and finance department, in division of sales and cost sections, the results of the new connection reducing the work process and be able to use existing information to its full potential. This results in related information being more reliable and secure. In addition, Henri Fayol also laid down the principles nearly 80 years ago, and some of these principles are still appropriate, stating that management involves fundamentals (Fayol, Henri, 1923). These include people, money, materials, equipment, and work procedures.

The well-known author, Taylor, is considered the father of scientific management, which gets to know and experience problems in work and have knowledge and understanding of employees' attitudes as well as having the opportunity to develop the quality of management, like guidelines of COSO, to be more efficient. It will be able to increase production efficiency (Taylor, Frederick W. 2002).

Suggestions

According to the result of this research, the researcher has recommendations classified into 2 main issues as detailed below.

1. Suggestions for applying research results

How should production savings groups pay attention to risk assessment in group management? To be able to adapt to every situation by strictly adhering to the principles of evaluating the effectiveness of risk management using the COSO-ERM model. The group should prepare a strategic plan for developing a risk management model and use the results of risk research in strategy, credit, operations, benefit returns, financial liquidity, legal, rules and regulations, reputation, information technology, and developing a risk prevention action plan for the production savings group as well as preparing an operation manual.

2. Suggestions for further research

2.1 There should be a comparative study of risk management strategies of savings groups productions between in urban and rural areas

2.2 There should be a study of the relationship between management factors and the risk management efficiency of production savings groups.

2.3 There should be a study on developing a risk management model for savings groups for productions according to the results ladder concept.

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Marketing Mix and External Factors in influencing Digital Marketing Program Enrollment in a Higher Education: A Case Study of Digital Marketing Program Students at the Faculty of Business Administration, Bangkok University

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Abstract

This research is a study of factors affecting the decision of digital marketing students from the faculty of business administration, at Bangkok University, to choose a digital marketing program at the higher education level. This study is quantitative research using survey research with a sample size of 233 people. The data was analyzed using descriptive statistics and inferential statistics to answer the research questions and hypotheses. The findings show that the marketing mix and external influence factors are the two primary categories that affect decision-making in selecting the digital marketing program in a higher education institution. The external factors are the influence of technology, family and friends, and job opportunities. Emphasizing the significance of these two components in program development is imperative for the university to attain the top position in the competitive higher education market.

Keywords: Marketing Mix, Higher Education, Digital Marketing Program

Introduction

One of the essential tools supporting the development of human resources is education. As a master's degree gives graduates significant influence over their futures and allows them to contribute to society. Education institution necessitates continuous enhancement of both quality and standards to effectively meet student's demands and keep up with the changing needs in the contemporary era. Considering the size of the younger prospects targeted for higher education and the number of universities in Thailand, further studies on factors that influence students in choosing a degree are crucial. One of the most popular programs in higher education is a digital marketing degree, reflecting the increasing importance of digital strategies in business operations. Digital marketing has become a fundamental aspect of any comprehensive marketing strategy.

The quick change in the digital environment and the resulting need for experts who understand how to use digital marketing are in line with this educational trend. Since digital marketing programs growing in popularity, knowing the factors that affect the decision-making process of the prospects in enrolling on the digital marketing program for a higher level will be advantageous for the university in developing the program. Therefore, this research examines the marketing mix and external factors that affect the prospect in choosing a digital marketing program.

Objectives

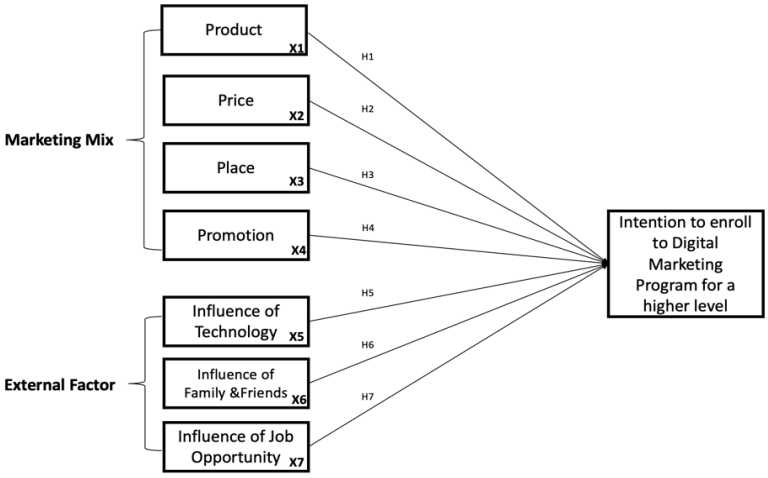
1. To study the effects of marketing mix factors on digital marketing enrollment for a higher level.
2. To study the effects of external factors on digital marketing enrollment for a higher level.

Concept theory framework

Research Questions

1. To study the effects of marketing mix factors on digital marketing enrollment for a higher level.
2. To study the effects of external factors on digital marketing enrollment for a higher level.

Conceptual Framework



Hypothesis

H1: Product Factors Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

H2: Price Factors Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

H3: Place Factors Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

H4: Promotion Factors Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

H5: Influence of Technology Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

H6: Influence of Family & Friends Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

H7: Influence of Job Opportunity Have a Positive Impact on Digital Marketing Program Enrollment for a higher level

Literature review

Marketing Mix: Product

The academic services and programs offered by universities are referred to as the "product component" in higher education. Research by Kotler and Fox (1995) emphasizes how important it is to align program offers to student needs and market demand. Academic institutions that offer innovative and pertinent curricula generally draw a higher volume of applications. In preparing an educational program, both course designs and other student services should collaboratively develop to enhance the institute's attractiveness and reputation (Nadelson et al., 2013). A study by Berliant (2020) also reveals that the program's quality, relevance, and innovation have a significant impact on students' evaluations of academic programs.

Marketing Mix: Price

The price component in higher education can be referred to as the cost of education. Findings from research by Hemsley and Oplatka (2006) reveal how much students' decisions are influenced by their perception of value for money, which includes tuition costs and the availability of financial aid. Postgraduate students are reported to be partially sensitive to tuition costs, payment flexibility, and alternate payment options. (Dao and Thorpe, 2015). To effectively attract prospects, competitive advantage can be gained by educational institutions that can clearly convey the value of their programs in relation to their costs (Hemsley and Oplatka, 2006).

Marketing Mix: Place

One of the key components of the higher education marketing mix is an institution's location. According to Becker and Watts (2001), students' decisions are influenced by universities' physical locations as well as their accessibility. Different populations can be attracted to urban, suburban, or rural environments. Educational Institutions should provide access for prospects for those from regional, remote, and rural backgrounds to attract prospective students (Brownie et al., 2023).

Marketing Mix: Promotion

The promotional activities, including marketing and communication strategies, are essential for attracting prospective students. To achieve communication objectives and goals, educational institutions should use different promotional tools (Kotler and Fox, 1995). As indicated by Yuan and Powell's (2013) research, carrying out a strong online presence, engaging in social media, and using targeted advertising is crucial in interfacing with young prospects. The promotion component utilizing digital marketing can result in interested prospects sharing and spreading promotional content online (Camilleri, 2019). A viral dispersion of the program's promotional message may trigger a positive response among prospects. Higher education institutions may enhance their attractiveness through promotional activities as such word-of-mouth publicity on social networks (Dumpit and Fernandez, 2017).

External Factor: Influence of technology

In the contemporary era, digital marketing plays a vital role. A variety of vocations view proficiency with digital tools and navigation as a valued skill set. Undoubtedly, young prospects are well-familiar with the usage of various technological tools. One important factor that prospective students consider is the need to enhance digital literacy and skills (Camilleri and Camilleri, 2017). Smith and Caruso's (2010) research highlight the fact that students pursuing higher education are looking for schools that provide courses that develop digital competencies.

External Factor: Influence of family & friends

According to research by Rowan et al. (2008), family is a major influence on people's decisions to pursue higher education. Parents are frequently seen as major influencers since they provide support, guidance, and expectations that affect the colleges and subjects that students choose to pursue. The influence of friends is also significant. The significance of social networks in the collegiate decision-making process is emphasized in Tinto's (1975) social integration model. Friends can influence people's decisions and perceptions by sharing experiences, offering support, and imparting information. Research suggests that the influence of family and friends has a significant impact on academic results and choice of study (Jeynes, 2003).

External Factor: Influence of job opportunity

Choosing the right career path is becoming more and more important for young students today. Students consider many things when choosing a career and college major. A study conducted by Carnevale et al. (2013) highlights how industry demands, and labor market trends affect higher education choices. People tend to select courses of study and universities that are aligned with industry trends. Students evaluate the potential return on investment of their education, considering factors such as future careers, earning potential, and alumni success (Malgwi, Howe, and Burnaby, 2010).

Materials and Methods

Research Design

This research is quantitative research using survey research. The data was collected from a sample of the population using an online questionnaire as a data collection tool. The data was analyzed using descriptive statistics and inferential statistics to answer the research questions and hypotheses by applying IBM SPSS v.28. Stepwise multiple regression analysis technique was employed in this paper.

Population and Sample Selection

The population of this study is all students majoring in Digital Marketing at the Faculty of Business Administration, Bangkok University. The sample size is 233 people.

The sample was selected using a convenient sampling method. The researcher believed that the list of names was a representative sample because they were all students majoring in Digital Marketing at the Faculty of Business Administration.

Instrument Design

The researcher used an online questionnaire as a data collection tool. The questionnaire was a closed-ended questionnaire with predetermined answers for the respondents to choose from. The questionnaire was developed based on a literature review and related research. The reliability and validity of the measurements were assessed before analyzing the regression.

The questionnaire was divided into four sections: **Section 1:** General information about the respondents. **Section 2:** Importance of the marketing mix, including product, price, place, and promotion. **Section 3:** External influencing factors, including influence of technology, influence of family and friends, and influence of job opportunity. **Section 4:** Decision-making to choose the Digital Marketing Program at Bangkok University

Results

General Information

Year of Study: It can be concluded that this data is for survey respondents who are in years 1-4, with the most respondents in year 1, followed by year 4, and year 3 and 2 respectively. **Gender:** It can be concluded that this data is for survey respondents who are predominantly female, with only 25% male respondents. Male respondents are 3 times less than female respondents. **Age:** It can be concluded that this data is for survey respondents who are mostly in school or just starting their careers, with only 6.0% of survey respondents being 23-25 years old. Most survey respondents are 18-22 years old, accounting for 93.1%. **Average Family Income/ Month:** It can be concluded that this data is for survey respondents who mostly have a monthly average income below 50,000 Thai baht, with only 28% of survey respondents having a monthly average income of more than 50,000 Thai baht. The data on the survey respondents is diverse. **Educational**

Qualification: It can be concluded that most survey respondents had completed high school before entering university, with only 9.2% of survey respondents having completed a GED equivalence test, 5.2% of survey respondents having completed a vocational certificate, and 1.7% of survey respondents having completed a high vocational certificate. **Grades:** It can be concluded that most survey respondents had a grade point average of 3.01, with only 1.3% of survey respondents having a grade point average lower than 2.00, 9.1% of survey respondents having a grade point average between 2.00 and 2.50, and 22.8% of survey respondents having a grade point average between 2.51 and 3.00. Most survey respondents had a grade point average of 3.01 or higher, accounting for 67.4%.

Table1: Present the results of stepwise multiple regression analysis when adding factors one by one)

Model		R	R^2	Adjusted R^2	Std. Error of the Estimate	F	Sig.
1	X_7	.561[a]	.315	.312	.54417	105.852	<.001[b]
2	X_7, X_4	.590[b]	.348	.342	.53233	60.982	<.001[c]

a. Predictors: (Constant), X_7

b. Predictors: (Constant), X_7, X_4

From Table 1, the results of the stepwise multiple regression analysis to find the predictors that have an impact on the enrollment in digital marketing for a higher level, from 7 independent variables, there are 2 independent variables that have been tested to be significantly different at the statistical level of 0.01, namely the Influence of Job Opportunity (X7) factor and the Promotion factor (X4). This can be explained as follows: The Influence of Job Opportunity (X7) factor can be predicted to be the factor that has the greatest impact on the enrollment in Digital Marketing for a higher level, with statistical significance at the 0.01 level. The regression coefficient or predictive power is 0.312, with an impact on the expected innovative performance of 31.20% when adding variables one at a time. Therefore, hypothesis 7 (H7) that the Influence of Job Opportunity factor has a positive impact on the enrollment in Digital Marketing for a higher level is accepted. When the Promotion factor (X4) is added to the equation, the regression coefficient or predictive power increases to 0.342. When the difference between this value and the original regression coefficient or predictive power is checked, it is found that it is still statistically significant at the 0.01 level. This means that the Influence of Job Opportunity and Promotion factors have an increased impact on the enrollment in Digital Marketing for a higher level of 34.20%. Therefore, the hypothesis 4 Hh4) that the Promotion factor has a positive impact on the enrollment in Digital Marketing for a higher level is accepted.

Table2: Present the results of stepwise multiple regression analysis

			B	S.D.	Beta	t	P
1	Influence of Job Opportunity (X_7)		0.459	0.059	0.468	7.777	<.001
2	Promotion Factors (X_4)		0.184	0.055	0.203	3.369	<.001
R = 0.590		R^2 = 0.348			Adjusted R^2 = 0.342		
SEE = 0.532		F = 60.982*			Constant = 1.315		

From Table 2, it was found that when stepwise multiple regression analysis was performed, the Influence of Job Opportunity (X7) and Promotion Factor (X4) could jointly predict the enrollment in Digital Marketing for a higher level with statistical significance at the 0.05 level. They could explain 34.8% of the variation in the enrollment in Digital Marketing for a higher level (R2 = 0.348), with a multiple correlation coefficient (R) of 0.590 and a standard error of prediction (SEE) of 0.532. These can be explained in detail as follows: The Influence of Job Opportunity (X7) has a regression coefficient of 0.459, meaning that if Influence of Job Opportunity increases by 1 unit while other factors remain constant, it will lead to a decision to study Digital Marketing by 0.459 units. The Promotion Factor (X4) has a regression coefficient of 0.184, meaning that if Promotion Factor increases by 1 unit while other factors remain constant, it will lead to a decision to study Digital Marketing by 0.184 units. Therefore, from the data analysis results, the two variables that can jointly predict the trend of enrollment in Digital Marketing for a higher level can be used to construct a predictive equation in raw score as follows:

Y= 1.315 + 0.459 (Influence of Job Opportunity) + 0.184 (Promotion Factor)

Z_Y= 0.468(Influence of Job Opportunity) + 0.203(Promotion Factor)

In this equation, the Influence of Job Opportunity is the factor with the best predictive power for enrollment in Digital Marketing for a higher level, followed by the Promotion Factor.

Conclusions and Discussion

This study investigates the factors that affect the decision to enroll in a digital marketing program for a higher level. A survey of 233 undergraduate students in Thailand was conducted. The results show that most respondents are female, aged 18-22, and come from families with monthly incomes of more than 50,000 baht. They have a high school diploma and a GPA of more than 3.51. Most respondents have no previous business experience. The results of the survey show that the four marketing mix factors (product, price, place, and promotion) and the two external factors (influence of technology and influence of job opportunity) all have a high level of confidence in the decision to apply in a digital marketing program for a higher level (high-level confidence from respondents). However, the stepwise multiple regression analysis shows that the influence of job opportunity and promotion are the two most important factors that predict enrollment in digital marketing for a higher level. These findings suggest that educational institutions that offer digital marketing programs should focus on meeting the needs

of the job market and creating attractive promotions to attract students.

Impacts of this research

1. Identify key enrollment drivers: By understanding students' priorities, such as job opportunities and promotions, institutions can tailor their digital marketing programs for a higher level to better meet student needs and expectations.
2. Inform program development and Craft effective promotional strategies: Understanding preferred marketing channels and messaging styles can help institutions reach their target audience more effectively and attract a wider range of diverse students.

Future Research Suggestions

1. Explore broader demographics: While this study focused on undergraduate students from Bangkok University, future research could explore a wider range of demographics, such as working professionals considering career transitions or individual learners.
2. Investigate specific job opportunities: Future research could explore specific types of digital marketing jobs students are interested in for a higher level.

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Sports Mega-Events and Culture: The Vietnamese Cultural Representations in the 31st Sea Games Opening Ceremony

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Abstract

Sports mega-events or international sports events with large-scale audiences have offered fruitful opportunities for host nations to promote their national and cultural identities. The purpose of this research is to study the semiotic construction and representation of Vietnamese cultural identity through the 31st SEA Games Opening Ceremony (2021) and its link with the perspectives of the text producers towards those representations and relevant socio-cultural context. This research adopted a textual analysis of the 31st SEA Games Opening Ceremony. To enhance the credibility of the textual analysis, this study also utilized online videos and articles interviewing the text producers as secondary data sources. The socio-cultural context of Vietnam was also drawn to explain such representations. The results of this study revealed that the Vietnamese cultural representations in the ceremony not only highlighted the cultural identity of the nation but also constructed an inclusive vision of Vietnam's and other Southeast Asian countries' identity. In this way, the text producers deliberately selected and designed the cultural representations to relate Vietnam's culture to Southeast Asia sports games or Southeast Asian cultures. Based on the aim of the sports mega-event, the cultural meanings emphasized Vietnamese cultural identity, promoted sports spirit, and encouraged a solid connection among participants. Furthermore, the concept of national and regional symbols was very significant in constructing such international and intercultural content.

Keywords: Vietnamese Cultural Representations, Vietnamese Culture, Semiotics, SEA Games Opening Ceremony, Sports Events

Introduction

Sports mega-events such as the Football World Cup and the Olympic Games are highly mediatized to reach global audiences. They have become major tools for countries to display their singularity and to compete on the global stage. Hosting international sports can provide global recognition, which can be beneficial for strengthening the global profile

and increasing economic investment. In a study of the correlation between sport, media and culture, Boyle and Haynes (1999) mentioned media and modern sports as tools of power to transform our understanding of cultural and social aspects.

By analyzing Vietnamese cultural representations shown in the 31st SEA Games Opening Ceremony, which Vietnam hosted in 2022, this study aims to examine at how Vietnam embraced their cultural identity to global audiences through an international sports game. Vietnam, as an Asian country, has entered global integration for more than 15 years (Nguyen & Do, 2020) by taking steps towards trade liberalization, economy, regional cooperation, cultural exchange events, and so forth. To be more specific about this study topic, Vietnam hosting the 31st SEA Games has been praised by news media in terms of high spirits in sports, honesty, and hospitality (Aziz, 2022). Participating in international sports games has given Vietnam a chance to enhance cultural identity. With the support of media distribution and promotion, Vietnam gained the chance to strengthen its cultural image in a global setting. In the research "Vietnamese Cultural Identity in the Process of International Integration" Nguyen and Vu (2020) stated that Vietnam, has been experienced thousand years of building and defending country, has its own personality. International integration with the rapid spread of social networks nowadays provides Vietnam with numerous conditions to enrich its identity and continue its own cultural quintessence.

Hosting the 31st SEA Games Opening Ceremony gave Vietnam a valuable opportunity to present its cultural identity to international audiences. The ceremony was broadcast live on Vietnamese national television stations, including VTV1, VTV5, VTV6 and other countries' telecast channels. The show was also officially streamed on *VTV The Thao* (a Vietnamese national sports YouTube channel with more than 1.6 million views) and other national and international YouTube channels. The total number of online audiences on YouTube reached nearly 4 million views.

It is proved directly or indirectly that sport events can be an influential vehicle for transnational corporations (Jackson, Andrews, & Scherer, 2005) and be a tool for countries showing political, economic power (Ludvigsen, Rookwood, & Parnell, 2022). Even though sports events and their ability to present a nation's culture have attracted scholarly attention for two decades, these studies focused on sports events in Western countries such as FIFA World Cup, The UEFA European Football Championship, London Olympics Games, etc. The studies about Asia, especially Southeast Asia countries' sport competitions, are still limited. In terms of culture, Asia is considered the cradle of humanity's unique civilizations (Vietnam Tourism, 2013). Hence, it is necessary to research a country in Southeast Asia to fill the gap. As a developing country in Southeast Asia and

the host of the recent SEA Games, Vietnam has a good opportunity to promote its cultural identity to both local and international audiences. It is interesting to study how Vietnam's culture has been portrayed in this event.

Objectives

The research project was conducted with two main research objectives:

1. To analyze how the semiotic elements of the 31st SEA Games Opening Ceremony reflect Vietnamese cultural representation.
2. To examine the perspectives of the text producers towards Vietnamese cultural representations through the 31st SEA Games Opening Ceremony.

Literature, Theories, and Conceptual Framework

Sports Mega-events and its Function in a Nation's Cultural Representations

Researchers claimed that mega-sport events provide host nations with a universally legitimate way to present and promote their national identities and cultures on a global scale as pointed out by Brownell (1995); Maguire (1999); Roche (2000) (as cited in Dolles & Soderman, 2008). Nations and states represented through international sporting competitions conjure a shared sense of awe-feeling among the spectators (Dolles & Soderman, 2008).

The Social Construction of Reality

Berger and Luckmann (1996 as cited in Lekngam, 2019, p.114) contended that "reality is socially constructed". Our backgrounds and beliefs influence how we perceive the world. Leeds-Hurwitz (2009, as cited in Lekngam, 2019, p.115) explained that people generate the meaning of a social world through a variety of communication modes, including words and/or actions. From the perspectives of sociology and communication, audiences base their conventional experience on producing meanings of the "real" world. In this study, to understand Vietnamese representation as a social construct, the researcher investigated the meanings of Vietnamese cultural elements constructed and represented in the SEA Games Opening Ceremony and how the show was mediatized as part of the semiotics of Vietnamese cultural representations and construction.

Semiotics Theory and National Symbols

Semiotics is the study of signs and symbols which we use to communicate and how they are used, according to Merriam-Webster dictionary. Ferdinand de Saussure's lectures, edited by Meisel and Saussy (2011), explained that a *sign* consists of a *signifier* and a *signified*. The *signifier* is the *sign's* image as we can perceive it. The *signified* is the mental concept that it refers to. The mental concept is broadly common to all members of the same culture who share the same language.

Jandt (2007) confirmed that *symbols* can be used to communicate across language barriers. Regarding the 31st SEA Games Opening Ceremony, the study of Vietnamese cultural presentation combines Cultural Semiotics and Theater Semiotics. Wiltgren (2014) stated that visual symbols such as flags and maps reproduce nationalism and serve as identity markers. *National symbols* are the *signifiers* of what individuals interpret that they have in common (the *signifieds*). Through *national symbols*, citizens can convey their sense of pride and love to national representation (Wiltgren, 2014).

Vietnamese Cultural Elements Model

Due to its geographical position, Vietnam has experienced a long cultural, historical and geopolitical process of development. This process has allowed Vietnam to expose themselves to different cultures from China, India, France and other Western countries. Tran (2006, p.278), a Vietnamese culture researcher, stated that Vietnam's cultural history has seen cultures pass by, but its own cultural identity still exists. On the other hand, Vietnamese culture is an adaptation to natural changes and defense of national territory, clearly shown through Wet Rice agriculture and the village structure with the presence of 54 ethnic groups. Vietnam's cultural is both diverse and unified because of the above factors. Therefore, the division of Vietnamese cultural elements by Tran (2006) is based on diverse geopolitical, historical, and natural factors to create 15 elements. Tran (2006, p. 73) stressed that "culture as a system constituted from various elements". Each element conveys the common but also unique characteristics of its own. The Vietnamese cultural model proposed by Tran (2006, p.73) consists of 15 elements: *Belief and Religion, Language, Performance Arts, Architecture, Sign and Symbol, Mass media, Literature, Cinematic and Photographic, Lifestyle, Fine Arts, Customs, Music, Festivals, Vietnamese theatre* (folk musical, classical drama, role-play, etc.), and *Handicrafts*. Based on this model, the representation of Vietnamese culture in the 31st SEA Games Opening Ceremony will be categorized.

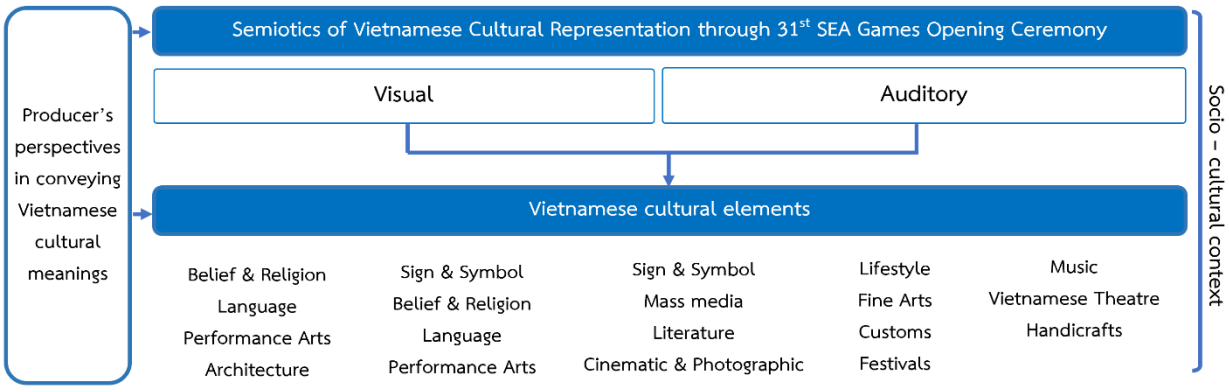

Figure 1: Conceptual Framework of the study

Research Methodology

This qualitative research adopted a textual analysis of the 31st SEA Games Opening Ceremony, using the recorded video of the ceremony published on VTV The Thao as a primary data sample. Textual analysis was adopted in this study to examine the content and its meanings and cultural elements embedded in the text. It is a way of approaching media texts to understand their meanings (Lekngam, 2019). This is to find out how Vietnamese cultural representations are reflected by semiotic elements in the show.

To enhance the credibility of textual analysis, this study uses multiple sources of data or methods to validate the findings. The researcher used YouTube videos and articles interviewing the text producers as secondary data sources. Purposive sampling was conducted to select samples for secondary data collection. The text producers interviewed included the art director Tran Ly Ly, the show producer/art director Hoang Cong Cuong, the composer of the SEA Games song, the hosts (MC) and the artist who invented the SEA Games mascot. The research procedure involves 3 phases of dealing with (1) primary data (the media texts of the show), (2) secondary data (the interview texts), and (3) contextualization of data to find a link between the data and relevant socio-cultural context. In the first and second phases, thematic analysis was conducted to analyze semiotic elements and cultural meanings, Vietnamese cultural categories, and text producers' perspectives in constructing and representing such cultural meanings.

Results

The Semiotic elements of Vietnamese cultural representations in the 31st SEA Games Opening Ceremony

The textual analysis of the media texts reveals six semiotics groups and four core concepts of Vietnamese cultural representations in the ceremony.

Semiotic Groups of Vietnamese cultural representations

The research results reveal three modes of communication as a tool that carries Vietnamese cultural meanings. These include the *Visual mode* (9 elements): images and graphics, gestures, movement, make-up, hairstyle, costume, accessory, lighting, and props; the *Auditory mode* (2 elements): music and sound effects; and the *Linguistic mode* (3 elements): written words, lyrics, and spoken words. Through the three modes of communication, there are 6 semiotic themes of Vietnamese representations in the 31st SEA Games Opening Ceremony. These include visual *nature and history settings, performers, national symbols, national elite members, folk arts, and the Vietnamese language*.

1) *The Visual Settings* appear as the most obvious and frequent semiotic element of the show. The settings depict Vietnam's natural geographic environment and its cultural and historical length. Designed images and AR graphics projected by 3D Mapping technology are used throughout the show to build the visual settings. Along with that, settings are supported by lighting effects and props.

Figure 2: A setting of Vietnamese history presented by the Golden Dragon as a historical symbol in gold and brown color.

Figure 3: Following the historical setting (as shown in Figure 1) is a "modernized" setting which is colored blue and pink. It displays logos of all SEA Games through years and introduce the Games taking place (the 31st SEA Games 2021 in Vietnam).

2) As an important part of visual settings, the *Performers* are separated into another group as it includes a wide range of visual semiotic elements (gestures, movements, makeup, hairstyle, costumes, and accessories). Vietnamese performers representing a modernized appearance of traditionality indicate that Vietnam encounters external cultural variants but still preserves its own cultural identities.

Figure 4: Traditional Conical Hats and national costume *Ao Dai* were newly designed, depicting a younger and hybrid version of Vietnam's culture.

3) *National symbols* in the show function as national identities of Vietnam. Vietnam's national symbols are shown by many semiotic elements (images, graphics, the performers' movements and props, the performers' costumes, the mascot, etc.). The national symbols, with variety and continuous repetition, declare the pride of Vietnam in its culture: We have our own uniqueness.

Figure 5: A representation of Vietnam's national flag in the show

4) *National elite members* include national leaders, national sports teams and local spectators. The inclusion of gestures, costumes, and accessories to become the "red combination" (the color of the Vietnamese national flag) conveys cultural meanings for Vietnam. In this ceremony, the elite members present Vietnamese people's pride of their solidarity.

Figure 6-7-8-9: Representations of the sport team, the spectators and national leaders who wavered national flags or wear red items.

5) *Folk arts* are another representation of Vietnam's identities in the show's cultural hybridization. The arts are illustrated by images, graphics, and music. An interesting finding is that Vietnam attempts to relate to regional similarities to call for union. This finding contributes to an intercultural communication tool applied to international events.

Figure 10: Folk *Dong Ho* paintings present cultures of 11 Southeast Asia nations.

Figure 11: The artist playing Bamboo Flute as a part of Bamboo circus performance.

6) Finally, the *Vietnamese language* presented by written texts, song lyrics and spoken words are combined to portray a resilient and friendly Vietnam. Vietnamese texts take over in the show duration (longer than English), especially in speeches and art forms of languages such as poems and songs.

Core concepts of Vietnamese cultural representations

The show conveys the key message *"For a stronger Southeast Asia"*, which involves political aims. This key message is established by four key cultural concepts. Since it is a sports mega-event, all cultural concepts aim to not only Vietnam but all Southeast Asia cultures as an inclusive identity. These include *The Connection with Water, A Resilient Vietnam, Hospitality for Peace, and A stronger Southeast Asia.*

1) The first concept is the exclusive trait in Vietnam's culture: *the connection with water in every aspect of life*. Due to the common geographic environment in the region, Water plays a crucial role in Southeast Asia cultures as well. This sends a political message: Similar cultures provide us with conditions to cooperate.

Figure 12-13: Wet Rice Civilization and the Lotus as representations of the aquatic link with Vietnamese and Southeast Asia cultures.

2) The second concept declares *a strong, resilient, and independent Vietnam* by presenting the *Bronze Drum* which dates back from the 1st millennium BC and the historical golden Dragon and from *Lý* Dynasty (1009 - 1054 and 1054 - 1225) in Vietnam history. Along with showing historical pride of Vietnam, this concept encourages sports spirit (strength, fair play, conquering challenges) by stressing on *Vovinam* – a traditional martial arts of Vietnam. Furthermore, this concept urges solidarity and unity among Southeast Asia nations by using the images of *Lotus* or *Bamboo* as common cultural representations in this area.

Figure 14: The augmented reality image of Bronze Dum displayed in the show.

Figure 15: The 31st SEA Games logo, rises from the Lotus Pond, is the metaphor of peace and victory podium, which is Vietnam's message to friends in the region.

3) The third concept presents *hospitality,* showing the host country's warm greeting to all Southeast Asia countries who visit Vietnam and participate in the games. Also, this concept is indicated by the way Vietnam familiarizes itself with Southeast Asia cultures through 11 folk paintings presenting identities of

all 11 countries (as shown in Figure 9).

4) The fourth concept conveys the message of *a stronger Southeast Asia* through the representations of the Sea Games mascot *Sao la, Lotus, the Sea and Fire* which urge sports spirits for competition in Southeast Asia cultures.

Figure 16: The fishermen gather as a big group sailing to the sea, one of Vietnamese traditional marine works, is a metaphor for common strength of Southeast Asia.

Text producers' purposes for Vietnamese cultural representations

By organizing the 31st SEA Games, the text producers considered economic, social, and technological issues when coming up with cultural ideas. One of the issues which affect the process of implementing Vietnamese representations in the show is cultural preservation. The revival of Vietnam's situation post-COVID is also mentioned by the producers as a challenge. Furthermore, insufficient technological supplies require a cautious selection of cultural representations. Hence, presenting a developing, strong, but friendly Vietnam is necessary in this situation because it can strengthen the thoughts of other nations about Vietnam.

The key message of this SEA Games is "For a stronger Southeast Asia", which forces the text producers to convey it in all performances and rituals of the ceremony. Since the SEA Games is an international event, messages about sport spirits and regional cooperation must be included. Specifically:

- Vietnamese cultural representations selected must build narratives for Vietnam, sports spirits and Southeast Asia, which fulfill the requirements of the governments and the text producers in the situation of the 31st SEA Games.
- The cultural representations serve multi-communicative purposes: (1) to show the pride in Vietnam in its "cultural wealth", (2) to show Vietnam's confidence to grow in globalization, (3) to imply political messages for cooperation amongst all Southeast Asia countries through sports spirits, (4) to enhance Vietnamese

cultural promotion and preservation.

- The text producers target both local and international audiences. Hence, they must consider the link between Vietnam's and Southeast Asian cultures.

To conclude, cultural representations depicted in this show are utilized to promote Vietnam's cultural identity. However, they are not compulsorily exclusive to Vietnam. The connection between Vietnamese culture and Southeast Asian culture is deliberately considered and represented by the text producers so that the show is a source of promoting international relations and at the same time foregrounding Vietnam's cultural identity representation.

Furthermore, cultural inclusion in such events can create a shared sense of awe-feeling among all participants. This serves the ultimate political aims of the SEA Games: Solidarity and Unity. For example, Vietnamese cultural representations presented in the ceremony are familiar to Asian or Southeast Asian cultures (such as Bamboo, Lotus, the Fishermen, etc.). In some cases, they are designed intentionally to relate Vietnam's culture to Southeast Asia sports games or Southeast Asia cultures (such as 11 Dong Ho Paintings depicting 11 Southeast Asia cultural identities; Vietnamese women wearing *Ao Dai* and conical hats create a "Journey to Vietnam" to welcome international friends).

Conclusions and Discussion

From the results, Vietnamese cultural representations are intentionally constructed so that they can produce common feelings and ideological meanings of a united SEA community. However, differences of perception take place between audiences due to their different cultural backgrounds. For example, the "reality" of the Wet Rice Civilization of a Vietnamese and Thai audience might be different.

In terms of semiotics, the cultural meaning production in this ceremony is not directly generated from a particular sign but from different *semiotic groups* of cultural representations as a whole system. Throughout the show, *national symbols* are used repeatedly and continuously under various representations. A Vietnamese national symbol such as Lotus can induce a sense of harmony among both local and international audiences as it is a common cultural symbol in the region. It should be aware that national symbols can be presented under different visual or audio modes to produce universal meanings. For example, in the show, "the yellow star" on the national flag implies "victory" or "glory" creating a sense of winning in sports. Hence, to strengthen sports values (which result in we-feeling) in a global event, symbols that carry both national and universal meanings (*regional symbols*) should be considered to link the host nation with other cultures as parts of a community. *National symbols* (of the host country) can conjure

a shared of we-feeling among local spectators, but *regional symbols* are supportive tools for strengthening international empathy and rapport.

In this 31st SEA Games Opening Ceremony, *Vietnamese lifestyle* and *History* are expected to be the main inspirations of the text producers. However, they considered issues including nation's economy, politics, geography and cultural differences and similarities to generate cultural meanings. Those aspects should also be included in the interpretation of any culture in global situations.

In terms of limitations, this study's qualitative method may reflect the researcher's own biases and assumptions, considering these might have influenced the analysis. However, the researcher adopts triangulation to enhance the validity and reliability of the results. During the analysis, it is expected that semiotic elements in the show would directly reflect Vietnamese cultural representations. In fact, the large number of semiotic elements generated based on the Vietnamese cultural model makes the interpretation process more complex. The researcher must transfer the semiotic system into bigger groups to find out which kind of Vietnamese cultural representations they present. In addition, due to the complex communicative purposes of the show, various aspects of history, geography, differences, and similarities of cultures are included in the interpretation to figure out the key messages that the text producers attempt to convey through the show.

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Knowledge, Attitude, and Practice (KAP) of Emergency Nurses in Caring for Older Patients: A Case Study of Health Regions 11 and 12

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Abstract

This descriptive study aimed to explore the level of knowledge, attitude, and emergency nurses' practice in caring for older patients. Two-hundred and sixty-eight emergency department (ED) nurses were conveniently recruited from 3 tertiary care hospitals and 6 secondary care hospitals in health regions 11 and 12. The response rate of questionnaires was 76.49%. Data were collected by using questionnaires, including demographic data, Knowledge of Geriatric Emergency Care (KGEC), Attitude of Older Patient Questionnaire (AOPQ), and Practice for Geriatric Emergency Care (PGEC). The content validity index values of the KGEC, AOPQ, and PGEC were 0.96, 0.92, and 0.99, respectively. The internal consistency reliability of KGEC using K-R 20 was 0.70, and the Cronbach's alpha coefficient values of AOPQ and PGEC were 0.81 and 0.94, respectively. The data were analyzed by using descriptive statistics. The findings of this study revealed that 46.30 % of participants reported their knowledge of geriatric emergency care at a moderate level, followed by a high level (27.32 %). The highest percent of participants reported a neutral attitude towards caring for older patients, accounting for 89.27 %, followed by a positive attitude, accounting for 10.24 %, while the practice for geriatric emergency care showed at a moderate level, accounting for 32.19 %, followed by a high level, accounting for 29.76 %. The study findings suggest that ED nurses should be better trained to advance their knowledge and motivate positive attitudes towards older patients. This could help ED nurses improve their geriatric emergency care practice.

Keywords: Older Patient, Emergency Department, Nursing Practice, Registered Nurse

Introduction

Older population is rapidly growing worldwide, having tripled from 260 million in 1980 to 761 million in 2021; this number is projected to reach 1.6 billion in 2050 (United Nations, 2023). In Thailand, about 13 million or 19.00 % of the total population in 2022 were people aged 60 or older, raising by 5.70 % from 13.20 % in 2010, and it is expected to exceed 19 million in the next two decades (Department of Older Person [DOP], 2022). Given this population change, the demand for emergency services among older people has increased since older people commonly encounter multiple conditions. As shown in the United States, about 15.00 – 15.80 % of older people visited the emergency department (ED) during 2015-2016 (Augustine, 2019). The national survey of emergency services in Thailand between 2016-2018 showed a higher percent of ED visits among older adults, which was 28.67 % (Lumjeaksuwan, Patcharasopit, Seksanpanit, Sritharo, Aeampuck, & Wittayachamnankul, 2022).

Older patients present ED visit rate in Baltimore City with more urgent and complex care needs than patients in younger aged group (Wang, et. al., 2015), resulting in negative patient outcomes, such as increased rate of ED revisits within 48 hours after discharge (Sri-on et al., 2016). To reduce poor service outcomes among older patients, competent healthcare providers, particularly nurses who take the vital role for patient's care at the ED are needed. Research studies exploring nurses' caring for older adults were mostly conducted in acute settings, but few studies were done in ED settings. For example, ED nurses reported their difficulties on providing a holistic approach for older patients (Deasey et al., 2014), communicating with cognitive impaired patients and dealing with family's needs and complex healthcare demands (Lennox, Braaf, Smit, Cameron, & Lowthian, 2019). These difficulties may lead to not only poor health outcomes for older patients but also further frustration of ED nurses due to lack of specialized skills to deal with these complexities.

Nurses' practice can be driven by knowledge and attitude since knowledge is a foundation of practice, and attitude is a driving force for people changing their behaviors. Existing evidence showed the positive correlations of knowledge (r = .564, p < .001) and attitude (r = .724, p < .001) with nurses' practice in caring for hospitalized elders (Kwon et al., 2013). However, the study's findings in Thai nurses regarding the correlations among Knowledge and attitude factors were not related to nurses' behavior in caring for the elderly (p >.05) (Arsavisate, Leethong-in, & Piyawattanapong, 2019). Thus, the exploration of knowledge, attitude, and nurses' practice in caring for older patients, particularly ED settings in Thailand is needed. The findings of this study could be used to guide the plan for improving ED services for older patients.

Purpose of the Study

This paper aimed to report the level of knowledge of geriatric emergency care, attitude of older patients, and ED nurses' practice in caring for older patients.

Conceptual Framework

A Knowledge-Attitude-Practice (KAP) theory and the literature review related to the emergency care for older patients were employed to guide this study. The KAP theory posits the changes in human practice that composes of three continuous processes, including acquiring knowledge, producing attitude, and forming practice (Protero, 1990 cited by Wang & Zhang, 2021). Among these three components, attitude can be influenced by knowledge, then drive practice or change behaviors (Wang & Zhang, 2021). The details of each component in this study are explained as the following:

Knowledge refers to understanding or comprehension of geriatric emergency care, consisting of general knowledge of aging and specific knowledge related to geriatric emergency care. General knowledge of aging includes aged-related physiological, psychological, and sociological changes, and complexity of care in older patients (Deasey, Kable, & Jeong, 2014; Melady, & Perry, 2018). Specific knowledge related to geriatric emergency care includes specific health conditions, geriatric assessments and care at the emergency department, referral or discharge, and family or caregiver's participation (Kihlgren et al., 2005).

Attitude refers to belief, perception, or opinion towards older patients and value of caring practice (Deasey et al., 2014). Based on the literature review, the perception that ED nurses have with older patients includes general aging characteristics, incontinence, use of medications, pain management, psychological status, decision-making, ageist stereotypes, discharge planning, and older patients at the emergency department (Deasey, Kable, Jeong, 2016; Dikken, et.al., 2016).

Practice refers to activities or behaviors that nurses perform for older patients at the ED. Based on the literature review, nursing practices compose of 10 components (Melady, & Perry, 2018; Society, Force, American College of Emergency Physicians, & Emergency Nurses Association, 2014), including (1) incorporation of general principle to address complex older patients for older patients, (2) adoption of a geriatric-specific approach (Melady, & Perry, 2018; Murdoch et al., 2015), (3) availability of equipment and supplies for older patients (Schoenenberger & Exadaktylos, 2014), (4) maintenance of awareness of atypical presentation, (5) use of multidisciplinary team for acute assessment and transitional care (Badawy et al., 2019; Cline 2015; Payne 2016), (6) assessment of acute presentation in the contexts of the patient's psychosocial needs, and caregiving

environment (Ferrell et al., 2018), (7) establishment of system for medical management, (8) use of palliative care principle in each assessment, (9) care quality improvement, and (10) education of emergency department staff about unique aspects of geriatric emergency care (American Geriatrics Society Expert Panel on Person-Centered Care et al., 2016; Brummel & Ferrante, 2018).

Research Methodology

This descriptive design study is a part of the research project entitled "ED Nurses' Practice in Caring for Older Patients and Related Factors".

Population and sample. The population in this study were emergency department (ED) nurses working at the hospitals in health regions 11 and 12. The samples in this study were conveniently recruited from three provincial hospitals and six community hospitals with the inclusion and exclusion criteria. The inclusion criteria included (1) working full-time at the ED at least 6 months, (2) being able to communicate in Thai, and (3) willing to participate in this study. The exclusion criteria included holding administrative position as a head nurse and having study leave during the time of data collection. Two hundred and sixty-eight ED nurses met the inclusion criteria, however, there were 205 ED nurses responding to the questionnaires, yielding the response rate of 76.49 %.

Ethical consideration. This study received the ethical approval from the Social and Behavioral Sciences Institutional of Review Board, Prince of Songkla University (SBS-IRB-PSU) issued PSU IRB 2021 - St - Nur 027 (Internal). This study also received permission from the director of each hospital where the data were collected. Participation in this study was voluntary and all participants had the right to refuse to take part in this study without penalty or loss of welfare. The data were kept confidential and used code to protect participants' identity.

Data collection. After receiving the institutional Review Board approval, the researcher asked the permission for data collection from the director of each hospital, then contacted the key persons from each hospital to distribute the questionnaires to potential participants. The researcher allowed time for all participants to complete the questionnaires. Data were collected during October 2021 – October 2023 It took about 40 minutes to complete the questionnaires.

Research instruments. Research instruments in this study included 4 parts, including demographic data questionnaire, knowledge of geriatric emergency care (KGEC) questionnaire, attitude of older patient questionnaire, and practice for geriatric emergency care (PGEC) questionnaire.

Demographic data questionnaire. This questionnaire consists of 12 items, including age, gender, level of education, work experience, ED working experience, geriatric training, availability of geriatric medicine, availability of geriatric assessment tools, types of hospital, and percentage of geriatric emergency attendances.

Knowledge of geriatric emergency care (KGEC) questionnaire. The KGEC questionnaire was developed by the researcher. It consists of 30 items, categorized into two domains, including general knowledge about older patients (13 items) and specific knowledge related to geriatric emergency care (17 items). All items are measured as dichotomous (true/false) with every correct answer assigned 1 point and incorrect answer assigned 0 points. The summed score ranges in 0-30 points. Moreover, to increase awareness of one's personal knowledge level, the response of each item is combined with the scale that allows respondents to indicate their level of certainty regarding the answer given (0–100% certainty). The summed score was converted into 100 percent and divided into 5 levels including excellence (90.00 – 100.00 %), Good (80.00 – 89.99 %) average (70.00 – 79.99 %), low (60.00 – 69.99 %), and need improved (less than 60.00 %). The content validity index was 0.96, and the reliability testing using Kuder-Richardson 20 (KR-20) was 0.70.

Attitude of older patient questionnaire (AOPQ). This questionnaire was developed by Deasey et al. (2016). In this study, item numbers of 14, 24, and 29 are modified to fit with emergency situations. It consists of 30 items, categorized into nine dimensions, including general aging (4 items), incontinence (1 item), medication (2 items), pain management (2 items), psychological status (1 item), decision-making (2 items), ageist stereotypes (11 items), discharge planning (2 items), and older persons in the ED (5 items). Each item was answered on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Negative items as Item1, 5, 6, 8, 9, 10, 14, 15, 16, 20, and 21 were reversed score before analysis. The summed score ranging of 30 – 150 was converted to 100 percent and divided into 3 levels as positive attitude (> 80.00 – 100.00), neutral attitude (50.00 – 79.99 %), and negative attitude (< 50.00 %). The content validity index was 0.92, and the reliability testing using the Cronbach alpha coefficient was 0.81.

Practice for geriatric emergency care (PGEC) questionnaire. It was developed by the researcher by integrating the best practice of geriatric emergency care and geriatric emergency care guideline (Melady, & Perry, 2018; American College of Emergency Physicians, et al.,2014). It consists of 28 items, categorized into 10 domains, including (1) incorporation of general principle to address complex older patients for older patients (6 items), (2) availability of equipment and supplies for older patients (1 item), (3) adoption of geriatric-specific approach or rapid assessment and risk stratification (8 items),

(4) maintenance of awareness of atypical presentation (2 items), (5) use of multidisciplinary team for acute assessment and transitional care (4 items), (6) Establishment of system for medical management (2 items), (7) Assessment of acute presentation in the contexts of the patient's psychosocial needs, and caregiving environment (1 items), (8) Use of palliative care principle in each assessment (1 item), (9) Care quality improvement (2 items), and (10) Education of emergency department staff about unique aspects of geriatric emergency care (1 item). The response of each item was a 5-point Likert scale ranging from 1 (never practice) to 5 (every time). The summed scores ranging from 28-140 were divided into 3 levels as low (28.00 – 66.00 score), moderate (66.01 – 104.00 score), and high (104.01 – 140.00 score). The content validity index was 0.99, and the reliability testing using the Cronbach alpha coefficient was 0.94.

Data analysis. Descriptive statistics were used to analyze demographic characteristics, knowledge of geriatric emergency care, attitude of older patients, and ED nurses' practice in caring for older patients.

Results

Sample characteristics. 205 ED nurses participated in this study with the mean age of 35 (SD = 9.48, Range 23 – 59) year. Most participants were female (87.80%) and attainted the educational level at a bachelor degree (97.07 %). More than half of participants had experience working for more than 10 years as a registered nurse (55.89%) and at the emergency department (50.24%). Most of participants reported trained in geriatric care (99.02%). For the emergency services, 51.10% of participants (106 persons) reported their hospitals at a secondary service level. The mean percentage of geriatric emergency attendances per day was 53.03 (SD=17.40, Range = 10-90) with 51.71 % of participants reported availability of geriatric assessment tools at the ED. However, about 95.60% (196 persons) reported no geriatric medicine at the ED. The details of sample characteristics are shown in Table 1.

Knowledge of geriatric emergency care. This study revealed the overall mean percentage of knowledge was 73.15 (SD = 8.96, range = 36.67 – 90.00). The highest percentage of ED nurses had geriatric emergency care knowledge at an average level, accounting for 46.30%, followed by a good level, accounting for 27.32% (Table 2).

Attitude of older patients. The participants in this study had a neutral attitude towards older patients (M = 73.15, SD = 8.96, Range = 46.67 – 87.33), accounting for 89.70%. Only 10.24 % of the respondents had a positive attitude towards older patients (Table 2).

ED nurses' practice in caring for older patients. The highest percentage of ED nurses reported their practice at a moderate level, accounting for 62.92 % with the overall mean score of 73.15 (SD = 8.96, Range = 36 – 140), followed by a high level, accounting for 33.17% (Table 2).

Table 1: Basic characteristics of the sample (N = 205)

Variable	Frequency (n)	Percentage (%)
Age (year) *(M = 35.0, SD = 9.48, Range = 23-60)*		
Gender		
Male	25	12.20
Female	180	87.80
Education level		
Bachelor's degree	199	97.07
Master's degree	6	2.93
Work experiences as a registered nurse (year) *(M= 13.19, SD = 9.11, Range = 1-38)*		
< 5 years	47	22.93
5 - 10 years	43	20.98
> 10 years	115	55.89
ED experiences *(M = 11.32, SD = 7.92, Range = 1-37)*		
< 5 years	56	27.32
5 - 10 years	46	22.44
> 10 years	103	50.24
Geriatric care training		
No	203	99.02
Yes	2	0.98
Hospital level		
Tertiary	99	48.29
Secondary	106	51.71
Availability of geriatric assessment tools		
No	196	95.60
Yes	9	4.40
Availability of geriatric medicine		

Variable	Frequency (n)	Percentage (%)
No	187	91.22
Yes	18	8.78
Percentage of geriatric emergency attendances *(M =53.03, SD=17.40, Range = 10-90)*		

Table 2: Levels of knowledge of geriatric emergency care, attitude of older patients, and ED nurses' practice in caring for older patients (N = 205)

Level of study Variables	Frequency (n)	Percentage (%)
Knowledge of geriatric emergency care *(M = 73.15, SD = 8.96, Range = 36.67-90.00)*		
Excellence	3	1.46
Good	56	27.32
Average	95	46.30
Low	36	17.56
Need improved	15	7.36
Attitude of older patients *(M = 71.42, SD = 6.57, Range = 36.67-90.00)*		
Positive	21	10.24
Neutral	183	89.27
Negative	1	0.49
ED nurses' practice *(M = 96.59, SD = 18.14, Range = 36-140)*		
High (104.01- 140.00)	68	33.17
Moderate (66.01 – 104.00)	129	62.92
Low (28.00 – 66.00)	8	3.91

Conclusions and Discussion

The findings of this study indicated an average level of knowledge about geriatric emergency care, a neutral attitude, and a moderate level of practice in caring for older patients at the ED. The highest percentage of the participants showed an average level of knowledge regarding geriatric emergency care. This finding was in line with a study conducted in Ethiopia, which found that more haft of the nurse participants had adequate knowledge regarding the geriatric care (Mitike, Yimam, Goshiye, & Kumar, 2023). It might be due to lack of geriatric care training available for the ED nurses. Adequate knowledge in caring for aging effect on practice in caring for older, this included training, experience, and attitude (Zeng, et al., 2019). Although more than 50 % of the participants in this study had experienced working in emergency department and been working as a registered nurse for more than 10 years, only two ED nurses (0.98%) had been trained for geriatric care. Thus,

the ED nurses should be well informed and trained about common problems, risk stratifications, and other issues related to the care for older patients.

The finding in this study also reflected a neutral attitude that almost all ED nurses perceived about older patients (89.27 %), however, only 10.27 % of the participants (21 persons) had a positive attitude. These findings were inconsistent with the integrative review study, which found that nurses had a negative attitude towards older patients, particularly geriatric characteristics, and care demand (Rush, Hickey, Epp, & Janke, 2017). The different findings might be related to knowledge which in this study is average, and lack of geriatric emergency care training. Knowledge can drive the attitude and further promote nursing practice (Yang, et. al., 2021). Thus, nurses who have a better knowledge in geriatric care are more likely to have a positive attitude towards elderly patients and increase nursing practice. In this study, more than half of ED nurses had a moderate level of nursing practice in caring for older patients (62.92%). Regarding this result, nurses might learn about geriatric emergency care by their work experiences, and as they grow older. there is a study indicated that less experience, negative attitude with inadequate knowledge, lack of training, working in non-clinical hospitals, and unavailability of guidelines with inadequate practices in caring for older adults were significantly associated (Mitike, et al., 2023).

This is the first study exploring knowledge, attitude, and nursing practice in caring for older patients at the emergency department in the South of Thailand. The study findings reflect the current situation in the way that ED nurses need to be trained to improve their knowledge and attitude, and ultimately improve their caring practice. The limitation in this study is a small sample size. Thus, the results may not be generalized to the population.

Recommendations

The findings in this study can guide nursing education and practice. The ED nurses need to be better trained to gain knowledge, attitude, and practice in caring for older patients at the emergency department. Future research should be conducted in a large population and explore factors predicting the ED nurses' practice in geriatric care.

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Capital that influences the decision to pursue an agricultural career: A case study of young farmers in the northeastern region of Thailand

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Abstract

This research aims to study the capital that influences the decision to pursue a career in agriculture among the new generation in the northeastern region of Thailand using quantitative research methods and used an interview form with a Cronbach's Alpha value of 0.90 to collect data from a sample of 310 people who were randomly selected (Simple random sampling) with an acceptable error level of 0.05. The research results are divided into 3 main issues: 1) Basic information of new generations farmer (Individual, Household, Economic) 2) Capital level influenced and 3) Relationship between basic information of new generations farmer and capital. The research found that the new generation is a group of people in Generation Y. The average age is 38 years. They have the status of being the children of farmers and 1 in 4 experiences working in other occupations before coming to agriculture. Entered the agricultural profession at the average age of 29 years. Most were households with debt and most had other occupations as well. Ownership of almost all land comes from traditional inheritance. Currently, households can make an average profit of 377,261 baht per year from farms and an average of 512,039 baht per year from other occupations. Human capital (mean = 3.8) and physical capital and natural capital (mean = 3.6) are important at the level. While social capital (mean = 3.1) and monetary capital (mean = 2.5) were of moderate importance. In terms of the relationship between the general information of the new generation and capital, it is found that personal basic factors with a statistically significant relationship at the 0.05 level, including the number of years of formal education. The basic household factors that have a statistically significant relationship at the 0.01 level include debt of farmer households and possession of high-value machinery. The basic economic factors of households that have a statistically significant relationship at the 0.05 level are the economic level of the province areas for livestock and selling products to middlemen.

Keywords: Capital, Young Farmer, New Generations, Migration, Occupation, Small Farmers, Farmer Household, Inheritable, Persistence

Introduction

Food security in many parts of the world is being seriously threatened. One important issue is Demographic problems in which agricultural society is currently entering an aging society. Joosse and Grubbstrom (2017) have explained this issue as follows: Currently, much of agriculture is left to aging farmers? Leaving one-third of the agricultural area in critical times. These problems span many countries around the world. For example, the average lifespan of farmers in the United States is 58 years (Zahniser et al., 2018), in Japan the average age is 67 years old (MAFF, 2017), in Italy the average age is 58 years old (Eurostat, 2016), and Thailand's average lifespan is 58 years old (National Statistical Office, 2018), etc. These situations are accelerating the need for many countries to increase the number of new generations of farmers entering the agricultural sector. However, this is not so easy as today's lifestyles change, and more lucrative careers emerge. The new generation tends to seek that opportunity in the city rather than remaining in the countryside, even though they are descendants of the farmers.

The exodus of young people from agriculture contributes to the stability of the agricultural sector. Stloukal (2004) states that due to this situation, many farming households are at risk of maintaining production levels but it cannot be clearly determined that this is a negative effect. Zhao and Jiang (2022) explain that emigration is an attempt to overcome obstacles from farms. Taylor and Martin (2001) state that emigration also increases the source of income and Lanzona (1998) stated that the migration of young people to other production sectors is due to necessity based on the economic level of households with different resources. Which can be seen that in smallholder households, there are vulnerabilities that are difficult to maintain or abandon. Saiyut et al. (2017) confirmed in his research that the thing that can best replace elderly farmers is the new generation of farmers. Thailand has designed a project named Young Smart Farmer (YSF) since 2015 with the objective of replacing elderly farmers, Department of Agricultural Extension (2021), but there are still not many new generation farmers participating in the project compared to with the total number of farmers, National Statistical Office (2018).

Deciding on a career is a type of decision that is relevant and specific to the individual. It is a process that is connected to many theories. This process involves the rational choice of one option or another, Downs (1957) explains. This decision is directly related to the expression of human behavior. Either in a way that we can recognize or not. Therefore, this review would like to study capital that is a precursor to the decision to pursue a career in agriculture for the new generation. Currently, there is no clear or specific report on this issue for the new generation of farmers in the northeastern region of Thailand.

Literature review

Concepts and theories of human decision-making

Human behavior and decision-making Career decisions are a type of decision that is relevant and specific to a person. It is a process that is linked to many theories, ranging from personality, behavior, environment, attitude, intuition, needs, motivation, goal setting. Identifying choices, decisions, satisfactions, and happiness, however, this process of choice is essential. to end a rational decision and decision making is directly related to the expression of human behavior. Royal Academy (2013) stipulates that decision means decision and Saaty (1980) who invented the Analytic Hierarchy Process, also known as AHP, as a method used in analysis to the decision to choose the best alternatives (Best Alternatives) is based on the principle of setting goals (Goal), Criteria, Sub-criteria, Alternatives (Alternatives), and then do a comparative analysis (Trade off) by Give the weight value of each choice. Including sensitivity analysis (Sensitivity Analysis) that may occur. then consider the reasonableness Consistency to find the best option Holland (1973) studied personal interests, traits, and behaviors. It has been summarized into four main concepts: 1) personality is the driving force of the individual, 2) the environment is dominated by personality, 3) the individual seeks an environment favorable to his or her personality, and 4) a person's behavior is determined by personality and environment. As for the issues of secondary concepts, four are: 1) Consistency; 2) Differentiation. (Differentiation), 3) Congruence and 4) Calculus, which is evident from Holland's (1973 study of behavior) that can isolate the reasons that lead to decision-making in the expression of behavior. It is divided into 2 groups of reasons, namely reason group 1, the expression of individual personal behavior that is unique. and Reason 2 Environment is an important complement that has an important influence on human behavior.

Human behavior and identity

Instinct is one of the things that produces the expression of behavior in humans. Royal Academy (2013) has given the meaning that intuition means knowledge that is born from birth. Make it possible to do it yourself without being taught by Freud (1917), who invented the theory of psychoanalysis. (Psychoanalysis Theory) and described intuition as It is the energy that is present in us from birth that makes us want to live. want to be creative Desire to achieve the goal of satisfaction (Pleasure) and happiness (Happiness).

Opinion and Attitude

Royal Academy (2013) has defined that attitude means opinion. and gave the meaning of the attitude that the attitude or feeling of a person towards something, where the word “attitude” corresponds to the English word “Opinion” and the word “attitude” to the English word “Attitude” (Oxford Dictionaries, 2011). This word is closely related. In which people will have opinions and behaviors will be consistent. In deciding which behaviors to perform,

individuals give their attitude to each choice as a detail from additional feelings to information and experiences that exist within the individual. After that, attitudes inclined toward favorable or pleasurable directions emerged.

Goals, Expectations, Drives, and Motives (Expectancy, Goal, Drive & Motives)

Locke and Latham (1990) established goal setting theory. (Goal-setting theory) and explained the theory that the planning process is to create objectives that indicate the direction of action. The success of the targeting lies in how appropriate the attributes are. how specific Can it be measured? And achieving goal objectives is a challenge. Vroom (1964) describes Vroom's expectancy theory with the formula Motivation = Expectancy x Valence, or motivation = expectation x value of result. Motivation is based on the degree to which a person wants something and the degree of probability that he or she will obtain it, Miller (1951) describes in The Need-Drive-Incentive Theory (Need-Incentive). Drive-Incentive Theory) People's mental needs are different. But there is one thing in common: desire causes stress or distress. This is what drives man to take action to satisfy his need, reduce, alleviate, or ultimately alleviate suffering, which is the driving force. It's called incentives by Robbins (1998). Motivation Theory states that motivation stimulates behavior and that people act powerfully. Realize the value have a clear direction Demonstrates intention, effort, or proves one's abilities.

Capital, Human and Behavior

The manifestation of individual decisions. The primary contributor to decision-making is the personality of the person who predominantly prevails over the environment that contributes to rational decision-making. These so-called “costs” are not just things that are monetary. Rather, everything that forms a person is unique. Mores and McNamara (2013) outlined the five areas of capital that people have differently. In a person, what is available can be a factor that causes both positive and negative decisions. There are 5 aspects of capital: 1) Human Capital 2) Social Capital 3) Capital Physical Capital 4) Natural Capital and 5) Financial Capital. Stephen and Nora (2013) describe five areas of capital that individuals will have. different in a person, things that exist can be factors that cause positive or negative decisions. Having good costs leads to good decisions. If there are costs to cover the decision, risks can be avoided. Each aspect of capital may have the following meanings:

1) Human Capital refers to the knowledge, skills, and expertise of a person. This arises from the experiences of people who have learned throughout time. both from education Occupation Training, familiarity, personal interest, etc. These are costs that express a person's specific techniques, including professional skills, analytical thinking. Assessment A person's goal orientation, attitude, attitude, emotions, and behavior.

2) Social capital refers to social resources that individuals interact with in their lives. This cost refers to trust. recognition Receiving support, etc. These things are received from

the social environment such as family, parents, friends, co-workers. What is gained from that interaction will make a person gain confidence and act according to faith. confidence This social capital supports the expression of individual behavior.

3) Physical capital refers to things that facilitate a person to be able to do something more conveniently. Both in occupation and in normal life It is a basic factor that supports or elevates a person's ability to be better. If it is within a sufficient level, the person will be able to display behavior to its full potential. These include housing, machinery, tools, transportation, electrical systems, plumbing systems, energy systems, communications.

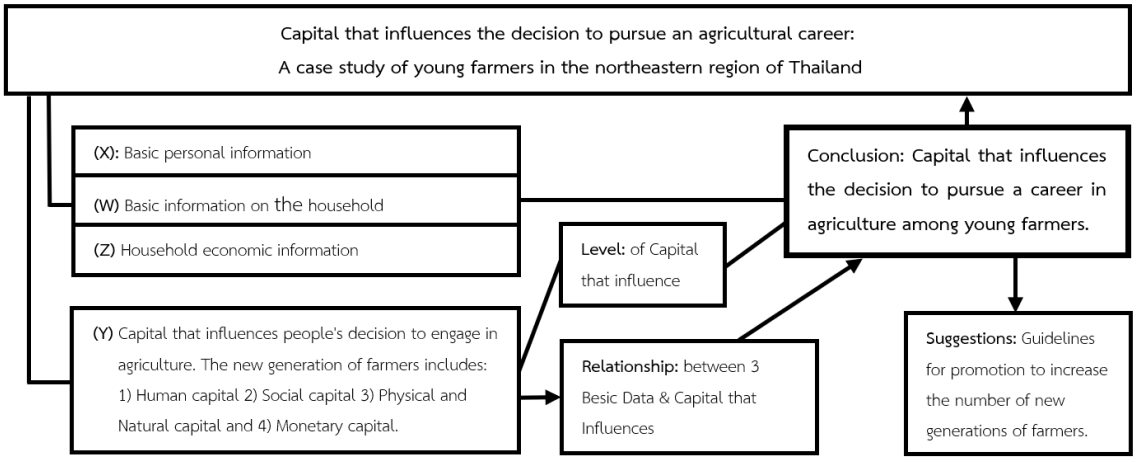
4) Natural Capital refers to designated natural resources. Life potential, this can be said about occupations, including land, minerals, water sources, weather, and energy. These things can determine a person's way of life, and the abundance of resources in some occupations is considered an important factor that indicates success or failure.

5) Financial capital refers to assets and assets obtained from collection or support, including capital, savings, loans, bonds, stocks, land, gold, gems, inheritance, plants, pets, silk, patents, these things. It's all about creativity, imagination, design and styles of living and working.

Research Objective

To analyze the capital that influences the decision to pursue a career in agriculture among young farmers in the northeastern region of Thailand.

Figure 2 Conceptual framework



Methodology and Methods

This research is quantitative research using Structured interview (Close-Ended Form) as a research tool. Descriptive statistics were used to explain, such as frequency, percentage, mean,

standard deviation, and multiple linear regression analysis is used to find the relationship between basic information of the new generation and the motivation that makes them decide to pursue agricultural careers.

The Study Area

The Northeastern region of Thailand.

The population and sample size

Selection of the sample was carried out in 2 phases: Phase 1 was the selection of the study area. The researcher reviewed the documents in various directions to consider and select the areas and after reviewing the documents the researcher was able to deduce that Economic data is linked to location. Area characteristics and social identity using the value of Gross Provincial Products or GPP (Office of the National Economic and Social Development Council, 2019) as the main criteria for consideration and selecting 5 provinces that can represent all 5 sub-regions. Including Udon Thani, Sakon Nakhon, Khon Kaen, Nakhon Ratchasima and Ubon Ratchathani. In the second phase, simple random sampling is used to get the appropriate proportion size from the population data to be selected to be Young Smart Farmers (YSF), a total of 1,325 people. (Office of Agricultural Extension and Development Area 4, 2021) using the formula of Yamane (1973), an acceptable error level of 0.05, which results in calculating the appropriate sample size is 310 cases. After that, a formula for calculating the size is used. Suitable example (Proportional allocation) (Suthasasna, 1984) to calculate the sample size in each province. The calculation results were as follows: Udon Thani 66 cases, Sakon Nakhon 60 cases, Khon Kaen 63 cases, Nakhon Ratchasima 61 cases, and Ubon Ratchathani 60 cases.

Data collection

Data collection for this research, an interview form is used to collect data from the sample. In the process of creating the interview form, it has been carried out through 3 important steps: Step 1 through checking the accuracy of the questions with the objectives (Index of item objective congruence or IOC) by 3 experts. Step 2 through interview testing. 30 samples, the test results had a Cronbach's Alpha value of 0.90, which can be considered a tool with confidence within the criteria for collecting data appropriately (Panpinij, 2010). Step 3: Passed ethics certification. Research in humans from the Human Research Ethics Committee Chiang Mai University, dated January 10, 2023, research project certificate number CMUREC No. 65/190, then proceeded to collect data between November 2022 – April 2023.

Data Analysis

Part 1: Basic personal information of the new generation. Basic household information of the new generation and economic information of the new generation's farming households.

In this section, descriptive statistics using frequencies, percentages, and medians will be used to explain.

Part 2: is an analysis of the level of motivation that influences the decision to pursue a career in agriculture. Data analysis in this section Will present data showing the mean and standard deviation Std. Deviation. This research uses interpretations from the data on a 5-level Likert scale: 1) Minimal influence or No influence = 1.00 – 1.80 2) has little influence = 1.81 – 2.60 3) Moderately influential = 2.61 – 3.40 4) Highly influential = 3.41 – 4.20 and 5) Most influential = 4.21 – 5.00 (Likert, 1961)

Part 3: Multiple Linear Regression Analysis to test the relationship between 3 basic data areas: 1) Basic personal data of the new generation (X) 2) Basic household data of the new generation. (W) and 3) Basic economic information of new generation households (Z) towards their motivation (Y) to find a relationship that is statistically significant. Using the SPSS program, perform a Linear Regression analysis using the Enter method and divide the relationship levels into 2 levels: 1) Highly Significant Level = Sig. < 0.01 (***) and 2) Significant Level = Sig. < 0.05 (*) (Limmathurotsakul, 2013)

Results and Discussion

1. General Individual Data for New Generations (N = 310)

The research found that the new generation of farmers are female. The average age is 38 years. Most education levels are at the bachelor's level. They are Generation Y. Most of them are married or have a partner. Almost all of them are children of farmers, almost one in three have worked in other occupations before, and almost half have previous experience working in the government sector. Their income in the last year from other occupations before entering agriculture was an average of 281,742 baht per year. The reason for changing careers or doing additional farming came mainly from family issues. They entered agriculture at an average age of 29 years, and they preferred Membership of agricultural-related groups in the community (Table 1)

Table 1 General Individual Data for New Generations (N=310)

General Individual Data	frequency	Unit	%	General Individual Data	frequency	Unit	%
Female	167	P	53.9	Have worked in the private sector before.	50	P	16.1
Male	143	P	46.1	Have worked in the private business field before	23	P	7.4
Age (Average)	38	Y		Have worked in the independent profession before	3	P	1.0
Gen Y	220	P	71.0	Number of years of other work (Average)	8	Y	
Gen X and Gen Z	90	P	29.0	Last income from other occupations before starting agriculture (Average)	281,742	฿ / Y	
In relations	167	P	53.9	Changes due to financial issues	98	P	31.6
Single	143	P	46.1	Changing careers because of family issues	192	P	61.9

General Individual Data	frequency	Unit	%
There is a farm in the original domicile.	248	HH	91.6
Number of years studied in the system (Average)	14	Y	
Children of farmers	292	P	94.2
Study in the field of agriculture	41	P	13.2
Never had any other occupation	88	P	28.4
Have worked in the government sector before	146	P	47.1

General Individual Data	frequency	Unit	%
Changing careers because of health issues	48	P	15.5
Changing careers because of social issues	74	P	23.9
Changing careers because of security issues	72	P	23.2
Changing careers because of lifestyle issues	124	P	40.0
(Average) Age when farming (Average)	29	Y	
Participating in agriculture-related groups	214	P	69.0

P = People, HH = Household, Y= Year, ฿ = Bath

2. General Household Data for New Generations (N = 310)

The research found that the household information of new generation farmers has an average of 4.3 household members. Most members have occupations. While some households have elderly and sick people who are unable to work and there are people who are studying. The level of importance of the attitude of agriculture to households was at the level of 77.3%, which was in the quartile of the main occupation. Almost all households were previously engaged in agriculture and half had other occupations outside of agriculture. At present, most households do agriculture together with other occupations. There are an average of 2.6 household members involved in farming, an average of 1.7 people in other occupations, an average area of 27.3 rai (4.4 hectares), an average distance from the city of 66.9 kilometers (calculated at a speed of 60 km per hour) 73.9 % identified as households in debt with an average outstanding debt of 616,299 baht, almost half have high-value machinery and more than half hired outside labor, and 72.9% still hired additional machinery for farming (Table 2).

Table 2 General Household Data for New Generations (N=310)

General Household Data	frequency	Unit	%
Member (Average)	4.3	P / HH	
Members with professions (Average)	3	P / HH	
Old or sick people (Average)	0.4	P / HH	
Children or currently studying (Average)	0.9	P / HH	
Employed persons to all members			72.0
Additional responsibilities of the employed person to the household			56.4
Level of importance of attitudes of agriculture to households (Average)			77.3
The household's original occupation was agriculture.	292	HH	94.2
The household's original occupation was another occupation.	155	HH	50.0

General Household Data	frequency	Unit	%
Farming members (Average)	2.6	P / HH	
Members who have other occupations (Average)	1.7	P / HH	
Household farming area (Average)	27.3	Rai	
Size of the district where the farm is located (Average)	11.3	Sub-D	
Time from farm to provincial center (Average at speed 60 KM per Hour)	66.9	Min	
In debt	229	HH	73.9
Outstanding debt (Average)	616,299	฿	
Have high value machinery	135	HH	43.5
Hire external labor	175	HH	56.5

General Household Data	frequency	Unit	%	General Household Data	frequency	Unit	%
Currently, households engage in agriculture and other Occupations.	277	HH	90.0	Hire agricultural machinery	226	HH	72.9

P = People, HH = Household, Y= Year, Sub-D= Sub District, ฿ = Bath, Min = Minute

3. General Economic of Household Data for New Generations (N = 310)

The research found that most of the new generation farmers are in provinces with a low economic level (median = 180,404 baht per year). They have an average crop area of 24 rai, an average livestock area of 1.8 rai, and an average farm water source of 1.6 rai. There are only 1 in 4 new generation farmers whose farmland is in an irrigated area, most of the farm area is lowland. Most ownership belongs to the parents. Next is the ownership of young farmers or their spouses. Almost all farming resources come from inheritance. Young farmers have an average of 3.8 farm production activities, with 74.8% stating that growing crops is their main activity. As for other main activities, there are still not many, while 32.9% have certified production standards. However, the source of distribution for most products is in the community and through middlemen. The new generation of farmer households can make an average profit from farms of 377,261 baht per year, and the new generation of farmer households can make an average of 512,039 baht per year from other occupations. On average, farming can generate an average income of 29,590 baht per rai- per year. And when calculating the level of economic importance to households, it was found that only 40.3% found that agriculture was more important than other occupations (median = 52% baht per year) (Table 3).

Table 3 General Economic of Household Data for New Generations (N=310)

General Economic of Household Data	frequency	Unit	%	General Economic of Household Data	frequency	Unit	%
Provinces with an economic level equal to or above the median (Equal & Over Median)	124	HH	40	Mainly grows crops	232	HH	74.8
Provinces with an economic level below the median (Under Median)	186	HH	60	They mainly livestock or insects.	36	HH	11.6
Cultivation area (Average)	24	Rai		Mainly engaged in fishing	8	HH	2.6
livestock area (Average)	1.8	Rai		Mainly processing	34	HH	11.0
Water source area (Average)	1.6	Rai		Have a standard	102	HH	32.9
Located in an irrigation area or public water source (Average)	83	HH	26.8	Sold in the community	270	HH	87.1
The farm is a lowland area.	219	HH	70.6	Sold to other areas	161	HH	51.9
The farm is a highland area.	162	HH	52.3	Sold to the purchasing yard	150	HH	48.4
The farm is a wetland.	32	HH	10.3	Sold to middlemen	195	HH	62.9
The farm is a mountainous area.	26	HH	8.4	Sold to contractors	30	HH	9.7
Ownership belongs to YSF or spouse.	177	HH	57.1	Sold via the internet	133	HH	42.9
Ownership belongs to parents.	198	HH	63.9	Farm Profit (Average)	377,261	฿ / Y	
Resources from traditional heritage	293	HH	94.5	Profit from other occupations (Average)	512,039	฿ / Y	
Resources from other YSF careers	155	HH	50	Income per 1 Rai (Average)	29,590	฿ / Y	

General Economic of Household Data	frequency	Unit	%
Resources from spouses	121	HH	39
Farm production activities (Average)	3.8	Act	

General Economic of Household Data	frequency	Unit	%
Agricultural income is highly important to the household economy (Equal & Over Median)	125	HH	40.3
Agricultural income is of low importance to the household economy (Under Median)	185	HH	59.7

P = People, HH = Household, Y= Year, Act = Activity, ฿ = Bath, Min = Minute

4. Motivation effecting of new generation for selection Occupation (N=310)

Capital that influences young farmers' decision to pursue an agricultural career both from a positive and a negative perspective. The results of the study found that from the 4 areas of capital, when arranged in order of their influence on the choice of agricultural careers of the new generation from most to least, can be arranged in order as follows: 1 human capital (mean = 3.8) 2 physical capital and natural capital (mean = 3.6) 3 social capital (mean = 3.3) and 4 monetary capital (mean = 2.7) It can be observed that Human capital has the greatest influence. This is consistent with TCDC (2018) who explained that the new generation tends to give quite a lot of freedom to their own thoughts and behaviors. It is surprising that they chose this path when other Gen Y turned their backs on agriculture. In terms of human capital Having a determination and determination in farming is the most important capital (mean = 4.2), which is consistent with Kurochikina (2015) who stated that the determination of the new generation is quite complex and if they choose to farm, they usually have profound meaning In terms of social capital support from family members is the most important source of capital (mean = 3.9), which is consistent with Cater III and Kidwell (2014) who confirmed that 86% of household business owners want to pass it on to their descendances and fully expect that the household business will be well taken care of both physical capital and natural capital. Having sufficient land size to generate capital income is the most important (mean = 3.7), consistent with Zhao and Jiang (2022) who explain that households with a large amount of agricultural land have a tendency for members to leave agriculture. Little and monetary capital the new generation sees that having non-agricultural income from both the YSF and other household members supporting farming is the most important (mean = 3.5). This point is consistent with Shi (2018) who stated that off-farm income influences farm potential of different household members (Table 4)

Table 4 Level of Capital effecting for new generation choosing agriculture (N=310)

Capital	Mean	Std. D	Level of influence
Human Capital	3.8452	.58328	High
Have good enough physical and mental health to engage in agriculture.	4.0516	.76572	High
Knowledgeable and skilled in farming skills.	3.5065	.75360	High
Have the skills to search and be able to access information necessary for farming.	3.8742	.80067	High
Have the necessary skills in marketing	3.5452	.86062	High

Capital	Mean	Std. D	Level of influence
Have a determination in farming.	4.2484	.77975	Most
Social Capital	3.2574	.62953	Moderate
There are counselors and agencies to support.	3.4774	.97101	High
Members within YSF households provide support.	3.8581	.85096	High
Have their own labor and machinery or can be provided in the community	3.4194	1.05432	Moderate
There is a market ready to sell the products.	3.6323	.92795	High
Contact farming	1.9000	1.21466	Low
Physical Capital and Natural Capital	3.6155	.69451	High
The farm location has suitable weather conditions for the agricultural activities that YSF has chosen.	3.6677	.90088	High
The nature of the farm area is suitable for the agricultural activities chosen by YSF.	3.5355	.90147	High
Natural resources in farm areas are available to support production in chosen agricultural activities.	3.5935	.88641	High
There are good and accessible utilities.	3.5645	1.10341	High
There is sufficient land size to generate income.	3.7161	.92610	High
Money Capital	2.7394	.62727	Moderate
There is enough investment to ensure good farm management.	3.0645	.91147	Moderate
Have a reserve fund in case of emergencies.	2.8516	.94024	Moderate
Have enough credit to provide additional financing.	3.0774	.93154	Moderate
Have income from non-agricultural occupations (from YSF and other household members)	3.4742	1.08728	High
There are investors who support farming.	1.2290	.68912	Minimal or no

5. Multiple Linear Regression Analysis for Individual and Capital

Multiple Linear Regression Analysis between 22 basic personal factors (X) and capital that influences the decision to pursue an agricultural career (Y), with the equation as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16} + \beta_{17} X_{17} + \beta_{18} X_{18} + \beta_{19} X_{19} + \beta_{20} X_{20} + \beta_{21} X_{21} + \beta_{22} X_{22}$$

The results of the analysis found that all 22 factors and capital were able to predict together (R^2) = .109 and had a joint significance value of (Constant Sig) = .000 and it was found that among these there were variables with significance values. Statistically, there is 1 variable as follows:

X_6 = Number of years of formal education (Highly Significant) is an issue that has a positive statistical significance at the 0.01 level. This explains that having a high number of years of formal education. (Highly educated) is an important capital for the new generation to choose to pursue a career in agriculture. Even though in normal social conditions young people in agriculture are often pushed out of agriculture. For the classic reason that if you study hard you will grow up to be a boss. This is consistent with Corbett (2007) who stated that the development of the education sector is a process in which new generations learn to leave their communities. But on the other hand, this new generation is a paradox, that is, they grow up according to the patterns of their time but turn their backs on their family's expectations (Table 5).

Table 5 Multiple Linear Regression for Individual and Capital

Variable	B	SE	Beta	t
(Constant)	45.833	5.481		8.362 ***
x_1 = Sex	-1.201	.917	-.077	-1.309
x_2 = Age	-.081	.099	-.064	-.820

Variable	B	SE	Beta	t
x_3 = Generation	.244	1.177	.014	.207
x_4 = Status	1.522	.953	.097	1.597
x_5 = The farm is located in hometown.	1.626	1.641	.058	.991
x_6 = Number of years of formal education	.530	.241	.143	2.204 ***
x_7 = Children of farmers	-.116	1.933	-.003	-.060
x_8 = Agricultural education	-1.318	1.318	-.057	-1.000
x_9 = Previously worked in the government sector	-.059	.132	-.052	-.445
x_{10} = Previously worked in the private sector	.630	2.994	.021	.211
x_{11} = Used to work in the private business field	1.570	3.265	.100	.481
x_{12} = Used to work in an independent field	6.823	4.393	.259	1.553
x_{13} = Number of experiences working in other occupations before engaging in agriculture	4.544	5.338	.159	.851
x_{14} = Annual income in the last year before engaging in agriculture	-1.602	1.120	-.265	-1.430
x_{15} = Changing careers because of financial issues	.343	1.125	.020	.304
x_{16} = Career change due to family issues	-.157	1.420	-.010	-.110
x_{17} = Changing careers because of health issues	-1.238	1.351	-.057	-.916
x_{18} = Changing careers because of urban social issues	-2.024	1.310	-.110	-1.545
x_{19} = Changing careers because of security issues	-.953	1.286	-.051	-.741
x_{20} = Changing careers because of lifestyle issues	1.254	1.094	.079	1.147
x_{21} = Age of the farmer when engaged in agriculture	.456	.823	.056	.554
x_{22}= Participating in agriculture-related groups	1.915	.999	.114	1.917

R^2 = .109, SEE = 7.66612, F = 1.583, Sig. of F = .049[b], * = Sig. < .05, *** = Sig. < 0.01

6. Multiple Linear Regression Analysis for Household and Capital

Multiple Linear Regression Analysis between 19 basic household factors (W) and capital that influences the decision to engage in agriculture (Y), with the equation as follows:

$$Y = \alpha + \beta_1 W_1 + \beta_2 W_2 + \beta_3 W_3 + \beta_4 W_4 + \beta_5 W_5 + \beta_6 W_6 + \beta_7 W_7 + \beta_8 W_8 + \beta_9 W_9 + \beta_{10} W_{10} + \beta_{11} W_{11} + \beta_{12} W_{12} + \beta_{13} W_{13} + \beta_{14} W_{14} + \beta_{15} W_{15} + \beta_{16} W_{16} + \beta_{17} W_{17} + \beta_{18} W_{18} + \beta_{19} W_{19}$$

The results of the analysis found that all 19 factors and capital were able to predict together (R^2) = .131 and had a joint significance value of (Constant Sig) = .000. And it was found that among these there were variables with significant values. Statistically, there are 2 variables as follows:

W_{15} = Having debt of farmer households (Highly Significant) is an issue with a negative statistical significance at the 0.01 level. It explains that debt-free farmer households are an important capital for the new generation to choose to pursue a career in agriculture. Debt is a controversial issue as to whether the presence or absence of debt is more beneficial to the farm. Having debt can mean having good credit, and not having debt can mean that the household is doing very well economically. This will affect the decisions of the new generation. This is consistent with Nuthall and Old (2017) who stated that debt in household farm businesses is passed down from ancestors. This increases the burden on successors and is directly detrimental to the farm (Table 6).

W_{17} = Having high-value machinery (Highly Significant) is an issue that has a positive statistical significance at the 0.01 level. It explains that having high-value machinery on the farm is an important capital for the new generation to choose to pursue a career in agriculture. It can be seen that the new generation recognizes the importance of using

technology to help with production within the farm and having large machinery ready to support farming as an important capital. Because there is no need to invest in additional resources. Large machinery can be considered an inheritance, and in some households, owning large machinery and working for hire in the community can create another source of income for the household, and many households can generate more income than agriculture. Sharma et al. (2016) stated that machines are still unable to replace labor in every step. Agricultural labor at the household level remains important. Encouraging them to move out is considered negligence in the production process (Table 6)

Table 6 Multiple Linear Regression for Household and Capital

Variable	B	SE	Beta	t
(Constant)	52.743	3.914		13.477 ***
w_1 = Number of members in farmer households	2.082	1.721	.378	1.209
w_2 = Number of members with occupations	-1.474	1.932	-.218	-.763
w_3 = Number of members without occupations	-2.740	1.527	-.245	-1.794
w_4 = Number of members who are children or are currently studying	-2.126	1.529	-.242	-1.390
w_5 = Percentage of responsibilities other than self of employed persons per household	.002	.019	.016	.105
w_6 = Level of importance of the agricultural profession to the household in terms of attitude	.026	.024	.068	1.062
w_7 = The traditional occupation of the household was agriculture.	-.365	2.060	-.011	-.177
w_8 = The traditional occupation of the household is an occupation other than agriculture.	1.374	.965	.088	1.425
w_9 = At present, households have occupations other than agriculture.	-.756	1.595	-.030	-.474
w_{10} = Number of members who are engaged in agriculture	-.104	.579	-.015	-.180
w_{11} = Number of members who have occupations other than from the agricultural profession	-.123	.322	-.025	-.382
w_{12} = Total farm area	.015	.016	.062	.953
w_{13} = Size of the district where the farm is located	.005	.083	.003	.058
w_{14} = Travel time from farm to provincial center	-.021	.014	-.086	-1.482
w_{15} = Indebtedness of farmer households	-4.365	1.057	-.243	-4.127 ***
w_{16} = Amount of debt of farmer households	-7.886E-8	.000	-.018	-.294
w_{17} = Owning high value machinery	2.728	.982	.173	2.779 ***
w_{18} = Hiring workers to do farming	.153	.943	.010	.162
w_{19} = Hiring machinery for agriculture	-.377	1.001	-.021	-.377

R^2 = .131, SEE = 7.56156, F = 2.279, Sig. of F = .002[b], * = Sig. < .05, *** = Sig. < 0.01

7. Multiple Linear Regression Analysis for Economic and Capital

Multiple Linear Regression Analysis between 30 basic household economic factors (Z) and capital that influences the decision to engage in agriculture (Y), with the equation as follows:

$$Y = \alpha + \beta_1 Z_1 + \beta_2 Z_2 + \beta_3 Z_3 + \beta_4 Z_4 + \beta_5 Z_5 + \beta_6 Z_6 + \beta_7 Z_7 + \beta_8 Z_8 + \beta_9 Z_9 + \beta_{10} Z_{10} + \beta_{11} Z_{11} + \beta_{12} Z_{12} + \beta_{13} Z_{13} + \beta_{14} Z_{14} + \beta_{15} Z_{15} + \beta_{16} Z_{16} + \beta_{17} Z_{17} + \beta_{18} Z_{18} + \beta_{19} Z_{19} + \beta_{20} Z_{20} + \beta_{21} Z_{21} + \beta_{22} Z_{22} + \beta_{23} Z_{23} + \beta_{24} Z_{24} + \beta_{25} Z_{25} + \beta_{26} Z_{26} + \beta_{27} Z_{27} + \beta_{28} Z_{28} + \beta_{29} Z_{29} + \beta_{30} Z_{30}$$

The results of the analysis found that all 30 factors and capital were able to predict together (R^2) = .129 and had a shared significance value (Constant Sig) = .000 and it was found that among these there were variables with significance values. Statistically, there are 3 variables as follows:

z_1 = economic level of the province (Significant) is an issue that has a negative statistical significance at the 0.05 level. It can be explained that if the new generation lives in a

province with a poor economic level (Below the median) is an important capital to choose to pursue a career in agriculture. This may make sense in order to explain the phenomenon from multiple perspectives. One interesting point is Provinces with poorer economies often have limited non-agricultural jobs, meaning those who persist in these provinces may have to pursue farming as a career. But in another way, it can be explained that the agricultural culture in the community is so strong that it attracts the new generation to choose to pursue a career in agriculture. Silva et al. (2021) concluded that returning to the community is due to a sense of belonging and belonging to the community. Those who emigrate often do not receive this in urban society (Table 7).

z_3 = Livestock area (Significant) is an issue with a negative statistical significance at the 0.05 level. This explains that the fact that households do not have or have little space for livestock is an important capital for the new generation to choose to pursue a career in agriculture. A number of farmers who mainly raise livestock for value reasons outweigh the important cereal crops that are commonly grown in the region. Their area is suitable. Especially with water sources in this region there is always the problem of shortages, so they are a group of people who are fortunate in terms of space and the capital required for raising livestock is much higher, for two important reasons. This may be concluded that differences in area affect household costs, which is an important decision-making variable. This is consistent with Shi et al. (2007) who described the value of land as agricultural land, besides serving as a factor of production, also has the function of being a source of capital for farms (Table 7).

z_{24} = selling products to middlemen (Significant) is an issue with a negative statistical significance at the 0.05 level, explaining that not selling produce to middlemen is an important capital that makes the new generation choose to pursue a career in agriculture. It can be seen that middlemen are often a major obstacle for small farmers that is difficult to avoid. If it can be sold in other ways, it will provide a more worthwhile profit. But due to the readiness potential of households that are different, there may not be a better option. Brar et al. (2018) explains that many farmers understand this problem well. But due to the unprepared potential of older farmers, declining strength and lack of young people on farms choosing this route seemed the best solution because losing some income at this point would mean dealing with finished farm products (Table 7).

Table 7 Multiple Linear Regression for Economic and Capital

Variable	B	SE	Beta	t
(Constant)	45.705	8.366		5.463 ***
z_1 = Economic level of the province	-2.020	.926	-.128	-2.181 *
z_2 = Cultivation areas	.016	.019	.064	.859
z_3 = Areas for Livestock	-.325	.148	-.144	-2.200 *
z_4 = Water sources within the farm	.621	.326	.137	1.907
z_5 = Utilizing public water sources or irrigation	.769	1.056	.044	.728
z_6 = The area of the farm is lowland.	.569	1.140	.033	.499
z_7 = The area of the farm is highland.	-.099	1.031	-.006	-.096

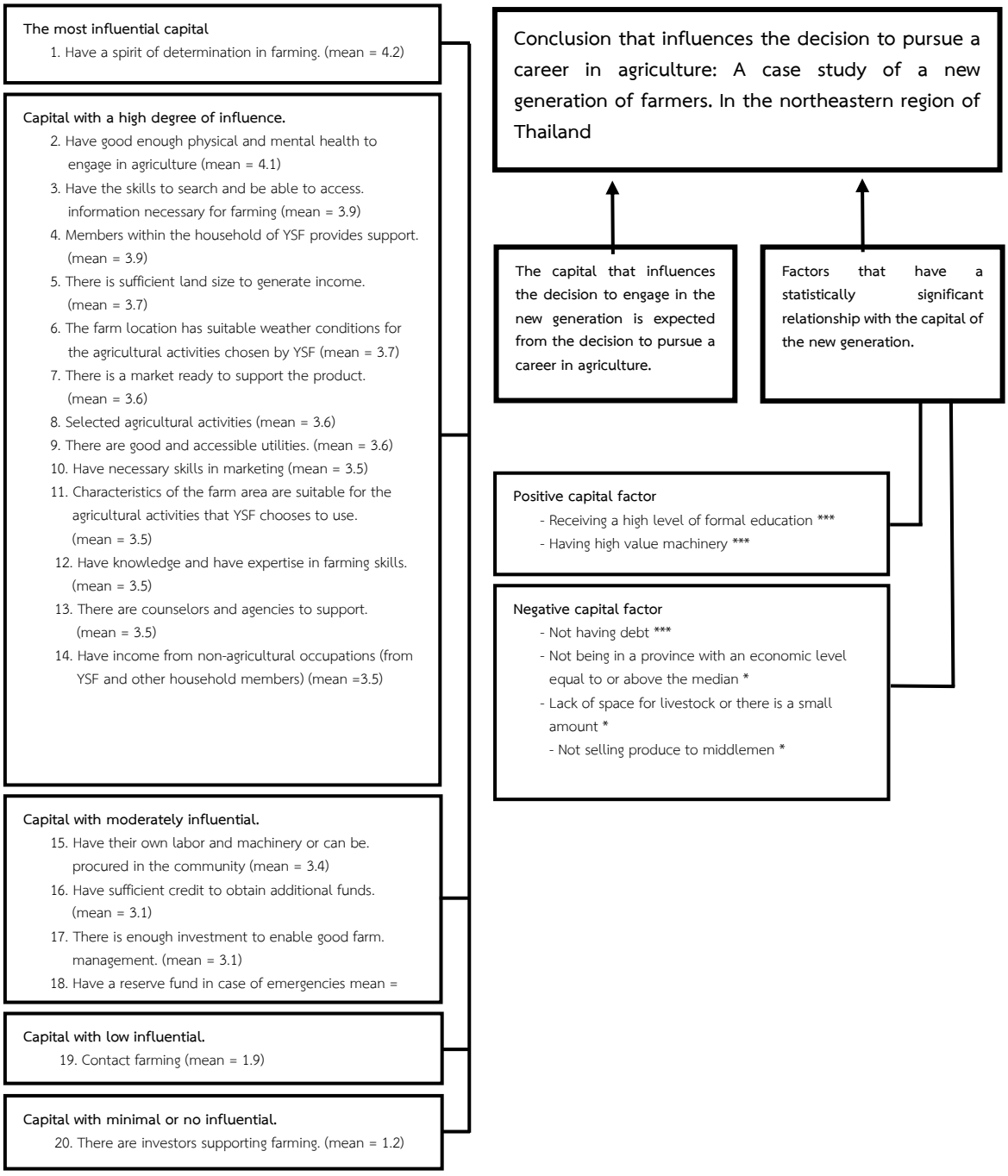
Variable	B	SE	Beta	t
z_8 = The farm's area is a wetland.	-1.737	1.549	-.068	-1.122
z_8 = The farm's area is mountainous.	1.519	1.570	.058	.968
z_{10} = Ownership belongs to YSF or spouse.	-.040	1.177	-.003	-.034
z_{11} = Ownership of the farm area belongs to the parents.	1.323	1.171	.082	1.129
z_{12} = Farming resources come from traditional heritage	-.476	2.136	-.014	-.223
z_{13} = YSF Farming resources come from other YSF professions.	.455	.938	.029	.485
z_{14} = The resources for farming come from the spouses.	.565	1.011	.035	.559
z_{15} = Total number of production activities within the farm	.022	.270	.006	.083
z_{16} = Growing crops is the main activity of the farm.	7.620	8.206	.427	.929
z_{17} = Livestock or insects is the main activity of a farm.	8.644	8.372	.362	1.032
z_{18} = Fishing is the main activity of the farm.	5.524	8.800	.113	.628
z_{19} = Processing is the main activity of the farm.	8.789	8.083	.355	1.087
z_{20} = Production activities on the farm have certified standards.	.999	1.002	.061	.997
z_{21} = Selling products in the community	-2.674	1.443	-.116	-1.852
z_{22} = Selling products to other areas	.808	1.043	.052	.775
z_{23} = Selling products to the purchasing yard	-.361	.989	-.023	-.365
z_{24} = Selling products to middlemen	-2.159	.953	-.134	-2.265 *
z_{25} = Selling products to contractors	-2.677	1.560	-.101	-1.716
z_{26} = Sell products using the internet as an intermediary.	.844	1.071	.054	.788
z_{27} = Net profit from farming per year	1.642E-7	.000	.012	.170
z_{28} = Net profit from other household occupations per year	5.211E-7	.000	.087	1.437
z_{29} = Average income from farming per rai per year	-7.778E-6	.000	-.066	-1.014
z_{30} = The level of importance of agriculture to the household economy	.721	1.022	.046	.706

R^2 = .129, SEE = 7.64057, F = 1.369, Sig. of F = .101[b], * = Sig. < .05, *** = Sig. < 0.01

Conclusion

A study of capital that influences the choice of agricultural careers of the new generation in the northeastern region of Thailand. The results of the research indicate that Human capital is of utmost importance. This is because they often make their own decisions. From the skills of the new generation who can find good information to confirm the possibility before making a decision. Therefore, their career choice is deliberate, and this group expresses it by choosing to engage in agriculture. Physical capital and natural capital are important at different levels. This is often due to their good fortune in having relatively good resources and large enough to generate the desired level of income. Most of this luck comes from their ancestors who collected it and passed it on to them. Social capital, although these new generations are resolute in their decisions, but they still desire good support from those around them because agriculture is still seen by many as a sedentary or, in extreme views, a career choice. Agriculture is backward. And lastly, there is monetary capital. They view that it may not yet be very important. But one thing that they value is having income from other careers to support them. In the case of the relationship of the variables Relationships are all positive. These things show relatively high individual potential and a relatively good economic level of the household. It may be divided into 2 groups: 1) Positive capital that the more you have or the more you have. Moreover, it is the capital that causes the new generation to decide to pursue a career in agriculture, including receiving a high level of formal education. And having 2) high-value machines has negative capital. In this group, if there are none or few It will further affect the decision to pursue a career in agriculture for the new generation, including not having debt. Not

being in a province with an economic level equal to or above the median, Lack of space to livestock or a small number and not selling produce to middlemen. Therefore, it can be concluded that the social and economic quantities of capital in each area of the farmer's household influence the choice of agricultural careers of the new generation. (Figure 2)



*** = Sig. < 0.01 (Highly Significant), * = Sig. < .05, (Significant)

Figure 2 Conclusion that influence the decision to pursue a career in agriculture: a case study of new generations of farmers in the northeastern region of Thailand

Suggestions

Suggestions for future research on relevant issues, there should be continuous study of the factors that are specific to the career choices of the new generation. Because these variables are even confirmed over a period of time, but it tends to change rapidly according to the development of the current world. You should also study other related issues such as motivation, pressure, decision-making conditions, and external factors.

Suggestions related work, for related work promoting the increase in the number of new-generation farmers is because it maintains the production structure in the agricultural sector. You should understand the factors involved in designing the project and selecting project participants appropriately in order to save resources in the process, including increasing success in project implementation.

Suggestions for farmer households, in this research it has been pointed out that household resources that are passed down are important for young farmers' career decisions. Therefore, the family institution should create a stable agricultural occupation. In order to attract the new generation to maintain stable household resources. **Suggestions for young farmers**, there are many career choices for today's new generation but choosing to abandon agriculture may mean abandoning the household. This risks the collapse of the family institution. Therefore, when choosing a career, you should take into account what you have and the appropriate direction to maintain your agricultural career while being able to pursue other areas without conflict.

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The Undesirable Effect of Facebook Addiction on Vietnamese Youth

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Abstract

This study investigates the complex dynamics of Facebook usage among Vietnamese youth and examines its negative effects on their well-being and social behaviors. Given the growing reliance on platforms like Facebook among Vietnam's youth, the research aims to highlight the adverse consequences of such extensive engagement. Using quantitative methods, a survey was conducted with 261 Vietnamese citizens aged 13 to 25, consisting of 24 questions covering demographics and Facebook usage frequency. Responses were measured on a five-point Likert scale, and data analysis was performed using SPSS software, including Multiple Regression Analysis. The results indicate a significant negative impact of social media addiction on self-esteem (H1 accepted), suggesting that Facebook addiction lowers the self-esteem of Vietnamese youth. Although H2 was not supported, the positive coefficient suggests a statistical significance, indicating that Facebook addiction does not diminish self-presentation on social media. Instead, it correlates with increased self-presentation, including false representation. Moreover, social media addiction positively influences self-harm intention (H3 accepted), indicating a heightened risk of physical and psychological self-harm among Vietnamese youth. These findings underscore the importance of addressing the negative effects of Facebook on the psychological and social well-being of Vietnam's younger generation. Interventions aimed at mitigating Facebook addiction and its consequences are crucial for creating a healthier online environment for Vietnamese youth. This research contributes valuable insights to understanding the nuanced impacts of social media, particularly Facebook, on Vietnam's youth.

Keywords: Social Media Addiction, Vietnamese Teenagers, the Impact of Facebook, Self- Esteem, Sel-Presentation, Self-Harm

Introduction

Recent advancements in science and technology have drastically reshaped society and communication, fueling the rapid expansion of the internet. Platforms like Facebook have emerged, meeting diverse needs, especially among young users seeking information,

entertainment, and connection. While Facebook's swift connectivity and broad sharing capabilities have become integral to daily life for many, excessive usage among young users has raised concerns about Facebook addiction and negative effects.

A 2013 report by Comscore revealed Facebook as the most popular social network among Vietnamese people, highlighting its significant impact on media and journalism, particularly among the youth. While Facebook offers benefits such as fast information access, entertainment, and global connections, over-reliance can lead to adverse health effects and reduced face-to-face interactions. The prevalence of Facebook addiction among young people has concerning implications, including mental disorders, depression, and suicidal thoughts. The World Health Organization (WHO) reports that approximately 700,000 individuals die by suicide annually, equating to one person every 35 seconds. Bark's survey of US teens' Facebook messages and activities revealed that nearly 75% of them had been involved in discussions or situations related to self-harm or suicide ("Bark's 2021 annual report," 2021). Jordan Smoller, from Massachusetts General Hospital, emphasizes that "Suicide is the second leading cause of death among young people in the United States," highlighting the alarming nature of this trend (DeSmith, 2023).

As of March 2022, over a third of Facebook users in Vietnam are between the ages of 13 and 24. While social networks offer benefits when used appropriately, they can also lead to negative consequences, influenced by factors like self-esteem and self-presentation.

Objectives

This study aimed to understand the dark side of Facebook on Vietnamese adolescents. There are three research objectives, which are:

- To examine the influence of Facebook addiction on Vietnamese youth in term of self-esteem.
    - To examine the influence of Facebook addiction on Vietnamese youth in term of self-presentation.
    - To examine the influence of Facebook addiction on Vietnamese youth in term of self-harm and suicides.

Literature Review and Conceptual Framework

Facebook use and Self-esteem

Early theories, notably by Abraham Maslow, posited self-esteem as a fundamental human need, comprising both external recognition and internal self-worth. Contemporary

theories, such as sociometer theory and terrorism management theory, further explore motivations behind self-respect maintenance and its protective function against anxiety. Carl Rogers emphasized the role of unconditional positive regard in fostering healthy self-esteem, crucial for young adults' development, particularly influenced by peer interactions and feedback (Matthew, 2023). However, social networking, exemplified by platforms like Facebook, presents a complex influence on self-perception.

With millions of photos uploaded daily on Facebook, teenagers frequently engage in comparison, significantly impacting their self-esteem. The emphasis on idealized images can fuel envy and admiration, particularly affecting self-image. Despite potential negatives, social media can also bolster self-esteem through positive feedback, fostering a sense of belonging and acceptance, crucial for adolescent development and well-being (Valkenburg, 2017). These dynamics underscore the importance of healthy self-esteem in shaping youths' psychological well-being and future success. Based on the previous study, we predict that social media might impact on self-esteem of Vietnamese youth. The following hypothesis can be proposed as follow:

H1: Facebook addiction negatively influence on Vietnamese youth’ self-esteem.

Facebook use and self-presentation

On Facebook, with the advent of the mobile internet and smartphones, people seem to be more interested in building their own profile and online personality. In today's social media landscape, users not only perform on stage, but also express themselves through turning profile pages and photos into “artifacts” on the internet or social networks, can be called “exhibition space” (Chua & Chang, 2016; Hogan, 2010). Social media introduces new interactive platforms in which self-presentation and peer influence interact to jointly build beauty standards (Meier & Gray, 2014). Social networks such as Instagram and Facebook have facilitated peer comparison of appearance and image among teenagers (Mascheroni & Ólafsson, 2014). Today, many teenage girls engage in online self-presentation such as posting self-portraits or “selfies” and sharing “casual clothes” photos for observation and comparison yourself and your peers (Kaplan & Haenlein, 2010). At the same time, the media image of idealistic beauty permeates the circuits of social networks through information sharing and through teenage girls embodying idealistic beauty standards in the content they post (Boyd, 2014).

Moreover, social media offers opportunities for feedback on self-presentation, sometimes leading individuals to misrepresent themselves online. This false self-presentation has been associated with increased social anxiety and decreased self-esteem,

highlighting the complex interplay between social media use and psychological well-being (Twomey & O'Reilly, 2017). Therefore, we formulate the following hypothesis:

H2: Facebook addiction negatively influence Vietnamese youth' self-presentation.

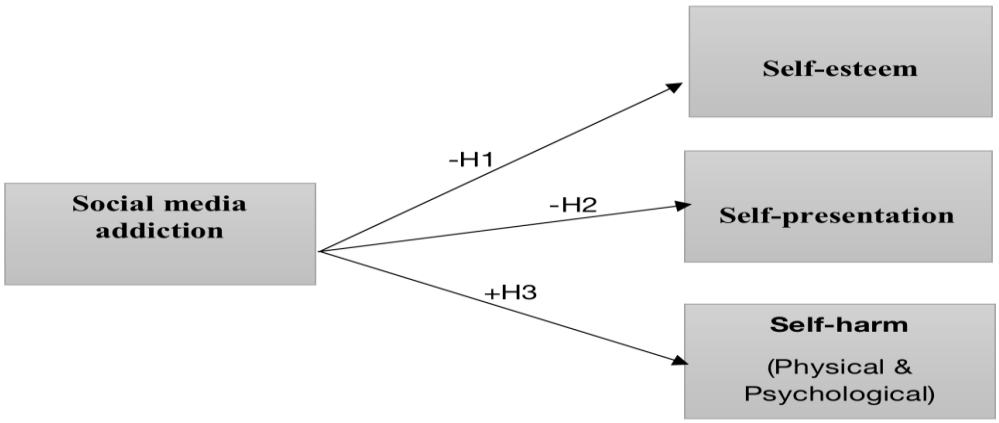
Facebook use and Self-suicide, Self-harm Behavior

During puberty age between 13- to 19-year-olds, adolescent 's thinking and psychophysiology develop very strong, they are easily affected by external factors, causing curiosity, want to learn and want to imitate becomes even more intense. While social networks are too large like Facebook, with countless information, graphic violent, sensitive content and bullying type of content, adolescents spend a lot of their time on social media are more likely to face mental health problems. Teenagers who spend too much of time for social media will easily lead to depression, self-harm and suicide. The algorithms of social media networks such as Facebook have the function of pushing similar content that the user has viewed before. And once users have viewed some related negative content, graphic, then the similar content will always show up and causing young people to fall into a dark rabbit hole filled with the content of self-harm, long-term lead to depression and suicide after that. In addition, the low self-esteem factor about the body of young people on social networks also has a significant influence on self-harm. Many people on social media even praise unhealthy content such as fasting and showing photos with slim bodies. Some teens even describe self-harm and share eating disorders in a positive light. Accessing these contents and images like this every day will make young people constantly compare their bodies. This condition can lead to anxiety, depression, and even suicide.

Cyberbullying also is a burning problem in several countries around the world. According to statistics, among teenagers, about 3 of 10 children are victims of cyberbullying. The researchers also found that being bullied online increased the risk of having suicidal thoughts and trying not to depend on face-to-face bullying. Increased internet use during the COVID-19 pandemic has fueled this trend even further. Based on previous study, we predict the following hypothesis as below:

H3: Facebook addiction positive influence on Vietnamese youth' about physical and psychological.

Conceptual Framework



Methodology

Research Design

This study aims to investigate the impact of social media addiction on youth' self-esteem, self-presentation, and self-harm behavior. According to Churchill (1996), quantitative research can provide precise relationships between the variables related to the hypotheses. In order to achieve the aim of this study, a large number of respondents are required, which is why a quantitative study is a suitable method. In this study, a quantitative research approach was used with the help of an online questionnaire created on Cognito Forms to collect the data. Multiple regression analysis was performed to test the proposed hypotheses. The author used Cronbach's alpha to measure the reliability of the measurement scales used in the questionnaire. In an effort to understand social media addiction, respondents will be asked about their frequency of using Facebook and in the last section of questionnaire, participants reported on their self-esteem, self-presentation and self-harm. To measure the level of agreement for these three variables, a five-point Likert scale was employed to measure.

Instrument Pretest

The questionnaires were sent to 176 respondents as a pretest to ensure that all of the questions and translations in this research were understandable and feasible for respondents to respond to. Among them, only 124 people were eligible for this pre-test. Because the research subjects were mainly Vietnamese teenagers, the researcher only selected data from survey participants between the ages of 13 and 25.

This pretest as well as investigated internal consistency and reliability (Cronbach's alpha values) of all measures were above 0.70, which is regarded satisfactory for exploratory investigations (Nunnally & Bernstein, 1994). The reliability test results for each variable are shown in Table 4.1

Table 1: Reliability of Instrument

Variable	No. of Item	Cronbach's Alpha (n=124)
Social Media Addiction	13	0.931
Self-esteem	10	0.766
Self-presentation	10	0.825
Self-harm	10	0.985

Results

Descriptive Results of Variables

The Cronbach's Alpha coefficient greater than 0.7 were examined to determine the measurement scales' reliability and extent the items are related. It is appropriate for this study (George & Mallery, 2003). Table 5.1 illustrates the results of the descriptive characteristics of the examined variables and the reliability of their measurement.

Table 2: Descriptive Statistics and Reliability Test of Examined Variables

Scales	Mean	Std. Deviation	Cronbach's Alpha (n=261)
Self-harm	1.94	1.20	0.962
Self-esteem	3.33	0.52	0.728
Social Media Addiction	2.47	0.96	0.975
Self-presentation	2.80	0.52	0.813

Results of Hypothesis Testing

Using multiple linear regression, the impact of Facebook addiction on self-esteem was analyzed. The adjusted R^2 of 0.299 ($p < 0.001$) indicates that 29.9% of Facebook users' self-esteem was affected by addiction. The Durbin-Watson coefficient of 1.72 falls within the acceptance zone. ANOVA sig (F) = 0.000, confirming a significant linear relationship between self-esteem and social media addiction. The results reveal a significant negative influence of social media addiction on self-esteem (β = -0.54*, Sig. < .05), supporting H1. In conclusion, Facebook addiction tends to lower the self-esteem of Vietnamese youth, as shown in Table 2.

Table 2: Results of Multiple Regression Analysis between Social media addiction and Self-esteem

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	4.064	.074		54.733	.000
	Social media addiction	-.296	.028	-.549	-10.569	.000

Dependent Variable: Self-esteem

Adjusted R square=0.299, F value=111.711, Durbin-Watson= 1.727, Sig.=0.000

The impact of Facebook addiction on self-presentation was also analyzed by multiple linear regression. The analysis indicates that Facebook addiction significantly affects users' self-expression by 31.1% (Adjusted R–square=0.311), with a Durbin-Watson coefficient of 1.70 falling within the acceptance zone. Despite not supporting H2, the positive β coefficient (β =0.56*, Sig. < .05) suggests statistical significance. In simpler terms, Facebook addiction does not diminish self-presentation on social media networks. Instead, the positive correlation implies that increased addiction correlates with a heightened inclination toward self-presentation on Facebook, including false self-representation. The coefficients indicated in table 5.3 as below.

Table 3: Results of Multiple Regression Analysis between Social media addiction and Self-presentation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	2.053	.075		27.487	.000
	Social media addiction	.306	.028	.560	10.867	.000
Dependent Variable: Self-presentation						

Adjusted R square=0.311, F value= 118.089, Durbin-Watson= 1.708, Sig.=0.000

Finally, the impact of Facebook addiction on self-harm was indicated in table 5.4. Social media addiction has a significant impact on self-harm intention, and the impact is positive (β = 0.62*, Sig. < .05). In other words, if social media addiction increases by 1-unit, self-harm intentions will increase by 0.62 units. Hence, H3 is accepted and is concluded that Facebook addiction positive influence on Vietnamese youth about physical and psychological.

Table 4: Results of Multiple Regression Analysis between Social media addiction and Self-harm

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.033	.161		.203	.839
	Social media addiction	.774	.061	.621	12.737	.000

Dependent Variable: Self-harm

Adjusted R square=0.383, F value= 162.228, Durbin-Watson= 1.011, Sig.=0.000

Conclusions and Discussion

H1: Facebook Addiction and Vietnamese youth' Self-Esteem

This study reveals a negative correlation between Facebook addiction and the self-esteem of Vietnamese teenagers, suggesting that increased social media use is linked to decreased self-esteem. The prevalence of social media platforms like Facebook exacerbates this issue by promoting excessive social comparison and presenting idealized images that can lower self-esteem.

H2: Facebook Addiction and Vietnamese youth' Self-Presentation

While Facebook addiction does not directly impair self-presentation, excessive time spent on social media encourages individuals to portray themselves differently online, often presenting an idealized version of themselves. This tendency reflects the desire to control how others perceive them, leading to false self-presentation among Vietnamese teenagers.

H3: Facebook Addiction and its Influence on Vietnamese youth' Physical and Psychological Well-being

The findings suggest that Facebook addiction among Vietnamese teenagers correlates with an increase in self-harm behaviors. Online communities may normalize harmful activities and fail to provide adequate support to individuals struggling with mental health issues, potentially exacerbating the problem.

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Cargo Operations Officer's Behavior In Using Social Media to Improve English Language Skills

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Abstract

The research aims to achieve two objectives. Firstly, it seeks to investigate the behavior of cargo operations officers in utilizing social media platforms to enhance their English language skills. Secondly, it aims to compare the behavior of cargo operations officers from three different departments in using social media for the purpose of improving their English language skills. The study involves 200 cargo operations officers who were selected through convenience sampling. A questionnaire was utilized as the primary tool for data collection. The collected data was analyzed using various statistical measures such as frequency, percentage, mean, standard deviation. The findings of the study indicate that cargo operations officers tend to use social media platforms approximately 3-4 times a day, with smartphones being the most commonly used devices for accessing these platforms. Facebook emerged as the most popular social media platform, followed by Line, Instagram, and YouTube. The primary purpose of using social media was found to be entertainment-related conversations. Additionally, it was observed that cargo operations officers frequently utilize online media to enhance their English skills by communicating with foreign friends or customers through platforms like Line, Email, and Facebook. Furthermore, they also engage in activities such as searching for work-related information, improving their listening skills through online media, and utilizing manuals for their work. Regarding the comparison of behavior among the three departments, no significant differences were found at a significance level of .05.

Keywords: cargo operations officer's behavior, social media, English language skills

Introduction

Learning English as a Foreign Language presents challenges, and one of them is the lack of opportunities to practice. However, social media offers a solution to this problem. Exposure to English: Social media provides a continuous flow of English content such as posts, articles, and videos. By following pertinent accounts and actively engaging with English content, the officer can fully immerse themselves in the language. Interaction and

Practice: Platforms like Twitter and language learning communities enable them to interact with native speakers, seek clarification, and enhance their English writing and speaking skills. Learning Resources: Numerous social media groups and pages are exclusively focused on English language learning. These platforms offer valuable tips, vocabulary exercises, and chances to practice English skills. Through social networks, people can interact with others, explore different cultures, and simultaneously enhance their English language skills. (Pranee Paweenchana, 2023).

The popular social media platforms, including Facebook, YouTube, Instagram, TikTok, and Twitter, have gained even more significance in the wake of the severe COVID-19 outbreak. As humans adapt to the new normal, the advantages of social media have become increasingly apparent. Platforms like YouTube, Facebook, Twitter, and Instagram, among others, are now widely utilized as effective tools for English language education (Mazer et al., 2007). Social media serves as a valuable resource for English learners, enabling them to interact, communicate, and learn language structures from native speakers, thereby enhancing their English communication skills (Blatterner & Fiori, 2011; Loard, 2012; Lomicka, 2016).

The individual conducting the research is an English educator at the Aviation Personnel Development Institute, Kasem Bundit University. Consequently, there is a keen interest in examining the behavior of cargo operations officers when utilizing social media to enhance their English language proficiency. The aim is to utilize the findings of this study as a reference point for refining teaching methodologies and strategies, as well as designing educational resources that cater to the specific needs of students within the aviation industry, thereby ensuring optimal benefits for professionals in this field.

Research Objectives

1. Can the utilization of social media, both in general and for work purposes, enhance the English language proficiency of cargo operations officers?
2. Is there a positive impact on the English language abilities of cargo operations officers when they engage with social media platforms, both in their personal lives and professional settings?
3. Does the incorporation of social media, both in a general context and within the work environment, contribute to the development of English language skills among cargo operations officers?

Research Question

Does the use of social media in general and the use of social media in work improve the English skills of cargo operations officer

Concept, Theory, Conceptual framework

Behavioral concepts

1. Behavior encompasses the actions or symptoms that are manifested through a person's cognitive muscles in response to internal and external stimuli, whether consciously or unconsciously, and can be either desirable or undesirable. It can be observed by others and assessed using various tools (Royal Academy, 2011). Paitoon Mecharit and team (2010: 7) also define behavior in a similar manner, highlighting the importance of studying behavior through different methods such as experimental, survey, introspection, clinical, systematic observation, questionnaires, and psychological testing.

2. Self-development, as discussed by Goud & Arkoff (1998: 121), involves actions taken for personal growth, leading to positive changes in one's determination, desires, and internal values that ultimately influence external behaviors. Development, as defined by various scholars such as Wortman and Loftus (1992: 253), Hetherington and Parke (1993: 2), and Woolfolk (1998: 24), encompasses patterns of growth and changes in behavior across different aspects of an individual's life from birth to old age, emphasizing the stability of these changes throughout life.

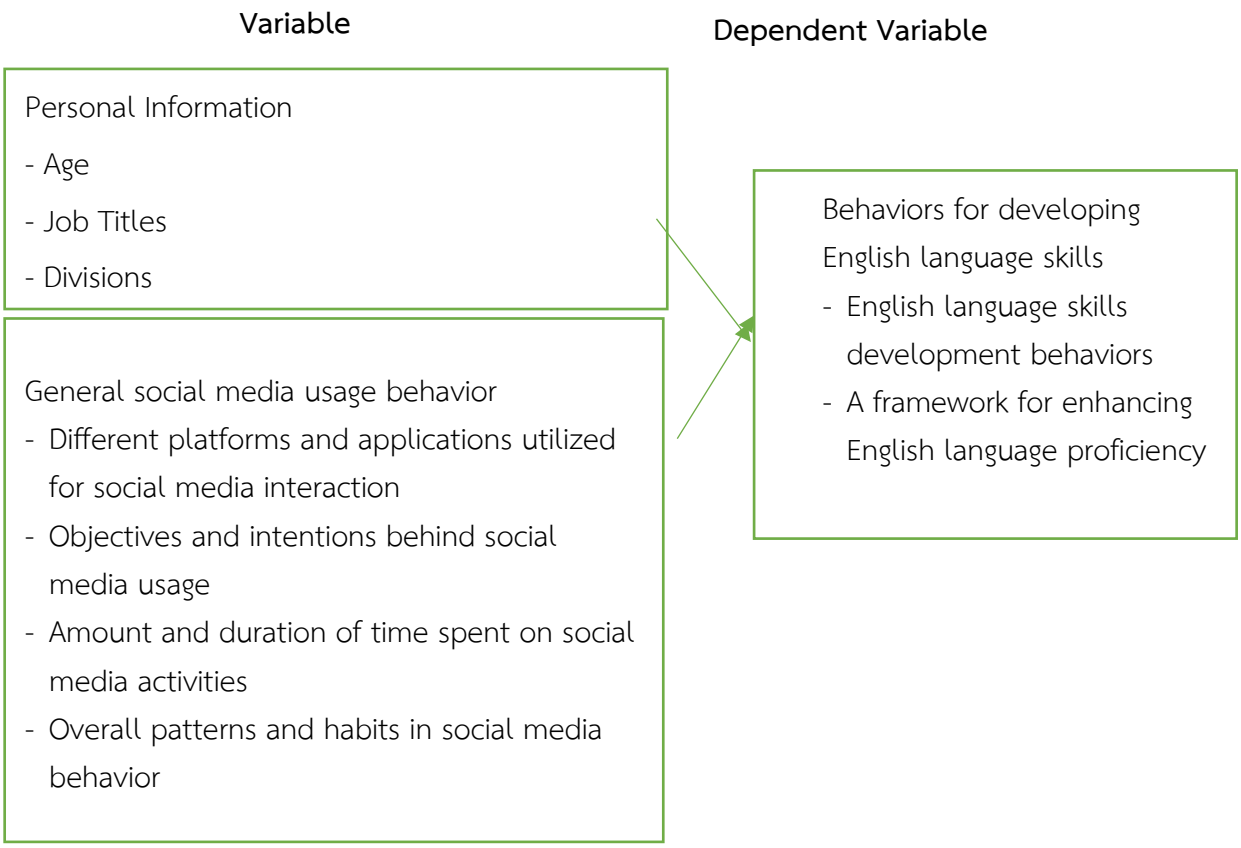
3. Social media, as defined by Davis, Amen, Aguilar, and Canché (2012), comprises web-based and mobile applications that enable individuals and organizations to create, engage, and share ideas or existing content through various forms of digital communication. These platforms allow for the development of personal profiles and the sharing of information in a digital environment, facilitating communication and interaction among users.

In her article on September 13, 2018, Sutasinee Lertwatcha provided 9 tips for improving English language skills. These tips include listening to English content daily, utilizing various online platforms such as YouTube channels like Learn English with English Class 101.com, Anglo-Link, Speak English With Mister Duncan, Rachel's English, and Jennifer ESL. Additionally, setting up devices in English, consuming news from international sources like BBC, CNN, and Google News, watching movies and listening to English songs, reading articles and online magazines, writing daily in English, learning new words from online dictionaries such as Dictionary.com and Oxford Dictionaries, practicing speaking with a language partner or using language learning websites like iTalk or Verbling, and finally, planning English practice by identifying specific skills to develop.

Related research

In 2015, Tananuraksakul conducted a study on the impact of creating a Facebook group for university students in Thailand to enhance their English writing skills. The group served as a platform for teachers to share topics and online resources related to English skill development, allowing students to engage in English discussions by posting comments and replies. The teacher would then provide feedback and correct any errors in the students' use of English. The study revealed that students found writing English on Facebook to be more engaging and stimulating, leading to increased interest in learning the language. Similarly, in 2012, Yunus and Salehi explored the effects of Facebook groups on improving English writing skills among university students in Malaysia. They established a group called "Write Out Loud," where teachers posted topics and encouraged students to brainstorm ideas and express their opinions in English. The results indicated that students demonstrated higher proficiency in English writing, and the accompanying questionnaire revealed that students felt more confident in their writing abilities through this Facebook group approach. Additionally, students expressed their preference for using Facebook as a platform for learning writing skills. In 2017, Hayikaleng investigated the use of YouTube to enhance the reading comprehension of vocational students in Narathiwat. The teacher utilized YouTube videos that were relevant to the lesson content, and after watching the videos, students were prompted with questions to activate their prior knowledge. The findings demonstrated that incorporating video clips from YouTube helped to stimulate students' interest in the upcoming reading material. Lastly, in 2016, Matmainna examined the use of blogs to develop English reading skills among Asians in non-English speaking countries, particularly those aged 14-30. Blogs were chosen as a social media platform that allowed teachers to incorporate text, photos, and video clips simultaneously.Unlike Facebook and Twitter, where teachers are limited to adding images, text, or videos, blogs offer a unique platform for students to practice their English reading skills across a wide range of topics. Through blogs, students can explore examples of language usage by others, which helps them develop their own thought processes. Additionally, blogs provide inspiration for readers to share their own stories and opinions, encouraging them to continue honing their writing skills.

Conceptual Framework



Methodology

The research focused on cargo operations officers as the population of interest. To gather data, a sample group of 200 cargo operations officers was selected from three different departments. The selection of participants was done using convenience sampling, ensuring a random and representative representation of the population.

Research Tools

1. A survey is being conducted to gather information about individuals' social media usage behavior. The questionnaire is divided into two parts, with the first part focusing on general information and overall social media usage behavior. This section includes questions about the types of devices used, the different online media platforms accessed, the purpose of using social media, the amount of time spent, and the frequency of usage. In total, there are 10 questions in this part.

2. The second part of the questionnaire specifically addresses the behavior of using social media to enhance English language skills. It is further divided into two categories: the format used for developing English skills and the benefits derived from it. This section consists of 12 questions, and respondents are required to select answers based on the frequency of their practice. The options include never practicing, practicing occasionally,

and practicing regularly.

Research Tools and Data collection

1. Developing a tool for conducting research involves examining documents related to social media usage patterns and enhancing proficiency in the English language.

2. Drafting a questionnaire is essential, followed by seeking validation from three experts to ensure the accuracy of the questions (IOC).

3. Subsequently, refining the questionnaire based on feedback and finalizing a comprehensive version is crucial for the research process.

4. The process of data collection includes gathering secondary data from a variety of sources like journals, textbooks, and websites.

5. Additionally, primary data is obtained through a questionnaire administered to 200 cargo operations officers selected randomly from three different departments for convenience.

6. In the data analysis phase, statistical methods are employed to examine frequencies, percentages, means, standard deviations to derive meaningful insights from the collected data.

Results

The analysis findings of the respondent's personal details are presented in Table 1.

	Variable	Numbers	%
Sex	male	150	75.0
	female	50	25.0
Age	21-25	18	9.0
	26-30	40	20.0
	31-35	72	36.0
	36-40	42	21.0
	40 and more	28	14.0
Departments	Cargo Services	80	40.0
	Shipping	80	40.0
	Warehouse loader	40	20.0
Work experience	less than 1 year	40	20.0
	1 - 3 years	72	36.0
	4 - 5 years	55	27.0
	more than 5 years	33	17.0

The data from the table reveals that there are a total of 150 male employees, constituting 75.0% of the workforce, while there are 50 female employees, making up 25.0%. The majority of employees fall within the age range of 31 to 35 years old. Specifically, there are 80 employees each in the Cargo Services department and the Shipping department, accounting for 40% each. In contrast, the Warehouse loader

department has 40 employees, representing 20% of the total workforce. Additionally, most employees have less than 3 years of work experience.

The findings from the data analysis of General social Media usage behavior are presented in Table 2.

Variable		Numbers	%
Frequency of media usage/day	I don't use it at all.	37	18.0
	1-2 times	41	21.0
	3-4 times	72	36.0
	more than 5 times	50	25.0
Media usage time	less than 1 hr.	71	35.0
	1-2 hrs	85	42.0
	more than 2 hrs.	23	12.0
	more than 3 hrs.	21	11.0
Places the media is used	house	151	75.5
	workplace	130	68.0
	BTS/Subway	146	73.0
	cafe	145	72.5
Devices used to access media	smartphone	168	84.5
	laptop	146	72.0
	PC	118	61.5
	tablet/ Ipad	132	66.0
The App service?	Facebook	175	86.5
	YouTube	13	6.5
	Line	82	41.0
	Instagram	27	13.0
	Twitter	46	23.0
	other	8	4.4
Contact person	father, mother, siblings	69	35.5
	relative	8	4.0
	friend	109	53.0
	manager	8	4.0
	other person	7	3.5
Activities performed online	posting pictures	83	41.5
	chatting	98	48.5
	working	83	41.5
	finding knowledge	43	21.5
	finding friends	14	7.0
	playing a game	20	10.0
	buying things	37	19.0
	other	10	5.0
Things posted online regularly	daily activities	68	34.0
	pictures	176	87.0
	restaurants	34	17.0

Variable		Numbers	%
	messages	57	28.25
	various products	25	12.0
	tourist attraction	55	27.5
	press like, press share.	66	32.0
	other	8	4.0
User experiences	less than 1 year	22	1.0
	1-2 years	50	25.0
	2-3 years	32	16.0
	3-4 years	86	43.0
	more than 5 years	10	5.0
Active time	06.00-12.00 a.m.	12	5.5
	12.00-18.00 p.m.	62	30.5
	18.00-24.00 p.m.	120	61.0
	24.00-06.00 a.m.	6	3.5

1. According to the data presented in the chart, the majority of individuals utilize social media platforms between 3 to more than 4 times daily, accounting for 36.0% of the respondents. The average duration spent on social media falls within the range of 1 to 2 hours, representing 42% of the participants.

2. The primary location where Cargo employees engage with social media is at home, with 75.5% of the individuals indicating this preference, closely followed by the sky train or subway at 73 %.

3. Smartphones emerge as the most popular device for accessing social media, with 84.5 % of the respondents favoring this option, while laptops and desktop computers are equally utilized at 72% and 66 % each.

Data analysis results Behavior of using online media to develop English skills

Cargo operations officers exhibit a tendency to enhance their English proficiency by utilizing social media platforms at a level that can be classified as "occasional practice." They primarily engage in English communication with foreign acquaintances or clients through Line, Email, and Facebook, and then proceed to consume English content and humor that piques their interest on online platforms like YouTube, with percentages of 86.5% and 82%, respectively. When analyzing the behavioral patterns of Cargo employees, it is evident that regular practice, with a percentage of 10.5%, is actively seeking out English-related information pertinent to their job responsibilities. This is closely followed by efforts to improve listening skills through online media sources in order to compile a manual for educational and professional purposes, accounting for 8.5% of the total.

The findings from the comparative analysis of social media usage patterns in three different departments for the purpose of enhancing English language skills

Department	$\bar{x}$	sd
Cargo Services	16.74	3.38
Warehouse loader	17.32	3.40
Shipping	15.96	4.42

The study revealed that the mean usage of social media for enhancing English proficiency across three departments showed comparable results. Specifically, the Cargo Services department, warehouse loader department, and Shipping department had average scores of 16.74, 17.32, and 15.96, respectively.

Behavior of using social media in developing English skills Interdepartmental

Source of Variation	SS	Df	MS	F	p
between groups	52.32	2	26.16	1.74	0.17
within the group	2891.74	197	14.68		
together	2944.06	199			

An examination revealed that there was no significant difference at the .05 level in the utilization of social media for enhancing English proficiency among the Cargo Services department, the warehouse loader department, and the Shipping department.

Conclusions and Discussion

Conclusions

1. Utilizing social media platforms in the workplace can greatly enhance the English proficiency of cargo operations officers.

2. The incorporation of social media into work-related activities can contribute to the development of English language abilities for cargo operations officers.

3. By integrating social media into their professional endeavors, cargo operations officers can effectively enhance their English language skills.

Discussion

Part 1: General social media usage behavior

The findings from the study revealed that cargo operations officers predominantly utilized smartphones as their primary device for accessing social media, accounting for 31.%, followed by laptops and desktop computers. This aligns with the research conducted by Suchalak Thamduangsri (2018) on the behavior of students at Maha Sarakham Rajabhat University, which also found that smartphones were the preferred device for accessing online social networks. Similarly, Jutharat Sarawanawong and colleagues (2018) conducted a study on social media usage among undergraduate students at Kasetsart University and found that smartphones were the most commonly

used device. This preference for smartphones can be attributed to their convenience and widespread availability among students. Furthermore, the attitudes and opinions towards the impact of social media were generally positive, particularly in the realm of communication.

Social media usage patterns typically involve individuals accessing these platforms between three to more than four times a day. On average, each session lasts between 1 to 2 hours, making up 42% of the total time spent online. This aligns with the findings of Suchalak Thamduangsri's (2018) study on student behavior regarding online social networks at Maha Sarakham Rajabhat University. The research revealed that students tend to use social media more than once a day, with each session lasting 3 hours or longer, often occurring during nighttime hours.

Cargo operations officers primarily utilize Facebook, with 49% of them using this platform, followed by Line with 24% and Instagram with 13%. This data aligns with the findings of Suchalak Thamduangsri's 2018 research on the behavior of students at Maha Sarakham Rajabhat University on online social networks. The study revealed that Facebook is the most popular social network among students, a trend that is also supported by Suthiwartnarueput & Wasanasomsithi's 2012 research on the use of Facebook to enhance students' English writing skills. Their study concluded that Facebook can effectively motivate students to engage in learning and facilitate a more convenient learning experience.

- Cargo operations officers primarily utilize social media platforms the most in their homes, accounting for 75.5% of their usage, followed closely by the sky train or subway at 73%. This trend aligns with the findings of Songsit Sa-ngansak (2016), who also noted that the most common locations for social media usage among this group are at home or in dormitories.
- The main individuals that cargo operations officers interact with on social media are their friends, parents, relatives, and siblings. Additionally, a significant portion of their online activity involves posting pictures, with 48% engaging in this activity, followed by 19% who watch music videos on YouTube.
- Social media platforms are commonly used for sharing working pictures and daily routines by 88% of users, while the remaining 4% focus on news notifications and appointments, as indicated by Arunrat Srichusin's research in 2011.
- Srichusin's study on graduate students in the Faculty of Education, Educational Sciences at public universities revealed that most individuals engage in self-study to stay informed about news through online social networks.
- The primary purposes identified for using social media include entertainment,

communication, and establishing identity, with a significant number of users sharing pictures of themselves engaging in activities with friends or loved ones.

Part 2: Behavior of using social media to develop English skills. Classified according to the format for developing English skills. and benefits received

1. The research findings revealed that the majority of cargo operations officers exhibited behavior consistent with Tassanee's research, indicating a level of proficiency in using social media to develop English language skills. In a study conducted by Kirisri & Samila Kirisri (2019) at Rajamangala University of Technology Srivijaya Songkhla, the researchers aimed to investigate the usage behavior of social media among undergraduate students in the Faculty of Liberal Arts, specifically in relation to improving their English skills. The results showed that these students utilized platforms such as Line, Email, and Facebook to communicate with foreign friends, as well as engaged in English games. Additionally, they frequently searched for information to support their homework and reports, as well as to enhance their listening skills through instructional supplements.

2. The average usage behavior of social media in improving English skills was examined across three departments: Cargo Services, warehouse loader, and Shipping. The results showed that the average percentages for these departments were 16.74%, 17.32%, and 15.96% respectively. Furthermore, when comparing the social media usage behavior in improving English skills among these departments, it was found that there were no significant differences at a .05 level. These findings align with a previous study conducted by Tassanee Kirisri & Samila Kirisri (2019) on undergraduate students at Rajamangala University of Technology Srivijaya Songkhla. The research aimed to investigate social media usage behavior and its impact on English skills. The results indicated that the mean scores for improving English skills were similar across the three departments. Additionally, there was no significant difference observed among the departments in terms of improving English skills at the .05 level. Based on these findings, it can be concluded that the overall social media usage behavior of cargo operations officers is high, but their primary purposes for using social media are entertainment, stress relief, communication, and personal development. However, the English skills of these employees are still at a low level. It is worth noting that Facebook is the most commonly used platform among Cargo employees, suggesting its potential as an effective learning tool for future improvement.

Suggestions

Suggestions for applying research results

1. The study revealed that how social media could be beneficial for cargo operation officers: they can connect with professional communities or follow industry publications on social media. This exposure to English specific to the maritime field can enhance their

vocabulary and understanding of technical terms used in communication.

2. Real-Time Communication: Social media platforms like Facebook groups or professional forums allow cargo operation officers to connect with colleagues and peers worldwide. Discussing job-related issues, sharing experiences, or asking questions in English provides practice in professional communication.

3. Upskilling Opportunities: There might be online courses or tutorials specifically designed for cargo operation officers on platforms like YouTube or LinkedIn Learning. These resources can help them improve their English proficiency in areas relevant to their work, such as writing reports, conducting inspections, or giving clear instructions.

Suggestions for the next research

1. Language learning strategies: Investigate the specific language learning strategies cargo operation officers employ when using social media.

2. Professional development: Explore how social media can be integrated into professional development programs for cargo operation officers to enhance their English language skills.

3. Cross-cultural communication: Examine how cargo operation officers use social media to improve their cross-cultural communication skills in English.

4. Impact on job performance: Assess the impact of cargo operation officers improved English language skills on their job performance, such as communication with international colleagues and clients.

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Empowering Person with Disabilities (PWD) For Graduates with Work-Readiness Training: A Journey with Employers

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Abstract

The employment sector presents a significant challenge to Persons with Disabilities (PWD). The rates of employability and unemployment among PWD are also increasingly worrying. Various stigmas and discrimination are experienced by PWD while working in certain sectors to the extent that their capabilities are perceived to have a significant performance gap compared to non-disabled workers. Therefore, the primary objective of this study is to explore the issues and challenges faced by employees with disabilities within a year of being placed in an organization and undergoing the career skills training of the (Peneraju Juang Skil Kerjaya) . This study utilizes a qualitative method employing a thematic approach to analysis. To uncover these issues, seven PWD employees were interviewed using the Focus Group Discussion (FGD) method. The interviews were then transcribed and analyzed using thematic analysis. The following four themes emerged: learning the necessary job skills, feelings of fear and difficulty adapting to the workplace environment, feeling inferior, and employer hesitancy in giving work assignments/instructions. These themes can serve as a guide to improving programs oriented towards the preparation of PWD graduate workers and the Training Module for Improving the Career Skills of PWD Graduates.

Keywords: Empowering, Person with Disabilities, Readiness Training, Skills

Introduction

Unemployed PWD Graduates with work readiness training describe a group of individuals with disabilities in Malaysia who have graduated from a higher education program, participated in job training, and are seeking employment. With the emergence of a global economic boom, career opportunities to transform the labor market into a more competitive entity await in the future. Responding to this challenge, various parties need to understand the questions and concerns arising from the current and expected changes in the workplace as we enter the era of the digital millennium and a world without borders.

The most significant obstacle among today's higher education graduates is meeting the job requirements and skills needed in the workplace (Suarta et al., 2017). Lack of qualifications is a primary factor limiting access to employment for the disabled, and negative attitudes among management levels are often identified as the main obstacle to the successful placement of disabled individuals (Toritsyn & Kabir, 2013). Their disabilities cause their abilities and opportunities to be denied, making them less competitive in the job market (Verulava & Bedianashvili, 2021). Creating an accessible workplace is essential to accommodate individuals with disabilities. Research emphasizes the positive effects of accessible infrastructure and inclusive workplace policies (Hernandez et al., 2017). Tailored skills development programs for individuals with disabilities have been shown to increase their employability (Capella-McDonnall, 2005). These programs focus on building both technical and soft skills. Discrimination and bias in the workplace can contribute to the unemployment of graduates with disabilities (Baldridge, Ehrhardt & Veiga, 2014). Employers' perceptions and misconceptions about the abilities of individuals with disabilities can influence hiring decisions. The role of government policy in addressing unemployment among graduates with disabilities is crucial, as demonstrated by a study impacting the impact of supportive policies in promoting inclusion and diversity in the workforce to be met by disabled workers (Shier, Jones, & Graham, 2015). According to the Social Model of Disability (SMD), if society is established and built in a way that is accessible and friendly to people with disabilities, those individuals will not be blocked from full participation in the world around them (Barnes, 2019). This model views the origin of disability as stemming from societal attitudes and physical structures, rather than being solely a medical condition faced by the individual. Social disability can lead to difficulties in making social and emotional progress, thereby reducing the quality of life for PWD. This study is also based on the Social Model of Disability, examining how organizational structures, policies, and cultural factors affect the experience of disabled workers through the Peneraju Juang Skil Kerjaya.

Graduates need to be prepared with skills and abilities for quality education, and training policies need to complement each other to make their dreams a reality (Suarta et al., 2017). In Malaysia, a career skills enhancement module that matches the potential and ability of OKU graduates in preparation for entering the world of work has already been developed. This study is a pilot study that uses a mixed-method design, a case study on 10-15 IPTA graduates with disabilities, and 10-15 Job Coaches from government-related companies (GLC). This research focuses on OKU graduates with physical disabilities. The research period is 18 months, starting from June 2022 until November 2023. The results of this study will contribute to the development of the training module for improving the

career skills of the disabled (SKIL-KERJAYA OKU) and the Job Coach module. This will provide a specific career enhancement training module for physically disabled Bumiputera graduates and a special training module for job coaches in preparation for placing disabled graduates in GLC through the MySTEP program. Therefore, the primary objective of this study is to comprehensively explore the issues and challenges encountered by employees with disabilities within a year of their placement in an organization, subsequent to undergoing the career skills training program offered by (Peneraju Juang Skil Kerjaya). The study aims to identify and analyze the specific obstacles faced by these individuals as they integrate into the workforce post-training. By delving into these challenges, the research seeks to provide insights that can inform strategies and interventions aimed at enhancing the employment experience and overall success of employees with disabilities in professional settings.

Materials and Methods

The researcher employed a qualitative method by implementing the Focus Group Discussion (FGD) approach. FGD is a qualitative research method commonly utilized in social science and market research. It entails a small group of participants, typically ranging from 6 to 10 people, who share their opinions, perceptions, and experiences on a specific topic under the guidance of a moderator (Morgan, 1997). The FGD technique is a qualitative research design intended to explore and comprehend participants' attitudes, beliefs, and experiences about a specific topic (Krueger & Casey, 2015). A small group of individuals, selected based on certain criteria, engage in open and interactive discussions facilitated by skilled moderators.

In this study, the purpose of the FGD was to gather in-depth insights about participants' experiences with employers during a year of working under the MySTep program. A total of seven participants took part in the FGD. Study participants have the right to express their thoughts without hesitation. Pseudonyms were used to represent them, and they were made aware that they could withdraw from this research at any point in time. Thematic analysis was employed to analyze the data. Thematic analysis is a technique used to discover, examine, and describe patterns (themes) within qualitative data. Braun and Clarke (2006) highlight that thematic analysis is a versatile and approachable method that can be adjusted to suit various research questions and viewpoints. They define themes as patterns of responses or meanings within a dataset that explain or represent possible interpretations of the data (Braun & Clarke, 2006). Themes capture important aspects of the data related to the research question and can be viewed as overarching concepts that emerge during the analysis process. Braun and Clarke (2006)

later stress that coding is a crucial step in thematic analysis and forms the basis for identifying potential themes. Thematic analysis in interviews involves self-transcribing as the first phase of qualitative data analysis. Textual findings from the narratives were collected and coded using manual analysis. The codes were reviewed to produce a thematic 'diagram' of the analysis.

Results

A thematic analysis was conducted on seven interview transcripts, each representing one disabled worker participant. The interviews aimed to uncover and understand the experiences of these individuals while working with employers in the selected sector. The analysis revealed a total of four themes derived from the interview transcripts, namely: (1) Learning a lot of skills needed in the job, (2), Feelings of fear and difficulty adapting to the workplace environment, (3), Feeling inferior, (4) Employers are hesitant to give work assignments/instructions.

Table 1: Demographic profile of the participants

Participants (not a real name)	Company (not a real name)	Age
R1	Education	25
R2	Education	26
R3	Finances	25
R4	Hospital	25
R5	Services	27
R6	NGO	24
R7	Foundation	27

1. Learning a lot of skills needed in the job

The statement "Learn a lot of skills needed in the job" discusses the importance of acquiring diverse skills in the workplace for individuals with disabilities. It emphasizes that learning various skills not only benefits their careers but also enhances their versatility in the job market. The skills gained may vary based on the industry and job role, encompassing technical skills, communication, cooperation, collaboration, and problem-solving abilities. The following quotes are from interviews with respondents:

"...Learned a lot related to the process of a letter being issued, how to deal with staff hassles, knowing about human resources"... (R1)

"...Interacting with customers via email and phone calls, and managing program participant registration..." (R2)
"...I was exposed to various situations when dealing with customers; from this point of view, I was able to gain experience and be confident to interact with customers..." (R3)

According to Omar et al., (2022), the problem related to the unemployment of disabled individuals is a challenging topic due to limited information on the characteristics and skills needed by the industry to promote employment for this group. The skills required for graduates to meet the needs of the job market include digital skills, information and communication technology skills, interpersonal skills, marketing skills, practical skills, and writing skills. On the other hand, according to the study by Abd Manaf et al., (2018), the majority of respondents (57.14%) suggested that employers and the community should be informed and educated about the capabilities of the disabled. Additionally, respondents recommended that job opportunities based on qualifications be opened and given to the disabled (28.57%), and suitable and safe facilities for the disabled should be improved (28.57%).

2. Feelings of fear and difficulty adapting to the workplace environment

The statement "feelings of fear and difficulty adapting to the workplace environment" addresses the challenges faced by respondents in adapting to and navigating the workplace environment. These challenges encompass both internal and external factors, impacting the emotional well-being and overall work experience of individuals. Specific challenges identified include stigma and discrimination, accessibility and accommodation concerns, and communication challenges. Communication difficulties emerge as a prominent issue, leading to social anxiety and feelings of isolation among respondents. Quotes from interviews further illustrate these challenges:

"...I think, in the long term, it makes them often gather among themselves and chat about other people. I'm a bit uncomfortable with this culture and sometimes feel left out. But not everything is like that..." (R3)
"...One of the main challenges I experienced was that it was difficult to understand what was taught..." (R4)
"...The structure of this building uses a lot of transparent glass which is quite clear so that I can't distinguish between glass and non-glass. This situation sometimes causes me to hit the glass. However, be more careful if you go through those places..." (R7)

According to Bam and Ronnie (2020), challenges and experiences of PWD employees at the workplace are evident in the practice of induction and orientation, the struggle with disclosing disabilities to colleagues, the desire to strive for 'normality,' and feelings of frustration and weakness at the workplace. In contrast, a study by Soeker et al., (2018) found that PWD workers perceived their colleagues in the workshop as "like family" and expressed enjoyment in work tasks and the work environment, highlighting special support from their colleagues. Achieving goals, engaging in work tasks, and experiencing a sense of universality at work contribute to employees finding meaning in their lives through work participation.

(3) Feeling inferior

Feelings of inferiority among employees PWD can arise from various factors, and addressing these concerns is crucial to foster an inclusive and supportive work environment. Inferiority feelings may stem from a negative workplace culture, leading to isolation if the workplace fails to support the abilities of individuals with disabilities. The fear of being perceived as less productive than non-disabled colleagues can contribute to low self-esteem. The following quotes are from interviews with respondents:

"...Low self-confidence - not confident of being able to do the given tasks correctly and well..." (RA3)
"...Difficulty getting along with colleagues..." (RA5)
"...The challenge I face is the challenge of perception. There are times when I feel that their perception of the disabled is very low..." (RA7)

According to Abd Razak et al., (2023), MySTEP specifically contributes to increasing the feasibility of graduates with disabilities by providing valuable opportunities for skill development and practical experience. The initiative also emphasizes the potential for expansion and cooperation with external organizations, aiming to offer comprehensive and actionable resources to transform the lives of unemployed graduates with disabilities through effective job readiness training. On the other hand, according to the study by Nogueira and Sousa (2021), Person with Disabilities (PWD) acknowledge their emotions when interacting with colleagues, but many disguise their discomfort. The prevailing emotion characterizing their daily professional life is pride, highlighting the significance of work in their daily lives. Feelings of inferiority are experienced as an emotional effect when interacting with colleagues in the organization.

4. Employers are hesitant to give work assignments/instructions

Most respondents expressed that employers may hesitate to give tasks or work instructions to PWD for various reasons, influenced by misconceptions, lack of awareness, or concerns about facilities. Throughout the work experience, employers harbor misconceptions about the capabilities of individuals with disabilities, assuming they may not perform as well as their non-disabled counterparts. The following quotes are from interviews with respondents:

"...sometimes they are afraid to give assignments because they think that this group is not capable of doing them. this has given an emotional challenge to do the task..." (R1)
"...What I don't like when I'm at work is that there are employees who are afraid to give me tasks because they are afraid that I won't be able to do the tasks." (R2)
"...the scope of the assignment is also unclear. they don't give assignments in an organized manner so that sometimes i lack assignments at work. Employee awareness of the disabled is still low..." (R4)

According to Borghouts-van de Pas and Freese (2021), most employers are not very proactive in hiring people with disabilities, and they often hold stereotypical beliefs unsupported by research evidence. Disabled workers are still perceived as less efficient than non-disabled workers, and expectations for their abilities are not high. It is crucial for employers to be knowledgeable about the rights of individuals with disabilities during the screening process, including awareness of prohibited questions during recruitment (Markel & Barclay, 2009). Additionally, Omar, Zakaria and Puad (2021) found that PWD face struggles with prejudices, narrow-mindedness, and maltreatment. Employment of PWD is hindered by a skeptical and doubtful perspective regarding their ability and capacity to fulfill job responsibilities. Encouraging continuous support at the grassroots level is essential for the more prosperous development of the lives of disabled people.

Conclusions and Discussion

The main objective of this study is to explore the experiences of MySTEP program who have undergone The Career Skills Improvement Training Module for PWD Graduates (Disabled Career Skills). MySTEP is a government initiative that offers short-term employment opportunities (contracts) in various ministries, government agencies, Government-Related Companies (GLCs), government-related investment companies (GLICs), and strategic partners. The program provides individuals with disabilities from diverse academic backgrounds the opportunity to gain job opportunities and work

experience, thus improving their marketability. It involves a minimum of one (1) month and a maximum of twelve (12) months of employment in any participating organization. From the interviews conducted, four main themes emerged based on their experiences over a year of working in the organization, namely. learning a lot of skills needed in the job, feelings of fear and difficulty adapting to the workplace environment, feeling inferiority, and employers are hesitant to give work assignments/instructions. Respondents shared both positive and negative experiences. The Career Skills Improvement Module Program can indeed help graduates who have just finished their studies to secure jobs, especially for those with disabilities. This program can also serve as a platform for graduates to find employment if conducted periodically or annually. Graduates with disabilities will also have a direction after completing their studies if this program is continued or improved. Many valuable experiences can be gained, especially in employment, compared to remaining unemployed for an extended period without the opportunity for disabled workers to venture into certain sectors. Then, there are some limitations and recommendations for future research, namely sample size and generalizability. If the study involves a small or specific sample of employees or organizations, the generalizability of the findings to a wider population may be limited. Future research could target larger and more diverse samples to increase the external validity of the findings. Another limitation is time constraints; limiting the study to challenges within one year of training may overlook long-term or evolving barriers that disabled workers face over time. Future studies could consider a longitudinal approach to capture changes and persistence of challenges over a longer period. Last but not least is the methodological challenge. Thematic analysis, while valuable, may have limitations in terms of subjective interpretation and researcher bias. Researchers should acknowledge and address these challenges to increase the rigor and credibility of the study.

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Model for Optimizing Night Market Dynamics: A 4C Marketing Analysis of Seller and Buyer

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Abstract

This research aims to investigate the 4C marketing mix factors influencing both buyers and sellers in night markets in Bangkok and analyze their impact on destination loyalty intentions. Data were gathered through questionnaires administered to 385 buyers and 385 sellers across various night markets in Bangkok, encompassing Chatuchak Night Market, Srinakarin Train Market, Ratchada Train Market, Liap Duan-Ramintra Market, and Jod Fair Rama 9 Market. The results obtained from multiple regression analysis indicate that customer factors, price, convenience, and communication significantly influence loyalty in service utilization. These factors exhibit predictive coefficients of 43 percent (R^2=0.433) for repeat travel and 40 percent (R^2=0.395) for word of mouth among buyers. Similarly, the analysis of sellers' customer factors, price, convenience, and communication in relation to loyalty in service utilization reveals predictive coefficients of 36 percent (R^2=0.364) for repeat sales and 45 percent (R^2=0.453) for word of mouth at the market. Integration of the findings with the existing literature offers actionable insights for market owners seeking to enhance seller development and attract more buyers. Guided by the 4C concept, the recommended strategies include increasing buyer and seller participation, improving product quality, ensuring transparent pricing, providing special offers, enhancing transaction channels, creating systematic routes for convenience, and bolstering marketing communication channels while actively seeking customer feedback. These recommendations contribute to the ongoing scholarly discourse and provide practical directions for market owners in optimizing night market dynamics.

Keywords: Night market, Buyer, Seller, 4C

Introduction

Night markets in Bangkok, with kaleidoscope of colors, diverse offerings, and bustling energy, have become emblematic of the city's cultural and economic vibrancy (Kalnaovakul & Promsivapallop, 2021). These markets serve as pivotal spaces where sellers and buyers converge in a dynamic exchange of goods, services, and cultural experiences (Xuan, 2018). While there are no official figures regarding night market trading, data from the Thai government's one-week flea market in 2019 revealed that there were over 400,000 buyers and approximately 70,000,000 baht in turnover from the market (Thairath, 2020). This indicates that flea markets serve as Bangkok's primary spending hub and constitute an economically significant area with a substantial circulation of funds. While numerous studies have delved into the preferences and behaviors of buyers, there exists a notable gap in research when it comes to understanding the supply side dynamics (Alam, 2010; Bamrongpol, Sornsaruht, & Deebhijarn, 2020; Kalnaovakul, & Promsivapallop, 2021). The equilibrium of night markets is a delicate interplay between sellers, often small-scale entrepreneurs, and buyers, who may be locals or travelers seeking unique experiences (Yu, 2004). Despite the symbiotic relationship between these two customer groups, scholarly attention has predominantly favored the buyer's perspective, overlooking the strategic role of night market owners in shaping market dynamics (Beverland & Lockshin, 2003).

Existing literature predominantly focuses on the buyer's journey and preferences within night markets, leaving a critical gap in our understanding of the challenges, strategies, and motivations of night market owners and sellers. Exploring the supply side is essential for a more nuanced comprehension of the market's overall functioning (Täuscher & Laudien, 2018). Night market owners operate within a unique dual-customer model, catering to both sellers and buyers. Neglecting the seller's perspective undermines the intricate balance required for a thriving night market ecosystem (Feld & Hathaway, 2020).

This research acknowledges the dual clientele and aims to uncover insights that can inform strategies benefiting both sellers and buyers. Moreover, Night market owners and sellers contribute significantly to the local economy. Small and medium-sized enterprises (SMEs) form the backbone of night markets (Kubíčková, Morávková, Tuzová, & Nečas, 2017), and understanding their challenges and opportunities is crucial for fostering entrepreneurship, economic growth, and job creation within the community.

Despite the growing interest in studying the influence of marketing mix factors on destination loyalty intention in various contexts, there remains a notable gap in research concerning the specific dynamics of night markets in Bangkok. While numerous studies have explored the traditional 4Ps marketing mix, relatively little attention has been given to the emerging relevance of the 4Cs (Hunt & Arnett, 2004). marketing mix factors within

the context of night markets in Bangkok.

As Thailand continues to evolve, it is imperative to understand and optimize the dynamics of night markets to ensure their sustainability and continued positive impact on the economy, tourism, and community well-being. This research seeks to contribute valuable insights into the 4C marketing aspects that can enhance the efficiency and effectiveness of night markets in Thailand.

Objectives

1. To study the 4C Marketing Mix factors of buyers and sellers in night markets in Bangkok
2. To analyze the influence of 4C Marketing Mix factors of Buyer and Seller on Destination loyalty Intention of night markets in Bangkok
3. To formulate model for optimizing night market dynamics: a 4c marketing analysis of seller and buyer

Literature Review and Research Framework

4C Marketing Mix

The shift from the traditional 4P model to the 4C model signifies a paradigmatic change in marketing philosophy. Kotler's (1960) 4P framework primarily focused on the producer's viewpoint, with a strong product-centric approach (Kotler & Schultz, 1970). However, as observed by Lauterborn (1990), the 4C model places the customer at the center, fostering a more customer-oriented and interactive marketing approach.

Customer-Centricity in Night Market Research: Night markets, characterized by diverse offerings and vibrant atmospheres (Ishak, Aziz, & Ahmad, 2012), necessitate a customer-centric approach that transcends the traditional buyer-focused studies (Sheth, Sisodia, & Sharma, 2000). The 4C framework provides a more holistic understanding of the Customer element by considering both buyers and sellers as customers (Ali & Ilyas, 2016). It allows researchers to delve into the motivations, preferences, and challenges faced by night market sellers, contributing to a more comprehensive analysis of market dynamics.

Cost Considerations for Sustainable Night Markets: The Cost component of the 4C model extends beyond the traditional pricing strategies (Cattani, Gilland, Heese, & Swaminathan, 2006). In the context of night markets, understanding the costs incurred by both sellers and buyers is crucial. Night market owners must be aware of the financial constraints faced by sellers, ensuring a fair and sustainable marketplace (Pottie-Sherman & Hiebert, 2015). Simultaneously, buyers' perceptions of value and affordability are integral to maintaining a balanced and thriving market ecosystem.

Convenience and the Night Market Experience: Convenience, in the 4C framework,

encompasses the ease of access, use, and transaction for both sellers and buyers (Maity & Singh, 2021). Night markets often operate in unconventional spaces and hours, making convenience a critical factor in attracting and retaining participants. A thorough examination of convenience factors can unveil opportunities for operational improvements, enhancing the overall night market experience for both parties (Lee & Pearce, 2020).

Communication Strategies for Night Market Success: Effective Communication is essential in the 4C model, facilitating meaningful interactions between sellers, buyers, and market organizers (Sridharan & Viswanathan, 2008). In night markets, clear communication channels contribute to vendor visibility, customer engagement, and the overall vibrancy of the market (Bartlett, Julien, & Baines, 2007). Analyzing communication dynamics helps identify areas for improvement, enabling the development of strategies that foster collaboration and mutual understanding.

In conclusion, the 4C Marketing Mix Theory offers a nuanced and inclusive framework for studying night markets, moving beyond the traditional buyer-centric approach. By comprehensively analyzing the Customer, Cost, Convenience, and Communication aspects, researchers and market stakeholders can develop insights and strategies that contribute to the holistic development and optimization of night markets, fostering sustainable and thriving marketplaces in urban landscapes like Bangkok

Destination loyalty intention

Destination loyalty intention, encompassing the intention to return and willingness to recommend, has become a crucial focal point in tourism and destination management literature. This review explores key concepts related to destination loyalty intention and how it serves as a significant indicator of the market owner's success in maintaining a loyal customer base among both buyers and sellers in dynamic marketplaces.

Intention to return refers to the psychological predisposition of a visitor or participant to revisit a destination. It reflects the satisfaction, positive experiences, and emotional connections formed during the initial visit. Studies by Bigne, Sanchez, and Sanjez (2001) emphasizes the role of satisfaction and perceived value in shaping tourists' intentions to return. Positive experiences, cultural immersion, and a sense of fulfillment contribute significantly to the intention to revisit a destination.

Willingness to recommend measures the extent to which visitors or participants are inclined to suggest a destination or marketplace to others. It is often seen as an indicator of overall satisfaction and positive perceptions. Research by Sparks and Browning (2011) and Lee and Hsu (2013) suggests that willingness to recommend is influenced by factors such as satisfaction, perceived value, and the quality of interactions. Positive word-

of-mouth generated through recommendations plays a vital role in attracting new participants.

Destination loyalty intention enable trust and positive experiences of the both seller and buyer. The intention to return and willingness to recommend are closely tied to the trust and positive experiences created within the marketplace (Anuwichanont & Mechinda, 2009). Market owners who prioritize transparent and fair practices, ensure quality offerings, and facilitate positive interactions contribute to the development of trust among both buyers and sellers (Corbera, Kosoy, & Tuna, 2007). When sellers perceive fair treatment, collaboration, and support from market owners, it positively influences their intention to participate consistently. This, in turn, contributes to the overall success and longevity of the market.

Therefore, effective communication and marketing strategies are essential for conveying the unique selling propositions of the marketplace. Market owners who engage in targeted promotional activities, communicate value propositions, and address the concerns of both buyers and sellers are more likely to witness a higher intention to return and recommend (Chaffey & Smith, 2022).

Bangkok Night market

Night markets and flea markets have become integral components of Bangkok's cultural, economic, and social landscape, offering a unique blend of traditional and contemporary experiences. This literature review delves into key themes and insights from academic studies and research articles that explore the multifaceted aspects of night markets and flea markets in the vibrant city of Bangkok.

Night markets in Bangkok play a crucial role in preserving and promoting the city's rich cultural heritage. Research by Mateo-Babiano (2012) emphasizes how these markets serve as spaces where traditional crafts, local cuisines, and indigenous products are showcased, contributing to the continuity of Thai cultural practices. Studies by Xuan (2018) also highlight the communal nature of night markets, fostering social interaction and community bonding. These markets provide spaces for residents and visitors alike to engage in shared cultural experiences, contributing to a sense of belonging and identity.

Night markets are often hubs for small-scale entrepreneurs and local artisans. Research by Niesing, Merwe, & Potgieter (2016) emphasizes the economic significance of these markets in providing income-generating opportunities for small businesses and entrepreneurs, contributing to the informal economy. In addition, the Tourism Authority of Thailand (2023) underscores the role of night markets in attracting tourists and stimulating economic growth. Night markets contribute substantially to tourist spending, creating a symbiotic relationship between the tourism industry and the local economy.

However, night market in Bangkok faces many challenges and opportunities. Challenges related to environmental sustainability are addressed in the research of Jumepaeng and Pongpun (2020). The research discusses the integration of technology in night markets, including the use of mobile applications and digital platforms for marketing and transaction purposes. The study explores how technology adoption can enhance market efficiency and customer satisfaction.

From preserving tradition and fostering entrepreneurship to contributing to urban revitalization and addressing contemporary challenges, the literature underscores the multifaceted nature of these markets. As Bangkok continues to evolve, ongoing research in these areas is crucial for informing policies, fostering sustainable development, and ensuring the continued vibrancy of night markets in the city

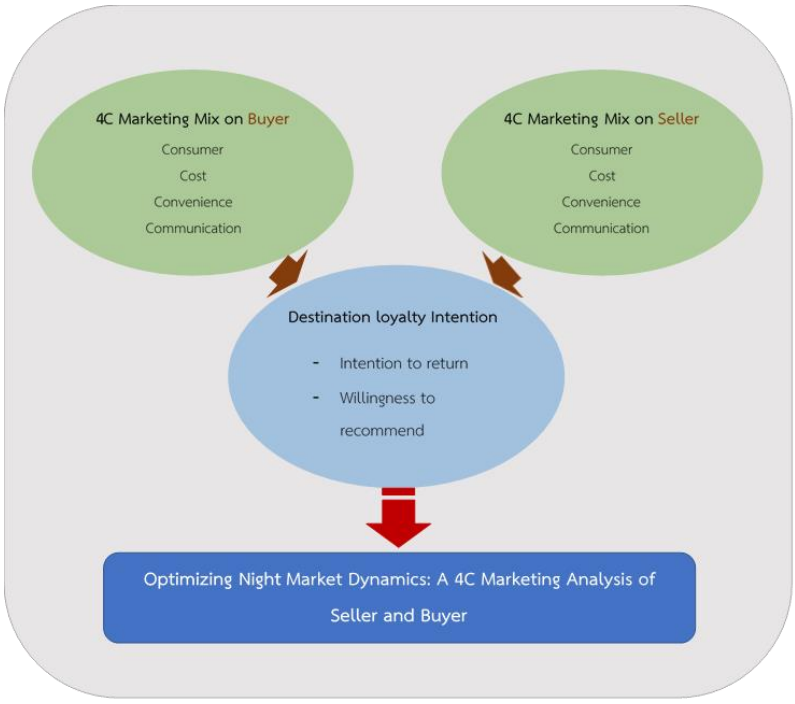

Figure 1: Research Framework

Research Methodology

1. Population and Samples

To attain research objectives 1 and 2, information was sourced from buyers and sellers at various night markets in Bangkok, including Chatuchak Night Market, Train Night Market Srinakarin, Train Night Market Ratchada, Liab Duan Market, Ramintra, and JODD FAIRS Rama 9. Due to the challenge of determining the population with absolute certainty, a statistical inference methodology, specifically Cochran's sample calculation, was applied. This calculation,

based on a 95% confidence level and a maximum margin of error of 0.05, resulted in a sample size of 385 for both buyers and sellers. The selection of the study population and participants was carried out using purposive and stratified sampling techniques, outlined in Table 1.

Table 1: Purposive and Stratified Sampling Techniques' Result

Province	proportional allocation for buyers	proportional allocation for sellers
Chatuchak Night Market	77	77
Train Night Market Srinakarin	77	77
Train Night Market Ratchada	77	77
Liab Duan Market, Ramintra	77	77
JODD FAIRS Rama 9 - Night markets	77	77
Total	**385**	**385**

2. Research Instrument

Primary data was collected using self-administered structured questionnaires, which underwent content validation by a panel of five tourism and hospitality experts. The Index of Item-Objective Congruence (IOC) yielded a score of 0.85, surpassing the 0.75 threshold, affirming questionnaire validity. A pilot test with 70 questionnaires (35 for buyers and sellers each) was conducted on non-target samples to identify and address potential issues. Reliability, assessed through Cronbach's Alpha Coefficient, yielded a high coefficient of 0.915, exceeding the recommended 0.7 threshold, indicating commendable reliability. On-site distribution ensured completeness, and an online option via Google Forms enhanced accessibility for effective data collection.

3. Data Analysis

Descriptive Statistics was used to present and explain the basic features of the data (Frequency, Percentage, Mean, and Standard Deviation). Multiple Regression was utilized for investigating the effect of 4C marketing mix of buyers and sellers on destination loyalty intention.

Results

As defined in Table 2 and 3, the outcomes derived from the Multiple Regression Analysis illuminate that the independent variables pertaining to buyers' 4C exerted a positive influence on the dependent variable of Destination Loyalty Intention. Specifically,

this influence manifested in the dimensions of 'Intention to return' and 'Willingness to recommend,' as denoted by notable correlation coefficients of 0.658 (R = 0.658) and 0.628 (R = 0.628), respectively.

The coefficient of determination (R^2) elucidates the extent to which the model explicates the variance in the dependent variables. In the context of 'Intention to return,' the coefficient of determination (R^2) between 4C and the intention was calculated at 0.433, implying that the model accounted for 43 percent of the variability in 'Intention to return.' Similarly, for 'Willingness to recommend,' the coefficient of determination (R^2) between 4C and the intention in question was determined to be 0.395, indicating that the model elucidated 40 percent of the variability in 'Willingness to recommend.'

Table 2: Results of multiple regression analysis for buyers' 4c affecting destination loyalty intention in intention to return.

Variable	B	S.Eb	Beta	t	Sig.
(Constant)	1.170	0.167		6.992	0.000
Customer	0.124	0.039	0.152**	3.176	0.002
Cost	0.167	0.037	0.207**	4.503	0.000
Convenience	0.159	0.037	0.195**	4.312	0.000
Communication	0.264	0.041	0.308**	6.521	0.000
R = 0.658 R2 = 0.433 S.E.est = 0.560 F = 72.601 Sig. = 0.000				Note: *p < 0.05, ** p < 0.01	

Table 3: Results of multiple regression analysis for buyers' 4C affecting destination loyalty intention in willingness to recommend.

Variable	B	S.Eb	Beta	t	Sig.
(Constant)	1.153	0.176		6.565	0.000
Customer	0.229	0.037	0.282**	6.183	0.000
Cost	0.115	0.049	0.134*	2.353	0.019
Convenience	0.144	0.054	0.158**	2.692	0.007
Communication	0.177	0.052	0.209**	3.419	0.001
R = 0.628 R2 = 0.395 S.E.est = 0.579 F = 61.910 Sig. = 0.000				Note: *p < 0.05, ** p < 0.01	

Table 4: Results of multiple regression analysis for sellers' 4c affecting destination loyalty intention in intention to return.

Variable	B	S.Eb	Beta	t	Sig.
(Constant)	1.390	0.169		8.241	0.000
Customer	0.193	0.053	0.232**	3.649	0.000
Cost	0.160	0.051	0.188**	3.124	0.002
Convenience	0.126	0.048	0.145**	2.618	0.009
Communication	0.110	0.038	0.153**	2.892	0.004
R = 0.603 R2 = 0.364 S.E.est = 0.558 F = 54.404 Sig. = 0.000				Note: *p < 0.05, ** p < 0.01	

Table 5: Results of multiple regression analysis for sellers' 4C affecting destination loyalty intention in willingness to recommend.

Variable	B	S.Eb	Beta	t	Sig.
(Constant)	1.003	0.163		6.155	0.000
Customer	0.171	0.051	0.197**	3.341	0.001
Cost	0.187	0.050	0.211**	3.772	0.000
Convenience	0.231	0.047	0.255**	4.965	0.000
Communication	0.105	0.037	0.140**	2.844	0.005
R = 0.673 R2 = 0.453 S.E.est = 0.539 F = 78.564 Sig. = 0.000				Note: *p < 0.05, ** p < 0.01	

As evidenced in Table 4 and 5, the outcomes of the Multiple Regression Analysis elucidated that the independent variables associated with the sellers' 4C exhibited a positive impact on the dependent variable of Destination Loyalty Intention, specifically within the dimensions of 'Intention to return' and 'Willingness to recommend.' Notably, the correlation coefficients for these dimensions were determined to be 0.603 (R = 0.603) and 0.673 (R = 0.673), respectively, signifying a substantial positive relationship.

The coefficient of determination (R^2) serves as an indicator of the proportion of variability in the dependent variable explained by the independent variables. For the dimension of 'Intention to return,' the calculated coefficient of determination (R^2) between 4C and the aforementioned intention was 0.364, denoting that the model accounted for 36 percent of the variance in 'Intention to return.' Similarly, in the context of 'Willingness to recommend,' the coefficient of determination (R^2) between 4C and the intention in question was established at 0.453, implying that the model explicated 45 percent of the variability in 'Willingness to recommend.'

Conclusions and Discussion

Customer - In order to cultivate a more personalized and customer-centric experience in Bangkok's night market, sellers should undergo training programs focused on enhancing their interpersonal skills (Zaki & Neely, 2019). This training aims to equip sellers with the ability to engage customers on a personal level, actively addressing individual preferences, and offering tailored recommendations (Swift, 2001). Concurrently, the implementation of loyalty programs and exclusive offers for returning customers becomes instrumental in fostering customer retention. By recognizing and rewarding customer loyalty, sellers can further enhance the overall shopping experience (Berman, 2006).

Moreover, an emphasis on the provision of high-quality products or services is paramount. Sellers are encouraged to prioritize the quality of their offerings, as this not only contributes to customer satisfaction but also establishes a foundation of trust (Ahearne, Jelinek, & Jones, 2007). Actively showcasing positive customer reviews and

testimonials becomes a powerful tool in building credibility and instilling confidence in potential buyers (Hyder, 2016). By incorporating these practices, sellers in the night market can create a positive and trusting environment that resonates with customers and encourages repeated engagement.

Cost - To promote a transparent and trustworthy transaction environment in Bangkok's night market, sellers should prioritize the clear display of prices, ensuring that customers have a comprehensive understanding of the costs associated with their purchases. This transparency not only establishes trust but also fosters a positive perception among customers (Iglesias, Markovic, Bagherzadeh, & Singh, 2020).

In addition to transparent pricing, sellers can implement competitive pricing strategies and periodic promotions or discounts to attract and retain customers (Kopalle, et al., 2009). Offering competitive prices and special promotions serves as an effective means of capturing customer attention, creating a compelling value proposition, and encouraging repeated patronage (Sheth & Sisodia, 2012). Moreover, sellers can further incentivize higher spending by providing bundled deals or discounts for customers purchasing multiple items. This approach not only adds value to the customer's shopping experience but also stimulates increased spending, contributing to the overall profitability of the seller.

Convenience - To enhance the overall customer experience in Bangkok's night market, sellers should prioritize streamlining payment processes to minimize waiting times and improve transaction efficiency. Accommodating diverse customer preferences, sellers should accept various payment methods (Liao, Chu, Chen, & Chang, 2012). Additionally, optimizing the market layout for easy navigation and accessibility is crucial to creating a seamless shopping environment (Kalbach, 2007). Clear signage and information should be implemented to assist customers in easily locating their desired products or services. By focusing on these aspects, sellers can create a more efficient and customer-friendly night market setting, ultimately contributing to heightened satisfaction and improved customer engagement (Lee, Chang, Hou, & Lin, 2008).

Communication - Effectively engaging with customers in Bangkok's night market involves the strategic utilization of signage and digital platforms. Sellers should invest in visually appealing and informative signage to attract and communicate with customers, creating an inviting atmosphere (Chin & Harun, 2015). Leveraging social media platforms for pre-market promotions and real-time updates enhances visibility and draws in a broader audience. Establishing channels for customer feedback showcases a commitment to improvement; actively seeking and responding to input demonstrates attentiveness and fosters positive customer relations (Zaki & Neely, 2019). By combining these strategies, sellers can optimize

communication channels, strengthen their online presence, and cultivate a customer-centric environment in the night market (Kalnaovakul, & Promsivapallop, 2021).

These strategies aim to enhance the sellers' 4C elements in the night market setting, aligning with the findings from the Multiple Regression Analysis. By focusing on personalized engagement, transparent pricing, convenience, and effective communication, sellers can foster positive perceptions among buyers, thereby increasing their 'Intention to return' and 'Willingness to recommend.' Additionally, continual assessment and adaptation of these strategies based on market dynamics and customer feedback will contribute to sustain success in the night market in Bangkok.

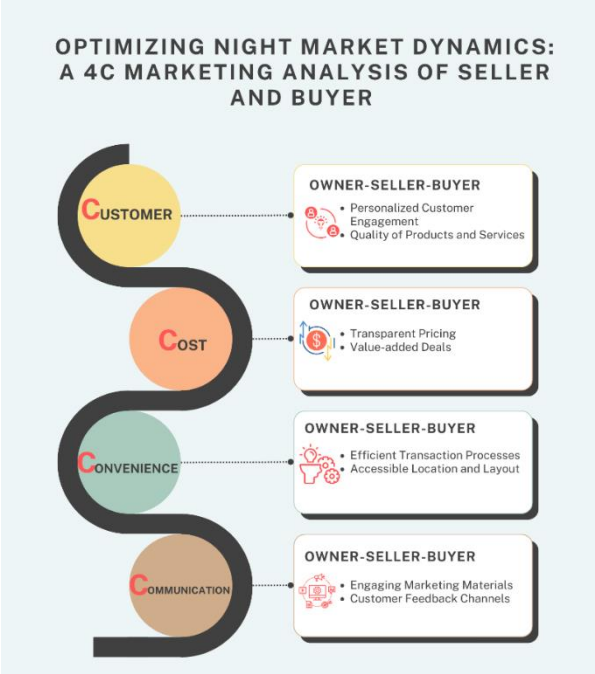

Figure 2: model for optimizing night market dynamics with the application of the 4C marketing analysis

Suggestions

This study investigates the 4C dimensions of buyers and sellers participating in night markets in Bangkok. The research aims to elucidate the buying behavior, preferences, and insights of buyers, an aspect that remains unexplored in the existing body of knowledge. Furthermore, the perspectives of sellers, inclusive of their opinions regarding market dynamics, have not been adequately addressed in scholarly discourse. Given the gap in the current understanding of these dynamics, interviews are proposed to be conducted.

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Determinants of Menu Pricing for Thai Food Restaurants in Bangkok

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Abstract

The objectives of this research article were to study the level of consumer opinions regarding food quality, service quality, restaurant atmosphere, and menu pricing of Thai restaurants in Bangkok, and the influencing factors affecting menu pricing of Thai restaurants in Bangkok. Questionnaires were used to collect data from 384 respondents who ate at 12 famous Thai restaurants advertised on the TrueID website. The results found that respondents had good opinions on food quality, service quality, and restaurant atmosphere, and provided opinions on menu pricing at an appropriate level. Food quality has the greatest influence on price (t = 8.121), followed by restaurant atmosphere (t = 5.607) and service quality (3.207) respectively. These three variables can explain the price by 42.1 percent, with a statistical significance at a .05 level.

Keywords: Food Quality, Service Quality, Restaurant Atmosphere, Menu Pricing, Thai Restaurants

Introduction

A restaurant business is of importance to Thai people living in a city because of a smaller family size, having no time for cooking every meal, and a convenience in ordering food online. In 2022, the number of food and beverage operators was recorded at 384,777, of which 22.25 percent registered in Bangkok and its vicinity. This business generated income of 260,171 million baht, of which 87.91 percent resulted from the restaurants in Bangkok and its vicinity. It was a 76.4 percent growth rate after the outbreak of the 2019 coronavirus can be controlled (Trade Policy and Strategy Office, 2022). Thai restaurant business, in addition, faces very high competition from overseas franchise restaurants and other distribution channels, such as Cloud Kitchen and Home Kitchen.

At present, food consumption behavior of Thai people in the city has changed a lot to eat out due to a smaller family size, and traffic congestion problems. Eating out is cheaper than cooking at home, better taste, and there are more promotions to choose from. Eating out is also considered an event to relieve stress from work stress, meet with friends and family. Many families spend time shopping for things for home uses and take the opportunity to eat outside together (Cha & Rha, 2021).

From the past study, there were main significant effects of food quality, service quality, and restaurant atmosphere on the menu pricing in the context of restaurants in the hotels abroad (Hanefors & Mossberg, 2021). Davenport, DelleMule and Lucker (2011) stated that it was important to consider that businesses should create specifically customized offers, good accurate service, and product quality. Han and Rye (2009) commented in their research that price is considered a factor that varies with the decoration and atmosphere of the restaurants. Customers will expect a good atmosphere from the restaurants that set high food prices. On the other hand, if the restaurant sets low prices, customers may think that the restaurant has low quality food and atmosphere. The researcher is therefore interested in studying whether those factors affect menu pricing of Thai restaurants in Bangkok.

Research Objectives

1. To study consumers' opinions toward food quality, service quality, restaurant atmosphere, and menu pricing of Thai food restaurants in Bangkok.
2. To study the influential factors affecting menu pricing of Thai food restaurants in Bangkok.

Literature Review

Ministry of Public Health (Bureau of Food and Water Sanitation, 2021) has divided Thai restaurants into 5 categories as below:

1) A hotel restaurant refers to a restaurant operated in a hotel.
2) A restaurant means a large eating place with 2 booths or more in the buildings, and its employees wear uniforms.
3) A food park means a large restaurant which mostly has outdoor dining place. with natural atmosphere. Its Employees wear uniforms.
4) A general restaurant means a small place with 1-2 booths inside the building. The food is mostly local food or specific food such as rice and curry, noodles, chicken rice, red pork rice, papaya salad, and a la carte food.
5) Beverage, dessert, and ice cream shop means a shop that sells only drinks, desserts, or ice cream.

The Ministry of Commerce (2009) classifies restaurants into 4 types according to their decorative design:

1) A luxury restaurant (Fine Dining) is a restaurant with a meticulously decorated, and beautiful design with expensive materials and equipment. The food is luxurious arranged and providing a 5-star service equivalence.

2) A Mid-range restaurant (Casual Dining) is a restaurant with an appropriate design. and decoration, emphasizing a casual and friendly atmosphere. The restaurant has moderate food prices, and friendly service staff.

3) A general restaurant (Fast Dining) is a restaurant with a simple design and decoration. The restaurant provides fast and convenient service with a limited menu but expects high visiting of customers.

4) A shop along the sidewalk (kiosk) is a shop with a simple design and decoration. Normally, the owner is the chef himself, and prepares easily and quickly dishes.

Ministry of Commerce by the Department of Business Development (2019) divides restaurants according to the service area as below:

1) A small restaurant is a restaurant with an area not exceeding 50 squares. meters. This type of restaurant may not have food served to the tables. The service is similar to that of other fast-food restaurants.

2) A medium restaurant is a restaurant with an area ranging from 50-200 square. meters. There may be a slight decoration to create an atmosphere that attracts customers' attention.

3) A large restaurant is a restaurant with an area of 200 square meters or more. This type of restaurant is expected to provide good service as customers willing to pay tips and VAT in addition to food costs.

Dube, Trudeau, and Belanger (1994) concluded in their research that service quality is related to price and customer satisfaction measuring in the areas including food taste, Varieties of food items, an attentiveness of service staff, Waiting time before seating, and restaurant atmosphere.

Kivela, Reece & Inbakaran (1999) explained in their research on measuring the dimensions of food quality, service quality, and restaurant atmosphere as follows:

Food quality can be measured by the palatability of food, a variety of food items, nutritional value of food, taste of food, freshness of ingredients, and food temperature.

Service quality can be measured by the service employees in terms of politeness, willingness to provide service, welcoming speech to customers, service efficiency, explaining food and beverage items correctly, solving customers' problems.

Restaurant atmosphere can be measured by noise level, cleanliness, customer privacy, temperature inside the restaurant, and surrounding view of the restaurant.

According to the research of Choi and Zhao (2010), different ages and demographics in the US prefer service speed, food and service quality, friendliness of

serving staff members, convenience and incentives while dining in restaurants that affect the price they willing to pay.

A recent study by Gan et al. (2017) illustrates that researchers have generally agreed on four factors affecting restaurant prices, namely food quality, service, atmosphere or ambience and menu choice. They analyzed Yelp review data of restaurants by using sentiment analysis to identify attributes affecting the overall star ratings. They found that food quality, service, context, and atmosphere had significant impacts on the overall price and dining experience.

Chen et al. (2020) collected the data from Gen Y respondents, surprisingly, the results showed that restaurant ambiance, brand image, having a new experience, the noise inside the restaurant, parking facilities and restaurant reviews were stated as neither important nor unimportant factor by more than one in third of the Gen Y participants. Unlike the previous study of Cullen (2005) and Liu and Tse (2018), these attribute dimensions are vital for restaurants since they are constantly competing to stand out in the restaurant industry.

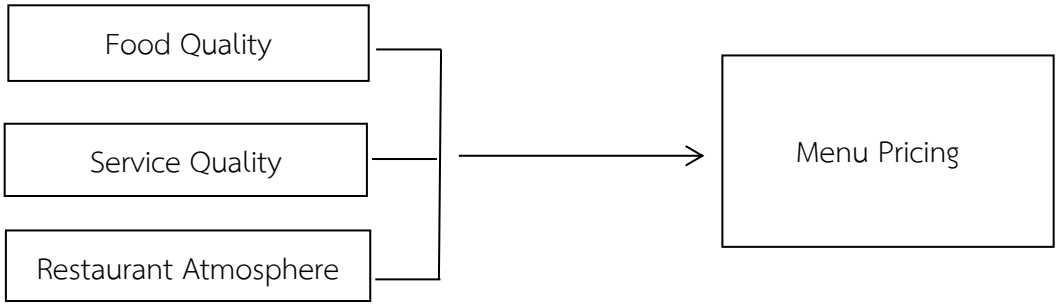
Scope of the Study

1) The population under the study was Thai consumers eating at Thai restaurants. in Bangkok.

2) The study emphasized on the effects of food quality, service quality, and restaurant atmosphere on menu pricing for Thai restaurants in Bangkok.

3) The questionnaires were collected from the respondents during December 15, 2023 to January 15, 2024.

Conceptual Framework



Research Methodology

Population and Samples

The population is the consumers who eat in large Thai restaurants in Bangkok. Due to an unknown population size, Cochran's formula (Cochran, 2007) is used to find the sample size by setting the proportion of the studied population at 0.5 level and allowing an error to occur at 5 percent. Therefore, the number of samples obtained from the calculation was 384 people as below.

$$n = \frac{p\,(1-p)\,z^2}{e^2}$$

$$n = \frac{0.5\,(1-0.5)(1.96)^2}{(.05)^2} = 384 \text{ คน}$$

n = Number of samples

P = Proportion of the population is set at 0.5

e = The desired level of error is set at .05

Z = The Z-value, extracted from a Z-table.

Z = 1.96, when the confident level is 95%

Z = 2.58, when the confident level is 99%

The samples were collected from the respondents eating in the twelve Thai restaurants advertised on the TrueID website as a famous restaurant. They are located in the districts of Phasi Charoen (one restaurant), Phra Nakhon (three restaurants), Khlong Toei (one restaurant), Sathorn (one restaurant), Watthana (one restaurant), Khlong San (one restaurant), Phaya Thai (one restaurant), Bang Yi Khan (one restaurant), Lat Phrao (one restaurant), and Yan Nawa (one restaurant). Only 32 complete questionnaires were collected from each restaurant by random sampling method.

Measurement and Instrumentation

A close-ended questionnaire was used to collect data from the respondents. The questionnaire was divided into three parts as follow:

Part 1: Demographic characteristics of the sample include gender, age, education level, occupation, and monthly income.

Part 2: Questions about consumers' opinions toward Thai restaurants in terms of food quality (items 1-5), service quality (items 6-9), restaurant atmosphere (items 10-13), and menu pricing (items 14-16). All questions are a Likert scale, which determines scores

according to the degree of agreement in 5 levels, where 5 means the highest level, 4 means a high level, 3 means a moderate level, 2 means a low level and 1 means the least level.

Part 3: Other recommendations to provide a space for the respondents to write if they had any suggestions.

The researcher defined the meaning of the average score for food quality, service quality, restaurant atmosphere, and menu pricing into 5 levels with the following criteria (Best & Kahn, 2014).

Average Score Range	Food Quality/ Service Quality/ Restaurant Atmosphere	Price
4.51 – 5.00	Excellence	Very Suitable
3.51 – 4.50	Good	Suitable
2.51 – 3.50	Fair	Moderate
1.51 – 2.50	Improvement	Expensive
1.00 – 1.50	Poor	Very Expensive

Validity and Reliability

1) To test the validity, the questionnaire was inspected by the experts in the field regarding the accuracy and appropriateness of the content and was corrected according to the experts' suggestions.

2) To test the reliability, a pilot test was conducted with 30 consumers who ate at a Thai restaurant. The reliability was calculated at 0.895 by using Cronbach's alpha coefficient method.

Statistical Analysis

1) Descriptive Statistics was used including frequency, percentage, mean and standard deviations.

2) Regression analysis was used to find factors affecting menu pricing of Thai restaurants in Bangkok.

Results

1. Characteristics of Respondents

The results of the respondents showed that the majority were female (53.1%), aged between 41-50 years (34.9%), had a bachelor's degree (57.6%), were employees by private companies (48.2%).

2. Level of consumer opinions regarding food quality, service quality, restaurant atmosphere, and menu pricing at Thai restaurants in Bangkok

2.1 Level of Consumer Opinion on Food Quality

The results found that the respondents had good opinions on overall food quality ($\overline{X}$ =3.97, S.D. = .590). When considering each item, the items with average scores arranged from highest to lowest was "Variety of food items" ($\overline{X}$ = 4.11, S.D. = .638), "Taste of food" ($\overline{X}$ = 4.04, S.D. = .685), "Food presentation" ($\overline{X}$ = 3.96, S.D. = .637), "Freshness of ingredients" ($\overline{X}$ = 3.91, S.D. = .693), and "Food temperature" ($\overline{X}$ = 3.85, S.D. = .725) as shown in Table 1.

Table 1: Level of consumer opinions on food quality of Thai restaurants in Bangkok

Items	Average Score	S.D.	Meaning
Variety of food items	4.11	.638	Good
Food presentation	3.96	.637	Good
Food temperature	3.85	.725	Good
Freshness of ingredients	3.91	.693	Good
Taste of food	4.04	.685	Good
Overall food quality	3.97	.590	Good

2.2 Level of Consumer Opinion on Service Quality

The results found that the respondents had good opinions on overall service quality ($\overline{X}$ = 3.85, S.D. = .595). When considering each item, the items with average scores arranged from highest to lowest was "Accuracy of order receiving" ($\overline{X}$ = 3.91, S.D. = .744), "Willingness to provide service of employees" ($\overline{X}$ = 3.85, S.D. = .747), "Cleanliness of service employees' uniform" ($\overline{X}$ = 3.82, S.D. = .798), and "Explanation of food details" ($\overline{X}$ = 3.80, S.D. = .746) as shown in Table 2.

Table 2: Level of consumer opinions on service quality of Thai restaurants in Bangkok

Items	Average Score	S.D.	Meaning
Cleanliness of service employees' uniform	3.82	.798	Good

Willingness to provide service of employees	3.85	.747	Good
Explanation of food details	3.80	.746	Good
Accuracy of order receiving	3.91	.744	Good
Overall service quality	3.85	.595	Good

2.3 Level of Consumer Opinion on Restaurant Atmosphere

The results found that the respondents had good opinions on overall restaurant atmosphere ($\overline{X}$ = 3.77, S.D. = .613). When considering each item, the items with average scores arranged from highest to lowest was "Lighting inside the restaurant" ($\overline{X}$ = 3.93, S.D. = .685), "Cleanliness of the area and equipment" ($\overline{X}$ = 3.82, S.D. = .693), "Temperature inside the restaurant" ($\overline{X}$ = 3.69, S.D. = .850), and "Appropriateness of noise in the restaurant" ($\overline{X}$ = 3.65, S.D. = .872) as shown in Table 3.

Table 3: Level of consumer opinions on restaurant atmosphere of Thai restaurants in Bangkok

Items	Average Score	S.D.	Meaning
Lighting inside the restaurant	3.93	.685	Good
Cleanliness of the area and equipment	3.82	.693	Good
Appropriateness of noise in the restaurant	3.65	.872	Good
Temperature inside the restaurant	3.69	.850	Good
Overall restaurant atmosphere	3.77	.613	Good

2.4 Level of Consumer Opinion on Menu Pricing

The results found that the respondents had good opinions on overall menu pricing ($\overline{X}$ = 3.78, S.D. = .624). When considering each item, the items with average scores arranged from highest to lowest was "Appropriateness of food price and quantity" ($\overline{X}$ = 3.93, S.D. = .691), "Value for money" ($\overline{X}$ = 3.84, S.D. = .685), and "Similar price to other restaurants" ($\overline{X}$ = 3.56, S.D. = .979) as shown in Table 4.

Table 4: Level of consumer opinions on restaurant atmosphere of Thai restaurants in Bangkok

Items	Average Score	S.D.	Meaning
Similar price to other restaurants	3.56	.979	Suitable
Appropriateness of food price and quantity	3.93	.691	Suitable
Value for money	3.84	.685	Suitable
Overall menu pricing	3.78	.624	Suitable

3. Determinants of menu pricing for Thai restaurants in Bangkok

The researcher used the multiple regression analysis method by entering all. independent variables including food quality, service quality, and restaurant atmosphere, and the dependent variable was menu pricing. The test was performed at the statistical significance level of .05.

From Table 5, the VIF (Variance inflation factor) value is between 1.617-2.090, which indicates the independent variables have little relationship. The results found that food quality, service quality, and restaurant atmosphere affected menu pricing with statistical significance at a .05 level (F = 41.488, Sig. = .000). The effects of food quality, service quality and restaurant atmosphere were positively related to menu pricing. Those variables were able to explain 42.1% of the variation in the menu price as shown in table 5.

Table 5: Regression analysis of the influential factors on menu pricing of Thai restaurants in Bangkok.

Model	Unstandardized Coefficients		Standardized Coefficients			
Variable	B	S.E	B	VIF	t	P-value
(Constant)	.936	.219			4.273	.000*
Food quality	.535	.066	.436	1.617	8.121	.000*
Service quality	.213	.064	.212	2.090	3.207	.000*
Restaurant atmosphere	.374	.059	.209	1.887	5.607	.000*
R^2 = .421, SEE = .516, F = 59.951, Sig. of F = .000						

* $p < .05$

Conclusions and Discussion

Food quality: The results showed that the variety of food items, the presentation of food items, and the freshness of ingredients had an influence on menu pricing, which is in line with a study of Saulo (2016). He explained that most restaurant customers are those in generation Y who eat at the restaurant because of social gatherings and wanting to take photos of the food and uploading them on their social media. Some researchers also explained in their research that food quality, which consisted of its temperature, its presentation and the accuracy of food ordering, determined menu price and the tips given to restaurant employees (Norris, Taylor, & Taylor, 2023).

Service quality: The results showed that service quality, especially in terms of willingness to provide service and being able to explain the details of food and drink, had effects on food prices. The manager had to consider providing equal services between males and females as the research found that males gave a lower score on service quality than females did. It must also consider the different expectations of an individual consumer's profession. Ryu and Han (2010) stated that service quality is an additional factor for further evaluation when customers perceived high prices after assessing food quality.

Restaurant atmosphere: The results showed that the restaurant atmosphere affected the price, especially the lighting and temperature inside the restaurant, and the cleanliness of the area and equipment. However, the sound in the restaurants did not have a significant effect on the price because each customer had common perception characteristics (Jordaan & Prinsloo, 2015). The restaurant atmosphere was an antecedent to customer satisfaction, leading to a willingness to pay high prices (Zhan et al., 2020).

Menu pricing: The results showed that food price was appropriate in general, but when comparing to the other restaurants, the price of Thai restaurants was somewhat higher. There were different opinions among age groups which was in line with the research of Raab, Mayer, Kim, and Shoemaker (2009) who collected data from customers who ate a buffet at a restaurant in Hong Kong and concluded that customers of different ages had different opinions on the price.

Recommendations

Recommendations for applying the research results

1) Thai restaurants should focus on developing a variety of food menus and use. fresh ingredients. They should use the same types of ingredients as much as possible in order to avoid lots of waste. Thai restaurants should inform chefs to cook strictly with specified standard recipes so that customers perceive a consistency of food taste.

2) Thai restaurants should have a process of selecting service staff who are polite, smiling and show a willingness to serve when customers call for service. Service staff must be trained in explaining details of food items or answering customers' questions, especially questions related to food items., for instance, “what are the raw materials used?”, “what does the taste like?”, or “does it take a long time to cook?”. Thai restaurants should allow service staff to taste new food items in order that they can explain to customers correctly.

3) Thai restaurants should pay attention to lighting and temperature in the restaurant depending on their target customers. Restaurants with the customers in early working adults may require lighting that is not too bright but has a cool temperature, while restaurants with middle to late working age or the elderly customers may need brighter light and temperature that is not very cold. Large restaurants with lots of service space may divide the areas into zones to turn electricity on and off depending of customer demand.

4) Thai restaurants should create activities in the restaurants so that customers don't feel that food price is more expensive than other restaurants. The activities may include having music, using technology in the service providing process, and promotions with credit cards, giving discounts, and collecting points.

Recommendations of the Future Research

1) Three independent variables of this study can explain menu pricing by 42 percent. Therefore, future research should include more independent variables relating to the image of the restaurant and customer consumption behavior.

2) From many research studies, consumer satisfaction is a significant factor leading.

to customer loyalty. Future research should study the factors affecting consumer satisfaction in eating at Thai restaurants in order to implement challenging strategies and build a long-term relationship with their customers.

3) Future research should be conducted with foreign tourists regarding them opinion on the factors affecting their satisfaction in using the service in Thai restaurants. This is because our government has an effort to attract foreign tourists to return to Thailand. It is estimated that there will be 35 million foreign tourists visiting Thailand in 2024 (Ministry of Tourism and Sports, 2024). In general, foreign tourists traveling abroad Often find local food to eat (Cook, Hsu, & Taylor, 2018; Muskat, Hortnagel, Prayag, & Wagner, 2019).

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Factors affecting Stock Selection in the Transport and Logistics Sector for Retail Investors: A Qualitative Study

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Abstract

The purpose of this research is to study the factors affecting the selection of stock in the transport and logistics sector of retail investors in the short and long term. In-depth interviewing is used for data collection. The sample of the study is Thai short-term retail investors who invest in transport and logistics stocks with four persons and long-term retail investors with four persons. The results of the study found that short-term investors who invest with the value of the investment not exceeding one million baht there will be short-term speculation based on volume analysis and references from SET index. While short-term investors who invest in a value exceeding one million baht use technical indicators to consider short-term investments and find entry points for speculation. For long-term retail investors who invest not exceeding one million baht, it was found that fundamental factors affect long-term investors, such as dividend payments. While investors who invested more than one million baht found that basic economic factors, fundamental factors, financial statement factors, and other factors affect the decision to invest in stocks in the transportation and logistics sector.

Keywords: Investment, Retail Investors, Common Stock, the Stock Exchange of Thailand (SET), Transportation and Logistics

Introduction

The capital market plays a crucial role in the economy by gathering and distributing resources efficiently to foster economic growth. Provide possibilities for diverse enterprises to obtain funding resources to assist investors in diversifying their investment portfolio and accumulating wealth. The market capitalization to GDP ratio has increased and reached 121% in 2022. (Stock Exchange of Thailand, 2022)

In 2022, the size of the Thai stock market, measured by the market capitalization of the Stock Exchange of Thailand, SET and Mai, has a value of 20.93 trillion baht, with an average annual growth of 19.22% (compound annual growth rate: CAGR) since the Stock Exchange of Thailand was established. The Thai stock market index or SET Index has

moved and developed according to economic conditions and factors both inside and outside the country and stood at 1668.66 index at the end of 2022, with a 6.56% compound annual growth rate. If considering the total return or Total Return of SET Index since 2002 has grown at 12.08% per year (CAGR) (Stock Exchange of Thailand, 2022)

In 2023, even though the Thai stock market will have lower returns than stocks in many countries that have benefited from capital inflows from the trend of falling bond yields and the weakening of the US dollar. However, if looking back in 2022, the SET Index is one of only a few indexes in the world that has produced positive returns. While, considering the period 2022-2023, it will be seen that the SET Index moves similarly to other indexes in the region (Stock Exchange of Thailand, 2023) when considering the accumulated net trading value by investor group in the past 1 year from March 2023. Until February 2024, it was found that the investment value of domestic investors has an upward trend, as shown in Figure 1.

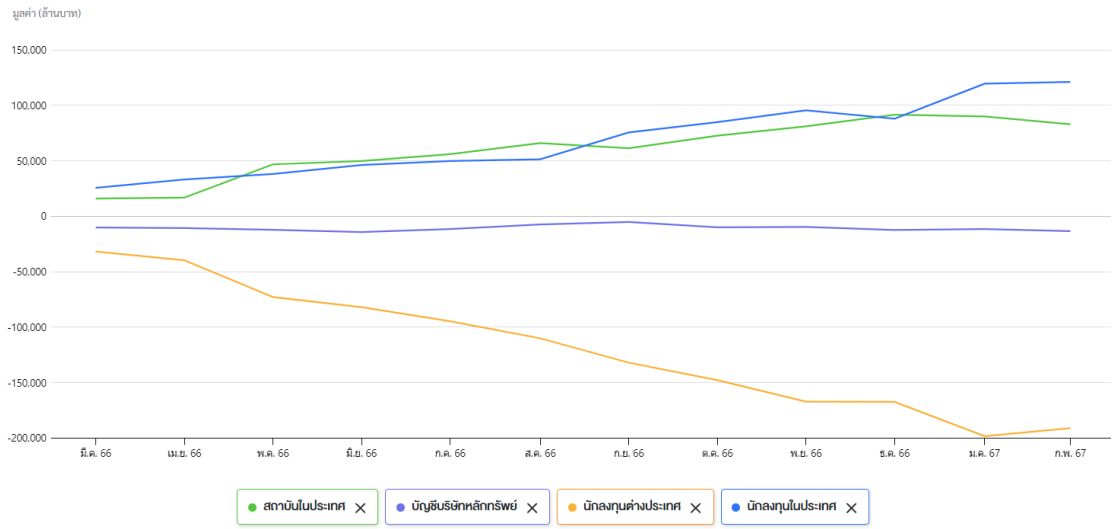

Figure 1: shows the cumulative net trading value by investor group between March 2023 and February 2024.

The COVID-19 pandemic has impacted various industries through lockdowns and social distancing measures, leading to a shift in consumer behavior towards online shopping. Online orders have increased by 80%, benefiting the logistics and transportation business (Online Manager, 2020). Consumers are expected to increasingly choose express delivery options. This presents an opportunity and challenge for both large and small organizations, as well as transportation businesses, to plan for handling the growing number of items delivered through online platforms. Logistics service providers require

effective technologies to manage and arrange the daily distribution of goods efficiently. This will help build consumer confidence in receiving prompt, precise, and secure services. The transportation and logistics stocks sector (TRANS) presents an intriguing investment opportunity following the global economic recovery. Currently, the transportation and logistics industry sector is playing a crucial role due to the rising volume of travel. (Stock Exchange of Thailand, 2021)

An analysis of the stock index in the transportation and logistics sector over the last three years revealed a rise during the COVID pandemic and a decline in 2023. In 2024, transportation and logistics stocks are expected to rise according to the uptrend as show in figure 2. This research aims to investigate the factors influencing investment decisions in transportation and logistics stock by retail investors, encompassing both short-term and long-term investments.

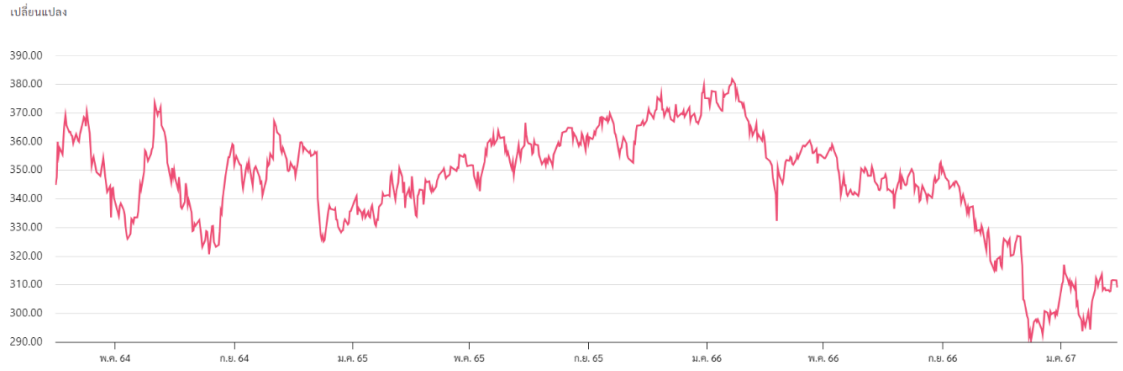

Figure 2: shows transportation and logistics stock index during 2021-2024.

Objectives

1. To study the factors Influencing stock selection in the transport and logistics sector for retail Investors engaging in short-term investments on the Stock Exchange of Thailand**.**

2. To study the factors Influencing stock selection in the transport and logistics sector for retail Investors engaging in long-term investments on the Stock Exchange of Thailand**.**

Related Concepts

1. Transport and logistics sector stocks

The transportation and logistics industry involves overseeing the transfer of commodities from one location to another. Since the raw materials movement, work in process, finished goods as well as people travel. Most companies have quite similar business models. The distinction is based on the client demographic and service structures. Therefore, transport and logistics stocks in the Stock Exchange of Thailand are grouped

into 5 categories as follows (Stock Exchange of Thailand, 2022).

1) Airline and airport stocks

Such as stocks AAV, AOT, BA, BAREIT, THAI*, NOK* stocks

This involves air transportation, encompassing airport administration and airline service providers for domestic and international flights. Encompassing both passenger carriers and cargo service carriers. This group plays a crucial part in the economy due to its fast and highly secure transportation services. However, it faces the drawback of high costs per unit and the necessity of investing in extensive infrastructure to sustain the transportation system.

*THAI and NOK are the listed company has operating results or financial positions which is subject to possible delisting (Non-Compliance: NC).

2) Rail rapid transit and expressway stocks

Such as BEM, BTS, BTSGIF**, DMT, TFFIF** stocks.

The company's primary focus is on providing mass transit and expressway services. These firms specialize in providing services to residents in Bangkok and nearby areas who require efficient and quick transportation. Both the rail rapid transit and highway industries require concessions from the government sector. It necessitates a substantial investment and has a long payback period. This commercial operation frequently involves a partnership between the public and private sectors. There are two types of investment models: Public Private Partnership (PPP) and Public Sector Comparator (PSC), where the government invests fully and then contracts the private sector for management.

** BTSGIF and TFFIF are infrastructure funds.

3) Shipping and port stocks

Such as AMA, ASIMAR, III, PRM, PSL, RCL, TTA, VL, PORT, NYT, TSTE stocks.

Marine transportation service businesses, also referred to as shipping businesses, can be classified into different types. Bulk ships are vessels designed for transporting bulk commodities, including coal, steel, and agricultural products. A container ship transports containers and is specifically designed for transport consumer products. Ships carrying crude oil and liquid petrochemicals and businesses related to shipping such as ship construction, ship maintenance, and transportation ship leasing services.

4) Logistics service stocks

Such as B, JWD, KEX, KIAT, KWC, LEO, MENA, NCL, NYT, SONIC, WICE stocks

The logistics service business includes port operations, warehouse rental, customs clearing services, domestic transportation, and cross-border transportation. This service provider offers comprehensive express delivery services for products purchased through e-commerce, parcels exchanged between individuals, and documents for various

enterprises.

5) Land and water transportation service group

Such as ATP30, RP stocks

The company operates in the passenger transportation business. Currently, Thai stock market consists of land transport service providers licensed by the Department of Land Transport, utilizing buses, mini busses, vans, and electric vans. Another group provides water transportation services, offering ferry services to various islands.

2. How to analyze stock transportation and logistics

According to The Stock Exchange of Thailand (2022), distinct business considerations influence various transport and logistics stocks. However, there are significant similarities. Investors must focus on the five important points listed below.

1) Type of goods

Each type of freight transport has a unique revenue model and different profit margins. Investors should analyze the distribution of income generated by different products. To examine variables influencing transportation demand, particularly agricultural products, which fluctuate based on seasonal production levels. The company will deliver consumer products to markets nationwide. Hence, it expands in accordance with consumer demands. The increase in economic activity over time is the key factor influencing energy goods like oil and coal, as well as the demand for construction materials and equipment, which depends on the level of construction work and real estate company growth. The final category consists of enterprises associated with travel that have extended to include housing developments along mass rapid transit routes and expressways.

Exploring shipping stocks further reveals a significant factor impacting income, namely the BDI (Baltic Dry Index), which serves as an indicator of shipping revenue. Higher freight leads to increased income. Each ship type is associated with specific freight values for reference, including HR (Howe Robinson Container Index), CCFI (China Containerized Freight Index), and SCFI (Shanghai Containerized Freight Index), which are commonly used for transporting goods in Asia.

2) Oil price

Oil prices are the primary expense of running a business. Whether by air, land, sea, or rail transit, such as the electric train, even if you do not directly utilize oil, The cost of electricity fluctuates in proportion to changes in crude oil prices.

3) Economic cycle

Transportation and travel volume there is a relationship with the direction of economic growth. The characteristics of transportation and logistics stock prices are cyclical stocks it performs well during the economic upturn but become stagnant during

economic decline. Analysis of transportation and logistics stocks it necessitates predictions of future GDP patterns and other crucial economic elements, such interest rates, inflation rate, monetary and fiscal policy, consumer confidence index, industrial sentiment index, and energy price index.

4) Special event

Transportation and logistics stocks are consistently influenced by unique occurrences related to economic conditions and external industries. Because it is a downstream industry that distributes items at various locations across the supply chain. For specific events like war, seizure of goods, international transportation regulation, contract renewals, etc.

5) Asset utilization efficiency

Business model for transportation and logistics, at the beginning, it needs to invest in a substantial number of assets like airplanes, ships, electric trains, warehouses, ports, and more. Over time, it will start to see gains from those investments, which is why it is important to analyze the total asset turnover. Companies use this financial metric to evaluate transportation and logistics equities and assess efficiency in using assets to generate sales. A greater total asset turnover figure indicates better performance by conducting a comparative analysis with other companies in the same industry. Some companies may have a larger total asset turnover due to leasing assets from external sources, as opposed to organizations that invest in their own assets.

3. Literature review

From the literature review, there are five factors affecting in the short term and long term of retail investors in the Stock Exchange of Thailand.

1) Fundamental economic factors

This factor assesses the economic situation in various countries. Key trading partners include the United States, China, Japan, and the European Union. Products will see increased demand if they are in good condition. Enhancing exports and repatriating capital will boost the Thai economy and enhance investor confidence. (Pumalee and Teeravaraprug, 2013)

2) Company fundamental factors

Regarding the company's core principles, the content will focus on dividend updates. News about earnings announcements and merger acquisitions, auction success, and effective corporate governance. (Pumalee and Teeravaraprug, 2013)

3) Fundamentals of financial statements factors

This aspect pertains to the company's financial inflow, outflow, and current position. Financial metrics such as return on equity (ROE), earnings per share, net profit margin, and

price-book value (P/BV) are used to display a business's assets, liabilities, revenues, costs, and cash flows from operating, investing, and financing activities. (Visudtiko, 2018)

4) Technical factors

It involves utilizing historical data, such as trends in price changes. Volume of trading intended for assessing upcoming trends. Utilizing an indicator tool and analyzing graphs to assist in making investment choices. (Suthiranart, 2016)

5) Other factors

These factors are external conditions that influence the supply and demand of a company's stock, such as domestic and international political situations, news, stock analysis articles, recommendations from friends, information from the internet, and investors' emotions. Additionally, the Freight Index and Consumer Confidence Index. (Intarasuwan, 2021)

Factors influencing trading behavior

Paisarn, Chancharat, and Chancharat (2021) analyzed comprehensive survey data and found that the specific attributes and behavioral tendencies that contribute to investor bias. At the same time, the result also reveals that biases are prevalent among investors, with men exhibiting a higher degree of overconfidence compared to women. Experiences are also analyzed as behavioral biases. Investment decisions made by investors exhibit a comparable level of sensitivity to the historical positive and negative returns observed in both stock and conventional funds (Lapanan, 2018). Hoffmann and Shefrin (2014) indicate that retail investors who utilize technical analysis are more likely to engage in speculating regarding stock market trends. This is because their main financial goals involve maintaining more concentrated portfolios, which they tend to sell at a higher rate.

Many studies in the literature review focus on analyzing stock selecting strategies. There are studies on choosing data for strategic decision-making, analysis of economic variables influencing stock selection, data and sources of data used by investors to make common stock investment decisions. However, there is a lack of qualitative research in factors that investors consider when investing in transport and logistics sector common stocks on the Stock Exchange of Thailand both short-term and long-term investments. This research investigates the factors Influence stock selection in the transport and logistics sector for retail Investors both short-term and long-term investments.

Research Methods

This study is a qualitative research approach that involves conducting in-depth interviews with individuals using open-ended questions to allow interviewees to freely express their opinions and attitudes.

Sampling method

The researcher selected a specific sample of Thai retail investors engaged in both short and long-term investments that own common stocks in the transportation and logistics sector listed on the Stock Exchange of Thailand (SET) in their investment portfolios. The study involved conducting in-depth individual interviews with eight individuals, consisting of four short-term investors and four long-term investors. Their classification is as follows: 1) short-term investors who have an investment value in common stocks not exceeding one million baht. 2) short-term investors who have an investment value in common stocks exceeding one million baht. 3) long-term investors who have an investment value in common stocks not exceeding one million baht 4) long-term investors who have an investment value in common stocks exceeding one million baht to provide information about factors affecting investment decisions in transportation and logistics sector stocks

Research Instrument

Utilize in-depth interviews to gather data from sources. Employing open-ended questions to enable the interviewer to articulate a wide range of thoughts and perspectives. Recorded and transcribed individual interviews for data analysis to address the research topics. The interview guide is developed by researchers to enumerate the inquiries or matters to be examined during the interview, encompassing an informed consent document.

Data Analysis

The researcher provides the code to avoid disclosing personal information. Provide a well-organized summary of information obtained through in-depth interview. Describe the research findings in a descriptive manner.

Limitations of the Study

Because the sample is a certain group. Using larger datasets may lead to different results in the study. The study findings may differ depending on a range of ideas, experiences, and attitudes.

Results

Analyzing factors that influence stock selection in the transport and logistics sector for retail investors. The sample group consists of Thai retail investors engaged in short-term and long-term investments in common stocks in the transport and logistics sector on the Stock Exchange of Thailand, with investments ranging from not exceeding to exceeding one million baht. Using qualitative research methodologies through in-depth interviews with open-ended questions. The study involved conducting in-depth individual interviews

with eight individuals, consisting of four short-term investors and four long-term investors. The results were categorized into two categories.

Factors Influencing Thai Retail Investors' Short-term Investments in Transport and Logistics Stocks on the Stock Exchange of Thailand

1. Factors used by investors who have an investment value in common stocks not exceeding one million baht in deciding to invest in transportation and logistics stocks as follow; Company fundamental factors, such as news of dividend payments, were found to influence short-term investors. High dividends lead to short-term speculation. News regarding entrepreneurs' activities or stock exchanges, which impact stock prices. This includes announcements of better-than-expected operating results, successful auction bids, obtaining concessions, etc. Volume analysis involves monitoring trading volume (bid-offer) and tracking stock price movements to make assessments. Additionally, short-term investors choose to invest for short-term speculation by monitoring the stock market index (SET index) to see if it is trending upwards or downwards. One element influencing short-term stock investments is the solicitation to purchase stocks through Facebook pages, websites, or recommendations from acquaintances. These are all variables that influence short-term investment.

2. Factors used by investors who have an investment value in common stocks exceeding one million baht in deciding to invest in transportation and logistics stocks as follow; Fundamental economic factors, particularly the economies of global superpowers such as the United States, China, and the European Union. It impacts the broader view of stocks in the transportation and logistics industry, such as the lack of shipping lines or containers during COVID-19. Some companies in the transportation and logistics sectors benefited from this increase. Short-term investing involves utilizing technical elements, like historical data analysis and candlestick charts, to make investment decisions based on stock prices. The historical data displays the opening price, closing price, highest price, and lowest price to aid in making investment decisions. Utilizing technical methods like Moving Average Convergence/Divergence (MACD) to analyze short-term investments and entry points based on crossover, overbought/oversold, and divergences. When the MACD falls below the signal line, it indicates a bearish signal and suggests selling. When the MACD rises over the signal line, it indicates a bullish signal, suggesting a buy opportunity. Overbought or oversold conditions occur when the moving average has significant upward or downward movement. Brokers' stock analysis is another aspect that influences short-term stock investments. Stocks and investment news to aid decision-making. Incorporating data from the Stock Exchange of Thailand.

Factors Influencing Thai Retail Investors' Long-term Investments in Transport and Logistics Stocks on the Stock Exchange of Thailand

1. Factors used by investors who have an investment value in common stocks not exceeding one million baht in deciding to invest in transportation and logistics stocks as follows. Company fundamental factors affect long-term investors, including information regarding dividend payments. It has a direct impact because it is a long-term investment. Investors will expect dividend returns regardless of fluctuations in the stock price. In addition, basic financial statement elements like the price to earnings ratio (P/E) and price to book value ratio (P/BV) will be considered when determining the purchase point. Earnings per share, a measure of the company's performance, will also be evaluated.

2. Factors used by investors who have an investment value in common stocks exceeding one million baht in deciding to invest in transportation and logistics stocks as follows. Company fundamental factors still affect long-term investors, including information on dividend payments, industry cycles, and individual equities. Financial statement indicators such as income, return on equity (ROE), earnings per share, and net profit margin have an impact on investment decisions. Long-term investments over one year involve considering technical variables and historical data to identify optimal investment opportunities. Various transportation-related elements, including crude oil prices, interest rates, inflation rate, monetary and fiscal policies, war, trade war, shipping conditions, freight rate, and tourist numbers, are considered before investing in companies in the transportation and logistics sector. Furthermore, this group of investors will analyze detailed data from reliable sources, such as the Stock Exchange of Thailand website, to gather further information, including stock valuations. Analysis of technical factors can help in choosing high-quality stocks at suitable prices, timing investing opportunities, and adapting stock portfolios to different situations. This group of investors can utilize financial statement analysis and various financial ratios to assess the business's financial health and make informed investment decisions, which may not always be long-term if market conditions shift. They are prepared to modify their investment portfolio as needed or to persist in investing in companies in other sectors.

Conclusions and Discussion

A study on factors that influence stock selection in the transport and logistics sector for retail investors revealed that variances in investment terms and the amount of money invested result in different factors being considered for investing. Short-term investors prioritize company fundamentals and technical factors for short-term speculation without analyzing the company's financial statements. It is a short-term investment strategy that relies on online information and advice from trusted individuals to achieve fast profits. This aligns with Srinuan (2016) which found that short-term investors use information from

online websites to make investment decisions. While long-term investors will analyze and choose individual equities, particularly those in the transportation and logistics sectors that are experiencing rapid changes, researching additional aspects that influence investment decisions, such as the freight index, crude oil prices, and domestic and international political situations. These factors directly influence this specific set of stocks (Intarasuwan, 2021) . Long- term investors also evaluate fundamental economic factors, company fundamental factors, and basic financial statement aspects when making long- term investment decisions. Utilizing technical analysis to examine industry trends and individual companies can help generate greater investment returns. Long-term investors have noted that when market conditions become volatile, they may not always maintain their long-term investment strategies. They are prepared to modify their investment portfolio as needed or to continue investing in companies across several sectors. Moreover, age is additionally examined in relation to behavioral biases. Older investors generally exhibit lower risk tolerance compared to younger investors. According to Dohmen et al. (2011), it is posited that elderly investors have a finite timeframe within which they can attain their aims and objectives.

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Myanmar-Japan political and economic relations from 2011-2021

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Abstract

This research examines Myanmar's foreign policy towards Japan from 2011-2021, particularly the development of the Thilawa Special Economic Zone (SEZ) and Myanmar's peace process. Since Myanmar's political reforms in 2011, Thein Sein's government engaged with Japan on Myanmar's economic and infrastructure development, and reconciliation process. This research uses the concept of hedging to explain how Myanmar opened to Japan's involvement in Myanmar's development to balance its dependence on China. The research applied qualitative research by analyzing government documents that related on Japan-Myanmar relations. This research finds that Myanmar's political reforms and the release of sanctions on Myanmar by the United States (US) created an opportunity for Japan and international actors to get involved in Myanmar's politics and economy. Moreover, the reforms helped Myanmar move away from being overdependent on China. During Myanmar's transformation, Japan played a significant role in Myanmar's reconciliation, economic and infrastructure development in urban areas. However, China retained its influence on Myanmar politics and the border trade with ethnic areas in the Northern part of Myanmar.

Keywords: Myanmar's Foreign Policy, Myanmar-Japan Relations, Hedging Strategy

Introduction

On March 31, 2011, General Thein Sein became President of the Union of Myanmar, after the Union Solidarity and Development Party (USDP) won a multiparty election. The USDP became the first democratically elected civilian government in 50 years. Following this, Thein Sein's administration released political prisoners, eased media censorship, passed trade and investment laws, and established a peace dialogue with ethnic armed organizations (EAOs) (Frontier of Myanmar, 2016). Thereafter, General Thein Sein announced political and economic reforms which made changes in domestic and international politics. Since the democratization, the United States (US) and Western countries resumed diplomatic relations with the quasi-civilian government. In addition, the

reforms created opportunities for external actors to participate in Myanmar's socio-economic development.

After the US and EU lifted economic sanctions on Myanmar's quasi-civilian government, Japan, which had a long historical friendship with Myanmar, took the opportunity to reestablish ties with Naypyidaw. Since the democratization, Japan and Myanmar held several bilateral meetings involving high-ranking officers from both Japan and Myanmar. The highlight of the improved relationship occurred when Japanese Foreign Minister Koichiro Gemba visited Myanmar between December 25 and 26, 2011, which was the first visit to Myanmar in 9 years for the Japanese Foreign Minister (The Irrawaddy, October 5, 2018). During his visits to Myanmar, Foreign Minister Koichiro Gemba talked with President Thein Sein on Myanmar's democratization and reconciliation process. Thereafter, Foreign Minister Gemba discussed with Daw Aung San Suu Kyi about free and fair elections, the situation related to the National League for Democracy (NLD)'s political activities, and the release of political prisoners (The Irrawaddy, 2015).

In addition, after President Thein Sein visited Japan in April 2012, Japan increased the funding for two grant aid projects for Myanmar of approximately 583 million yen and 251 million yen (The Irrawaddy, 2018). Furthermore, another significant event occurred on May 13, 2013, when Prime Minister Shinzo Abe visited Myanmar and pledged $5.7 billion USD in loans to Myanmar (The Irrawaddy, 2018). The climax of the relationship emerged when the Japanese government announced the establishment of the Thilawa Special Economic Zone (SEZ) in 2013, a joint venture project between Japan and Myanmar worth around $3.28 billion USD. This was the first special economic zone in Myanmar (The Irrawaddy, 2018). In terms of economics, Tokyo and the Asian Development Bank assisted Thein Sein's administration in drafting a special economic zone law in 2014 and investment law in 2016 (Hartley, 2018, p.314). Furthermore, Japanese companies, including the Daiwa Institute of Research and Japan Exchange, with the cooperation of the Myanmar Economic Bank, formed the Yangon Stock Exchange in October 2015. (The Irrawaddy, 2018). Overall, Japan and Myanmar's relationship had been strengthened by the USDP government. Additionally, cooperation between the two countries increased in various areas such as political, economic, and infrastructure development, as well as legislative cooperation.

In contrast, Myanmar-China ties shifted in the Thein Sein administration. Myanmar halted the Myitsone Dam Project in September 2011. According to the Government of Myanmar, the reasons for the suspension included public criticism of the project, its environmental impact, hydrological risk, and risk of causing displacement and loss of livelihood (BBC, 2011). The hydropower project was supported by Chinese businesses. In this case, the suspension led to tension between Myanmar's and China's governments.

However, one month after the unexpected suspension of the Myitsone Dam Project, President Thein Sein improved the relations with China and expanded strategic cooperation with Beijing again. In brief, China remained the largest trading partner for Myanmar's government (Passeri & Marston, 2022, p.199).

This research focuses on Myanmar's foreign strategy towards Japan during the former's democratization in 2011-2021 and the development of the Thilawa SEZ. This case study is selected because, since the transformation process in 2011, Japan played a crucial role in Myanmar's social and economic reforms. The government of Japan provided assistance in Myanmar's democratic, economic, social, and peace processes.

Since Myanmar and Japan reestablished relations in 2011, the government of Japan played an important role in Myanmar's socio-economic development. According to Hartley (2018), the Japanese government aided with Myanmar's national reconciliation. In 2013, Japan appointed Yohei Sasakawa, the president of the Nippon Foundation, as Special Envoy of the Government of Japan for National Reconciliation in Myanmar. Sasakawa helped Japan improve relations with Myanmar's government, Myanmar's military, and ethnic groups. The Nippon Foundation adopted Japan's kakehashi "bridge building approach." Because of this, Japan was able to contact and arrange several meetings between Japan's leaders and Myanmar' military leaders. (Hartley, 2018, p.377). Sasakawa also played a significant role by helping Japan's government improve relations with Myanmar's ethnic groups. For example, the Nippon Foundation provided financial assistance for food distribution to Myanmar's war zone. In addition, Sasakawa participated in the Myanmar peace process as a broker between Myanmar's government and ethnic armed groups. Sasakawa and the government of Japan were successful in their role as mediator, as Myanmar's government and ethnic armed groups signed ceasefire agreements in 2015 and 2018. (Hartley, 2018, p. 377). In conclusion, Tokyo had an important role in Myanmar's reconciliation process between 2010-2018 because of Sasakawa's special relations with both Naypyidaw and the ethnic groups.

Myanmar's approach to Japan regarding political and economic development was different from its approach to China, the US, and other Western countries. For example, the government of Japan made a statement that they will invest in the Thilawa SEZ. In addition, Prime Minister Shinzo Abe visited Myanmar in May 2013, which was the first visit of a Japanese prime minister to Myanmar in 36 years. During his visit, Abe pledged a 57 billion USD billion loan for socio-economic development in Myanmar (the Irrawaddy, 2015).

Although there have been a number of studies on Myanmar's foreign policy and Japan-Myanmar relationships, only a few studies investigate Myanmar's approach to

Japan's political and economic assistance, the development of the Thilawa SEZ, and the foreign strategic interests of Myanmar during its democratization process in 2011-2021.

This case study represents an analysis of Myanmar's hedging strategy towards Japan. Furthermore, the research will examine why Myanmar under Thein Sein's government approached Japan for aid and socioeconomic reforms.

Objectives

1. To examine strategic approaches of Myanmar's democratic and social reforms towards Japan.
2. To analyze the Myanmar-Japan relationship between 2011-2021.
3. To investigate how Thein Sein's government approached Japan's Myanmar democratic transformation in 2015.
4. To examine Myanmar's hedging character towards Japan.

Research questions

1. Why did Myanmar under Thein Sein's government approach Japan for aid and social-economic reforms?
2. How important was Japan's government in Myanmar's hedging strategy during its time of democratization?

Literature

This literature review examines two key topics which relate to Myanmar-Japan relations, including internal and external factors that affect on Myanmar and Japan relations. Kudo (2007) and Li (2015) studied internal factors that affected Japan's foreign policy towards Myanmar. Kudo (2007) observed that Japan-Myanmar's relations declined since the State Law and Order Restoration Council (SLORC) assumed power in 1988. Japan-Myanmar's diplomatic and economic ties faded under the military regimes because the intra-relations between Japan's and Myanmar's elites changed. Japan's elites did not have special ties with the regimes in Myanmar. Furthermore, the Japanese government revised the ODA charter, which focused on democracy and human rights. Therefore, Kudo (2007), Peng Er (2010), Strefford (2016) have argued that the government of Japan adopted cautious engagement and "carrot stick" policies during the military regimes.

Similarly, Li (2015) analyzed that Tokyo applied "constructive interference": a middle-way policy that maintained a relationship with the military regimes in Myanmar and the US, while promoting democratization and human rights in Myanmar and encouraging the military regime to enact political change.

Some authors studied both internal and external factors such as Strefford (2016) and Lam (2016). Strefford (2016) examined internal and external factors during the post-2010 Japan-Myanmar economic collaboration through historical aspects.

Lam (2016) studied internal and external factors for Japan's foreign policy towards Myanmar since the political transformation in 2010. He analyzed factors including economic interest, geopolitics, and security cooperation, which are dominant issues that formulate Japan's policies for Myanmar in the present period.

For Myanmar's foreign policy, Fiori & Passeri (2015) studied Myanmar's ties with China and the US through the hedging concept. The authors argued that China had played a crucial role in Myanmar's internal and external affairs during the SLORC/SPDC governments. At the external level, China supported Myanmar's economy, which created stability in Myanmar's market, enabling it to sustain external threats. At the international level, China backed Myanmar in the face of sanctions against Myanmar's military regimes after the Saffron Revolution in 2007. At the same time, China also gained benefits from Myanmar.

Passeri & Marston (2022) examined Myanmar's independent foreign policy that shifted between the two opposite forms of non-alignment from 2011to 2021. The authors analyzed that, between 2010 and 2016, Thein Sein's government adopted a positive non-alignment or shift towards this as a foreign policy.

From the literature on Myanmar's foreign strategy and hedging strategy and Myanmar-Japan relations that were reviewed, the authors focused on Myanmar's state behavior and foreign policy and hedging strategies towards the US and China. Furthermore, some authors focused on internal and external factors in Myanmar-Japan relations, including, for example, Japanese businessmen, Japanese bureaucracy, ODA, China, and ASEAN. Some scholars focused on the US dominance on Japan's foreign policy towards Myanmar. Moreover, some scholars studied Myanmar's foreign policies and hedging strategies towards China and the US. However, there were rarely studies done that focused specifically on Myanmar-Japan's diplomatic relations through hedging strategy or even on why Myanmar approached Japan for supporting socio-economic and political reforms instead of the US and EU. This research examines Myanmar's foreign policy towards Japan and vice versa. In addition, this research examines Myanmar's approach to Japan's assistance during the democratization process. Myanmar-Japan political and economic ties can create a better understanding of Myanmar's foreign strategy. In addition, this paper aims to investigate what Myanmar's intention is for Japan's assistance with political reforms.

Conceptual framework

This study draws on a hedging strategy framework to understand Myanmar's foreign strategy with Japan, defining hedging as a set of complex insurance and engagement policies adopted by a small state in a relationship with a superpower that neither chooses one side nor adopts one direct policy (Goh, 2006 as cited in Fiori & Passeri, 2015). The paper aims to examine Myanmar's foreign strategy towards Japan and external powers during the former's democratization process in 2011-2021. The case of Myanmar's and Japan's relations during the transformation period seems to represent how Myanmar as a small state in global politics interacts with major powers at regional and global levels.

Research Methodology

This thesis will mainly consist of documentary and qualitative research. Primary sources include official documents such as documents from the government of Japan, Ministry of Foreign Affairs, Ministry of Trade, Ministry of Finance, Japan External Trade Organization (JETRO), the Japan International Cooperation Agency (JICA), and the Thilawa SEZ Committee. Secondary sources include academic research, reports from NGOs, academic journals, and news from reliable media. I will review these sources and look for important themes about Japan-Myanmar relations during 2010-2021, Japan's assistance on economic and infrastructure development, peace and reconciliation, and Myanmar's foreign policy towards Japan and the international community.

Results

This research found out that during the reforms in 2011-2021, Myanmar's government applied a hedging strategy in its foreign policy. The reforms created an opportunity for Myanmar's government to engage and develop bilateral relations with Western countries and be independent from China. This case study found that during the reforms, Myanmar's foreign policy focused on reintegrating with the international community. By this time, Japan's bilateral relations with Myanmar were strengthened and Japan played a crucial role in Myanmar's economic and infrastructure development. During its reforms, Myanmar's government needed foreign assistance for economic and infrastructure development, trade, investment, as well as democratization and national reconciliation. Japan was the best answer for Myanmar's government because of its historical ties with Myanmar. Unlike China's government, Japan provided support for infrastructure development such as roads, railways, and buses. For Myanmar's government, the infrastructure development was important for its reforms process. More importantly, Japan was a good fit for Myanmar's reforms because Japan also aimed to

balance China's dominance in Myanmar and Southeast Asia. Because of this Japan's supported and invested in Myanmar's infrastructure development. Besides, Japan helped Myanmar's on trade, investment, as well as peace reconciliation. Myanmar approached Japan for support for its reforms because of Japan's assistance for Myanmar's economy and trade. Unlike the West, Japan provided aid for Myanmar's development and maintained good relations with Thein Sein's government. Meanwhile, Western countries like US and EU can impose sanction and suspend economic assistance anytime Japan's government was important for Myanmar's hedging strategy because Myanmar's government adopted hedging as a foreign strategy to balance relations with external power. As mentioned earlier, Japan was the best fit for special ties with Myanmar and Japan's businesses were also interested to invest in Myanmar, including in the Thilawa Special Economic zone. Hence, Myanmar used Japan to balance power with China.

Conclusions and Discussion

Because Myanmar was isolated during its military regimes, the country had relied on China and ASEAN countries for political and economic support. After its reforms, Western countries such as the US and EU released economic sanctions on Thein Sein's administration. Because the US resumed bilateral ties with Myanmar, Japan as US partner used this opportunity to reestablish relations with Myanmar's government.

This research shows that Myanmar used a hedging strategy in its relations with Japan and China. During the rule of the State Law and Order Restoration Council (SLORC) and State Peace and Development Council (SPDC) between 1988-2011, Myanmar was isolated by the Western countries, and hence Naypyidaw relied on China for economic and political support. By this time, China played a significant role in Myanmar's affairs in both the domestic and international arenas. Because Myanmar's leaders were concerned with China's dominance in the country, after Myanmar started reforms, Myanmar's foreign relations during Thein Sein's administration focused more on reengagement with the global community including the US, Japan, EU, India, as well as Russia. This research can be an example of a small country in Southeast Asia balancing relations with superpowers. Also, future study can look at Myanmar's foreign relations with Japan and superpowers such as China and the US after the 2021 military coup.

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Exploring Indonesian Consumer Insights and Factors Driving their Food Purchase Intention on TikTok Shop

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Abstract

This study applied a qualitative approach to investigate factors influencing Indonesian consumers' food purchase intentions on TikTok Shop. The research addresses a critical gap in existing literature by exploring insights into the intersection of TikTok as a new platform, consumer behavior, and the food market. The objectives are to identify and analyze the factors influencing consumer decisions to purchase food products on TikTok Shop, by examining user interactions and preferences on TikTok Shop, with data derived from semi-structured in-depth interviews with fifteen participants, encompassing content analysis and word coding. The findings revealed that consumer perceptions of TikTok content, influencer credibility and attractiveness and perceived benefits of TikTok Shop significantly impact food purchase intentions on Tiktok shop, with emotional (affective and appetite) and cognitive responses (perceived value and trust) playing mediating roles.

Keywords: Food Purchase Intention, TikTok Shop, Emotional Response, Cognitive Response, Consumer Behaviour

Introduction

In today's digital world, TikTok and TikTok Shop become big player in social platform. With 272.7 million downloads in Q3 of 2023, TikTok goes beyond content presentation. It facilitates closer brand-customer relationships, evident in its high average engagement rate of 4.25% in 2023, surpassing Instagram (0.60%), Facebook (0.15%), and Twitter (0.05%) (Cucu, 2023). Additionally, TikTok Shop also significantly and successfully stimulates impulse product purchase of TikTok users. The food sector is one of the business domains that can gain various benefits via TikTok Shop. Particularly in Indonesia; where there are around 1.5 million food micro and small enterprises (Statistic, 2020). On the demand site, Indonesian TikTok users are highly interested in culinary content, as shown by the trending hashtag #Makananindonesia (Indonesian food), with 1.1 billion views in 2023.

The rapid growth of TikTok has sparked numerous studies on consumer behavior, particularly focusing on social interactions between users and influencers. However, research on shopping behavior, specifically regarding food and beverage purchases on TikTok Shop, remains limited due to the novelty of these platforms. Two studies have demonstrated the direct impact of parasocial interactions, social media marketing factors and product quality on purchase intention (Manaf, 2021; Meliawati et al., 2023). To the best of our knowledge, the studies on underlying purchasing processes at TikTok Shop, namely mediators and moderators, are lacking. Drawing from research on other social commerce platforms, it is anticipated that marketing factors may not only directly influence online purchase intentions, especially on TikTok Shop, where entertainment and emotions play a big role.

Understanding consumer insights and factors driving food purchase intention on TikTok Shop, including emotional and cognitive influences, is vital for modern food businesses. This study explores the mediating roles of cognitive and emotional states between TikTok Shop marketing factors and online food purchase intention using the stimulus-organization-Response theory. Through qualitative research, we aim to grasp consumers' understanding of TikTok and TikTok Shop dynamics.

Objectives

To provide insights into Indonesian consumers' online platforms usage and the factors underlying their food purchase intentions on TikTok Shop.

Concept theory framework

Stimulus Organism Response

Stimulus organism response (S-O-R) is one of the models that is commonly used to explain online commerce behavior. The model explains how external cues (stimuli) shape cognitive and emotional reactions such as perceptions (organism), leading to changes in consumer behavior on s-commerce platforms (response; Mehrabian & Russell, 1974). Based on S-O-R model. This study will investigate the effects of TikTok and TikTok Shops (an external environmental stimulus) on consumers' online purchase intention (response) through the influence of individual internal states (organism). Several underlying factors (explained below) are expected to influence consumers' shopping at TikTok Shop.

Factors related to Stimulus

Perception of Content In social commerce, stimuli, such as short video content and live streaming have an enormous impact on consumers' emotional experiences, perceptions, and purchase intention (Van Tuan et al. (2023). The content can lead to

different perceptions (e.g., perceived entertainment and informative). *Perceived informativeness of content* refers to consumers' perceptions of the ability of content to provide useful and relevant information to consumers. Informative content can influence the perceived advertisement's value, grab consumer attention, foster a positive attitude, and increase purchase intention (Reyck & Degraeve, 2003). *Perceived entertainment of content* refers to the enjoyment and amusement consumers experience when interacting with the content. Most of the commercials on social commerce are entertaining which is a crucial factor to captivate potential audiences. Research showed that entertaining content could stimulate addictive behavior and is crucial to captivate potential audiences' attention (Araujo et al., 2022; Ma & Hu, 2021).

Perception toward Influencer Influencers and their recommendation can effectively influence consumer decisions. Followers tend to buy goods or services recommended by the influencer, particularly those who are considered expert, credible, attractive, or trustworthy (Iqbal et al., 2023; Lou & Kim, 2019). *The attractiveness of influencers* helps form social and interpersonal relationships between influencers and customers (Bowling et al., 2004; Sigall & Landy, 1973). Moreover, research showed that the *Credibility of the Influencer (i.e.,* influencer's trustworthiness and expertise) has been an impactful factor in determining an online purchasing decision and customers' trust, especially when there is no physical interaction between the consumers and the product or brand, leading to consumer uncertainty (Grewal et al., 2003; Pornpitakpan, 2004).

Perception of Benefit concerns the favorable outcomes that users expect to receive from a particular action (Leung, 2013). A study of online purchases by Chan et al. (2017) shows that perceived benefits, such as product types, convenience, discounts, prices, and product shortages, can influence consumers' online purchases.

Perceived convenience in social commerce includes access, search, possession, and transaction (Seiders et al., 2000). Perceived convenience makes purchasing easier for consumers and therefore significantly shapes consumers' attitudes, driving impulse buying and intentions to shop online (Adnan, 2014; Rehman 2018)

Promotion benefit is an approach used by advertisers to effectively stimulate consumer purchasing behavior for a product or service (Blattberg & Briesch, 2012). Since TikTok Shop always gives promotions in live streaming, this research expects the promotion benefit to enhance purchase intention and impulse buying.

Factors related to Organism.

Appetite includes the sensation of starving and the desire to consume food. It is expected to be one of the organisms (mediating variable) stimulated after consumers view

food content on TikTok since food content exposure can stimulate metabolic activity, leading to food cravings and hunger (Brookhaven National Laboratory, 2004).

Trust is the result of consumers' internal evaluation after receiving stimuli from the social commerce environment. Trust is likely to be a primary antecedent of people's intention to adopt and engage in social commerce (Lu et al., 2016). Therefore, Trust may drive user engagement and purchase intention on the TikTok Shop when the brand or influencer meets consumer expectations.

Perceived Value can drive consumers' preferences and choices in today's market. There are numerous types of values consumers can receive. First, functional value reflects the utility value of a product, including quality, price, or other utilitarian aspects. Second, social value considers how consumers connect with others through products or brands to gain approval from social groups. Third, emotional value describes the value that a product or service evokes feelings or affective states of consumers. Fourth, epistemic value is delivered when the products can pique consumers' curiosity or satisfy their desire for knowledge. Lastly, conditional value refers to a situational factor that encourages consumers to purchase, such as seasonal products (Sheth et al., 1991).

Purchase Intention (Response)

Purchase intention is the final stage in online shopping, reflecting consumers' inclination to buy goods and services, serving as a reflection of behavioral outcomes. (Zhang et al., 2014). Regarding prior studies on social commerce (Chen et al., 2017; Liu et al., 2016), this study addresses purchase intention as the response due to its reflection of customer outcomes and final choices after internal assessments (organism).

Materials and Methods

The study employed semi-structured in-depth interviews and grounded theory to understand the complex process of food purchase intention on TikTok Shop. Since there was a lack of research on the underlying process, the grounded theory principle was applied to explore the construction of hypotheses (Rubin & Rubin, 2011). Fifteen Indonesian Generation Z participants were selected through purposive convenience sampling for their influence and role as primary buyers on TikTok Shop. Themes and theoretical constructs were derived using open coding.

Interview Protocol

The interview protocol started with questions about participants' food purchases from the TikTok Shop, proceeding only if they answered positively. Topics covered included social media and S-commerce usage patterns, perspectives on TikTok and the TikTok Shop, and factors influencing food purchase intentions. Questions were adjusted

during interviews to balance differences between student and employed participants, which could potentially bias our findings. Fifteen interviews were conducted via Zoom, comprising 6 males and 9 females, aged 17 to 28, with 9 employed and 6 students.

Data collection and analysis

Participants were briefed, provided consent, and granted permission for interview recording and transcription. Interviews lasted 30 – 35 minutes, with summaries written afterward. The data was transcribed and translated from Indonesian to English. Domain and content analysis were used. All the transcript text was extracted and assigned to the S-O-R model with the group code.

Results

Social media and social commerce usage

Participants reported using TikTok, Instagram, Facebook, and WhatsApp, respectively. Students reported spending 40 – 70% of their online time on TikTok due to its entertainment value and user-friendliness. However, workers spend less time on TikTok due to time constraints and engage more in real-life interactions.

In terms of social commerce usage most females (90%) prefer shopping on Shopee, while half of male's favor TikTok Shop. Participants explained that they prefer Shopee because it offers a wider range of products. However, participants noted that TikTok Shop's is relatively new platform and recent resumption after a temporary ban in Indonesia may impact preferences.

".... I still prefer Shopee because there is a greater variety of products on Shopee..." (P3).

However, all participants mentioned experiencing impulse buying on TikTok. This may be attributed to TikTok and TikTok shop features including live streaming, enticing promotions, and discounts. Live streams appearing randomly on feeds strongly influence users and prompt unplanned purchases.

External factors that affect an individual's internal state (stimulus)

Our findings highlight the importance of content on TikTok, influencing both usage and consumer perceptions. Among female respondents, four out of nine prefer entertainment content, enjoying funny videos, and engaging with "fyp" videos. Meanwhile, five out of nine people appreciate TikTok for both entertainment and informative content, finding it beneficial for staying updated and gaining valuable information. Additionally, four out of six male participants prefer informative content, emphasizing TikTok's role in providing valuable information and following trends. In addition to the stimulating content that encourages customers to stay engaged with TikTok, other factors include the perception of influencers, peer reviews, and perceived benefits such as discounts and

convenience of TikTok also stimulate customers' purchases on TikTok shop. Before purchasing a product, most respondents check reviews from influencers. However, they do not rely on just one influencer; instead, they also seek information from other influencers. Additionally, they confirm their decision by looking at comments from other users. *"...I have been influenced by influencers before, but I also check reviews from people who have used the product..." (p8).*

Moreover, most respondents were also swayed by the frequent appearance of product content, creating curiosity and higher preference, and prompting participants to make purchases. All student respondents and three out of seven employee respondents waited for discounts and participated in live streaming when making a purchase. In contrast, the other four employees were not affected by discounts, live streaming, or specific monthly dates for shopping.

Individuals Self Evaluation State (Organism)

Participants reported that the stimuli from TikTok can activate their internal state including cognitive and affective states. Thirteen out of fifteen participants have enjoyed food content (e.g., ASMR, food culinary, and food review content) on TikTok. and admitted that the food content affects their appetites *".... I enjoy watching Mukbang because it makes me feel hungry..."* (P3). Furthermore, participants stated that engaging with influencers, content, and peer reviews could also enhance their trust before making purchases on TikTok shop.

In addition, participants also considered different values when purchasing food on TikTok Shop, namely functional value, emotional value, and epistemic value. In terms of functional value, ten out of fifteen respondents mentioned that packaging, ingredients, and taste were the important factors influencing their decision to buy food.

"... the most important things when buying food are the packaging must be secure, and the ingredients should be clear.... (P1).

Furthermore, four out of fifteen respondents stated that they purchased food when it became viral and trending on TikTok. We categorize this as emotional value, signifying the emotional aspects and personal experiences when making purchases.

"*I have bought food products because the food is trending, and I was feared of missing out (FOMO) since everyone is trying them, so I also want to try them....*" *(P7).*

The next identified value is epistemic value. Four out of fifteen respondents showed interest when sellers demonstrated the cooking process content, helping consumers better understand the quality of ingredients. This highlights how informational and educational aspects contribute to the attractiveness of food products.

Purchase Intentions (Response)

Participants decide to buy food on TikTok Shop after being influenced by external factors that affect their internal cognitive and affective states. As explained, all participants reported impulsively purchasing products and food from the TikTok shop (an unplanned purchase) after being stimulated by TikTok's content, influencer, and perceived value.

Underlying Factor

This study uncovers that social media marketing elements, including influencers and content, not only directly shape product purchase intentions but also evoke cognitive and emotional state and lead to the intention to buy. TikTok food content particularly fences emotions, satisfaction, enjoyment, and appetite. These factors signal the mediating roles on purchase intention on TikTok Shop, especially impulsive buying. Trust and perceived product values emerge as mediators relating to the internal cognitive evaluations. Our study outlines the underlying process in the purchasing journey on TikTok Shop, indicating that stimuli from content, influencers, and perceived benefits influence self-evaluation, shape perceptions of product values, trust, and personal preferences, and ultimately drive consumer food purchase intention and purchasing behavior on TikTok Shop. Therefore, the proposed research model is as follows:

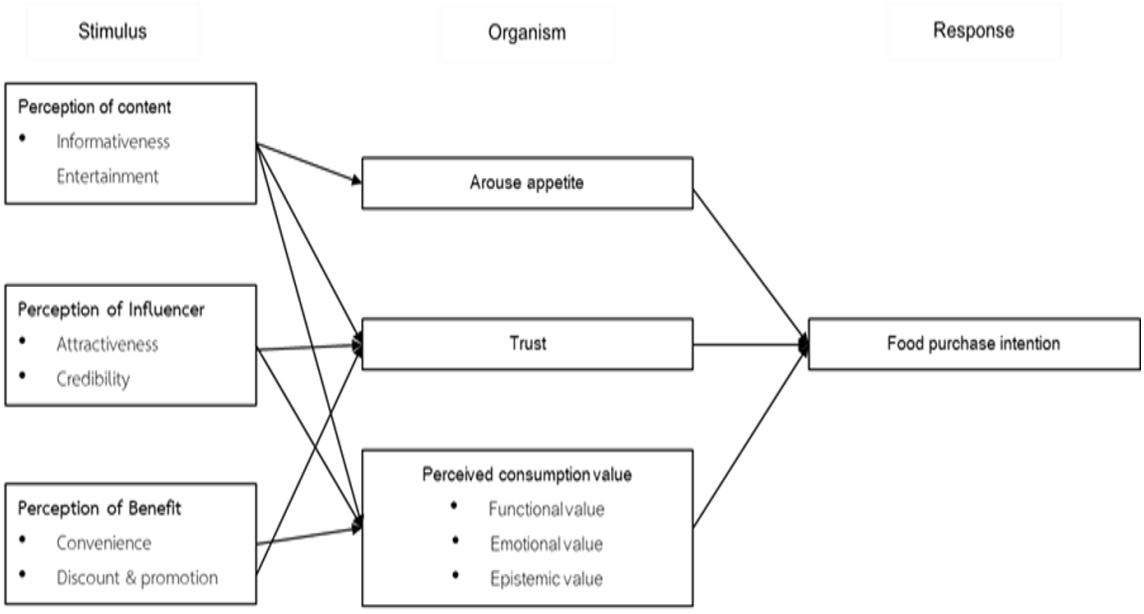

Figure 1: Proposed model

Conclusions and Discussion

Previous studies have examined the impact of external factors on food purchase intention in online commerce, including influencers, social media marketing, price expectations, and product quality (Manaf, 2021; Meliawati et al., 2023; Tran et al., 2023). However, little attention has been given to how these external factors affect the internal state of individuals before they decide to purchase food from TikTok Shop. This study applies S-O-R theory to uncover the underlying process. We found that TikTok frequently impacts impulsive buying behavior. Furthermore, when consumers are exposed to food related content on TikTok and TikTok shop (external stimuli), they subsequently assess these cues before making a purchase decision. The current research found that consumers' evaluation and perceptions towards external stimuli, such as the influence of content, recommendations from influencers, peer reviews, and benefits like discounts, pricing, and convenience can impact consumers' trust in products and their assessment of the product's value before making a purchase decision.

This research supports Lou Kim (2019) that awareness of influencer integrity is pivotal for sustaining consumer trust in social commerce platforms. Additionally, while influencer recommendations are important, many consumers highlighted the crucial of validating influencer reviews with feedback from fellow online customers. Therefore, companies should apply a reward program (e.g., cashback) after reviewing items on TikTok to boost consumer motivation for sharing experiences. Ultimately, it enhances user engagement and trust within the TikTok Shop community.

Moreover, we also found the appetite as an additional underlying process or organism when the stimuli are related to food content. Participants mentioned their interest in food-related video content or culinary reviews such as Mukbang or ASMR, which leads them to make a purchase because it affects their internal feelings by stimulating their appetite. Therefore, business owners should pay attention to strengthening the quality of content's visuals and audio and live streaming to ensure that consumers see product details. The good-quality content will elevate consumer experience and ultimately enhance consumer interest in food. These findings align with studies by Chen (2021) that indicate voice, sounds, and visual mediate the effect of advertisements on purchase intention.

Furthermore, this study reveals that consumption values, such as functional value, emotional value, and epistemic value, are factors considered by individuals before purchasing food products through TikTok Shop. Functional value, especially *packaging* and *ingredients,* is the most frequently mentioned factor by respondents. Aligns with Underwood & Klein (2002), our findings indicate that marketers should prioritize secure

packaging and provide clear storage instructions to enhance consumer trust. Essentially, the packaging can directly affect consumers' perceived quality of the product. Participants emphasized the emotional value, particularly from trending items on TikTok. Hence, businesses should enhance their product visibility by collaborating with influencers and utilizing affiliate marketing. Establishing strong partnerships with influential individuals can help products reach a broader audience through recommendations and positive reviews. Creating a sense of "fear of missing out" (FOMO) can also stimulate impulse purchases. Furthermore, in TikTok culinary content, participants value the epistemic aspect, where sellers showcase the cooking process and creative serving techniques. This highlights the importance of the journey of products shown in video, and livestreaming in capturing consumers' attention. This result supports findings in previous studies that Epistemic value has been suggested as one of the important reasons for leading consumers' choice behavior to purchase local food (Yeon Ho Shin, 2020).

Finally, for future research, quantitative research needs to be employed to validate our proposed underlying process. Moreover, the current research is limited to past food purchasing behavior which focuses on general food. However, it is important to acknowledge that different foods may be related to diverse internal state such as values for consumers (cognitive or affective). Some foods may be dominant in emotional value, while others may provide higher functional value. Therefore, to gain deeper understanding of the underlying process, it is crucial to consider the variations in values that may arise within the context of consumer preferences for specific types of food (moderator).

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The Impact of Marketing Mix and Social Media Influencers on Online Customers' Purchase Intention: A Case Study of JD. COM

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Abstract

This research aimed to study the impact of marketing mix and social media influencers on online customers' purchase intention among Chinese JD users. One hundred and sixty-two Chinese JD users participated in the survey research. The respondents were Chinese customers aged 18 years old to 40 years old and are currently using JD online platform during the past 6 months. The respondents were selected using purposive sampling and convenience sampling. The mean and standard deviation were tabulated, and hypotheses were analyzed using Stepwise Regression analysis. The findings revealed that: (1) product, place, and promotion were significant predictors of respondents' purchase intention of JD.com products. However, price was not a significant predictor of respondents' purchase intention of JD. Com products, and (2) Social influencer significantly influenced the respondents' purchase intention of JD.com products.

Keywords: Marketing Mix, Social Media Influencers, Purchase Intention, JD. Com

Introduction

Development of e-commerce has transformed traditional offline marketing into online marketing. Many studies have confirmed that there was a significant relationship between marketing mix variables and purchase intention (Bahl & Chandra, 2018). Marketing mix is the specific embodiment of the marketing strategy. Enterprises can use the marketing mix to decide the extent the services should be provided to customers, and to what extent they can satisfy customer needs and their values (Mothersbaugh & Hawkins, 2016). In social media, the figure of a person or reference group that can give influence is broadly called "social media influencer" who can change the purchase intention of these followers. So social media influencers may positively influence the company, enabling the company to extensively promote its products and gain revenue (Nurhandayani, Syarief, & Najib, 2019). The research on the expectation of Chinese customers on marketing mix of

online platform and the impact of social media influencer can be used to enhance the effectiveness of marketing communication strategy in the e-commerce in China.

Literature Review

The marketing mix is the business model, historically centered around product, price, place, and promotion (McCarthy, 1964). The marketing mix is defined as "the set of marketing tools that a company uses to pursue its marketing objectives in its target market" (Kotler, 2001). A product refers to an item that satisfies people's needs or desires. It can be a tangible item or an intangible item, and some are even an electronic product. A product can also refer to an item sold by a business, which has its own design, its own brand and category, service, and packaging (Blythe, 2009). Price is the amount a customer must pay to purchase a product, and it is also the total cost to the customer of obtaining the product. It may include money and psychological costs, etc., such as the time spent buying products, etc. Price is also the main thing that customers will consider when purchasing a product (Blythe, 2009). Place is a direct or indirect marketing channels, logistics, orders, retail stores, etc. The physical location where the business conducts business or the distribution channel through which it enters the market and can be referred as to a retail store, but now more and more a virtual shopping platform (Blythe, 2009). Promotion refers to the various activities carried out by enterprises to promote and introduce their products and persuade customers to buy their products, including advertisements, public relations, personal sales, promotional activities, etc. (Kotler, 2001).

Many studies have shown that there is a significant relationship between marketing mix variables and purchase intention. (Bahl & Chandra, 2018). According to previous studies, marketing mix variables are related to consumer attitudes. (Bahl & Chandra, 2018).

Social media is an interactive technology that can spread one's own information, interests, ideas, opinions, etc. through virtual communities and networks (Kietzmann & Hermkens, 2011; Obar & Wildman, 2015). In social media, the figure of a person or reference group that can give influence is called “Celebgram”, “Blogger”, “Vlogger”, “youtuber”, “KOL (Key opinion leader)”, or broadly they are all referred to be called “Social media influencers” (Nurhandayani, Syarief & Najib, 2019).

Objectives of Study

1. To examine the influence of perception of marketing mix (4Ps) of JD.com on the Chinese customers’ purchase intention of JD.com.
2. To examine the influence of opinion toward the impact of social media influencers of JD.com on the Chinese customers’ purchase intention of JD.com.

Theoretical framework

The study has the developed the following hypotheses and theoretical framework:

Hypothesis 1: Perceptions of marketing mix (including product, price, place, and promotion) significantly influence customers' purchase intention of JD.com products.

Hypothesis 2: Opinion on the impact of social Influencer of JD. Com significantly influences customers' purchase intention of JD.com products.

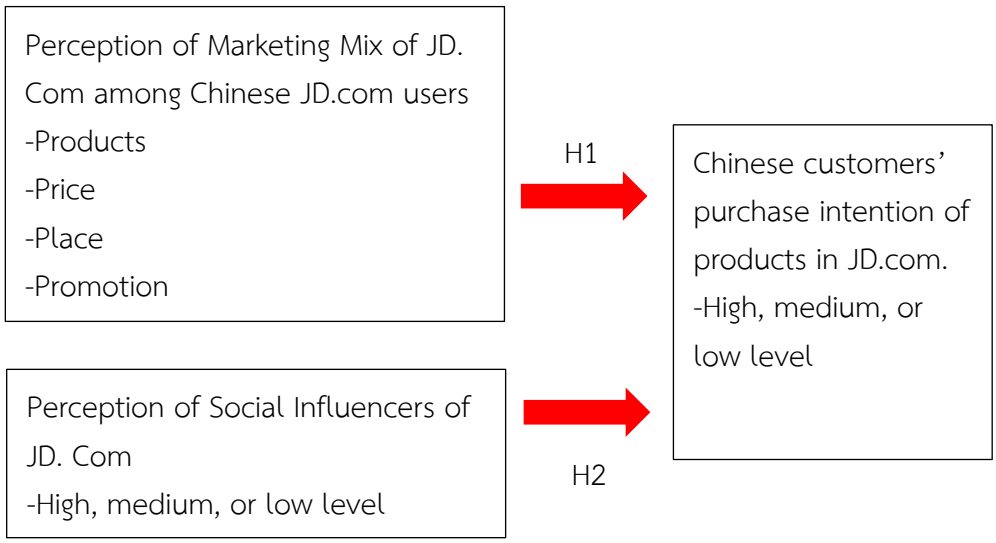

Figure 1: Theoretical framework

Materials and Methods

Research Design

This quantitative research used survey research. The questionnaires were distributed to current JD.com customers via JD online communities, WeChat groups, QQ groups, etc. The population was current Chinese JD.com customers, who were exposing to JD.com during the past 6 months. One-hundred and sixty-two Chinese JD.com customers were selected using purposive sampling and convenience sampling.

Research Instrument

There are 4 parts in the questionnaire. Part I inquired about the demographic data of the respondents. Part II, III, and IV used 5-point Likert scale, arranging from 1 Strongly disagree to 5 Strongly agree. In Part II, the researcher adopted the marketing mix scale to measure the opinion of respondents toward the marketing mix and the impact of social media influencer from Lyu (2021). In Part III, the researcher adopted the scale to measure the impact of social influence from Zin (2020) and used the customer purchase scale adopted from Gao (2019) in Part IV.

Instrument Pretest

The English questionnaire has been translated into Chinese and translated back to Chinese language to ensure content validity of the questionnaire. To ensure the reliability of the questionnaire, the questionnaire was pretested with 30 Chinese online customers prior to the data collection, and the findings revealed that all parts have cronbach alpha higher than 0.70. Part II, marketing mix has cronbach alpha of 0.929, impact of social influencers has cronbach alpha of 0.816, and customers' purchase intention has cronbach alpha of 0.857. The reliability results revealed that each scale is considered to have acceptable reliability.

Data Analysis

Perception of customers toward the marketing mix, including products, price, place, and promotion of the products sold in JD.com was the independent variable, and impact of social media influencers on the customers' purchase intention of JD.com products was the mediating factor. The dependent variable was customers' purchase intention of JD.com products. The hypotheses were analyzed using Stepwise Regression Analysis with the statistical significance at 0.05.

Results

Summary of Descriptive Findings

Descriptive findings showed majority of the respondents were male (56.2%, n = 91) followed by female (43.8%, n = 71), with the age between 18-30 years old (43.2%, n =70), earning a monthly salary between 5,001-10,000 yuan (59.9%, n = 97), married (68.5% n = 111), and completed bachelor's degree or other equivalent education (80.9% n = 131).

Descriptive findings revealed that majority of the respondents agreed with all the statements about each factor of marketing mix and had high perception of the overall marketing mix ($\overline{X}$ = 3.57, *S.D.* = 9.911). When examining each factor of the marketing mix, respondents had the highest perception on the products of JD.com ($\overline{X}$ = 3.58, *S.D.* = 1.08), followed by place ($\overline{X}$ =3.57, *S.D.* = 0.989), price ($\overline{X}$ = 3.56, *S.D.* = 0.981), promotion ($\overline{X}$ = 3.56, *S.D.* = 1.01), respectively. The finding also revealed that respondents had high perception of products, place, price, and promotion respectively too.

When examining each factor of the marketing mix, the findings revealed that in respect to product factor, respondents ranked the quality of JD. products as the reason for buying JD. com products having the highest mean ($\overline{X}$ = 3.73, *S.D.* =1.115), followed by product packaging ($\overline{X}$ = 3.51, *S.D.*=1.310). In respect to the price factor, respondents ranked cheap prices as the reason for their purchasing intention of JD. products having the highest mean ($\overline{X}$ = 3.67, *S.D.* =1.260), followed by payment method. In respect to the place factor,

respondents ranked fast delivery as the reason for their purchase intention having the highest mean ($\overline{X}$ =3.65, *S.D.*= 1.218), followed by convenience. In respect to the promotion factor, respondents ranked promotions and discounts having the highest mean to influence their purchase intention ($\overline{X}$ = 3.65, *S.D.* = 1.218), followed by coupons.

Majority of the respondents agreed with the statements about the opinions on the impact of social media influencers of JD.com ($\overline{X}$ = 3.52, S.D. = 0.921), ranking the trust of social media as the highest mean, followed by their personal preference on the social media influencer ($\overline{X}$ =3.68, *S.D.* = 1.172). Finally, respondents had high purchase intention of JD.com products after exposing to the marketing mix promoted in JD.com. ($\overline{X}$ = 3.56, *S.D.*= 0.962), ranking that statement," I trust the recommendations of some social media influencers of JD.com more than I choose the products by myself with the highest mean.

Summary of Inferential Findings

Hypothesis 1 Perceptions of marketing mix (including product, price, place, and promotion) significantly influence customers' purchase intention of JD.com products.

Stepwise Regression analysis found that perception of marketing mix can explain 87.4% of the customer purchase (R^2= 0.874*, p< 0.05), which was considered to be high prediction. When examining the power of each marketing mix, the findings revealed that perception on product (Beta = 0.451*, p<0.05), place (Beta = 0.249*, p<0.05), and promotion (Beta = 0.133*, p<0.05) are significant predictors of respondents' purchase intention of JD.com products. However, price was not significant predictors of respondents' purchase intention of JD. Com products (Beta = 0.128, p > 0.05). Therefore, hypothesis 1 was partially supported.

Table 1: Summary of Regression Analysis for Hypothesis 1

Predictors (Independent variables)	*B*	Std. Error of the Estimates	Beta (Standardized)	Sig.t
Marketing mix	0.916	0.4820	0.867	0.000
Product	0.400	0.068	0.451	0.000
Price	0.125	0.070	0.128	0.070
Place	0.243	0.059	0.249	0.000
Promotion	0.126	0.062	0.133	0.042

Dependent variables: Customers' purchase intention of JD.com products (R^2= 0.874*, df= 4, p<0.05)

Hypothesis 2 Social media influencers significantly influence Chinese customers' purchase intention of products in JD.com.

Stepwise Regression analysis found that social media influencers in JD. com can explain 64.3% of respondents' purchase intention of JD.com. (R^2= 0.643*, p< 0.05), which was considered to be high prediction In addition, the social media influencers significantly influenced the respondents' purchase intention of JD.com products (Beta= 0.802*, p< 0.05). Therefore, hypothesis 2 was accepted.

Table 2: Summary of Regression Analysis for Hypothesis 2

Predictors (Mediating variables)	*B*	Std. Error of the Estimates	Beta (Standardized)	Sig.t
Social influencers	0.838	0.049	0.802	.000

Dependent variable: Customers' purchase intention of JD.com products (R^2= 0.643, df= 1, p<0.05)

Hypothesis 1 findings revealed that perception of marketing mix can explain 87.4% of the customers' purchase intention of JD.com products. When examining the power of each marketing mix, the findings revealed perception on the product, place, and promotion were significant predictors of respondents' purchase intention of JD.com products. However, price was not significant predictors of respondents' purchase intention of JD. Com products according to the findings. Therefore, hypothesis was partially accepted.

Hypothesis 2 findings revealed that social media influencers in JD. com can explain 64.3% of respondents' purchase intention of JD.com. and social influencer significantly influenced the respondents' purchase intention of JD.com products. Therefore, hypothesis 2 was accepted.

Conclusions and Discussion

In respect to the product factor, this study revealed that the quality, packaging, and kinds of JD products significantly influence JD users' purchase intention., which coincided with Ririn, Rahmat & Rina (2019), who found that the quality of the product and the specific packaging significantly affect the customer's purchase intention.

In respect to the place factor, this study revealed that the convenience of JD.com's channels, the speed of express delivery and after-sales service significantly influence

customers' purchasing intentions. This result coincided with Rachmawati, Shukri, Azam, & Khatibi (2019) who found that location of service and service after purchase can significantly influence customer purchase intention.

In respect to the promotion factor, this study revealed that using coupons and other promotional methods significantly influence JD.com's customers' purchase intentions. This result coincided with Yusuf and Sunarsi (2020) who found that promotions have such a positive significance on customers' purchase intention.

In conclusion, this study found that the marketing mix significantly influence the purchase intention of JD.com users. This study coincided with Putra, Tarigan, Sitepu, & Singh (2020) who found that marketing mix has an impact on purchase intention.

In addition, this study found that online influencers and influencer advertising can influence JD customers' purchase intentions. Hypothesis 2 findings coincided with Nurhandayani, Syarief, & Najib (2019) who examined the impact of social media influencer and brand images to purchase intention" and they found that social media influencers also have a positive impact on customer purchase intentions. Nurhandayani, Syarief, & Najib (2019) claimed that social media influencers also have a positive impact on JD.com's customer purchase intentions.

In conclusion, this study supported the assumptions of Blau's (1964) and Emerson's (1976) Social Exchange theory and Festinger's Cognitive Dissonance theory (1957). Hypothesis 1 results revealed that marketing mix factors can significantly influence Chinese customers' purchase intention of products in JD.com. Homans (1961) defined Social Exchange as "the exchange of activity, tangible, or intangible, and more or less rewarding or costing between at least two persons." (p. 13). The theory also deals with economic relationships cost-benefit analysis occurs when each party has a good that the other party values (Roeckelein, 2018). Social exchange theory states that if the cost of a relationship is higher than the return, for example, if a lot of effort or money has been invested in a relationship without a return, then the relationship may be terminated or abandoned (Emerson & Cook, 1976).

The results also coincided with Festinger' Cognitive dissonance theory (1957) which posited that people can psychologically dissect the information they are exposed to and choose the evidence that is favorable and ignore the evidence that is unfavorable. Schiffman and Kanuk (2007) introduced the concept of five stages that revealed the process: (1) Awareness, (2) Interest, (3) Decision, (4) Trial, and (5) Adoption or Rejection. Schiffman and Kanuk (2007) found that when customers make a purchase intention, they are first exposed to marketing mix variables such as product and price. The core of Social Exchange theory is mutual benefit. The hypothesis findings supported the assumption of

the Social Exchange theory, because customers perceived that JD. products are rewarding to their purchase, because the marketing mix make them fully informed about the product quality, product packaging, affordable price, fast delivery service, and convenience which are consistent to the Chinese customers' expectations. JD. com also reached their mutual expectation from the customers' purchase too.

Hypothesis 2 results confirmed that social media influencers significantly influence Chinese customers' purchase. When customers have the intention to purchase a product, they must first be aware of and interested in the product. Social media influencers can make products available to more people and increase product exposure. The expertise and appeal of social media influencers can have a positive impact on customers' purchase intentions (Zin, 2020). Hypothesis 2 results supported the assumption of the Social Exchange theory, because Chinese customers gained knowledge about products from social media influencers, reducing the customer's choice pressure or uncertainty. At the same time, social media influencers can also benefit from JD.com. too, such as earning revenue and generating their own brand recognition from the endorsing the JD.com products.

However, this study found that price are not significant predictors of respondents' purchase intention of JD. Com products. Widyastuti, Pujiharto, Tubastuvi, & Santoso (2020) also found that the price did not affect the purchase decision in the study. It can be seen from JD.com's market positioning that, as a B2C platform, JD.com mainly provides consumers with a high-quality, high-standard, and reliable comprehensive shopping experience, and emphasizes authenticity guarantee and quality control. Therefore, the primary target customers of JD.com are mainly those who prioritize high quality and authentic products, and thus price is not a major consideration for them. However, the researcher also suggests that JD.com should try its best to make prices more affordable, reaching other target customers, who are looking for "two-in-one purchase" having both high-quality products and affordable price at the same purchase. If JD. com could promote the unique selling position of "two-in-one purchase" policy, JD. com can generate a higher penetration and revenue among Chinese customers.

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(ระดับชาติ)

กลุ่มมนุษยศาสตร์

พฤติกรรมการเปิดรับข่าวสาร การรู้ทันสื่อ และการรู้ทันตนเองในสื่อสังคมออนไลน์ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ

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บทคัดย่อ

การวิจัยเรื่อง พฤติกรรมการเปิดรับข่าวสาร การรู้ทันสื่อ และการรู้ทันตนเองในสื่อสังคมออนไลน์ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมการเปิดรับข่าวสาร การรู้ทันสื่อ การรู้ทันตนเองในการเปิดรับสื่อสังคมออนไลน์ และศึกษาปัจจัยด้านลักษณะทางประชากร การรู้ทันสื่อ และการรู้ทันตนเองที่ส่งผลต่อพฤติกรรมการเปิดรับสื่อผ่านสื่อสังคมออนไลน์ เป็นการวิจัยเชิงปริมาณ ใช้แบบสอบถามเป็นเครื่องมือ ผ่านการทดสอบเครื่องมือวิจัยโดยมีค่าความเชื่อมั่นจากสัมประสิทธิ์แอลฟา (Alpha Coefficient) ของครอนบาช (Conbach's Coefficient Alpha) แสดงว่าแบบสอบถามมีคุณภาพเพียงพอสำหรับใช้ในการเก็บรวบรวมข้อมูล จากกลุ่มตัวอย่างจำนวน 230 คน โดยกำหนดขนาดกลุ่มตัวอย่าง ตามสูตรของ ทาโร่ ยามาเน่ (Taro Yamane) แล้วสุ่มตัวอย่างแบบชั้นภูมิตามสัดส่วนของขนาดประชากร และใช้สถิติเชิงพรรณนา ได้แก่ ค่าความถี่ ร้อยละ ส่วนเบี่ยงเบนมาตรฐาน และค่าเฉลี่ย รวมถึงการหาค่าการทดสอบสมมติฐานโดยการวิเคราะห์การถดถอยเพื่อหาความสัมพันธ์ระหว่างตัวแปร ในการวิเคราะห์ผล

ผลการวิจัยพบว่า กลุ่มตัวอย่างส่วนใหญ่ เรียนอยู่วิทยาเขตกรุงเทพ เป็นเพศชาย มีอายุ ระหว่าง 18 - 20 ปี มีรายได้เฉลี่ยต่ำกว่า 5,000 บาท ส่วนใหญ่เรียนอยู่ชั้นปีที่ 2 มีการใช้เฟซบุ๊กมากที่สุด ส่วนเอ็กซ์น้อยที่สุด และใช้เวลา 5 - 8 ชั่วโมงต่อวัน เพื่อเปิดรับเนื้อหาด้านภาพยนตร์/เพลง มากที่สุด เหตุผลในการใช้สื่อสังคมออนไลน์คือใช้ยามว่าง และคาดหวังด้านความรวดเร็วในการใช้เป็นเครื่องมือติดต่อ สื่อสารมากที่สุด ส่วนพฤติกรรมต่อการเปิดรับข่าวสารสื่อสังคมออนไลน์อยู่ในระดับมาก การรู้ทันสื่อสังคมออนไลน์อยู่ในระดับเห็นด้วยสูงในขณะที่ความคิดเห็นที่มีต่อการรู้ทันตนเอง อยู่ในระดับปานกลาง สำหรับผล การ

ทดสอบสมมติฐาน พบว่า ปัจจัยลักษณะทางประชากร ได้แก่ เพศชาย อายุ 18 - 20 ปี ชั้นปีที่ 2 รายได้ต่อเดือนของนักศึกษาส่งผลทางบวกต่อตัวแปรพฤติกรรมการเปิดรับข่าวสารผ่าน สื่อสังคมออนไลน์ อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ส่วนปัจจัยด้านการรู้ทันสื่อ และการรู้ทันตนเองมีความสัมพันธ์กับพฤติกรรมการเปิดรับข่าวสารผ่านสังคมออนไลน์ สามารถพยากรณ์พฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ได้อย่างมีนัยสำคัญทางสถิติที่ระดับ .05

คำสำคัญ: พฤติกรรม, การเปิดรับข่าวสาร, การรู้เท่าทันสื่อ, การรู้ทันตนเอง, สื่อสังคมออนไลน์

Abstract

The objectives of “Information Exposure Behavior, Media Literacy and Self Awareness in Social Media of Sport Communication, Faculty of Liberal Arts, Thailand National Sport University” were 1) to study information exposure behavior, media literacy and self-awareness in social media and 2) to study demographic factors of media literacy and self-awareness that affect information exposure behavior in social media. It is a quantitative research using a questionnaire as a tool. The research instrument was tested with reliability using Cronbach's alpha coefficient, indicating that the questionnaire was of sufficient quality for use in data collection. From a sample of 230 people, the sample size was determined according to Taro Yamane formula. The sample was then divided in proportion to the population size. And use descriptive statistics such as frequency, percentage, standard deviation, mean, as well as finding values to test hypotheses using regression analysis to find relationships between variables. to analyze the results

According to the study results, it was found that most of the sample group studied at Bangkok campus, were male, aged between 18 - 20 years, earning an average income of less than 5,000 baht, most of them studying in the second year, using Facebook the most while X was the least. And spend 5 - 8 hours a day to get the most movie / music content. The reasons for using social media are when they are at leisure and expect the fastest speed in using communication tools. Likewise, the information exposure behavior was at a high level. Social media literacy is at a high level, while opinion of self-awareness is at a moderate level. For the hypothesis testing, it was found that demographic factors, such as male, 18 - 20 years old, 2nd year, monthly income of students had a positive effect on social media exposure behavior variables statistically significant at the .05 level. Meanwhile, the media literacy and self-awareness factors were related to social media exposure behavior, where they were able to predict social media exposure behavior was statistically significant at the .05 level.

Keywords: Behavior, Information Exposure, Media Literacy, Social Media

บทนำ

ในยุคข้อมูลข่าวสาร สื่อใหม่ (New Media) มีการหลอมรวมเทคโนโลยี ตัวอย่างเช่น สื่อสังคมออนไลน์ (Social Media) ได้เข้ามามีบทบาทต่อชีวิตประจำวันของผู้คนในสังคมหลากหลายด้าน โดยเฉพาะอย่างยิ่งบทบาทในด้านการสื่อสาร จากคุณสมบัติดังกล่าว เป็นผลให้จำนวนผู้ใช้สื่อใหม่ในยุคการหลอมรวมเทคโนโลยีเพิ่มขึ้นอย่างรวดเร็ว รวมทั้งการเป็นสื่อใหม่ที่ผู้ใช้มีเสรีภาพสูงในการกำหนดเนื้อหา และรูปแบบการใช้ประโยชน์ หากมีการนำไปใช้ในทางที่ไม่เหมาะสมอันก่อให้เกิดความเสียหาย กระทบกระเทือนต่อระบบเศรษฐกิจ สังคม และความมั่นคงของรัฐ รวมทั้งความสงบสุขและศีลธรรมอันดีของประชาชน

นับได้ว่า เทคโนโลยีสารสนเทศเป็นเทคโนโลยีแบบสุนทรียะสัมผัส และตอบสนองตามความต้องการแบบการสื่อสารสองทางที่ก้าวหน้าและแพร่หลายมากขึ้น มีการโต้ตอบผ่านเครือข่ายทำให้เสมือนมีปฏิสัมพันธ์ได้จริง ทั้งผู้พูดและผู้ฟังต่างก็ได้รับข้อมูลข่าวสารถึงกัน การพัฒนาของ “สื่อสารสนเทศ” จึงเข้ามามีบทบาทและอิทธิพลอย่างมากต่อผู้รับสาร (Receiver) (อุษา บิ้กกิ้นส์, 2555) สื่อสังคมออนไลน์ คือ สื่อที่ผู้ส่งสารแบ่งปันสารซึ่งอยู่ในรูปแบบต่าง ๆ ไปยังผู้รับสารผ่านเครือข่ายออนไลน์ โดยสามารถโต้ตอบกันระหว่างผู้ส่งสารและผู้รับสารหรือผู้รับสารด้วยกันเองซึ่งสามารถแบ่งสื่อสังคมออนไลน์ออกเป็นประเภทต่าง ๆ ได้แก่ บล็อก (Blogging) เอ็กซ์ และไมโครบล็อก (X and Micro blogging) เครือข่ายสังคมออนไลน์ (Social Networking) และการแบ่งปันสื่อทางออนไลน์ (Media Sharing) (พิชิต วิจิตรบุญยรักษ์, 2554)

ทั้งนี้ “การรู้เท่าทันสื่อ” เป็นแนวคิดที่ได้รับการยอมรับอย่างกว้างขวางในระดับสากล ถือเป็นเครื่องมือสำคัญในการเสริมสร้างพลังอำนาจในการบริโภคสื่ออย่างชาญฉลาดของผู้บริโภคสื่อ การรู้เท่าทันสื่อและสารสนเทศจะเน้นการส่งเสริมมากกว่าการป้องกันและเน้นเสริมพลังภาคพลเมืองให้สามารถเข้าใจสื่อ วิเคราะห์สื่อ และมีภูมิคุ้มกันด้านสื่อที่ดี ซึ่งสื่อนั้นครอบคลุมสื่อใหม่ ได้แก่ เทคโนโลยีสารสนเทศด้วย การจะขับเคลื่อนสื่อได้อย่างมีประสิทธิภาพควรให้ความสำคัญกับการเรียน การสอนเน้นที่หลักสูตรการสอน มีการออกแบบเครื่องมือและกิจกรรมสร้างสรรค์สำหรับการศึกษานอกระบบ โดยอาศัยการมีส่วนร่วมและการสนับสนุนจากผู้กำหนดนโยบายด้านการรู้เท่าทันสื่อ การรู้เท่าทันสื่อและสารสนเทศจึงควรเป็นการรวม ศักยภาพด้านต่าง ๆ ทั้งความรู้ทักษะ และทัศนคติ (อุษา บิ้กกิ้นส์, 2555)

ดังนั้นผู้วิจัยจึงสนใจศึกษาพฤติกรรมการเปิดรับข่าวสาร การรู้ทันสื่อ และการรู้ทันตนเอง ในสื่อสังคมออนไลน์ของ ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ เนื่องจากเปิดการเรียนการสอนด้านสื่อสารการกีฬา จำนวน 6 วิทยาเขต จึงจำเป็นต้องมีทักษะการรู้เท่าทันสื่อ รู้เท่าทันตนเองในสื่อสังคมออนไลน์ได้อย่างเหมาะสมนั้น เนื่องจากนักศึกษาเป็นทั้งผู้เปิดรับข่าวสารและเป็นผู้ผลิตสื่อ จึงจำเป็นต้องศึกษาถึงอิทธิพลของปัจจัยที่เกี่ยวข้องกับการรู้เท่าทันสื่อ เพื่อเป็นพื้นฐานในการพัฒนาทักษะในการเรียนการสอนได้อย่างเหมาะสมต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาความคิดเห็นที่มีต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ
2. เพื่อศึกษาการรู้ทันสื่อสังคมออนไลน์ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ

3. เพื่อศึกษาการรู้ทันตนเองในการเปิดรับสื่อสังคมออนไลน์ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ

4. เพื่อศึกษาปัจจัยด้านลักษณะทางประชากร การรู้ทันสื่อ การรู้ทันตนเองที่ส่งผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดการรู้เท่าทันสื่อ

สุชาดา จักรพิสุทธิ์ (2554) ให้ความหมายว่า ความสามารถในการเข้าถึง การวิเคราะห์ วิพากษ์วิจารณ์ การประเมินคุณค่า และทักษะการตอบสนอง (สื่อสาร) ต่อข่าวสารในรูปแบบต่าง ๆ ขณะที่ อนงค์นาฎ รัศมีเวียงชัย (2556) ให้คำจำกัดความว่า ความรู้ทันสื่อหมายถึง ความสามารถในการอนุมานความตื้นลึกหนาบางของข้อมูลที่ปรากฏในสื่อมวลชนอย่างมีหลักการซึ่งจะช่วยป้องกันการตกเป็นเหยื่อให้สื่อมวลชนโดยไม่รู้สึกตัว และยังช่วยเป็นรากฐานที่ตะล่อมให้สื่อมวลชนอยู่ในร่องในรอยตามความปรารถนาของผู้บริโภคสื่อมวลชนมากยิ่งขึ้น

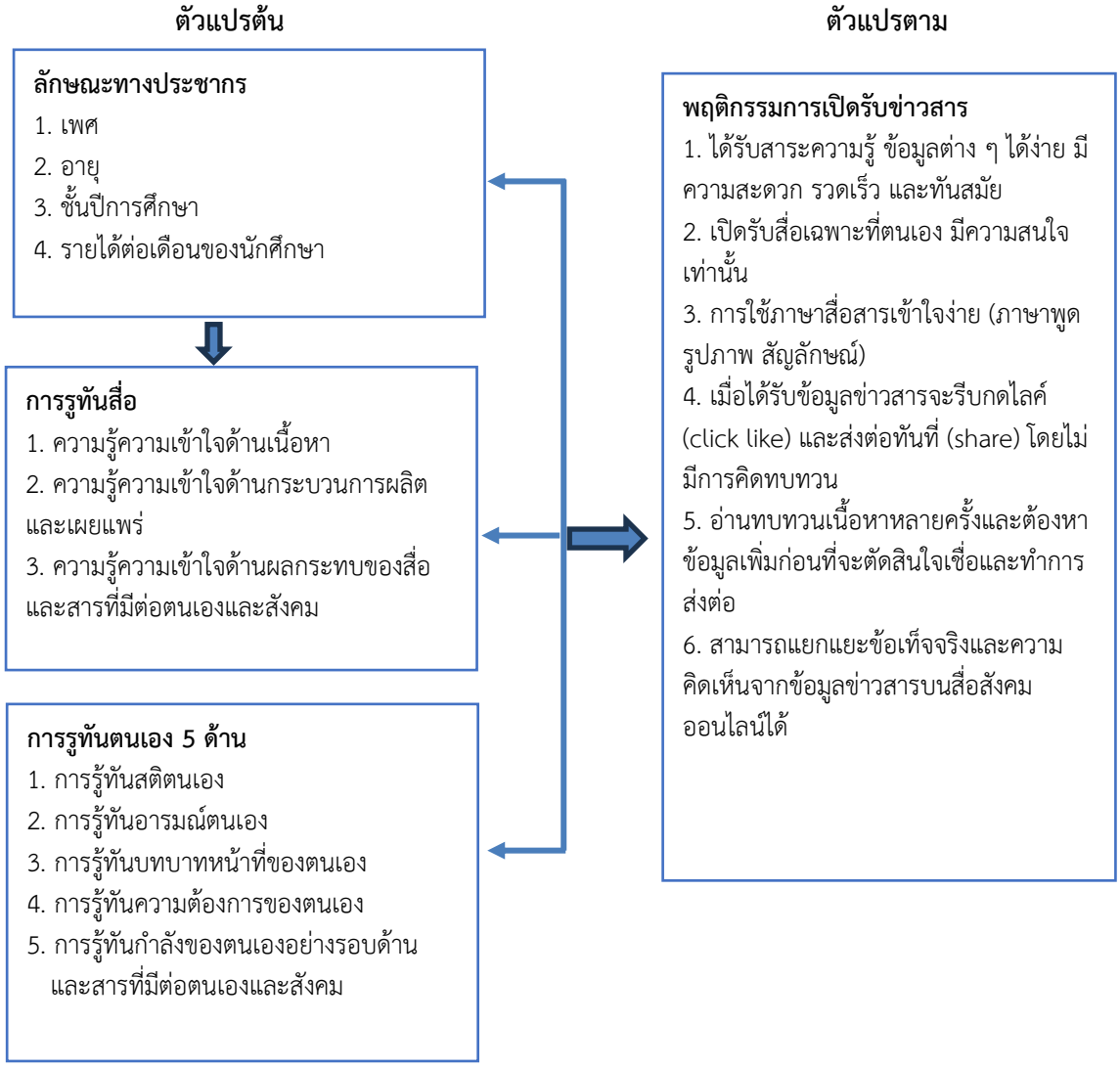
แนวคิดการรู้เท่าทันตนเอง

ทัศนีย์ สุริยะไชย (2554) ให้ทัศนะว่า การตระหนักรู้ในตนเองเป็นกระบวนการในการปรับใช้ข้อมูลมากมายที่มีอยู่ ได้แก่ อารมณ์ ความรู้สึก การรับรู้ทางประสาทสัมผัส การประเมินค่าการแสดงออก และความตั้งใจ ซึ่งจะช่วยให้บุคคลเข้าใจตนเองและข้อมูลเหล่านี้จะช่วยให้บุคคลนั้นเข้าใจปฏิกิริยาตอบสนองพฤติกรรมการสื่อสารและการปฏิบัติในสถานการณ์ต่าง ๆ

พฤติกรรมการเปิดรับข่าวสาร

ทฤษฎีการเปิดรับข่าวสาร (Media Exposure Theory) ความต้องการแรงจูงใจ ความคาดหวัง ทัศนคติ ความสนใจ หรือปัจจัยภายนอก ซึ่งเป็นคำอธิบายมาจากวิชาสังคมวิทยา เช่น เพศ อายุ รายได้อาชีพ เป็นต้น โดยลักษณะของปัจจัยเหล่านี้เป็นตัวกำหนดการเข้าถึงสื่อ ด้านจิราพร รุจิวัฒนากร (2556) กล่าวถึงแนวคิดด้านประชากรศาสตร์ ว่าคนที่มีลักษณะทางประชากรศาสตร์แตกต่างกันจะมีพฤติกรรมที่แตกต่างกัน อย่างไรก็ตามพฤติกรรมการเปิดรับสื่อนี้จึงเป็นปัจจัยสำคัญในการนำมาประกอบการตัดสินใจของบุคคล ยิ่งบุคคลนั้นยังคงมีความลังเล ไม่แน่ใจในเรื่องใดเรื่องหนึ่ง บุคคลนั้นย่อมต้องการเปิดรับข่าวสารมากขึ้นเท่านั้น ไม่ว่าจะจากสื่อใดก็ตาม จึงทำให้เกิดกระบวนการเลือกรับข่าวสารขึ้น ซึ่งแตกต่างกันไปตามปัจจัยต่าง ๆ ของแต่ละบุคคล มงคล โสภณ และวิภาวรรณ กลิ่นหอม (2558)

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากร ประกอบด้วย นักศึกษามหาวิทยาลัยการกีฬาแห่งชาติ จาก 17 วิทยาเขต ผู้วิจัยเลือกแบบเจาะจงที่เปิดการเรียนการสอนในสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ ทั้งหมด 6 วิทยาเขต ได้แก่ วิทยาเขตกรุงเทพ วิทยาเขตชัยภูมิ วิทยาเขตเพชรบูรณ์ วิทยาเขตสมุทรสาคร วิทยาเขตสุพรรบุรี และวิทยาเขตอุดรธานี ตั้งแต่ชั้นปีที่ 1 - 4 จำนวน 582 คน

การเลือกกลุ่มตัวอย่าง โดยใช้สูตรของ โดยใช้สูตรทาโร่ ยาเมเน่ (Taro Yamane) กำหนดความคลาดเคลื่อนในการสุ่มกลุ่มตัวอย่างเท่ากับ 0.05 Taro Yamane (อ้างถึงใน สถิตย์ ศรีสองเมือง, 2555) จากนักศึกษาทั้งหมด 582 คน คำนวณตามสูตรได้กลุ่มตัวอย่างจำนวน 222 คน ทั้งนี้ เพื่อทดแทนการสูญหาย ผู้วิจัยจึงปรับจำนวนกลุ่มตัวอย่างเป็น 230 คน เพื่อศึกษาการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ 5 สื่อ ได้แก่ เฟซบุ๊ก เอ็กซ์ อินสตาแกรม ยูทูปอและโปรแกรมสนทนาไลน์

ภาพที่ 2 การเปิดรับสื่อสังคมออนไลน์

โดยใช้วิธีสุ่มกลุ่มตัวอย่างแบบชั้นภูมิตามสัดส่วนของขนาดประชากร (Proportional to size) เพื่อให้ได้ตัวแทนของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ ดังนี้

$$\text{กลุ่มตัวอย่างในแต่วิทยาเขต} = \frac{\text{ประชากรในแต่วิทยาเขต} \times \text{จำนวนกลุ่มตัวอย่าง}}{\text{ประชากรทั้งหมด}}$$

เมื่อคำนวณตามสูตรดังกว่าจะได้คำนวณตัวอย่าง แสดงในตารางที่ 1

ตารางที่ 1 แสดงจำนวนกลุ่มตัวอย่าง

ลำดับที่	วิทยาเขต	จำนวนประชากร	กลุ่มตัวอย่าง
1	วิทยาเขตกรุงเทพ	178	71
2	วิทยาเขตชัยภูมิ	44	17
3	วิทยาเขตเพชรบูรณ์	58	23
4	วิทยาเขตสมุทรสาคร	120	48
5	วิทยาเขตสุพรรณบุรี	40	16
6	วิทยาเขตอุดรธานี	138	55
	รวม	**580**	**230**

เครื่องมือที่ใช้ในการวิจัย

การวิจัยครั้งนี้ใช้แบบสอบถามเป็นเครื่องมือในการเก็บรวบรวมข้อมูล ทั้งนี้ ลักษณะของแบบสอบถามจะเป็นคำถามปลายปิด ซึ่งมีทั้งแบบเลือกตอบและประเมินค่า โดยแบ่งออกเป็น 5 ตอนดังนี้

ตอนที่ 1 ข้อมูลลักษณะทางประชากรของนักศึกสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ เป็นคำถามแบบเลือกตอบเพียงข้อเดียว (check list) จำนวน 5 ข้อ

ตอนที่ 2 ข้อมูลการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ เป็นคำถามแบบให้เลือกตอบเพียงข้อเดียว (check list) จำนวน 6 ข้อ

ตอนที่ 3 พฤติกรรมการเปิดรับข่าวสาร เป็นคำถามเกี่ยวกับความคิดเห็นที่มีต่อพฤติกรรมการใช้สื่อสังคมออนไลน์ ในรูปแบบของแบบประเมินค่า (Rating Scale) 5 ระดับ คือ จริงมากที่สุด จริง ค่อนข้างจริง ค่อนข้างไม่จริง และ ไม่จริงเลย จำนวน 7 ข้อ

ตอนที่ 4 การรู้ทันสื่อสังคมออนไลน์เป็นการวัดความคิดเห็นที่มีต่อความรู้ความเข้าใจในการรู้ทันสื่อใน 3 ด้านคือ 1) ด้านเนื้อหา 2) ด้านกระบวนการผลิตและเผยแพร่ 3) ด้านผลกระทบของสื่อและสารที่มีต่อตนเองและสังคม เป็นคำถามแบบประเมินค่า (Rating Scale) 5 ระดับ คือ เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่แน่ใจ ไม่เห็นด้วย และไม่เห็นด้วยอย่างยิ่ง รวมจำนวน 38 ข้อ

ตอนที่ 5 การรู้ทันตนเองเป็นการประเมินตนเองในการใช้สื่อสังคมออนไลน์ที่เกี่ยวข้องกับพฤติกรรมในการเปิดรับสื่อ การรับรู้ความต้องการของตนเอง การตระหนักรู้หรือมีสติในการใช้สื่อการรู้ทันอารมณ์ตนเอง การรับรู้บทบาทของตนเอง และการวิเคราะห์กำลังของตนเองอย่างรอบด้านเป็นคำถามแบบประเมินค่า (Rating Scale) 5 ระดับ คือ จริงมากที่สุดจริง ค่อนข้างจริง ค่อนข้างไม่จริง ไม่จริงเลย จำนวน 35 ข้อ

การสร้างเครื่องมือวิจัย

ผู้วิจัยสร้างและพัฒนาแบบสอบถามขึ้นตามวัตถุประสงค์การวิจัยโดยรวบรวมจากเอกสาร แนวคิด/ทฤษฎี งานวิจัยที่เกี่ยวข้อง เพื่อให้ได้ข้อมูลจากกลุ่มตัวอย่างตามที่กำหนดไว้ จากนั้นจึงทำการทดสอบความเที่ยงตรง (Validity) และความเชื่อถือได้ (Reliability) ของแบบสอบถาม โดยการนำให้ผู้ทรงคุณวุฒิจำนวน 3 ท่าน ตรวจสอบ พัฒนาแก้ไขแบบสอบถาม นำมาทดสอบความเชื่อมั่นของแบบสอบถาม โดยใช้โปรแกรมสำเร็จรูปในการหาความเชื่อมั่น โดยใช้เทคนิคการวัดความสอดคล้องภายในชุดเดียวกัน (Internal Consistency Method) ด้วยการหาค่าสัมประสิทธิ์อัลฟา ของครอนบาท (Cronbach's Alpha Coefficient) โดยได้ค่าอัลฟาเท่ากับ 0.935 ซึ่งถือว่าแบบสอบถามนี้มีความเชื่อถือได้จากนั้นจึงนำแบบสอบถามไปใช้กับกลุ่มตัวอย่าง

การวิเคราะห์ข้อมูล

การวิเคราะห์ข้อมูลโดยใช้โปรแกรมสำเร็จรูปแบ่งออกเป็น 3 ส่วน ดังนี้

1. ข้อมูลในตอนที่ 1 และ 2 วิเคราะห์โดยใช้สถิติเชิงพรรณนา (Descriptive Statistics) ได้แก่ การแจกแจงความถี่ และร้อยละ

2. ข้อมูลในตอนที่ 3, 4 และ 5 วิเคราะห์โดยใช้สถิติเชิงพรรณนา (Descriptive Statistic) ได้แก่ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

3. การทดสอบสมมติฐานที่ใช้ในการวิเคราะห์ความสัมพันธ์ระหว่างตัวแปรจะใช้การวิเคราะห์การถดถอย (Regression Analysis)

สมมติฐานข้อที่ 1 ปัจจัยด้านลักษณะทางประชากรมีผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์

สมมติฐานข้อที่ 2 การรู้ทันสื่อและการรู้ทันตนเองมีผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์

สรุปผลการวิจัย

1. ข้อมูลลักษณะทางประชากร

ผลจากการวิจัย พบว่า จำนวนและร้อยละของผู้ตอบแบบสอบถามจำแนกตามเพศและกลุ่มวิทยาเขต พบว่า มีผู้ตอบแบบสอบถามทั้งสิ้น 230 คน ส่วนใหญ่เป็นเพศชาย จำนวน 129 คน คิดเป็นร้อยละ 56.09 ส่วนใหญ่มีอายุระหว่าง 18 - 20 ปี จำนวน 168 คน คิดเป็นร้อยละ 73.04 มีรายได้ต่ำกว่า 5,000 บาท จำนวน 155 คน คิดเป็นร้อยละ 67.39 เมื่อจำแนกตามชั้นปี พบว่า ส่วนใหญ่เรียนอยู่ชั้นปีที่ 2 จำนวน 75 คน คิดเป็นร้อยละ 32.61

ประเภทของสื่อสังคมออนไลน์ที่ใช้ พบว่า มีการใช้เฟซบุ๊กมากที่สุด จำนวน 228 คน คิดเป็นร้อยละ 27.47 เวลาในการเข้าถึงสื่อสังคมออนไลน์ พบว่า มีการใช้เวลา 5 - 8 ชั่วโมงมากที่สุด จำนวน 83 คน คิดเป็นร้อยละ 36.09 การเปิดรับเนื้อหาของสื่อสังคมออนไลน์ พบว่า จำนวนที่เปิดรับเนื้อหาด้านภาพยนตร์ /

เพลง มากที่สุด จำนวน 194 คน ร้อยละ 23.95 เหตุผลในการใช้สื่อสังคมออนไลน์ พบว่า ใช้ยามว่างมากที่สุด จำนวน 195 คน คิดเป็นร้อยละ 21.57 ความคาดหวังในการใช้สื่อสังคมออนไลน์ พบว่า ส่วนใหญ่คาดหวัง ความรวดเร็วในการใช้เป็นเครื่องมือติดต่อสื่อสารมากที่สุด จำนวน 228 คน คิดเป็นร้อยละ 21.90

2. ข้อมูลการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์

ประเภทของสื่อสังคมออนไลน์ที่ใช้ พบว่า มีการใช้เฟซบุ๊กมากที่สุด รองลงมาคือ ยูทูป ไลน์ อินสตาแกรม และเอ็กซ์ ตามลำดับ

ด้านการเปิดรับเนื้อหาของสื่อสังคมออนไลน์ พบว่า จำนวนที่เปิดรับเนื้อหาด้านภาพยนตร์/เพลง มากที่สุด รองลงมาคือ เกมส์ ข้อมูลสินค้า ข่าวประจำวัน และสาระความรู้ ตามลำดับ

ด้านเหตุผลในการใช้สื่อสังคมออนไลน์ พบว่า ใช้ยามว่างมากที่สุด รองลงมาคือ ใช้เพื่อความบันเทิง ใช้เพื่อสร้างสังคม หาเพื่อนใหม่ ติดตามข้อมูลข่าวสาร และใช้เพื่อนำเสนอตัวตน (ภาพ ข้อมูลผลงานส่วนตัว) ตามลำดับ

ด้านความคาดหวังในการใช้สื่อสังคมออนไลน์ พบว่า ส่วนใหญ่คาดหวัง ความรวดเร็วในการใช้เป็นเครื่องมือติดต่อสื่อสาร มากที่สุด รองลงมา คือ ด้านความสามารถในการสร้างสังคม ความสามารถในการโต้ตอบได้อย่างทันที ความสามารถในเผยแพร่ข่าวสารได้อย่างกว้างขวาง และเป็นสื่อที่ผู้ใช้สามารถสร้างและผลิตเนื้อหาเองได้ ใช้งานง่าย ตามลำดับ

3. ความคิดเห็นที่มีต่อพฤติกรรมการเปิดรับข่าวสาร ของนักศึกษา สาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ

พฤติกรรมการใช้สื่อสังคมออนไลน์อยู่ในระดับมาก มีค่าเฉลี่ย 3.71 เมื่อพิจารณาพฤติกรรมในแต่ละด้าน พบว่า ด้านได้รับสาระความรู้ ข้อมูลต่าง ๆ ได้ง่าย มีความสะดวก รวดเร็ว และทันสมัย รองลงมาด้านการใช้ภาษาสื่อสารเข้าใจง่าย (ภาษาพูด รูปภาพ สัญลักษณ์) ด้านสามารถแยกแยะข้อเท็จจริงและความคิดเห็นด้านเปิดรับสื่อเฉพาะที่ตนเองมีความสนใจเท่านั้น ระดับความคิดเห็นค่อนข้างเห็นด้านอ่านทบทวนเนื้อหาหลายครั้งและต้องหาข้อมูลเพิ่มก่อนที่จะตัดสินใจเชื่อและทำการส่งต่อ ด้านเมื่อได้รับข้อมูลข่าวสารจะรีบกดไลค์ (click like) และส่งต่อทันที (share) โดยไม่มีการคิดทบทวน ตามลำดับ

4. การรู้ทันสื่อสังคมออนไลน์ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ

ตารางที่ 2 ค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐาน ระดับความคิดเห็นเกี่ยวกับการรู้ทันสื่อสังคมออนไลน์

การรู้ทันสื่อสังคมออนไลน์	ระดับความรู้ความเข้าใจที่มีต่อการรู้ทันสื่อ		
	$\bar{x}$	S.D	ความหมาย
1. ด้านเนื้อหา	3.76	0.55	สูง
2. ด้านกระบวนการผลิต	3.43	0.40	สูง
3. ด้านผลกระทบของสื่อที่มีต่อตนเองและสังคม	3.18	0.41	ปานกลาง
รวม	**3.46**	**0.36**	**สูง**

จากตารางที่ 2 การรู้ทันสื่อสังคมออนไลน์ ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ พบว่า โดยภาพรวมผู้ตอบแบบสอบถามมีความรู้ทันสื่อสังคมออนไลน์ทั้ง 3

ด้านอยู่ในระดับสูง มีค่าเฉลี่ย 3.46 ซึ่งด้านที่มีค่าเฉลี่ยการรู้ทันสื่อในสังคมออนไลน์สูง คือ ด้านเนื้อหา มีค่าเฉลี่ย 3.76 รองลงมา คือ ด้านกระบวนการผลิต มีค่าเฉลี่ย 3.43 และความคิดเห็นอยู่ระดับปานกลาง ด้านผลกระทบของสื่อที่มีต่อตนเองและสังคม มีค่าเฉลี่ยน้อยที่สุด 3.18 ตามลำดับ

5. การรู้ทันตนเองในการเปิดรับสื่อสังคมออนไลน์ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ

การรู้ทันตนเองในการเปิดรับสื่อสังคมออนไลน์ ของนักศึกษาสาขาสื่อสารการกีฬา คณะศิลปศาสตร์ มหาวิทยาลัยการกีฬาแห่งชาติ พบว่า โดยภาพรวมผู้ตอบแบบสอบถามมีการรู้ทันตนเองทั้ง 5 ด้าน อยู่ในระดับปานกลาง มีค่าเฉลี่ย 3.38 ซึ่งด้านที่มีค่าเฉลี่ยการรู้ทันตนเองสูง คือ ด้านการรู้ทันสติ มีค่าเฉลี่ย 3.72 รองลงมา ความคิดเห็นอยู่ในระดับปานกลาง ดังนี้ ด้านการรู้ทันอารมณ์ตนเอง มีค่าเฉลี่ย 3.70 ด้านการรู้ทันกำลังของตนเองอย่างรอบด้าน มีค่าเฉลี่ย 3.23 ด้านการรู้ทันความต้องการของตนเอง มีค่าเฉลี่ย 3.06 ด้านการรู้ทันบทบาทหน้าที่ของตนเอง มีค่าเฉลี่ย 2.68 ตามลำดับ

ผลการทดสอบสมมติฐาน

สมมติฐานข้อที่ 1 ปัจจัยด้านลักษณะทางประชากรมีผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์

ผลการทดสอบสมติฐาน พบว่า พฤติกรรมการเปิดรับข่าวสารผ่าน สื่อสังคมออนไลน์ ด้วยการวิเคราะห์ถดถอยพหุคูณ ปรากฏว่า ตัวแปร เพศชาย อายุ 18 - 20 ปี ชั้นปีที่ 2 รายได้ต่อเดือนของนักศึกษา ส่งผลทางบวกต่อตัวแปร พฤติกรรมการเปิดรับข่าวสารผ่าน สื่อสังคมออนไลน์ และสามารถอธิบายความแปรปรวนได้ร้อยละ 95.8 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 โดยที่ตัวแปร อายุ 18 - 20 ปี มีผลมากที่สุด รองลงมา คือ เป็นเพศชาย และชั้นปีที่ 2 และรายได้ต่อเดือนของนักศึกษา ตามลำดับ

สมมติฐานข้อที่ 2 การรู้ทันสื่อและการรู้ทันตนเองมีผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์

ตารางที่ 3 การวิเคราะห์การถดถอยเพื่อพยากรณ์ การรู้ทันสื่อและการรู้ทันตนเองโดยการนำปัจจัยด้านพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์เข้าสมการ

ตัวแปร	β	SE	t	S
การรู้ทันสื่อสังคมออนไลน์	.554	.075	7.385	.000
การรู้ทันตนเอง	.262	.090	2.917	.004
ค่าคงที่	.937	.293	3.202	.002

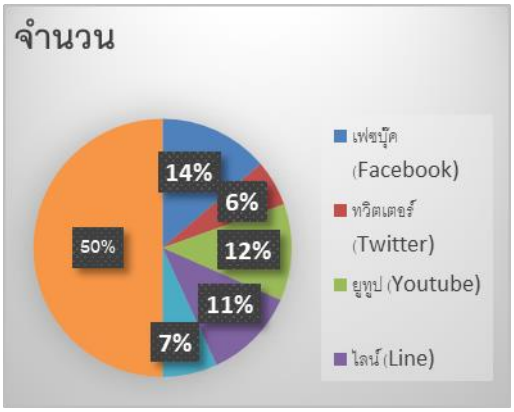
R =.568 ; R^2 = .323 ; F = 54.048 ; Sig = .000

จากตารางที่ 3 ผลการทดสอบสมติฐาน พบว่า การรู้ทันสื่อและการรู้ทันตนเองมีความสัมพันธ์กับพฤติกรรมการเปิดรับข่าวสารผ่านสังคมออนไลน์ เมื่อพิจารณาค่าสัมประสิทธิ์การถดถอยของตัวพยากรณ์ พบว่า การรู้ทันสื่อสังคมออนไลน์ และการรู้ทันตนเอง สามารถพยากรณ์พฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ได้อย่างมีนัยสำคัญทางสถิติที่ระดับ .05

อภิปรายผล

พฤติกรรมการเปิดรับข่าวสาร

การเลือกใช้สื่อสังคมออนไลน์ พบว่า มีการใช้เฟซบุ๊กมากที่สุด ส่วนระยะเวลาในการเข้าถึงสื่อสังคมออนไลน์ พบว่า มีการใช้เวลา 5 - 8 ชั่วโมงมากที่สุด โดยจำนวนที่เปิดรับเนื้อหาด้านภาพยนตร์/เพลง มากที่สุด เหตุผลในการใช้สื่อสังคมออนไลน์ พบว่า ส่วนใหญ่คาดหวังความรวดเร็วในการใช้เป็นเครื่องมือติดต่อสื่อสารมากที่สุด พฤติกรรมการใช้สื่อสังคมออนไลน์อยู่ในระดับมาก เมื่อพิจารณาพฤติกรรมในแต่ละด้าน พบว่า ด้านได้รับสาระความรู้ ข้อมูลต่าง ๆ ได้ง่าย มีความสะดวก รวดเร็ว และทันสมัย รองลงมา คือ ด้านการใช้ภาษาสื่อสารเข้าใจง่าย (ภาษาพูด รูปภาพ สัญลักษณ์) ด้านสามารถแยกแยะข้อเท็จจริงและความคิดเห็นได้ ด้านเปิดรับสื่อเฉพาะที่ตนเองมีความสนใจเท่านั้น ด้านอ่านทบทวนเนื้อหาหลายครั้งและต้องหาข้อมูลเพิ่มก่อนที่จะตัดสินใจเชื่อและทำการส่งต่อ ด้านเมื่อได้รับข้อมูลข่าวสารจะรีบกดไลค์ (click like) และส่งต่อทันที (share) โดยไม่มีการคิดทบทวน ซึ่งผลวิจัยดังกล่าว มีความสอดคล้องกับ งานวิจัยของ กฤษณพร ประสิทธิ์วิเศษ (2560) พฤติกรรมการเปิดรับข่าวสาร การรู้ทันสื่อและการรู้ทันตนเอง ในสื่อสังคมออนไลน์ของนักศึกษานิเทศศาสตร์ในเขตกรุงเทพมหานคร ผลการวิจัยพบว่า กลุ่มตัวอย่างส่วนใหญ่เปิดรับข้อมูลข่าวสารทุกวัน มีการใช้เฟซบุ๊กมากที่สุด และเอ็กซ์ น้อยที่สุด มีการเปิดรับเนื้อหาประเภทภาพยนตร์และเพลง โดยรูปแบบการใช้งานจะเน้นสนทนาการฟังเพลง ดูหนัง ชอบแสดงความคิดเห็นและกดไลค์ โดยมีเหตุผลในการใช้เพื่อความบันเทิง และมีความคาดหวังเกี่ยวกับความรวดเร็วในการใช้ สื่อเป็นเครื่องมือในการสื่อสาร และงานวิจัยของ ณัฐนันท์ ศิริเจริญ (2557) ทำการศึกษาเรื่อง การสื่อสารเพื่อการรู้เท่าทันสื่อและสารสนเทศจากสื่ออินเตอร์เน็ตของนักศึกษาระดับปริญญาตรี พบว่า วัตถุประสงค์ในการเปิดรับข้อมูลข่าวสารมากที่สุด คือ เพื่อรับรู้เหตุการณ์ปัจจุบันโดยใช้การสนทนาผ่านเครือข่ายเฟซบุ๊กและโปรแกรมไลน์ รองลงมา คือ เพื่อความเพลิดเพลิน สอดคล้องกับ ทฤษฎีการแสวงหาข่าวสาร (information seeking) ถูกนำมาใช้ประโยชน์อย่างกว้างขวาง เพื่อความบันเทิงในทุกกลุ่มคน และใช้ในทุกมิติ ทั้งเรื่องส่วนตัวและการงาน เนื่องจากศักยภาพที่ประมวลเอาข้อเด่นของคอมพิวเตอร์ โทรศัพท์ การสื่อสารแบบเครือข่าย และสื่ออื่น ๆ เข้ามาไว้ด้วยกัน ดังนั้นการเลือกใช้ทฤษฎีการใช้ประโยชน์จากสื่อจึงสอดรับกับคุณลักษณะของสื่อใหม่ ทั้งในเรื่องผู้ใช้สื่อที่มีความต้องการข้อมูลข่าวสาร (กาญจนา แก้วเทพ และนิคม ชัยขุนพล, 2555) ดังภาพภาพที่ 3 การเลือกใช้สื่อสังคมออนไลน์



ภาพที่ 3 การเลือกใช้สื่อสังคมออนไลน์

การรู้ทันสื่อสังคมออนไลน์

การรู้ทันสื่อสังคมออนไลน์ นับได้ว่า เป็นการศึกษาในแง่ของมุมมองของผู้ใช้สื่อสังคมออนไลน์ในการเปิดรับข่าวสารในปัจจุบันซึ่งมีผู้ใช้บริการมากขึ้น และพบว่ายังมีนักศึกษาบางส่วนอาจตีความความหมายของข้อมูลข่าวสารในการเข้าถึง วิเคราะห์ ประเมิน และบริโภคสื่ออย่างชาญฉลาดที่แตกต่างกันออกไป สุชาดา จักรพิสุทธิ์ (2554) ให้ความหมายว่า ความสามารถในการเข้าถึง การวิเคราะห์ วิพากษ์วิจารณ์ การประเมินคุณค่า และทักษะการตอบสนอง (สื่อสาร) ต่อข่าวสารในรูปแบบต่าง ๆ ซึ่งผลจากการวิจัย พบว่า โดยภาพรวมมีความรู้ทันสื่อสังคมออนไลน์ อยู่ในระดับสูง ซึ่งด้านที่มีค่าเฉลี่ยการรู้ทันสื่อในสังคมออนไลน์สูง คือ ด้านเนื้อหา รองลงมาด้านกระบวนการ และด้านผลกระทบของสื่อที่มีต่อตนเองและสังคม

ด้านเนื้อหา สุดารัตน์ ดิษยวรรธนะ และจันทรา วัฒนากุล (2554) ให้ความหมายในด้านเนื้อหาว่าเป็นความสามารถในการเข้าถึง วิเคราะห์ ประเมิน และบริโภคสื่ออย่างชาญฉลาด ขณะที่ด้านกระบวนการผลิตและเผยแพร่ หากใช้ “ทฤษฎีเศรษฐศาสตร์การเมือง” อธิบายเห็นถึงกระบวนการทำงานของสื่อหรือองค์กรผู้ผลิตในการผลิตเนื้อหา แต่หากใช้ “แนวคิดเรื่องการใส่และถอดรหัสแห่งความหมาย” จะเห็นถึงวิธีการทำงานของผู้ส่งสารในการผลิตข่าวสาร การติดตั้งกลไกต่าง ๆ เพื่อให้ผู้รับสารรับหรืออ่านความหมายตามที่ผู้ส่งสารหรือผู้ผลิตสารต้องการ

การรู้ทันสื่อสังคมออนไลน์ แม้ว่าสื่อมีพลังและอำนาจในการสร้างผลกระทบต่อผู้รับอย่างมหาศาล เช่น ทฤษฎีกระสุนวิเศษ หรือทฤษฎีเข็มฉีดยา เช่น ในกรณีที่เรากลัวอิทธิพลจากหนังสือการ์ตูน ภาพยนตร์ หรือความรุนแรงต่าง ๆ ในโทรทัศน์ในอดีต และปัจจุบันเรากลัวอิทธิพลของอินเทอร์เน็ตในการสอนวิธีการทำระเบิดหรือกังวลถึงเพลงประเภทแร็พหรือเฮฟวีเมทัล ซึ่งมีเนื้อร้องที่เกี่ยวโยงถึงการฆ่าตัวตาย รวมถึงเนื้อหาในละครโทรทัศน์ที่เต็มไปด้วยเรื่องทางเพศและการใช้สิ่งเสพสิ่งต่าง ๆ จากผลวิจัยที่มีนักศึกษาบางส่วนอาจตีความความหมายของข้อมูลข่าวสาร ในการเข้าถึง วิเคราะห์ ประเมิน และบริโภคสื่ออย่างชาญฉลาดที่แตกต่างกันออกไป ดังนั้นการรู้เท่าทันสื่อที่นำเสนอจึงมีความสำคัญอย่างยิ่งที่หลายภาคส่วนควรให้ความสำคัญในการนำเสนอข้อมูลข่าวสาร ที่ส่งผลต่อผู้เสพสื่อที่อาจจะเกิดพฤติกรรมเลียนแบบในการเสพสื่อเหล่านั้น หากขาดการวิเคราะห์ไตร่ตรองอย่างตื่นรู้ อมรรัตน์ ทิพย์เลิศ (2550) ให้ความหมายว่าความสามารถในการเข้าถึงสื่อ การทำความเข้าใจสื่อในแง่การผลิตและการถ่ายทอด การวิเคราะห์ความหมายของเนื้อหาที่สื่อได้พยายามสื่อสารออกมาเพื่อให้เท่าทันเล่ห์เหลี่ยมของสื่อ

นอกจากนี้ยังมีอีกแนวคิดหนึ่งคือแนวคิดที่ว่าด้วย “the third person effect” ที่อธิบายว่าการที่คนเรามักจะรู้สึกว่า “ข่าวสารต่าง ๆ ที่ส่งผ่านมาทางสื่อนั้นจะมีอิทธิพลต่อทัศนคติและพฤติกรรมของ บุคคลอื่น ๆ อย่างมาก แต่จะไม่เกิดผลหรือไม่มีอิทธิพลต่อตัวเราแต่ประการใด ทั้ง ๆ ที่ในความเป็นจริงแล้วนั้น เราอาจจะได้รับอิทธิพลจากสื่อมากกว่าที่เราคาดคิดไว้ก็เป็นได้ (Severin and Tankard, 2001 อ้างถึงใน นิษฐา หรุ่นเกษม, 2549) จากแนวคิดทฤษฎีดังกล่าว เกี่ยวข้องกับผลวิจัยในแง่ของทัศนคติหรือความเชื่อของแต่ละบุคคลในการที่จะเลือกรับ จดจำ นำไปใช้ประโยชน์จากสื่อนั้นตามความเชื่อส่วนบุคคลที่ต้องตระหนักรู้เรื่องประโยชน์และโทษของการรู้ทันสื่อสังคมออนไลน์ และบางครั้งนักศึกษาต้องคอยเป็นหูเป็นตาสอดส่องคนรอบข้างว่ามีความตระหนักรู้ในสื่อที่ได้รับมากน้อยเพียงใดเพื่อไม่ให้เกิดผลกระทบตามมา

การรู้ทันตนเองในการเปิดรับสื่อสังคมออนไลน์

ผลจากการวิจัย พบว่า การรู้ทันตนเองในการเปิดรับสื่อสังคมออนไลน์ โดยภาพรวมผู้ตอบแบบสอบถามมีการรู้ทันตนเอง ทั้ง 5 ด้าน อยู่ในระดับปานกลาง ซึ่งด้านที่มีค่าเฉลี่ยการรู้ทันตนเองสูง คือ ด้านการรู้ทันสติ ความพึงพอใจอยู่ในระดับปานกลาง ด้านการรู้ทันอารมณ์ตนเอง ด้านการรู้ทันกำลังของตนเองอย่างรอบด้าน ด้านการรู้ทันความต้องการของตนเอง และด้านการรู้ทันบทบาทหน้าที่ของตนเองตามลำดับ จึงแสดงให้เห็นว่านักศึกษาจำเป็นที่จะต้องรู้ทันตนเองและต้องรู้จักยับยั้งตนเอง ในการเปิดรับสื่อสังคมออนไลน์ สอดคล้องกับแนวคิดของ ธาม เชื้อสถาปนศิริ (2557) อธิบายว่า การนำเสนอเรื่องราวความเป็นส่วนตัวของตนเอง เพื่อให้คนอื่นได้รับรู้เป็นการตระหนักถึงพื้นที่ส่วนตัวบนพื้นที่สาธารณะ (มิติด้านพื้นที่) โดยที่ตนเองสามารถแยกแยะความจริง ข้อเท็จจริง หรือความเป็นจริงที่ปรากฏในโลกออนไลน์ได้ (มิติด้านตัวตน) และสามารถเข้าไปมีส่วนสร้างผลกระทบต่อสังคม ทั้งด้านการสร้างและเผยแพร่เนื้อหา คำพูด ทัศนคติ ซึ่งควรให้ความใส่ใจคนรอบข้างที่อยู่ในสังคม การเคารพกฎกติการอยู่ร่วมกันในโลกออนไลน์ ต้องมีสติและใช้ความรู้ ความจริง เจตนาที่ดีในการใช้สื่อเพื่อการอยู่ร่วมกันในสังคมได้อย่างมีความสุข ทัศนีย์ สุริยะไชย (2554) อธิบายว่า การรู้ทันอารมณ์ตนเอง เป็นความสามารถในการรับรู้ถึงอารมณ์ความรู้สึกของตนเองและผลที่ตามมา สามารถระบุสาเหตุความรู้สึกที่เกิดขึ้นได้ และสามารถปรับอารมณ์ตนเองได้อย่างเหมาะสม

การรู้ทันสติ ธาม เชื้อสถาปนศิริ (2557) ให้ความหมาย มิติตัวตน (self) ว่าหมายถึง เราใช้มองสร้าง ปฏิบัติ และวางกรอบตัวตนเราอย่างไร 1) เรารู้สึกว่าตัวตนที่แท้จริงของเรานั้นคือตัวไหน ระหว่างในโลกออนไลน์ ในเกมออนไลน์ ในเฟซบุ๊ก หรือตัวเราที่เป็นตัวเนื้อร่างกายที่แท้จริง อันนี้หมายถึง “ตัวตนกายเนื้อ กายจิต” เราวางตำแหน่งแห่งที่มันไว้ตรงไหนอย่างไร 2) เรามีตัวตนเดียว หรือ หลายๆ ตัวตน วัยรุ่นสมัยนี้ หรือผู้ใหญ่บางคนรู้สึกว่าตนเองสามารถสร้างตัวตนจำลอง ร่างอวตารได้หลาย ๆ ตัว นั่นอาจเป็นข้อดีและข้อแย่ เพราะคนในปัจจุบันจะมีอัตลักษณ์บุคคลหลากหลายมากขึ้น ซึ่งมันแย่แน่ ๆ ถ้าคุณเริ่มที่จะ “สับสน” กับการสร้างอัตลักษณ์ของคุณในเฟซบุ๊ก ถ้ามันแตกต่างกันมาก มันก็ย่อมส่งผลเชิงจิตวิทยาอัตลักษณ์ตัวตนของคุณ 3) เรามีความสับสนเรื่องอัตลักษณ์ตัวตนหรือไม่ ระหว่างตัวตนที่เราอยากจะเป็นตัวตนที่คนอื่นมองเราจริง ๆ ตัวตนที่เราอยากให้คนอื่นมอง และตัวตนที่เราเป็นจริง ๆ ผู้คนในโลกปัจจุบันให้ความสำคัญว่า “การสร้างอัตลักษณ์ และการสร้างชื่อเสียง และสถานะ” นั้นกลายเป็นเรื่องเดียวกัน อันตรายจึงอยู่ที่ว่า “ตัวตนและชื่อเสียง สถานะทางสังคมในโลกสื่อใหม่นั้น อาจกร่อนทำลาย อัตลักษณ์ที่แท้จริงของความเป็นคุณ” คนที่ไม่ระมัดระวังเพียงพอจะถูกผู้คนในโลกสื่อใหม่ / สื่อสังคมครอบงำ

ไวซิงเจอร์ (Weisinger, 1998 อ้างถึงใน ทัศนีย์ สุริยะไชย, 2554) ให้ทัศนะว่า การตระหนักรู้ในตนเองเป็นกระบวนการในการปรับใช้ข้อมูลมากมายที่มีอยู่ ได้แก่ อารมณ์ ความรู้สึก การรับรู้ทางประสาทสัมผัส การประเมินค่าการแสดงออก และความตั้งใจ ซึ่งจะช่วยให้บุคคลเข้าใจตนเองและข้อมูลเหล่านี้จะช่วยให้บุคคลนั้นเข้าใจปฏิกิริยาตอบสนอง พฤติกรรม การสื่อสาร และการปฏิบัติในสถานการณ์ต่าง ๆ ของตนเอง การตระหนักรู้ในตนเองในระดับสูงจะทำให้สามารถตรวจสอบและสังเกตตนเองในการแสดงออกแบบต่าง ๆ ได้ ส่วนการขาดการตระหนักรู้ในตนเองจะทำให้ขาดข้อมูลที่เพียงพอในการตัดสินใจที่ดี รวมทั้งเป็นอุปสรรคในการตอบสนองต่อผู้อื่นและสถานการณ์ต่าง ๆ เนื่องจากมีข้อมูลไม่เพียงพอที่จะเข้าถึงสิ่งเหล่านั้น

การทดสอบสมมติฐาน

สมมติฐานข้อที่ 1 พบว่า ปัจจัยด้านลักษณะทางประชากรมีผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ ด้วยการวิเคราะห์ถดถอยพหุคูณ ส่งผลทางบวกต่อตัวแปรต่อพฤติกรรมการเปิดรับข่าวสารผ่าน สื่อสังคมออนไลน์ และสามารถอธิบายความแปรปรวนได้ร้อยละ 95.8 ซึ่งพฤติกรรมการเปิดรับข่าวสารผ่าน สื่อสังคมออนไลน์ อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 เป็นไปตามสมมติฐานที่ตั้งไว้

สมมติฐานข้อที่ 2 การรู้ทันสื่อและการรู้ทันตนเองมีผลต่อพฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ สามารถพยากรณ์พฤติกรรมการเปิดรับข่าวสารผ่านสื่อสังคมออนไลน์ได้ร้อยละ 3.23 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 เป็นไปตามสมมติฐานที่ตั้งไว้

ข้อเสนอแนะ

1. ควรศึกษาเพิ่มเติมเกี่ยวกับการใช้สื่อส่วนบุคคลบนพื้นสาธารณะ และการละเมิดสิทธิ์ส่วนบุคคลในสื่อสังคมออนไลน์

2. ในการวิจัยครั้งต่อไปอาจจะเปรียบเทียบพฤติกรรมการใช้สื่อสังคมออนไลน์กับนักศึกษาต่างคณะที่อยู่ภายในมหาวิทยาลัยเดียวกัน เพื่อให้ได้ข้อมูลที่หลากหลายและเป็นภาพรวมมากยิ่งขึ้น

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ภาพสะท้อนสังคมจากสำนวนภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุง
Social Reflections from the Southern Thai Dialect Expressions of Kuan Khanun, Khuan Khanun District, Phatthalung Province

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อวิเคราะห์ภาพสะท้อนสังคมจากสำนวนภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุง โดยผู้วิจัยเก็บรวบรวมข้อมูลโดยการสัมภาษณ์เชิงลึกจากผู้บอกภาษาที่คัดเลือกโดยวิธีสุ่มตัวอย่างแบบเจาะจง จำนวน 3 คน สำนวนที่ใช้สำหรับการวิเคราะห์รวมทั้งสิ้น 130 สำนวน

ผลการวิเคราะห์ภาพสะท้อนสังคม พบว่า จำนวนทั้งหมด 15 ภาพสะท้อน เรียงจากภาพสะท้อนที่พบมากที่สุดไปน้อยที่สุด ดังนี้ สำนวนที่สะท้อนให้เห็นถึงสัตว์ จำนวน 26 สำนวน สำนวนที่สะท้อนให้เห็นถึงความเชื่อ จำนวน 25 สำนวน สำนวนที่สะท้อนให้เห็นถึงพฤติกรรมของมนุษย์ จำนวน 19 สำนวน สำนวนที่สะท้อนให้เห็นถึงอวัยวะในร่างกาย จำนวน 11 สำนวน สำนวนที่สะท้อนให้เห็นถึงอาชีพ จำนวน 9 สำนวน สำนวนที่สะท้อนให้เห็นถึงสิ่งของเครื่องใช้ จำนวน 8 สำนวน สะท้อนให้เห็นถึงวัฒนธรรมการกิน สำนวนที่สะท้อนให้เห็นถึงธรรมชาติ และสำนวนที่สะท้อนให้เห็นถึงวิถีชีวิตความเป็นอยู่ พบเท่ากันจำนวน 6 สำนวน สำนวนที่สะท้อนให้เห็นถึงเครือญาติและสำนวนที่สะท้อนให้เห็นถึงพืชและผลไม้ พบเท่ากัน จำนวน 4 สำนวนที่สะท้อนให้เห็นถึงผู้มีอำนาจและสำนวนที่สะท้อนให้เห็นถึงสิ่งปฏิกูล พบเท่ากันจำนวน 2 สำนวน ส่วนภาพสะท้อนที่พบน้อยที่สุด จำนวน 1 สำนวน คือ สำนวนสะท้อนให้เห็นถึงวัฒนธรรมการแต่งงาน และสะท้อนให้เห็นถึงขนบธรรมเนียมประเพณี

คำสำคัญ: ภาษาไทยถิ่นใต้, สำนวน, ภาพสะท้อนสังคม

Abstract

The research aims to analyze social reflections from the Southern Thai dialect spoken in Kuan Khanun, Kuan Khanun District, Phatthalung Province. The researchers collected in-depth interviews from three specific language speakers by a purposive

sampling method. A total of 130 words were used for analysis.

According to the social reflection analysis, a total of 15 reflections were shown in the following order: 26 reflective expressions for animals, 25 reflective expressions for beliefs, 19 reflective expressions for human behavior, 11 reflective expressions for body organs, 9 reflective expressions for careers, 8 expressions reflecting the items of appliances, 6 expressions reflecting the culture of eating, expressions reflecting the nature and lifestyle, 4 expressions reflecting relatives and expressions reflecting plants and fruits, 2 expressions reflect authority and expressions reflect waste, and the least common reflection is one expression, reflective expressions for marriage culture and tradition.

Keywords: Southern Thai Dialect, Idiomatic, Social Reflection

บทนำ

สำนวน หมายถึง ถ้อยคำที่มิได้มีความหมายตรงไปตรงมาตามตัวอักษร หรือแปลตามรากศัพท์ แต่เป็นถ้อยคำที่มีความหมายเป็นอย่างอื่น คือเป็นชั้นเชิงชวนให้คิด ซึ่งอาจใช้ในเชิงเปรียบเทียบ หรืออุปมาอุปไมย อีกทั้งความหมายของสำนวนมักจะเป็นความหมายโดยนัยหรือความหมายแฝง เรื่องของสำนวนจึงเป็นเรื่องลึกซึ้ง ผู้ที่จะเข้าใจความหมายและวิธีใช้สำนวนได้ดีที่สุด “คือเจ้าของภาษา” การใช้ถ้อยคำที่มีความหมายแฝง หรือเป็นสำนวนมีชั้นเชิงจะเกิดคุณค่าในกระบวนการต่าง ๆ เช่น ไพเราะ ลึกซึ้ง น่าคิด น่าฟัง รื่นหู จูงใจ เป็นต้น หากนำไปใช้ได้เหมาะกับข้อความหรือเรื่องราวจะช่วยเพิ่มคุณค่าส่งเสริมข้อความหรือเรื่องราวเหล่านั้นให้มีน้ำหนัก น่าคิด น่าสนใจ น่าติดตามยิ่งขึ้น (ไขสิริ ปราโมช ณ อยุธยา, 2534)

การศึกษาเรื่องสำนวนภาษาไทยถิ่นใต้ แม้จะมีผู้สนใจอยู่บ้างแต่ก็ยังมีน้อย งานวิจัยนี้มีจุดมุ่งหมายเพื่อศึกษาภาพสะท้อนสังคมจากสำนวนที่ใช้ในภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุง โดยศึกษาเพื่อแสดงให้เห็นว่าภาษาสามารถสะท้อนถึงลักษณะของสังคม สภาพแวดล้อม วิถีชีวิต สิ่งแวดล้อมของชุมชน รวมถึงวัฒนธรรมต่าง ๆ ที่มีความสัมพันธ์กับภาษา และแสดงให้เห็นว่าสำนวนเป็นองค์ประกอบทางภาษาอย่างหนึ่งที่บ่งบอกถึงบริบททางสังคมได้อย่างชัดเจน จึงอาจกล่าวได้ว่ามิติของ “ภาษา” จะมีข้อเท็จจริงของสังคมบางประการ ที่เป็นเสมือนกระจกสะท้อนของวัฒนธรรม สังคม และประสบการณ์ทางโลกของผู้คน

จากการสำรวจข้อมูลเบื้องต้น ภาษาไทยถิ่นใต้ควนขนุนจะมีการใช้ภาษาที่เป็นถ้อยคำสำนวนเพื่อสื่อสารอยู่เสมอ และถ้อยคำสำนวนภาษานั้น ๆ จะสะท้อนวิถีชีวิต ขนบธรรมเนียมประเพณี ธรรมชาติของท้องถิ่น ฯลฯ อันแสดงให้เห็นถึงอัตลักษณ์ของอำเภอควนขนุน จังหวัดพัทลุง ตัวอย่างสำนวนที่ว่า “ขัดถอขัดพาย” หมายถึง ไม่ลงร่องลงรอยกัน แสดงให้เห็นถึงวิถีชีวิตของคนในอำเภอควนขนุนที่ประกอบอาชีพประมง โดยใช้เรือหางยาวซึ่งมีไม้ถอและไม้พาย ซึ่งเป็นไม้สำหรับขับเคลื่อนเรือ อุปกรณ์ทั้ง 2 ชนิดนี้เป็นเครื่องมือสำคัญที่ใช้ในการเดินเรือ ซึ่งสำนวนดังกล่าวสะท้อนให้เห็นสภาพวิถีชีวิตที่อาศัยเรือเป็นประจำ จึงนำคำศัพท์ดังกล่าวมาสร้างเป็นสำนวนภาษาขึ้น

ดังนั้น ผู้วิจัยจึงเห็นถึงความสำคัญของสำนวนภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุงที่จะสามารถสะท้อนภาพสังคมวัฒนธรรมได้ ยิ่งไปกว่านั้น เพื่อไม่ให้สำนวนภาษาถิ่นเหล่านี้ สูญหายไปตามกาลเวลา จึงเลือกที่จะศึกษาสำนวนภาษาไทยถิ่นใต้ควนขนุน ให้อนุชนรุ่นหลังได้เรียนรู้และศึกษา

ต่อไป

วัตถุประสงค์ของการวิจัย

เพื่อวิเคราะห์ภาพสะท้อนสังคมจากสำนวนที่ใช้ในภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุง

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิดเรื่องสำนวน

ชัชวดี ศรลัมพ์ (2538) กล่าวถึง “สำนวน” ในความหมายที่แตกต่างออกไป คือ“สำนวน” หมายถึง ข้อความที่แสดงการเปรียบเทียบของ 2 สิ่ง ที่มีคุณสมบัติหรือลักษณะร่วมกันบางแง่ แตกต่างกันบางแง่ในเวลาเดียวกัน สำนวนแต่ละสำนวนจะเป็นการนำเสนอความคิดใดความคิดหนึ่ง โดยผ่านคำหรือข้อความซึ่งอ้างถึงอีกสิ่งหนึ่งสิ่งนั้น เท่ากับมีบทบาทเป็นสื่อให้เราเข้าใจถึงความคิดที่กล่าวถึงในตอนแรก สอดคล้องกับการกล่าวถึงความหมายของสำนวนของ บุญศิริ สุวรรณเพ็ชร์ (2546) ที่ให้ความหมายของสำนวนไว้ว่า “สำนวน” คือ คำพูดที่นำมาใช้เพื่อให้มีความหมายเฉพาะถึงการอย่างใดอย่างหนึ่ง หรือคำพูดที่นำมาเรียบเรียงเข้าด้วยกันให้มีความหมายเฉพาะถึงการอย่างใดอย่างหนึ่ง เช่น คอเป็นเอ็น ไม้ใกล้ฝั่งอ่อยเหยื่อ เป็นต้น นอกจากนี้สำนวนยังมีความหมายว่า โวหารหรือการกล่าวโดยใช้ถ้อยคำที่กินความลึกซึ้งหรือทำให้เกิดความไพเราะทางภาษาในการพูด หากกล่าวถึงที่มาของสำนวน สำนวนเกิดจากประสบการณ์ของคนรุ่นก่อน ๆ ซึ่งสังเกตความจริงจากสิ่งแวดล้อมที่เกิดขึ้น เช่น สังเกตเห็นว่า เวลาที่คนเราตะเบ็งเสียงมาก ๆ ขณะที่พูดนั้นเส้นเอ็นบริเวณลำคอจะโปนขึ้นมาอย่างเห็นได้ชัด ดังนั้น เมื่อใครเถียงเพื่อเอาแพ้เอาชนะกันให้ได้โดยการตะเบ็งเสียงดังขึ้นทุกที ๆ ก็พูดว่า “เถียงคอเป็นเอ็น” หรือคนสังเกตเห็นว่าต้นไม้ที่อยู่ริมตลิ่งเมื่อน้ำเซาะตลิ่งเขามาเรื่อย ๆ วันหนึ่งต้นไม้นั้นก็โค่นลงสู่แม่น้ำและต้นไม้ที่อยู่ชิดตลิ่งเหล่านี้โอกาสที่จะโค่นย่อมมีมากกว่าต้นไม้ที่อยู่ห่างจากตลิ่งก็นำมาเปรียบเทียบกับคนแก่ซึ่งมีโอกาสที่จะตายได้ง่ายกว่าคนหนุ่มว่า “เหมือนไม้ใกล้ฝั่ง” เป็นต้น (บุญศิริ สุวรรณเพ็ชร์, 2546 หน้า 10)

จากความหมายทั้งหมดที่ได้กล่าวมาแล้วข้างต้น ผู้วิจัยขอสรุปความหมายของ “สำนวน” ที่ใช้ในการวิจัยดังนี้ “สำนวน” หมายถึง ถ้อยคำหรือข้อความที่มีความหมายไม่ตรงตัวหรือมีความหมายอื่นแฝงอยู่เป็นถ้อยคำหรือข้อความที่ไม่ถูกหลักไวยากรณ์แต่ใช้กันอย่างแพร่หลายจนเป็นที่ยอมรับ เพื่อทำให้เกิดความลึกซึ้งและความไพเราะทางภาษาในการพูดซึ่งอาจเป็นเชิงเปรียบเทียบ

2. แนวคิดด้านวัฒนธรรมศึกษา

ผู้วิจัยได้ศึกษาแนวคิดด้านวัฒนธรรม เนื่องจากภาษากับวัฒนธรรมเป็นสิ่งที่มนุษย์จะใช้ร่วมกัน ภาษาเป็นสิ่งสะท้อนวัฒนธรรมและวัฒนธรรมก็ถูกถ่ายทอดผ่านภาษา

แนวคิดด้านวัฒนธรรมศึกษา (Cultural Studies) คำว่าวัฒนธรรมมีความหมายหลากหลายขึ้นอยู่กับว่าการตีความของคนแต่ละวงการซึ่งมีความแตกต่างกัน วิลเลียมส์ (Williams, 1983 อ้างถึงในรังสิมา รุ่งเรือง, 2560) ได้ให้ความหมายของคำว่า “วัฒนธรรม” ไว้ 3 ประการ ดังนี้

1. วัฒนธรรม คือ สิ่งที่เกี่ยวข้องกับกิจกรรมทางศิลปะ เช่น วรรณกรรม ดนตรี การแสดง การวาดภาพ ภาพยนตร์ หรือวิลเลียมได้กล่าวไว้อีกนัยหนึ่งว่า วัฒนธรรมอันสละสลวยที่ผู้คนต้องเกี่ยวข้องในชีวิตประจำวัน

2. วัฒนธรรม คือวิถีชีวิต ในวิทยาการของมนุษย์ คำว่า “วัฒนธรรม” ได้ถูกอ้างถึง การสร้างและการใช้สัญลักษณ์ มีการจำแนกวิถีชีวิตของบุคคล และกลุ่มคนออกจากกัน มนุษย์สามารถแสดงออกถึง

วิถีชีวิตได้เพราะเป็นผู้สร้างและใช้สัญลักษณ์ เช่น มนุษย์รู้จักการแสดงออกถึงแนวคิด เกี่ยวกับบุคคล สิ่งของ ความรู้สึกผ่านคำพูด ท่าทาง ผ่านการใช้สัญลักษณ์ และสัญลักษณ์เหล่านี้จึงรวมตัวกันกลายเป็นวัฒนธรรม

3. วัฒนธรรม คือ กระบวนการและการพัฒนา ในสมัยยุคกลางคำว่า วัฒนธรรม หมายถึง การทำการเกษตร ปลูกผัก เลี้ยงสัตว์ เมื่อกาลเวลาผ่านไป ความหมายของคำว่าวัฒนธรรมจึงเปลี่ยนไป ตามช่วงเวลา คำว่าวัฒนธรรมถูกใช้ในการอธิบายการบ่มเพาะสติปัญญาและความสามารถของมนุษย์

นอกจากนี้รังสิมา รุ่งเรือง (2560) กล่าวว่าในการวิเคราะห์ภาษาได้อธิบายระบบภาษาของมนุษย์ไว้ว่า ทุกภาษามีระบบเสียง ระบบคำ ระบบประโยค และระบบความหมายเป็นส่วนประกอบ กระบวนการต่าง ๆ นี้ทำให้เกิดวัฒนธรรมที่สอดแทรกอยู่ในความหมาย และวัฒนธรรมเหล่านี้ปรากฏขึ้นในสังคม แม้ว่าความหมายจะมีระบบและมาตรฐาน แต่ก็สามารถเปลี่ยนแปลงได้ตามกาลเวลา สิ่งต่าง ๆ ที่ถูกสื่อสารผ่านภาษาล้วนเป็นผลผลิตของภาษานั้น ๆ อันเนื่องมาจากภาษาถูกคิดค้นมาเพื่ออธิบายและให้ความหมายแก่ประสบการณ์ของมนุษย์ จึงอาจกล่าวได้ว่าภาษานั้นเป็นตัวแทนที่แสดงออกถึงบุคคล ความรู้สึก เหตุการณ์ เป็นต้น

3. แนวคิดด้านภาษาไทยถิ่นพัทลุง

เจ มาร์วิน บราวน์ (Brown, J. M., 1965 อ้างถึงใน จริยา หนูตีด, 2554) ได้ศึกษาเปรียบเทียบภาษาไทถิ่น 60 ถิ่นและได้แสดงวิวัฒนาการของภาษา โดยบราวน์ได้แสดงให้เห็นว่าภาษาไทยถิ่นใต้มีวิวัฒนาการมาจากภาษากลุ่มสุโขทัยและสามารถแบ่งออกเป็น 2 กลุ่ม คือ กลุ่มนครศรีธรรมราช และกลุ่มตากใบ

1. กลุ่มภาษานครศรีธรรมราช แบ่งออกเป็น 2 สาย คือ
   1.1 สายไชยา แบ่งออกเป็น 3 กลุ่มย่อย คือ
      1.1.1 ภาษาชุมพร
      1.1.2 ภาษาไชยา แบ่งออกเป็น 2 กลุ่มย่อย คือ
         ก. ภาษาระนอง, ไชยา (อำเภอในจังหวัดสุราษฎร์ธานี) หลังสวน, สวี (อำเภอในจังหวัดชุมพร)
         ข. ภาษาตะกั่วป่า (อำเภอในจังหวัดพังงา) และ ภูเก็ต
      1.1.3 ภาษาเกาะสมุย (อำเภอในจังหวัดสุราษฎร์ธานี)
   1.2 สายนครศรีธรรมราช แบ่งออกเป็น 2 กลุ่มย่อย คือ
      1.2.1 ภาษานครศรีธรรมราช แบ่งออกเป็น 3 กลุ่มย่อย คือ
         ก. ภาษากระบี่
         ข. ภาษานครศรีธรรมราช ทุ่งสง (อำเภอในจังหวัดนครศรีธรรมราช) ตรัง และควนขนุน (อำเภอในจังหวัดพัทลุง)
         ค. ภาษาหัวไทร (อำเภอในจังหวัดนครศรีธรรมราช)
      1.2.2 ภาษาสงขลา แบ่งออกเป็น 2 กลุ่มย่อย คือ
         ก. ภาษาสงขลา และ ระโนด (อำเภอหนึ่งในสงขลา)
         ข. ภาษายะลา และ ภาษาสตูล
2. กลุ่มภาษาตากใบ ที่อำเภอตากใบ จังหวัดนราธิวาส

โดยกลุ่มภาษานครศรีธรรมราช บราวน์ได้ใช้อำเภอควนขนุน จังหวัดพัทลุง เป็นพื้นที่ในการเก็บ

ข้อมูล ดังนั้น ในงานวิจัยนี้จึงอิงการคัดเลือกพื้นที่ตามแนวคิดของบราวน์ และมองว่าภาษาของอำเภอควนขนุนน่าจะเป็นพื้นที่วิจัยที่น่าสนใจ

วิธีดำเนินการวิจัย

การวิจัยเรื่องภาพสะท้อนสังคมจากสำนวนที่ใช้ในภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุง เป็นการวิจัยเชิงคุณภาพ ประเภทศึกษาเฉพาะกรณี (Case Study) ด้วยกระบวนการสัมภาษณ์ (Interview) ซึ่งผู้วิจัยมีขั้นตอนการดำเนินการ ดังนี้

1. วิธีการวิจัย ผู้วิจัยศึกษาเอกสารและงานวิจัยที่เกี่ยวข้อง สัมภาษณ์ข้อมูลเบื้องต้นจากผู้บอกภาษาในพื้นที่ เพื่อให้เห็นทิศทางของข้อมูลภาษาที่น่าสนใจ จากนั้นผู้วิจัยจึงได้ดำเนินการวิจัยตามขั้นตอนต่อไป

2. แหล่งข้อมูล ผู้วิจัยกำหนดแหล่งข้อมูล คือ พื้นที่ตำบลควนขนุน อำเภอควนขนุน จังหวัดพัทลุง

3. ผู้บอกภาษา ผู้วิจัยกำหนดจำนวนผู้บอกภาษาจำนวน 3 คน โดยวิธีสุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) (จรัลวิไล จรูญโรจน์, 2556) ซึ่งกำหนดคุณสมบัติของผู้บอกภาษาตามเกณฑ์ของสมทรง บุรุษพัฒน์ (2543) ดังนี้ 1) เป็นผู้ที่มีภูมิลำเนา กำเนิด เติบโต และอาศัยอยู่ในพื้นที่อำเภอควนขนุน จังหวัดพัทลุง โดยไม่มีการย้ายถิ่นฐานไปที่อื่น 2) อายุ 60 ปีขึ้นไป 3) เป็นผู้ใช้ภาษาถิ่นในชีวิตประจำวัน 4) ผู้บอกข้อมูลต้องมีอวัยวะที่ใช้ในการออกเสียงที่ครบสมบูรณ์ สามารถออกเสียงได้ชัดเจน ไม่มีปัญหาในการใช้ภาษา และ 5) เป็นผู้ที่ประกอบอาชีพเป็นเกษตรกรหรือชาวประมงเท่านั้น

4. เครื่องมือที่ใช้ในการวิจัย ผู้วิจัยได้กำหนดลักษณะของเครื่องมือในการวิจัยและการสร้างเครื่องมือที่ใช้ในการวิจัย ดังนี้ ส่วนที่ 1 แบบสอบถามเกี่ยวกับข้อมูลส่วนตัวของผู้บอกภาษา โดยลักษณะแบบสอบถามข้อมูลประวัติของผู้บอกภาษา ส่วนที่ 2 แบบสอบถามเกี่ยวการใช้สำนวนภาษาไทยถิ่นใต้ควนขนุนที่ใช้ในสถานการณ์ต่าง ๆ โดยแบบสอบถามเป็นคำถามปลายเปิด ด้วยการยกตัวอย่างเหตุการณ์เพื่อให้ผู้บอกภาษาออกเสียงสำนวนภาษาไทยถิ่นใต้ควนขนุน และเมื่อผู้บอกภาษาออกเสียงสำนวนดังกล่าวแล้ว ผู้วิจัยจะให้ผู้บอกภาษาอธิบายความหมายและที่มาของสำนวน ส่วนที่ 3 แบบสอบถามเกี่ยวกับคำถามแบบปลายเปิด โดยลักษณะแบบสอบถามผู้วิจัยได้ใช้คำถามแบบไม่จำเพาะเจาะจงต่อเหตุการณ์นั้น ๆ เพื่อให้ผู้บอกภาษาบอกถึงข้อมูลนอกเหนือจากที่ผู้วิจัยได้กำหนดในส่วนที่ 2

ผลการวิจัย

จากการวิเคราะห์ภาพสะท้อนสังคมจากสำนวนที่ใช้ในภาษาไทยถิ่นใต้ควนขนุน อำเภอควนขนุน จังหวัดพัทลุง พบภาพสะท้อนสังคมทั้งหมด 15 ภาพสะท้อน ดังแสดงในรายละเอียดตามลำดับต่อไปนี้

1. สะท้อนให้เห็นถึงวัฒนธรรมการกิน

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงวัฒนธรรมการกิน ผลการศึกษาพบจำนวน 6 สำนวน ซึ่งสะท้อนวัฒนธรรมการรับประทานข้าว การรับประทานข้าวหลาม การรับประทานขนมหวานข้าวเหนียวกับน้ำกะทิทุเรียน การรับประทานกะปิ และการรับประทานหมากพลู ตัวอย่างเช่น

สำนวน **“กินเหมือนจุกบอก”**

สำนวน กินเหมือนจุกบอก หมายถึง กินจุ กินได้มากเหมือนเอาของอัดใส่ลงไปในกระบอกจนเต็มแน่น คำว่า จุก ในภาษาถิ่นใต้ หมายถึง ยัดหรืออัดให้แน่น ส่วนคำว่า บอก หมายถึงกระบอกข้าวหลาม (ภาษาถิ่นใต้เรียกว่า เหนียวหลาม) ซึ่งเวลาจะทำข้าวหลามต้องอัดข้าวเหนียวลงไปให้แน่นให้เกือบเต็ม

กระบอก จึงต้องใช้ปริมาณข้าวเหนียวจำนวนมาก สำนวนนี้จึงใช้เปรียบกับคนที่กินข้าวได้เยอะ เหมือนเอาข้าวเหนียวอัดลงไปในกระบอกจนเต็มแน่น

สำนวน **“เอือนเหมือนเหนียวเรียน”**

สำนวน เอือนเหมือนเหนียวเรียน หมายถึง อาการเบื่อเหน่ายต่อสิ่งนั้น ซึ่งคำว่า “เอือน” ในภาษาถิ่นใต้ หมายถึง อาการเบื่อหน่าย ส่วน “เหนียวเรียน” หมายถึง ข้าวเหนียวกับน้ำกะทิทุเรียน เป็นขนมหวานที่มีรสชาติหวานมัน ถ้าหากรับประทานมากเกินไปทำให้รู้สึกเลี่ยนได้ ฉะนั้นจึงเป็นที่มาของสำนวนที่นำมาเปรียบเทียบกับคนที่มาอาการเบื่อหน่ายกับสิ่งนั้นมาก

2. สะท้อนให้เห็นถึงวัฒนธรรมการแต่งงาน

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงวัฒนธรรมแต่งงาน ผลการศึกษาพบ จำนวน 1 สำนวน ซึ่งสะท้อนวัฒนธรรมการไม่อยู่ก่อนแต่ง และวัฒนธรรมการแต่งงานตามประเพณี ที่ถูกต้องตามขั้นตอน ดังนี้

สำนวน **“เข้าตามตรอก ออกตามตู”**

เข้าตามตรอก ออกตามตู คำว่า “ตู” หมายถึง ประตู สำนวนนี้สะท้อนให้เห็นถึงการสอนให้คนเรารู้จักการทำตามประเพณีที่ถูกต้องดีงาม โดยเฉพาะอย่างยิ่งการรักใคร่ชอบพอกับหญิงสาวใด ควรเข้าหาผู้ใหญ่เพื่อแนะนำตนเอง ไม่แอบคบกันหรือแอบทำอะไรที่ไม่เหมาะสม ซึ่งนอกจากจะไม่ถูกต้องตามประเพณีแล้ว ยังเป็นการไม่ให้เกียรติผู้ใหญ่และไม่ให้เกียรติฝ่ายหญิงด้วย

3. สะท้อนให้เห็นถึงขนบธรรมเนียมประเพณี

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงขนบธรรมเนียมประเพณี ผลการศึกษาพบจำนวน 1 สำนวน คือ ขนบธรรมเนียมประเพณีด้านการบวช ดังนี้

สำนวน **“เข้าพร้อมตอกออกพร้อมต้ม”**

สำนวน เข้าพร้อมตอกออกพร้อมต้ม หมายถึง บวชตามประเพณี ช่วงที่พระเข้าพรรษา เพียงพรรษาเดียวเท่านั้น คำว่า “ตอก” คือ ข้าวตอก คำว่า “ต้ม” คือ ขนมต้มสามเหลี่ยม มีลักษณะเป็นทรงสามเหลี่ยม ทำจากข้าวเหนียวห่อใบพ้อแล้วนำมาต้มให้สุก สองสิ่งนี้สะท้อนให้เห็นถึงธรรมเนียมประเพณีช่วงเข้าพรรษาและออกพรรษา ในการถวายข้าวตอกนั้น เป็นภูมิปัญญาของชาวบ้านในช่วง 3 เดือนที่เข้าพรรษา จะอยู่ช่วงฤดูมรสุม เป็นช่วงที่พระไปบิณฑบาตไม่ได้ อีกทั้งช่วงนั้นข้าวปลาอาหารขาดแคลน ข้าวตอกจึงเป็นอีกหนึ่งอย่างที่ชาวบ้านนำมาถวาย เพื่อรักษาประเพณี คำว่า ออกพร้อมต้ม จึงหมายความว่า การออกพรรษา ที่ชาวปักษ์ใต้ นิยมทำต้ม ในวันขึ้น 15 ค่ำ เดือน 11 ก่อนวันออกพรรษา ในวันแรม 1 ค่ำ เดือน 11 โดยทางภาคใต้เราจะมีประเพณีลากพระ หรือชักพระ ซึ่งชาวบ้านจะนำต้มสามเหลี่ยมที่ได้ทำไว้ไปแขวนที่เรือพระ หรือเอาไปใส่บาตรให้พระสงฆ์ เพื่อเป็นการถวายองค์พระสัมมาสัมพุทธเจ้าที่เสด็จลงมาจากชั้นดาวดึงส์

4. สำนวนที่สะท้อนให้เห็นถึงสัตว์

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงสัตว์ ผลการศึกษาพบจำนวน 26 สำนวน ซึ่งสะท้อนความสัมพันธ์ของคนกับสัตว์ที่เป็นทั้งสัตว์ทั่วไปและสัตว์เลี้ยง ดังตัวอย่างเช่น

สำนวน **“ค้นขอนพบแข็บ”**

สำนวน ค้นขอนพบแข็บ หมายถึง หาเรื่องเดือดร้อนมาสู่ตัวเอง คำว่า “ขอน” ในภาษาใต้ คือ ท่อนไม้ ส่วนคำว่า “แข็บ” ในภาษาใต้ คือ ตะเข็บ, ตะขาบ ซึ่งตะเข็บเป็นสัตว์ที่มีขนาดเล็ก มีพิษ เมื่อถูกตะเข็บกัดจะมีอาการปวด บวมแดง คัน แสบร้อน ตะเข็บชอบซ่อนตัวอยู่ที่ที่มีกลิ่นอับ ที่มืดโดยเฉพาะใต้

ท่อนไม้ หรือที่รก ฉะนั้นสำนวนนี้เปรียบได้กับการที่ท่อนไม้ตั้งอยู่ในที่ของมันโดยที่ไม่มีใครไปทำอะไรท่อนไม้นั้น แต่เมื่อมีคนไปรื้อค้นอาจทำให้ตัวตะเข็บวิ่งออกมา ซึ่งอาจได้รับอันตรายจากพิษของตะเข็บได้ จึงเป็นที่มาของสำนวน ค้นขอนพบแข็บ

สำนวน **“แน่งเจ้าพิษ”**

สำนวน แน่งเจ้าพิษ หมายถึง คนที่มีลักษณะนิ่งเงียบแต่มีจิตใจที่โหดร้าย คำว่า “แน่ง” ในภาษาถิ่นใต้ หมายถึง นิ่ง, เฉย, ไม่ยินดียินร้าย ส่วนคำว่า “เจ้าพิษ” ในสำนวนนี้เปรียบกับงู เพราะงูเป็นสัตว์ที่มีพิษร้ายแรง ฉะนั้นสำนวน แน่งเจ้าพิษ จึงใช้เปรียบเทียบกับคนที่มีลักษณะภายนอกดูนิ่งเฉยไม่แสดงอาการใด ๆ ออกมา แต่ภายในใจคิดร้ายยิ่งกว่าพิษของงู

สำนวน **“ปัดปัดเหมือนแม่ไก่รังทัง”**

สำนวน ปัดปัดเหมือนแม่ไก่รังทัง หมายถึง อยู่ไม่นิ่ง คำว่า “ปัดปัด” เป็นภาษาเฉพาะถิ่นที่หมายถึง อยู่ไม่นิ่ง ส่วนคำว่า “แม่ไก่รังทัง” คือ แม่ไก่ที่จะหารังวางไข่แต่ไม่รู้จะลงตรงไหนดี จึงเป็นสำนวนที่นำมาเปรียบกับกิริยาอาการของการเดินที่น่าตำหนิของมนุษย์ เหมือนกับแม่ไก่รังทังที่จะหาที่จะวางไข่ จึงเป็นที่มาของสำนวน ปัดปัดเหมือนแม่ไก่รังทัง

สำนวน **“เกลี้ยงแผวแมวเลีย”**

สำนวน เกลี้ยงแผวแมวเลีย หมายถึง กินหมดเกลี้ยงไม่เหลืออะไรเลย คนโบราณได้ เปรียบเปรยลักษณะการกินของแมว กินจนหมดเกลี้ยง เลียจนหมดไม่มีเหลือ จึงเป็นที่มาของสำนวน เกลี้ยงแผวแมวเลีย

5. สำนวนที่สะท้อนให้เห็นถึงธรรมชาติ

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงธรรมชาติ ผลการศึกษาพบจำนวน 7 สำนวน ซึ่งสะท้อนความสัมพันธ์ของคนกับป่าหรือการใช้ชีวิตโดยพึ่งพิงธรรมชาติ ดังตัวอย่างเช่น

สำนวน **“ท่องมีตา ป่ามีหู”**

สำนวน ท่องมีตา ป่ามีหู หมายถึง การพูดหรือทำอะไรต้องระมัดระวัง ในภาษาถิ่นใต้ “ท่อง” หมายถึง ทุ่ง ในอดีตมนุษย์มักใช้ชีวิตหากินอยู่ตามทุ่งนาป่าเขา ซึ่งไม่สามารถทราบได้เลยว่ามีใครอยู่ส่วนไหนในบริเวณนั้นบ้าง ฉะนั้นหากคิดที่จะทำหรือพูดอะไรออกไปควรที่จะมีความระมัดระวังรอบคอบเป็นอย่างดี เพื่อจะไม่เป็นภัยต่อตนเองในภายหลัง จึงเป็นที่มาของสำนวน ท่องมีตา ป่ามีหู

สำนวน **“ขวางหวัน”**

สำนวน ขวางหวัน หมายถึง ผู้ที่ประพฤติตนและมีความคิดที่ต่างออกไปและไม่ยอมรับความคิดเห็นของผู้อื่น คำว่า “หวัน” ในภาษาใต้ หมายถึง ดวงอาทิตย์ ซึ่งที่มาของสำนวน มาจากการปลูกเรือน กล่าวคือ คนใต้มักจะปลูกเรือนตามการขึ้นของดวงอาทิตย์ ที่เรียกว่า “ตามหวัน” ซึ่งจะปลูกเรือนในลักษณะดังกล่าวจะทำให้ตัวบ้านไม่ร้อน คนอยู่ในบ้านก็จะอยู่เย็นเป็นสุข หากใครปลูกเรือน “ขวางหวัน” ก็จะผิดธรรมเนียมปฏิบัติ ดังนั้น “ขวางหวัน” จึงการกระทำของคนที่ชอบอะไรผิดแปลกไปแตกต่างไป จากผู้อื่น

สำนวน **“ฝนเดือนห้า ฟ้าเดือนหก”**

สำนวน ฝนเดือนห้า ฟ้าเดือนหก หมายถึง ไม่มีความแน่นอน โดยที่มาของสำนวนนี้มากจากที่ว่า เดือนห้าในภาษาไทยถิ่นใต้จะตรงกับเดือนเมษายน และเดือนหกจะตรงกับพฤษภาคม ซึ่งในช่วงเดือนดังกล่าวจะเป็นฤดูร้อน จะไม่มีฝนตกเช่นช่วงหน้าฝน แต่หากมีฝนตกฟ้าครึ้มก็ค่อนข้างจะตกหนักและมีฟ้าร้องฟ้าผ่ารุนแรง สำนวนจึงสะท้อนถึงความไม่แน่นอนและแฝงไปด้วยความน่ากลัวของธรรมชาติ

เพราะไม่รู้ว่าจะตกตอนไหนหรือฟ้าจะผ่าที่ใด ไม่มีใครสามารถรู้ได้ เพียงแต่ต้องระวังตัวและเตรียมรับมือกับความไม่แน่นอนเหล่านี้

6. สำนวนที่สะท้อนให้เห็นถึงอาชีพ

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงอาชีพ ผลการศึกษาพบจำนวน 9 สำนวน ซึ่งสะท้อนความสัมพันธ์ของคนที่มีอาชีพหลากหลายไม่ว่าจะเป็นอาชีพข้าราชการครู นักการเมือง อาชีพค้าขาย อาชีพประมง ดังตัวอย่างเช่น

สำนวน **“หัวล้านนอกครู”**

สำนวน หัวล้านนอกครู หมายถึง ผู้ที่ประพฤติตนนอกแบบแผนไปจากคำสอน บริเวณพื้นที่ทะเลน้อยเป็นท้องถิ่นที่มีการสืบทอดวัฒนธรรมจากรุ่นสู่รุ่นมาตั้งแต่อดีตจนถึงปัจจุบัน โดยเฉพาะศิลปวัฒนธรรมแขนงมโนราห์ โดยมีครูภูมิปัญญาประจำท้องถิ่นเป็นผู้ถ่ายทอดศาสตร์ความรู้ เมื่อลูกศิษย์คนนั้นได้มาฝึกหัดเรียนรู้ก็จะได้วิชาที่สามารถนำไปใช้ในการประกอบอาชีพได้ แต่หากลูกศิษย์ประพฤติปฏิบัติตนนอกเหนือจากที่ครูได้สั่งสอนหรือถ่ายทอดความรู้ไป ก็อาจเป็นภัยต่อตนเองได้ในภายหลัง จึงเป็นที่มาของสำนวน หัวล้านนอกครู

สำนวน **“หลักกุ้งหลักปลาได้กิน แต่ถ้าหลักคนได้ตีกัน”**

สำนวน หลักกุ้งหลักปลาได้กิน แต่ถ้าหลักคนได้ตีกัน หมายถึง อย่าขัดขวางผู้อื่นขณะที่ ผู้นั้นคิดจะทำอะไร เพราะจะทำให้ตัวเองเดือดร้อนได้ ในภาษาถิ่นใต้คำว่า “หลักกุ้งหลักปลาได้กิน” หมายถึง หากุ้ง หาปลา ก็ได้กินกุ้งกินปลา ส่วนคำว่า “หลักคนได้ตีกัน”หมายถึง ขัดขวางหรือกีดกันคนอื่น อาจจะทำให้เกิดความเดือดร้อนได้ คำกล่าว “หลักกุ้งหลักปลาได้กิน” มีที่มาจากการดำรงชีพด้วยการประมงหากุ้งหาปลาเป็นอาหาร

7. สำนวนที่สะท้อนให้เห็นถึงเครือญาติ

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงเครือญาติ ผลการศึกษาพบจำนวน 1 สำนวน ซึ่งสะท้อนความสัมพันธ์ของพ่อ แม่ และผู้ใหญ่ในชุมชน ดังตัวอย่างเช่น

สำนวน **“เฒ่าลายคราม”**

สำนวน เฒ่าลายคราม หมายถึง เก่าแต่มีค่า คำว่า “เฒ่า” หมายถึง คนที่แก่ชรา มีอายุมาก ส่วนคำว่า “ลายคราม” หมายถึง เครื่องภาชนะเนื้อกระเบื้องที่เขียนลายลงบนผิวด้วยสีน้ำเงิน จากสำนวนทำให้เห็นว่าถึงจะเก่าจะแก่มีอายุมานานมากแล้วแต่ก็ยังมีคุณค่ามีความงดงามของลายนั้นอยู่เช่นเดิม

สำนวน **“เซ่อช้างให้แลหาง เซ่อนางให้แลแม่”**

สำนวน เซ่อช้างให้แลหาง เซ่อนางให้แลแม่ คำว่า “เซ่อ” ในภาษาถิ่นใต้หมายถึง ซื้อสำนวนดังกล่าว หมายถึง ให้พิจารณาลักษณะบุคคลหรือหญิงที่จะเลือกเป็นคู่ครองโดยดูจากแม่

8. สำนวนที่สะท้อนให้เห็นถึงความเชื่อ

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงความเชื่อ ผลการศึกษาพบจำนวน 25 สำนวน ซึ่งสะท้อนความสัมพันธ์ความเชื่อด้าน บาป บุญ คุณ โทษ ความเชื่อด้านไสยศาสตร์ ความเชื่อถึงสิ่งลี้ลับ ดังตัวอย่างเช่น

สำนวน **“ใช้ชาติ”**

สำนวน ใช้ชาติ หมายถึง ทำอย่างไรย่อมได้อย่างนั้น ในภาษาไทยถิ่นใต้ คำว่า “ชาติ” หมายถึง ชาติเกิด ที่เกิดมาในชาตินี้ ก่อผลกรรมอะไรไว้ก็ได้เช่นนั้น

สำนวน **“โนราหราชิก”**

สำนวน โนราหราชิก หมายถึง คนที่ประพฤติผิดต่อหน้าที่ตนเอง คำว่า โนรา หมายถึง มโนราห์ ส่วนคำว่า หราชิก แปลว่า การประพฤติผิดต่อขนบธรรมเนียมประเพณีความเชื่อของมโนราห์ ต้องครองพรหมจรรย์เป็นระยะเวลา 21 ปี เมื่อครบกำหนดต้องตัดจุกผูกผ้าเป็นมโนราห์ใหญ่พร้อมกับบวชเรียน หลังจากนั้นต้องรำถวาย 3 วัด 3 บ้าน มโนราห์ใหญ่ผู้นั้นจึงจะเป็นมโนราห์ที่สมบูรณ์แบบสามารถประกอบพิธีกรรมทุกรูปแบบได้อย่างถูกต้องครบถ้วนสมบูรณ์ตามตำรา แต่หากมโนราห์คนไหนที่ไม่สามารถครองพรหมจรรย์ได้ตามกำหนด ก็ถือว่าเป็นมโนราห์ที่ดิบ ไม่สามารถประกอบพิธีกรรมได้และหากฝ่าฝืนก็จำทำให้สิ่งไม่ดีกลับเข้าสู่ตัวเอง จึงเป็นที่มาของสำนวน โนราหราชิก

9. สำนวนที่สะท้อนให้เห็นถึงสิ่งของเครื่องใช้

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงสิ่งของเครื่องใช้ ผลการศึกษาพบจำนวน 8 สำนวน ซึ่งสะท้อนถึงการใช้ชีวิตประจำที่จะมีสิ่งของเครื่องใช้จำเป็นต่าง ๆ ดังตัวอย่างเช่น

สำนวน **“ลูกขี้หม้อไม่ทันดำ”**

สำนวน ลูกขี้หม้อไม่ทันดำ หมายถึง สามีภรรยาที่แต่งงานอยู่กินด้วยกันแล้วเลิกกันเร็ว เกินไป คำว่า ลูกขี้หม้อ ในภาษาถิ่นใต้หมายถึง ก้นหม้อ สะท้อนถึงชีวิตคู่แต่งงานใหม่ที่จะต้องมีอุปกรณ์การทำอาหารใหม่โดยเฉพาะหม้อข้าวหม้อแกง เมื่อปรุงอาหาร อุปกรณ์ต่าง ๆ ที่ใช้ปรุงอาหารจะต้องโดนไฟเผาจนดำ หากว่าคู่แต่งงานใหม่ที่อยู่กันไม่นานก้นของหม้อข้าวหรือหม้อแกงจะไม่ทันดำ

สำนวน **“ม่ายกูสู้ได้พบรถ”**

สำนวน ม่ายกูสู้ได้พบรถ หมายถึง สังคมที่มีความหมุนเวียนเปลี่ยนแปลงไปตามกาลเวลา เนื่องจากคนสมัยก่อนหากต้องเดินทางไปไหนมาไหนต้องเดินเท้า ยังไม่มียานพาหนะ เช่น รถ คอยอำนวยความสะดวกเหมือนกับปัจจุบัน คนสมัยก่อนจึงพูดเอาไว้ว่า “ม่ายกูสู้ได้พบรถ” หมายถึง เมื่อคนในสมัยนั้นเสียชีวิตไป ยุคสมัยต่อมาจะมีรถหรือยานพาหนะคอยอำนวยความสะดวกในการเดินทาง ไม่ต้องลำบากเหมือนยุคสมัยในอดีต

10. สำนวนที่สะท้อนให้เห็นถึงพฤติกรรมของมนุษย์

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงพฤติกรรมของมนุษย์ ที่เป็นการกระทำของมนุษย์ในสถานการณ์ต่าง ๆ ผลการศึกษาพบจำนวน 19 สำนวน ซึ่งสะท้อนถึงอากัปกิริยาของมนุษย์ ความคิด ทัศนคติ และมุมมอง ลักษณะนิสัย ดังตัวอย่างเช่น

สำนวน **“ดับกุบ”**

สำนวน ดับกุบ หมายถึง เสียชีวิตแล้ว ซึ่งคำว่า “ดับ” หมายถึง การดับสิ้นหรือการตายไปแล้ว ส่วนคำว่า “กุบ” เป็นคำสร้อยที่คนในท้องถิ่นนำมาใช้ต่อท้ายสำนวนที่ให้อารมณ์ความรู้สึกเหมือนผ่านไปแล้ว

สำนวน **“เติมเฒ่า”**

สำนวน เติมเฒ่า หมายถึง คนที่มีอายุน้อยแต่ชอบไปเลียนแบบพฤติกรรมของคนที่มีอายุมากกว่าจนเกินเหตุ คำว่า “เฒ่า” ในภาษาใต้ หมายถึง คนเฒ่าคนแก่ ที่มาของสำนวนมาจากคนที่มีอายุน้อยยังเป็นเด็ก แต่ชอบไปนั่งฟังขณะผู้ใหญ่คุยกันแล้วพูดสอดแทรกในเรื่องนั้น ๆ ทั้งที่ตัวเองไม่ได้มีความรู้อย่างถ่องแท้ แต่กลับไปพูดอวดรู้ในวงสนทนาของผู้ใหญ่ด้วย สำนวน เติมเฒ่า จึงหมายถึง การที่เด็กไปพูดสอดแทรกหรือกระทำอะไรบางอย่างเลียนแบบผู้ใหญ่ ทั้งที่คนไม่มีความรู้ในเรื่องนั้นอย่างแท้จริง

11. สำนวนที่สะท้อนให้เห็นถึงอวัยวะในร่างกาย

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงอวัยวะในร่างกาย อาทิ ศีรษะ ใบหน้า ปาก ท้อง หรือมือ ผลการศึกษาพบจำนวน 11 สำนวน ดังตัวอย่างเช่น

สำนวน **“ขึ้นตามปาก”**

สำนวน ขึ้นตามปาก หมายถึง พูดอย่างไรมักเป็นไปอย่างนั้น ที่มาของสำนวน ขึ้นตามปาก มาจากการที่ผู้ใหญ่กล่าวว่าเด็กคนหนึ่งไปอย่างไร เด็กคนนั้นก็มักเป็นไปตามที่ผู้ใหญ่คนนั้นได้พูด

สำนวน **“แทงข้างพุง”**

สำนวน แทงข้างพุง หมายถึง การเสียดสีผู้อื่น คำว่า “พุง” ในภาษาถิ่นใต้ หมายถึง ท้อง ซึ่ง ที่มาของสำนวน เป็นการเสียดสีผู้อื่นให้มีความเจ็บช้ำ

12. สำนวนที่สะท้อนให้เห็นถึงผู้มีอำนาจ

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงผู้มีอำนาจ ผลการศึกษาพบจำนวน 2 สำนวน คือ

สำนวน **“ลูกท่านหลานเธอ”**

สำนวน ลูกท่านหลานเธอ หมายถึง ลูกเจ้านายหรือผู้มีอำนาจ ที่มาของสำนวนมาจาก ลูกของผู้มีอำนาจย่อมมีสิทธิ์มากกว่าผู้อื่นและได้รับการต้อนรับที่ดีอยู่เสมอ

สำนวน **“บ้านาย”**

สำนวน บ้านาย หมายถึง ประจบสอพลอ คำว่า “นาย” ในภาษาถิ่นใต้หมายถึง เจ้านาย คนที่เป็นหัวหน้า หรือข้าราชการตำแหน่งสูง ๆ ที่มาของสำนวนมาจาก ผู้ที่พยายามใกล้ชิดเจ้านายเพื่อให้เห็นว่าตนทำงานดี กล่าวชมเจ้านาย กล่าวเยินยอ ประจบประแจงเพื่อประโยชน์ของตนเองหรือเพื่อให้ผู้อื่นเห็นว่าตนสนิทกับเจ้านาย

13. สำนวนที่สะท้อนให้เห็นถึงวิถีชีวิตความเป็นอยู่

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงวิถีชีวิตความเป็นอยู่ ในด้านต่าง ๆ เช่น การเข้าครัวทำอาหาร ถิ่นที่อยู่อาศัย ผลการศึกษาพบ จำนวน 6 สำนวน ดังตัวอย่างเช่น

สำนวน **“อย่าปิดควันไฟ”**

สำนวน อย่าปิดควันไฟ หมายถึง เรื่องเสื่อมเสียที่เกิดขึ้นและมีคนทราบเรื่องกันในวงกว้างแล้ว จะทำอย่างไรก็ไม่สามารถปิดเรื่องนั้นได้ต่อไปอีก ที่มาของสำนวนมาจากการจุดไฟเผาบางอย่างแล้วแม้ว่าสิ่งที่เผาอาจจะมอดไหม้ แต่ควันไฟยังคงลอยอยู่ สะท้อนวิถีชีวิตที่ต้องมีการเผาไม้เผาหญ้าเพื่อให้ไล่ยุงให้วัวควาย

สำนวน **“เสาเรินอยู่ในพาย”**

สำนวน เสาเรินอยู่ในพาย หมายถึง คนที่ไม่มีที่อยู่เป็นหลักแหล่ง คำว่า “เริน” ในภาษาใต้ คือ บ้านเรือน ส่วนคำว่า “พาย” คือ กระเป๋าผ้าสะพายที่ใช้ติดตัวเป็นประจำ โดยปกติเสาของบ้านเรือนจะอยู่เป็นหลักเป็นแหล่งติดกับตัวบ้านที่ก่อสร้างขึ้นมา แต่สำนวนนี้เป็นการเปรียบเทียบคนที่ไม่มีที่อยู่เป็นหลักแหล่ง เพราะหากเดินทางไปที่ไหนก็ถือว่าที่นั่นเป็นบ้านเรือนของตน

14. สำนวนที่สะท้อนให้เห็นถึงพืชและผลไม้

สำนวนภาษาไทยถิ่นใต้ควนขนุนที่สะท้อนให้เห็นถึงพืชและผลไม้ ผลการศึกษาพบจำนวน 4 สำนวน ดังตัวอย่างเช่น

สำนวน **“งอกราก”**

สำนวน งอกราก หมายถึง อยู่กับที่ในเวลานานโดยเปล่าประโยชน์ ที่มาของสำนวนคือการทำอะไรอยู่กับที่เป็นเวลานานแต่กลับไม่มีผลประโยชน์อะไร เสียเวลาเปล่า

สำนวน **“พร้าวรอกจ้อ”**

สำนวน พร้าวรอกจ้อ หมายถึง ผู้หญิงที่เสียความบริสุทธิ์แล้วถูกทอดทิ้ง คำว่า “พร้าว” ในภาษาถิ่นใต้คือ มะพร้าว คำว่า “รอก” คือ ตัวกระรอกที่เป็นสัตว์ ส่วนคำว่า “จ้อ” คือ เจาะ สำนวนนี้มีที่มาจากการที่กระรอกใช้ฟันแทะมะพร้าวที่ยังเป็นมะพร้าวอ่อนอยู่ เพราะกระรอกสามารถใช้ฟันเจาะแทะออกได้ ดังนั้น สำนวน พร้าวรอกจ้อ จึงเป็นคำเปรียบเปรยที่หมายถึงหญิงสาวที่เสียความบริสุทธ์ให้กับผู้ชายตั้งแต่ยังไม่ถึงวัยอันควร

15. สำนวนที่สะท้อนให้เห็นถึงสิ่งปฏิกูล

สำนวนภาษาไทยถิ่นใต้ควรขนุนที่สะท้อนให้เห็นถึงสิ่งปฏิกูล ผลการศึกษาพบจำนวน 2 สำนวน คือ

สำนวน **“ขี้ติดวาน”**

สำนวน ขี้ติดวาน หมายถึง หากเราปิดบังอะไรไว้ ไม่มีทางที่จะเป็นความลับไปได้ตลอด ในภาษาถิ่นใต้คำว่า “ขี้” หมายถึง อุจจาระ ซึ่งที่มาของสำนวนมาจากการที่คนถ่ายอุจจาระแล้วจะล้างออกแต่ก็ยังคงมีกลิ่นติดอยู่ด้วย ดังนั้นสำนวน ขี้ติดวาน จึงหมายถึง หากปิดบังหรือเคยทำอะไรไว้ สุดท้ายสิ่งนั้นก็ต้องถูกเปิดเผยออกมาไม่ทางใดก็ทางหนึ่ง

สำนวน **“กำขี้ดีหวากำตด”**

สำนวน กำขี้ดีหวากำตด หมายถึง ได้บ้างดีกว่าไม่ได้อะไรเลย ซึ่งคำว่า “ดีหวา” ในภาษาถิ่นใต้ หมายถึง ดีกว่า โดยที่มาของสำนวนมาจาก การกำขี้แม้จะเป็นสิ่งปฏิกูลที่มีกลิ่นเหม็นแต่ก็สามารถกำได้ แต่ตดมีกลิ่นเหม็นเหมือนกันแต่ไม่สามารถกำได้ สำนวนสะท้อนว่าขอให้ได้อะไรสักอย่างดีกว่าไม่ได้อะไรเลย แม้ว่าทั้งคู่จะเป็นสิ่งที่ไม่ดีพอ ๆ กันก็ตาม

สรุปและอภิปรายผล

1. สำนวนที่ใช้ในภาษาไทยถิ่นใต้ควรขนุนสะท้อนให้เห็นถึงมโนทัศน์ของสภาพบริบททางสังคมในด้านวิถีชีวิต ภูมิปัญญา การประกอบอาชีพ ขนบธรรมเนียมประเพณี ศิลปวัฒนธรรม ที่บ่งบอกถึงอัตลักษณ์ท้องถิ่น ซึ่งมีความแตกต่างจากมโนทัศน์ของสำนวนที่ใช้ในภาษาไทยมาตรฐานอย่างเห็นได้ชัด เช่น กินเหมือนจุกบอก ในภาษาไทยมาตรฐานใช้ ท้องยุ้งพุงกระสอบ มโนทัศน์ในสำนวนภาษาไทยถิ่นใต้ควรขนุนทำให้เห็นว่า มีนำกระบอกข้าวหลามมาเปรียบเทียบ เพราะในควรขนุนมีการทำข้าวหลามเพื่อการประกอบอาชีพ นับว่านำวิถีชีวิตที่คุ้นเคยมาใช้เปรียบเทียบเป็นสำนวนที่สะท้อนการกินของคนในสังคม แต่ในสำนวนภาษาไทยมาตรฐานใช้กระสอบมาเป็นสิ่งเปรียบเทียบ เพราะกระสอบเป็นสิ่งของที่ใช้กันโดยทั่วไป สำนวน เฒ่าลายคราม หมายถึง เก่าแต่มีค่า เฒ่า หมายถึง คนที่แก่ชราอายุมากแล้ว ลายคราม หมายถึง เครื่องภาชนะเนื้อกระเบื้องที่เขียนลายลงบนผิวด้วยสีน้ำเงิน จากสำนวนทำให้เห็นว่าถึงจะมีอายุมานานมากแล้วแต่ก็ยังมีคุณค่าอยู่เช่นเดิม สำนวน โถกเหมือนโลกเคย หมายถึง ถูกมาก ที่มาของสำนวนลูกเคยได้มาจากปลาที่พอง หรือตายมาแล้วไม่สามารถนำไปรับประทานได้ จึงนำปลาเหล่านั้นมาใส่เกลือตากแดด จากนั้นนำมาใส่ครกที่มีลักษณะเฉพาะสำหรับการตำลูกเคย ในภาษาใต้จะเรียกกันว่า เชเคย เมื่อเชเสร็จแล้วก็นำมาปั้นเป็นก้อนกลม เพื่อนำไปจำหน่ายใช้เป็นวัตถุดิบในการทำอาหารชนิดแกงในภาคใต้ สำนวน โถกเหมือนโลกเคย จึงเปรียบเทียบถึงสิ่งของที่มีราคาถูกมาก ไม่เหมาะสมกับระยะเวลาในการทำ ลูกเคย ในภาษาใต้ หมายถึง กะปิ ซึ่งแสดงให้เห็นถึงภาพมโนทัศน์ทางสังคมในด้านวิถีชีวิตที่หาปลาได้ง่ายเพราะมีพื้นที่ติดกับทะเล ซึ่งเป็นการประกอบอาชีพหลักของท้องถิ่นใต้ควรขนุนได้อย่างชัดเจน

2. สำนวนที่ใช้ในภาษาไทยถิ่นใต้ควรขนุนสะท้อนให้เห็นถึงเอกลักษณ์ทางวัฒนธรรมที่โดดเด่นโดยถ่ายทอดออกมาทางสำนวนภาษาที่คมคาย ซึ่งจังหวัดพัทลุงเป็นดินแดนแห่งเมืองหนังโนราห์เป็น

ท้องถิ่นที่มีการสืบทอดวัฒนธรรมจากรุ่นสู่รุ่นมาตั้งแต่อดีตจนถึงปัจจุบัน โดยเฉพาะศิลปวัฒนธรรมแขนงมโนราห์ โดยมีครูภูมิปัญญาประจำท้องถิ่นเป็นผู้ถ่ายทอดศาสตร์ความรู้ เมื่อลูกศิษย์คนนั้นได้มาฝึกหัดเรียนรู้ก็จะได้วิชาที่สามารถนำไปใช้ในการประกอบอาชีพได้ แต่หากลูกศิษย์ประพฤติปฏิบัติตน นอกเหนือจากที่ครูได้สั่งสอนหรือถ่ายทอดความรู้ไป ก็อาจเป็นภัยต่อตนเองได้ในภายหลัง จึงเป็นที่มาของสำนวนหัวล้านนอกครู และอีกสำนวนหนึ่งที่สะท้อนให้เห็นถึงรากเหง้าทางขนบธรรมเนียมประเพณีวัฒนธรรมที่ยังคงยึดถือและดำรงไว้ซึ่งแนวทางในการประพฤติปฏิบัติสืบต่อมาจากรุ่นสู่รุ่น ดังสำนวน โนราหราชิก หมายถึง คนที่ประพฤติผิดต่อหน้าที่ตนเอง โนรา หมายถึง มโนราห์ หราชิก แปลว่า การประพฤติผิดต่อขนบธรรมเนียมประเพณี ตามความเชื่อของมโนราห์ต้องครองพรหมจรรย์เป็นระยะเวลา 21 ปี เมื่อครบกำหนดต้องตัดจุกผูกผ้าเป็นมโนราห์ใหญ่พร้อมกับบวชเรียน หลังจากนั้นต้องรำถวาย 3 วัด 3 บ้าน มโนราห์ใหญ่ผู้นั้นจึงจะเป็นมโนราห์ที่สมบูรณ์แบบสามารถประกอบพิธีกรรมทุกรูปแบบได้อย่างถูกต้องครบถ้วนสมบูรณ์ตามตำรา แต่หากมโนราห์คนใดที่ไม่สามารถครองพรหมจรรย์ได้ตามกำหนด ก็ถือว่าเป็นมโนราห์ที่ดิบหรือภาษาไทยถิ่นใต้ควนขนุนใช้คำว่า หราชิก มาจากคำว่า ปาราชิก หมายถึง อาบัติหนักในพระวินัย ซึ่งหากนำมาเปรียบกับมโนราห์ก็จะไม่สามารถประกอบพิธีกรรมได้และหากฝ่าฝืนก็จะทำให้สิ่งไม่ดีกลับเข้าสู่ตัวเองจากที่จะรุ่งเรืองแต่ก็อาจจะตกอับลงได้ในที่สุด จึงเป็นที่มาของสำนวน โนราหราชิก

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. สำนวนภาษาไทยถิ่นใต้ควนขนุนอาจจะมีความคล้ายถึงกับสำนวนภาษาไทยถิ่นใต้ในอำเภออื่น ๆ ของจังหวัดพัทลุง ซึ่งจำเป็นต้องทำการวิจัยในวงกว้างมากกว่านี้

2. สำนวนภาษาไทยถิ่นใต้ควนขนุนอาจจะมีจำนวนมากกว่าที่งานวิจัยนี้พบ แต่เนื่องจากงานวิจัยนี้มีเวลาที่จำกัด จึงรวบรวมและศึกษาได้จำนวนหนึ่งเท่านั้น หากมีเวลาในการลงพื้นที่มากขึ้น และสอบถามผู้บอกภาษาได้ครอบคลุมขึ้น อาจจะพบสำนวนภาษาไทยถิ่นใต้ควนขนุนมากกว่างานวิจัยนี้

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ศึกษาสำนวนภาษาไทยถิ่นใต้ในพื้นที่อื่นของจังหวัดพัทลุง หรือศึกษาสำนวนภาษาไทยถิ่นใต้ของจังหวัดพัทลุงเปรียบเทียบกับจังหวัดอื่น ๆ และเปรียบเทียบกับภาษาไทยมาตรฐาน

2. ศึกษาบทมโนราห์ หนังตะลุง เพลงกล่อมเด็ก วรรณกรรมท้องถิ่น ฯลฯ อาจทำให้เห็นถึงอัตลักษณ์ของแต่ละท้องถิ่นที่สะท้อนออกมาจากมุมมองของภาษาถิ่นและวรรณกรรมท้องถิ่นได้อย่างชัดเจนยิ่งขึ้น เพื่อประโยชน์ในการเข้าใจแนวคิด วิถีชีวิต และขนบธรรมเนียมประเพณีที่ก่อให้เกิดความเข้าใจซึ่งกันและกันของคนในสังคมยิ่งขึ้นต่อไปอีกด้วย

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การศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼”

A Comparative Study of Thai Idiomatic Expressions Containing the Word “Pla” (Fish) with Chinese Idiomatic Expressions Containing the Word “鱼” (Fish)

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บทคัดย่อ

สำนวนเป็นถ้อยคำที่ร้อยเรียงขึ้นจากความคิดและประสบการณ์ของคนในแต่ละสังคม เพื่อนำมาใช้สั่งสอนหรือเป็นข้อคิดเตือนใจเกี่ยวกับการดำเนินชีวิตของคนในสังคมนั้น การศึกษาสำนวนจะช่วยทำให้เข้าใจวิถีชีวิต สภาพสังคม วัฒนธรรม ตลอดจนภูมิปัญญาของชาติต่าง ๆ ได้ บทความวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” ซึ่งมีความหมายเหมือนหรือคล้ายคลึงกัน และศึกษาภาพสะท้อนจากสำนวนทั้งสองภาษานี้ โดยการวิเคราะห์ความหมายประจำรูปของคำที่ประกอบอยู่ในสำนวน และความหมายของสำนวนไทยที่มีคำว่า “ปลา” ที่นำมาศึกษามีจำนวนทั้งหมด 8 สำนวน ส่วนสำนวนจีนที่มีคำว่า “鱼” ที่นำมาศึกษามีจำนวนทั้งหมด 14 สำนวน ผลการศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” ซึ่งมีความหมายเหมือนหรือคล้ายคลึงกันสามารถแบ่งออกได้เป็น 3 ประเภท คือ 1) สำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” เหมือนกัน 2) สำนวนไทยมีคำว่า “ปลา” แต่สำนวนจีนใช้คำอื่น และ 3) สำนวนจีนมีคำว่า “鱼” แต่สำนวนไทยใช้คำอื่น การวิเคราะห์ภาพสะท้อนของสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” พบว่า สะท้อนให้เห็นถึงลักษณะภูมิประเทศ วิถีชีวิตความเป็นอยู่ ภูมิปัญญา รวมทั้งมุมมองเกี่ยวกับการดำเนินชีวิตของคนในสังคม

คำสำคัญ: สำนวนไทย, สำนวนจีน, ปลา

Abstract

Idioms are phrases constructed from the thoughts and experiences of people in each society, used to educate and provide moral guidance about the way of life within that society. The study of idioms helps to understand the lifestyle, social conditions, culture, and the wisdom of various nations. The primary aim of this research article is to explore Thai Idiomatic Expressions featuring the term "Pla" (Fish) with their Chinese counterparts that contain the term "鱼" (Fish). By examining idioms that share similar or

identical meanings, the study aims to study the underlying connotations and implications in these bilingual idioms. Through a comprehensive analysis of the words and meanings in Thai Idiomatic Expressions utilizing the term "Pla" (Fish) with a total of 8 Thai Idiomatic Expressions and Chinese Idiomatic Expressions employing the term "鱼" (Fish) with a total of 14 Chinese Idiomatic Expressions. the research reflects on the interplay between the two languages. The comparative examination reveals that Thai Idiomatic Expressions utilizing the term "Pla" (Fish) and Chinese Idiomatic Expressions employing the term "鱼" (Fish), sharing synonymous or similar meanings, can be classified into three categories. Firstly, there are cases where both Thai and Chinese idioms employ the exact same term for fish, namely "Pla" and "鱼" respectively. Secondly, certain Thai idiomatic expressions incorporate the term "Pla" (Fish) while their Chinese counterparts utilize alternative terminology. Lastly, some Chinese idiomatic expressions incorporate the term "鱼" (Fish) while Thai idioms use different words altogether. The analysis of the reflections in Thai and Chinese idioms containing the word " Pla " or "鱼" reveals the geographical conditions, ways of life, wisdom, and perspectives on how people conduct their lives in society

Keywords: Thai Idiomatic Expressions, Chinese Idiomatic Expressions, Fish

บทนำ

ประเทศไทยเป็นประเทศที่มีปลาและสัตว์น้ำอุดมสมบูรณ์มาตั้งแต่ในสมัยโบราณ ดังสำนวนที่กล่าวว่า “ในน้ำมีปลา ในนามีข้าว” และ “ทรัพย์ในดิน สินในน้ำ” ทั้งนี้เนื่องจากประเทศไทยมีพื้นที่อยู่ติดกับทะเลอันดามันและอ่าวไทย อีกทั้งยังมีแม่น้ำหลายสายไหลผ่านเกือบทุกพื้นที่ของประเทศ ด้วยเหตุนี้จึงทำให้ปลามีความสำคัญต่อวิถีชีวิตและวัฒนธรรมของคนไทยเป็นอย่างมาก ความสำคัญของปลาที่เห็นได้อย่างชัดเจนประการหนึ่งคือ เป็นอาหารหลักของคนไทย ดังจะเห็นได้จากข้อความที่ปรากฏในศิลาจารึกพ่อขุนรามคำแหงด้านที่ 1 และคำให้การชาวกรุงเก่า ที่กล่าวถึงปลาไว้ว่า

> “เมื่อชั่วพ่อกู กูบำเรอแก่พ่อกู กูบำเรอแก่แม่กู กูได้ตัวเนื้อตัวปลา กูเอามาแก่พ่อกู”
>
> (ศูนย์มานุษยวิทยาสิรินธร, 2555)

ดังที่ สุมาลี วีระวงศ์ (2539) ในงานวิจัยเรื่อง เรื่องของปลาในสำนวนไทยกล่าวไว้ว่า สิ่งที่คนไทยกินกับข้าวเป็นประจำคือ ปลา จึงไม่แปลกที่สำนวนไทยที่อ้างอิงถึงปลาทั้งธรรมชาติ ลักษณะของปลา วิธีและอุปกรณ์สำหรับจับปลาและแปรสภาพปลาเป็นอาหารมีจำนวนมาก เช่น ปลากระดี่ได้น้ำ ปลาใหญ่กินปลาเล็ก ปลาหมอตายเพราะปาก ใจปลาซิว เป็นต้น อาจกล่าวได้ว่า สำนวนเหล่านี้มีที่มาจากลักษณะความเป็นอยู่และวิถีชีวิตของคนไทยที่อยู่ใกล้ชิดและผูกพันกับปลามาตั้งแต่ในอดีต จึงได้สังเกตเห็นลักษณะทางธรรมชาติของปลาแล้วนำมาเปรียบเปรยเป็นสำนวน

สำนวน คือ ถ้อยคำหรือข้อความที่กล่าวสืบต่อกันมาช้านานแล้ว มีความหมายไม่ตรงตามตัว พูดขึ้นมาเพื่อเปรียบเทียบ โดยใช้คำที่สั้น แต่กินความมาก (ขุนวิจิตรมาตรา, 2543, น. 1-2) สำนวนไทยเป็นเรื่องที่สำคัญเรื่องหนึ่งที่จะช่วยทำให้ผู้เรียนภาษาไทยเห็นความคิด ความเชื่อ และค่านิยมของสังคมไทยที่สืบทอดมาตั้งแต่ในอดีต (กรมวิชาการ กระทรวงศึกษาธิการ, 2554, น. ก - ฉ)

ประเทศจีนเป็นอีกประเทศหนึ่งที่ปลามีความสำคัญต่อวิถีชีวิตของคนในสังคม ดังที่ Tao Siyan (2019, p. 3-18) ในหนังสือวัฒนธรรมปลาอธิบายไว้ว่า ปลามีความเกี่ยวข้องกับวิถีชีวิตประจำวันของคนจีนหลายด้าน อาทิ ด้านอาหารการกิน คนจีนนิยมบริโภคปลาและถือว่าเป็นอาหารหลัก ในประเทศจีนจะมีวัฒนธรรมการรับประทานปลาเพื่อความเป็นสิริมงคลในเทศกาลสำคัญด้วย เนื่องจากคำว่า “鱼” หรือ “ปลา” ในภาษาจีน ออกเสียงพ้องกับคำว่า “余” หมายถึง มีมากมายจนล้นเหลือ ทางด้านคติความเชื่อ คนจีนเชื่อถือกันว่าปลาเป็นสัตว์มงคล เป็นสัญลักษณ์ของความมั่งคั่ง ความเจริญ รุ่งเรือง และความสุข ในประเพณีหรือเทศกาลสำคัญ คนจีนจึงมักจะนำรูปปลามาใช้ประกอบในพิธี เช่น งานแต่งงานจะตัดกระดาษเป็นรูปปลาคู่ แล้วนำไปติดไว้ที่หน้าต่าง นอกจากนี้ คนจีนยังใช้ปลาเป็นสัญลักษณ์แทนความรัก ส่วนใหญ่เป็นเพราะความสัมพันธ์ที่แยกกันไม่ออกระหว่างปลากับน้ำทำให้นึกถึงความรักระหว่างสามีและภรรยา ซึ่งเห็นได้จากสำนวน เช่น “鱼水之情” (Zhao Shuting, 2022, P. 81)

Sun Yongbing (2008, p. 23) กล่าวว่าสำนวนที่มีคำว่า “ปลา” มีอยู่มากมายในภาษาจีนและภาษาไทย เช่น สำนวนจีน “大鱼吃小鱼, 小鱼吃虾米” จึงมีความหมายตรงกับสำนวนไทยว่า “ปลาใหญ่กินปลาเล็ก” ในภาษาไทย และสะท้อนให้เห็นสังคมมนุษย์เพื่อแสดงปรากฏการณ์ทางสังคมปลาเป็นสัตว์ที่มีบทบาทสำคัญต่อวิถีชีวิตของคนจีนเช่นเดียวกันกับคนไทย

หลังจากการศึกษาข้อมูลต่าง ๆ ผู้วิจัยเห็นว่า สำนวนที่มีคำว่า “ปลา” ในภาษาไทยและภาษาจีนมีจำนวนมาก สำนวนไทย - จีนที่มีคำว่า “ปลา” และความหมายคล้ายคลึงกัน สามารถสะท้อนให้เห็นวัฒนธรรมต่าง ๆ ของสังคมไทยและจีน ดังนั้น ผู้วิจัยจึงสนใจศึกษาสำนวนไทย – จีนที่มีคำว่า “ปลา/鱼” และมีความหมายตรงหรือคล้ายคลึงกันเพื่อให้เห็นวัฒนธรรมร่วมและลักษณะเฉพาะของสังคมไทยและจีน

วัตถุประสงค์ของการวิจัย

1) เพื่อศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” ซึ่งมีความหมายเหมือนหรือคล้ายคลึงกัน

2) เพื่อศึกษาภาพสะท้อนจากสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼”

ทบทวนวรรณกรรม

1) ความหมายของคำว่า “สำนวน” ในภาษาไทย

ขุนวิจิตรมาตรา (2543) อธิบายเกี่ยวกับสำนวนไว้ว่า เป็นคำพูดที่เป็นชั้นเชิง ไม่ตรงไปตรงมา แต่มีความหมายในคำพูด ผู้ฟังอาจเข้าใจทันที หรือต้องคิดจึงเข้าใจ หรือบางทีคิดแล้วเข้าใจเป็นอื่น หรือไม่เข้าใจเลยก็ได้ สำนวนนั้นเกิดจากมูลเหตุต่าง ๆ เช่น ธรรมชาติ การกระทำ ศาสนา ประเพณี ความประพฤติ

พจนานุกรมฉบับราชบัณฑิตยสถาน พ.ศ. 2556 ให้ความหมายของสำนวนไว้ คือ ถ้อยคำที่เรียบเรียง บางทีก็ใช้ว่า สำนวนโวหาร เช่น สารคดีเรื่องนี้สำนวนโวหารดี

ในการศึกษาครั้งนี้ ผู้วิจัยจะอาศัยนิยามของสำนวนตามที่ขุนวิจิตรมาตราและราชบัณฑิตยสถานให้ไว้คือ เป็นถ้อยคำที่ใช้สืบต่อกันมาเป็นเวลานาน มีความหมายไม่ตรงตามตัวอักษร และมีความหมายเชิงเปรียบเทียบ

2) ความหมายของคำว่า “成语” (สำนวน) ในภาษาจีน

พจนานุกรม Xiandai Hanyu Cidian (2016) อธิบายความหมายของ“成语” (สำนวน) ไว้ว่า

คือ กลุ่มคำหรือวลีที่ใช้สืบต่อกันมาเป็นระยะเวลานาน มีรูปแบบตายตัว มักจะประกอบด้วยคำจำนวน 4 คำ และใช้ภาษาสละสลวย

ในหนังสือ Cihai (Shanghai Cishu Chubanshe, 2020: คำนำ) ให้นิยามความหมายของ “成语” (สำนวน) ไว้ว่า เป็นสำนวนประเภทหนึ่งที่นิยมใช้ในการสื่อสาร จะประกอบด้วยคำจำนวน 4 คำ บางสำนวนอาจแปลความหมายตามตัวอักษร และบางสำนวนต้องทราบแหล่งที่มาก่อนจึงจะเข้าใจความหมายของสำนวน

ในพจนานุกรม Xiaoxueshen Chengyu Cidian (Caituban) (Shuowenjiezi Cishu Yanjiu Zhongxi, 2019: คำนำ) กล่าวถึงความหมายของ “成语” (สำนวน) ว่า เป็นกลุ่มคำหรือประโยคสั้น ๆ ที่ใช้สืบกันมาเป็นเวลานาน มีรูปแบบตายตัว

สรุปได้ว่าคำว่า “成语” (สำนวน) ในภาษาจีนนั้นหมายถึง ถ้อยคำที่ใช้สืบต่อกันมาเป็นเวลานาน มีความหมายทั้งแบบตรงตามตัวอักษร และแบบตีความโดยอาศัยแหล่งที่มาของถ้อยคำ

จากข้อมูลดังกล่าวแสดงให้เห็นความต่างของสำนวนไทยและสำนวนจีน คือ สำนวนไทยเป็นถ้อยคำที่มีความหมายไม่ตรงตามตัวอักษร และมีความหมายเชิงเปรียบเทียบ แต่สำนวนจีน “成语” มีความหมายตรงตามตัวอักษรและไม่ตรงตามตัวอักษร

3) งานวิจัยที่ศึกษาเกี่ยวกับการเปรียบเทียบสำนวนไทยกับสำนวนจีนเกี่ยวกับสัตว์

จากการสำรวจงานวิจัยที่ศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนเกี่ยวกับสัตว์ พบว่า งานวิจัยที่ศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนเกี่ยวกับสัตว์จะศึกษาสำนวนที่กล่าวถึงสัตว์ชนิดใดชนิดหนึ่ง งานวิจัยในลักษณะนี้มีทั้งหมด 3 เรื่อง ได้แก่ งานวิจัยเรื่อง “สำนวนไทยและสำนวนจีนที่มีคำว่า งู” ของ สุภัชญา สวัสดิ์โยธิน (2562) งานวิจัยนี้มีวัตถุประสงค์การศึกษา 3 ประการ คือ 1) เพื่อศึกษาประเภทของสำนวนไทยและสำนวนจีนที่มีคำว่า “งู” 2) เพื่อศึกษาภาพสะท้อนจากสำนวนที่มีคำว่า “งู” ในสำนวนไทยและสำนวนจีน 3) เพื่อศึกษาความเข้าใจการใช้สำนวนไทยที่มีคำว่า “งู” ของนักศึกษาระดับปริญญาตรี สาขาวิชาภาษาอังกฤษเพื่อการสื่อสารสากล งานวิจัยอีกเรื่องหนึ่งคือ การศึกษาเปรียบเทียบสำนวนจีนที่มีคำว่า “虎” กับสำนวนไทยที่มีคำว่า “เสือ” ของ พิชชาภา พลานุมาศ (2564) งานวิจัยนี้มุ่งศึกษาความหมายของสำนวนที่มีคำว่า “เสือ” ในภาษาไทยและภาษาจีนโดยการเปรียบเทียบความเหมือนของสำนวนที่มีคำว่า “เสือ” ในภาษาไทยกับสำนวนจีนมีคำว่า “虎” งานวิจัยเรื่องสุดท้ายคือ งานวิจัยของ เรณุกา สิทธิตถะวงศ์ (2559) เรื่องการใช้ถ้อยคำเปรียบเทียบ “สุนัข” กับ “คน” ในภาษาไทยและภาษาจีน งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความหมายของถ้อยคำที่เปรียบเทียบพฤติกรรมของสุนัขกับการกระทำของคน และถ้อยคำที่เปรียบเทียบรูปลักษณ์ของสุนัขกับการกระทำของคน

นอกจากนี้ยังมีงานวิจัยที่ศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนเกี่ยวกับสัตว์โดยศึกษาเป็นชนิดหรือประเภทของสัตว์ ได้แก่ งานวิจัยเรื่อง “การศึกษาเปรียบเทียบสำนวนจีนและสำนวนไทยที่มีคำเกี่ยวกับสัตว์ปีก” ของ Waralak Saeueng (2550) งานวิจัยนี้มีวัตถุประสงค์ 3 ประการ ประการแรกคือ เพื่อศึกษาลักษณะทั่วไปของสำนวนจีนและสำนวนไทยที่มีคำเกี่ยวกับสัตว์ปีก ประการที่สองคือ เพื่อวิเคราะห์ความหมายเปรียบเทียบสำนวนจีนและสำนวนไทยที่มีคำเกี่ยวกับสัตว์ปีก ประการสุดท้ายคือ เพื่อศึกษาภาพสะท้อนจากสำนวนที่เกี่ยวกับสัตว์ปีกในภาษาไทยและภาษาจีน

งานวิจัยที่ศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนเกี่ยวกับสัตว์ที่พบอีกลักษณะหนึ่งคือ การศึกษาเปรียบเทียบสำนวนโดยศึกษาจากสำนวนที่เกี่ยวกับสัตว์หลายชนิด ได้แก่ งานวิจัยเรื่อง “สำนวนจีนและสำนวนไทยที่คำเกี่ยวกับสัตว์ : การเปรียบเทียบ” ของ พิริยา สุรขจร (2544) งานวิจัยนี้มี

วัตถุประสงค์การศึกษา 3 ประการคือ 1) ศึกษาลักษณะทั่วไปของสำนวนจีนและสำนวนไทยที่มีคำเกี่ยวกับสัตว์ 2) วิเคราะห์ความเปรียบในสำนวนจีนและสำนวนไทยที่มีคำเกี่ยวกับสัตว์ 4 ชนิด คือ ม้า เสือ มังกร และปลา และ 3) ศึกษาภาพสะท้อนจากสำนวนจีนและสำนวนไทยที่มีคำเกี่ยวกับสัตว์ด้านสิ่งแวดล้อม ขนบธรรมเนียม ประเพณี วัฒนธรรม และวิถีชีวิตความเป็นอยู่ของชาวจีนและชาวไทย

งานวิจัยที่ศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนเกี่ยวกับสัตว์ในประเทศจีน เช่น Zhao Lele (2017) ศึกษาเรื่อง汉泰成语对比研究 (การศึกษาเปรียบเทียบสำนวนจีนและไทย) โดยมีวัตถุประสงค์ คือ เพื่อเปรียบเทียบสำนวนจีนและสำนวนไทยที่เกี่ยวกับสัตว์ พืช และอาหาร จากนั้นวิเคราะห์ศึกษาภาพสะท้อนทางวัฒนธรรมจากสำนวนจีนและสำนวนไทย ทั้งวัฒนธรรมที่เหมือนกันหรือคล้ายคลึงกัน และวัฒนธรรมที่แตกต่างกันในทั้งสองประเทศ เช่น ประเทศจีนและประเทศไทยมีวิธีการเดินทางในสมัยก่อนไม่เหมือนกัน ประเทศจีนส่วนใหญ่จะใช้วัวหรือม้าเป็นพาหนะ แต่ในประเทศไทย คนสมัยก่อนส่วนใหญ่นั่งเรือ เห็นได้จากสำนวนไทยว่า ไม่รู้จักเสือ เอาเรื่อมาจอด น้ำพึ่งเรือเสือพึ่งป่า เป็นต้น

จากงานวิจัยดังกล่าวเห็นได้ว่า งานวิจัยที่ศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนที่เกี่ยวกับสัตว์ในประเทศไทยและประเทศจีนส่วนใหญ่จะศึกษาความหมายเปรียบเทียบของสำนวน และศึกษาเปรียบเทียบภาพสะท้อนจากสำนวนทั้งสองภาษา ในการศึกษาครั้งนี้ผู้วิจัยจะนำวิธีการศึกษาของงานวิจัยดังกล่าวมาใช้เป็นแนวทางในการศึกษาต่อไป

วิธีดำเนินการวิจัย

1. ทบทวนงานวิจัยที่เกี่ยวข้อง ได้แก่ งานวิจัยที่เกี่ยวข้องกับการศึกษาเปรียบเทียบสำนวนไทยและสำนวนจีน และงานวิจัยที่ศึกษาเกี่ยวกับสำนวนที่มีคำว่า “ปลา”

2. รวบรวมสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” ผู้วิจัยได้ศึกษาข้อมูลจากเอกสารและงานวิจัยที่เกี่ยวข้องเพื่อศึกษาแนวทางและวิธีดำเนินการวิจัย จากนั้นจึงรวบรวมสำนวนไทยที่มีคำว่า “ปลา” จากเอกสารและตำราที่นักวิชาการและนักวิจัยส่วนใหญ่นิยมใช้ในการศึกษาเกี่ยวกับสำนวนไทย จำนวนทั้งหมด 5 เล่ม ได้แก่ 1) สำนวนไทยของขุนวิจิตรมาตรา (2543) 2) สำนวนไทยของกรมวิชาการ กระทรวงศึกษาธิการ (2545) 3) สำนวนไทยของประเทือง คล้ายสุบรรณ์ (2554) 4) พจนานุกรมฉบับราชบัณฑิตยสถาน (2556) 5) ภาษิต คำพังเพย สำนวนไทย (ราชบัณฑิตยสถาน, 2561)

เอกสารและตำราเกี่ยวกับสำนวนจีนที่ใช้ในการศึกษาวิจัยครั้งนี้มีจำนวนทั้งหมด 7 เล่มที่เป็นหนังสือน่าเชื่อถือและนักวิจัยนิยมนำมาใช้ ได้แก่ 1) 中国成语大辞典 (Zhongguo Chengyu Da Cidian) พจนานุกรมสำนวนจีน ของ Wang Tao (2008) 2) 成语大词典 (Chengyu Da Cidian) พจนานุกรมสำนวนใหญ่ ของ Chengyu Da Cidian Bianweihui (2013) 3) 现代汉语词典第七版 (Xiandai Hanyu Cidian) พจนานุกรมภาษาจีนสมัยใหม่ ของ Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi (2016) 4) สำนวนจีน ของ ส.สุวรรณ (2541) 5) ชุมนุมสำนวนจีน ของ มานิต เจียรบรรจงกิจ เล่ม 1 (2542) 6) ชุมนุมสำนวนจีน ของ มานิต เจียรบรรจงกิจ เล่ม 2 (2544) 7) ชุมนุมสำนวนจีน ของ มานิต เจียรบรรจงกิจ เล่ม 3 (2544)

3. วิเคราะห์ข้อมูล ผู้วิจัยจะนำข้อมูลที่ได้มาวิเคราะห์เชิงเนื้อหา (Content Analysis) เพื่อศึกษาเปรียบเทียบความหมายของสำนวนทั้งสองภาษา พร้อมทั้งวิเคราะห์ภาพสะท้อนความเหมือนและความต่างของสำนวนไทยและสำนวนจีน

4. สรุปและอภิปรายผล

ผลการวิจัย

จากการศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” พบว่าสามารถแบ่งออกเป็น 3 ประเภทใหญ่ ๆ ได้แก่ 1) สำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” เหมือนกัน 2) สำนวนไทยที่มีคำว่า “ปลา” แต่สำนวนจีนใช้คำอื่น 3) สำนวนจีนที่มีคำว่า “鱼” แต่สำนวนไทยใช้คำอื่น

1. สำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” เหมือนกัน

สำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” ซึ่งมีความเหมือนหรือคล้ายคลึงกันมีทั้งหมด 6 สำนวน ดังตารางต่อไปนี้

ตารางที่ 1 สำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” เหมือนกัน

สำนวนไทย	สำนวนจีน
1. ปลาใหญ่กินปลาเล็ก	大鱼吃小鱼, 小鱼吃虾米 (ปลาใหญ่กินปลาเล็ก ปลาเล็กกินกุ้งฝอย)
2. กระดี่ได้น้ำ	如鱼得水 (เหมือนปลาได้น้ำ)
3. เอากุ้งฝอยไปตกปลากะพง	以蚓投鱼 (เอาไส้เดือนมาหย่อนปลา)
4. จับปลาสองมือ	鱼与熊掌不可兼得 (ปลากับอุ้งตีนหมีได้มาพร้อมกันไม่ได้)
5. ปลาติดหลังแห	城门失火, 殃及池鱼 (ประตูเมืองไฟไหม้ ภัยลามไปถึงบ่อปลา)
6. ในน้ำมีปลา ในนามีข้าว	鱼米之乡 (ถิ่นนาปลาข้าว)

สำนวน “ปลาใหญ่กินปลาเล็ก” ในภาษาไทย หมายถึง ประเทศหรือคนที่มีอำนาจที่กดขี่ข่มผู้อ่อนแอหรือผู้น้อย (ราชบัณฑิตยสถาน, 2556) ส่วนในภาษาจีนใช้ว่า “大鱼吃小鱼, 小鱼吃虾米” (ปลาใหญ่กินปลาเล็ก ปลาเล็กกินกุ้งฝอย) หมายถึง คนที่มีอำนาจหรือมีกำลังและเอาเปรียบผู้ที่อ่อนแอกว่า (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016 : 247) จะเห็นได้ว่าสำนวนทั้งสองนี้เปรียบจากการสังเกตลักษณะตามธรรมชาติของปลาและห่วงโซ่อาหารตามธรรมชาติ คือสัตว์ที่มีขนาดใหญ่จะกินเหยื่อที่มีขนาดเล็กกว่าเพื่อความอยู่รอด โดยใช้เปรียบเทียบพฤติกรรมของบุคคลที่มีอำนาจซึ่งมักจะเอาเปรียบบุคคลที่อ่อนแอกว่าอยู่เสมอ

สำนวน “กระดี่ได้น้ำ” ในภาษาไทย หมายถึง คนที่แสดงอาการดีอกดีใจตื่นเต้นจนตัวสั่น (ราชบัณฑิตยสถาน, 2556) สำนวนดังกล่าวเกิดจากการสังเกตลักษณะตามธรรมชาติของปลากระดี่ว่า ยังสามารถอาศัยอยู่ในบ่อได้เมื่อถึงฤดูแล้ง เนื่องจากมีอวัยวะช่วยหายใจอยู่ในเหงือก เมื่อถึงฤดูฝนปลากระดี่จะกระโดดโลดเต้นว่ายน้ำเล่นได้ด้วยอาการสดชื่น จึงนำมาเปรียบกับพฤติกรรมของบุคคลที่มีอาการตื่นเต้นดีใจอย่างมาก ในขณะที่ภาษาจีนใช้ว่า “如鱼得水” (เหมือนปลาได้น้ำ) หมายถึง อยู่ในสิ่งแวดล้อมสบายและรู้สึกดีใจมาก (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016 : 1110) ซึ่งเกิดจากการสังเกตลักษณะตามธรรมชาติของปลาที่อาศัยอยู่ในน้ำที่มีความเย็นสบายและเหมาะสมสำหรับปลา คนจีนจึงนำสำนวนนี้มาเปรียบเทียบกับพฤติกรรมของบุคคลที่มีความรู้สึกดีใจและสบายใจ

สำนวน “เอากุ้งฝอยไปตกปลากะพง” ในภาษาไทย หมายถึง ลงทุนน้อยแต่หวังได้ผลกำไรมาก (ราชบัณฑิตยสถาน, 2556) โดยคนไทยมองว่า กุ้งฝอยเป็นสัตว์ที่สามารถพบเจอและจับได้ง่ายตามแหล่งน้ำธรรมชาติ ในขณะที่ปลากะพงเป็นสัตว์ที่พบเจอได้ยากกว่าและต้องลงทุนลงแรงโดยใช้เหยื่อไปล่อเพื่อให้ได้

ปลากะพงมา ส่วนสำนวนจีนใช้ว่า “以蚓投鱼” (เอาไส้เดือนมาหย่อนปลา) หมายถึง การนำของที่มีค่าเพียงเล็กน้อยมาใช้ล่อเพื่อให้ได้ของที่มีค่ามาก (Wang Tao, 2008 : 877) โดยคนจีนมองว่า ไส้เดือนเป็นสัตว์ที่เจอและจับได้ง่ายตามพื้นดิน ส่วนปลาเป็นสัตว์ที่จะต้องลงทุนลงแรงโดยใช้เหยื่อไปล่อเพื่อให้ได้มา

สำนวน “จับปลาสองมือ” ในภาษาไทย หมายถึง มุ่งจะเอาให้ได้ทั้งสองอย่างพร้อมกัน ในที่สุดไม่ได้สักอย่าง (ราชบัณฑิตยสถาน, 2556) สำนวนนี้เกิดจากการสังเกตพฤติกรรมของบุคคลที่ใช้มือเดียวจับปลาข้างละหนึ่งตัว โดยธรรมชาติของปลาจะมีผิวลื่น จับได้ยาก หากอยากจับปลาได้มั่นควรใช้มือทั้งสองช่วยประคองไว้ แต่หากโลภมากจับปลาพร้อมกันสองตัวในทีเดียว ก็อาจลื่นหลุดมือไปหมด (พุทธิรา มาสาซ้าย, 2555) ส่วนสำนวนจีนใช้ว่า “鱼与熊掌不可兼得” (ปลากับอุ้งตีนหมีได้มาพร้อมกันไม่ได้) หมายถึง คนเราไม่สามารถได้ของที่มีค่าสองอย่างมาพร้อมกัน (Wang Tao, 2008, p. 650) โดยคนจีนมองว่า ปลาเป็นอาหารชั้นดี และอุ้งตีนหมีเป็นอาหารชั้นดียิ่งกว่า สำนวนนี้จะสื่อว่า ถ้าจะได้อีกอย่างมันก็ต้องเสียอย่างไม่มีทางได้พร้อมกันทั้งสองอย่าง (ส.สุวรรณ, 2541)

สำนวน “ปลาติดหลังแห” ในภาษาไทย หมายถึง คนที่พลอยได้รับเคราะห์กรรมร่วมกับผู้อื่นทั้งที่ไม่ได้มีส่วนพัวพันด้วย (ราชบัณฑิตยสถาน, 2556) สำนวนนี้เกิดจากการที่คนไทยสังเกตวิธีการทอดแหจับปลา เมื่อสาวแหนำปลาขึ้นมาแล้ว อาจมีปลาด้านนอกของแหติดขึ้นมาด้วย (กรมวิชาการ กระทรวงศึกษาธิการ, 2545 : 182) ส่วนสำนวนในภาษาจีนใช้ว่า “城门失火, 殃及池鱼” (ประตูเมืองไฟไหม้ ภัยลามไปถึงบ่อปลา) หมายถึง คนเดือดร้อนเพราะสิ่งที่ไม่เกี่ยวตัวเอง คนจีนในสมัยก่อนนิยมขุดคลองรอบเมือง และเลี้ยงปลาไว้ในคลอง เมื่อเวลาในเมืองเกิดเพลิงไหม้ คนจะไปตักน้ำที่คลองมาเพื่อใช้ดับไฟ ส่งผลให้ปลาขาดน้ำและอาศัยอยู่ในบ่อไม่ได้ (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016 : 169) คนจีนได้เปรียบสถานการณ์ของปลาดังกล่าวกับสถานการณ์ของคนได้รับความเดือดร้อนในสิ่งที่ไม่ได้เกี่ยวข้องกับตนเอง

สำนวน “ในน้ำมีปลา ในนามีข้าว” ในภาษา ไทย หมายถึง บ้านเมืองมีความอุดมสมบูรณ์เต็มไปด้วยอาหารการกิน ส่วนสำนวนจีนใช้ว่า “鱼米之乡” (ถิ่นนาปลาข้าว) หมายถึง แหล่งที่หรือบ้านที่มีความอุดมสมบูรณ์ (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016 : 1596) สำนวนทั้งสองนี้แสดงให้เห็นว่า ปลาเป็นอาหารที่สำคัญของคนไทยและคนจีน การพบปลาและข้าวจำนวนมากย่อมแสดงให้เห็นถึงความอุดมสมบูรณ์ของทั้งสองประเทศ

2. สำนวนไทยที่มีคำว่า “ปลา” แต่สำนวนจีนใช้คำอื่น

จากการศึกษาข้อมูลพบว่า สำนวนไทยที่มีคำว่า “ปลา” แต่สำนวนจีนใช้คำอื่น มีทั้งหมด 4 สำนวน ดังตารางต่อไปนี้

ตารางที่ 2 สำนวนไทยที่มีคำว่า “ปลา” แต่สำนวนจีนใช้คำอื่น

สำนวนไทย	สำนวนจีน
1. ปลาข้องเดียวกัน	一个馒头起酵，一笼馒头起酵 (หมั่นโถวก้อนหนึ่งขึ้นรา หมั่วโถวทั้งตะกร้าก็ขึ้นรา)
2. ฝากปลาไว้กับแมว	如狼牧羊 (ให้หมาป่าไปเฝ้าแกะ)

สำนวน “ปลาข้องเดียวกัน” ในภาษาไทย หมายถึง คนที่อยู่รวมกัน ถ้ามีคนหนึ่งที่ทำสิ่งไม่ดี ก็จะพลอยให้คนอื่นเสียไปด้วย เหมือนปลาที่ใส่ไว้ในข้องเดียวกัน พอตัวหนึ่งเน่าเหม็น ก็พลอยทำให้ปลาตัวอื่น ๆ เน่าเหม็นไปด้วย (กรมวิชาการ กระทรวงศึกษาธิการ, 2545 : 181) ตรงกับสำนวนจีนว่า “一个馒头

起酵，一笼馒头起酵” (หมั่นโถวก้อนหนึ่งขึ้นรา หมั่นโถวทั้งตะกร้าก็ขึ้นรา) หมายถึง ข้อบกพร่องของสิ่ง ๆ เดียว กลับส่งผลให้มวลรวมของสิ่ง ๆ นั้นแย่ไปด้วย (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016)

สำนวน “ฝากปลาไว้กับแมว” ในภาษาไทย หมายถึง ไว้ใจคนที่ไม่ควรไว้ใจ (กรมวิชาการ กระทรวงศึกษาธิการ, 2545 : 202) ปลาพบเห็นได้โดยทั่วไป เนื่องจากบ้านอยู่ริมน้ำ อีกทั้งปลาก็เป็นอาหารที่ต้องการของแมว สัตว์ทั้งสองจึงถูกนำมาใช้เปรียบกับการกระทำของบุคคลที่ไม่อาจไว้ใจได้ เนื่องจากเป็นสิ่งที่เขาต้องการอยู่แล้ว เช่นเดียวกับในสำนวนจีนที่ว่า “如狼牧羊” (ให้หมาป่าไปเฝ้าแกะ) หมายถึง ไว้ใจคนที่ไม่ควรไว้ใจ (Wang Tao, 2008 : 592)

3. สำนวนจีนที่มีคำว่า “鱼” แต่สำนวนไทยใช้คำอื่น

จากการศึกษาข้อมูลพบว่า สำนวนจีนที่มีคำว่า “鱼” แต่สำนวนไทยใช้คำอื่น มีทั้งหมด 8 สำนวน ดังตารางต่อไปนี้

ตารางที่ 3 สำนวนจีนที่มีคำว่า “鱼” แต่สำนวนไทยใช้คำอื่น

สำนวนจีน	สำนวนไทย
1. 鱼游釜中 (ปลาว่ายในหม้อ)	ลูกไก่อยู่ในกำมือ
2. 浑水摸鱼 (จับปลาในน้ำขุ่น)	ชุบมือเปิบ
3. 得鱼忘筌 (พอได้ปลาแล้วลืมไซ)	ได้แกง เทน้ำพริก
4. 鱼死网破 (ปลาตายตาข่ายแตก)	สู้ยิบตา
5. 三天打鱼, 两天晒网 (ตกปลาสามวัน ตากแหสองวัน)	เหยียบขี้ไก่ไม่ฝ่อ
6. 鱼靠水，水靠鱼，鱼水不分离 (ปลาพึ่งน้ำ น้ำพึ่งปลา ปลาและน้ำไม่แยกจากกัน)	น้ำพึ่งเรือ เสือพึ่งป่า
7. 鱼目混珠 (ตาปลาปะปนไข่มุก)	ย้อมแมวขาย
8. 瞎子摸鱼 (ตาบอดคลำปลา)	ตาบอดคลำช้าง

สำนวนในภาษาจีนว่า “鱼游釜中” (ปลาว่ายในหม้อ) หมายถึง ตกอยู่ในอันตราย ไม่มีทางรอดไปได้ (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016 : 1597) โดยคนจีนได้เปรียบผู้ที่ตกอยู่ในอันตรายกับปลาที่กำลังอยู่ในหม้อที่ตั้งบนเตาไฟว่า ไม่สามารถหนีรอดไปไหนได้ ในขณะที่สำนวนไทยใช้ว่า “ลูกไก่อยู่ในกำมือ” หมายถึง ผู้ที่ตกอยู่ใต้อำนาจหรืออยู่ในบังคับ ไม่มีทางต่อสู้ได้ (ราชบัณฑิตยสถาน, 2556)

สำนวนในภาษาจีนว่า “浑水摸鱼” (จับปลาในน้ำขุ่น) หมายถึง ฉวยโอกาสในช่วงที่ชุลมุน (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016) สำนวนนี้เกิดจากการสังเกตว่า ในช่วงที่น้ำขุ่น ทำให้ปลาไม่สามารถว่ายหนีไปไหนได้ ช่วงที่กำลังชุลมุนของปลาทำให้คนสามารถจับปลาได้ง่ายมากยิ่งขึ้น คนจีนจึงเปรียบการฉวยโอกาสกับการจับปลาในน้ำขุ่น ในขณะที่สำนวนไทยใช้ว่า “ชุบมือเปิบ” หมายถึง ฉวยประโยชน์จากคนอื่นโดยไม่ได้ลงทุนลงแรง (ราชบัณฑิตยสถาน, 2556)

สำนวนในภาษาจีนว่า “得鱼忘筌” (พอได้ปลาแล้วลืมไซ) หมายถึง พอทำอะไรได้สำเร็จ ก็ลืมสิ่งที่เคยพึ่ง (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016 : 272) สำนวนนี้คนจีนใช้การเปรียบการกระทำของบุคคลที่ลืมหรือไม่เห็นประโยชน์ของสิ่งที่เคยทำประโยชน์ให้แก่ตนเอง

โดยเปรียบกับการจับปลาได้สำเร็จแล้ว ก็ลืมทิ้งไซไว้ สำนวนดังกล่าวคล้ายกับสำนวนไทยว่า “ได้แกง เทน้ำพริก” ซึ่งหมายถึง ได้ของใหม่มาก็ทิ้งของเก่าที่มีอยู่โดยไม่เห็นค่า (กรมวิชาการ กระทรวงศึกษาธิการ, 2545)

สำนวนในภาษาจีนว่า “鱼死网破” (ปลาตายตาข่ายแตก) หมายถึง ต่อสู้กันจนตายทั้งสองฝ่าย (Chengyu Da Cidian Bianweihui, 2013) สำนวนนี้นำลักษณะธรรมชาติของปลาที่พยายามต่อสู้เพื่อให้หนีรอดจากการถูกดักจับ ซึ่งความหมายของสำนวนนี้มีความคล้ายคลึงกับสำนวนในภาษาไทยว่า “สู้ยิบตา” หมายถึง สู้จนถึงที่สุด, สู้ไม่ถอย (ราชบัณฑิตยสถาน, 2556)

สำนวนในภาษาจีนว่า “三天打鱼, 两天晒网” (ตกปลาสามวัน ตากแหสองวัน) หมายถึง ไม่มีจิตใจที่มั่นคงแน่วแน่ในการทำงานหรือการเรียน มักจะหยุดกลางคันเสมอ หรือทำอะไรไม่เสมอต้นเสมอปลาย (Chengyu Da Cidian Bianweihui, 2013) สำนวนนี้เปรียบกับการกระทำของบุคคลที่ไม่ได้มีความมุ่งมั่นตั้งใจในสิ่งที่ทำเหมือนกับการออกไปทอดแหจับปลาได้เพียงสามวัน แล้วก็หยุดพักอีกสองวัน ตรงกับสำนวนไทยว่า “เหยียบขี้ไก่ไม่ฝ่อ” หมายถึง ทำอะไรไม่จริงจัง (ราชบัณฑิตยสถาน, 2556)

สำนวนในภาษาจีนว่า “鱼靠水, 水靠鱼, 鱼水不分离” (ปลาพึ่งน้ำ น้ำพึ่งปลา ปลาและน้ำไม่แยกจากกัน) หมายถึง การอยู่ร่วมกันโดยพึ่งพาอาศัยซึ่งกันและกัน เปรียบเหมือนกับปลาที่ต้องอาศัยน้ำและน้ำก็ต้องอาศัยปลา ฉะนั้นจึงไม่สามารถที่จะแยกกันได้ (Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi, 2016) คนจีนได้เปรียบการพึ่งพาอาศัยกันเหมือนน้ำกับปลา ซึ่งเป็นสิ่งที่จะแยกขาดจากกันไม่ได้ กล่าวคือ ถ้าปลาไม่มีน้ำก็จะไม่สามารถมีชีวิตอยู่ได้ ในขณะที่น้ำที่ไม่มีปลาก็จะแสดงถึงความไม่สมบูรณ์ของระบบนิเวศ สัตว์อื่น ๆ ก็ไม่สามารถอาศัยอยู่ได้ ตรงกับสำนวนไทยว่า “น้ำพึ่งเรือ เสือพึ่งป่า” หมายถึง การพึ่งพาอาศัยกัน (ราชบัณฑิตยสถาน, 2556)

สำนวนในภาษาจีนว่า “鱼目混珠” (ตาปลาปะปนไข่มุก) หมายถึง เอาสิ่งของที่ไม่ดีหรือของปลอม มาปะปนกับของดีหรือของจริง เพื่อหลอกลวง ตบตาคนอื่นให้หลงเชื่อ (Chengyu Da Cidian Bianweihui, 2013) เปรียบกับการนำตาของปลามาปะปนกับไข่มุก ซึ่งมีลักษณะคล้ายคลึงกัน เพื่อหลอกลวงตบตาผู้อื่น สำนวนนี้ทำให้เห็นว่าคนจีนมองไข่มุกเป็นของที่มีคุณค่าและมีราคา ในขณะที่ภาษาไทยใช้ว่า “ย้อมแมวขาย” หมายถึง หลอกลวงเอาง่าย ๆ เอาของหรือคนไม่ดีมาหลอกขาย หรือหลอกให้หลงเชื่อว่าเป็นของดี (ราชบัณฑิตยสถาน, 2556)

สำนวนในภาษาจีนว่า “瞎子摸鱼” (ตาบอดคลำปลา) หมายถึง ทำอะไรเหมือนคนตาบอด ขาดการพิจารณาไตร่ตรองให้รอบคอบเสียก่อน แล้วค่อยตัดสินหรือสรุปเรื่องราวเหตุการณ์นั้น ๆ (Chengyu Da Cidian Bianweihui, 2013) ในขณะที่สำนวนไทยใช้ว่า “ตาบอดคลำช้าง” หมายถึง ทำอะไรไม่ได้ทำความเข้าใจในเรื่องราวหรือเหตุการณ์อย่างถ่องแท้จนทั่วทุกด้านเสียก่อน ก็ทำการสรุปหรือคาดคะเนอย่างไม่ถูกต้อง หรือคนที่รู้อะไรเพียงด้านเดียวหรือจุดเดียว แล้วคิดว่าตนเองรู้จักสิ่งนั้นอย่างแท้จริง (ราชบัณฑิตยสถาน, 2556) จะเห็นได้ว่า

ภาพสะท้อนจากสำนวนไทยและสำนวนจีนเกี่ยวกับปลา

จากการศึกษาสำนวนไทยที่มีคำว่า “ปลา” และสำนวนจีนที่มีคำว่า “鱼” โดยวิเคราะห์จากรูปคำที่ประกอบอยู่ในสำนวน ทำให้เห็นภาพสะท้อนในด้านลักษณะภูมิประเทศ สภาพวิถีชีวิตความเป็นอยู่ ภูมิปัญญา มุมมองเกี่ยวกับปลาของคนในสังคมไทยและสังคมจีน ดังนี้

1. ลักษณะทางภูมิประเทศ จากการพิจารณาสำนวนไทยที่มีคำว่า “ปลา” จำนวน 3 สำนวน ได้แก่ 1) ปลาใหญ่กินปลาเล็ก 2) กระดี่ได้น้ำ และ 3) ใจปลาซิว และสำนวนจีนที่มีคำว่า “鱼” ทั้ง 3

สำนวน ได้แก่ 1) “大鱼吃小鱼, 小鱼吃虾米” (ปลาใหญ่กินปลาเล็ก ปลาเล็กกินกุ้งฝอย) 2) “如鱼得水” (เหมือนปลาได้น้ำ) และ 3) “鱼靠水, 水靠鱼, 鱼水不分离” (ปลาพึ่งน้ำ น้ำพึ่งปลา ปลาและน้ำไม่แยกจากกัน) ทำให้เห็นลักษณะตามธรรมชาติของปลาที่อาศัยอยู่ในน้ำ ทำให้เห็นว่าทั้งประเทศไทยและประเทศจีนเป็นประเทศที่มีแหล่งน้ำและมีระบบนิเวศที่สมบูรณ์ ซึ่งเป็นประเทศที่มีภูมิประเทศคล้ายคลึงกัน

2. สภาพวิถีชีวิตความเป็นอยู่ จากการศึกษาสำนวนไทยที่มีคำว่า “ปลา” และสำนวนจีนที่มีคำว่า “鱼” ช่วยสะท้อนให้เห็นสภาพวิถีชีวิตความเป็นอยู่ของชาวไทยและชาวจีนจำนวน 3 ด้าน ได้แก่ การทำประมง เกษตรกรรม และอาหารการกิน ดังรายละเอียดต่อไปนี้

2.1 อาหารการกิน จากสำนวน “ข้าวใหม่ปลามัน” “ฝากปลาไว้กับแมว” ช่วยสะท้อนให้เห็นอาหารการกินของคนไทยว่า ทานข้าวและปลาเป็นอาหารหลัก ตลอดจนมีการนำปลามาเป็นวัตถุดิบในการทำอาหาร ในขณะที่สำนวนจีนว่า “鱼游釜中” (ปลาว่ายในหม้อ) สะท้อนให้เห็นว่า คนจีนก็ถือว่าปลาเป็นอาหารหลักเช่นกัน ดังที่ Tao Siyan (2019) กล่าวไว้ว่า คนจีนถือปลาเป็นอาหารหลัก ตั้งแต่การกินปลาดิบไปจนถึงการปิ้งและปรุงเป็นอาหารต่าง ๆ ตั้งแต่การบริโภคตรงจนถึง การทำให้แห้ง และการดอง ซึ่งสะท้อนถึงวัฒนธรรมการกินปลาของคนจีน ดังนั้นคนไทยและคนจีนทานปลาเป็นอาหารหลักและมีวิธีปรุงอาหารปลาได้หลายอย่าง

2.2 การงานอาชีพ จากสำนวนไทยว่า “เอากุ้งฝอยไปตกปลากะพง” “จับปลาสองมือ” และ “ปลาติดหลังแห” และสำนวนจีนว่า “以蚓投鱼” (เอาไส้เดือนมาหย่อนปลา) “浑水摸鱼” (จับปลาในน้ำขุ่น) “三天打鱼两天晒网” (ตกปลาสามวัน ตากแหสองวัน) และ “鱼死网破” (ปลาตายตาข่ายแตก) สำนวนเหล่านี้ทำให้เห็นสภาพของการทำประมงว่า ทั้งสองประเทศมีการหาปลาจากแหล่งน้ำ โดยใช้เครื่องมือจับสัตว์น้ำชนิดต่าง ๆ คือ การใช้เบ็ดตกปลา การใช้แหในการจับปลา นอกจากนี้ ยังสังเกตได้จากสำนวน “ในน้ำมีปลา ในนามีข้าว” ในภาษาไทยสะท้อนให้เห็นว่า สังคมไทยเป็นสังคมเกษตรกรรม คนไทยส่วนใหญ่มีวิถีชีวิตเกี่ยวข้องกับการเกษตรคือ การประกอบอาชีพปลูกข้าวทำนา ซึ่งมีลักษณะคล้ายกับสำนวนจีนว่า “鱼米之乡” (ถิ่นนาปลาข้าว) สะท้อนให้เห็นว่า ประเทศจีนมีลักษณะภูมิประเทศที่เอื้อต่อการปลูกข้าวทำนา และปลากับข้าว

3. ภูมิปัญญา จากการศึกษาสำนวนไทยที่มีคำว่า “ปลา” และสำนวนจีนที่มีคำว่า “鱼” ช่วยแสดงให้เห็นภูมิปัญญาที่สำคัญ คือ ภูมิปัญญาด้านการประดิษฐ์เครื่องมือจับปลารูปแบบต่าง ๆ เช่น ดัก ช้อน จับ และขัง ได้แก่ “ไซ” “แห” “ข้อง” เป็นการประดิษฐ์ของกลุ่มบุคคลที่อาศัยอยู่บริเวณลุ่มแม่น้ำ เนื่องจากเป็นพื้นที่ที่เหมาะสมสำหรับทำการเกษตรและประมง ทำให้บุคคลเหล่านี้ประดิษฐ์เครื่องมือโดยผสานความคิดสร้างสรรค์ ขนบประเพณี ความเชื่อเฉพาะถิ่น จนทำให้เครื่องจักสานมีลักษณะเฉพาะถิ่นที่แฝงด้วยภูมิปัญญา (สถาบันส่งเสริมศิลปหัตถกรรมไทย, 2561) เช่น

ไซ หรือที่ชาวจีนเรียกว่า 筌 (ไซ) เป็นเครื่องมือที่ใช้สำหรับดักปลา โดยใช้ไม้ไผ่เป็นวัตถุดิบในการจักสาน เนื่องจากทนทานต่อสภาพภูมิอากาศแบบร้อนชื้นและทนน้ำ จากสำนวนจีนว่า “得鱼忘筌” (พอได้ปลาแล้วลืมไซ) รวมถึงสำนวนไทยว่า “ตีปลาหน้าไซ” ทำให้เห็นว่า ทั้งสองประเทศมีเครื่องจักสานที่ใช้ดักปลาเหมือนกัน ทั้งนี้เพราะมีลักษณะภูมิประเทศที่เป็นบริเวณลุ่มแม่น้ำใกล้เคียงกัน

แห หรือที่ชาวจีนเรียกว่า 网 (แห) เป็นเครื่องมือที่ใช้จับสัตว์น้ำ ซึ่งชาวบ้านนิยมใช้แหเป็นเครื่องมือจับปลา โดยการถักเป็นตาข่ายแล้วใช้ทอดให้แผ่เป็นวงลงในน้ำ แล้วรวบดึงปลาขึ้นมาจากน้ำ เมื่อใช้แหจับปลาเสร็จเรียบร้อยแล้วจึงนำแหมาตากให้แห้ง และนำไปเก็บไว้บนที่สูง (อานนท์ ภาคมาลี, 2556)

จากสำนวนไทยว่า “ปลาติดหลังแห” และสำนวนจีนว่า “三天打鱼, 两天晒网” (ตกปลาสามวัน ตากแหสองวัน) และ “鱼死网破” (ปลาตายตาข่ายแตก) ทำให้เห็นว่า ทั้งสองประเทศมีการประดิษฐ์เครื่องมือจับปลาที่มีลักษณะเหมือนกัน ทั้งนี้เพราะมีลักษณะภูมิประเทศที่เป็นบริเวณลุ่มแม่น้ำใกล้เคียงกัน รวมทั้งมีพื้นที่ที่อยู่บริเวณชายฝั่งทะเล

ข้อง เป็นเครื่องมือที่ใช้ใส่ปลา ปู รูปทรงคล้ายตะกร้าปากแคบ ก้นเป็นทรงสี่เหลี่ยมจตุรัส จากสำนวนไทยที่ว่า “ปลาในข้องเดียวกัน” ทำให้เห็นว่า คนที่อยู่อาศัยบริเวณลุ่มน้ำในประเทศไทยได้สานข้องมาใช้เพื่อต้องการจับสัตว์น้ำที่หามาได้

4. มุมมองเกี่ยวกับปลา จากการเปรียบเทียบสำนวนเกี่ยวกับปลาของทั้งสองประเทศพบว่า สำนวนทั้งสองประเทศได้สะท้อนมุมมองเกี่ยวกับปลาที่มีความคล้ายคลึงกันคือ “ปลาเป็นผลประโยชน์หรือโอกาส” กล่าวคือ ในสำนวนไทยว่า “เอากุ้งฝอยไปตกปลากะพง” “จับปลาสองมือ” และ “ขุดบ่อล่อปลา” คนไทยมองว่า ปลาเป็นสัตว์ที่ใช้เปรียบกับโอกาสที่จะต้องไปแสวงหาเพื่อให้ได้มา เช่นเดียวกับในสำนวนจีนว่า “浑水摸鱼” (จับปลาในน้ำขุ่น) “以蚓投鱼” (เอาไส้เดือนมาหย่อนปลา) และ “鱼与熊掌不可兼得” (ปลากับอุ้งตีนหมีได้มาพร้อมกันไม่ได้) สำนวนดังกล่าวสะท้อนให้เห็นมุมมองที่ชาวจีนมีต่อปลาว่า ปลาเปรียบกับผลประโยชน์หรือโอกาส ดังจะเห็นได้จากการที่ปลาถูกนำมาใช้เป็นสัญลักษณ์ของผลกำไรหรือผลประโยชน์จากการทำธุรกิจ ดังนั้นชาวจีนที่ทำธุรกิจการค้าขายจึงมักชอบเลี้ยงปลา หรือมีของประดับตกแต่งที่ทำงานของตกแต่งบ้านเกี่ยวกับปลาจำนวนมาก (ModernArt, 2558)

สรุปและอภิปรายผล

สำนวนไทยที่มีคำว่า “ปลา”กับสำนวนจีนที่มีคำว่า “鱼”ดังกล่าวนี้ ซึ่งมีความหมายเหมือนหรือคล้ายคลึงกัน สามารถแบ่งออกได้เป็น 3 ประเภทคือ 1) สำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” เหมือนกัน มีสำนวนในภาษาไทย 6 สำนวน สำนวนในภาษาจีน 6 สำนวนเช่นกัน 2) สำนวนไทยที่มีคำว่า “ปลา” แต่สำนวนจีนใช้คำอื่น มีสำนวนไทยที่มีคำว่า “ปลา” ในภาษาไทย 4 สำนวน 3) สำนวนจีนที่มีคำว่า “鱼” แต่สำนวนไทยใช้คำอื่น มีสำนวนจีนที่มีคำว่า “鱼” 8 สำนวน สำนวนทั้งสามประเภทนี้ส่วนใหญ่มักจะนำลักษณะตามธรรมชาติของปลา และวิธีการหาปลามาเปรียบเทียบกับพฤติกรรมหรือการกระทำของบุคคล และมีภาพสะท้อนด้านลักษณะทางภูมิประเทศ ทางวิถีชีวิตความเป็นอยู่ รวมทั้งการทำประมง เกษตรกรรม อาหารการกิน ทางภูมิปัญญา และมุมมองเกี่ยวกับปลา ซึ่งแสดงให้เห็นวัฒนธรรมร่วมและเฉพาะในสังคมไทยและสังคมจีน

การศึกษาเปรียบเทียบความหมายของสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” สะท้อนให้เห็นถึงลักษณะภูมิประเทศของทั้งสองประเทศว่ามีแหล่งน้ำและมีระบบนิเวศที่สมบูรณ์ อีกทั้งยังมีวิถีชีวิตความเป็นอยู่ที่คล้ายคลึงกันในด้านการงานอาชีพ และอาหารการกิน

นอกจากลักษณะภูมิประเทศ และวิถีชีวิตแล้ว การศึกษาเปรียบเทียบสำนวนไทยมีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼” ยังทำให้เห็นภาพสะท้อนทางด้านภูมิปัญญาเกี่ยวกับการประมงด้วย ผลการศึกษาวิจัยในครั้งนี้สอดคล้องกับผลการวิจัยของพิริยา สุรขจร (2544) ที่ศึกษาเปรียบเทียบ สำนวนจีนและสำนวนไทยที่คำเกี่ยวกับสัตว์ จำนวน 4 ชนิด คือ ม้า เสือ มังกร และปลา ซึ่งผลการวิจัยสำนวนเกี่ยวกับปลาได้สะท้อนให้เห็นถึงวิถีชีวิตความเป็นอยู่ในด้านการงานอาชีพที่ทำเกษตรกรรม และการประมงเหมือนกัน อีกทั้งมีลักษณะการกินอยู่คล้ายคลึงกันด้วย

ประเทศไทยและประเทศจีนมีภูมิประเทศและภูมิอากาศใกล้เคียงกันบ้าง ทั้งสองประเทศมีแม่น้ำที่อุดมสมบูรณ์ คนในทั้งสองประเทศ โดยเฉพาะคนภาคกลางนิยมสร้างบ้านเรือนอาศัยอยู่ริมแม่น้ำ และ

จับปลามาทำกับข้าว ดังนั้นในภาษาไทยและภาษาจีนมีสำนวนที่เกี่ยวกับปลาเป็นจำนวนมาก (ฉิน หยงหลิน, 2526) การศึกษาเปรียบเทียบสำนวนไทยที่มีคำว่า “ปลา” กับสำนวนจีนที่มีคำว่า “鱼”ที่มีความหมายตรงกันหรือคล้ายคลึงกัน นอกจากทำให้เห็นความเหมือนหรือคล้ายคลึงกันในด้านความหมายของสำนวนไทยและสำวนจีนแล้ว ยังช่วยให้เห็นถึงวัฒนธรรม วิถีชีวิตความเป็นอยู่ และความคิดต่าง ๆ ในสำนวน ซึ่งจะเห็นวัฒนธรรมร่วมและลักษณะเฉพาะในสังคมไทยและสังคมจีนอย่างเด่นชัด

ข้อเสนอแนะ

ควรศึกษาเปรียบเทียบสำนวนไทยกับสำนวนในภาษาอื่นที่มีคำว่า “ปลา” เช่น สำนวนญี่ปุ่น สำนวนเกาหลี สำนวนเวียดนาม เป็นต้น

ควรศึกษาเปรียบเทียบสำนวนไทยกับสำนวนจีนที่เกี่ยวข้องกับสัตว์อื่น ๆ เช่น ควาย/วัว ไก่ หมา เป็นต้น

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ชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลากับความเชื่อเทพเจ้าฉีเทียนต้าเซิ่ง

Thai-Chinese people in Hat Yai District Songkhla Province and the belief in The Monkey King

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บทคัดย่อ

หลายคนอาจเคยรู้จักหรือได้ยินเรื่องราวของเทพเจ้าฉีเทียนต้าเซิ่ง หรือที่เราคุ้นหูกันว่า เทพเจ้าเห้งเจีย หรือไต่เสี่ยฮุกโจ้วนั้น หลายคนคงเข้าใจว่าเทพเจ้าจีนเห้งเจียนี้ก็มาจากนวนิยายจีนชื่อดัง ไซอิ๋ว ที่แต่งโดย อู๋เฉิงเอิน ในสมัยราชวงศ์หมิง แล้วสงสัยกันหรือไม่ จากตัวละครในนวนิยายอมตะของจีนนั้น ทำไมถึงมากลายเป็นเทพเจ้าจีนที่หลายคนเคารพสักการะบูชากันมากมายขนาดนี้ จากการศึกษานวนิยายไซอิ๋วเป็นเพียงแค่การแต่งขึ้นมาของอู๋เฉิงเอินเท่านั้น ซึ่งอาจมีการได้รับอิทธิพลจากการเดินทางไปยังเมืองต่าง ๆ เช่น การเดินทางไปยังเมืองฝูเจี้ยน ซึ่งทางนั้นมีการสักการะบูชาเทพเจ้าลิงกันอยู่แล้ว และอาจได้รับอิทธิพลจากการรับรู้เรื่องรายของพระสงฆ์สวนจ้าง ซึ่งพระสงฆ์สวนจ้างมีตัวตนจริง ๆ ทางประวัติศาสตร์

บทความนี้มีวัตถุประสงค์เพื่อศึกษาคติและความเชื่อในเทพเจ้าจีนเห้งเจีย ของชาวอำเภอหาดใหญ่ จังหวัดสงขลา ประเทศไทย โดยการเก็บรวบรวมข้อมูลจากการลงพื้นที่สังเกตการณ์ สัมภาษณ์ บันทึกภาพ ตลอดจนการรวบรวมเอกสาร และภาพถ่ายต่าง ๆ ที่มีความเกี่ยวข้อง ผลการศึกษา พบว่า ศาลเจ้าเห้งเจีย ที่มีองค์เทพเจ้าเห้งเจียเป็นประธานหลักของศาลเจ้าจริง ๆ มีด้วยกัน 3 แห่ง ประกอบด้วย 1) ศาลเจ้าเห้งเจีย ตั้งอยู่ถนนจันทร์นิเวศ 2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ และ 3) ศาลเจ้าเห้งเจีย ทางไปสนามบินหาดใหญ่ ซึ่งนอกจากทั้ง 3 แห่งนี้ที่มีเทพเจ้าเห้งเจีย เป็นองค์ประธานหลักของศาลเจ้าแล้ว ยังมีศาลเจ้าจีนอีกหลายแห่งที่มีองค์เทพเจ้าเห้งเจียประดิษฐานอยู่เช่นกัน เช่น ศาลเจ้าไฉ่ชิงเอี๊ยะ เป็นต้น

คำสำคัญ: เทพเจ้าเห้งเจีย, ฉีเทียนต้าเซิ่ง, ความเชื่อ, ไซอิ๋ว, ชาวหาดใหญ่

Abstract

Many people may have known or heard the story of the Qi Tian Da Sheng, or as we are familiar with that Heng Jia, The Great Sage Buddha or The Monkey King. Many people probably understand that the Qi Tian Da Sheng comes from the famous Chinese novel “西游记” or “Journey to the West” in English, written by Wu Cheng En during the Ming Dynasty. So are you wondering? From the characters in the immortal Chinese novels Why has he become a Chinese god that many people worship so much? From my study, Journey to the West novel was just Wu Cheng En's creation. This may be influenced by traveling to different cities, such as traveling to Fujian Province. In that direction, there

was already worship of the monkey god and may have been influenced by the perception of the income of Monk Xuanzang, which Monk Xuanzang Hiring monks really existed in history.

This article aims to study the beliefs and Thai-Chinese people in Hat Yai District Songkhla Province beliefs in the Chinese god, the Qi Tian Da Sheng, Heng Jia, The Great Sage Buddha or The Monkey King. By collecting data from observing, interviewing, recording images, as well as collecting documents. and various photographs that are relevant. The results of the study found that the Qi Tian Da Sheng or Heng Jia Shrine There is actually the Qi Tian Da Sheng or Heng Jia as the main president of the shrine. There are 3 places, consisting of 1. Heng Jia Shrine. Located on Channiwate Road. 2. Tai Sia Huk Chou Shrine, Khlong Wa Subdistrict and 3. Heng Jia Shrine, Thung Lan Subdistric, the way to Hat Yai Airport. In addition to these 3 places where the Qi Tian Da Sheng or Heng Jia Heng Jia is the main president of the shrine, There are also many Chinese shrines where Heng Jia is also enshrined, such as Cai Xing Ye Shrine, etc.

Keywords: Heng Jia, the Qi Tian Da Sheng, Beliefs, Journey to the West, Hat Yai people

บทนำ

อำเภอหาดใหญ่ จังหวัดสงขลา เป็นอีกหนึ่งสถานที่ในประเทศไทยที่ยังคงมีคนไทยเชื้อสายจีนอาศัยอยู่จำนวนมาก และคนจีน หรือคนไทยเชื้อสายจีนส่วนใหญ่นั้น ได้มีการอพยพย้ายถิ่นฐานมาจากทางตอนใต้ของประเทศจีน โดยชาวจีนเริ่มเข้ามาประเทศไทยตั้งแต่ในสมัยสุโขทัย โดยเข้ามาทำงาน ทำมาหากิน แต่งงานกับหญิงชาวไทย ตั้งรกราก ผสมกลมกลืนไปกับสังคมไทยในที่สุด ชาวจีนเป็นคนขยัน อดทน ประหยัด เป็นทุนเดิม และเมื่อย้ายไปอยู่ที่ใดก็ได้นำวัฒนธรรม วิถีชีวิต แนวความคิดแบบแผนของสังคมชาวจีนไปด้วย โดยในสมัยพระบาทสมเด็จพระจุลจอมเกล้าเจ้าอยู่หัว หรือรัชกาลที่ 5 แห่งกรุงรัตนโกสินทร์ หลังได้มีการสร้างทางรถไฟเสร็จนั้น ก็ได้มีชาวจีนมากมายอพยพลงมาทางใต้ของประเทศไทย และมีจำนวนไม่น้อยที่ได้มาตั้งรกรากอยู่ในพื้นที่อำเภอหาดใหญ่ จังหวัดสงขลาของประเทศไทย และมีผลให้อำเภอหาดใหญ่กลายเป็นชุมชนเมืองของชาวจีนที่สำคัญอีกแห่งของประเทศไทย นับตั้งแต่อดีตจนถึงปัจจุบัน

เมื่อมีการตั้งรกรากของชาวจีนนั้น ชาวจีนเหล่านั้นก็ได้มีการนำพาคติ ความเชื่อ เอกลักษณ์ทางวัฒนธรรมของตัวเองตามที่เมื่อครั้งยังอาศัยอยู่ที่ประเทศจีนเข้ามาเผยแพร่ด้วยเช่นกัน และในอำเภอหาดใหญ่มีการจัดตั้งสมาคมจีนเพื่อพบปะกัน และจัดกิจกรรมต่าง ๆ ตามประเพณีของตน หลัก ๆ มีด้วยกัน 5 สมาคม คือ แต้จิ๋ว, ฮากกา, กว่างตุ้ง, ฮกเกี้ยน และไหหลำ และแน่นอนเมื่อชาวจีนเข้ามาย่อมไม่ลืมความเชื่อดั้งเดิมก็คือ การบูชาเทพเจ้าต่าง ๆ ตามความเชื่อของตนเอง และเมื่อมีการบูชารูปเคารพ ซึ่งอาจเป็นรูปเคารพที่ตนนำติดตัวมาจากประเทศ

จีน หรือสร้างขึ้นมาใหม่ก็ตามนั้น จึงมีความจำเป็นต้องสร้างศาสนสถานเพื่อประดิษฐานรูปเคารพ ซึ่งก็คือ ศาลเจ้า

คำว่า ศาลเจ้าจีน กับ วัดจีนนั้น หลายคนอาจคิดว่าเหมือนกัน แต่แท้จริงแล้วนั้นมีความหมายต่างกัน ศาลเจ้าจีน ในภาษาจีนคือคำว่า 庙 (เมี่ยว) หรือ 宫 (กง) ศาลเจ้าจีนจะเกี่ยวข้องกับเทพในลัทธิ

เต๋า และไม่มีนักบวชประจำวัด มีเพียงผู้ดูแลศาลเจ้าซึ่งเป็นคนธรรมดาเท่านั้น ส่วนวัดจีนนั้น ในภาษาจีนคือคำว่า 寺 (ซื่อ) วัดจีนจะมีความเกี่ยวข้องกับพุทธศาสนานิกายมหายาน และจำเป็นต้องมีพระหรือนักบวชจำพรรษาอยู่ด้วย (อชิรัชญ์ ไชยพจน์พานิช, 2561)

ชาวจีนที่ได้เข้ามาตั้งรกรากที่อำเภอหาดใหญ่นั้น ได้มีการสร้างศาลเจ้าจีนขึ้นหลายแห่ง เช่น ศาลเจ้าหลื่อโจ้ว (วัดฉื่อฉางในปัจจุบัน), ศาลเจ้าพ่อเสือ, ศาลเจ้านาจา, ศาลเจ้าซาเจียงกุน, ศาลเจ้าไฉ่ซิงเอี๊ยะ และศาลเจ้าเห้งเจีย เป็นต้น

เทพเจ้าจีนฉีเทียนต้าเซิ่ง หรือที่คนไทยส่วนใหญ่คุ้นหูกับคำว่า เทพเจ้าเห้งเจีย หรือ เทพเจ้าไต่เสี่ยฮุกโจ้วก็เป็นหนึ่งในเทพเจ้าจีนที่ชาวจีน และชาวไทยเชื้อสายจีนมากมายในอำเภอหาดใหญ่ให้การเคารพสักการะบูชา จนได้มีการสร้างศาลเจ้า โดยมีองค์เทพเจ้าเห้งเจีย หรือ ฉีเทียนต้าเซิ่ง หรือไต่เสี่ยฮุกโจ้วเป็นองค์ประธานหลักของศาลเจ้า ได้แก่ 1) ศาลเจ้าเห้งเจีย ตั้งอยู่ถนนจันทร์นิเวศ 2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ และ 3) ศาลเจ้าเห้งเจีย ตำบลทุ่งลาน ทางไปสนามบินหาดใหญ่ ซึ่งนอกจากทั้ง 3 แห่งนี้ที่มีเทพเจ้าเห้งเจียเป็นองค์ประธานหลักของศาลเจ้าแล้ว ยังมีศาลเจ้าจีนอีกหลายแห่งที่มีองค์เทพเจ้าเห้งเจียประดิษฐานอยู่เช่นกัน เช่น ศาลเจ้าไฉ่ซิงเอี๊ยะ เป็นต้น

ในช่วง 3 – 4 ปีที่ผ่านมานี้ ในประเทศไทยมีกระแสความเชื่อ ความศรัทธาในองค์เทพเจ้าฉีเทียนต้าเซิ่งอย่างเห็นได้ชัด และมีการปรากฏในสื่อโทรทัศน์ หรือโซเชียลมากมาย จึงทำให้เป็นที่นิยมของชาวไทยและชาวไทยเชื้อสายจีน เนื่องจากเทพเจ้าฉีเทียนต้าเซิ่ง หรือเห้งเจียนั้น เป็นลิงซึ่งเราหลายคนรู้จักจากนวนิยายจีนไซอิ๋ว เพียงเท่านั้น เหตุใดผู้คนหลายคนทั้งชาวไทย ชาวไทยเชื้อสายจีน หรือกระทั่งชาวต่างชาติถึงได้เคารพศรัทธา กราบไหว้บูชา กระทั่งมีศาลเจ้า และมีผู้คนหลั่งไหลมากราบไหว้ไม่ขาดสาย การศึกษาวิจัยครั้งนี้ เป็นการศึกษาถึงคติความเชื่อ รวมถึงวัฒนธรรมประเพณี พิธีกรรมต่าง ๆ ของชาวไทยและชาวไทยเชื้อสายจีน ในอำเภอหาดใหญ่ จังหวัดสงขลา ที่มีต่อเทพเจ้าฉีเทียนต้าเซิ่ง (กรองจันทน์ จันทรพาหา, 2566)

วัตถุประสงค์ของการวิจัย

บทความนี้มีวัตถุประสงค์เพื่อศึกษาคติและความเชื่อในเทพเจ้าจีนเห้งเจีย ของชาวอำเภอหาดใหญ่ จังหวัดสงขลา ประเทศไทย

วิธีดำเนินการวิจัย

1. เก็บรวบรวมข้อมูลจากคำค้นหา “ศาลเจ้า” และ “ชาวจีนในอำเภอหาดใหญ่” จากฐานข้อมูล ThaiLIS ฐานข้อมูล Thai Journals Online (ThaiJO) และฐานข้อมูล China National Knowledge Infrastructure (CNKI)

2. เก็บรวบรวมข้อมูลจากการลงพื้นที่สังเกตการณ์จริงที่ศาลเจ้าทั้ง 3 แห่ง ประกอบด้วย 1) ศาลเจ้าเห้งเจีย ตั้งอยู่ถนนจันทร์นิเวศ 2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ และ 3) ศาลเจ้าเห้งเจีย ทางไปสนามบินหาดใหญ่ และมีการสัมภาษณ์ผู้ดูแลศาลเจ้า รวมถึงผู้คนที่เดินทางไปสักการะที่ศาลเจ้า

สาเหตุที่เลือกอำเภอหาดใหญ่ จังหวัดสงขลา เนื่องจากในอำเภอหาดใหญ่ จังหวัดสงขลานั้น มีชาวจีน และชาวไทยเชื้อสายจีนเป็นจำนวนมาก และเป็นหนึ่งจังหวัดในภาคใต้ของประเทศไทยที่มีศาลเจ้าเห้งเจียมาก

3. นำข้อมูลที่ได้มาตรวจสอบวิเคราะห์ และเชื่อมโยงกับหัวข้อต่าง ๆ ที่วางไว้

4. สรุปผล

ผลการวิจัย

1. ชาวจีน และชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลา

ชาวจีนที่เข้ามาในประเทศไทยนั้น โดยส่วนใหญ่แล้ว คือ ชาวจีนที่อพยพมาจากดินแดนทางตอนใต้ของประเทศจีน คือ มณฑลกวางตุ้ง ฮกเกี้ยน และ ไหหลำ ชาวจีนเหล่านี้ ได้แก่ ชาวจีนกวางตุ้ง ชาวจีนแคะ (ฮากกา) ชาวจีนแต้จิ๋ว ชาวจีนฮกเกี้ยน และ ชาวจีนไหหลำ รวม 5 กลุ่มภาษาใหญ่ หลักฐานที่ชี้ให้เห็นถึงการอพยพเข้ามาตั้งถิ่นฐานของชาวจีน 5 กลุ่มภาษาดังกล่าวในประเทศไทย เห็นได้จากศาลเจ้า สมาคมตระกูลแซ่ สมาคมกลุ่มภาษา สมาคมถิ่นเกิด สมาคมอาชีพ และโรงเรียนจีน อันเป็นหลักฐานที่แน่ชัด ซึ่งเราสามารถสืบหาข้อเท็จจริงได้

สำหรับช่วงเวลาในการอพยพของชาวจีนเข้าสู่ไทยแบ่งได้เป็นหลายกลุ่ม ดังนี้

กลุ่มที่ 1 คือ กลุ่มที่อพยพเข้ามาตั้งแต่ก่อนสมัยอยุธยา ซึ่งมักจะเป็นพวกกะลาสีเรือ พ่อค้า พวกโจรสลัด ชาวจีนกลุ่มนี้เริ่มเข้ามาอยู่ที่เมืองท่าต่าง ๆ เช่น สุราษฎร์ธานี นครศรีธรรมราช ปัตตานี ชาวจีนเหล่านี้อาจเข้ามาตั้งหลักแหล่งตั้งแต่สมัยราชวงศ์ถังแล้ว

กลุ่มที่ 2 คือ พวกที่เข้าไทยในสมัยอยุธยา (พ.ศ. 1967 - 2310) การผลัดเปลี่ยนราชวงศ์ ทำให้เกิดการหยุดชะงัก ชาวจีนอพยพช่วงนี้จะเป็นพวกพ่อค้า และเป็นพวกที่ประสบความสำเร็จในทางการค้า

กลุ่มที่ 3 คือ พวกที่เข้ามาในสมัยพระเจ้าตากสิน (พ.ศ. 2310 - 2325) จนถึง รัชกาลที่ 4 พระบาทสมเด็จพระจอมเกล้าเจ้าอยู่หัว (พ.ศ. 2393 - 2411) ชาวจีนอพยพในช่วงนี้จะเป็นชาวจีนแต้จิ๋วเป็นส่วนใหญ่ เพราะพระเจ้าตากสินทรงมีเชื้อสายจีนแต้จิ๋ว

กลุ่มที่ 4 เป็นกลุ่มที่อพยพเข้ามาในสมัยรัชกาลที่ 5 พระบาทสมเด็จพระจุลจอมเกล้าเจ้าอยู่หัว จนถึงปลายรัชกาล (พ.ศ. 2411 - 2453)

กลุ่มที่ 5 เป็นช่วงที่กระแสโลกเกิดการเปลี่ยนแปลงในสมัยรัชกาลที่ 6 จนถึงปี พ.ศ. 2493 ซึ่งเป็นปีสุดท้ายที่รัฐบาลกำหนดให้มีชาวจีนอพยพเข้ามาน้อยที่สุด

ในส่วนของชาวจีนในอำเภอหาดใหญ่ จังหวัดสงขลานั้น โดยส่วนมากแล้วเป็นชาวจีนที่อพยพมาทางภาคกลางของประเทศไทยก่อน และในช่วงรัชกาลที่ 3 ถึง รัชกาลที่ 5 นั้น มีการอพยพเข้ามามาก เนื่องจากมีการสร้างทางรถไฟ เดิมหาดใหญ่ เป็นหมู่บ้านขนาดเล็กมีชื่อว่า “โคกเสม็ดชุน” มีประชากรจำนวนไม่มาก และส่วนใหญ่หาเลี้ยงชีพด้วยการหาของป่าและเกษตรกรรมเล็ก ๆ น้อย ๆ และในสมัยรัชกาลที่ 5 พระบาทสมเด็จพระจุลจอมเกล้าเจ้าอยู่หัว ทรงให้เวนคืนที่ดินบริเวณบ้านโคกเสม็ดชุนนี้ เพื่อสร้างเส้นทางรถไฟไปยังแหลมมลายู การกลายสภาพของบ้านโคกเสม็ดชุนเป็นเมืองหาดใหญ่ จึงเริ่มต้น ณ จุดนี้ ในการสร้างทางรถไฟ จำเป็นต้องมีการเกณฑ์ และว่าจ้างแรงงานจำนวนมากเข้ามาสร้างทางรถไฟ ประชาชนในแถบนั้นจึงได้รวมตัวกันเพื่อสร้างทางรถไฟ รวมทั้งมีคนต่างถิ่นอีกหลายกลุ่มที่เข้ามามีส่วนร่วมในการสร้างทางรถไฟนี้ เป็นต้นว่า ชาวจีนอพยพเก่าผู้หวังจะมาหาที่ทางทำกินในพื้นที่นี้ หนึ่งในนั้นคือ นาย เจีย กีซี (ต่อมาได้เป็นขุนนิพัทธ์จีนนคร) ได้มาเป็นผู้รับเหมาก่อสร้างทางรถไฟ และได้ริเริ่มสร้างชุมชนเล็ก ๆ บริเวณสถานีรถไฟและขยายพื้นที่กลายเป็นเมืองหาดใหญ่ในภายหลัง

ความเจริญของหาดใหญ่มากับเส้นทางรถไฟสายใต้ ตั้งแต่ในอดีต ชาวจีนที่อพยพเข้ามาในช่วงแรก ๆ ส่วนใหญ่จึงเข้ามาด้วยจุดประสงค์ในการรับจ้างสร้างรางรถไฟ ชาวจีนที่อพยพเข้ามาใน

หาดใหญ่จึงมีหลากหลายกลุ่ม ได้แก่ ชาวจีนแต้จิ๋ว ชาวจีนไหหลำ ชาวจีนฮกเกี้ยน และชาวจีนแคะ (ฮากกา) ดังนั้นหลายอย่างที่เกิดขึ้นจากการเข้ามาของชาวจีนนั้น ก่อให้เกิดการรวมกลุ่มกัน อันได้แก่ ชมรม สมาคม โรงพยาบาลมิตรภาพสามัคคี (มูลนิธิท่งเซียเซี่ยงตึ๊ง) เป็นต้น เราจะเห็นได้ว่าชาวจีนในอำเภอหาดใหญ่ที่รวมกลุ่มกันเพื่อทำการค้า แล้วพัฒนามาสู่การจัดสวัสดิการอำนวยความสะดวกต่าง ๆ ระหว่างสมาชิกด้วยกัน คอยช่วยเหลือกันในยามเจ็บป่วย การช่วยเหลือกันนี้เป็นไปด้วยความสมัครใจ เน้นช่วยเหลือกันมากกว่า โดยชาวจีนในอำเภอหาดใหญ่นั้นมีจำนวนมาก ส่งผลให้เกิดวัฒนธรรมหลายอย่าง เช่น อาหารจีนในหาดใหญ่ ก็มีความหลากหลาย อันเนื่องมาจากกลุ่มชาวจีนที่เพิ่งอพยพมาใหม่จะรวมตัวกันในเฉพาะกลุ่มเท่านั้น และต้องเป็นกลุ่มที่มาจากเมืองเดียวกัน พูดภาษาเดียวกันด้วย คือ แยกเป็นกลุ่มแต้จิ๋ว กลุ่มกวางตุ้ง กลุ่มแคะ กลุ่มไหหลำ และ กลุ่มฮกเกี้ยน ซึ่งในอำเภอหาดใหญ่ จังหวัดสงขลา มีสมาคมไทย - จีน รวมตัวชาวจีน หรือชาวไทยเชื้อสายจีน อีกทั้งยังมีสมาคมจีนหลัก ๆ คือ สมาคมจีนแต้จิ๋ว สมาคมจีนฮากกา สมาคมจีนไหหลำ สมาคมจีนฮกเกี้ยน เป็นต้น และยังมีสมาคมตระกูลแซ่อยู่มากมาย อาทิเช่น สมาคมตระกูลลิ้ม มูลนิธิสามัคคีธรรมตระกูลอึ้ง มูลนิธิตระกูลโง้วสามัคคีธรรมสงเคราะห์หาดใหญ่ เป็นต้น ซึ่งชาวจีนและชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลา นั้นถือว่ายังมีความสามัคคีอยู่มาก จะเห็นได้จากโรงเรียนจีน ที่นอกจากโรงเรียนจีนเก่าแก่อย่างโรงเรียนศรีนครมูลนิธิแล้วนั้น ก็มีโรงเรียนคุณธรรมวิทยา หรือแม้แต่โรงเรียนกอบกาญจน์ศึกษามูลนิธิ

จากการที่ชาวจีน และชาวไทยเชื้อสายจีนมีความสามัคคี แข็งแกร่ง การรวมตัวเกิดขึ้น ก็ย่อมมีการสืบทอดประเพณี วัฒนธรรมของตัวเองที่มีสืบต่อกันมา ก็มีการก่อตั้งศาลเจ้าขึ้นมามากมาย เมื่อชาวจีนอพยพเข้ามาอยู่ในไทย ก็ได้นำวัฒนธรรมความเชื่อ ชีวิตความเป็นอยู่ ประเพณี วัฒนธรรมติดมาด้วย เราจะเห็นได้ว่าวัด ศาลเจ้า หรือโรงเจ ถูกสร้างขึ้นมาในทุกที่ที่มีชุมชนจีน พิธีกรรมทางศาสนา และประเพณีประจำปีของชาวจีนก็ยังมีการปฏิบัติกันสืบต่อมาจนทุกวันนี้ อีกทั้ง ชาวจีนที่ได้เข้ามาตั้งรกรากที่อำเภอหาดใหญ่นั้น ได้มีการสร้างศาลเจ้าจีนขึ้นหลายแห่ง เช่น ศาลเจ้าหลื่อโจ้ว (วัดฉื่อฉางในปัจจุบัน) ศาลเจ้าพ่อเสือ ศาลเจ้านาจา ศาลเจ้าซาเจียงกุน ศาลเจ้าไฉ่ซิงเอี๊ยะ และศาลเจ้าเห้งเจีย เป็นต้น

2. ชาวจีน และชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลา กับการเคารพบูชาเทพเจ้าจีนฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจีย

เทพเจ้าหรือสิ่งศักดิ์สิทธิ์ของจีนนั้น มีที่มาจากความเคารพธรรมชาติ และความกตัญญูต่อบรรพชนของคนจีน อาจารย์ถาวร สิกขโกศล แบ่งประเภทของเทพเจ้า และสิ่งศักดิ์สิทธิ์ของจีนไว้ในบทความ “เทพ สิ่งศักดิ์สิทธิ์และภูตผีปีศาจของจีน” ปรากฏในวารสารศิลปวัฒนธรรม ฉบับมกราคม ปี พ.ศ. 2561 (เสมียนอารีย์, 2566) ดังนี้ 1) เทพประจำธรรมชาติและเรื่องสำคัญที่เกี่ยวข้องกับวิถีชีวิตมนุษย์มีความเคารพและกลัวธรรมชาติ เชื่อว่ามีเทพกำกับ เช่น ฟ้า ดิน เดือน ดาว ลม ฝน แม่น้ำ ภูเขา มีพิธีเซ่นไหว้มาแต่โบราณ เทพแห่งประตูบ้าน เทพประตูห้อง เทพเตาไฟ เทพห้องโถงกลาง หรือเทพแห่งชุมชน เป็นต้น 2) เทพบรรพชน บุคคลในตำนานและบุคคลสำคัญบางคน ประมุขยุคโบราณและบุคคลในตำนานผู้มีคุณูปการต่อคนจีนได้รับยกย่องเป็นเทพเจ้ามาช้านาน เช่น เหลาจื่อ กวนอู เจ้าแม่มาจู่หรือที่คนไทยเรียกเจ้าแม่ทับทิม 3) เทพและสิ่งศักดิ์สิทธิ์ในพุทธศาสนา ได้แก่ พระพุทธเจ้า พระโพธิสัตว์ พระอรหันต์ เทพเถระ และที่สำคัญอีกประเภทหนึ่งคือ เทพผู้คุ้มครองพุทธศาสนาและวัด ที่เราเห็นประจำในวัดจีน คือ ท้าวจตุโลกบาล ซึ่งอยู่ด้านในประตูวัด และพระเวทโพธิสัตว์ยืนถือคทาอยู่ด้านใน พุทธศาสนามหายานมีเทพและสิ่งศักดิ์สิทธิ์หลากหลายและเป็นระบบมาก มีผลทำให้คนจีนโดยเฉพาะอย่างยิ่งศาสนาเต๋าพัฒนาเทวดาและสิ่งศักดิ์สิทธิ์ของตนเป็นระบบชัดเจนขึ้น 4) เทพในศาสนาเต๋า เทพและสิ่งศักดิ์สิทธิ์ของศาสนาเต๋ายุคแรกมาจากเทพประจำธรรมชาติ และเทพบรรพชนบุคคลในตำนาน แต่เพิ่มเติมขึ้นอีกมาก

เช่น การบูชา ฟ้า ดิน น้ำ ของจีนโบราณ ศาสนาเต๋าได้สร้างเทพประจำธรรมชาติทั้งสามนี้ให้มีตัวตนชัดเจนขึ้น เป็นเทพเทียนกวนกำกับดูแลฟากฟ้า ตี้กวนกำกับดูแลพื้นดิน และสุ่ยกวนกำกับดูแลท้องน้ำ

นอกจากนี้ ชาวจีนในอำเภอหาดใหญ่เมื่ออพยพเข้ามา ก็มีการนำสิ่งที่ตัวเองเคารพ บูชา สักการะติดตัวมาด้วย และเมื่อมีการรวมตัวกันก็มีการสร้างสถานที่ขึ้นมา เป็นศาลเจ้า เพื่อไว้รวมตัวทำกิจกรรมร่วมกัน ดังที่มีนักวิชาการกล่าวว่า เมื่อชาวจีนอพยพถิ่นฐานไปต่างแดน พวกเขาหวังว่าสิ่งศักดิ์สิทธิ์จะปกป้องคุ้มครอง ดังนั้นจึงมีการสร้างวัดจีน และศาลเจ้าในดินแดนใหม่ที่ตนไปตั้งหลักปักฐาน ผู้เขียนเห็นพ้องกับคำกล่าวนี้ เพราะจะสังเกตได้ว่า ศาลเจ้าหรือวัดจีน มักจะปรากฏในชุมชนชาวจีนเสมอ

เทพเจ้าฉีเทียนต้าเซิ่ง หรือที่คนไทยคุ้นหูกันว่า เทพเจ้าเห้งเจียนั้น หลายคนคงรู้จักมาจากนวนิยายจีนที่แต่งโดยอู่เฉิงเอิน จากการศึกษานวนิยายไซอิ๋วเป็นเพียงแค่การแต่งขึ้นมาของอู่เฉิงเอินเท่านั้น ซึ่งอาจมีการได้รับอิทธิพลจากการเดินทางไปยังเมืองต่าง ๆ เช่น การเดินทางไปยังเมืองฝูเจี้ยน ซึ่งทางนั้นมีการสักการะบูชาเทพเจ้าลิงกันอยู่แล้ว และอาจได้รับอิทธิพลจากการรับรู้เรื่องรายของพระสงฆ์สวนจ้าง ซึ่งพระสงฆ์สวนจ้างมีตัวตนจริง ๆ ทางประวัติศาสตร์ ในประเทศไทยโดยเฉพาะคนไทยเชื้อสายจีน รู้จัก และมีการเคารพบูชาเทพเจ้าเห้งเจีย ไต่เสี่ยฮุกโจ้ว หรือ ฉีเทียนต้าเซิ่ง

ชาวไทย และชาวไทยเชื้อสายจีนหลายคนในประเทศไทยหลายคนก็เชื่อว่า มาจากวรรณกรรมจีนไซอิ๋ว จากลิงเผือก ได้ไปร่ำเรียนวิชากับพระอาจารย์ผู้ถือโจวซือ จนเป็นอู้คง ได้วิชาอาคมจนกระทั่งมีอิทธิฤทธิ์แกร่งกล้าจนได้สมญานามว่า ฉีเทียนต้าเสิ้ง ถูกพระยูไลปราบ พระถังรับเป็นศิษย์ให้ชื่อว่า ซุนเห้งเจีย จนอันเชิญพระไตรปิฎกสำเร็จได้รับแต่งตั้งนามโดยพระยูไล นามว่า โต่วจ้านเสิ้งฝอ และหลายคนนั้นก็เชื่อว่าแต่เดิมทางใต้ของประเทศจีน บริเวณมณฑลฝูเจี้ยน และมณฑลกว่างตงนั้นมีการสักการะบูชาลิง ชาวจีนที่ได้อพยพมานั้นก็มีการนำพาสิ่งศักดิ์สิทธิ์ติดตัวมาด้วย และเทพเจ้าฉีเทียนต้าเสิ้งก็เป็นหนึ่งสิ่งที่ได้นำติดตัวข้ามน้ำข้ามทะเลมาด้วยเช่นกัน (จรัสศรี จิรภาส, 2547).

ด้วยลักษณะนิสัยของเห้งเจีย ในวรรณกรรมนั้น ฉลาดหลักแหลม มีสติปัญญาเป็นเลิศ มีพลังสามารถปราบชนะมารร้ายได้ ผู้คนก็มักจะเชื่อว่าหากบูชาเทพเจ้าเห้งเจีย จะปราศจากสิ่งชั่วร้ายรบกวน มีพลานามัยที่แข็งแรง มีสติปัญญาเป็นเลิศ เฉลียวฉลาด ปฏิภาณไหวพริบและความกล้าหาญ จะสามารถแก้ปัญหาได้ทุกอย่าง และหาหนทางแก้ไขปัญหาความเดือดร้อนได้เสมอ จึงเป็นที่นิยมกันมากในหมู่ผู้ประกอบธุรกิจที่ทำให้สามารถหาทางออกได้ในทุกอุปสรรคทุกปัญหา รวมถึงผู้ที่อยู่ในสายเก็งกำไรนั้นมักต้องหามาบูชากันจำนวนมากนั่นเอง ด้วยหลาย ๆ อย่าง รวมถึงในช่วงนึงมีภาพยนตร์ และซีรีย์เรื่องไซอิ๋วได้เข้ามาฉายในประเทศไทยนั้น ก็ทำให้วรรณกรรมจีนไซอิ๋ว และตัวละครต่าง ๆ โดยเฉพาะเห้งเจีย เป็นที่รู้จักกันมากขึ้นในสังคมไทย และด้วยความที่ประเทศไทยเปิดกว้างกับด้านศาสนา การบูชา สักการะเทพเจ้าเห้งเจียก็มีแพร่หลายมากขึ้น

ผลการศึกษา พบว่า ในอำเภอหาดใหญ่ จังหวัดสงขลานั้น มีการเคารพ สักการะเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียอยู่ไม่น้อย โดยพบว่า ศาลเจ้าที่มีองค์เทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียเป็นประธานหลักของศาลเจ้าจริง ๆ มีด้วยกัน3แห่ง ประกอบด้วย 1) ศาลเจ้าเห้งเจีย ตั้งอยู่ถนนจันทร์นิเวศ 2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ และ 3) ศาลเจ้าเห้งเจีย ทางไปสนามบินหาดใหญ่ รายละเอียดดังนี้

1) ศาลเจ้าเห้งเจีย ถนนจันทร์นิเวศ

ศาลเจ้าแห่งนี้มีการจดทะเบียนจัดตั้งเป็นมูลนิธิ คือ มูลนิธิเมตตาธรรม (ต้าเซิ่ง) ที่นี่แม้จะเป็นศาลขนาดเล็กแต่ก็เป็นศาลแห่งหนึ่งที่เก่าแก่พอสมควร โดยไม่สามารถระบุปีได้ แต่จากคำบอกเล่าของประธาน

ศาลเจ้าคนปัจจุบันบอกว่า มีมานานกว่า 100 ปีแล้ว ศาลเจ้าแห่งนี้มีเทพเจ้าเห้งเจีย เป็นประธาน เป็นปางไต่เสี่ยฮุกโจ้ว หรือภาษาจีนเรียกว่า 大圣佛祖 และประธานศาลเจ้ายังบอกอีกว่ากิมซิ้นองค์นี้ได้นำมาจากเมืองจีนเลยทีเดียว และนอกจากเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียแล้ว ยังมีเทพเจ้า หรือสิ่งศักดิ์สิทธิ์อื่น ๆ อีก เช่น พระโพธิสัตว์กวนอิม พระเสือ เป็นต้น ศาลเจ้าแห่งนี้มีการเข้าทรงสัปดาห์ละ 1ครั้ง โดยการเข้าทรงก็เพื่อที่จะช่วยชี้แนะแนวทางแก้ปัญหา ขจัดปัดเป่าอุปสรรค หรือเสริมความโชคดีให้แก่ลูกหลานที่มีความเชื่อ

ภาพที่ 1 ศาลเจ้าเห้งเจีย ถนนจันทร์นิเวศ

2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ

ศาลเจ้าแห่งนี้ ตั้งอยู่ไม่ไกลจากสี่แยกคลองหวะ สร้างตั้งแต่ปี พ.ศ. 2533 โดยศาลเจ้าแห่งนี้เป็นของส่วนบุคคล ไม่มีการเข้าทรงแต่อย่างใด แต่อนุญาตให้บุคคลข้างนอกสร้างสามารถเข้าไปสักการะบูชาได้

ภาพที่ 2 ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ

3) ศาลเจ้าเห้งเจีย ตำบลทุ่งลาน ทางไปสนามบินหาดใหญ่

ศาลเจ้าถูกล้อมรอบด้วยรั้วกำแพง ภายในรั้วมีบริเวณกว้างขวาง ศาลแห่งนี้อยู่ในเขตพื้นที่ ต.ทุ่งลาน อ.คลองหอยโข่ง จ.สงขลา

ภาพที่ 3 ศาลเจ้าเห้งเจีย ตำบลทุ่งลาน ทางไปสนามบินหาดใหญ่

ซึ่งนอกจากทั้ง 3 แห่งนี้ที่มีเทพเจ้าเห้งเจียเป็นองค์ประธานหลักของศาลเจ้าแล้ว ยังมีศาลเจ้าจีนอีกหลายแห่งที่มีองค์เทพเจ้าเห้งเจียประดิษฐานอยู่เช่นกัน เช่น ศาลเจ้าไฉ่ซิงเอี๊ยะ ศาลเจ้านาจา เป็นต้น

3. ความเชื่อชาวจีน และชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลา กับเทพเจ้าจีนฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจีย

ในด้านความเชื่อ และความศรัทธา โดยเฉพาะด้านศาสนาของชาวไทย และชาวไทยเชื้อสายจีนเป็นหลักยึดเหนี่ยวจิตใจ และเป็นส่วนหนึ่งของการตัดสินใจในการดำเนินชีวิตที่มีมาอย่างช้านานโดยปฏิเสธไม่ได้ ที่จะเกี่ยวข้องกับศาลเจ้า หรือมูลนิธิการกุศล โดยนอกเหนือจากการขอพร หรือปรึกษา จากเทพเจ้าต่าง ๆ ในศาสนสถานนั้น ๆ นอกเหนือจากนี้ยังมีการเข้าปรึกษาปัญหาต่าง ๆ กับผู้เป็นตัวแทนที่มีความเชื่อว่าอัญเชิญเทพเจ้ามาผ่าน หรือที่เราเรียกว่าร่างทรง โดยจะมีการเล่าถึงปัญหา ปรึกษาแนวทางแก้ไข แนวทางการตัดสินใจในการดำเนินชีวิต จากการลงพื้นที่พบว่าทั้งสามศาลเจ้า คือ 1) ศาลเจ้าเห้งเจีย ถนนจันทร์นิเวศ 2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ และ 3) ศาลเจ้าเห้งเจีย ตำบลทุ่งลาน ทางไปสนามบินหาดใหญ่ ยังคงมีความเชื่อที่สัมพันธ์กับการขอพรกับเทพเจ้าที่ประดิษฐานภายในศาลเจ้านั้น โดยมีรายละเอียดดังนี้ (พลาธิป อนันตยะ, 2551)

3.1 ความเชื่อเรื่องการเงิน

ชาวไทย และชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ หลายคนที่มาขอพรกับ เทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียนั้น มีความเชื่อว่า ท่านสามารถให้พรด้านการเงินแก่ผู้ที่มาสักการะบูชาได้ เช่น คุณมารวย (คนไทยเชื้อสายจีน) ผู้มาสักการะเทพเจ้าฉีเทียนต้าเซิ่ง ณ ศาลเจ้าเห้งเจีย ถนนจันทร์นิเวศ เป็นประจำ ได้กล่าวว่า

“โดยส่วนตัวเชื่อว่าที่ศาลเจ้าแห่งนี้ เด่นเรื่องการขอพรด้านการเงิน และการงาน ทุกครั้งที่มีปัญหา และอุปสรรค จะมากราบไหว้ขอพร เพื่อเป็นกำลังใจ ให้กลับไปแก้ปัญหาได้อย่างราบรื่น และทุกครั้งที่มาก็จะประสบความสำเร็จ ปัญหาอุปสรรคคลี่คลายได้ง่าย และรวดเร็ว จึงมีความเชื่อ และความศรัทธากับเทพเจ้าเห้งเจีย”

(คุณมารวย, สัมภาษณ์, 2567, มีนาคม)

3.2 ความเชื่อเรื่องการงาน และการค้า

ผู้คนหลายคนที่เข้ามาสักการะบูชา นอกจากจะมาไหว้ขอพรต่อเทพเจ้า หรือสิ่งศักดิ์สิทธิ์แล้วนั้น หลายคนยังมีการขอเช่า-ทอนวัตถุมงคล เพื่อนำกลับไปพกติดตัว หรือนำกลับไปบูชาที่บ้าน โดยมีความเชื่อว่าเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียนั้นจะคอยช่วยเรื่องการงาน และการค้า ให้ค้าขายดี การงานเจริญรุ่งเรือง ดังที่ได้พูดคุยกับ คุณสุนทร แซ่ตั้ง (ชาวไทยเชื้อสายจีน) ผู้มาสักการะบูชาที่ศาลเจ้า ซึ่งดำเนินธุรกิจค้าขายอะไหล่รถยนต์อยู่ที่อำเภอหาดใหญ่ จังหวัดสงขลาได้บทสรุปว่า

“ในทุก ๆ ปี จะมีการมาที่ศาลเจ้าเห้งเจีย เพื่อขอบูชาวัตถุมงคล เช่น ฮู้ หรือยันต์ เพื่อนำไปติดไว้หน้าร้าน เพื่อเรียกลูกค้าและกันสิ่งชั่วร้ายต่าง ๆ”

(คุณสุนทร แซ่ตั้ง, สัมภาษณ์, 2567, มีนาคม)

3.3 ความเชื่อเรื่องสุขภาพ

การขอพรด้านสุขภาพ เป็นอีกหนึ่งด้านที่มีผู้คนเข้ามาขอพรจากเทพเจ้า หรือสิ่งศักดิ์สิทธิ์เยอะรองจากด้านการเงิน และการงาน เนื่องจากว่าการมีสุขภาพที่ดีเป็นปัจจัยหลัก ที่จะทำให้การดำเนินชีวิตประจำวันของมนุษย์เรานั้นมีประสิทธิภาพ ซึ่งชาวไทย และชาวไทยเชื้อสายจีนมากมายที่ได้เข้ามาสักการะบูชาที่ศาลเจ้านั้น ก็ได้มีความเชื่อความศรัทธาว่าเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียนั้น

สามารถช่วยปัดเป่าโรคภัยไข้เจ็บ รวมถึงโรคร้ายต่าง ๆ ได้

3.4 ความเชื่อเรื่องการขอบุตร

การขอบุตรจากเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจีย มักจะได้รับความนิยมจากคู่รักหนุ่มสาววัยทำงาน รวมถึงผู้ที่มีบุตรยาก และมีความเชื่อว่าหากได้มาขอบุตรจากเทพเจ้าฉีเทียนต้าเซิ่ง จะทำให้ตั้งครรภ์ง่าย และบุตรที่คลอดออกมาก็จะมีความฉลาดหลักแหลม ปฏิภาณไหวพริบดั่งเช่นเทพเจ้าเทพเจ้าฉีเทียนต้าเซิ่ง

ในส่วนพิธีกรรมหรืองานเทศกาลประจำปีที่จัดขึ้นที่ศาลเจ้าเห้งเจียนั้นก็เป็นกิจกรรมอย่างหนึ่งที่มีการสืบทอด และปฏิบัติต่อกันมายาวนาน จากการลงพื้นที่ได้มีการสอบถามแต่ละศาลเจ้านั้น ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ นั้นเมื่อถึงเทศกาลต่าง ๆ จะมีการจัดทำกันภายใน ไม่ได้มีการประชาสัมพันธ์ เนื่องจากว่าเป็นศาลเจ้าส่วนบุคคล แต่โดยปกติแล้วก็อนุญาตให้บุคคลข้างนอกสร้างสามารถเข้าไปสักการะบูชาได้ ในส่วนศาลเจ้าเห้งเจีย ตำบลทุ่งลาน ทางไปสนามบินหาดใหญ่ และ ศาลเจ้าเห้งเจีย ถนนจันทร์นิเวศ จะมีงานประจำของศาลเจ้าหลัก ๆ ดังนี้

1. งานอธิษฐานขอพรและสะเดาะเคราะห์ ภาษาจีนเรียกว่า 祈合众福 หรือ 求福 จะจัดในวัน 正月廿六日 หรือวันที่ 26 ของเดือนแรกตามปฏิทินจันทรคติจีน ซึ่งจากการสอบถามพูดคุยกับผู้ดูแลศาลเจ้า ได้กล่าวว่า ในวันนี้ที่ศาลเจ้าจะมีการจุดธูปไหว้สิ่งศักดิ์สิทธิ์ ถวายผลไม้
2. งานเทกระจาด ภาษาจีนเรียกว่า 施孤 ซึ่งจะตรงกับวัน 七月三十日 หรือวันที่ 30 เดือน 7 ตามปฏิทินจันทรคติจีน
3. งานวันกำเนิดเทพเจ้าเห้งเจีย ภาษาจีนเรียกว่า 庆祝大圣诞 ซึ่งจะจัดในวัน 八月十六日 หรือวันที่ 16 เดือน 8 ตามปฏิทินจันทรคติจีน
4. งานขอบคุณเทพเจ้าเห้งเจีย ภาษาจีนเรียกว่า 酬神盛会 หรือ 还福 ซึ่งจะตรงกับวัน 十二月初六 หรือวันที่ 6 ของเดือน 12 ตามปฏิทินจันทรคติจีน

สรุปและอภิปรายผล

เทพเจ้าจีนฉีเทียนต้าเซิ่ง หรือที่คนไทยส่วนใหญ่คุ้นหูกับคำว่า เทพเจ้าเห้งเจีย หรือ เทพเจ้าไต่เสี่ยฮุกโจ้วก็เป็นหนึ่งในเทพเจ้าจีนที่ชาวจีน และชาวไทยเชื้อสายจีนมากมายในอำเภอหาดใหญ่ให้การเคารพสักการะบูชา จนได้มีการสร้างศาลเจ้า โดยมีองค์เทพเจ้าเห้งเจีย ฉีเทียนต้าเซิ่ง หรือ ไต่เสี่ยฮุกโจ้ว เป็นองค์ประธานหลักของศาลเจ้า ได้แก่ 1) ศาลเจ้าเห้งเจีย ตั้งอยู่ถนนจันทร์นิเวศ 2) ศาลเจ้าไต่เสี่ยฮุกโจ้ว ตำบลคลองหวะ และ 3) ศาลเจ้าเห้งเจีย ตำบลทุ่งลาน ทางไปสนามบินหาดใหญ่ ซึ่งนอกจากทั้ง 3 แห่งนี้ที่มีเทพเจ้าเห้งเจียเป็นองค์ประธานหลักของศาลเจ้าแล้ว ยังมีศาลเจ้าจีนอีกหลายแห่งที่มีองค์เทพเจ้าเห้งเจียประดิษฐานอยู่เช่นกัน เช่น ศาลเจ้าไฉ่ชิงเอี๊ยะ เป็นต้น

จากการศึกษาผู้เขียนพบว่า ความเชื่อในเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจีย กับชาวไทยและชาวไทยเชื้อสายจีนในอำเภอหาดใหญ่ จังหวัดสงขลานั้น มีที่มาจากการสืบทอดทางความเชื่อจากรุ่นสู่รุ่น โดยเฉพาะในชาวไทยเชื้อสายจีนที่มีบรรพบุรุษมาจากประเทศจีน และอีกหนึ่งปัจจัยคือ กระแสความเชื่อ ความนิยมที่มีขึ้นมาใหม่ในระยะ 3 – 4 ปี ที่ผ่านมานี้ อาจจะเป็นเพราะว่า ผู้คนต้องการที่พึ่ง หรือที่ยึดเหนี่ยวทางจิตใจ เพื่อเป็นกำลังใจในการดำเนินธุรกิจ และการดำเนินชีวิต

จากการศึกษาสะท้อนให้เห็นว่า สังคมชาวอำเภอหาดใหญ่ สามารถแบ่งออกได้เป็น 2 กลุ่มช่วง

อายุ ซึ่งทั้ง 2 กลุ่มที่จำแนกออกมานี้ มีทั้งส่วนสะท้อนให้เห็นถึงความเหมือนและความแตกต่างได้ ดังนี้

1. กลุ่มวัยกลางคนขึ้นไปถึงวัยผู้สูงอายุ

ส่วนใหญ่เกือบ 100% จะต้องเป็นผู้ที่มีความสัมพันธ์หรือเกี่ยวข้องกับชาวจีนรุ่นก่อนที่มีการอพยพมาอาศัยอยู่ในอำเภอหาดใหญ่ หรือพื้นที่ใกล้เคียง เช่น ตัวเองมีเชื้อสายจีน หรือตัวเองอาจจะไม่ได้เป็นคนเชื้อสายจีนแต่มีคู่ครองเป็นคนเชื้อสายจีน ก็จะถูกปลูกฝังถึงขนบความเชื่อในตัวเทพเจ้าฉีเทียนต้าเซิ่ง และได้รับอิทธิพลธรรมเนียมปฏิบัติในการเดินทางไปสักการะบูชาเทพเจ้าฉีเทียนต้าเซิ่งตามศาลเจ้าต่าง ๆ ซึ่งหากตัวเองเป็นคนเชื้อสายจีนอยู่แล้ว ก็จะได้รับการปลูกฝังจากผู้ใหญ่มาตลอด ความเชื่อเหล่านี้จะค่อย ๆ ซึมซับแล้วยังคงมีการส่งต่อสู่รุ่นต่อไปอีกด้วย และจากสอบถามพูดคุยจากผู้คนกลุ่มนี้ได้ความว่าส่วนใหญ่จะมาขอเรื่องสุขภาพของตนเองหรือไม่ก็ของบุคคลในครอบครัว เรื่องธุรกิจ และปรึกษาปัญหาชีวิต ตามลำดับ

2. กลุ่มวัยรุ่นถึงวัยกลางคน

ในกลุ่มนี้จะมีทั้งผู้ที่มีเชื้อสายจีน และไม่มีเชื้อสายจีน ซึ่งโดยส่วนใหญ่แล้วกลุ่มวัยรุ่นจนถึงวัยกลางคนนี้ จะได้รับอิทธิพลของการเข้าถึงทางสื่อโซเชียลสมัยใหม่ที่มีกระแสความนิยมในองค์เทพเจ้าฉีเทียนต้าเซิ่งมาในระยะ 3 – 4 ปีมานี้ ยิ่งทำให้ในกลุ่มนี้ได้มีการขวนขวายที่จะเข้าหาศาลเจ้าที่มีเทพเจ้าฉีเทียนต้าเซิ่งเพื่อที่จะสักการะบูชามากขึ้น จากการสอบถามในกลุ่มช่วงอายุนี้มักจะมาขอเรื่องความรัก การเรียน การงาน ตามลำดับ หรือจะเรียกกลุ่มนี้ว่า “สายมู” ก็ไม่ผิด

ซึ่งทั้ง 2 กลุ่มนี้ แม้จะมาบรรจบที่ปลายทางเดียวกันนั่นก็คือ ศาลเจ้าและความเคารพศรัทธาที่มีต่อองค์เทพเจ้าฉีเทียนต้าเซิ่ง หากวัตถุประสงค์และคำอธิษฐานจะมีส่วนน้อยที่เหมือนหรือคล้ายคลึงกันด้วยจากเหตุปัจจัยที่ดึงดูดให้เข้ามาสักการะบูชาที่ไม่ค่อยจะเหมือน แต่ทั้งนี้ทั้งนั้นก็มีบางส่วนที่เหตุปัจจัยที่เหมือนกัน ไม่ว่าจะด้วยเหตุปัจจัยใด ๆ ก็ตามที่ทำให้ชาวอำเภอหาดใหญ่ จังหวัดสงขลา เข้าถึงความเชื่อและสักการะบูชาในองค์เทพเจ้าฉีเทียนต้าเซิ่งนั้น สะท้อนให้เห็นถึงการดำเนินชีวิตที่ยังคงต้องพึ่งในอิทธิฤทธิ์บารมีขององค์ฉีเทียนต้าเซิ่ง เพื่อเป็นขวัญและกำลังใจในการดำรงชีวิตต่อไป

หากจะกล่าวถึงความสัมพันธ์ระหว่างศาลเจ้าเห้งเจีย หรือศาลเจ้าฉีเทียนต้าเซิ่ง กับชุมชนชาวไทยเชื้อสายจีน หรือไม่ใช่เชื้อสายจีนก็ตามนั้นมีมากมาย จะเห็นได้ชัดเจนเวลาศาลเจ้าจัดกิจกรรมต่าง ๆ มักจะได้รับร่วมมือจากชุมชนชาวอำเภอหาดใหญ่อยู่เสมอ เช่น กิจกรรมงานเทศกาลขอบคุณเทพเจ้า กิจกรรมงานเทศกาลเทกระจาด กิจกรรมวันเกิดเทพเจ้าฉีเทียนต้าเซิ่ง เป็นต้น

นอกเหนือจากการจัดกิจกรรมต่าง ๆ แล้วนั้น ชาวอำเภอหาดใหญ่เอง หรือแม้กระทั่งนักท่องเที่ยวชาวมาเลเซีย หรือสิงคโปร์ ผู้ที่ศรัทธาในเทพเจ้าจีน ก็มักจะมาแวะเวียน สักการะเพื่อความสบายใจอยู่ไม่ขาดสาย ซึ่งถือว่าเป็นการส่งเสริมธุรกิจการท่องเที่ยวอีกทางหนึ่ง

ข้อเสนอแนะ

ในการศึกษาในครั้งนี้ทำให้ทราบถึงการบูชาสักการะเทพเจ้าฉีเทียนต้าเซิ่ง หรือเทพเจ้าเห้งเจียในอำเภอหาดใหญ่ จังหวัดสงขลานั้น ที่มีจำนวนไม่น้อย และศาลเจ้าก็มีจำนวนไม่น้อยเลย สำหรับการศึกษาครั้งต่อไป ควรมีการศึกษาเกี่ยวกับอิทธิพลที่มีผลต่อแรงผลักดันด้านความเชื่อของผู้คน เพื่อให้ได้การวิจัยที่ครอบคลุม และสมบูรณ์มากขึ้น

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วิเคราะห์เทคนิคการบรรเลงกีตาร์ในบทเพลง Being With You ของ George Benson
An Analysis of Guitar Playing Techniques in George Benson's Being with You

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บทคัดย่อ

บทความวิจัยนี้ เกี่ยวกับการเทคนิคการเล่นกีตาร์ บทเพลง Being with you ซึ่งเป็นผลงานเพลงบรรเลงกีตาร์โดย George Benson (ค.ศ.1983) มีวัตถุประสงค์เพื่อการศึกษาเทคนิคของ เพลง Being with you บทเพลงนี้อยู่ในอัลบั้ม In your eyes บทเพลงนี้มีเทคนิคที่น่าสนใจ และมีทำนองที่เคลื่อนไหว ยืดหยุ่น และไพเราะสวยงามโดยมีความเป็น Smooth Jazz ทำให้ฟังง่าย สำหรับ เพลง Being with you มีท่อนเพลงแบบ Ternary Form A (Theme) A B A (Solo) A B A (Theme) ท่อน A (Theme) เป็น Theme หลักของเพลง เริ่มด้วยเทคนิคการสไลด์ทั้งการสไลด์แบบเต็มเสียง และสไลด์แบบครึ่งเสียง ท่อน A ในท่อนนี้มีเทคนิคที่น่าโดดเด่น คือเทคนิคการดีดแบบกวาด Sweep Picking ท่อน B ท่อนนี้แส่วนที่โดดเด่น คือการเล่นโน้ตคู่ ท่อน A (Solo) เทคนิคที่น่าสนใจในท่อนนี้คือฟิงเกอร์โรล ท่อน A ท่อนนี้ค่อนข้างมีความ น่าสนใจเป็นอย่างมาก เนื่องจากเป็นเทคนิคที่ George Benson ได้รับอิทธิพลจาก เวสมอน โกเมอรี่ คือ มือขวาเลือกใช้นิ้วในการเล่นแทนการใช้ปิ๊ก ทำให้เสียงที่เล่นออกมามีความนุ่มมากกว่าการใช้ปิ๊ก ต่อมาท่อน B ในท่อนนี้มีเทคนิคที่โผล่มาใหม่ก็คือ การเปลี่ยนตำแหน่งนิ้ว (Position Shifting) เนื่องจากโน้ตที่เล่นในท่อนนี้มี ระยะห่างการใช้นิ้วที่ค่อนข้างกว้าง จึงมีการเปลี่ยนตำแหน่งนิ้วในการช่วยให้เล่นได้ง่ายขึ้น และในท่อนสุดท้าย A(Theme) จะเน้นเทคนิคของมือขวา คือ การดีดแบบประหยัด (Economy Picking) ใช้เพื่อทำให้เคลื่อนไหวมือน้อยที่สุด

คำสำคัญ: จอร์จ เบ็นสัน, กีตาร์

Abstract

This research article, about guitar playing techniques in Being with You as a guitar song played by George Benson (1983), aims to study the techniques played in Being with You on the album of in Your Eyes. This song contains interesting techniques and beautiful, moving, and flexible rhythms like Smooth Jazz, making it easy to listen to. For Being with You, it consists of a verse of a Ternary Form A (Theme) A B A (Solo) A B A (Theme). In verse A (Theme) , it is the main theme of the song, beginning with both full-tone slides and

semi-tone slides. In verse A, it has the outstanding technique of Sweep Picking. In verse B, it has the outstanding technique of double note playing in section A (Solo) with the interesting technique of finger roll. This section is quite interesting because the technique that George Benson used was influenced by Wesmon Gomery, playing through the right-hand fingers instead of using a pick and making the sound softer than using a pick. In verse B, there is a new emerging technique in changing finger positions (Position Shifting) because the notes played in this verse have wide finger spacing, making it easier to change a finger position. In the last verse, A (Theme), the right-hand technique with economy strumming (Economy Picking) is emphasized to minimize hand movement.

Keywords: George Benson , Guitar

บทนำ

แจ๊สถือกำเนิดขึ้นในปลายศตวรรษที่ 19 ในเมืองนิวออร์ลีน เมืองท่าที่เคยเป็นอาณานิคมของฝรั่งเศสและสเปน นิวออร์ลีนเป็นที่รวมวัฒนธรรมที่หลากหลาย จากผู้คนที่พยายามมีชีวิตอยู่ ดิ้นรนทำงานอยู่ร่วมกันภายในพื้นที่ของถนน โรงเรียนและร้านค้าที่แออัด การเป็นอาณานิคมของฝรั่งเศสทำให้นิวออร์ลีน มีความซับซ้อนทางวัฒนธรรมที่ไม่เหมือนใคร มีทั้งชาว แอฟริกัน ชาวอเมริกันพื้นถิ่น ชาวแคริเบียน ชาวละตินอเมริกันที่มีบทบาททางสังคมและการเมืองมาจนถึงปัจจุบัน ดนตรีของชาวนิวออร์ลีนในขณะนั้นมีทั้งโอเปร่า, วงมาร์ชชิ่ง, เปียโนแรกไทม์ การเต้นแบบละติน ไปจนถึงวงซิมโฟนีออเครสตรา ดนตรีลีลาศ เพลงสวด เพลงบลูส์ เพลงเต้นรำของชาวแอฟริกัน องค์ประกอบของแนวดนตรีทั้งหมดที่กล่าวมาโดยเฉพาะแรกไทม์, บลู และดนตรีใน โบสถ์ รวมอยู่ในดนตรีแนวใหม่ที่เรียกว่า “แจ๊ส” (Samuel, 2017)

ปัจจุบัน ดนตรีแจ๊สร่วมสมัยเป็นอีกรูปแบบหนึ่งของดนตรีแจ๊สที่ได้รับความนิยมในหมู่นักดนตรี แสดงดนตรีแจ๊สร่วมสมัยมีพัฒนาการมาจากสมูธแจ๊ส และโมเดิร์นแจ๊ส โดยได้รับอิทธิพลทางดนตรีมาจากดนตรีป๊อป ฟังค์ และฟิวชั่นแจ๊สได้รับความนิยมอย่างมากในช่วงปลายศตวรรษที่ 20 แจ๊สร่วมสมัยเป็นรูปแบบดนตรีที่นำเอาดนตรีรูปแบบอื่น ๆ มาผสมผสาน อย่างไรก็ตามก็คงมีการด้นสด (Improvise) นอกจากนั้นดนตรีแจ๊สร่วม สมัยมีอัตราความเร็วที่ใกล้เคียงกับบีบ็อบ (Bebop) แต่ไม่มีการด้นสดมากเท่าโดยจะให้ความสำคัญในเรื่องของจังหวะและทำนอง (หัสพงศ์ นิธิสุภาเมสิทธิ์ และ เฉลิมศักดิ์ พิกุลศรี, 2566)

กีตาร์แจ๊ส เป็นเครื่องดนตรีที่มีบทบาทและพัฒนาการ ตั้งแต่ศตวรรษที่ 19 ซึ่งเริ่มจากเป็นเครื่องดนตรีประกอบจังหวะในวงแจ๊สแบบนิวออร์ลีนส์ จนกระทั่งเทคโนโลยีมีการพัฒนาขึ้นการเกิดขึ้นของเครื่องขยายเสียง ส่งผลให้กีตาร์มีบทบาทมากขึ้นในวงดนตรีแจ๊ส อีกทั้งพัฒนาการทางดนตรีแจ๊สทำให้กีตาร์ สามารถที่จะเป็นผู้นำวงหรือผู้เล่นประกอบได้อีกเช่นกัน

เทคนิคการเล่นเสียงประสาน กีตาร์เป็นเครื่องดนตรีที่สามารถเล่นเสียงประสานได้ในหลากหลายรูปแบบ ไม่ว่าจะเป็นการพลิกกลับ หรือการเพิ่มเสียงประสานได้มากถึง 6 เสียง เทคนิคการเล่นเสียงประสานนี้ นอกจากสามารถใช้ในการอิมโพรไวส์ได้แล้ว ยังคงมีความสำคัญอย่างมากในการเล่นประกอบหรือเล่นสนับสนุนให้กับผู้บรรเลงเดี่ยว อีกทั้งเทคนิคการเล่นเสียงประสานของกีตาร์นี้ยังสามารถผสมการเล่นทำนองเข้าไปด้วยโดยเรียกว่าคอร์ดเมโลดี (Chords Melody) เป็นการเล่นทำนองผสมกับเสียง

ประสานโดยมักใช้โน้ตที่เป็นทำนองอยู่บนสุดของเสียงประสาน เป็นการเล่นทำนองผสมกับเสียงประสานโดยมักใช้โน้ตที่เป็นทำนองอยู่บนสุดของเสียงประสาน

จอร์จ เบ็นสัน ผู้เชี่ยวชาญด้านการด้นสด (Improvisation) และศิลปินผู้สร้างความบันเทิงอันทรงพลัง เกิดวันที่ 22 มีนาคม ค.ศ. 1943 เกิดที่ประเทศสหรัฐอเมริกา, รัฐเพนซิลเวเนีย, เมืองพิตต์สเบิร์ก และได้รับการยกย่องเป็น NEA Jazz ลักษณะดนตรีของ จอร์จ เบ็นสัน มีผสมผสานสไตล์เฉพาะตัวเข้ากับจังหวะสวิง ทำให้ได้รับการยกย่องว่าเป็นนักกีตาร์แจ๊สที่ยิ่งใหญ่ที่สุดคนหนึ่ง มีผลงานเป็นที่รู้จักไปทั่วโลก ผลงานเพลงที่มีชื่อเสียง ได้แก่ Breezin, Give Me the Night, This Masquerade, และ On Broadway

จอร์จ เบ็นสัน ได้รางวัลทางดนตรีของแกรมมี่ ทั้งหมด 10 รางวัล นอกจากนี้ การแสดงดนตรีของจอร์จ เบ็นสัน ยังสร้างความประทับใจให้กับผู้ชมทั่วโลก ไม่ว่าจะเป็นงานฉลองเมอร์ เดกา ครบรอบ 50 ปี ของมาเลเซีย หรือเทศกาล Mawazine Festival ที่โมร็อกโก

เพลง Being with you ถูกประพันธ์โดยโอมาร์ ฮาคิม (Omar Hakim) บทเพลงนี้อยู่ในอัลบั้มทั้งหมด 7 อัลบั้ม เริ่มต้นที่อัลบั้ม In Your Eyes ในปี ค.ศ. 1983, อัลบั้ม The Best of George Benson: The Instrumentals ในปี ค.ศ. 1997, อัลบั้ม The George Benson Anthology ในปี ค.ศ. 2000, อัลบั้ม The Greatest Hits of All ในปี ค.ศ. 2003, อัลบั้ม Very Best of George Benson: The Greatest Hits of All ในปี ค.ศ. 2004 ต่อมาเป็นอัลบั้ม Classic Love Songs ในปี ค.ศ. 2010 และอัลบั้ม The Ultimate Collection ในปี ค.ศ. 2015

การศึกษาค้นคว้าวิจัยครั้งนี้ มีเป้าหมายเพื่อเสริมความรู้ความเข้าในการปฏิบัติเครื่องดนตรีกีตาร์ไฟฟ้า เป็นการวิเคราะห์เทคนิคในตัวบทเพลง Being with you จากอัลบั้ม In your eyes ของ จอร์จ เบ็นสัน เพลงนี้มีความโดดเด่นชัดเจน ในเรื่องของเทคนิค และยังมีทำนองที่ไพเราะ ผู้วิจัยเล็งเห็นว่าหากมีการวิเคราะห์เทคนิคการเล่นกีตาร์ที่ดี จะทำให้การฝึกซ้อมมีประสิทธิภาพมากขึ้น และใช้เวลาที่สั้นลงในการฝึกซ้อม สำหรับวิจัยชิ้นนี้ผู้วิจัยจะทำการวิเคราะห์เทคนิค เพื่อให้เกิดประโยชน์สูงสุดในการฝึกซ้อมบทเพลงนี้

วัตถุประสงค์ของการวิจัย

เพื่อวิเคราะห์เทคนิคการบรรเลงกีตาร์ในบทเพลง Being with you ของ จอร์จ เบ็นสัน ได้อย่างมีประสิทธิภาพ

แนวคิด ทฤษฎี กรอบแนวคิด

ขอบเขตการวิจัย

ผู้วิจัยได้ทำการวิเคราะห์เทคนิคจากบทเพลง Being with you อัลบั้ม In your eyes ของ จอร์จ เบ็นสัน

ประวัติ จอร์จ เบ็นสัน (George Benson)

จอร์จ เบ็นสัน เป็นนักกีตาร์ที่มีเอกลักษณ์ในการบรรเลงเฉพาะตัวได้รับอิทธิพล การบรรเลง และเทคนิคที่พัฒนาจาก เวส มอนต์โกเมอรี (Wes Montgomery) เป็นนักกีตาร์แจ๊สคนแรก ที่ได้รับความนิยมอย่างแพร่หลายในหมู่คนฟังเพลงทั่วไป เวส มอนต์โกเมอรี มีเทคนิคการเล่นโดย ใช้นิ้วโป้งแทนปิ๊ก (Pick) เพื่อให้ได้เสียงที่นุ่มหนาแน่นและเสียงที่อุ่น ในลักษณะของการดีดลง และนิยม บรรเลงโน้ตขั้นคู่ 8

ในลักษณะของแนวทำนองบีบอป (Bebop) ได้อย่างรวดเร็ว ซึ่งเป็นเอกลักษณ์ใน การบรรเลงของเวส มอนต์โกมอรี (Wes Montgomery) (ณป่าน พิชัยกุล, 2559)

จอร์จ เบ็นสัน ได้รางวัลทางดนตรีของแกรมมี่ ทั้งหมด 10 รางวัล นอกจากนี้ การแสดงดนตรีของ จอร์จ เบ็นสัน ยังสร้างความประทับใจให้กับผู้ชมทั่วโลก ไม่ว่าจะเป็นงานฉลอง เมอร์เดกา ครบรอบ 50 ปี ของมาเลเซีย หรือเทศกาล Mawazine Festival ที่โมร็อกโก

สรุปได้ว่า จอร์จ เบ็นสัน เป็นศิลปินและเป็นนักกีตาร์แจ๊ส ที่มีชื่อเสียงในโลก คนหนึ่ง ได้รับ รางวัลที่การันตีสำเร็จ และได้รับยกย่องเป็น Jazz Master จาก National Endowment of the Arts และการคว้ารางวัลแกรมมี่ถึง 10 รางวัล

บทเพลง Being with you

เพลง Being with you บทเพลงของจอร์จ เบ็นสัน (George Benson) ถูกประพันธ์โดยโอมาร์ ฮาคิม (Omar Hakim) อัลบั้ม In Your Eyes ผลงานได้เผยแพร่ในปี ค.ศ. 1983 ซึ่งเป็นเพลงบรรเลงกีตาร์ สำหรับอัลบั้มนี้มีเพลงบรรเลงเพียง 2 เพลงเท่านั้น และเพลง Being With You เป็นหนึ่งในนั้น (Jenny, 2024)

เพลง Being with You ของจอร์จ เบ็นสัน ได้รับรางวัลแกรมมี่สาขาการ แสดงดนตรี Pop เพลงบรรเลงยอดเยี่ยม ประจำปี ค.ศ. 1984

สำหรับบทเพลง Being with You นอกจากจะมีการเผยแพร่ในอัลบั้ม In Your Eyes ยังได้ ถูกนำมาเผยแพร่อีก 6 อัลบั้ม ได้แก่ The Best of George Benson: The Instrumentals ในปี ค.ศ. 1997, อัลบั้ม The George Benson Anthology ในปี ค.ศ. 2000, อัลบั้ม The Greatest Hits of All ในปี ค.ศ. 2003, อัลบั้ม Very Best of George Benson: The Greatest Hits of All ในปี ค.ศ. 2004 ต่อมาเป็นอัลบั้ม Classic Love Songs ในปี ค.ศ. 2010 และอัลบั้ม The Ultimate Collection ในปี ค.ศ. 2015 รวมแล้ว บทเพลงนี้ มีการเผยแพร่ ในอัลบั้มของจอร์จ เบ็นสัน ทั้งสิ้น 7 อัลบั้ม (All Music, 2024)

สรุปได้ว่า บทเพลง Being with You ของจอร์จ เบ็นสัน ได้ประพันธ์โดย โอมาร์ ฮาคิม (Omar Hakim) อยู่ใน อัลบั้ม In Your Eyes เผยแพร่ครั้งแรกในปี 1983 เป็นเพลงบรรเลง กีตาร์ ซึ่งเป็นหนึ่งใน สองเพลง จากอัลบั้มดังกล่าว และต่อมายังได้นำมาเผยแพร่ในอัลบั้มอื่น ๆ อีกทั้งสิ้น 6 อัลบั้ม

เทคนิคการเล่นกีตาร์

1. เทคนิคการดีดแบบกวาด (Sweep Picking) เป็นเทคนิคการเล่นกีตาร์ ที่สามารถสร้างรูปแบบ (Pattern) และความเร็วที่เทคนิคการเล่นแบบดีดสลับ (Alternate Picking) ทำได้ยาก แม้ว่าเทคนิคการ เล่นกีตาร์โดยการดีดแบบกวาด มีมานานแล้ว นักกีตาร์แจ๊สอย่างจังโก ไรน์ฮาร์ดท์ (Django Reinhardt) และ ทัล ฟาร์โลว์ (Tal Farlow) ใช้เทคนิคนี้ตั้งแต่ต้นศตวรรษที่ 20 แต่ความนิยมของเทคนิคการดีดแบบ กวาดเพิ่มขึ้น เมื่อนักกีตาร์ร็อคอย่าง อิงวี่ เจ มาล์มสทีน (Yngwie J Malmsteen) และนักกีตาร์ฟิวชั่น อย่าง แฟรงก์ แกมเบล (Frank Gambale) ได้นำเทคนิคนี้ไปใช้ในการเล่นกีตาร์

การดีดแบบกวาด คือ การดีดไปในทิศทางเดียว (ขึ้นหรือลง) อย่างต่อเนื่อง ผ่านสายสองสาย ขึ้นไป และที่สำคัญคือทำให้เสียงโน้ต บนสายที่อยู่ติดกันแยกกันชัดเจน เพื่อให้แน่ใจว่า โน้ตไม่ดังพร้อมกัน เมื่อย้ายไปสายอื่น ให้ยกนิ้วออกจากเฟร็ตก่อนที่จะดีดสายต่อไป เทคนิคนี้ต้องมีการการประสานกัน ระหว่างมือที่ดีดและมือที่กดเฟร็ต

เทคนิคการเล่นกีตาร์ ที่สร้างเสียงที่ราบรื่นและลื่นไหล โดยการดีดแต่ละสายอย่างรวดเร็วด้วยการเคลื่อนไหวการดีดอย่างต่อเนื่อง ในขณะที่กดโน้ตต่าง ๆ บนเฟรตบอร์ดด้วยอีกมือ ใช้การดีดแบบเอียงข้ามสาย คล้ายกับการกวาดปิ๊กไปทั่วสาย วิธีนี้ช่วยได้เสียงที่ดีและเล่นได้รวดเร็ว (Joe, 2024)

สรุปได้ว่า การดีดแบบกวาด คือ การดีดไปในทิศทางเดียวกันทั้งขึ้นและลงอย่างต่อเนื่อง ผ่านสายไป และเสียงโน้ตแยกออกจากกันชัดเจน ทำให้เสียงที่ได้ลื่นไหล และราบรื่น และรวดเร็ว

2. เทคนิคการดีดสลับ (Alternate Picking)

เทคนิคการดีดแบบสลับ (Alternate Picking) คือ การใช้ปิ๊กดีดทั้งขึ้นและลงสลับกันอย่างต่อเนื่อง เป็นเทคนิคที่สำคัญ และประโยชน์มากกว่าการดีดแค่หัวลงอย่างเดียว เพราะการดีดทั้งขึ้นและลงช่วยให้สามารถเปล่งเสียงโน้ตได้ ทำให้เล่นได้เร็วขึ้น

การดีดสลับ (Alternate Picking) คือ การดีดสลับระหว่างหัวขึ้นและหัวลง (หรือลง-ขึ้น) เมื่อเปลี่ยนสายมีเทคนิคหลักอยู่ 2 แบบคือ “การดีดด้านใน” (Inside Picking) และ “การดีดด้านนอก” (Outside Picking) เป็นเทคนิคพื้นฐานในการเล่นกีตาร์ที่เกี่ยวข้องการดีดสายด้วยการดีด ขึ้น-ลง-ขึ้น-ลง เป็นการเคลื่อนไหวอย่างต่อเนื่อง ของการดีดด้วยการดีดสลับ ระหว่างขึ้นและลงเทคนิคนี้มีความสำคัญสำหรับการดีดสายกีตาร์ทั้งหมดอย่างสม่ำเสมอและเป็นพื้นฐานสำหรับเทคนิคการเล่นกีตาร์อื่น ๆ

สรุปได้ว่า การดีดสลับ คือ การดีดแบบสลับระหว่างการดีดขึ้นและดีดลง ไม่ใช่แค่การดีดขึ้นหรือดีดลงอย่างเดียว และการดีดสลับยังเป็นพื้นฐานสำหรับการเล่นเทคนิคอื่น ๆ อีกด้วย

3. เทคนิคการดีดแบบประหยัด (Economy Picking)

เมื่อดีดในสายเดียวกันให้ดีดสลับขึ้นลงแต่เมื่อดีดข้ามสาย สายต่อไปอยู่ต่ำกว่า สายปัจจุบันให้ดีดลงตลอด แต่ถ้าสายต่อไปอยู่สูงกว่าสายปัจจุบันให้ดีดขึ้นตลอด (ณป่าน พิชัยกุล, 2559)

เทคนิคการดีดแบบประหยัด (Economy Picking) เป็นเทคนิคการดีดกีตาร์ขั้นสูงที่ต่อยอดมาจากเทคนิคการดีดสลับ (Alternate Picking) เทคนิคนี้มีเป้าหมายเพื่อลดการดีดที่ไม่จำเป็นและเพิ่มประสิทธิภาพสูงสุดเมื่อเล่นโน้ตที่ต้องมีการเปลี่ยนสาย

Kevin (2019). ได้กล่าวว่า การใช้ทั้งการดีดลงและดีดขึ้นเมื่อเล่นบนสายเดียวกันแต่เมื่อเปลี่ยนสายการดีดจะต้องเป็นทิศทางเดียวกับการดีดก่อนหน้านี้

สรุปได้ว่า การดีดประหยัด คือ เทคนิคการดีดที่ใช้การดีดสลับ และการดีดแบบกวาดผสมกันในการดีด เวลาที่อยู่สายเดียวกันให้ใช้การดีดสลับ และเมื่อมีการดีดข้ามสายในการดีดให้ใช้การดีดตามทิศทางของการข้ามสาย ทำให้ลดการดีดที่ไม่จำเป็น และมีประสิทธิภาพมากขึ้นเมื่อเล่นโน้ตที่ต้องมีการเปลี่ยนสาย

4. เทคนิคการสไลด์ (Slide)

การสไลด์บนเฟร็ตบอร์ด (Fretboard Slide) เป็นเทคนิคที่นักกีตาร์นิยมใช้ เทคนิคนี้เกี่ยวข้องกับการใช้นิ้วเดียว (หรือหลายนิ้ว) เพื่อสไลด์โน้ตขึ้นหรือลงบนสายเดียวกัน ลักษณะพิเศษของเทคนิคนี้ คือ เสียงที่นิ้ว สร้างขึ้นขณะเลื่อนไปตามสาย สัมผัสกับเฟร็ตอื่น ๆ ขณะที่สไลด์ ยิ่งสไลด์มากเสียงเอฟเฟกต์ก็จะยิ่งชัดเจน เทคนิคนี้ช่วยให้หลุดออกจากกรอบเพนทาโทนิก (Pentatonic Box Shapes)

การเล่นสไลด์ คือการเล่นโน้ต 2 ตัวหรือมากกว่านั้น จากการดีดสายกีตาร์ครั้งเดียว เพียงแต่การเล่นโน้ตตัวที่ 1 ไปตัวที่ 2 จะมีการสไลด์ของนิ้วมือซ้าย โดยที่การสไลด์ สามารถเล่นได้ทั้งขาไป และขากลับ (Clifford, 2021)

สรุปได้ว่า การสไลด์ คือ เทคนิคที่ทำให้เกิดการเคลื่อนไหวของโน้ตในมือซ้ายทั้งขาขึ้นและขาลง เสียงที่เกิดขึ้นจากการที่นิ้วขยับไปตามสาย และสัมผัสกับเฟร็ต แทนที่จะเป็นการดีดโน้ตสองครั้ง เพื่อให้ได้สองเสียง ใช้การสไลด์แทนเพื่อให้เกิดเสียงการดีดที่น้อยลงและโน้ตมีความนุ่มนวลเสียงต่อเนื่องมากขึ้น

5. เทคนิคการเกี่ยวและตบสาย (Hammer On and Pull Off)

การเกี่ยวสาย (Hammer On) เริ่มต้นด้วยการดีดสาย ทั้งในรูปแบบของการกดเฟร็ตหรือการเล่นสายเปล่า จากนั้นใช้นิ้วมือเดียวกันแตะลงบนเฟร็ตที่สูงกว่าอย่างรวดเร็วด้วยแรงกดของนิ้วมือ จะทำให้สายสั่นสะเทือน และเกิดเสียงโน้ตที่สูงขึ้น

การตบสาย (Pull Off) เริ่มต้นด้วย การดีดสายที่กดเฟร็ตไว้ จากนั้นดึงนิ้วมือออกจากเฟร็ตอย่างรวดเร็ว การดึงนิ้วมือออกอย่างรวดเร็ว จะทำให้สายสั่นสะเทือนและเกิดเสียงโน้ตที่ต่ำลง

เทคนิคการเกี่ยวและตบสาย (Hammer On and Pull Off) เป็นเทคนิคที่ใช้บนเฟรตบอร์ดของกีตาร์ เพื่อเล่นโน้ตสองตัวหรือมากกว่านั้นติดต่อกันโดยไม่ต้องดีดสายอีกครั้งเทคนิคเหล่านี้เป็นเทคนิคที่สำคัญสำหรับการสร้างประโยคที่ให้เสียงราบรื่นและต่อเนื่อง

สรุปได้ว่า เทคนิคการตบสายและการเกี่ยวสายเป็นเทคนิคที่ใช้นิ้วมือซ้ายในการตบสายหรือการเกี่ยวสายเพื่อให้ได้ โน้ตที่มากกว่าสองตัวหรือมากกว่านั้นติดต่อกันโดยไม่ต้องดีดสายอีกครั้งเป็นเทคนิคที่ทำให้การสร้างประโยคมีความราบรื่นและต่อเนื่อง

6. เทคนิคการใช้นิ้วในการเล่นกีตาร์

วัชรินทร์ สุขทรัพย์ศรี (2559) ได้กล่าวว่า ทางนิ้ว คือ การเลือกใช้นิ้วที่เหมาะสมในการเล่น ดนตรีเป็นเทคนิคเฉพาะสำหรับเครื่องเล่นดนตรีแต่ละชนิดและเป็นหลักสำคัญในการปฏิบัติเครื่องดนตรี โดยมีวิธีการดังนี้

6.1 การเปลี่ยนตำแหน่งนิ้ว (Position Shifting) ทำให้มือซ้ายขยับไปได้หลายทิศทาง ผู้เชี่ยวชาญ แนะนำให้ใช้นิ้วโดยใช้สายเปิดเพื่อเพิ่มเวลาในการเปลี่ยนตำแหน่งมือ

6.2 เทคนิคการทาบสายควบ (Barre Technique) Ed Wilson.(2011) ได้กล่าวว่า คอร์ดบาร์เร (Barre Chords) คำว่า “บาร์เร” (Carre) ภาษาฝรั่งเศสแปลว่า “แท่ง” ซึ่งเกิดจากการใช้นิ้วชี้มือซ้ายเป็นแท่งเพื่อกดสายหลายสายบนเฟร็ตเดียวกัน ทำให้กลายเป็นเหมือนการสร้าง Nut ใหม่ขึ้นไปบนคอกีตาร์ นิ้วที่เหลืออีกสามนิ้วจะใช้สำหรับสร้างรูปทรงของคอร์ดการใช้บาร์เรเหล่านี้สามารถย้ายรูปทรงเหล่านี้ขึ้นลงบนเฟร็ตบอร์ดได้ ทำให้เล่นคอร์ดต่าง ๆ ได้เกือบทั่วทั้งคอกีตาร์ คอร์ดจะคงคุณภาพเดิม เมเจอร์ยังคงเป็นเมเจอร์ ไมเนอร์ยังคงเป็นไมนอร์ แต่เปลี่ยนทั้งระดับเสียงและชื่อ เทคนิคบาร์เรช่วยให้เล่นคอร์ดใดก็ได้โดยใช้รูปแบบเดียว หรือเล่นคอร์ดใดก็ได้โดยใช้หลายรูปแบบ นอกจากนี้ยังช่วยให้เล่นคอร์ดและสเกลบนเฟร็ตบอร์ดได้ทุกที่ผ่านระบบที่เรียกว่า CAGED

6.3 การยืดนิ้วมากเกินไป (Over Stretching Fingering) ส่งผลให้เกิดระยะห่างของนิ้ว มากเกินไป โดยใช้มือซ้ายที่ไม่ชิดกันและใช้โน้ตในสายเปิดเพื่อหลีกเลี่ยงปัญหาที่เกิดขึ้น

สรุปได้ว่า เทคนิคการเล่นกีตาร์ที่ดี เกิดจากการจัดระเบียบนิ้วที่ดีของมือซ้าย การเลือกใช้นิ้วให้เหมาะสมเพื่อที่การเคลื่อนไหวของนิ้วมือซ้ายจะได้มีความต่อเนื่อง ไม่ติดขัด และในส่วนของมือขวาควรจะวิเคราะห์ ว่าในแต่ละท่อนควรจะใช้เทคนิคไหน วางเทคนิคให้เหมาะสมกับโน้ตที่ จะต้องเล่นเพื่อที่การเล่นของมือซ้าย และมือขวาจะได้สอดคล้องกัน และเหมาะสมกับร่างกายของผู้เล่น

วิธีดำเนินการวิจัย

เครื่องมือที่ใช้ในการวิจัย

บทเพลง Being with You บทประพันธ์ของ จอร์จ เบ็นสัน ในอัลบั้ม In Your Eyes

การเก็บรวบรวมข้อมูล

บทเพลง Being with You บทประพันธ์ของ จอร์จ เบ็นสัน ผู้วิจัยเก็บข้อมูลประวัติ ผู้ประพันธ์และรูปแบบดนตรีที่ปรากฏในบทประพันธ์ต่างๆ จากบทเพลงอื่น ๆ ของ George Benson

การวิเคราะห์ข้อมูล

1. การวิเคราะห์บทเพลงเพื่อการบรรเลง

1.1 วิเคราะห์บทเพลงโดยใช้โน้ต Transcription จากเว็บไซต์ transcribemaster เพลง Being with You

1.2 เลือกใช้นิ้วที่เหมาะสม โดยพิจารณาจากประโยคจากบทเพลงที่ผู้วิจัยแบ่งวรรคตอนตามเห็นสมควร เพื่อหารูปแบบนิ้วและท่อนที่ยากที่ต้องการฝึกซ้อม

1.3 แนวคิดและวิธีการฝึกซ้อมบทเพลงทำนองสอดประสาน

2. วิเคราะห์เทคนิคการเล่นกีตาร์ที่ผู้ประพันธ์เลือกใช้ในบทเพลง

3. ทดลองปฏิบัติกับบทเพลงจริง

4. นำเสนอผลการวิเคราะห์

ผลการวิจัย

การวิเคราะห์เทคนิคการเล่นกีตาร์บทเพลง Being with You ผู้วิจัยได้นำเสนอในรูปแบบของโน้ตเพลงและแทบกีตาร์ (Tablature) เพื่อให้เห็นระบบการวางนิ้วมือซ้ายที่ชัดเจนยิ่งขึ้น โดยกำหนดหมายเลขต่าง ๆ ใช้เป็นสัญลักษณ์ ของการวางนิ้วมือซ้ายบนคอกีตาร์ เพื่อให้ข้อมูลมีเนื้อหาที่ชัดเจนขึ้น ได้แก่ เลข 1 หมายถึง นิ้วชี้, เลข 2 หมายถึง นิ้วกลาง, เลข 3 หมายถึง นิ้วนาง, เลข 4 หมายถึง นิ้วก้อย

สำหรับบทเพลง Being with You ศิลปิน จอร์จ เบ็นสัน มีความยาวของเพลง 3.54 นาที อยู่ใน Key B^b Major มีทั้งสิ้น 59 ห้อง โดยท่อนเพลงแบบ Ternary Form โดยมีการจัดวางรูปแบบท่อนเพลงดังนี้ A (Theme) A B A (Solo) A B A (Theme)

จากการวิเคราะห์สังคีตลักษณ์ในบทเพลงนี้ พบว่า เป็นสังคีตลักษณ์ โดยการใช้ทำนองหลักและการแปร (Theme and Variation) ในส่วนของทำนองหลัก มีการสร้างและพัฒนาทำนองหลักโดยใช้วิธีการซ้ำ (Repetition) โดยการขยายทำนองด้วยการซีเควนซ์ (Sequence) และขยายแนวคิดด้วยการสร้างทำนองใหม่ เพื่อการสร้างความแตกต่าง (Contrast)

ในส่วนของการแปรทำนอง พบว่า มีการแปรทำนองด้วยวิธีการอิมโพรไวซ์ (Improvisation) ในรูปแบบของคอรัส (Chorus) โดยมี 3 รูปแบบ ได้แก่ การเล่นแบบโน้ตแนวเดียว (Single Notes) การเล่นแบบขั้นคู่ (Octave) และการเล่นแบบบล็อกคอร์ด (Block Chord) มีวิธีการใช้การพัฒนาโมทีฟ (Motif) โดยยึดโครงสร้างของเสียงประสานควบคู่ไปกับแนวทำนองด้วยการใช้โหมด (Mode) บันไดเสียง (Scale) โครมาติก (Chromatic) อาร์เพจิโอ (Arpeggios)

ท่อน A ของทำนองหลัก ประกอบด้วยทั้งสิ้น 8 ห้อง ผู้ประพันธ์ใช้แนวทำนองที่มีความสัมพันธ์กับคอร์ดในแต่ละห้องเน้นใช้เทคนิคการสไลด์ (Guitar Slide) ซึ่งจะมีทั้งห่างระยะ 1 เสียงและ ครึ่งเสียง (Semitone Slide) ในห้องแรก ส่วนของห้องที่ 3 จะเป็นการสไลด์ ระยะห่าง 1 เสียงที่จังหวะที่ 1 และ 3

และมีเทคนิคการเกี่ยวสาย (Pull Off) โน้ตจากสาย 3 ช่อง 7 มา ช่อง 5 และสไลด์โน้ตโดยใช้นิ้ว 3 ไปกลับจากโน้ตที่สาย 3 ช่อง 5 ไปยัง ช่อง 7 และ สไลด์กลับมายังช่อง 5 และเล่นแบบเกี่ยวสาย (Pull Off) มาที่ช่อง 3 ส่วนมือขวาใช้เทคนิคการดีดสลับ (Alternate Picking)

ท่อน A ประกอบด้วยทั้งสิ้น 8 ห้อง คือห้องที่ 9-16 ผู้ประพันธ์ใช้แนวทำนองที่มีความสัมพันธ์ กับคอร์ดในแต่ละห้อง สำหรับท่อนนี้ จะเน้นการใช้เทคนิคการดีดแบบกวาด (Sweep Picking) และการดีดสลับ (Alternate Picking) และต้องมีเทคนิคฟิงเกอร์โรล (Finger Roll) เพื่อให้ง่ายต่อการเล่นได้อย่างต่อเนื่อง ในส่วนนี้ ควรจะเลือกใช้นิ้วที่เหมาะสม เพื่อให้สะดวกต่อการเล่นได้ต่อเนื่อง โดยการใช้ 1 นิ้ว ต่อ 1 ช่อง เรียงไป และมองรูปแบบ Blocking ของ โน้ตที่วิ่งไป โดยโน้ตแรกที่สาย 6 ช่อง 8 ให้ใช้นิ้ว 4 และโน้ตหลังจากนั้นมองตามช่อง โดยนิ้ว 3 อยู่ที่ช่อง 7 นิ้ว 2 อยู่ที่ ช่อง 6 นิ้ว 1 อยู่ที่ช่อง 5 อาจจะมีการยืดหยุ่นนิ้วในบางส่วน แล้วแต่สรีระของผู้เล่น และความถนัดที่แตกต่างกัน

ภาพที่ 1 แสดงการวางรูปแบบนิ้ว (Blocking)

ในห้องที่ 10 ส่วนของห้องที่ 11 จะมีการเล่นโน้ตข้ามสาย ห้องที่ 15 จะมีการเล่นโน้ตจากสาย 1 ช่อง 5 และมีการเล่นโน้ตสะบัดที่ช่อง 6 กลับมายังช่องที่ 5

ท่อน B ประกอบด้วยทั้งสิ้น 9 ห้อง คือ ห้องที่ 17-25 ห้องที่ 19 จะมีการเล่นโน้ตจากสาย 1 ช่อง 5 และมีการเล่นโน้ตสะบัดที่ช่อง 6 กลับมาช่องที่ 5 สำหรับห้องที่ 21-22 มีการเล่นโน้ตคู่แปด (Octave) ในการเล่นโน้ตคู่แปดตรงนี้ ผู้วิจัยเลือกใช้ นิ้ว 1 กับ นิ้ว 4 เพราะโน้ตมีระยะห่างที่ค่อนข้างไกล ส่วนมือขวาจะเป็นการใช้นิ้วในการเล่นโดยใช้วิธีการเก็บปิ๊ก

ท่อน A (Solo) ประกอบด้วยทั้งสิ้น 8 ห้อง คือ ห้องที่ 26-33 ในส่วนของห้องที่ 26-28 ผู้ประพันธ์ได้เน้นไปที่เทคนิคการสไลด์เป็นหลักมีการสไลด์ย้ำโน้ตเดิมซ้ำ ๆ หลายรอบ และตั้งแต่ห้องที่ 28-32 จะมีการเล่นเพนทาโทนิค (Pentatonic) ผสมกับอาร์เพจจิโอ (Arpeggio) ค่อนข้างเร็ว และมีการใช้เทคนิคการใช้ฟิงเกอร์โรล (Finger Roll) ในห้องที่ 29, และห้องที่ 31-32 ในท่อนนี้มือขวาจะใช้การดีดสลับ (Alternate Picking) เป็นหลัก

ท่อน A ประกอบด้วยทั้งสิ้น 8 ห้อง คือ ห้องที่ 34-41 สำหรับท่อนนี้จะมีการเล่นตั้งแต่โน้ตเดี่ยว (Single Note) โน้ตขั้นคู่ (Interval) และทรัยแอด (Triad) สลับกันไปมา และมีการสไลด์ผสมอยู่ด้วย ส่วนมือขวาจะใช้นิ้วในการเล่นทั้งหมด 4 นิ้ว นิ้วโป้ง, นิ้วชี้, นิ้วกลาง, นิ้วนาง นิ้วโป้งจะเล่นโน้ตที่เป็นเบสเป็นหลักที่สาย 6, 5, 4 ส่วนนิ้วชี้ จะเล่นที่สาย 3 นิ้วกลางเล่นที่สาย 2 นิ้วนางเล่นที่สาย 1 แต่บางจุดต้องขยับนิ้วชี้, นิ้วกลาง, นิ้วนางขึ้นมาจากสาย 3, 2 และ 1 ในห้องที่ 37 และ 40 และยังมีการกลับไปใช้ปิ๊กในจุดที่เป็นโน้ตเดี่ยว (Single Note) และต้องใช้ความเร็วในการเล่นในห้องที่ 37

ท่อน B ประกอบด้วยทั้งสิ้น 9 ห้อง คือห้องที่ 42-50 เป็นการเล่นเพนทาโทนิค (Pentatonic) ผสมกับบันไดเสียง (Scale) นิ้วในการเล่นท่อนรันนี้ จะเลือกรูปแบบการวางนิ้ว โดยแบ่งเป็นชุด แบ่งตาม ห้องเพลง เพื่อให้เกิดความคล่องตัว และง่ายต่อการจำ โดยวางนิ้ว 1 ช่อง ต่อ 1 นิ้ว มือขวาเล่นแบบดีดสลับ (Alternate Picking) และมีการเชื่อม Scale ด้วยเทคนิคการสไลด์ (Guitar Slide) และการเปลี่ยนตำแหน่งนิ้ว (Position Shifting) ในห้องที่ 43 และ รูปแบบการวางนิ้ว (Blocking) โดยเล่นโน้ตสาย 6 ช่อง 8 มาช่อง 6 และ 5 จนถึง ช่อง 3 ซึ่งระยะห่างของโน้ต ค่อนข้างไกล ผู้วิจัยจึงเลือกใช้นิ้ว 4 ในการเล่นโน้ตสาย 6 ที่ช่อง 8 นิ้ว 2 ที่ช่อง 6 และนิ้ว 1 ที่ช่อง 5 ตามภาพที่ 1

การเปลี่ยนตำแหน่งนิ้ว (Position Shifting) นิ้วชี้ไปยังช่องที่ 3 ห้องที่ 44, 45 และ 47 มีการเปลี่ยนตำแหน่งนิ้ว (Position Shifting) แบบเดียวกัน จะใช้ในจุดที่มีการเล่นโน้ต ในแต่ละชุดมากกว่า 3 ตัวขึ้นไป และการที่จะเล่นโน้ตนั้นด้วยวิธีการยืดนิ้วมากเกินไป (Over Stretching Fingering) ส่งผลให้เกิดระยะห่างของนิ้วมากเกินไป จึงเลือกใช้การเปลี่ยนตำแหน่งนิ้ว (Position Shifting) เพื่อที่นิ้วจะได้ยังคงความเป็น รูปแบบนิ้ว เป็นชุด และโน้ตที่เล่นออกมาจะได้มีความต่อเนื่อง และนิ้วไปต่อได้อย่างไม่ติดขัด

ท่อน A (Theme) ท่อนจบเพลง ประกอบด้วยทั้งสิ้น 9 ห้อง คือห้องที่ 51-59 ท่อนนี้ จะเน้นการเล่นอาร์เพจจิโอ (Arpeggio) กับบันไดเสียง (Scale) ผสมกัน ในห้องที่ 52-53 จะใช้ เทคนิคการดีดกวาด (Sweep Picking) และ การดีดสลับ (Alternate Picking) หรือจะใช้ เป็นการดีดประหยัด (Economy Picking) แทนกันก็ได้ 54-58 เน้นไปที่การดีดแบบสลับ (Alternate Picking) และห้องที่ 55 จะมีการเล่นโน้ตจากสาย 1 ช่อง 5 และ มีการเล่นโน้ตสะบัด (Grace Note) ที่ช่อง 6 กลับมายังช่องที่ 5 ในห้องที่ 57 จะมีการเล่นโน้ตอยู่ที่สาย 1 ช่อง และการเกี่ยวสาย (Pull Off) จากช่อง 6 กลับมาที่ช่อง 5 ส่วนห้องที่ 59 จะกลับมาที่การดีดสลับ (Alternate Picking) กับการดีดแบบกวาด (Sweep Picking)

สรุปและอภิปรายผล

เมื่อศึกษาเทคนิคการบรรเลงกีตาร์ที่ใช้ในเพลง Being with You ศิลปิน George Benson มีแบ่งการใช้เทคนิคการเล่น ดังนี้

สำหรับมือซ้าย การเล่นเสียงโน้ตและทำนองการใช้นิ้ว

1. เทคนิคการสไลด์ (Guitar Slide)
2. เทคนิคฟิงเกอร์โรล (Finger Roll)
3. การเปลี่ยนตำแหน่งนิ้ว (Position Shifting)

สำหรับมือขวา การบรรเลงเรื่องของจังหวะและการดีด

1. เทคนิคการเกี่ยวและตบสาย (Hammer On and Pull Off)
2. เทคนิคการดีดสลับ (Alternate Picking)
3. เทคนิคการดีดแบบกวาด (Sweep Picking)

4. เทคนิคการดีดแบบผสม (Hybrid Picking)

5. เทคนิคการดีดแบบประหยัด (Economy Picking)

จากการวิจัยพบรายละเอียดใน 2 ประเด็นที่ส่งผลต่อเทคนิคการเล่นกีตาร์ ดังนี้

ประเด็นที่ 1 การวิเคราะห์สังคีตลักษณ์

จากการวิเคราะห์สังคีตลักษณ์ในบทเพลงนี้ พบว่าเป็นสังคีตลักษณ์ โดยการใช้ทำนองหลักและการแปร (Theme and Variation) ในส่วนของทำนองหลัก มีการสร้างและพัฒนา ทำนองหลักโดยใช้วิธีการซ้ำ (Repetition) โดยการขยายทำนองด้วยการซีเควนซ์ (Sequence) และขยายแนวคิดด้วยการสร้างทำนองใหม่เพื่อการสร้างความแตกต่าง (Contrast)

ในส่วนของการแปรทำนอง พบว่า มีการแปรทำนองด้วยวิธีการอิมโพรไวซ์ (Improvisation) ในรูป แบบของคอรัส (Chorus) โดยมี 3 รูปแบบได้แก่ การเล่นแบบโน้ตแนวเดียว (Single Notes) การเล่นแบบขั้นคู่ (Octave) และการเล่นแบบบล็อคคอร์ด (Block Chord) มีวิธีการใช้การพัฒนาโมทีฟ (Motif) โดยยึดโครงสร้างของเสียงประสานควบคู่ไปกับแนวทำนองด้วยการใช้โหมด (Mode) บันไดเสียง (Scale) โครมาติก (Chromatic) อาร์เพจิโอ (Arpeggios)

ประเด็นที่ 2 เทคนิคการเล่นกีตาร์

เพลง Being with You ศิลปิน George Benson มีแนวคิด เทคนิคหรือองค์ประกอบสำคัญในการเล่นกีตาร์ ได้แก่

1. วิธีการเล่นของ George Benson มีอิทธิพลมาจาก เวส มอนต์โกเมอรี (Wes Montgomery) ในเรื่องของเทคนิคการใช้นิ้ว (Fingering) และการดีด (Picking)

2. เทคนิคการเล่นกีตาร์ที่พบบ่อยครั้งในเพลงคือ เทคนิคการสไลด์ (Guitar Slide)

3. การใช้การบรรเลงคีตปฏิภาณที่มีการผสมผสานระหว่างโหมด (Mode) อาร์เพจจิโอ (Arpeggios)

4. วิธีการเล่นหากมีการวางรูปแบบนิ้ว (Blocking) จะทำให้เล่นได้ง่ายขึ้นในหลายจุด

ประเด็นที่ 3 การวิเคราะห์คอร์ด และรูปแบบการวางนิ้ว

จากการวิเคราะห์รูปแบบทางเดินคอร์ด ส่งผลต่อรูปแบบการวางนิ้ว (Blocking) ทำให้มีการเล่นเพลง ได้สะดวกมากขึ้น ใช้นิ้วมือที่ใกล้กันได้ ทำให้เล่นเทคนิคต่าง ๆ ได้ง่ายขึ้น

นอกจากนี้ จากการศึกษาและวิเคราะห์ ส่งผลให้ผู้วิจัยเข้าใจถึงแนวทางบทเพลง Being with You มากยิ่งขึ้น และการพัฒนาศักยภาพในการบรรเลงเพลงแจ๊สในด้านต่าง ๆ ให้มีความลึกซึ้งสามารถนำไปใช้ในการบรรเลงกีตาร์ ในรูปแบบดนตรีแจ๊สต่อไปได้ ซึ่งเป็นจุดที่น่าสนใจของงานวิจัยเรื่องนี้ด้วย

ข้อเสนอแนะ

จากการดำเนินการศึกษาวิจัยในครั้งนี้ ผู้วิจัยขอเสนอแนะแนวคิด วิธีและเทคนิคการเล่น ผู้ที่สนใจหรือกำลังศึกษาเรื่องที่เกี่ยวข้องพิจารณาเพื่อนำไปวิเคราะห์เพิ่มเติม เช่น เรื่องความดังเบาของแนวทำนองในการบรรเลงในแต่ละท่อนเพลง ความสัมพันธ์กันระหว่างความดังเบากับทิศทางแนวทำนอง

สิ่งที่ได้จากการวิเคราะห์เพลง Being With You สามารถนำไปใช้งานในทางดนตรีได้หลากหลาย เช่น นำไปเป็นแนวคิดในการประพันธ์เพลง นำแนวคิดเรื่องคอร์ดไปผสมผสานในจังหวะอื่น ๆ รวมไปถึงสิ่งที่ได้ จากการวิเคราะห์การบรรเลงคีตปฏิภาณของ จอร์จ เบ็นสัน ที่สามารถนำไปพัฒนาความสามารถในการปฏิบัติการเล่นกีตาร์ได้

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งานวิจัยสร้างสรรค์บทประพันธ์ดนตรี: “ลมจากทิศใต้”

A Creative Musical Composition: "Wind from the South"

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บทคัดย่อ

งานวิจัยสร้างสรรค์บทประพันธ์ดนตรี “ลมจากทิศใต้” ได้รับแรงบันดาลใจจากเสียงในวัฒนธรรมดนตรีท้องถิ่นภาคใต้ของประเทศไทย ผสมผสานกับความเป็นดนตรีสมัยนิยมที่มีความทันสมัยเป็นสากล โดยดนตรีได้ทำหน้าที่เป็นสื่อทางวัฒนธรรมที่จับต้องไม่ได้ เพื่อสะท้อนจินตภาพของชื่อบทประพันธ์ “ลมจากทิศใต้” ซึ่งลมหมายถึงเสียงที่พัดพากลิ่นอายความเป็นภาคใต้ที่มาจากหลากหลายมุมมอง เช่น วิถีชีวิตของผู้คนในท้องถิ่น ดนตรี ประเพณี วัฒนธรรม การละเล่น อัตลักษณ์ทางภูมิศาสตร์ที่มีดินแดนติดทะเลเป็นส่วนใหญ่ ความเจริญการค้าขายทางทะเลที่มีมายาวนานตั้งแต่อดีต ความสวยงามของดินแดนใต้ที่มีทรัพยากรธรรมชาติทางทะเล หมู่เกาะต่าง ๆ ที่เป็นเสน่ห์ให้นักท่องเที่ยวทั้งชาวไทยและต่างชาติเดินทางมาเยือนอย่างไม่ขาดสาย

ผู้ประพันธ์จึงสะท้อนแนวคิดโดยนำทำนองเพลง “ฝรั่งยีแฮม” มาเป็นตัวแทนเล่าเรื่องในการมาเยือนของผู้คนต่างชาติในฐานะนักท่องเที่ยวที่ดำเนินชีวิตอยู่ท่ามกลางกลิ่นอายวัฒนธรรมภาคใต้ได้อย่างลงตัว บทประพันธ์นี้ได้ซ่อนองค์ประกอบของอัตลักษณ์ดนตรีใต้ เช่น เสียงฆ้องคู่ ทำนองปี่มโนราห์ จังหวะหน้าทับตะลุง หน้าทับมโนราห์ อยู่ภายในโครงสร้างทั่วทั้งบทเพลง โดยมีการเดินทำนองฝรั่งและพัฒนาทำนองในแต่ละท่อนด้วยวิธีการประพันธ์สมัยใหม่ ผู้วิจัยตั้งใจให้บทประพันธ์นี้มีลักษณะกลมกลืนไปด้วยกันอย่างแยกไม่ออก

บทประพันธ์ดนตรี “ลมจากทิศใต้” เป็นดนตรีบรรเลงไม่มีเนื้อร้อง ให้ความรู้สึกเป็นสากล ผ่านกระบวนการประพันธ์และวิธีการเรียบเรียงเสียงประสานตามหลักทฤษฎีดนตรีตะวันตก เพื่อให้ได้ภาพรวมของเสียงที่มีความสอดคล้องเข้ากันได้อย่างกลมกลืนในทุกมิติ ทั้งสัดส่วนจังหวะ ท่วงทำนองและเสียงประสาน ผู้วิจัยคาดหวังว่าแนวคิดและวิธีประพันธ์ในครั้งนี้จะเป็นแนวทางในการพัฒนาดนตรีในภาคใต้ของประเทศไทย ให้ก้าวหน้ามีความทันสมัยและเป็นสากลยิ่งขึ้น ผู้ฟังสามารถรับรู้และเข้าถึงดนตรีวัฒนธรรมท้องถิ่นใต้ได้มากขึ้น

คำสำคัญ: การประพันธ์ดนตรี, วัฒนธรรมดนตรีภาคใต้ของประเทศไทย, ฝรั่งยีแฮม

Abstract

The creative research project presents "Wind from the South" music composition. The composition inspiration from the sounds of local music culture in the southern region of Thailand, combined with popular music that is modern and international. Music has served as an intangible cultural medium to reflect the imagery of “Wind from the South” The wind refers to the sound that carries the southern flavor that comes from various perspectives, such as the way of life of local people, music, traditions, culture, games, and geographic identity with most of the land next to the sea. The prosperity of maritime trade has existed since ancient times. The beauty of the southern region with its natural marine resources and various islands is a charm for tourists, both Thais and foreigners, to visit continuously.

The composer therefore reflected the idea by bringing the song "Farang Yi Ham" to present stories about the visits of people who come to live in the culture in the south. This composition incorporates elements of Southern music identity, such as the sound of the double gongs and the melody of the Nora pipe. The rhythm of Thap Talung and Manohra is within the structure throughout the song. It follows a Western melody and develops the melody in each section using modern composition methods. The researcher intends for this piece to be blending together inseparably

The musical composition “Wind from the South” is a musical instrument with no lyrics. Gives an internationalization feel through the composition process and methods of arranging harmonies according to the principles of Western music theory. To get an overall of sound that is consistent and harmonious in every dimension. both rhythmic, melodies and harmonies. The researcher expects that the concepts and methods in this work will be a guideline for the development of music in the southern region of Thailand. To progress and become more modern and international Listeners can understand and have more access to southern local cultural music.

Keywords: Music Composition, Southern Thai Music Culture, Farang Yi Ham

บทนำ

วัฒนธรรมดนตรีของภาคใต้ มีความเป็นเอกลักษณ์บ่งบอกถึงความเป็นอยู่และวิถีชีวิตของผู้คนที่มีความหลากหลายทางวัฒนธรรมและศาสนาอยู่ร่วมกัน หรือที่เรียกว่า พหุวัฒนธรรม ผู้คนในภาคใต้จึงได้รับวัฒนธรรมดนตรีการแสดงและการละเล่น มาจากหลากหลายแหล่งรวมกันจนกลายเป็นอัตลักษณ์ที่บ่งบอกถึงความเป็นคนใต้ มีดนตรีเป็นมรดกทางวัฒนธรรมไทย พัฒนาและเปลี่ยนแปลงมาจากยุคสมัยต่าง ๆ ที่เปลี่ยนไป บ่งบอกถึงเอกลักษณ์และค่านิยมความรู้สึกที่ออกมาทางเสียงเพลง ทำนอง จังหวะและการประพันธ์เพลงของแต่ละบุคคลมีความแตกต่างกัน อาจจะมาจากการพัฒนาของดนตรีไทยในสังคมที่มีความเกี่ยวข้องกับการเมืองการปกครองหรือความต้องการ เพื่อตอบสนองผู้ฟังที่มีหลากหลาย ดนตรีและบทเพลงจึงมีความเชื่อมโยงกับวัฒนธรรมของสังคมไทย รวมทั้งบ่งบอกถึงวัฒนธรรมที่มีส่วนร่วมของ

อิทธิพลของตะวันตกและนานาชาติ ทำให้วัฒนธรรมดนตรีมีการเปลี่ยนแปลง รวมถึงเทคโนโลยีเทคโนโลยีและสื่อต่าง ๆ ที่เข้ามามีส่วนร่วมในปัจจุบัน ทำให้องค์ความรู้และผู้คนที่เข้าถึงดนตรีนั้นเกิดการพัฒนาและเปลี่ยนแปลงอย่างหลากหลาย บางส่วนอาจชอบทำนองหรือจังหวะบ่งบอกถึงวัฒนธรรมในแต่ละท้องถิ่นหรือดนตรีพื้นบ้าน ผ่านการถ่ายทอดผ่านครูบาอาจารย์ ศิลปิน หรือบุคคลต่างๆที่ประพันธ์เพลงออกมาให้มีความแตกต่างกัน รวมทั้งนำเอาเทคโนโลยี เข้ามาดัดแปลงแต่ยังคงถึงเสน่ห์ของวัฒนธรรมและดนตรีไทยเอาไว้ ซึ่งต่อยอดศิลปวัฒนธรรมการดนตรีให้คงอยู่ในฐานะ “มรดกภูมิปัญญาของชาติ” (กิตติชัย รัตนพันธ์, 2566)

พรรัตน์ ดำรุง (2563) ได้กล่าวว่า “โนราขึ้นบัญชีมรดกภูมิปัญญาทางวัฒนธรรมของชาติ ประจำปีพุทธศักราช 2552 ในสาขาศิลปะการแสดง และขึ้นทะเบียนเป็นรายการที่เป็นตัวแทนมรดกวัฒนธรรมที่จับต้องไม่ได้ของมนุษยชาติในปีพุทธศักราช 2564” โนราเป็นศิลปะการแสดงพื้นบ้านที่เป็นที่นิยมของคนในภาคใต้ องค์ประกอบหลักในการแสดงโนรา คือ เครื่องแต่งกาย และเครื่องดนตรีของโนราส่วนใหญ่เป็นเครื่องตีให้จังหวะ ประกอบด้วยทับ (โทนหรือทับโนรา) มี 2 ใบ เสียงต่างกันเล็กน้อย ใช้คนตีเพียงคนเดียวเป็นเครื่องตีที่สำคัญที่สุด เพราะทำหน้าที่คุมจังหวะและเป็นตัวนำในการเปลี่ยนจังหวะทำนองตามผู้รำกลองทำหน้าที่เสริมเน้นจังหวะและล้อเสียงทับ ปี่ โหม่ง หรือฆ้องคู่ ฉิ่ง และแตร

การประพันธ์เพลง คือ กระบวนการสะท้อนความรู้สึกของศิลปินสู่ผู้ฟัง โดยใช้สัญลักษณ์และเสียงเพื่ออธิบายความรู้สึกและบรรยายเรื่องราว ซึ่งปัจจุบันการผสมผสานวัฒนธรรมระหว่างโลกตะวันตกและตะวันออก ก่อให้เกิดแนวดนตรีและทฤษฎีการประพันธ์รูปแบบใหม่ เช่น ดนตรีอิเล็กทรอนิกส์ ระบบไร้กุญแจเสียง (ณรงค์ฤทธิ์ ธรรมบุตร, 2552)

ดังนั้นผู้วิจัยได้สร้างสรรค์บทประพันธ์ดนตรีที่แสดงถึงวัฒนธรรมประเพณี ในรูปแบบของดนตรีบรรเลงที่ทันสมัยเพื่อสืบสานศิลปวัฒนธรรมให้ยังคงอยู่ถึงปัจจุบัน โดยใช้ทำนองของเสียงฆ้องคู่ของภาคใต้ ทำนองปี่โนราของภาคใต้และเพลงฝรั่งยีแฮม เป็นองค์ประกอบในการประพันธ์ดนตรี

วัตถุประสงค์ของการวิจัย

1. เพื่อสร้างสรรค์บทประพันธ์ดนตรี โดยใช้อัตลักษณ์ดนตรีท้องถิ่นภาคใต้เป็นส่วนประกอบ
2. เพื่อเป็นแนวทางในการพัฒนาดนตรีบรรเลงในภาคใต้

ประโยชน์ที่คาดว่าจะได้รับ

1. มีผลงานประพันธ์ดนตรีบรรเลงที่ผสมอัตลักษณ์ความเป็นท้องถิ่นใต้เฉพาะตัว
2. เพิ่มการรับรู้และเข้าถึงดนตรีวัฒนธรรมท้องถิ่นใต้

แนวคิด ทฤษฎี กรอบแนวคิด

1. วัฒนธรรมดนตรีภาคใต้

“วัฒนธรรม” หมายถึง “วัฒนา” ที่มีความหมายว่า ความเจริญรุ่งเรืองในขณะนั้น และคำว่า “ธัม” มีความหมายว่า การกระทำหรือการปฏิบัติ เมื่อนำคำทั้งสองมารวมกัน หมายถึง การกระทำที่เติบโต วัฒนธรรมจึงครอบคุมทุกด้านที่มนุษย์สร้างขึ้นไม่ว่าจะเป็นนามธรรมหรือเป็นรูปธรรม นอกจากนี้ยังหมายถึงรูปแบบพฤติกรรมของสังคมจากอดีตที่ผ่านการเรียนรู้ การประดิษฐ์ การปรับตัว เพื่อตอบสนองความต้องการและการพัฒนาการดำรงชีวิตอย่างเป็นระบบเพื่อสร้างการเติบโต วัฒนธรรมและวิถีชีวิตของภาคใต้มีความหลากหลาย เช่น ด้านความเชื่อทางศาสนา การนับถือศาสนาพุทธและอิสลาม ในส่วนของ

ชาติพันธุ์ที่อาศัยอยู่ร่วมกันทั้งชาวไทยพุทธ ไทยมุสลิม จีน จีน-มาลายู (ยะหยา) การแต่งกายที่มีลักษณะแตกต่างกัน นอกจากนี้ภาคใต้ยังเป็นศูนย์รวมศิลปะการแสดงที่สนุกสนาน คึกคัก เร้าใจ เช่น การแสดงหนังตะลุง มโนราห์ ลิเกฮูลู และรองเง็ง เครื่องดนตรีของภาคใต้ที่ใช้ประกอบการแสดงมีอยู่ 3 ประเภทหลัก ๆ คือ 1.) ประเภทตี เช่น ทับ เป็นกลองทำด้วยไม้เนื้อแข็งขึงด้วยหนังสัตว์หน้าเดียวมีหลายขนาดใช้บรรเลงประกอบการแสดงหนังตะลุง เรียกว่า ทับหนัง 2.) ประเภทเป่า เช่น “ปี่ต้น” นิยมใช้บรรเลงประกอบการแสดงมโนราห์สมัยโบราณ “ปี่กลางหรือเรียกว่าปี่หนังตะลุง” ใช้ประกอบการแสดงหนังตะลุงและมโนราห์ในปัจจุบัน ลักษณะทำด้วยไม้เนื้อแข็งเจาะรูยาวตลอดตัวปี่ มีรูสำหรับเปิดปิดเพื่อเปลี่ยนระดับเสียง 3.) ประเภทสี ได้แก่ “ซอด้วง” ชาวใต้บางกลุ่มเรียกว่า “ซออี้” ใช้บรรเลงประกอบการแสดงมโนราห์และหนังตะลุง ลักษณะเหมือนซอด้วงของภาคกลางแต่กะโหลกซอจะใหญ่กว่า มีสองสายเช่นเดียวกัน (กรมส่งเสริมวัฒนธรรม กระทรวงวัฒนธรรม, 2559)

2. มโนราห์

โนรา หรือ มโนราห์ เป็นศิลปะการแสดงอันเก่าแก่ของชาวภาคใต้ที่รู้จักกันอย่างแพร่หลาย นับเป็นมรดกทางวัฒนธรรมที่ชาวใต้ได้ร่วมกันสร้างสรรค์ขึ้นมา สะท้อนให้เห็นถึงวิถีชีวิตและสังคม จึงมีความผูกพันกับวิถีความเป็นอยู่ของชาวบ้านมาอย่างยาวนาน การแสดงโนราแบ่งออกได้ 2 ประเภท คือ โนราที่ใช้การแสดง และโนราที่ใช้ในพิธีกรรม หรือที่เรียกว่า “โนราลงครู หรือ โนราโรงครู” เครื่องดนตรีที่ใช้มีปี่อ้อ 1 เลา กลองตุ๊ก 1 ใบ ฆ้อง 2 ใบ เพลงที่ใช้ในการแสดงมโนราห์ประกอบด้วย เพลงโหมโรง เพลงบรรเลง เพลงเพลงประกอบรำ เพลงประกอบท่าเดิน เพลงขึ้นเครื่อง เพลงลงเครื่อง บันไดเสียงที่ใช้คือ โด ฟาและซอล รูปแบบของทำนองเพลงจะเป็นทำนองแบบสูงขึ้นและต่ำลง สลับกันแบบฟันปลา ลักษณะของหน้าทับและจังหวะถือเป็นส่วนสำคัญและเป็นจุดเด่น มีการผสมผสานระหว่าง ฉิ่ง ฆ้อง กลองตุ๊กและทับ ในรูปแบบจังหวะที่เร็วและช้าสลับกัน (สิงห์คม บริสุทธิ์, 2562)

3. เพลงฝรั่งยีแฮม

เพลง “ฝรั่งยีแฮม” หรือฝรั่ง Hymn มาจากภาษาอังกฤษ “Hymn” ซึ่งเป็นชื่อเพลงสวดหนึ่งที่ใช้ในศาสนาคริสต์ บทเพลงนี้มีการบันทึกว่ามีการบรรเลงในฉบับไทยให้แก่ “ดยุก โยฮันอัลเบิร์ต (Duke John Albert) แห่งเยอรมนี ขณะที่มาเยือนสยามใน พ.ศ.2542 ในการบรรเลงครั้งนั้นปรากฏว่า มจ.จงจิตรถนอม ดิศกุล ได้เข้าร่วมฟังอยู่ด้วยและในเวลาต่อมายังได้จดบันทึกไว้ในเรื่อง “การรับตุ๊กโยฮันอัลเบรกต์ ร.ศ. 238” พิมพ์อยู่ในหนังสือพระราชนิพนธ์ ที่ระลึกในงานฉลองพระชันษา ครบ 84 พรรษา ซึ่งมีความตอนหนึ่งกล่าวถึงเพลงไทยสำเนียงฝรั่งเศสนี้โดยให้ชื่อเพลงว่า “เพลงฝรั่งแดแฮม” ไว้ดังนี้ “เพลงฝรั่งแดแฮม จากที่ มจ.จงจิตรถนอม ดิศกุล ได้ฟังเมื่อคราวยังพระเยาว์ ท่านทราบแต่เพียงว่าเป็นเพลงที่มีสำเนียงเป็นสำเนียงฝรั่งจนกระทั่งวันหนึ่ง มจ.มารยาตรกัญญา ดิศกุล ได้นำเนื้อร้องเพลง “ฝรั่งแดแฮม” ทูลถามสมเด็จพระเจ้าบรมวงศ์เธอ กรมพระยาดำรงราชานุภาพว่าเป็นเพลงอะไร สมเด็จพระเจ้าบรมวงศ์เธอ กรมพระยาดำรงราชานุภาพ จึงได้ตอบผู้เป็นลูกสาวว่า ในขณะที่จหมื่นสรรเพชรภักดีได้เป็นอุปทูต ในคณะราชสำนักของพระบาทสมเด็จพระจอมเกล้าเจ้าอยู่หัว มีพระยามนตรีศรีสุริยวงศ์เป็นราชทูต นำเครื่องมงคลบรรณาการไปเจริญพระราชไมตรีกับสมเด็จพระบรมราชินีนาถวิคตอเรีย (Queen Victoria) และยังมีโอการได้เข้าชมพิธีแต่งงานของเจ้าชายเฟรดดริควิลเลียม (Prince Frederick William) กับเจ้าหญิงวิลเลียม (Princess William) ณ โบสถ์ชาเปลรอยัล (Chapel Royal Church) ดูจากรายละเอียดหมายเหตุ เป็นเพลงที่มาจากเพลงสวด เพลง The Heavenly Bride-Groom เพราะเป็นเพลงสวดที่ใช้ในงานแต่งงาน และสำนวนภาษาก็เป็นคำร้องตามลีลาการสวดในนิกายโปรเตสแตนท์ ซึ่งเป็นนิกายประจำราชวงศ์อังกฤษ” (อติภพ ภัทรเดชไพศาล, 2560)

สุกรี เจริญสุข (2564) ได้กล่างถึงที่มาของ “เพลงฝรั่งยีแฮม” ในการแสดงออร์เคสตรา ชุดการแสดงเสียงอดีตสร้างจินตนาการภาพโบราณ เล่นเพลงอยุธยาหน้าวัดพระราม วันที่ 12 กุมภาพันธ์ พ.ศ. 2564 ได้กล่าวว่า เพลงฝรั่งยีแฮม อยู่ในวงปี่พาทย์ในสมัยกรุงศรีอยุธยา โดยในสมัยนั้นกรุงศรีอยุธยามีโบสถ์คริสต์อยู่หลายแห่งที่ดูแลโดยชาวโปรตุเกส ชาวฮอลแลนด์และชาวฝรั่งเศส ในพิธีการแต่งงานของชาวคริสต์จะมีการใช้เพลงสวดประกอบพิธี โดยใช้เพลง The Heavenly Bride-Groom เมื่อวงปี่พาทย์ของไทยได้ฟัง จึงนำไปแปลทำนองจนกลายเป็น “เพลงฝรั่งยีแฮม”

วิธีดำเนินการวิจัย

1. ศึกษาบทเพลงวัฒนธรรมท้องถิ่นภาคใต้ มีขั้นตอนดังนี้

1.1 ศึกษาดนตรีตะลุง มโนราห์ จากการสืบค้นบทความและฟังจากอินเทอร์เน็ต นำมาใช้เป็นองค์ประกอบเพื่อสร้างสรรค์บทประพันธ์ดนตรี “ลมจากทิศใต้” ได้แก่ ทำนองฆ้องคู่ ทำนองขึ้นหัวปี่ จังหวะหน้าทับโนราทำบท มาเขียนเป็นโน้ตสากลผ่านโปรแกรม Sibelius

1.2 กำหนดทำนองหลัก โดยเลือกทำนองเพลง “ฝรั่งยีแฮม” จากที่ได้ศึกษาประวัติความเป็นมาความน่าสนใจ ช่วงเสียง นำมาใช้เป็นทำนองหลักและพัฒนาทำนองต่อยอด โดยทำนองนี้มีลักษณะที่จดจำได้ง่าย เหมาะที่จะนำมาทำเป็นเพลงบรรเลงสมัยนิยม

2. กำหนดโครงสร้างการประพันธ์ดนตรี

โครงสร้างประกอบด้วยท่อนหลักทั้งหมด 4 ท่อน เรียกว่าท่อน A-B-C-D แต่ละท่อนมีการเลือกใช้องค์ประกอบที่แตกต่างกัน โดยองค์ประกอบในโครงสร้างตั้งแต่ท่อน A-B-C ถูกพัฒนาให้มีลักษณะผสมผสานเข้าด้วยกันและปรากฏอีกครั้งในท่อน D

3. ศึกษาช่วงเสียง ทำนอง และลักษณะเด่นที่เกิดขึ้นบ่อยในดนตรีประกอบการแสดงมโนราห์ และตะลุง เพื่อนำมาใช้เป็นแนวคิดในการกำหนดบันไดเสียง และโครงสร้างคอร์ด

4. ประพันธ์ดนตรีด้วยวิธีการพิมพ์โน้ตผ่านโปรแกรม Sibelius

5. นำโน้ตที่ได้จากโปรแกรม Sibelius แปลงเป็นไฟล์มาตรฐานสำหรับการใส่รหัสเสียงรูปแบบดิจิทัล (midi) นำเข้าสู่โปรแกรม Logic Pro เพื่อทำขั้นตอนการบันทึกเสียง จัดวางสมดุลเครื่องดนตรีในท่อนต่าง ๆ รวมถึงการปรับปรุงคุณภาพเสียงในขั้นตอนสุดท้าย

ผลการวิจัย

1. แนวคิดโครงสร้างบทประพันธ์ดนตรี “ลมจากทิศใต้”

ผู้วิจัยมีแนวคิดในการสร้างสรรค์บทประพันธ์ดนตรีบรรเลง โดยกำหนดสังคีตลักษณ์แบ่งออกเป็น 4 ท่อน ประกอบด้วยท่อน A-B-C-D และมีอัตราจังหวะ 4/4 สอดคล้องกับลักษณะที่มักพบได้ทั่วไปในดนตรีท้องถิ่นใต้ เช่น ตะลุง มโนราห์ ใช้อัตราความเร็ว 86 bpm กำหนดให้อยู่บนกุญแจเสียง D เมเจอร์ สัดส่วนจังหวะนำมาจากองค์ประกอบเด่นในดนตรีตะลุง มโนราห์ เช่น สัดส่วนหน้าทับกลอง สัดส่วนทำนองปี่ โน้ต และจังหวะจากฆ้องคู่

2. แนวคิดการสร้างสรรค์ทำนองหลัก

ผู้วิจัยยืมทำนองจากบทเพลง “ฝรั่งยีแฮม” มาดัดแปลงทำนองและขยายทำนอง โดยใช้ทรัมเป็ตและ อัลโตแซ็กโซโฟน เป็นเครื่องดนตรีดำเนินทำนอง

ภาพที่ 1 แสดงทำนองหลักที่ยืมจากเพลง “ฝรั่งยีแฮม”

3. แนวคิดการสร้างสรรค์ทำนองรอง

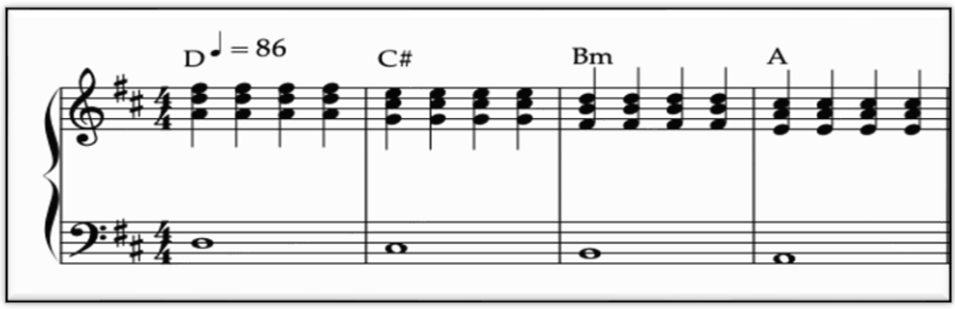
ผู้วิจัยใช้องค์ประกอบที่ได้จากดนตรีมโนราห์ ที่เรียกว่า “ขึ้นหัวปี่” มาดำเนินทำนองประสาน และพัฒนาทำนองย่อยในบทประพันธ์ โดยใช้ทรัมเป็ต และ อัลโตแซ็กโซโฟน เป็นเครื่องดนตรีหลักดำเนินทำนอง

ภาพที่ 2 แสดงทำนองรองบทเพลง “ลมจากทิศใต้”

4. แนวคิดการดำเนินคอร์ด “ลมจากทิศใต้”

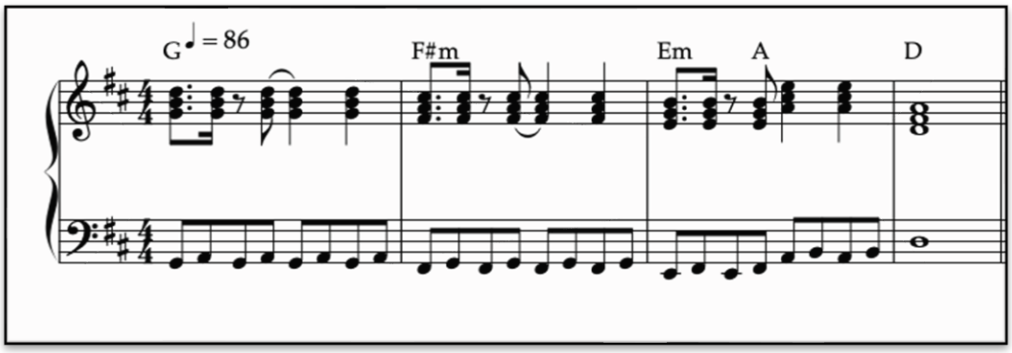
เนื่องจากบทประพันธ์ “ลมจากทิศใต้” มีจุดประสงค์ที่ต้องการให้มีความเป็นบทเพลงบรรเลงในแนวสมัยนิยมที่มีความทันสมัย แต่ยังคงสอดแทรกเอกลักษณ์ของดนตรีใต้ ผู้วิจัยจึงเลือกใช้กลุ่มโน้ตบนกุญแจเสียง D เมเจอร์ ซึ่งมักพบในวัฒนธรรมดนตรีท้องถิ่นใต้ โดยใช้คอร์ดประเภททรัยแอด ซึ่งแต่ละคอร์ดประกอบไปด้วยกลุ่มโน้ต 3 ตัว มีทางเดินคอร์ด ดังนี้

ท่อน A และ ท่อน B ใช้การดำเนินคอร์ดตามลำดับดังนี้ I - vii – vi – V



ภาพที่ 3 แสดงการดำเนินคอร์ดในท่อน A และท่อน B

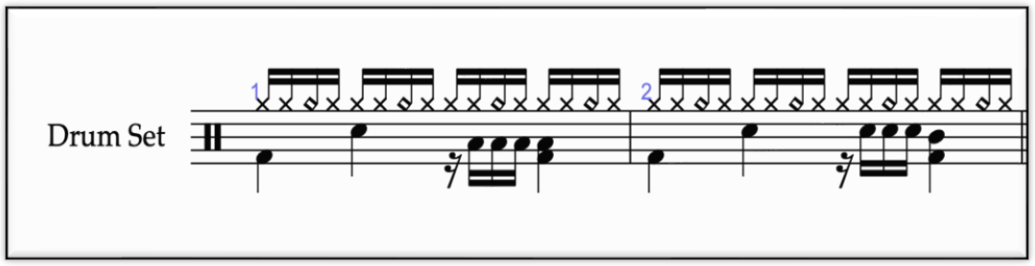
สำหรับการเดินคอร์ดในท่อน C ใช้คอร์ดตามลำดับ ดังนี้ IV – iii – ii – V – I



ภาพที่ 4 แสดงการดำเนินคอร์ดในท่อน C

5. แนวคิดการในประพันธ์จังหวะ

ผู้วิจัยใช้องค์ประกอบที่ได้จากดนตรีมโนราห์ ที่เรียกว่า “จังหวะหน้าทับโนราทำบท” โดยปกติจะใช้กลองตุ๊กในการบรรเลง ในการประพันธ์งานชิ้นนี้ได้นำรูปแบบของจังหวะหน้าทับโนราทำบทบนกลองตุ๊กมาประยุกต์ให้กลองชุดบรรเลงแทน



ภาพที่ 5 แสดงการใช้ “จังหวะหน้าทับโนราทำบท” บนกลองชุด

6. ภาพรวมผลงานประพันธ์ดนตรี “ลมจากทิศใต้”

ท่อน A ได้นำอัตลักษณ์ของดนตรีมโนราห์ที่เป็น “ทำนองฆ้องคู่” มาเป็นองค์ประกอบเริ่มต้นในการประพันธ์ โดยทำนองนี้เป็นเสียงที่คุ้นเคยได้ยินบ่อยในดนตรีท้องถิ่นใต้ ทำนองฆ้องคู่ปรากฏครั้งแรกในท่อน A ช่วงนำเสนอตั้งแต่ห้องที่ 1- 16

ท่อน B ห้องที่ 17-32 เครื่องดนตรีที่ใช้ในการบรรเลงได้แก่ เปียโน กลองชุด กีตาร์เบสไฟฟ้า อัลโตแซกโซโฟนและทรัมเป็ต โดยให้อัลโตแซกโซโฟนบรรเลงทำนองหลัก การปรากฏของโน้ตในห้องที่ 19 เป็นโน้ตที่เกิดจากการนำเสียงปี่ที่มีลักษณะเป็นทำนองเด่นของดนตรีท้องถิ่นใต้มาใช้ ทำนองนี้เรียกว่า “ขึ้นหัวปี่” โดยกำหนดให้ทรัมเป็ตเป็นผู้บรรเลงทำนอง มีการสอดแทรกจังหวะด้วยกลองชุด ในส่วนของทำนองฆ้องคู่ยังคงปรากฏในท่อน B มีลักษณะเป็นทำนองประสานอยู่เบื้องหลัง ใช้เปียโนในการดำเนินทำนอง พัฒนาสัดส่วนจังหวะเปลี่ยนไปอย่างช้า ๆ

ท่อน C ห้องที่ 33-56 เครื่องดนตรีที่ใช้ในการบรรเลงได้แก่ เปียโน กลองชุด กีตาร์เบสไฟฟ้า อัลโตแซกโซโฟนและทรัมเป็ต ในท่อน C ปรากฏทำนองเพลง “ฝรั่งยีแฮม” ครั้งแรกอย่างชัดเจน โดยดำเนินทำนองแบบถาม-ตอบ มีการประสานเสียงแบบตะวันตกผสมผสานทำนอง “ขึ้นหัวปี่” และ

“ทำนองฆ้องคู่” โดยผู้วิจัยได้ดัดแปลงให้มีความเป็นดนตรีบรรเลงแบบสมัยนิยมมากขึ้น ในการบรรเลงในท่อน C สื่อถึงความสนุกสนาน ครึกครื้น

ท่อน D ห้องที่ 57-64 เครื่องดนตรีที่ใช้บรรเลง ได้แก่ เปียโน กลองชุด และทรัมเป็ต ซึ่งในท่อน D มีทำนองที่พัฒนามาจาก “ฝรั่งยีแฮม” เป็นทำนองใหม่ ดำเนินทำนองด้วยทรัมเป็ต และมีการใช้ “จังหวะหน้าทับโนราทำบท” เข้ามาเสริม โดยประยุกต์สัดส่วนจังหวะที่บรรเลงบนกลองชุดผสานเข้าสู่จังหวะหน้าทับ ภาพรวมการพัฒนาในท่อน D มีการอ้างอิงคอร์ดจากท่อน A และในช่วงสุดท้ายของท่อนจะเชื่อมกลับไปสู่ดนตรีในท่อน B อีกครั้ง

สรุปและอภิปรายผล

1. จากการศึกษาทำนองของบทดนตรีท้องถิ่นใต้ ผู้วิจัยได้นำองค์ประกอบจาก “ทำนองฆ้องคู่” เสียง “ขึ้นหัวปี่” สัดส่วน “จังหวะหน้าทับโนราทำบท” และทำนองบทเพลง “ฝรั่งยีแฮม” มาใช้สร้างสรรค์บทประพันธ์ ทำให้ผู้วิจัยซาบซึ้งถึงความเป็นมาของวัฒนธรรมภาคใต้ สิ่งที่น่าสนใจที่พบระหว่างสืบค้นดนตรีท้องถิ่นใต้และบทเพลง “ฝรั่งยีแฮม” คือ เพลงทั้งสองบทมีประวัติที่มาสืบทอดกันมาอย่างยาวนานและยังคงอยู่ในปัจจุบัน จึงเป็นผลดีที่ทำให้วัฒนธรรมนี้ยังคงอยู่ต่อไป

2. การประพันธ์ดนตรี “ลมจากทิศใต้” ประสบผลสำเร็จตามวัตถุประสงค์ที่ได้กำหนดไว้อย่างสมบูรณ์ เป็นบทประพันธ์ที่สร้างสรรค์จากการผสมผสานวัฒนธรรมดนตรีพื้นบ้านภาคใต้ โดยนำเพลง “ฝรั่งยีแฮม” มาเรียบเรียงแก้ไข พัฒนา สามารถอธิบายด้านทฤษฎีดนตรีที่ผสมผสานอยู่ในบทประพันธ์ได้อย่างชัดเจน

3. การสร้างสรรค์ดนตรีบรรเลงร่วมสมัยครั้งนี้ จึงเป็นแนวทางใหม่ที่ผสมผสานดนตรีตะวันตกเข้ากับดนตรีพื้นบ้านภาคใต้ เป็นบทเพลงร่วมสมัยที่ส่งเสริมให้เกิดสุนทรียภาพในการฟังดนตรี

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แคปชั่นเสี่ยวเกี่ยวกับกีฬา: การใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์
Cheesy Messages about Sports: a Communicative Language of Teenagers in Social Media

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บทคัดย่อ

บทความนี้มุ่งศึกษาลักษณะการใช้ภาษาเพื่อการสื่อสารและบทบาทหน้าที่ของคติชนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ ใช้วิธีการวิจัยทางภาษาและคติชนวิทยา เลือกศึกษาด้วยการสืบค้นคำว่า “แคปชั่นกีฬา” ใน www.google.com ตั้งแต่วันที่ 1 มกราคมจนถึง 31 ธันวาคม พ.ศ. 2566 รวมระยะเวลา 1 ปี โดยเก็บข้อมูลจากเว็บไซต์ออนไลน์ที่ได้รับความนิยมเข้าชมสูงสุด พบแคปชั่นเสี่ยวเกี่ยวกับกีฬาจำนวน 162 แคปชั่น ผลการวิจัยพบลักษณะการใช้ภาษาเพื่อการสื่อสาร 6 ลักษณะ ได้แก่ 1. การใช้คำคล้องจอง 2. การเล่นคำซ้ำ 3. การใช้คำเปรียบเทียบ 4. การสร้างคำใหม่ 5. การเปลี่ยนแปลงการสะกดคำ 6. การทับศัพท์ภาษาอังกฤษ ส่วนบทบาทหน้าที่ของคติชนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาพบ 2 บทบาทหน้าที่ ได้แก่ 1. บทบาทหน้าที่ด้านการอบรมสั่งสอน ในเรื่องของคุณลักษณะและคุณสมบัติของการเป็นนักกีฬาที่ดี เรื่องของการดำเนินชีวิตและความเป็นอยู่ในสังคม และเรื่องของการประกอบอาชีพและความสำเร็จ 2. บทบาทหน้าที่ด้านการระบายความรู้สึกของมนุษย์ นอกจากนี้ยังพบว่า แคปชั่นเสี่ยวเป็นผลผลิตทางวัฒนธรรมทางภาษาของกลุ่มชนรุ่นใหม่ที่แสดงถึงการสร้างสรรค์ การปรับประยุกต์ใช้ และการส่งต่อข้อมูลเฉพาะกลุ่มเพื่อการสื่อสารร่วมกันในบริบทสังคมวัฒนธรรมร่วมสมัย

คำสำคัญ: แคปชั่นเสี่ยว, การใช้ภาษาเพื่อการสื่อสาร, สื่อสังคมออนไลน์, บทบาทหน้าที่ของคติชน

Abstract

This research proposes to study the nature of language use for communication and the functions of folklore through cheesy messages about sports among teenagers on social media. Using research methods by searching for the word “sports captions” on www.google.com from January 1 to December 31, 2023, a total of 1 year was collected from the most popular and visited online websites. the results of the study found 162 captions of cheesy messages about sports, which showed six characteristics of using

language for communication: 1. Using rhyming words 2. Using the word repeat (Reduplication) 3. Using metaphors 4. Creating new words 5. Spelling changes 6. English transliteration. As for the functions of folklore through cheesy messages about sports, two functions were found: 1. The functions of teaching about the characteristics and qualities of being a good athlete, matters of lifestyle and living in society, and matters of occupation and success. 2. The functions of expressing human feelings. In addition, it was found that cheesy messages are a product of the linguistic culture of the new generation, which shows creativity, application adjustment, and forwarding of group-specific information for joint communication in the contemporary social and cultural context.

Keyword: Cheesy Messages, Language usage for communication, Social Media, Functions of folklore

บทนำ

“95 แคปชั่นกีฬากวน ๆ แคปชั่นโดน ๆ แคปชั่นเด็ด ๆ สำหรับคอกีฬา ชาวเน็ตสายสปอร์ต” (สนุกดอทคอม, 2566) **“แคปชั่นแฟนนักกีฬา แคปชั่นแฟนนักบอล สำหรับคนคลั่งรัก แคปชั่นใหม่ล่าสุด 2023”** (ทรูไอดี, 2566) และ **“100 แคปชั่นกีฬากวน ๆ ฮา ๆ 2566 ปล่อยมุกไว้เรียกรอยยิ้ม!”** (นานิทอล์ค, 2566) จากตัวอย่างพาดหัวข่าวเกี่ยวกับ “แคปชั่นกีฬา” ที่ปรากฏผ่านเว็บไซต์ออนไลน์ที่ได้รับความนิยมสูงสุดจากการเข้าชม และมีการส่งต่อหรือแชร์ (share) ข้อมูลเกี่ยวกับแคปชั่นผ่านทางสื่อสังคมออนไลน์ เช่น เฟซบุ๊ก (Facebook) ทวิตเตอร์ (Twitter) อินสตาแกรม (Instagram) ติ๊กต็อก (TikTok) นั้น พบว่าในปัจจุบันการใช้ “แคปชั่น” เพื่อการสื่อสาร หรือการใช้ถ้อยคำบรรยายประกอบรูปภาพเพื่อโพสต์ผ่านทางสื่อสังคมออนไลน์ดังที่กล่าวไป ได้รับความนิยมอย่างมากในทุกกลุ่มชน โดยเฉพาะอย่างยิ่งใน “กลุ่มวัยรุ่น” หรือ “กลุ่มคนรุ่นใหม่” ซึ่ง “สาร” หรือข้อมูลที่ส่งผ่านแคปชั่นมีหลากหลายประเด็น เช่น แคปชั่นความรัก แคปชั่นธรรมชาติ แคปชั่นคาเฟ่ แคปชั่นการเรียน แคปชั่นสู้ชีวิต แคปชั่นตลก แคปชั่นกีฬา และแคปชั่นอื่น ๆ ซึ่งถือว่า “แคปชั่น” เป็นอีกหนึ่งวิธีการที่น่าสนใจสำหรับการใช้ภาษาเพื่อการสื่อสารของกลุ่มชนในบริบทสังคมวัฒนธรรมร่วมสมัย

ทั้งนี้ ผู้วิจัยในฐานะ “อาจารย์” ผู้สอนรายวิชาการใช้ภาษาไทยและภาษาอังกฤษเพื่อการสื่อสารในมหาวิทยาลัยการกีฬาแห่งชาติ วิทยาเขตสุโขทัย ซึ่งเป็นสถาบันการศึกษาด้านการกีฬาที่มุ่งเน้นตามปรัชญาของสถาบันที่ว่า “พลศึกษาและกีฬา พัฒนาคน พัฒนาชาติ” นั้น อีกทั้งยังได้เห็นถึงการใช้ “แคปชั่น” เพื่อการสื่อสารของนักศึกษา โดยเฉพาะ “แคปชั่นกีฬา” ผ่านทางสื่อสังคมออนไลน์ กอปรกับการพิจารณาถึงเนื้อหาสาระสำคัญของแคปชั่นกีฬาพบว่าเป็นการใช้ถ้อยคำที่ชวนให้เกิดความเลี่ยนหรือการเล่นมุกเชย รวมไปถึงการเล่นมุกจีบเพื่อเกี้ยวพาราสีซึ่งกันและกัน และยังเป็นแคปชั่นที่ใช้สำหรับเฉพาะกลุ่มของเพื่อนสนิทในวงสังคมกีฬาเดียวกัน โดยในกลุ่มวัยรุ่นจะเรียกลักษณะความเลี่ยนนี้ว่า “แคปชั่นเสี่ยว” ซึ่งถือว่าเป็นแคปชั่นเด็ด หรือแคปชั่นโดนใจของกลุ่มวัยรุ่น ผู้วิจัยตั้งข้อสังเกตจากจำนวนการกดไลก์ (Like) กดรัก (Love) กดห่วงใย (Take Care) กดว้าว (Wow) กดฮ่า ๆ (HaHa) กดเศร้าใจ (Sad) กดโกรธ (Angry) และการแสดงความคิดเห็นผ่านสัญรูป (Emoticon) ที่แสดงสีหน้าและอารมณ์ความรู้สึกผ่านความหมายของแต่ละแคปชั่นเสี่ยว

จากความสำคัญดังกล่าวข้างต้นนั้น ผู้วิจัยเห็นถึงปรากฏการณ์การใช้ภาษาเชิงสร้างสรรค์ผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่น จึงสนใจศึกษาถึงลักษณะการใช้ภาษาเพื่อการสื่อสาร ในฐานะ “ภาษาเฉพาะกลุ่ม” ของนักกีฬาบนสื่อสังคมออนไลน์ และศึกษาถึงบทบาทหน้าที่ของคติชนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ ในฐานะ “ผลผลิตทางวัฒนธรรมของกลุ่มชน” ที่มีการสร้างสรรค์ การปรับประยุกต์ใช้ และการส่งต่อข้อมูลร่วมกันของกลุ่มชนในสังคมร่วมสมัย

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาลักษณะการใช้ภาษาเพื่อการสื่อสารผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์
2. เพื่อศึกษาบทบาทหน้าที่ของคติชนด้านภาษาผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์

แนวคิด ทฤษฎี กรอบแนวคิด

ผู้วิจัยได้ทบทวนแนวคิด ทฤษฎี และงานวิจัยที่เกี่ยวข้อง เป็นกรอบความคิดการวิจัย เพื่อใช้ในการศึกษาและวิเคราะห์ข้อมูล ดังรายละเอียดต่อไปนี้

กลุ่มที่ 1 งานวิจัยที่เกี่ยวข้องกับการใช้ภาษาเพื่อการสื่อสาร

งานวิจัยที่เกี่ยวข้องกับการใช้ภาษาเพื่อการสื่อสาร ได้แก่ ซารีณา นอรอเอ, นุรอัซวีตา จารง, ณฐพร มุสิกเจริญ และวรเวทย์พิสิษ ยศศิริ (2561) ได้ศึกษาเรื่อง **ลักษณะการใช้ภาษาบนสื่อสังคมออนไลน์ของวัยรุ่นไทยในปัจจุบัน** พบลักษณะการใช้ภาษาจำแนกได้ 12 ลักษณะ ได้แก่ การแปรเสียง การแปรเสียงพยัญชนะสระและวรรณยุกต์ การซ้ำสระ พยัญชนะและตัวสะกด การประดิษฐ์คำใหม่ การตัดเสียงการทำให้ความหมายเปลี่ยนไปจากเดิม คำที่เกิดจากข้อจำกัดของแป้นพิมพ์ (ไม่ได้กดปุ่ม Shift) การเลี่ยงคำหยาบหรือเลี่ยงคำที่ห้ามใช้ในสื่อสังคมออนไลน์ การใช้คำแสดงเสียง อารมณ์และกิริยาอาการ การใช้อักษรย่อ การใช้คำทับศัพท์ภาษาอังกฤษ และการสะกดตามคำพูดของเด็ก (Baby Talk) ส่วน ปรีชา ธนะวิบูลย์ และสิริวรรณ นันทจันทูล (2559) ได้ศึกษาเรื่อง **วัจนกรรมคำคมความรักในเครือข่ายสังคมออนไลน์** พบคำคมความรักมีการใช้วัจนกรรมกล่าวความจริงมากที่สุด รองลงมา คือ การกล่าวชี้นำ กล่าวแสดงความรู้สึก และกล่าวผูกผันตามลำดับ ไม่พบรูปแบบวัจนกรรมกล่าวประกาศ วิภาวรรณ อยู่เย็น (2550) ได้ศึกษาเรื่อง **การศึกษาเรื่องคำคมในภาษาไทย** พบรูปแบบของคำคมในภาษาไทย มีทั้งคำคมที่มีสัมผัสและไม่มีสัมผัส ลักษณะเด่นของรูปแบบคำคม คือ มีขนาดสั้น เนื้อหาของคำคมพบว่าคำคม ในภาษาไทยมีเนื้อหาที่ให้ข้อคิด ทั้งที่เกี่ยวข้องกับการปฏิบัติตนและมิได้เกี่ยวกับการปฏิบัติ กลวิธีในการเขียนคำคม คือ ใช้คำที่มีความหมายโดยนัย ส่วนที่มาของคำคม คือ เกิดจากการตั้งข้อสังเกตและวัตถุประสงค์ของคำคม คือ เพื่อนำไปใช้อ้างอิงให้คำพูดมีน้ำหนัก และ ธำรงสิทธิ์ พจนานุภาพ และ สิริวรรณ นันทจันทูล (2558) ได้ศึกษาเรื่อง **การศึกษาเรื่องการใช้คำของคำคมที่ปรากฏในเว็บเพจคำคมจากเครือข่ายสังคมออนไลน์เฟซบุ๊ก** พบลักษณะการใช้คำในเว็บเพจคำคมจากเครือข่ายสังคมออนไลน์เฟซบุ๊กมีปรากฏทั้งสิ้น 15 ลักษณะ คือ การซ้ำคำ ปรากฏมากที่สุด รองลงมาคือ การใช้คำธรรมดา การซ้ำกลุ่มคำ การใช้คำสัมผัส คำตรงข้าม คำที่สะกดผิดไปจากรูปเดิม คำหยาบ คำเสริม การใช้คำทับศัพท์ คำที่มีความหมายโดยนัย การสลับตำแหน่งของคำ คำสแลง การเขียนด้วยรูปภาษาเดิม คำพ้องรูปและเสียงและการเปลี่ยนสระจากเสียงสั้นเป็นเสียงยาวตามลำดับ

กลุ่มที่ 2 แนวคิดและงานวิจัยที่เกี่ยวข้องกับบทบาทหน้าที่ของคติชน

ศิราพร ณ ถลาง (2554) ได้อธิบายแนวทางการศึกษาข้อมูลคติชนของนักคติชนวิทยา ซึ่งรับแนวคิดทฤษฎีหน้าที่นิยมของนักมานุษยวิทยามาปรับประยุกต์ใช้ โดยแนวคิดดังกล่าว มองว่า

“ข้อมูลคติชนมีบทบาทหน้าที่อย่างไรในสังคมในฐานะที่เป็นข้อมูลทางวัฒนธรรมและมองว่าวัฒนธรรมในสังคมมีหน้าที่ตอบสนองความต้องการของมนุษย์ ทั้งในด้านปัจจัยพื้นฐาน ด้านความมั่นคงทางสังคมและด้านความมั่นคงทางจิตใจ อีกทั้งวัฒนธรรมในส่วนที่เป็นคติชน เช่น เพลง การละเล่น การแสดง ความเชื่อ และพิธีกรรม ล้วนมีหน้าที่ตอบสนองความต้องการของมนุษย์ทางด้านจิตใจและช่วยสร้างความเข้มแข็งและความมั่นคงทางวัฒนธรรมให้แต่ละสังคม ดังนั้น การศึกษาข้อมูลทางคติชนจึงควรศึกษาบริบททางสังคมของกลุ่มชนนั้น ๆ ด้วย เพื่อให้เห็นความสำคัญของข้อมูลคติชนที่ช่วยให้สังคมดำรงอยู่ได้อย่างมั่นคง”

นอกจากนี้ ศิราพร ณ ถลาง (2554) ยังได้อธิบายทฤษฎีบทบาทหน้าที่ของวิลเลียม บาสคอม (William Bascom) ในบทความ “Four Functions of Folklore” จำแนกบทบาทหน้าที่ของคติชน 4 บทบาทหน้าที่ ได้แก่ 1) ใช้อธิบายที่มาและเหตุผลในการทำพิธีกรรม 2) ทำหน้าที่ให้การศึกษาในสังคมที่ใช้ประเพณีบอกเล่า 3) รักษามาตรฐานทางพฤติกรรมที่เป็นแบบแผนของสังคม 4) ให้ความเพลิดเพลินและเป็นทางออกให้ความคับข้องใจของบุคคล และได้นำบทบาทหน้าที่ 4 ประการดังกล่าว มาปรับประยุกต์ใช้เป็นกรอบการอธิบายบทบาทหน้าที่ของคติชนในสังคมไทย โดยนำเสนอบทบาทหน้าที่ของคติชนเป็น 3 บทบาทหน้าที่ คือ 1) บทบาทคติชนในการอธิบายกำเนิดและอัตลักษณ์ของกลุ่มชนและพิธีกรรม 2) บทบาทคติชนในการให้การศึกษา อบรมระเบียบสังคม และรักษามาตรฐานพฤติกรรมทางสังคม 3) บทบาทคติชนในการเป็นทางออกให้กับความคับข้องใจของบุคคลอันเกิดจากกฎเกณฑ์ทางสังคม

ส่วนงานวิจัยที่เกี่ยวข้องกับแนวคิดบทบาทหน้าที่ของคติชน ได้แก่ สุกัญญาโสภี ใจกล่ำ (2563) ได้ศึกษาเรื่อง **บทบาทหน้าที่และอุปกิเลสในนิทานพื้นบ้านภาคเหนือตอนล่าง** มีวัตถุประสงค์เพื่อศึกษาบทบาทหน้าที่ของนิทานพื้นบ้านที่มีต่อกลุ่มชน พบบทบาทหน้าที่ของนิทานพื้นบ้านให้ความเพลิดเพลินและเป็นทางออกให้กับความคับข้องใจของบุคคล บทบาทหน้าที่ให้การศึกษาในสังคมที่ใช้ประเพณีบอกเล่าและนิทานที่มีบทบาทหน้าที่ในการอธิบายที่มาและเหตุผล และบทบาทหน้าที่การรักษามาตรฐานทางพฤติกรรมที่เป็นแบบแผนของสังคม และ ปรียานุช สองศร (2558) ได้ศึกษาเรื่อง **การศึกษาบทบาทการสื่อสารคำคมคัตโตะและบ่นบ่นผ่านสื่อสังคมออนไลน์เฟซบุ๊ก** มีวัตถุประสงค์เพื่อศึกษารูปแบบและประเภท การอ่านความหมายและการใช้ประโยชน์ และบทบาทคำคมของคัตโตะและบ่นบ่นที่ปรากฏในสื่อสังคมออนไลน์เฟซบุ๊ก ผลการศึกษาพบว่า ในส่วนของบทบาทคำคมผู้ส่งสารได้มีความคาดหวังบทบาทในการสื่อสารคำคมตรงกับที่ผู้รับสารนั้นได้รับประโยชน์ คือ 1) เป็นประสบการณ์ทางอ้อม 2) เป็นพื้นที่ระบายความรู้สึก 3) ให้ข้อคิดในการดำเนินชีวิต 4) ให้กำลังใจ 5) แทนความรู้สึก 6) ความบันเทิง นอกจากนั้นยังมีบทบาทที่ผู้รับสารได้รับนอกเหนือจากความคาดหวังของผู้ส่งสาร คือ 1) เป็นแนวทางในการดำเนินชีวิต 2) ย้อนเรื่องราวที่เคยเกิดขึ้น 3) สั่งสอน 4) ฉุกคิด 5) ส่งเสริมในด้านของการสั่งสอนกับสื่อ

วิธีดำเนินการวิจัย

การวิจัยครั้งนี้เป็นการวิจัยเชิงคุณภาพ ใช้ระเบียบวิธีวิจัยทางภาษาและคติชนวิทยา ผู้วิจัยได้แบ่งวิธีการดำเนินการวิจัยเป็น 4 ขั้นตอน ดังนี้

1. ขั้นตอนการศึกษาข้อมูลจากเอกสารและงานวิจัยที่เกี่ยวข้องกับแคปชั่นกีฬา การใช้ภาษาเพื่อการสื่อสาร และแนวคิดบทบาทหน้าที่ของคติชน

2. ขั้นตอนการรวบรวมข้อมูลจากเว็บไซต์ออนไลน์ที่เผยแพร่ โดยเลือกศึกษาด้วยการสืบค้นคำว่า “แคปชั่นกีฬา” ใน www.google.com ซึ่งมีการกำหนดขอบเขตด้านระยะเวลา ตั้งแต่วันที่ 1 มกราคม จนถึง 31 ธันวาคม พ.ศ. 2566 รวมระยะเวลา 1 ปี ทั้งนี้ผู้วิจัยได้เลือกเจาะจงเว็บไซต์ออนไลน์ที่ได้รับความนิยมจากจำนวนการเข้าชมสูงสุดและนำเสนอข้อมูลเกี่ยวกับแคปชั่นเสี่ยวเกี่ยวกับกีฬา ได้แก่

1. www.thairath.co.th
2. www.sanook.com
3. www.trueid.com
4. www.kapook.com
5. www.lemon8-app.com
6. www.lovetwit.in.th

3. ขั้นตอนการวิเคราะห์ข้อมูล นำข้อมูลที่ได้จากการรวบรวมมาวิเคราะห์ โดยการจำแนกข้อมูลตามขอบเขตการวิจัยด้วยการวิเคราะห์เชิงเนื้อหา (Content Analysis) จากนั้นนำข้อมูลมาอธิบายด้วยแนวคิดทางภาษาและแนวคิดบทบาทหน้าที่ของคติชนในสังคม

4. ขั้นตอนสรุปและอภิปรายผล นำข้อมูลที่ได้จากการวิเคราะห์มาสรุปและอภิปรายผลในรูปแบบของการพรรณนาวิเคราะห์ (Descriptive Analysis) โดยแบ่งประเด็นเป็น 2 ส่วน คือ

ส่วนที่ 1 ลักษณะการใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาในสื่อสังคมออนไลน์

ส่วนที่ 2 บทบาทหน้าที่ของคติชนด้านภาษาผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์

ผลการวิจัย

จากการรวบรวมข้อมูลแคปชั่นเสี่ยวเกี่ยวกับกีฬาจากเว็บไซต์ออนไลน์ตามขอบเขตการวิจัยที่กำหนด พบแคปชั่นเสี่ยวเกี่ยวกับกีฬาจำนวน 162 แคปชั่น สามารถจำแนกประเภทตามชนิดกีฬาได้เป็น 8 ประเภท ได้แก่ 1. กีฬาฟุตบอล จำนวน 44 แคปชั่น 2. กีฬาวอลเลย์บอล จำนวน 19 แคปชั่น 3. กีฬาบาสเก็ตบอล จำนวน 13 แคปชั่น 4. กีฬาแบดมินตัน จำนวน 5 แคปชั่น 5. กีฬาเทนนิส จำนวน 11 แคปชั่น 6. กีฬากอล์ฟ จำนวน 11 แคปชั่น 7. กีฬามวย จำนวน 6 แคปชั่น 8. กีฬาเบ็ดเตล็ด หรือที่ไม่ได้ระบุชนิดกีฬาอย่างชัดเจน จำนวน 53 แคปชั่น

ทั้งนี้ แคปชั่นเสี่ยวเกี่ยวกับกีฬาในแต่ละชนิดข้างต้นนั้น ผู้วิจัยพบลักษณะของการใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาในสื่อสังคมออนไลน์ และบทบาทหน้าที่ของคติชนด้านภาษาผ่านแคปชั่นของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ ดังมีรายละเอียดต่อไปนี้

ลักษณะการใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาในสื่อสังคมออนไลน์

จากการรวบรวมแคปชั่นเสี่ยวเกี่ยวกับกีฬา ผู้วิจัยเห็นถึงลักษณะการใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาในสื่อสังคมออนไลน์ จำแนกได้ 6 ลักษณะ ได้แก่

1. การใช้คำคล้องจอง เป็นลักษณะของการเล่นคำซ้ำ พยางค์ สระ หรือเสียงผันวรรณยุกต์ที่สัมผัสกัน หรืออาจไม่สัมผัสกัน ซึ่งแบ่งออกเป็นการใช้คำคล้องจองแบบมีสัมผัส และไม่มีสัมผัส ดังนี้

1.1. มีสัมผัส

ดังตัวอย่าง 1. “เจ็บกว่าการโดนทิ้ง คือโดนยิงนาทีสุดท้าย” 2. “อย่าไปกลัวความดำ เพราะมันคือวีรกรรมของนักบอล” 3. “ถึงหุ่นทรงหมี แต่ลงสนามทีอย่างพลิ้วนะ พูดเลย” 4. “ไม่ได้ที่หนึ่งก็ไม่เป็นไร แค่เป็นที่หนึ่งในใจคุณก็พอ” 5. “แข่งกีฬาต้องทำคะแนน แต่อยากได้น้องเป็นแฟนต้องทำไง” 6. “เตะบอล 90 นาทียังทำได้ ให้จีบเธอตลอดไป เราไหวอยู่แล้ว” 7. “เป็นผู้หญิงซื่อ ๆ แอบดื้อนิดหน่อย น่ารัก เรียบร้อย กินน้อย เล่นกีฬา”

1.2 ไม่มีสัมผัส

ดังตัวอย่าง 1. “ว่ายน้ำก็เหมือนชีวิต ต้องมีจังหวะขึ้นและลง” 2. “มวยก็เหมือนความรัก ต้องมีใจสู้” 3. “แพ้บ้าง ชนะบ้าง เป็นเรื่องธรรมดาของชีวิต” 4. “ตบบอลก็เหมือนจีบเธอ ต้องมีจังหวะที่แม่น” 5. “เล่นวอลเลย์บอลก็เหมือนชีวิต ต้องมีแรงส่ง”

2. การเล่นคำซ้ำ เป็นการเล่นคำเหมือนหรือคำเดิมในประโยคเดียวกัน พบการเล่นคำซ้ำ 2 ลักษณะ ได้แก่

2.1 ซ้ำคำหน้า เป็นการเล่นคำซ้ำพยางค์หน้า จุดประสงค์จะเน้นการเปรียบเทียบการกระทำ ความต้องการ สองอย่างที่มีผลต่างกันหรือมีผลเหมือนกัน (นภาลัย สุวรรณธาดา, 2524) เช่น 1. “**เรื่อง**งานอย่างเพลีย **เรื่อง**เชียร์สู้ตาย” 2. “**เสิร์ฟ**ลูกห้ามนอกเส้น **เสิร์ฟ**รักห้ามเล่นนอกใจ” 3. “**อยาก**ได้แต้มต้องทำ **อยาก**ได้เธอจังต้องทำไง” 4. “**เรื่อง**บอล **เรื่อง**เชียร์ **เรื่อง**เบียร์ สู้ตาย” 5. “**เชียร์**ข้างไหนไม่สำคัญ **เชียร์**ข้างกันเท่านั้นพอ” 6. “**เจ็บ**แล้วจำ คือ รัก **เจ็บ**แล้วไม่พัก คือ กีฬา”

2.2 ซ้ำกลาง เป็นการเล่นคำซ้ำ คำเหมือน หรือคำเดิมอยู่ในประโยคเดียวกันช่วงกลางประโยค เพื่อเน้นย้ำคำที่ขึ้นต้นให้มีน้ำหนักความยิ่งขึ้น เช่น 1. “ถึงหน้าตาเหมือน**ติด**ยา แต่จริง ๆ **ติด**กีฬานะขอบอก” 3. “ถ้าเบื่อ**วิ่ง**อยู่ในลู่ ก็มา**วิ่ง**อยู่ในใจผม” 4. “เล่นบอลมี**ล้ำ**หน้า แต่**ล้ำ**ค่ามีแค่เธอ”

3. การใช้คำเปรียบเทียบ เป็นการใช้คำ พยางค์ ที่มีความหมายคล้ายคลึงกันหรือความหมายตรงกันข้าม โดยมีจุดประสงค์เพื่อเน้นการเปรียบเทียบการกระทำ ความต้องการ บทบาทหน้าที่ เปรียบเปรย ยกตัวอย่างเพื่อให้เห็นภาพ และในบางคำก็เป็นการใช้คำเปรียบเทียบให้เกิดความหมายโดยนัยที่ต่างไปจากคำเดิม เช่น

3.1 ความหมายคล้ายกัน เป็นการใช้คำเดิม หรือคำใหม่ที่มีความหมายคล้ายกัน เพื่อใช้เปรียบเปรยให้เห็นถึงรูปลักษณ์ การกระทำ รวมไปถึงบทบาทหน้าที่ โดยการยกตัวอย่างที่มีลักษณะคล้ายกันหรือเหมือนกัน เช่น

1. “ไม่อยากเป็นหรอก**ผู้รักษาประตู** แต่อยากเป็น**ผู้รักษาหัวใจ**” ซึ่ง “ผู้รักษา” ในความหมายคล้ายกันนี้ หมายถึง ผู้ที่มีบทบาทหน้าที่คอยป้องกัน ดูแลและรักษา

2. “ถึงคู่แข่งจะเก่งเท่า**ฟ้า** แต่เมื่อลงสนามมาก็มีสองขาเหมือนกัน” คำว่า เก่งเท่า “ฟ้า” หมายถึง ความเก่งที่มีมากราวกับพื้นที่ของ “ฟ้า” เป็นการเปรียบเทียบ พร้อมยกตัวอย่างมองให้เห็นภาพ

3. “ช่วงนี้อ่อนแอ อยากรับ**โค้ช**มาดูแลไม่จำกัด” คำว่า “โค้ช” ในความหมายหลักหมายถึง “ผู้ฝึกสอน” แต่ในความหมายของแคปชั่นนี้เป็นการใช้ความหมายโดยนัยที่หมายถึง “คนรัก” หรือ “ผู้ดูแลหัวใจ”

4. “**หน้าสนาม**กับ**หน้าหนู** อะไร**น่าดู**กว่ากันคะ” เป็นการยกตัวอย่างเปรียบเทียบระหว่าง “หน้าสนาม” หมายถึง หน้าพื้นที่สนามแข่งขันกีฬา ส่วนคำว่า “หน้าหนู” หมายถึง หน้าของบุคคลหรือผู้พูด ว่าสิ่งใดชวนมองหรือสำคัญกว่ากัน นอกจากนี้ ยังพบการใช้คำพ้องเสียงคำว่า “หน้า” กับ “น่า” พบในคำว่า “น่าดู” ซึ่งเป็นการใช้บอกความรู้สึก ชวนมอง ชวนชม และชวนให้ดู

3.2 ความหมายตรงกันข้าม เป็นการใช้คำที่มีความหมายตรงกันข้าม เพื่อเน้นย้ำ ชี้ชัด สะท้อนให้เห็นถึงความแตกต่าง ตัวอย่างเช่น

1. “อยากได้แฟน**รวย**ให้ควงนักบิน อยากได้แฟน**ติดดิน**ให้ควงนักบอล” ความหมายตรงกันข้ามสะท้อนถึงฐานะทางสังคมผ่าน “ความรวย” และ “ความจน”

2. “ไม่ใช่**ราชา** แต่เป็น**นักบอลธรรมดา**ที่เธอไม่มอง” ความหมายตรงกันข้ามสะท้อนถึงสถานะทางสังคมผ่าน “ราชา” เป็นสถานะ “กลุ่มชนชั้นสูง” และ “นักบอลธรรมดา” เป็นสถานะ “กลุ่มชนชั้นล่าง”

3. “**บนฟ้า**อะนักบิน **บนดิน**อะนักบอล” ความหมายตรงกันข้ามสะท้อนถึง “ความสูง” และ “ความต่ำ”

4. “ความรักก็เหมือนฟุตบอล **ตัวสำรอง**จะมีค่าก็ต่อเมื่อ**ตัวจริง**เจ็บ” กล่าวคือ “ตัวสำรอง” และ “ตัวจริง” มีบทบาทหน้าที่ในการเล่นกีฬาเหมือนกัน แต่ความสำคัญต่างกัน ชี้ให้เห็นถึงการเปรียบเทียบเรื่องของการจัดลำดับความสำคัญก่อนและหลัง

5. “**เสียเหงื่อ**ให้กีฬา ดีกว่า**เสียน้ำตา**ให้เธอ” แสดงถึง การเปรียบเทียบผลการกระทำในเรื่องของประโยชน์กับการให้คุณค่าของสองสิ่งที่ให้ผลลัพธ์ต่างกัน โดยยกตัวอย่างแสดงให้เห็นว่าสิ่งใด “ดีกว่า” สิ่งใด

4. การสร้างคำใหม่ เป็นการสร้างคำใหม่ของกลุ่มวัยรุ่นเพื่อให้ดูสุภาพ มีความน่ารัก แสดงอัตลักษณ์ความเป็นตัวตนของแต่ละบุคคล สร้างความแปลกใหม่ของคำที่ใช้ในการสนทนา สร้างความคุ้นเคยกับคู่สนทนา ซึ่งมีการนำมาปรับใช้และปรากฏในแคปชั่นเสี่ยวเกี่ยวกับกีฬา เช่น

1. “เชียร์เทนนิสเค้าไม่ให้ส่งเสียง แต่อยากได้**ป๋ม**ไปข้างเคียงพี่ต้องส่งใจนะ**ฮับ**”

2. “เล่นบอลอย่าง**เฟี้ยว** เธอก็ไม่มาเหลียวมอง”

จากตัวอย่างข้างต้น พบการสร้างคำใหม่ ปรากฏคำว่า **“ป๋ม”** เป็นการสร้างคำใหม่จากคำว่า **“ผม”** หรือ **“กระผม”** ส่วนคำว่า **“ฮับ”** มาจากคำว่า **“ครับ”** คำว่า **“เฟี้ยว”** มาจากคำว่า **“เก่ง”**

5. การเปลี่ยนแปลงการสะกดคำ เป็นการใช้ภาษาเพื่อเลียนเสียงพูดของเด็ก หรือการลากเสียงยาว เพื่อต้องการแสดงถึงความน่ารัก ความเป็นกันเองอย่างไม่เป็นทางการ และสร้างความสนุกสนานแก่ผู้รับสาร แสดงถึงอารมณ์และกิริยาท่าทาง ตัวอย่างเช่น

1. “ชอบทีม**หนาย**ก็เลือกเอา แต่ถ้าชอบเราก็ทักมา”

2. “ขอบอกเลย**งับ**คนดี ทีมที่ดีต้องมีผม”

3. “ลงแข่งต้องจับฉลากลุ้นสาย มาลงเอยกับเรา**มั้ยยย** ไม่ต้องลุ้น”

จากตัวอย่างข้างต้น พบการเปลี่ยนแปลงการสะกดคำ ปรากฏคำว่า **“หนาย”** เดิมเป็นคำว่า **“ไหน”** คำว่า **“งับ”** เดิมเป็นคำว่า **“ครับ”** และคำว่า **“มั้ยยย”** เดิมเป็นคำว่า **“ไหม”** เพื่อแสดงถึงความเป็นกันเอง ออดอ้อน หรือเน้นย้ำการลากเสียงด้วยการกดย้ำแป้นพิมพ์ ทดแทนการลากเสียงพูด

6. การทับศัพท์ภาษาอังกฤษ เป็นวิธีการใช้ภาษาที่ง่ายและสะดวกในการติดต่อสื่อสาร เพราะคำของภาษาอังกฤษมีลักษณะสั้นและกระชับกว่าคำของภาษาไทย แสดงให้เห็นถึงผู้สื่อสารหรือผู้ใช้เป็นบุคคล

ที่มีความรู้ และความสามารถทางด้านภาษา รวมถึงสามารถสื่อความหมายได้ตรงตัว สามารถจำแนกการทับศัพท์ภาษาอังกฤษได้ 4 ลักษณะ ได้แก่

6.1 การทับศัพท์คงรูปเดิม ลักษณะการใช้คำศัพท์โดยสะกดเป็นคำอ่านภาษาไทยจากคำศัพท์ภาษาอังกฤษอย่างตรงตัว และคงความหมายเดิม ได้แก่

คำว่า **"เชียร์"** (Cheer) หมายถึง การให้กำลังใจด้วยการส่งเสียง ตะโกน ร้อง มักใช้ในการแข่งขันกีฬา เช่น 1. "กีฬาจะยิ่งน่าดู ถ้าได้นั่ง**เชียร์**คู่กับเธอ" 2. "**เชียร์**บอลให้ส่งเสียง อยากมีคนข้างเคียงให้ส่งใจ" 3. "สนุกกว่า**เชียร์**ทีมดี ๆ ก็เชียร์นักกีฬาหน้าตาดีนี่แหละ" 4. "ถ้าไม่รู้จะ**เชียร์**ข้างไหนมา**เชียร์**ข้าง ๆ เราก็ได้นะ" 5. "เรื่องงานอย่างเพลีย แต่เรื่องบอลเรื่องเชียร์ คือ สู้ตาย"

คำว่า **"แชมป์"** (Champ) หมายถึง ผู้ชนะในการแข่งขันกีฬา เช่น 1. "คนที่เป็น**แชมป์**ไม่ใช่ไม่เคยท้อ ไม่เคยแพ้เค้าแค่เป็นคนที่ไม่เคยหยุด" 2. "คำว่า**แชมป์**ไม่ได้ลอยจากฟ้า แต่มาจากการแสวงหาและอดทน" 3. "เป็น**แชมป์**อย่าหลง ขาลงอย่าท้อ"

คำว่า **"เสิร์ฟ"** (Serve) หมายถึง การส่งลูกให้ฝ่ายตรงข้ามรับ เช่น 1. "**เสิร์ฟ**ผิดอาจเสียแต้ม แต่ถ้าหอมแก้มเธอไม่เสียอะไรเลย" 2. "**เสิร์ฟ**ลูกห้ามนอกเส้น **เสิร์ฟ**รักห้ามเล่นนะรู้ไหม" 3. "อยากได้แต้มต้อง**เสิร์ฟ**เอซ อยากเป็นคนพิเศษต้องทำไง" 4. "เงินเดือนก็เหมือนลูก**เสิร์ฟ**เอซ เห็นปุ๊บหายปั๊บ" 5. "เกม**เสิร์ฟ**อาจติดบล็อค แต่ถ้าบอกชอบเธอจะติดอะไรไหม"

คำว่า **"ทีม"** (Team) หมายถึง กลุ่มผู้เข้าร่วมการแข่งขันกีฬา เช่น 1. "จะไปถึง**ทีม**ชาติเริ่มที่ทำวันนี้ให้สุดความสามารถที่เรามี" 2. "ไปคนเดียวอาจจะไว แต่ถ้าอยากยิ่งใหญ่ต้องไปเป็น**ทีม**" 3. "เล่นกีฬาเป็น**ทีม**อะพอรู้ แต่เล่นบทเจ้าชู้ยังไม่เคย" 4. "**ทีม**ที่ดี คือ **ทีม**ที่มีผม ฝากไว้ให้คิดครับโค้ช"

คำว่า **"ไดรฟ์"** (Drive) หมายถึง การตี การส่งลูกให้ตรง เช่น 1. "ตีไกล **ไดรฟ์**ตรง ถึงธงจ่ายตัง" 2. "**ไดร์ฟ**ตรงแล้วยังไง ลงหลุมไปก็เสียเงิน"

คำว่า **"ยู"** (You) หมายถึง คุณ, เธอ หรือคำสรรพนามสำหรับกล่าวถึงบุคคลที่ 2 เช่น "กีฬาฟุตบอลต้องมีผู้รักษาประตู ส่วนตัวเราอยากมี**ยู** (you)"

6.2 การทับศัพท์คงเดิมย่อคำ ลักษณะการใช้คำในรูปแบบย่อคำเดิม จากคำศัพท์ภาษาอังกฤษย่อเพียงพยางค์แรก พยางค์ท้าย หรือย่อตัวอักษรตัวแรกมาใช้ เพื่อช่วยให้การสื่อสารเป็นไปด้วยความรวดเร็วและง่ายขึ้น ตัวอย่างเช่น

คำว่า **"วีเออาร์"** (VAR ย่อมาจาก Video Assistant Referee) หมายถึง ผู้ช่วยผู้ตัดสินในรูปแบบวีดิทัศน์ โดยการใช้ช่วงภาพของวีดิทัศน์ในการตัดสินกีฬา เช่น "ต่อให้มี VAR ก็เอาเธอกลับมาไม่ได้"

คำว่า **"ชาเลนจ์"** (Challenge ย่อมาจาก Challenge System) หมายถึง ระบบภาพช้าสำหรับการแข่งขันกีฬาวอลเลย์บอล โดยการใช้เทคโนโลยีในการช่วยตัดสิน เช่น "กฎการ**ชาเลนจ์**ยังพอรู้กฎการเจ้าชู้ไม่รู้เลย"

6.3 การทับศัพท์คงเดิมเติมคำข้างหน้า ลักษณะการใช้คำในรูปแบบการทับศัพท์รูปคงเดิมเติมคำข้างหน้า เป็นได้ทั้งการเติมคำภาษาไทยและคำภาษาอังกฤษด้านหน้าคำเดิม เพื่อให้เกิดการขยายความหมาย หรือเปลี่ยนความหมายของคำนั้น ๆ ชี้ให้เห็นชัดในความหมายที่ต้องการสื่อเพิ่มมากยิ่งขึ้น เช่น

คำว่า **"ซัลโว"** (Salvo) หมายถึง ผู้เล่นที่ทำคะแนนประตูได้มากที่สุดในการแข่งขันนั้น ๆ เช่น "ถึงไม่ใช่**ดาวซัลโว** แต่มีหนี้ก่อนโตนะสนมั้ย"

คำว่า **“รี-รัน”** (Rerun) หมายถึง การเริ่มใหม่อีกครั้ง เช่น “จะลง**รัน** (run) อีกสักกี่ที่ เธอคนดีก็ไม่**รีรัน** (Rerun)”

คำว่า **“ไฮ-สแตนดาด”** (Hight-standard) หมายถึง สูงกว่ามาตรฐาน หรือบรรทัดฐานที่กำหนด เช่น “อยากจะเป็นนักกีฬา **ไฮ-สแตนดาด** (Hight-standard) แต่ขี้เกียจ แถมขาด ไม่มาซ้อม”

คำว่า **“ซุปเปอร์แมน”** (Superman) หมายถึง ยอดมนุษย์ หรือผู้ที่มีพละกำลัง มีอำนาจเหนือมนุษย์ทั่วไป เช่น “เล่นบอลเก่งไม่เท่า**ซุปเปอร์แมน** แต่ผมก็เป็น**ซุปเปอร์แฟน**ได้นะ”

6.4 การทับศัพท์แบบตัดคำ ลักษณะการใช้คำในรูปแบบตัดคำเดิม โดยการตัดพยางค์แรกหรือพยางค์ท้าย ให้มีลักษณะที่สั้นและกระชับ

คำว่า **“วอลเลย์บอล”** (Volleyball) พบในลักษณะที่ตัดคำใช้เพียง วอลเลย์ (Valley) ในแคปชั่น 1. “เล่น**วอลเลย์**มีติดเน็ต มาติดเราสิเด็ดกว่ากันเยอะ” 2. “เรารักเธอเหมือน**วอลเลย์** ถึงใครจะตบเธอออกมา เราก็พร้อมรับเสมอ” 3. “**วอลเลย์**มีติดตาข่าย แต่เป็นเธอมีแค่ติดใจอย่างเดียวเลย” 4. “ความรักก็เหมือน**วอลเลย์** กี่ครั้งแล้วที่รับไม่ได้ แต่ก็ไม่เคยหยุด”

คำว่า **“ฟุตบอล”** (Football) พบการตัดคำใช้เพียงคำว่า **บอล** (Ball) เช่น 1. “เตะ**บอล**เพราะรักกีฬา ส่วนที่ไลน์ไปหาเพราะรักนะ” 2. “ถึงเตะ**บอล**ยังไม่เก่ง แต่ใช้เงินเก่งมากนะ” 3. “วิ่งตาม**บอล**ที่เรารัก ดีกว่าวิ่งตามรักที่ไร้ตัวตน” 4. “ลูกกลม ๆ คือ **บอล** คนขี้งอน คือ เธอ”

บทบาทหน้าที่ของคติชนด้านภาษาผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์

“แคปชั่นเสี่ยว” จัดว่าเป็น “คติชน” หรือ “ผลผลิตทางวัฒนธรรมทางภาษา” ที่มีการสร้างสรรค์การปรับประยุกต์ใช้ และการส่งต่อข้อมูลร่วมกันของกลุ่มชน โดยเฉพาะกลุ่มชนรุ่นใหม่หรือกลุ่มวัยรุ่นที่ใช้ภาษาไทยและภาษาอังกฤษเพื่อการสื่อสารกันในสื่อสังคมออนไลน์ มีทั้งปรากฏ และไม่ปรากฏว่าใครเป็นผู้คิดค้นขึ้น เมื่อพิจารณาแคปชั่นเสี่ยวพบว่า เป็นการใช้ถ้อยคำที่ชวนให้เกิดความเลี่ยนหรือการเล่นมุกเชย รวมไปถึงการเล่นมุกเพื่อจีบในลักษณะของการเกี้ยวพาราสีซึ่งกันและกัน และยังเป็นแคปชั่นที่ใช้เฉพาะกลุ่มของเพื่อนสนิทในวงสังคมเดียวกัน โดยในกลุ่มวัยรุ่นจะเรียกลักษณะความเลี่ยนนี้ว่า “แคปชั่นเสี่ยว” ซึ่งเป็นแคปชั่นเด็ด หรือแคปชั่นโดนใจของกลุ่มชนรุ่นใหม่ในสังคมร่วมสมัย

ทั้งนี้ แคปชั่นเสี่ยวมีลักษณะสำคัญที่คล้ายคลึงกับ “ภาษิต” “สำนวน” และ “คำคม” ซึ่งเป็นถ้อยคำหรือคำกล่าวที่มีความหมาย ความสำคัญและคุณค่าด้านการอบรมสั่งสอน ด้านสังคมวัฒนธรรมและด้านภาษาที่สืบทอดต่อกันมาตามวัฒนธรรมประเพณี อีกทั้งยังมีลักษณะชวนให้ผู้รับสารได้พิจารณาสาระสำคัญต่าง ๆ ซึ่งอาจไม่ต้องแปลความหมายโดยตรง แต่สามารถรับรู้ถึงความหมายโดยนัยร่วมกันได้ จากการวิเคราะห์ข้อมูลแคปชั่นเสี่ยวเกี่ยวกับกีฬาพบบทบาทหน้าที่ของคติชนด้านภาษา 2 บทบาทหน้าที่ ดังรายละเอียดต่อไปนี้

1. บทบาทหน้าที่ด้านการอบรมสั่งสอน

บทบาทหน้าที่ด้านการอบรมสั่งสอนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬา เป็นบทบาทหน้าที่ที่มีการชี้นำ มีข้อตกลงหรือระเบียบแบบแผนพฤติกรรมตามที่สังคมกำหนดและคาดหวังไว้ให้กลุ่มชนรุ่นใหม่โดยเฉพาะกลุ่มนักกีฬาทุกชนิดได้ประพฤติปฏิบัติตาม อันเป็นเสมือนเครื่องมือสำหรับควบคุมพฤติกรรมของกลุ่มชนในสังคมให้ดำเนินไปในทิศทางเดียวกันอย่างเป็นระเบียบเรียบร้อย และเป็นกลไกสำคัญในการสร้างความกดดันในสังคม กล่าวคือหากบุคคลนั้นประพฤติปฏิบัติตนตามจำได้รับการยกย่องเชิดชู ส่วนบุคคลที่ละเมิดก็จะโดนลงโทษจากสังคม อันเป็นการรักษาแบบแผนทางวัฒนธรรมของสังคม พบบทบาทหน้าที่ด้านการอบรมสั่งสอนหรือการศึกษา 3 ด้าน ได้แก่

1.1 ด้านคุณลักษณะและคุณสมบัติของการเป็นนักกีฬาที่ดี แคปชั่นเสี่ยวเกี่ยวกับกีฬามีจุดประสงค์เพื่อบอกถึงคุณลักษณะประจำและคุณสมบัติของการเป็นนักกีฬาที่ดี เมื่อพิจารณาเนื้อหาที่ปรากฏในสื่อสังคมออนไลน์ พบการใช้คำว่า “ต้อง” ซึ่งเปรียบเสมือนเป็นการบอกให้ต้องกระทำตามหรือต้องปฏิบัติตนตามข้อตกลงหรือระเบียบแบบแผนพฤติกรรมตามที่กลุ่มของนักกีฬาได้กำหนดขึ้น ดังต่อไปนี้

ด้านคุณลักษณะของการเป็นนักกีฬาที่ดี เป็นคุณลักษณะประจำตน หรือคุณลักษณะส่วนบุคคลที่เกี่ยวข้องกับด้านสมรรถภาพทางร่างกาย รวมถึงด้านการมีวินัยของการเป็นนักกีฬา ตัวอย่าง เช่น

“เล่นกีฬา**ต้องซ้อมบ่อย** แต่ซ้อมจีบเธอไม่เคยซ้อมเลย”
“เล่นกีฬา**ต้องเสียเหงื่อ** แต่เสียใจเพราะเธอ เสียเหงื่อดีกว่าเยอะ”
“เล่นกีฬา**ต้องมีความอดทน** แต่อดทนไม่ไหวกับเธอ”
“เล่นกีฬา**ต้องมีแรง** แต่แรงไม่พอที่จะจีบเธอ”
“เล่นกีฬา**ต้องมีพลัง** แต่พลังไม่พอที่จะปกป้องเธอ”
“เล่นกีฬา**ต้องมีเทคนิค** แต่เทคนิคไม่พอที่จะจีบเธอ”
“เล่นกีฬา**ต้องมีทักษะ** แต่ทักษะไม่พอที่จะดูแลเธอ”
“เล่นกีฬา**ต้องมีไหวพริบ** แต่ไหวพริบไม่พอที่จะจีบเธอ”
“เล่นกีฬา**ต้องมีพรสวรรค์** แต่พรสวรรค์ไม่พอที่จะจีบเธอ”

จากตัวอย่างแคปชั่นเสี่ยวเกี่ยวกับกีฬาข้างต้น สะท้อนถึงคุณลักษณะสำคัญของการเป็นนักกีฬาที่ดีสำหรับการปฏิบัติตน หรือการฝึกตนของนักกีฬาในทุกประเภท หรือทุกชนิดกีฬาที่ต้องมีสมรรถภาพทางร่างกายที่แข็งแรง โดยเกิดจากการต้องฝึกซ้อมอย่างหนัก ต้องมีการฝึกความอดทน ต้องมีไหวพริบปฏิภาณดี รวมถึงต้องมีทักษะและเทคนิควิธีการเพื่อนำไปสู่เป้าหมายแห่งชัยชนะในการแข่งขันกีฬา

ด้านคุณสมบัติของการเป็นนักกีฬาที่ดี เป็นคุณสมบัติประจำตนที่มีอยู่ภายในจิตใจ หรือจิตวิญญาณของนักกีฬา ตัวอย่างเช่น

“เล่นกีฬา**ต้องมีน้ำใจ** แต่เรื่องหัวใจมีน้ำใจให้เธอคนเดียว”
“เล่นกีฬา**ต้องมีความกล้าหาญ** แต่กล้าหาญไม่พอที่จะบอกรักเธอ”
“เล่นกีฬา**ต้องมีความมุ่งมั่น** แต่มุ่งมั่นไม่พอที่จะจีบเธอ”
“เล่นกีฬา**ต้องมีความสามัคคี** แต่สามัคคีกันไม่ได้กับเธอ”
“เล่นกีฬา**ต้องมีความเสียสละ** แต่เสียสละเธอไม่ได้”
“เล่นกีฬา**ต้องมีความรับผิดชอบ** แต่รับผิดชอบเรื่องความรักไม่ได้”
“เล่นกีฬา**ต้องรู้จักแพ้** แต่แพ้เธอไม่ได้”
“เล่นกีฬา**ต้องรู้จักชนะ** แต่ชนะเธอไม่ได้”
“เล่นกีฬา**ต้องรู้จักยอมรับ** แต่ยอมรับไม่ได้ถ้าเธอไม่รัก”
“เล่นกีฬา**ต้องรู้จักปล่อยวาง** แต่ปล่อยวางเธอไม่ได้”

จากตัวอย่างแคปชั่นเสี่ยวเกี่ยวกับกีฬาข้างต้น สะท้อนถึงคุณสมบัติของการเป็นนักกีฬาที่ดีสำหรับการเล่นกีฬาทุกประเภทนั้น นอกจากความแข็งแรงทางด้านร่างกายแล้ว นักกีฬาจะต้องมีความแข็งแรงทางด้านจิตใจ หรือพลังทางด้านความคิดที่ส่งผลต่อการพัฒนาตนเองให้ดีขึ้นด้วย โดยนักกีฬาจะต้องมีควบคุมความคิด อารมณ์ และความรู้สึกต่าง ๆ ตลอดจนการรับรู้ต่อตนเอง ต้องมีความรับผิดชอบต่อ

หน้าที่ ต้องมีความกล้าหาญ ต้องมีความเสียสละ ต้องมีความมุ่งมั่น ต้องมีความสามัคคี ต้องมีน้ำใจเป็นนักกีฬา รวมถึงต้องรู้จักแพ้ รู้จักชนะ รู้จักปล่อยวาง และรู้จักยอมรับในผลของการแข่งขันกีฬา

1.2 ด้านการดำเนินชีวิตและความเป็นอยู่ในสังคม เป็นการชี้แนะแนวทางการดำเนินชีวิตและการปฏิบัติตนเมื่ออยู่ในสังคม เพื่อให้เข้าใจสัจธรรมความจริงของชีวิต ตัวอย่างเช่น

“บาสเก็ตบอลก็เหมือนชีวิต ถ้าไม่สู้ก็ไม่มีทางชนะ”
“เล่นวอลเลย์บอลก็เหมือนชีวิต ต้องมีแรงส่ง”
“ว่ายน้ำก็เหมือนชีวิต ต้องมีจังหวะขึ้นและลง”
“บอลลอยมาก็เหมือนโอกาสที่เข้ามาในชีวิต”
“ตีลูกไม่ตรงก็เหมือนทำผิดพลาดในชีวิต”
“แพ้บ้าง ชนะบ้าง เป็นเรื่องธรรมดาของชีวิต”

จากตัวอย่างแคปชั่นเสี่ยวเกี่ยวกับกีฬาข้างต้น สะท้อนให้เห็นถึงการเปรียบเทียบ “กีฬา”กับ “ชีวิต” ของกลุ่มชน ไม่ว่าจะเป็นเรื่องความรู้สึกนึกคิดของผู้คนในยุคปัจจุบัน และเรื่องสัจธรรมความจริงของชีวิต เช่น เรื่องผลของการกระทำ ได้แก่ “บาสเก็ตบอลก็เหมือนชีวิต ถ้าไม่สู้ก็ไม่มีทางชนะ” หรือ “แพ้บ้าง ชนะบ้าง เป็นเรื่องธรรมดาของชีวิต” ส่วนเรื่องของโอกาส ได้แก่ “บอลลอยมาก็เหมือนโอกาสที่เข้ามาในชีวิต” และเรื่องความผิดพลาด ได้แก่ “ตีลูกไม่ตรงก็เหมือนทำผิดพลาดในชีวิต”

1.3 ด้านการประกอบอาชีพและความสำเร็จ เป็นการชี้แนะแนวทางผ่านการเปรียบ “กีฬา” กับ “การทำงาน” หรือการประกอบอาชีพ สู่การประสบความสำเร็จในชีวิต ตัวอย่างเช่น

“กอล์ฟก็เหมือนการทำงาน ต้องมีวินัยและอดทน ถึงจะประสบความสำเร็จ”
“เทนนิสก็เหมือนการทำงาน ต้องมีสมาธิและจดจ่อ ถึงจะประสบความสำเร็จ”
“กีฬา คือ การพิสูจน์ในสถานการณ์ที่ท้าทาย”
“กีฬาทำให้เราสร้างประวัติศาสตร์ในตัวเอง”

จากตัวอย่างแคปชั่นเสี่ยวเกี่ยวกับกีฬาข้างต้น สะท้อนถึงการมีระเบียบแบบแผนพฤติกรรมตามที่สังคมกำหนด หรือคาดหวังไว้ในเรื่องของการทำงาน ซึ่งหากต้องการประสบความสำเร็จทั้งด้านของการกีฬา และด้านการประอาชีพ จะต้องมีสมาธิ มีวินัย และมีความอดทนต่อสถานการณ์ หรือบททดสอบสำหรับพิสูจน์ตนเอง เพื่อไปสู่หนทางแห่งความสำเร็จดังที่ตั้งเป้าหมายไว้ รวมถึงการสร้างประวัติศาสตร์หรือเรื่องเล่าขานของตนเองอย่างภาคภูมิใจ

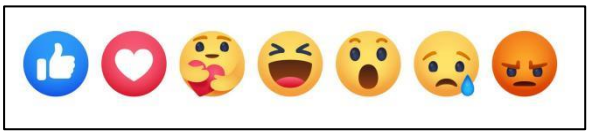
2. บทบาทหน้าที่ด้านการระบายความรู้สึกของมนุษย์ในสังคม

บทบาทหน้าที่ด้านการระบายความรู้สึกหรือความคับข้องใจของมนุษย์ในสังคมปัจจุบันผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬา พบลักษณะสำคัญของการระบายความรู้สึกทางด้านอารมณ์และความรู้สึกนึกของกลุ่มวัยรุ่น โดยเฉพาะเรื่องของ “ความรัก” ของหนุ่มสาวนักกีฬา นอกจากนี้ยังพบว่ามีการใช้แคปชั่นเสี่ยวเกี่ยวกับกีฬามีวัตถุประสงค์เพื่อการจีบ การบอกชอบ และการบอกรัก และอาจกล่าวได้ว่าเป็นการใช้ถ้อยคำในลักษณะการเกี้ยวพาราสีซึ่งกันและกันผ่านคำบรรยายประกอบรูปภาพในสื่อสังคมออนไลน์ เช่น เช่น เฟซบุ๊ก (Facebook) ทวิตเตอร์ (Twitter) อินสตาแกรม (Instagram) ติ๊กต็อก (TikTok) ดังนี้

“เล่นกีฬาก็เหมือนความรัก ต้องมีแพ้ มีชนะ มีผิดหวัง แต่สุดท้ายก็ยังมี**เธอ**”
“เล่นกีฬาก็เหมือนความรัก ต้องมีเพื่อนร่วมทีม มีคู่แข่ง แต่สุดท้ายก็ยัง**มีเธอ**”
“เล่นกีฬาก็เหมือนความรัก ต้องมีเป้าหมาย มีอุปสรรค แต่สุดท้ายก็ยัง**มีเธอ**”
“ตบบอลก็เหมือน**จีบเธอ** ต้องมีจังหวะที่แม่น”

“แข่งกีฬาต้องทำคะแนน แต่**อยากได้น้องเป็นแฟน**ต้องทำไง”
“ถ้าวิ่งในลู่น่าเบื่อไป **มาวิ่งในใจ**ผมมั้ยล่ะ”
“ถ้าเธอไม่เล่นกีฬา มาแข่ง**สบตากับเรา**ก็ได้”
“เล่นกีฬายังมีพัก แต่พอ**เธอทักทำเอาเพ้อ**”
“เชียร์บอลให้ส่งเสียง **อยากมีคนข้างเคียงให้ส่งใจ**”
“เสิร์ฟลูกห้ามนอกเส้น **เสิร์ฟรัก**ห้ามเล่น ๆ นะรู้ไหม”
“เล่นบอลหลังเป็นตัวหลอก แต่ที่**บอกชอบเราจริงจัง**นะ”
“วิ่งตามลูกฟุตบอลที่เรารัก ดีกว่าไป**วิ่งตามหาความรัก**กับ**คนไม่มีใจอย่างเธอ**”
“วิ่งตามลูกบอลที่เรารัก ดีกว่า**วิ่งตามรัก**ที่ไร้ตัวตน”
“เล่นวอลเลย์มีติดเน็ต **มาติดเราสิเด็ดกว่ากันเยอะ**”
“เสียเหงื่อให้กีฬา ดีกว่าเสียน้ำตาให้กับ**คนไม่มีใจ**”
“กีฬาเป็นยาวิเศษ แต่**คนพิเศษ**อะ**เป็นเธอ**”
“แข่งกีฬามันเหนื่อย อยาก**เดินเรื่อย ๆ ข้างเธอ**มากกว่า”

จากตัวอย่างแคปชั่นเสี่ยวเกี่ยวกับกีฬาที่เป็นการระบายความรู้สึกหรือความคับข้องใจของมนุษย์ด้านความรักข้างต้นนั้น ยังมีการแสดงความรู้สึกผ่านการกดปุ่มความรู้สึกต่าง ๆ เช่น กดไลก์ (Like) กดรัก (Love) กดห่วงใย (Take Care) กดว้าว (Wow) กดฮ่า ๆ (HaHa) กดเศร้าใจ (Sad) กดโกรธ (Angry) และการแสดงความคิดเห็นผ่านสัญรูป (Emoticon) โดยการแสดงสีหน้าและอารมณ์ความรู้สึกผ่านความหมายของแต่ละแคปชั่นเสี่ยวอีกด้วย



ภาพที่ 1 ปุ่มแสดงความรู้สึกผ่านสัญลักษณ์ในสื่อสังคมออนไลน์

สรุปและอภิปรายผล

การศึกษาลักษณะการใช้ภาษาเพื่อการสื่อสารและบทบาทหน้าที่ของคติชนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ ใช้วิธีการวิจัยทางภาษาและคติชนวิทยา โดยการเก็บข้อมูลจากเว็บไซต์ออนไลน์ตามขอบเขตงานวิจัยนั้น พบแคปชั่นเสี่ยวเกี่ยวกับกีฬาจำนวน 162 แคปชั่น ซึ่งปรากฏลักษณะการใช้ภาษาเพื่อการสื่อสารจำแนกได้ 6 ลักษณะ ได้แก่ 1) การใช้คำคล้องจอง 2) การเล่นคำซ้ำ 3) การใช้คำเปรียบเทียบ 4) การสร้างคำใหม่ 5) การเปลี่ยนแปลงการสะกดคำ 6) การทับศัพท์ภาษาอังกฤษ จากการศึกษามีลักษณะการใช้ภาษาเพื่อการสื่อสารผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ มีความสอดคล้องกับงานวิจัยเรื่องลักษณะการใช้ภาษาบนสื่อสังคมออนไลน์ของวัยรุ่นไทยในปัจจุบัน (ซารีณา นอรอเอ และคณะ, 2561) พบลักษณะการใช้ภาษาจำแนกได้ 12 ลักษณะ ได้แก่ การแปรเสียง การแปรเสียงพยัญชนะสระ และวรรณยุกต์ การซ้ำสระ พยัญชนะ และตัวสะกด การประดิษฐ์คำใหม่ การตัดเสียงการทำให้ความหมายเปลี่ยนไปจากเดิม คำที่เกิดจากข้อจำกัดของแป้นพิมพ์ (ไม่ได้กดปุ่ม Shift) การเลี่ยงคำหยาบ หรือเลี่ยงคำที่ห้ามใช้ในสื่อสังคมออนไลน์ การใช้คำแสดงเสียง

อารมณ์ และกิริยาอาการ การใช้อักษรย่อ การใช้คำทับศัพท์ภาษาอังกฤษ และการสะกดตามคำพูดของเด็ก (Baby Talk)

ทั้งนี้ ผู้วิจัยตั้งข้อสังเกตเกี่ยวกับลักษณะของการใช้ภาษาเพื่อการสื่อสารของกลุ่มวัยรุ่นในสื่อออนไลน์ผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาพบลักษณะสำคัญ 2 ประการ คือ ประการแรก **การใช้สำนวนและคำคล้องจอง** เป็นการใช้ภาษาที่แสดงถึงลักษณะของความเป็นไทยในบริบทสังคมวัฒนธรรมร่วมสมัย หรือมีลักษณะ “เจ้าบทเจ้ากลอน” เป็นบทกลอนหรือถ้อยคำที่มีลักษณะเชิงวรรณศิลป์ มีเสียงสัมผัส มีการเลือกสรรคำไพเราะ หรือคำร่วมสมัย โดยมีการปรับเปลี่ยนคำเพื่อให้เกิดสาระหรือข้อมูลใหม่ เพื่อความสนุกสนานและแสดงออกถึงความรู้สึก

ประการที่สอง **การทับศัพท์ภาษาอังกฤษ** หรือ**การใช้ภาษาอังกฤษปนภาษาไทย** เป็นวิธีการที่ง่ายและสะดวกในการติดต่อสื่อสาร เพราะคำของภาษาอังกฤษนั้นมีความสั้นและกระชับกว่าคำของภาษาไทย นอกจากนี้ยังแสดงให้เห็นถึงผู้ส่งสารหรือผู้ใช้ เป็นบุคคลที่มีความรู้ ทักษะและความสามารถทางด้านภาษา

ส่วนการศึกษาเรื่องบทบาทหน้าที่ของคติชนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์พบ 2 บทบาทหน้าที่ ได้แก่ 1) บทบาทหน้าที่ด้านการอบรมสั่งสอน ในเรื่องของคุณลักษณะและคุณสมบัติของการเป็นนักกีฬาที่ดี เรื่องของการดำเนินชีวิตและความเป็นอยู่ในสังคม และเรื่องของการประกอบอาชีพและความสำเร็จ 2) บทบาทหน้าที่ด้านการระบายความรู้สึกของมนุษย์ โดยเฉพาะเรื่องของความรักของหนุ่มสาวในการเกี้ยวพาราสีในลักษณะของการจีบกัน การบอกชอบ บอกรัก หรือการแสดงความน้อยใจในความรัก ซึ่งผลการศึกษาดังกล่าวสอดคล้องกับงานวิจัยเรื่องการศึกษาบทบาทการสื่อสารคำคมคัตโตะและบ่นบ่นผ่านสื่อสังคมออนไลน์เฟซบุ๊ก (ปรียานุช สองศร, 2558) พบบทบาทคำคมผู้ส่งสารได้มีความคาดหวังบทบาทในการสื่อสารคำคมตรงกับที่ผู้รับสารนั้นได้รับประโยชน์ คือ 1) เป็นประสบการณ์ทางอ้อม 2) เป็นพื้นที่ระบายความรู้สึก 3) ให้ข้อคิดในการดำเนินชีวิต 4) ให้กำลังใจ 5) แทนความรู้สึก 6) ความบันเทิง นอกจากนั้นยังมีบทบาทที่ผู้รับสารได้รับนอกเหนือจากความคาดหวังของผู้ส่งสาร คือ 1) เป็นแนวทางในการดำเนินชีวิต 2) ย้อนเรื่องราวที่เคยเกิดขึ้น 3) สั่งสอน 4) ฉุกคิด 5) ส่งเสริมในด้านของการสั่งสอนกับสื่อ

จากลักษณะการใช้ภาษาเพื่อการสื่อสารและบทบาทหน้าที่ของคติชนผ่านแคปชั่นเสี่ยวเกี่ยวกับกีฬาของกลุ่มวัยรุ่นในสื่อสังคมออนไลน์ดังกล่าวข้างต้น หากมองว่า “แคปชั่นเสี่ยว” เป็นเพียงคำบรรยายประกอบรูปภาพเพื่อโพสต์ผ่านทางสื่อสังคมออนไลน์โดยทั่วไป แคปชั่นเสี่ยวก็จะเป็นเพียงการใช้ “ภาษาธรรมดา” หรือ “ภาษาเสี่ยว” เพื่อการสื่อสารของกลุ่มวัยรุ่นเท่านั้น แต่ถ้าพิจารณาถึงสาระสำคัญต่าง ๆ ไม่ว่าจะเป็นความหมาย ความสำคัญ คุณค่าและบทบาทหน้าที่ของแคปชั่นเสี่ยวในฐานะเป็น “ผลผลิตทางวัฒนธรรมทางภาษา” ของกลุ่มชนรุ่นใหม่ จะเห็นถึงการส่งสารและการรับสารผ่านการใช้ “ภาษาเฉพาะกลุ่ม” ซึ่งจะสะท้อนถึงการใช้ภาษาเชิงสร้างสรรค์ การปรับประยุกต์ และการส่งต่อข้อมูลร่วมกันบนสื่อสังคมออนไลน์เพื่อการสื่อสารในบริบททางสังคมวัฒนธรรมร่วมสมัยต่อไป

ข้อเสนอแนะ

ควรมีการศึกษาแคปชั่นในประเด็นอื่น ๆ ที่ปรากฏในสื่อสังคมออนไลน์ เช่น แคปชั่นความรักแคปชั่นธรรมชาติ แคปชั่นคาเฟ่ แคปชั่นการเรียน แคปชั่นสู้ชีวิต แคปชั่นตลกและแคปชั่นอื่น ๆ เพื่อจะได้รับรู้ถึงลักษณะการใช้ภาษาเพื่อการสื่อสารของแต่ละกลุ่มชนที่แสดงความเหมือนคล้ายและความแตกต่างกันทางด้านภาษา รวมถึงขยายขอบเขตพื้นที่สำหรับการศึกษาที่นอกเหนือจากสื่อสังคมออนไลน์ต่อไป

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สัจนิยมมหัศจรรย์กับการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินในละครแนวการแพทย์ไทย เรื่อง รักฉุดใจนายฉุกเฉิน

Magical Realism and the Representation of Emergency Physicians' Lives in Thai Medical Drama My Ambulance

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บทคัดย่อ

บทความนี้มีวัตถุประสงค์เพื่อวิเคราะห์การนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินผ่านการนำเสนอเรื่องแบบสัจนิยมมหัศจรรย์ในละครแนวการแพทย์เรื่อง รักฉุดใจนายฉุกเฉิน ผลการศึกษาพบว่า ละครเรื่องนี้นำเสนอภาพแทนชีวิตแพทย์ฉุกเฉิน 2 ลักษณะ ได้แก่ ความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน และการพัฒนาความสัมพันธ์ของแพทย์ฉุกเฉิน ผลการศึกษาแสดงให้เห็นว่าสัจนิยมมหัศจรรย์มีความสำคัญต่อการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินในฐานะที่เป็นมนุษย์ ขณะเดียวกันก็ชี้ชวนให้เห็นถึงปัญหาในวงการแพทย์ด้วย นับว่าเป็นการเปิดมุมมองในการทำความเข้าใจละครแนวการแพทย์ได้อย่างน่าสนใจ

คำสำคัญ: แพทย์ฉุกเฉิน, ละครแนวการแพทย์, สัจนิยมมหัศจรรย์

Abstract

The purpose of this article was to analyze how emergency physicians are portrayed by the use of magical realism in Thai medical drama My Ambulance. The result demonstrates the representation of emergency physicians in 2 ways: the disequilibrium between their personal and professional lives, and the growth of their relationship. Thus, magical realism plays a vital role in shedding light on the human being of emergency physicians' lives, and also highlighting issues within the medical field. The outcome of this article may broaden the scope of medical drama research.

Keywords: emergency physicians, medical drama, magical realism

บทนำ

ละครแนวการแพทย์ (Medical Drama) หมายถึง ละครที่เหตุการณ์ภายในเรื่องเกิดขึ้นในโรงพยาบาลเป็นหลัก และเหตุการณ์เหล่านั้นสัมพันธ์กับการพัฒนาเรื่องราวของตัวละครสำคัญซึ่งมักเป็นแพทย์ พยาบาล แพทย์ฝึกหัด หรือผู้ป่วย นอกจากนี้ ละครแนวการแพทย์ยังหมายถึงประเภทของละคร

ที่นำเสนอเรื่องราวที่ตัวละครสำคัญเข้าไปมีส่วนร่วมกับอุบัติการณ์ทางการแพทย์ สัมพันธภาพเชิงวิชาชีพ หรือเหตุการณ์เร้าอารมณ์ (Rocchi, 2019) ละครแนวนี้ได้รับความนิยมในหลาย ๆ ประเทศ เช่น เรื่อง *The Good Doctor* ของสหรัฐอเมริกา เรื่อง *Hospital Playlist* ของเกาหลีใต้ ในประเทศไทยก็มีละครแนวนี้เช่นกัน เช่นเรื่อง *I See You พยาบาลพิเศษ เคสพิศวง* เรื่อง *Med in Love รักเธอคุณหมอฝึกหัด* เป็นต้น เรื่องราวในละครแนวการแพทย์ของไทยที่กล่าวถึงข้างต้นนั้น มีจุดเน้นร่วมกันที่การนำเสนอสัมพันธภาพของตัวละครซึ่งเป็นบุคลากรทางการแพทย์กับตัวละครอื่น ๆ อย่างไรก็ดี มีละครแนวการแพทย์ของไทยเรื่องหนึ่งที่แม้จะนำเสนอเรื่องราวสัมพันธภาพของตัวละคร แต่ก็มีลักษณะบางประการที่แตกต่างไปจากละครที่กล่าวถึงข้างต้น คือเรื่อง *รักฉุดใจนายฉุกเฉิน*

ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ผลิตโดยความร่วมมือระหว่างบริษัท เดอะ วัน เอ็นเตอร์ไพรส์ จำกัด (มหาชน) และบริษัทนาดาวบางกอก จำกัด นอกจากนี้ยังได้รับความอนุเคราะห์จากภาควิชาเวชศาสตร์ฉุกเฉิน คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล ในการควบคุมบทละครและเนื้อหาทางการแพทย์ตลอดการถ่ายทำ (ดนัย อังควัฒนวิทย์, 2563) เนื้อหาของละครเรื่องนี้นำเสนอเรื่องราวของ “ทานตะวัน” หญิงสาวที่มีพลังวิเศษในการเรียกคนรักให้มาหาผ่านตัวกลางใดก็ได้ กับ “หมอเป้ง” แพทย์ฉุกเฉินในโรงพยาบาลแห่งหนึ่งซึ่งเป็นคนรักของทานตะวัน จนกระทั่งในวันครบรอบการคบกัน 15 ปี ความสัมพันธ์ของทั้งคู่เริ่มระหองระแหง ทานตะวันเริ่มไม่แน่ใจแล้วว่าหมอเป้งจะดำเนินความสัมพันธ์ชีวิตรักของทั้งคู่ไปอย่างไร ขณะเดียวกัน พลังวิเศษของทานตะวันก็กลับไปอยู่กับ “ฉลาม” นักศึกษาแพทย์ปี 6 ด้วย นั่นจึงทำให้เหตุการณ์วุ่นวายต่าง ๆ ตามมา ละครเรื่องนี้กำกับการแสดงโดย นฤเบศ กูโน ออกอากาศครั้งแรกเมื่อวันที่ 6 กันยายน พ.ศ. 2562 และออกอากาศตอนสุดท้ายเมื่อวันที่ 26 ตุลาคม ในปีเดียวกัน

ในแง่กระแสตอบรับที่มีต่อละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* พบว่า ละครเรื่องนี้ได้รับกระแสตอบรับขณะออกอากาศแตกต่างกันระหว่างการออกอากาศทางโทรทัศน์และการออกอากาศผ่านสื่อออนไลน์ กล่าวคือ ละครโทรทัศน์ที่ออกอากาศ 16 ตอน มีกระแสตอบรับเฉลี่ยอยู่ที่ 1.32 มีเพียงตอนสุดท้ายตอนเดียวที่ได้กระแสตอบรับไปถึง 2.0 ขณะที่ยอดรับชมทางสื่อออนไลน์ผ่าน LINE TV มีจำนวนรวมกว่า 189 ล้านครั้ง อีกทั้งการออกอากาศตอนสุดท้ายทำปรากฏการณ์ติดเทรนด์ทวิตเตอร์อันดับ 1 ของโลกในขณะฉาย (อรัณย์ หนองพล, 2562) นอกจากนี้ยังมีชื่อเข้าชิงรางวัลนาฏราช ครั้งที่ 11 หลายรางวัลด้วย มีผู้วิเคราะห์ไว้ว่า ความสำเร็จของละครแนวการแพทย์เรื่องนี้เกิดจากปัจจัย 5 ประการ ได้แก่ การสร้างความแตกต่างจากละครเรื่องอื่นด้วยแนวเรื่อง “โรแมนติก-แฟนตาซี” ที่มีหลากรส การใช้เพลงประกอบละครที่ได้รับกระแสตอบรับอย่างดี การคัดเลือกนักแสดงที่ลงตัว การออกอากาศทั้งทางโทรทัศน์และสื่อออนไลน์ และการเข้าถึงคนดูทุกเพศทุกวัย (Marketingoops, 2562)

ลักษณะบางประการที่น่าสนใจในละครเรื่อง *รักฉุดใจนายฉุกเฉิน* ซึ่งทำให้ละครเรื่องนี้แตกต่างจากละครแนวการแพทย์เรื่องอื่น ๆ คือ การผสมผสานความเป็นจินตนิมิต (Fantasy) เพื่อนำเสนอเรื่องราวความสัมพันธ์ของตัวละคร โดยผสมเข้ากับการนำเสนอภาพชีวิตของแพทย์ฉุกเฉินในลักษณะที่เป็นสัจนิยม ทำให้ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* มีลักษณะการเล่าเรื่องแบบเดียวกับวรรณกรรมแนวสัจนิยมมหัศจรรย์ (Magical Realism) คือ มีการผสมผสานระหว่าง “ความเป็นจริง” และ “ความมหัศจรรย์” โดยไม่ได้ออกนอกกรอบของการนำเสนอเรื่อง และการใช้ฉากตามแบบสัจนิยม แต่อาจจะมีเหตุการณ์แปลกประหลาดหรือคาดไม่ถึงเกิดขึ้น (สุรเดช โชติอุดมพันธ์, 2554) ลักษณะดังกล่าวทำให้ละครแนวการแพทย์เรื่องนี้แตกต่างไปจากละครแนวการแพทย์เรื่องอื่น ๆ เป็นอย่างมาก

เมื่อพิจารณางานวิจัยในประเทศไทย พบว่า มีการศึกษาละครแนวการแพทย์ของไทยอยู่บ้าง ดังเช่นบทความเรื่อง “เสียงจากศพ: อาชญากรรมกับการดัดแปลงใน *พฤติการณ์ที่ตาย*” (ธงชัย แซ่เจี่ย, 2566ก) และบทความเรื่อง “เสียชีวิตเวลาสี่ทุ่มห้าสิบห้านาที: อาชญากรรมกับการดัดแปลงใน *ทริอาช*” (ธงชัย แซ่เจี่ย, 2566ข) บทความทั้งสองเรื่องศึกษาละครแนวการแพทย์เรื่อง *พฤติการณ์ที่ตาย* และเรื่อง *ทริอาช* ซึ่งดัดแปลงมาจากนวนิยายชื่อเดียวกัน นวนิยายทั้งสองเรื่องเป็นผลงานของแซมม่อน ความโดดเด่นที่ปรากฏร่วมกันในการดัดแปลงจากฉบับนวนิยายเป็นฉบับละครก็คือ อาชญากรรมที่เพิ่มเข้ามาในฉบับละคร ละครทั้งสองเรื่องนำเสนอภาพบุคลากรทางการแพทย์ที่เกี่ยวข้องกับอาชญากรรม อันสื่อนัยวิพากษ์บุคลากรในโรงพยาบาลที่ไม่ปฏิบัติตามจรรยาบรรณวิชาชีพ ขณะเดียวกัน ตัวบทละครฉบับดัดแปลงก็เป็นพื้นที่ให้นักแสดงและผู้ผลิตละครได้แสดงศักยภาพในอุตสาหกรรมสื่อบันเทิงยาโออิที่กำลังเติบโตด้วย

ส่วนงานวิจัยที่ศึกษาละครเรื่อง *รักฉุดใจนายฉุกเฉิน* โดยตรง คือ บทความเรื่อง “กระบวนการสร้างสรรค์และปัจจัยที่มีผลต่อความสำเร็จของละครโทรทัศน์เรื่อง *My Ambulance รักฉุดใจนายฉุกเฉิน*” (ดาวิกา โฮร์เน่, 2564) ซึ่งเก็บข้อมูลด้วยการสัมภาษณ์แบบเจาะลึกประกอบกับวิธีการสังเกตการณ์ เพื่อทำความเข้าใจมุมมองแนวคิดที่สะท้อนอยู่ในกระบวนการสร้างสรรค์ละครแนวการแพทย์เรื่องนี้ ทั้งในขั้นเตรียมการถ่ายทำ ขั้นการถ่ายทำ และขั้นตอนหลังการถ่ายทำ และละครพยายามจะสื่อสารไปถึงผู้ชม รวมถึงเพื่อทราบปัจจัยที่มีผลให้ละครเรื่องดังกล่าวประสบความสำเร็จ ซึ่งประกอบไปด้วยปัจจัยด้านสังคม ปัจจัยด้านเทคโนโลยีการสื่อสาร และปัจจัยด้านการแข่งขัน

งานวิจัยที่กล่าวถึงข้างต้น เป็นการศึกษาละครแนวการแพทย์ในประเด็นการดัดแปลงและสารที่นำเสนอ ส่วนงานวิจัยของ ดาวิกา โฮร์เน่ เป็นการศึกษาละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ในแง่การผลิตและผลตอบรับที่ทำให้ละครเรื่องนี้ประสบความสำเร็จ ยังไม่มีผู้ใดศึกษาละครแนวการแพทย์เรื่องนี้ในประเด็นการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินผ่านการนำเสนอเรื่องแบบสัจนิยมมหัศจรรย์ นับว่าเป็นประเด็นที่น่าสนใจอย่างมาก

วัตถุประสงค์ของการวิจัย

เพื่อวิเคราะห์การนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินผ่านการนำเสนอเรื่องแบบสัจนิยมมหัศจรรย์ในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน*

แนวคิด ทฤษฎี กรอบแนวคิด

ในสหรัฐอเมริกา ละครแนวการแพทย์ปรากฏสู่สาธารณชนบนหน้าจอโทรทัศน์เป็นครั้งแรกในช่วงทศวรรษ 1950 ละครเรื่องแรก คือ *City Hospital* ในระยะนี้ ละครแนวการแพทย์มีเนื้อหาเกี่ยวกับผู้ป่วยที่ต้องทนทุกข์ทรมานจากความเจ็บป่วย การทำหน้าที่ของแพทย์และพยาบาล รวมไปถึงสภาพแวดล้อมในโรงพยาบาล โดยนำเสนอแบบสัจนิยมเพื่อดึงดูดความสนใจของผู้ชม (Jacobs, 2001) ละครแนวนี้ได้รับความนิยมอย่างมากในช่วงทศวรรษ ค.ศ. 1950 - 1980 ก่อนที่ในเวลาต่อมาจะมีพัฒนาการของการนำเสนอเนื้อหาที่เปลี่ยนแปลงไป โดยเปลี่ยนจุดเน้นของเรื่องที่เล่าเป็นการเล่าชีวิตของแพทย์และพยาบาลในฐานะที่เป็นมนุษย์มากขึ้น มีการนำเสนอภาพชีวิตของบุคลากรทางการแพทย์ทั้งในแง่บวกและแง่ลบ (Turow, 2010) ความเปลี่ยนแปลงที่เกิดขึ้นเป็นการผสมผสานความเป็นวิชาชีพ ในการทำงานกับอารมณ์ความรู้สึกในฐานะมนุษย์ ทำให้ละครแนวการแพทย์มีเนื้อหาสาระหลากหลายมากขึ้น ผู้ชมมีอารมณ์ความรู้สึก

ร่วมกับละครได้มากขึ้น ขณะเดียวกันก็เปิดโอกาสให้ได้สำรวจตรวจสอบละครแนวนี้ด้วยมุมมองหรือทฤษฎีที่หลากหลายมากขึ้นด้วย

พัฒนาการก้าวต่อมาของละครแนวการแพทย์มุ่งเน้นให้ละครมีความถูกต้องเที่ยงตรงมากขึ้น ขณะเดียวกันก็ไม่ละเลยความบันเทิงของผู้ชมด้วย ไม่ว่าจะเป็นการใช้เทคนิคการถ่ายภาพและอุปกรณ์ เช่น กล้องกันสั่น (Steadycam) เพื่อแช่ภาพฉากบางฉากในละคร การใช้บุคลากรทางการแพทย์เป็นส่วนหนึ่งของละครที่ถ่ายทำ รวมถึงการให้แพทย์ในฐานะผู้เชี่ยวชาญเป็นส่วนหนึ่งของฝ่ายเขียนบท วิธีการเหล่านี้แม้จะเป็นรายละเอียดเล็กน้อย แต่ก็สร้างความสมจริงให้กับละครได้มาก ทั้งยังให้ความรู้ควบคู่ความบันเทิงแก่ผู้ชมด้วย (Baer, 1996) กระทั่งหลังปี ค.ศ. 2000 เป็นต้นมา ละครแนวนี้จึงได้ลดทอนความเป็น “วีรบุรุษ” ของตัวละครที่เป็นบุคลากรทางการแพทย์ลง มีการนำเสนอเรื่องราวความสัมพันธ์ระหว่างแพทย์กับผู้ป่วย สถานการณ์เปราะบางที่บุคลากรทางการแพทย์พบในชีวิตประจำวัน หรือไม่ก็อาจเป็นเหตุการณ์ที่แพทย์ต้องตัดสินใจภายใต้กรอบศีลธรรมและจรรยาบรรณวิชาชีพ ทำให้ละครแนวการแพทย์นำเสนอความเป็นมนุษย์ของบุคลากรทางการแพทย์มากขึ้นกว่าอดีต ทั้งยังช่วยลดระยะห่างกับผู้ชมด้วย (Rocchi, 2019)

ในแง่ของการศึกษาวิจัยเกี่ยวกับละครแนวการแพทย์สามารถทำได้หลายวิธี ในระยะแรกที่ละครประเภทนี้ถือกำเนิดขึ้น นักวิจัยพุ่งความสนใจไปที่บริบทแวดล้อมการผลิตละครแนวการแพทย์ ประเด็นและมุมมองที่ปรากฏเฉพาะในละครแนวการแพทย์จำนวนมาก และทำให้แตกต่างจากละครประเภทอื่น ๆ จนละครแนวนี้ก่อรูปขึ้นมาเป็นประเภทหนึ่งของละคร ยิ่งละครแนวการแพทย์มีคุณภาพ และความสร้างสรรค์มากขึ้น กอปรกับการแพร่หลายไปสู่สื่ออื่น ๆ ก็ยิ่งทำให้เกิดการศึกษาวิจัยเพิ่มขึ้นตามไปด้วย (Rocchi, 2019) ในช่วงเวลาไล่เลี่ยกัน มีนักวิชาการเสนอทัศนะว่า การศึกษาวิจัยเกี่ยวกับละครแนวการแพทย์ควรให้ความสนใจกับประเด็นเรื่องความหมายหรือสารที่ละครนำเสนอด้วย เนื่องจากละครแนวนี้มักปรากฏตัวละครแพทย์ซึ่งมีลักษณะเป็นสากล ทั้งยังมีเนื้อหาซับซ้อนและส่งผลกระทบต่อความรู้สึกของคนในสังคมเป็นวงกว้าง (Grignaffini & Pozzato, 2007) โดยนัยนี้ ละครแนวการแพทย์จึงควรได้รับการสำรวจตรวจสอบและศึกษาวิจัยด้วยมุมมองที่แตกต่างหลากหลาย (Rocchi, 2019)

ในแง่หนึ่ง ละครแนวการแพทย์อาจศึกษาในมิติเพศภาวะและเพศวิถีได้ ดังที่ฟิลิปส์ (Philips, 2000) ได้แสดงให้เห็นพัฒนาการของการนำเสนอตัวละครแพทย์ว่า ในระยะแรก ๆ ละครแนวการแพทย์มักปรากฏเฉพาะแพทย์ที่เป็นเพศชาย และได้รับบทบาทเสมือนวีรบุรุษ แต่จากการศึกษาในระยะหลังพบว่า บทบาทดังกล่าวปรากฏทั้งแพทย์ที่เป็นเพศชายและเพศหญิง (Rocchi, 2019) ในอีกแง่หนึ่ง ละครแนวการแพทย์ยังสามารถศึกษาในเชิงสหวิทยาการผ่านแว่นวัฒนธรรมศึกษา ซึ่งจะช่วยวิเคราะห์เนื้อหาในมิติทางสังคมและวัฒนธรรม รวมไปถึงอุดมการณ์เบื้องหลังการผลิตละครแนวนี้ด้วย (Rossman, 2003)

นอกจากนี้การศึกษาละครแนวการแพทย์ในเชิงมานุษยวิทยาสื่อมวลชนก็เป็นอีกแง่มุมหนึ่งที่น่าสนใจ นักวิจัยหลายคนศึกษาละครแนวดังกล่าวด้วยทฤษฎีมานุษยวิทยาสื่อมวลชนเพื่อพิจารณาประสบการณ์ของผู้รับสารที่รับชมละครแนวการแพทย์ การรับสารเกี่ยวกับการส่งเสริมสุขภาวะและความป่วยไข้ รวมทั้งผลกระทบของเรื่องราวระหว่างแพทย์กับผู้ป่วยในละครแนวการแพทย์ที่มีต่อความสัมพันธ์หลากหลายรูปแบบระหว่างแพทย์และผู้ป่วยในชีวิตจริง (Rocchi, 2019) ขณะที่นักวิจัยด้านภาษาอาจพิจารณาละครแนวการแพทย์ในมิติการสื่อสารศัพท์เฉพาะกลุ่ม เช่น การถ่ายทอดศัพท์ทางการแพทย์ไปสู่ผู้ชม หรืออาจพิจารณาการสื่อสารระหว่างวัฒนธรรมผ่านการพากย์หรือคำบรรยาย เมื่อละครแนวนี้เดินทางออกไปเผยแพร่ในต่างประเทศ (Rocchi, 2019) นอกจากที่กล่าวมาแล้ว กระบวนทัศน์ล่าสุด

ที่ปรากฏในการศึกษาละครแนวการแพทย์ คือ การศึกษาผ่านกระบวนทัศน์ “ระบบนิเวศของเรื่องเล่า” (Narrative Ecosystem) กล่าวคือ เป็นการศึกษาความสัมพันธ์ระหว่างการผลิตละครแนวการแพทย์ บริบทที่แวดล้อม กับการรับชมของผู้รับสารและปฏิกิริยาตอบกลับของผู้รับสารที่มีต่อละครที่ได้รับชม เพื่อสำรวจตรวจสอบองค์ประกอบในละครแนวการแพทย์ที่ทำให้ละครแนวนี้ประสบความสำเร็จ ซึ่งการศึกษาแนวนี้อาจต้องก้าวเข้าไปในพื้นที่สื่อออนไลน์เพื่อรับทราบถึงปฏิกิริยาของผู้ชมด้วย (Rocchi, 2019)

จากที่กล่าวมาจะเห็นว่า ละครแนวการแพทย์และการศึกษาวิจัยเกี่ยวกับละครแนวนี้ ในโลกวิชาการตะวันตกสามารถศึกษาได้ทั้งในแง่องค์ประกอบที่ทำให้เป็นประเภทหนึ่งของละคร การศึกษาในแง่ความหมายและการสื่อความหมาย การศึกษาในมิติเพศภาวะและเพศวิถี การศึกษาด้วยกระบวนทัศน์วัฒนธรรมศึกษา รวมไปถึงการศึกษาในเชิงมานุษยวิทยาสื่อมวลชน อย่างไรก็ดี ด้วยเหตุที่ลักษณะการเล่าเรื่องในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* มีการผสมผสานระหว่าง “ความเป็นจริง” และ “ความมหัศจรรย์” ตามลักษณะการเล่าเรื่องในวรรณกรรมแนวสัจนิยมมหัศจรรย์ดังที่ได้กล่าวไปแล้วในที่นี้จะได้กล่าวถึงแนวคิดทฤษฎีที่เกี่ยวกับสัจนิยมมหัศจรรย์ด้วย

สัจนิยมมหัศจรรย์เป็นแนวการเขียนวรรณกรรมที่หลายคนเข้าใจว่า มีต้นกำเนิดจากภูมิภาคละตินอเมริกา แต่ในความเป็นจริงแล้ว ศิลปะแนวนี้มีต้นกำเนิดจากจิตรกรรมในยุโรป ก่อนที่นักเขียนจากละตินอเมริกาจะนำมาประยุกต์ใช้กับวรรณกรรม (ชูศักดิ์ ภัทรกุลวณิชย์, 2548) และมักถูกเข้าใจในฐานะเป็นกลวิธีการเขียนวรรณกรรมการเมือง (ชูศักดิ์ ภัทรกุลวณิชย์, 2556) ซึ่งที่จริงแล้วไม่จำเป็นต้องเป็นเช่นนั้นเสมอไป

วรรณกรรมแนวสัจนิยมมหัศจรรย์ผสมผสานระหว่าง “ความเป็นจริง” และ “ความมหัศจรรย์” โดยไม่ได้ออกนอกกรอบของการนำเสนอเรื่องและการใช้ฉากตามแบบสัจนิยม กล่าวคือ ฉากในวรรณกรรมสัจนิยมมหัศจรรย์มักจะเป็นโลกที่รู้จักมักคุ้นเป็นอย่างดี แต่อาจจะมีเหตุการณ์แปลกประหลาดหรือคาดไม่ถึงเกิดขึ้น อันทำให้ต้องหวนกลับมาคิดเกี่ยวกับสิ่งที่เรียกว่า “ความเป็นจริง” หรือ “ความมหัศจรรย์ทั้งยังมีประเด็นทางสังคมซ่อนเร้นอยู่ภายในนั้นด้วย (สุรเดช โชติอุดมพันธ์, 2554) งานวิชาการที่ศึกษาวรรณกรรมแนวสัจนิยมมหัศจรรย์ของไทยเริ่มแพร่หลายตั้งแต่ พ.ศ. 2548 เป็นต้นมา เนื่องจากนักเขียนไทยสร้างสรรค์วรรณกรรมแนวนี้เพิ่มมากขึ้น ขณะเดียวกัน แนวการวิเคราะห์ก็มีอย่างหลากหลาย ทั้งการวิเคราะห์เชิงพัฒนาการ การวิเคราะห์เชิงสังคม การวิเคราะห์เฉพาะเรื่อง และการวิเคราะห์เชิงเปรียบเทียบ (อัษฎาวุธ ไชยวรรณ, 2564) ทั้งนี้ อาจเนื่องมาจากคุณค่าของวรรณกรรมแนวสัจนิยมมหัศจรรย์ในแง่การวิพากษ์สังคม การเมือง และวาทกรรมกระแสหลักของสังคม พร้อมทั้งสามารถนำเสนออัตลักษณ์พื้นถิ่นไทยในบริบทสังคมที่มีความหลากหลายด้วย (รัตนาวดี ปาแปง, 2556)

ด้วยเหตุที่สัจนิยมมหัศจรรย์มีต้นกำเนิดจากศิลปะและสามารถประยุกต์เป็นแนวการเขียนวรรณกรรมได้ สัจนิยมมหัศจรรย์ก็น่าที่จะสามารถประยุกต์เป็นลักษณะการเล่าเรื่องหรือนำเสนอเรื่องราวในสื่ออื่น ๆ เช่น ภาพยนตร์หรือละครได้ด้วยเช่นกัน ดังที่วรรณกรรมประเภทสัจนิยมมหัศจรรย์เคยได้รับการสร้างเป็นภาพยนตร์ เช่นเรื่อง *Like Water for Chocolate* (1992) หรือเรื่อง *Being John Malkovich* (1999) แต่ไม่ได้รับความนิยมนักจึงไม่จัดว่าเป็นตระกูลภาพยนตร์ (Genre) (เขมพัทธ์ พัชรวิชญ์, 2560) ส่วนงานวิจัยที่ศึกษาประยุกต์ใช้สัจนิยมในการศึกษาภาพยนตร์ คือ บทความเรื่อง “สัจนิยมมหัศจรรย์กับการนำเสนอภาพความรักของเกย์ในภาพยนตร์ไทยเรื่อง *คืนนั้น*” ของ ธงชัย แซ่เจี่ย (2558) ข้อค้นพบของบทความนี้ คือ การนำเสนอเรื่องแบบสัจนิยมมหัศจรรย์ในภาพยนตร์ไทยเรื่อง *คืนนั้น* สัมพันธ์กับสาระสำคัญที่มุ่งนำเสนอภาพความรักของตัวละครเกย์ที่สัมพันธ์กับผลประโยชน์ สัมพันธ์กับคุณธรรมจริยธรรม

และสัมพันธ์กับอำนาจรัฐ

ผู้วิจัยเห็นว่า ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* มีลักษณะการนำเสนอเรื่องแบบสัจนิยมมหัศจรรย์ เพราะผสมผสาน “ความเป็นจริง” และ “ความมหัศจรรย์” อยู่ด้วยกันภายในกรอบการนำเสนอเรื่องและฉากแบบสัจนิยม จึงประยุกต์ใช้กรอบแนวคิดและทฤษฎีดังกล่าวข้างต้น เพื่อศึกษาละครแนวการแพทย์เรื่องนี้ ดังจะได้อภิปรายต่อไปข้างหน้า

วิธีดำเนินการวิจัย

1. ศึกษาเอกสารและงานวิจัยที่เกี่ยวข้องเพื่อกำหนดกรอบแนวคิดและทฤษฎี
2. วิเคราะห์ภาพแทนชีวิตแพทย์ฉุกเฉินในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* โดยใช้แนวคิดสัจนิยมมหัศจรรย์
3. สรุปผลการวิเคราะห์ อภิปรายผล และนำเสนอ

ผลการวิจัย

ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* มีองค์ประกอบของความมหัศจรรย์โดยนำเสนอผ่านตัวละครเอกหญิง ชื่อ ทานตะวัน ผู้ที่ได้รับพลังวิเศษในการเรียกคนรักให้มาหาผ่านตัวกลางใดก็ได้ เธอได้รับพลังวิเศษเมื่อพยายามจะกระทำอัตวินิบาตกรรมตามรอยบิดามารดา แต่การณ์กลับกลายเป็นว่าเธอตกลงไปในกระท่อมที่อยู่ในพื้นที่ห่างไกล เมื่อทานตะวันเรียกชื่อเป้งเพื่อขอความช่วยเหลือ ดาวหางสีชมพูก็พาให้เป้งทะลุกำแพงมาหาทานตะวันได้ทันที (นาดาว บางกอก, 2562) ดังภาพต่อไปนี้

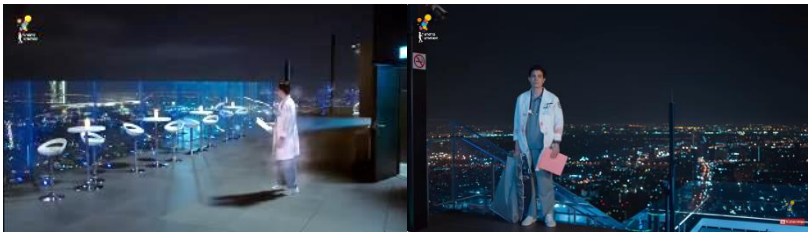
ภาพที่ 1 การใช้พลังวิเศษครั้งแรกของทานตะวัน

ภาพข้างต้นเป็นเหตุการณ์ในตอนที่ 1 ซึ่งเป็นจุดเริ่มต้นความสัมพันธ์ของทานตะวันและเป้งในช่วงที่เป็นวัยรุ่น พลังสีชมพูที่ออกจากปากของทานตะวันสามารถพาให้เป้งมาหาเธอได้ (นาดาว บางกอก, 2562) ลักษณะดังกล่าวเป็นความมหัศจรรย์ที่นำเสนอในละครและมีบทบาทสำคัญต่อเรื่อง เมื่อพิจารณาพลังวิเศษของทานตะวันตามแนวคิดสัจนิยมมหัศจรรย์แล้ว พบว่า พลังวิเศษสัมพันธ์กับการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉิน โดยเฉพาะประเด็นความสมดุลระหว่างการงานและชีวิตส่วนตัว (work-life balance) แนวคิดดังกล่าวเกิดขึ้นเพื่อลดผลกระทบจากการทำงานหนักเกินไป ช่วยให้มีความสุขกับชีวิตมากขึ้น สุขภาพกายและสุขภาพจิตดีขึ้น และคุณภาพของปฏิสัมพันธ์ต่อคนรอบข้างก็มีมากขึ้นด้วย (ชาวิท ตันวีระชัยสกุล, 2564) อย่างไรก็ดี ความมหัศจรรย์ของพลังวิเศษในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* เผยให้เห็นภาพแทนชีวิตแพทย์ฉุกเฉิน 2 ลักษณะ ได้แก่ ความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน และการพัฒนาความสัมพันธ์ของแพทย์ฉุกเฉิน ดังมีรายละเอียดต่อไปนี้

1. ความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน

ความอสมดุล (Disequilibrium) หมายถึง สถานะที่สิ่งต่าง ๆ ไม่คงที่ ไม่มั่นคง หรือไม่เป็นปกติ

และอาจเกิดการเปลี่ยนแปลงขึ้นได้ในทันทีทันใด (Collins, 2024) ในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ใช้สัจนิยมมหัศจรรย์เพื่อนำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน โดยนำเสนอผ่านความสัมพันธ์ระหว่างตัวละครทานตะวันกับหมอเป้ง ดังตัวอย่างต่อไปนี้



ภาพที่ 2 หมอเป้งโผล่มาเพราะพลังวิเศษของทานตะวันทั้งที่ยังออกตรวจคนไข้

ภาพแรกเป็นภาพจากละครตอนที่ 1 เป็นฉากที่ทานตะวันใช้พลังเรียกหมอเป้งมาเพื่อทานอาหารเนื่องในวาระครบรอบ 15 ปีความสัมพันธ์ของทั้งสองตามที่ทานตะวันวางแผนและจัดเตรียมไว้ แต่เนื่องจากหมอเป้งยังรักษาอาการของผู้ป่วยในแผนกฉุกเฉินอยู่ จึงทำให้เขาโผล่มาทั้งที่ยังใส่ชุดออกตรวจที่เปื้อนคราบเลือดและในมือก็ยังถือคลิปบอร์ดบันทึกอาการคนไข้ หมอเป้งต่อว่าทานตะวันว่า “เรายังรักษาคนไข้ไม่เสร็จเลย แกใช้พลังทำไม อย่าใช้พลังสุ่มสี่สุ่มห้าได้ไหม” ทำให้ทานตะวันเสียใจและตอบกลับว่า “แกรู้ไหมว่ายี่สิบสี่ชั่วโมงของแกแทบจะเป็นหมอไปหมดแล้วนะ ปกติหมอฉุกเฉินเข้าเวรแปดชั่วโมง แกก็เพิ่มเป็นสิบสองชั่วโมง เดือนหนึ่งหยุดได้สิบวันแต่แกขอหยุดแค่วันอาทิตย์วันเดียว ทั้งหมดที่แกทำเพราะว่าแกอยากจะทำให้เก่งขึ้น อยากจะทำให้ดีกว่าเดิม ลึก ๆ แล้วเราเสียใจนะที่เราไม่ค่อยได้เจอกันเลย เราอยากใช้ชีวิตกับแกบ้าง แต่ที่เสียใจคือวันนี้แกลืม มันจะมีสักเวลาไหมที่แกอยากจะอยู่กับเรา นี่มันไม่ใช่ครั้งแรก ลืมบ่อยขนาดนี้มันไม่ใช่ลืมนัดแล้ว แต่แกลืมไปด้วยซ้ำว่ายังมีเราอยู่” (นาดาว บางกอก, 2562) เหตุการณ์ดังกล่าวเป็นการนำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน เนื่องจากหมอเป้งไม่สามารถจัดวางสมดุลระหว่างการทำงานเป็นแพทย์ฉุกเฉินกับการใช้ชีวิตส่วนตัวร่วมกับทานตะวันซึ่งเป็นคนรักได้ ทั้งยังเป็นการเปิดเรื่องให้เห็นปมปัญหาในความสัมพันธ์ระหว่างทานตะวันและหมอเป้งเพื่อนำไปสู่เรื่องราวในตอนต่อ ๆ ไปด้วย

การนำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินในละครเรื่องนี้ปรากฏอีกครั้ง ดังตัวอย่างต่อไปนี้

ภาพที่ 3 หมอเป้งถูกตามตัวกลับโรงพยาบาลขณะรับประทานอาหารเย็นกับทานตะวัน

ตัวอย่างข้างต้นเป็นภาพจากละครตอนที่ 3 ตัวอย่างดังกล่าวนำเสนอความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินผ่านเหตุการณ์ที่ทานตะวันใช้พลังวิเศษเรียกให้หมอเป้งมาร่วมรับประทานอาหารเย็นเนื่องในวันลอยกระทง เพื่อกระชับความสัมพันธ์ให้แน่นแฟ้นขึ้น แม้ทั้งสองจะ

พยายามหาเวลาอยู่ด้วยกัน แต่ก็ยังมีบะหมี่ พนักงานขับรถฉุกเฉินตามตัวหมอเป้งไปทำหน้าที่แพทย์ฉุกเฉิน เนื่องจากมีแพทย์หนีเวร ทำให้หมอเป้งเลือกจะทิ้งทานตะวันไว้ที่ร้านอาหาร ดังบทสนทนาที่ว่า “แกกินไปก่อนเลย ไม่ต้องห่วง เราจะรีบกลับมาให้ทันลอยกระทง” อย่างไรก็ดี ทานตะวันตอบกลับว่า “เป้ง นี่มันเวลาออกเวรของแกนะ แล้วทั้งโรงพยาบาลไม่ได้มีแกเป็นหมอคนเดียว นี่เป็นเวลาพักผ่อนของแก แกควรพักจริง ๆ บ้าง” (นาดาว บางกอก, 2562) เหตุการณ์ดังกล่าวนำเสนอภาพแทนความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน และการที่หมอเป้งตัดสินใจไปโรงพยาบาลกับรถฉุกเฉินทั้งที่ยังสวมชุดสำหรับไปลอยกระทงอยู่ก็แสดงให้เห็นจุดยืนในการเลือกของหมอเป้งว่าเลือกหน้าที่การงานมากกว่าชีวิตส่วนตัว

เหตุการณ์ที่ตอกย้ำการนำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินคือเหตุการณ์ต่อไปนี้

ภาพที่ 4 หมอเป้งตัดสินใจช่วยคนอื่นก่อนและทิ้งทานตะวันไว้

เหตุการณ์ข้างต้นมาจากละครตอนที่ 6 เมื่อทานตะวันพยายามเข้าช่วยเหลือคนที่กำลังกระโดดสะพานลอยแต่กลับประสบอุบัติเหตุไปด้วย ทำให้มีผู้บาดเจ็บสามคน หมอเป้งวิเคราะห์สถานการณ์แล้วตัดสินใจช่วยคนที่กระโดดสะพานลอยก่อนเนื่องจากเลือดไหลไม่หยุดอาการหนักกว่า ดังบทสนทนาที่ว่า “เราต้องไปดูเล็ก ถ้าปล่อยไว้อย่างนี้ไม่รอดแน่ อาการแกยังรอได้อยู่” ก่อนจะปล่อยให้ทานตะวันนอนอยู่ตรงจุดที่เกิดเหตุ ทานตะวันจึงใช้พลังวิเศษเรียกให้ฉลามมาช่วยแทน (นาดาว บางกอก, 2562) จะเห็นได้ว่า แม้จะเกิดเหตุฉุกเฉินกับคนที่อยู่ในความสัมพันธ์ในชีวิตส่วนตัวของหมอเป้ง แต่หมอเป้งกลับเลือกทำหน้าที่แพทย์ฉุกเฉินด้วยการช่วยเหลือคนที่อาการหนักมากกว่าก่อนและละเลยคนในความสัมพันธ์ที่ก็ต้องการความช่วยเหลือเช่นกัน

ภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินที่นำเสนออยู่ในละครเรื่องนี้นำไปสู่จุดสิ้นสุดความสัมพันธ์ระหว่างทานตะวันกับหมอเป้งด้วย ดังภาพต่อไปนี้

ภาพที่ 5 จุดสิ้นสุดของความสัมพันธ์และพลังวิเศษของทานตะวันที่มีต่อหมอเป้ง

จากภาพละครตอนที่ 16 ซึ่งเป็นตอนอวสานจะเห็นว่า พลังวิเศษของทานตะวันไม่สามารถทำให้หมอเป้งทะลุผ่านสิ่งกีดขวางมาได้อีกต่อไป มีเพียงแขนข้างหนึ่งที่ผ่านกำแพงเข้ามาเท่านั้น หมอเป้งกล่าวกับทานตะวันว่า “เรากับแกไม่ต้องมาฝืนกันแล้วเนาะ ถ้ามันใช่มันใช่ไปนานแล้ว” ขณะที่ทานตะวันก็

ตัดสินใจบอกเลิกเป้งและคืนแหวนให้ในที่สุดพร้อมกับกล่าวว่า “เราคืนให้นะ แล้ววันหนึ่งแกจะเจอคนที่เข้ากับแกมากกว่าเรา” แล้วหลังจากนั้นเป้งก็ไม่สามารถทะลุมาหาทานตะวันได้อีกเลย (นาดาว บางกอก, 2562) จะเห็นได้ว่า การที่ละครเรื่องนี้นำเสนอว่าพลังวิเศษของทานตะวันที่มีต่อหมอเป้งเดินทางมาถึงจุดสิ้นสุดพร้อม ๆ กับที่ทานตะวันตัดสินใจยุติความสัมพันธ์กับหมอเป้งทั้งที่คบกันมา 15 ปีเป็นผลมาจากความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินที่ละครนำเสนอมาตั้งแต่ต้น

2. การพัฒนาความสัมพันธ์ของแพทย์ฉุกเฉิน

ในขณะที่ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ใช้สัจนิยมมหัศจรรย์เพื่อนำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินผ่านเรื่องราวความสัมพันธ์ระหว่างทานตะวันกับหมอเป้งดังที่กล่าวมาแล้ว ละครเรื่องนี้ก็ยังใช้สัจนิยมมหัศจรรย์เพื่อนำเสนอภาพการพัฒนาความสัมพันธ์ของแพทย์ฉุกเฉินดังภาพต่อไปนี้

ภาพที่ 6 พลังวิเศษของทานตะวันกับจุดเริ่มต้นความสัมพันธ์ที่มีต่อฉลาม

ภาพข้างต้นเป็นเหตุการณ์ในตอนที่ 1 เช่นกัน จากภาพแสดงให้เห็นตัวละครฉลามซึ่งเป็นนักศึกษาแพทย์ปีสุดท้ายที่ฝึกงานในโรงพยาบาลเดียวกับหมอเป้ง ฉลามสามารถทะลุประตูห้องน้ำแล้วมาโผล่ที่ทานตะวันอยู่ได้ แทนที่จะเป็นหมอเป้งคนเดียว ฉลามตกใจและพูดขึ้นว่า “เมื่อกี๊ผมอาบน้ำอยู่ที่หอ แล้วผมมาโผล่อยู่ที่นี่ได้ยังไง” (นาดาว บางกอก, 2562) ลักษณะดังกล่าวเป็นความมหัศจรรย์ที่นำเสนออยู่ในละครและมีบทบาทสำคัญในการเริ่มต้นความสัมพันธ์ระหว่างตัวละครทานตะวันกับฉลาม แม้ว่าทานตะวันจะไม่ได้ตั้งใจก็ตาม

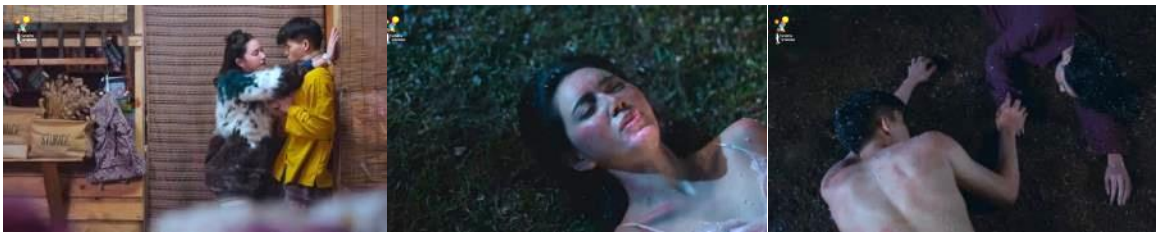
อย่างไรก็ดี ขณะที่ละครเรื่องนี้นำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินผ่านตัวละครหมอเป้งและเรื่องราวความสัมพันธ์ที่หมอเป้งมีร่วมกับทานตะวันดังที่กล่าวไปแล้ว ละครก็ได้นำเสนอว่าพลังวิเศษของทานตะวันส่งผลต่อการพัฒนาความสัมพันธ์ระหว่างตัวละครทานตะวันกับฉลาม ดังตัวอย่างจากภาพต่อไปนี้

ภาพที่ 7 การสานสัมพันธ์ระหว่างทานตะวันกับฉลาม

ในละครตอนที่ 3 ซึ่งนำเสนอภาพความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉินดังที่ได้กล่าวไปก่อนหน้า พลังวิเศษของทานตะวันก็เรียกตัวฉลามมาด้วยแต่ฉลามไม่กล้าออกมาให้ทั้งสองเห็น จนกระทั่งทานตะวันพบว่า ฉลามหลบอยู่ใต้โต๊ะ เหตุการณ์ดังกล่าวทำให้ทานตะวันได้ปรับ

ทุกข์กับฉลามจนฉลามต้องปลอบว่า “พี่ไม่ต้องกลั้นน้ำตาแล้ว พี่อยากร้อง พี่ก็ร้องออกมาได้เลย เวลาคนเสียใจ เป็นใครใครก็ร้องทั้งนั้น” และนำไปสู่ความเข้าใจกันของตัวละครทั้งสอง (นาดาว บางกอก, 2562) จะเห็นได้ว่า พลังวิเศษของทานตะวันส่งผลต่อการพัฒนาความสัมพันธ์ระหว่างทานตะวันกับฉลามด้วย

การพัฒนาความสัมพันธ์ของแพทย์ฉุกเฉินได้รับการตอกย้ำผ่านการนำเสนอเรื่องราวระหว่างทานตะวันและฉลาม ดังตัวอย่างต่อไปนี้



ภาพที่ 8 การพัฒนาความสัมพันธ์ระหว่างทานตะวันกับฉลาม

จากภาพละครตอนที่ 10 เป็นฉากที่ทานตะวันอยู่ที่เชียงใหม่และเผลอใช้พลังวิเศษโดยไม่ได้ตั้งใจ พลังนั้นทำให้ฉลามสามารถทะลุไปหาทานตะวันและเป็นโอกาสที่ตัวละครทั้งสองพัฒนาความสัมพันธ์กันได้ ทั้งสองได้ไปเที่ยวที่ต่าง ๆ ด้วยกัน อย่างไรก็ดี ในเหตุการณ์ที่พาทานตะวันไปทิ้งไว้บนยอดดอยที่ขณะที่ทานตะวันกำลังหลับ อุณหภูมิหนาวเย็นทำให้ร่างกายของทานตะวันไม่สามารถต้านทานได้ จึงใช้พลังร้องขอความช่วยเหลือจากฉลาม เป็นเหตุให้ฉลามทะลุไปหาทานตะวัน และช่วยเหลือในเบื้องต้นก่อนที่แพทย์ฉุกเฉินจะมาถึง (นาดาว บางกอก, 2562) จะเห็นได้ว่า เหตุการณ์วิกฤตดังกล่าว ทำให้ทานตะวันใช้พลังวิเศษ และเปิดโอกาสให้ความสัมพันธ์ระหว่างทานตะวันกับฉลามได้พัฒนาไปอีกขั้นหนึ่ง

การพัฒนาความสัมพันธ์ระหว่างทานตะวันและฉลามในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ดำเนินไปถึงตอนอวสาน ดังภาพต่อไปนี้

ภาพที่ 9 การตัดสินใจเลือกของทานตะวัน

จากภาพละครตอนที่ 16 ซึ่งเป็นตอนอวสานจะเห็นว่า ในการใช้พลังของทานตะวันเพื่อตัดสินใจเลือกว่าจะรักษาความสัมพันธ์กับใครระหว่างหมอเป้งและฉลาม ทานตะวันเลือกฉลาม เป็นเหตุให้ฉลามสามารถเปิดประตูมาหาทานตะวันได้ บทสนทนาระหว่างทานตะวันและฉลาม มีว่า

> “ผมใช่คนเดียวกับที่พี่เลือกไว้ในใจหรือเปล่า”
> “อืม คนเดียวกัน”
>
> (นาดาว บางกอก, 2562)

บทสนทนาข้างต้นเป็นการตอกย้ำว่า พลังวิเศษของทานตะวันสัมพันธ์กับการพัฒนาความสัมพันธ์ของตัวละครทานตะวันและฉลาม ฉากจบที่ทั้งสองไปทานอาหารเย็นด้วยกันเป็นเครื่องยืนยันการเลือกของ

ทานตะวัน ขณะเดียวกันก็แสดงให้เห็นพฤติกรรมที่ทานตะวันคาดหวังจากคนที่อยู่ในความสัมพันธ์ด้วย นั่นคือ การได้ใช้เวลาในชีวิตร่วมกัน ซึ่งนั่นเป็นสิ่งที่ฉลามทำได้แต่หมอเป้งทำไม่ได้

สรุปและอภิปรายผล

ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* มีองค์ประกอบของความมหัศจรรย์โดยนำเสนอผ่านตัวละครเอกหญิง ชื่อ ทานตะวัน เมื่อพิจารณาพลังวิเศษของทานตะวันตามแนวคิดสัจนิยมมหัศจรรย์แล้ว พบว่า องค์ประกอบด้านความมหัศจรรย์ที่นำเสนออยู่ในละครแนวการแพทย์เรื่องดังกล่าวเกี่ยวข้องกับการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉิน สามารถจำแนกประเด็นได้เป็น 2 ประเด็น

ประเด็นหนึ่ง ความอสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของแพทย์ฉุกเฉิน สัจนิยมมหัศจรรย์ในละครเรื่องนี้นำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินว่า แพทย์ฉุกเฉินที่ไม่สามารถจัดสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานได้จะส่งผลต่อความสัมพันธ์ที่มีต่อบุคคลอื่นในชีวิตจนทำให้ต้องยุติความสัมพันธ์ลงแม้ว่าจะอยู่ในความสัมพันธ์กันมานานถึง 15 ปีก็ตาม อีกประเด็นหนึ่ง การพัฒนาความสัมพันธ์ของแพทย์ฉุกเฉิน สัจนิยมมหัศจรรย์ในละครเรื่องนี้นำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินว่า แพทย์ฉุกเฉินที่สามารถแบ่งเวลาให้กับหน้าที่การงานและชีวิตส่วนตัวได้จะประสบความสำเร็จในเรื่องความสัมพันธ์ที่มีกับตัวละครอื่น กล่าวได้ว่า พลังวิเศษของทานตะวันและเรื่องราวความสัมพันธ์ที่ปรากฏในเรื่องเผยให้เห็นประเด็นเปราะบางของชีวิตแพทย์ฉุกเฉินที่นำเสนออยู่ในละคร นั่นคือเรื่องการจัดการกับความสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงาน

ในแง่หนึ่ง หากสัจนิยมมหัศจรรย์ทำให้ต้องหวนกลับมาคิดเกี่ยวกับสิ่งที่เรียกว่า “ความเป็นจริง” หรือ “ความมหัศจรรย์” (สุรเดช โชติอุดมพันธ์, 2554) ความมหัศจรรย์ในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ก็ชวนให้ขบคิดเกี่ยวกับความสัมพันธ์ระหว่างตัวละครทั้งที่เป็นคนธรรมดาและที่เป็นแพทย์ฉุกเฉินในโรงพยาบาลว่าเป็นความสัมพันธ์เฉกเช่นเดียวกับที่มนุษย์ทั่วไปมี ขณะที่ภาพแทนชีวิตของแพทย์ฉุกเฉินที่นำเสนออยู่ในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ก็มีลักษณะหลากหลายสอดคล้องกับความเป็นมนุษย์ กล่าวได้ว่า สัจนิยมมหัศจรรย์มีความสำคัญต่อการนำเสนอภาพแทนชีวิตแพทย์ฉุกเฉินในฐานะที่เป็นมนุษย์

ในอีกแง่หนึ่ง ละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* ยังชวนให้ขบคิดถึงเรื่องความสมดุลระหว่างชีวิตส่วนตัวและหน้าที่การงานของชีวิตแพทย์ฉุกเฉิน แม้ว่าละครจะนำเสนอเรื่องราวความสัมพันธ์ของตัวละครที่อยู่ภายในเรื่อง แต่ประเด็นเรื่องความอสมดุลของชีวิตแพทย์นั้นเป็นประเด็นปัญหาที่สะสมมานานของวงการแพทย์ไทย เพราะเมื่อแพทย์มีภาระงานหนักมากเกินกำลังก็จะส่งผลให้คุณภาพชีวิตย่ำแย่ลงจนนำไปสู่การที่แพทย์ตัดสินใจลาออก แม้ประเด็นนี้จะไม่ได้เกิดกับแพทย์ทุกคนหรือไม่ได้เกิดในโรงพยาบาลทุกแห่ง แต่ก็ปฏิเสธไม่ได้ว่าปรากฏการณ์เหล่านี้มีอยู่จริงและเป็นปัญหาที่ยังไม่ได้รับการแก้ไขอย่างที่ควรจะเป็น (สมาคมนักข่าวนักหนังสือพิมพ์แห่งประเทศไทย, 2566)

โดยนัยนี้ สัจนิยมมหัศจรรย์ในละครแนวการแพทย์เรื่อง *รักฉุดใจนายฉุกเฉิน* จึงทำหน้าที่ชี้ชวนให้เห็นถึงปัญหาในวงการแพทย์อีกทางหนึ่งด้วยนับว่าเป็นการเปิดมุมมองในการทำความเข้าใจละครแนวการแพทย์และเปิดประเด็นปัญหาในวงการแพทย์สู่สาธารณะที่น่าสนใจเป็นอย่างมาก

ข้อเสนอแนะ

ควรมีการศึกษาละครแนวการแพทย์เรื่องอื่น ๆ เพิ่มเติม เนื่องจากเป็นตัวบทที่ยังมีผู้ศึกษาน้อย

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นิทานพื้นบ้านไทลื้อ : การศึกษาบทบาทหน้าที่มีต่อชาวไทลื้อสิบสองปันนา
The Folk Tales of Tai Lue : Functions of Folk Tales on Tai Lue Sipsongpanna People

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บทคัดย่อ

บทความวิจัยนี้มีวัตถุประสงค์ เพื่อศึกษาวิจัยเรื่องบทบาทหน้าที่ของนิทานพื้นบ้านไทลื้อสิบสองปันนาที่มีต่อชาวไทลื้อสิบสองปันนา ผู้วิจัยรวบรวมนิทานพื้นบ้านไทลื้อจากเอกสาร 91 เรื่อง โดยประยุกต์ใช้ทฤษฎีบทบาทหน้าที่ของคติชนที่นิยมและเสนอผลการวิจัยเชิงพรรณนาวิเคราะห์

ผลการวิจัยพบว่า นิทานพื้นบ้านไทลื้อทั้ง 91 เรื่อง มีนิทานตลก 27 เรื่อง นิทานประจำถิ่น 17 เรื่อง ตำนานปรัมปรา 11 เรื่อง นิทานอธิบายเหตุ 8 เรื่อง นิทานมหัศจรรย์ 7 เรื่อง นิทานสัตว์ 7 เรื่อง นิทานชาดก 6 เรื่อง นิทานคติ 5 เรื่อง นิทานเรื่องผี 2 เรื่อง และนิทานชีวิต 1 เรื่อง นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ 4 ประการ คือ บทบาทหน้าที่การให้ความบันเทิงแก่ชาวไทลื้อในด้านเนื้อเรื่องที่สนุกสนาน บทบาทหน้าที่ให้การศึกษาแก่ชาวไทลื้อทั้งทางตรงและทางอ้อมในด้านการสอนและปลูกฝังค่านิยมต่าง ๆ แก่บุคคลในสังคม มีบทบาทหน้าที่สำคัญการควบคุมและรักษาแบบแผนของสังคม โดยเป็นแนวทางให้ชาวไทยลื้อประพฤติและปฏิบัติตามเพื่อความสงบสุขของสังคม และยังมีบทบาทหน้าที่สำคัญในการแสดงอัตลักษณ์ของกลุ่มชุมชนไทลื้อสิบสองปันนา ในด้านชื่อบ้านนามเมืองและการตั้งชุมชน วัฒนธรรม ประเพณี และความเชื่อพิธีกรรมที่สำคัญของชาวไทยลื้อสิบสองปันนา

คำสำคัญ: บทบาทหน้าที่, นิทานพื้นบ้าน, ไทลื้อ, สิบสองปันนา, ไทลื้อสิบสองปันนา

Abstract

The purpose of this research study was to investigate the functions of Tai Lue Sipsongpanna Folk Tales and their impacts on Tai Lue Sipsongpanna people. The study involved assembling a collection of ninety-one Tai Lue folk tales, analyzing, synthesizing, and applying theoretical framework of functions in folklore as well as presenting the findings of research descriptively.

The research findings reveal that among the ninety-one Tai Lue folk tales examined, they encompass a variety of genres. These include twenty-seven humorous

tales, seventeen local legends, eleven legendary myths, eight explanatory tales, seven fairy tales, seven animal tales, six Jataka Tales, five moral tales, two ghost stories, and a life story. The folk tales of Tai Lue Sipsongpanna have four functions: the functions in entertainment, offering engaging and captivating narratives. Beyond mere amusement, these tales also convey subtle yet profound forms of education and values to the community. Serving as guardians of societal norms, they act as moral guides, leading the community towards harmony and mutual understanding. Furthermore, these tales serve as expressions of the Tai Lue cultural identity, fostering community cohesion, preserving cultures and traditions, and commemorating significant rituals rooted in the beliefs of the Sipsongpanna people.

Keywords: Functions, Folk Tales, Tai Lue, Sipsongpanna, Tai Lue Sipsongpanna

บทนำ

ชาวไทลื้อสิบสองปันนาเป็นชนชาติไทที่พูดภาษาตระกูลไท และเช่นเดียวกันกับคนไทกลุ่มอื่น ๆ นับถือศาสนาพุทธนิกายเถรวาท และชาวไทลื้อสิบสองปันนาเป็นชนชาติข้ามพรมแดนที่อาศัยกระจายอยู่โดยทั่วไปในดินแดนสิบสองปันนา เช่น อำเภอเชียงรุ่ง อำเภอเมืองฮาย และอำเภอเมืองล่าของเขตสิบสองปันนา มณฑลยูนนาน นอกจากชาวไทลื้อที่อาศัยอยู่ที่ประเทศจีนแล้ว ยังมีชาวไทลื้อกระจัดกระจายอยู่ในประเทศต่าง ๆ เช่น ตอนเหนือประเทศลาว ภาคเหนือตอนบนของประเทศไทย รัฐฉานของประเทศพม่า และตอนเหนือของประเทศเวียดนาม (Cheah, 2005)

วัฒนธรรมของชาวไทลื้อมีความหลากหลาย ทั้งในด้านขนบธรรมเนียม ประเพณี และความเชื่อ ในด้านเรื่องเล่านิทานและตำนานพื้นบ้านไทลื้อเป็นส่วนหนึ่งของวรรณกรรมไทลื้อ ซึ่งเป็นสิ่งที่สะท้อนให้เห็นถึงความเป็นอัตลักษณ์ของชาวไทลื้อ นิทานพื้นบ้านไทลื้อสะท้อนให้เห็นถึงวัฒนธรรม ประเพณี ความเชื่อ และชีวิตความเป็นอยู่ในสังคมชาวไทลื้อทั้งทางตรงและทางอ้อม นิทานพื้นบ้านไทลื้อมีการได้รับอิทธิพลพุทธศาสนาเป็นอย่างมาก นิทานพื้นบ้านไทลื้อมีเนื้อหามากมายที่เกี่ยวกับคำสอนค่านิยมของสังคม นิทานพื้นบ้านไทลื้อแม้จะไม่ใช่ธรรมะโดยตรงที่ใช้สั่งสอนชาวไทลื้อหรือกลุ่มผู้ฟัง แต่เรื่องราวต่างก็แฝงไว้ด้วยคติเตือนใจ ข้อคิดที่สอดคล้องกับบรรทัดฐานของสังคม

ในสังคมชาวไทลื้อนิยมเล่านิทานในโอกาสต่าง ๆ ปู่ย่าตายายอาจจะเล่าให้ลูกหลานฟังในยามว่างงาน หรือการได้ยินได้ฟังพระสงฆ์เทศน์นิทานชาดกในงานบุญของวัฒนธรรมไทลื้อ เช่น ในงานบุญเข้าพรรษา การฟังเทศมหาชาติ เป็นต้น

นิทานไทลื้อผ่านการรับรู้ การเล่าสู่กันฟังมาหลายชั่วอายุคน นิทานไทลื้อมีทั้งสำนวนมุขปาฐะ ดังเช่น เรื่อง เจ้าหงส์ผาคำ ซึ่งเล่าเรื่องในรูปแบบนิทานชาดก มีตำนานที่แสดงลักษณะสอดคล้องกับนิทานพื้นบ้านของชาวไทกลุ่มอื่น ๆ เช่น ตำนานปลาอานนท์ ย่าขวัญข้าว ตำนานวันปีใหม่ของชาวไทลื้อ และเรื่องเจ้าสุธนกับนางมโนราห์ เป็นต้น

จากการสำรวจงานวิจัยเกี่ยวกับนิทานพื้นบ้านไทลื้อสิบสองปันนา พบว่า Tian (2015) ได้ศึกษาวิจัย เรื่อง นิทานพื้นบ้าน: ภาพสะท้อนวิถีชีวิตไทลื้อชุมชนม่านเปี่ยน ตำบลเมิ่งฮุ่น อำเภอเมิ่งไห่ จังหวัดสิบสองปันนา โดยรวบรวมนิทานพื้นบ้านมุขปาฐะ จำนวน 53 เรื่อง มีจุดประสงค์เพื่อรวบรวมและจัดประเภทนิทานพื้นบ้าน ศึกษาวิถีชีวิตทางสังคมและวัฒนธรรมของชาวไทลื้อผ่านนิทานพื้นบ้าน และ

ศึกษาอิทธิพลของนิทานพื้นบ้านที่มีต่อการดำรงชีวิตของชาวไทลื้อชุมชนม่านเปี่ยน ตำบลเมิ่งฮุ่น อำเภอเมิ่งไห่ จังหวัดสิบสองปันนา ผลของการวิจัยพบว่า นิทานพื้นบ้านไทลื้อจัดประเภทได้ 8 ประเภท คือ นิทานประจำถิ่น นิทานอธิบายเหตุ นิทานศาสนา นิทานคติ นิทานมหัศจรรย์ นิทานสัตว์ นิทานเรื่องผี และนิทานวีรบุรุษ นิทานพื้นบ้านไทลื้อได้สะท้อนวิถีชีวิต ความเป็นอยู่ ความเชื่อ การพึ่งพาธรรมชาติและยังสะท้อนค่านิยม ขนบธรรมเนียม ประเพณีสำคัญ ๆ ที่ยึดถือและปฏิบัติสืบต่อกันมายังปัจจุบัน และยังมีงานวิจัยของ วกุล มิตรพระพันธ์ ได้ศึกษาวิจัยเรื่อง มหาชาติไทลื้อ กัณฑ์ที่ 1 - 7: กลวิธีทางวรรณศิลป์และภาพสะท้อนสังคมและวัฒนธรรม โดยศึกษาต้นฉบับมหาชาติไทลื้อในสิบสองปันนา 4 สำนวน ได้แก่ สำนวนห่านห้าว สำนวนนางหล้า สำนวนเมืองบ่อ และสำนวนผ้าขาว การศึกษาจำกัดศึกษาเฉพาะกัณฑ์ที่ 1 - 7 ผลการศึกษาพบว่า มหาชาติไทลื้อกัณฑ์ที่ 1 - 7 มีกลวิธีทางวรรณศิลป์ 4 ประการคือ กลวิธีสร้างความงามด้านเสียง กลวิธีสร้างความงามด้านถ้อยคำ กลวิธีสร้างความงามด้านความหมายและกลวิธีตั้งชื่อกัณฑ์ มหาชาติไทลื้อกัณฑ์ที่ 1 - 7 ให้ภาพสะท้อน 5 ประการคือ ภาพสะท้อนด้านค่านิยม ภาพสะท้อนด้านวิถีชีวิตความเป็นอยู่ ภาพสะท้อนด้านสภาพสังคม ภาพสะท้อนด้านคติความเชื่อ และภาพสะท้อนด้านธรรมชาติและสิ่งแวดล้อม ภาพสะท้อนเหล่านี้สะท้อนวิถีชีวิต ความเป็นอยู่ ค่านิยม ความเชื่อ ตลอดจนวัฒนธรรมด้านอื่น ๆ ของชาวไทลื้อในสิบสองปันนาอย่างชัดเจน

Petchaboon (2010) ได้ศึกษาวิจัยเรื่อง มหาชาติไทลื้อ กัณฑ์ที่ 8-13: กลวิธีทางวรรณศิลป์และภาพสะท้อนสังคมและวัฒนธรรม โดยศึกษามหาชาติของชาวไทลื้อในเขตปกครองตนเองสิบสองปันนามณฑลยูนนาน สาธารณรัฐประชาชนจีน เพื่อปริวรรตมหาชาติไทลื้อกัณฑ์ที่ 8 - 13 จากต้นฉบับในหนังสือธัมม์ใบลานช่วงโค้รอมมวร จากอักษรไทลื้อเป็นอักษรไทย ศึกษากลวิธีทางวรรณศิลป์ และภาพสะท้อนสังคมและวัฒนธรรมในมหาชาติไทลื้อ ผลการศึกษาพบว่า มหาชาติไทลื้อกัณฑ์ที่ 8 - 13 ใช้ภาษาที่เรียบง่ายและงดงาม สร้างจินตนาภาพที่ชัดเจน ปรากฏภาพสะท้อนทางสังคมและวัฒนธรรม ด้านเครื่องแต่งกาย ด้านอาหาร ด้านข้าวของเครื่องใช้ ด้านความสัมพันธ์ของคนในสังคม ด้านความเชื่อ ด้านสุภาษิต และด้านศิลปะการแสดง

งานวิจัยทั้ง 3 เรื่อง ศึกษาทั้งข้อมูลประเภทมุขปาฐะและลายลักษณ์ ซึ่งไม่ซ้ำกับข้อมูลนิทานพื้นบ้านไทลื้อที่ผู้วิจัยได้นำมาศึกษา คือ หนังสือ นิทาน ‘ไทลื้อ’ ในมลฑลยูนนาน ฉบับแปลของ Phumborirak (1995) และหนังสือนิทานพื้นบ้านไทลื้อฉบับภาษาจีน ของ Ai (2009)

การรวบรวมนิทานพื้นบ้านไทลื้อสิบสองปันนา ผู้วิจัยได้นำมาจากหนังสือนิทาน ‘ไทลื้อ’ ในมณฑลยูนนาน ฉบับภาษาไทย โดย Phumborirak (1995) แปลจากผลงานต้นฉบับภาษาจีนของเหยินเวินเปียน, เจิงเผิง จำนวน 38 เรื่อง และ หนังสือนิทานพื้นบ้านไทลื้อต้นฉบับภาษาจีน บรรณาธิการโดย Ai (2009) แปลโดยผู้วิจัย จำนวน 53 เรื่อง รวมเป็น 91 เรื่อง ซึ่งการศึกษาวิจัยครั้งนี้ผู้วิจัยจะศึกษาวิจัยโดยจะประยุกต์ใช้กรอบแนวคิดและทฤษฎีบทบาทหน้าที่ของคติชนตามแนวทางของ Na Thalang (2020) เป็นสำคัญ

แม้สภาพสังคมชาวไทลื้อสิบสองปันนาในปัจจุบันจะมีการเปลี่ยนแปลงไปมาก อันเนื่องจากความเจริญด้านสภาพเศรษฐกิจและเทคโนโลยี แต่ชาวไทลื้อสิบสองปันนายังคงรักษาขนบธรรมเนียมประเพณีดั้งเดิมไว้อย่างเหนียวแน่น นิทานพื้นบ้านไทลื้อยังมีความสำคัญในสังคมชาวไทลื้อทั้งในชีวิตประจำวันในโรงเรียนและในงานบุญสำคัญ ๆ เช่น งานบุญเทศน์มหาชาติ นิทานพื้นบ้านถือว่าเป็นมรดกภูมิปัญญาวัฒนธรรมที่น่าสนใจ การดำรงอยู่ของนิทานพื้นบ้านดังกล่าว น่าจะมีบทบาทหน้าที่สำคัญต่อชาวไทลื้อหลายประการ ซึ่งผู้วิจัยจะศึกษาต่อไป

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาบทบาทหน้าที่ของนิทานพื้นบ้านไทลื้อที่มีต่อชาวไทยลื้อสิบสองปันนา

แนวคิด ทฤษฎี กรอบแนวคิด

กรอบแนวคิดทางคติชนวิทยา และทฤษฎีบทบาทหน้าที่นิยม โดยประยุกต์ใช้ จาก Bascom (1965). และ Na Thalang (2020)

วิธีดำเนินการวิจัย

การศึกษาบทบาทหน้าที่ของนิทานพื้นบ้านไทลื้อสิบสองปันนาครั้งนี้ ผู้วิจัยได้ดำเนินการตามขั้นตอนดังนี้

1. การศึกษาข้อมูลเบื้องต้น

ศึกษาเอกสารและงานวิจัยที่เกี่ยวข้องได้แก่ เอกสารและงานวิจัยที่เกี่ยวข้องกับนิทานพื้นบ้านกลุ่มชาติพันธุ์ไทลื้อ สภาพสังคม และวัฒนธรรมชาวไทลื้อสิบสองปันนา และกรอบแนวคิดทฤษฎีบทบาทหน้าที่นิยม

2. ดำเนินการเก็บรวบรวมข้อมูล

รวบรวมข้อมูลนิทานพื้นบ้านลายลักษณ์ที่เกี่ยวกับนิทานไทลื้อ ดังนี้

2.1 การรวมข้อมูลลายลักษณ์จากหนังสือนิทาน ‘ไทลื้อ’ ในมณฑลยูนนาน (ฉบับภาษาไทย) โดย Phumborirak (1995) แปลจากผลงานต้นฉบับภาษาจีนของเหยินเวินเปียน, เจิงเผิง จำนวน 38 เรื่อง

2.2 การรวมข้อมูลลายลักษณ์จากหนังสือนิทานพื้นบ้านไทลื้อ (ฉบับภาษาจีน) บรรณาธิการโดย Ai (2009) ผู้วิจัยแปลเป็นภาษาไทยด้วยตนเอง จำนวน 53 เรื่อง

2.3 หนังสือนิทาน ‘ไทลื้อ’ ในมณฑลยูนนาน (ฉบับภาษาไทย) แปลโดย Phumborirak (1995) ซึ่งได้รวบรวมนิทานจากผลงานของเหยินเวินเปียน, เจิงเผิงโดยตรง และหนังสือนิทานพื้นบ้านไทลื้อ (ฉบับภาษาจีน) บรรณาธิการโดย Ai (2009) ผู้วิจัยแปลเป็นภาษาไทยด้วยตนเอง ซึ่งรวมนิทานทั้งหมด 91 เรื่อง ซึ่งไม่มีใครศึกษาวิจัยในประเด็นบทบาทหน้าที่มาก่อน

3. วิเคราะห์ข้อมูล

ผู้วิจัยจะวิเคราะห์บทบาทหน้าที่ของนิทานพื้นบ้านไทลื้อที่มีต่อชาวไทลื้อสิบสองปันนา โดยประยุกต์ใช้ทฤษฎีบทบาทหน้าที่ของคติชนตามแนวทางของ Na Thalang (2020) ในหนังสือทฤษฎีคติชนวิทยา: วิธีวิทยาในการวิเคราะห์ตำนาน-นิทานพื้นบ้าน ใน 3 ประการใหญ่ ๆ ที่สำคัญ ดังนี้

3.1 บทบาทคติชนในการอธิบายกำเนิดและอัตลักษณ์ของกลุ่มชนและพิธีกรรม

3.2 บทบาทคติชนในการให้การศึกษา อบรมระเบียบสังคม และรักษามาตรฐานพฤติกรรมของสังคม

3.3 บทบาทคติชนในการเป็นทางออกให้กับความคับข้องใจของบุคคลอันเกิดจากกฎเกณฑ์ทางสังคม

4. สรุปผลการวิเคราะห์แบบพรรณนาเชิงวิเคราะห์และอภิปรายผล

สรุปและอภิปรายผล

ผลการศึกษาวิจัย

ชาวไทลื้ออาศัยอยู่ในหลายประเทศที่มีอาณาเขตติดต่อหรือใกล้เคียงกันทั้งในประเทศไทย ประเทศลาว และประเทศเวียดนาม เป็นต้น ชาวไทลื้อสิบสองปันนาถือว่าเป็นกลุ่มใหญ่ที่มีขนบธรรมเนียมและวัฒนธรรมที่น่าสนใจ ชาวไทลื้อจะนับถือศาสนาพุทธแบบเถรวาทเหมือนกัน การปฏิบัติตนในฐานะศาสนิกชนที่มีลักษณะคล้ายกันโดยเฉพาะการทำบุญ ถือศีล และฟังธรรม

วัฒนธรรมการเล่าและการฟังนิทานพื้นบ้านมักเกี่ยวข้องกับกิจกรรมทางศาสนา การดำเนินวิถีชีวิตประจำวันในสังคมเกษตรกรรม และในปัจจุบันการศึกษามีความเจริญก้าวหน้าอย่างมาก นิทานพื้นบ้านจึงมีบทบาทหน้าที่สำคัญในการจัดการเรียนการสอนในสังคมปัจจุบันอีกด้วย จากการรวบรวมนิทานพื้นบ้านที่ตีพิมพ์ ทั้ง 91 เรื่อง สามารถนำมาจำแนกประเภทโดยประยุกต์จากการจำแนกประเภทนิทานของ Nimmanhaemin (2000) ในขณะเดียวกันผู้วิจัยได้ลงพื้นที่เพื่อสัมภาษณ์ชาวไทลื้อสิบสองปันนาเพื่อความชัดเจนเกี่ยวกับการการจัดประเภทนิทานในฐานะเจ้าของวัฒนธรรมอีกด้วย ดังตารางต่อไปนี้

ตารางที่ 1 ประเภทของนิทานพื้นบ้านไทลื้อสิบสองปันนาที่ใช้ในการศึกษาวิเคราะห์

ประเภทนิทาน	ชื่อเรื่อง
นิทานตลก (จำนวน 27 เรื่อง)	1. สามพ่อค้า 2. พ่อไอ้ยานกับแม่ไอ้ยาน 3. ลุกจากแท่นประทับ 4. ร้องไห้แล้วก็หัวเราะ 5. ฟั่นเชือกขี้เถ้าฟาง 6. แทะกระดูกไก่ 7. ย้ายบ้าน 8. สืบจับผู้ร้าย 9. นับจำนวนดวงดาว10. ร้องไห้อาลัยม้าตาย 11. คนเราตายแล้วกลายเป็นอะไร 12. ทายปริศนา 13. ข้าราชการผู้โง่เง่า 14. ถางป่าทำเป็นนา 15. พระคุณเจ้าทำนายโชคชะตา 16. ยืมพันธุ์ข้าว 17. ชั่งฝ้าย 18. ออกเดินทาง 19. ของขวัญ 20. ผึ้งของใคร 21. วัวตัวผู้คลอดลูก 22. แมลงวันจีบเงินร้อน 23. ขโมยเล็กกับขโมยใหญ่ 24. หม้อวิเศษ 25. ใครยิงกวางตาย 26. ทำให้ข้าวเสีย นกยูงก็ต้องรับโทษเช่นเดียวกันกับนกกระจอก27.ไม้ผุชนเรือ
นิทานประจำถิ่น (จำนวน 17 เรื่อง)	1. ผ้าถุงลายดอก 2. นกกระรางคอกับช่างขับ 3. ช่างขับกับนกโกลก 4. ฟ้อนกวางทอง 5. ต้นไม้เทพเจ้า 6. เชียงรุ่ง-เมืองแห่งรุ่งอรุณ 7. กวางทองคำ 8. ความเป็นมาของดอยน้ำหน่อ 9. เขากวางอ่อน 10. การพบยารักษากระดูกหัก 11. ยาแก้วห้าต้น 12. ความขมแห่งสามครอบครัวกับยารักษาไข้ป่า 13. การพบกระดูกเสือรักษาโรคไขข้อ 14. ความเป็นมาของยาหญ้าลาน 15. การพบผักป๊อเลียงรักษาโรคบิด 16. การพบต้นยางหน่อง 17. พ่อเฒ่ายาเมือง
ตำนานปรัมปรา (จำนวน 11 เรื่อง)	1. ปฐมกัปพรหมสร้างโลก 2. ปู่สังกะย่าสังกะ 3. ปู่สังกะสาย่าสังกะสี 4. ดวงอาทิตย์ 5. สริยุปราคากับจันทรุปราคา 6. ปลาอานนท์ 7. ย่าขวัญข้าว 8. กำเนิดวันปีใหม่ของไทลื้อ 9. กำเนิดประเพณีการแข่งเรือ 10. ไข่เซ่นสรวง 11. ข้าวเปลือกกับคนขี้เกียจ

ประเภทนิทาน	ชื่อเรื่อง
นิทานอธิบายเหตุ (จำนวน 8 เรื่อง)	1. ทำไมในวันปีใหม่ต้องสาดน้ำ 2. วันสงกรานต์ 3. ความเป็นมาของการจุดบั้งไฟ 4. กฎเกณฑ์สำหรับการดื่มเหล้าและเคี้ยวหมาก 5. ทำไมผู้ชายไทลื้อต้องมีรอยสัก 6. ความเป็นมาของการผูกข้อมือในงานแต่ง 7.จดหมายใบลาน 8. พญาสัมพาที
นิทานมหัศจรรย์ (จำนวน 7เรื่อง)	1. ช่างไม้น้อย 2. ช้างงาคำ 3. การผจญภัยของหยกอุ่น 4. ความเขาวิเศษ 5. อีกทุกข์กับเจ้าชายนาคา 6. อีชายทุกข์กับสาวปลาไน 7. สามเจ้าชายเลือกคู่
นิทานสัตว์ (จำนวน 7 เรื่อง)	1. ลิง เสือ พระฤาษี 2. อีกากับนกแซงแซว 3. มดแดงกับน้ำผึ้ง 4. ไก่ฟ้องร้อง 5. งูกับกบ 6. นกยูงกับนกอีกา 7. คางคกกับเจ้าพระมหานคร
นิทานชาดก (จำนวน 6 เรื่อง)	1. เจ้าหงส์ผาคำ 2. ชามแสง 3. เจ้าสุธน-นางมโนราห์ 4. กันทากุรี 5. นางแมว 6. คนหน้าจักจั่น
นิทานคติ (จำนวน 5 เรื่อง)	1. ลิงหามกลอง 2. วัวตีนงอ 3. พ่อค้าจนกับพ่อค้ารวย 4. น้องสาวผู้ยากจนกับพี่สาวผู้ร่ำรวย 5. การชีแนะจากนกเขา
นิทานเรื่องผี (จำนวน 2 เรื่อง)	1. ผีปอบ 2. “ อีเหว่ ” ปิดหน้า
นิทานชีวิต (จำนวน 1 เรื่อง)	1. ปลาไนทอง

จากการศึกษาเนื้อเรื่องของนิทานพื้นบ้านไทลื้อทั้ง 91 เรื่อง และการลงภาคสนามในชุมชนไทลื้อ ผู้วิจัยสามารถวิเคราะห์บทบาทหน้าที่ของนิทานพื้นบ้านที่มีต่อชาวไทลื้อสิบสองปันนาได้ ดังนี้

1. นิทานพื้นบ้านไทลื้อมีบทบาทหน้าที่ในการให้ความบันเทิงแก่กลุ่มชุมชนไทลื้อสิบสองปันนา

วัฒนธรรมการเล่านิทานในสังคมไทลื้อสิบสองปันนานิยมเล่ากันเพื่อความสนุกสนาน ผ่อนคลายจิตใจของตนและสร้างความเพลิดเพลิน นิทานพื้นบ้านไทลื้อทั้งประเภทลายลักษณ์และประเภทมุขปาฐะต่างก็สร้างความบันเทิงมาให้แก่กลุ่มชุมชนไทลื้อสิบสองปันนา ปัจจุบันเทคโนโลยีทางสังคมได้รับการเปลี่ยนแปลงไปอย่างมาก สื่อที่ให้ความบันเทิงก็มากขึ้นไปตามกระแสความเจริญของสื่อเทคโนโลยี แต่การเล่านิทานพื้นบ้านก็ยังเป็นช่องทางสำคัญที่ให้ความบันเทิงแก่กลุ่มชุมชนไทลื้อสิบสองปันนาในโอกาสต่าง ๆ ดังเช่น

งานบุญเข้าพรรษา ชาวไทลื้อสิบสองปันนามีการถือศีล ฟังธรรมเหมือนชาวไทยทั่วไปที่นับถือศาสนาพุทธแบบนิกายเถรวาท ในช่วงเทศกาลเข้าพรรษาจนถึงเทศกาลออกพรรษาตลอดระยะเวลา 3 เดือนนี้ ในวันที่ 7 วันที่ 8 วันที่ 14 และวันที่ 15 ของแต่ละเดือนตามปฏิทินไทลื้อ ชาวไทลื้อสิบสองปันนาก็จะพากันเข้าวัดประจำหมู่บ้านของตน ฟังการเทศน์ของพระสงฆ์ สมัยนี้แม้ว่าเยาวชนรุ่นใหม่ ๆ ก็เริ่มมีความนิยมเข้าวัดทำบุญและฟังการเทศน์ของพระสงฆ์ในระยะเวลา 3 เดือนเช่นกัน ถือเป็นการสืบทอดและรักษาวัฒนธรรมอันดีงามของบรรพบุรุษที่สืบทอดกันมายาวนาน การเทศน์ในงานบุญเข้าพรรษา พระสงฆ์จะนำนิทานชาดกลายลักษณ์ต่าง ๆ มาเทศน์ให้ชาวบ้านฟัง เช่น เรื่องเจ้าสุธน-นางมโนราห์ นางแมว ฯลฯ ชาวไทลื้อสิบสองปันนาเชื่อว่าจากการฟังเทศน์ของพระสงฆ์ จะเกิดเป็นสิริมงคลให้แก่ตนเอง

งานบุญตานธรรม เป็นประเพณีสำคัญอีกอย่างหนึ่งของชาวไทลื้อสิบสองปันนา การตานธรรมเป็น การแสดงพระธรรมเทศนา คล้ายคลึงกับประเพณีการฟังธรรมของชาวล้านนา มักจะจัดขึ้นในหลังเข้าพรรษาของทุกปี แต่ไม่มีวันที่กำหนดไว้ว่าต้องจัดขึ้นในวันไหนอย่างชัดเจน จะจัดตามแต่ละหมู่บ้านที่กำหนดวันเวลาของหมู่บ้านเอง ชาวไทลื้อสิบสองปันนาเชื่อว่า คนที่ตายไปแล้วยังมีความต้องการในปัจจัยสี่ เหมือนขณะมีชีวิตอยู่ทุกประการ แต่การจะได้ปัจจัยสี่เหล่านั้น นอกจากจะอาศัยบุญของผู้ตายที่เคยทำไว้ขณะยังมีชีวิตอยู่ แล้วยังอาจได้รับจากญาติพี่น้องลูกหลานอุทิศไปให้ผ่านทางพระสงฆ์ ในโอกาสนี้ได้มีการเทศน์เช่นเดียวกัน

นอกจากตานธรรมให้คนที่ตายไปแล้ว ยังมีตานธรรมอีกประเภทหนึ่งที่เรียกว่าตานธรรมมหาปาง เป็นการทำบุญครั้งใหญ่ให้แก่ตัวเอง และเป็นการทำบุญอุทิศส่วนกุศลครั้งใหญ่ให้บรรพบุรุษตามลำดับ ในตานธรรมมหาปาง นอกจากที่มีการเทศน์จากพระสงฆ์แล้ว ยังมีช่างขับซึ่งเป็นการแสดงพื้นบ้านของชาวไทลื้อสิบสองปันนา เจ้าภาพงานตานธรรมมหาปางจะเชิญช่างขับมาขับร้อง โดยเนื้อเรื่องที่ขับร้องจะเกี่ยวกับเรื่องเวสสันตระ หรือพระเวสสันดรชาดกเป็นส่วนมาก

ในงานบุญต่าง ๆ นี้ ผู้ฟังชาวไทลื้อที่มาทำบุญร่วมกัน ฟังเทศน์ฟังธรรมจากพระสงฆ์ เชื่อว่าเป็นการสร้างกุศลสำหรับของตน และยังช่วยให้จิตใจตนเองสงบ ฝ่ายพระสงฆ์ที่เป็นผู้เทศน์ หรืออ่านนิทานธรรมก็เชื่อว่าเป็นการสร้างกุศลของตนเช่นกัน

การเล่านิทานพื้นบ้านประเภทมุขปาฐะ นิทานพื้นบ้านเหล่านี้สืบทอดจากปากต่อปาก ชาวไทลื้อสิบสองปันนานิยมเล่านิทานพื้นบ้านประเภทมุขปาฐะจะมีโอกาสฟังในการแสดงของช่างขับ ซึ่งเป็นการแสดงพื้นบ้านประจำสังคมชาวไทลื้อสิบสองปันนา โดยมีช่างขับมาขับร้องเล่าเรื่องต่าง ๆ จากประสบการณ์จริงของชีวิต หรือเล่าเรื่องนิทานพื้นบ้านที่เคยอ่านจากนิทานลายลักษณ์ แล้วนำมาขับร้องให้ผู้ฟังได้รับฟัง โดยมีเสียงดนตรีที่ไพเราะประกอบการเล่าเรื่อง เป็นการเล่านิทานพื้นบ้านผ่านการแสดงพื้นบ้าน ชาวไทลื้อสิบสองปันนานิยมฟังช่างขับเป็นอย่างมาก จึงมีคำว่า “หากชีวิตนี้ไม่มีเสียงช่างขับเหมือนกินข้าวไม่มีเกลือ” ท่ามกลางการฟังช่างขับสนุกสนานเป็นอย่างยิ่ง

นิทานพื้นบ้านในทุก ๆ โอกาสนี้ที่นำความบันเทิงมาให้กลุ่มชุมชนไทลื้อสิบสองปันนา ผู้ฟังทุกระดับได้รับความเพลิดเพลินจากการเล่าหรือการอ่านนิทานพื้นบ้าน จึงได้พบเห็นว่านิทานพื้นบ้านไทลื้อมีบทบาทหน้าที่ในการให้ความบันเทิง ดังต่อไปนี้

1.1 ความบันเทิงจากเนื้อเรื่องนิทานพื้นบ้านที่สนุกสนาน ตื่นเต้น และเร้าใจ

ในนิทานพื้นบ้านไทลื้อสิบสองปันนาที่รวบรวมมาส่วนหนึ่งเป็นนิทานชาดก ซึ่งมีเนื้อเรื่องขนาดยาว และมีโครงเรื่องที่ซับซ้อน เช่น เรื่อง เจ้าหงส์ผาคำ ชามแสง เจ้าสุธน-นางมโนราห์ กันทากุรี และเรื่อง ปลาไนทอง เป็นต้น นิทานพื้นบ้านกลุ่มดังกล่าวมีการดำเนินเรื่องตั้งแต่ตัวละครรุ่นพ่อแม่ไปสู่รุ่นลูกที่เป็นตัวละครเอกของเรื่อง เมื่อตัวละครเอกเติบโตขึ้นก็มักจะออกเดินทางผจญภัย จนพบคู่ครองก็เผชิญปัญหาขัดแย้งกับตัวละครปฏิปักษ์ ซึ่งมีทั้งมนุษย์และยักษ์ มีการสู้รบเพื่อแย่งชิงคนรัก และแย่งชิงบ้านเมืองซึ่งกันและกัน การดำเนินเรื่องในแต่ละตอนมีทั้งเรื่องความรัก ความโลภ ความโกรธ และความหลง ซึ่งนำไปสู่ความสุขนาฏกรรม และโศกนาฏกรรม ซึ่งทำให้ผู้ฟังได้รับความบันเทิงในหลายลักษณะแตกต่างกันไปตามรสนิยมของผู้ฟัง

ความบันเทิงใจจากเนื้อเรื่องการผจญภัย การสู้รบ อันเนื่องความขัดแย้งต่าง ๆ นานา ดังในเรื่อง เจ้าหงส์ผาคำ เจ้าหงส์ผาคำกำลังเดินทางกลับบ้านระหว่างทาง ได้พบกับยักษ์ แล้วยักษ์ก็จับตัวเจ้า

หงส์ผาคำเพื่อจะกินเป็นอาหาร แต่ด้วยความสามารถของเจ้าหงส์ผาคำ จึงสามารถรบชนะและฆ่ายักษ์ตายในที่สุด ดังความว่า

> “เจ้าหงส์ผาคำเดินทางออกมาทางประตูเมืองทิศใต้ เมื่อยักษ์อยู่ข้างทาง...จึงกระโดดเข้ามาจับตัวเจ้าหงส์ผาคำ ยักษ์อ้าปากที่เปื้อนเลือดและส่งเสียงหัวเราะอย่างบ้าคลั่ง... เจ้าหงส์ผาคำเงยหน้าขึ้นมองยักษ์... บอกให้ยักษ์รีบปล่อย อยากกินเนื้อข้า อย่าคิดเลย แล้วเจ้าหงส์ผาคำก็ชักดาบด้ามหยกที่พระอินทร์มอบให้... ชี้ปลายดาบขึ้นบนท้องฟ้า ดาบก็พุ่งออกไปทันทีมีประกายแสงจากดาบพุ่งมายังยักษ์จนถึงแก่ความตาย”
>
> (Ai, น. 27)

ในเรื่องเจ้าหงส์ผาคำ นอกจากตัวละครเองจะผจญภัยและสู้รบกับยักษ์แล้วในระหว่างออกเดินทางเพื่อไปตามหาย่านั้น ยังต้องผจญภัยกับผีร้าย สัตว์ประหลาดมากมาย ซึ่งทำให้เนื้อเรื่องน่าตื่นเต้นเร้าใจผู้ฟัง ต่างปรารถนาให้เจ้าหงส์ผาคำประสบกับชัยชนะทุก ๆ ครั้งไป

ในเรื่องกันทากุรี พระราชาต้องการแย่งชิงภรรยาของกันทากุรี มาเป็นมเหสีของตนเอง จึงกลั่นแกล้งกันทากุรี โดยแข่งขันกับกันทากุรี 4 ครั้ง หากครั้งใดครั้งหนึ่งกันทากุรีแพ้ ต้องยอมยกภรรยาให้กับพระราชา ครั้งแรก หาไก่ชนมาแข่งขันกับพระราชา ครั้งที่ 2 พระราชาให้แข่งม้า ครั้งที่ 3 แข่งขันการชนวัว ครั้งที่ 4 การแข่งขันชนช้าง ในการแข่งขันทุก ๆ ครั้ง กันทากุรี จะได้รับความช่วยเหลือจากเทวดา จนสามารถชนะและฟันฝ่าอุปสรรคไปได้ และในที่สุดชีวิตก็พบกับความสุขสมหวัง

ความบันเทิงใจและประทับใจการบรรยายฉากและการพรรณนาธรรมชาติที่สวยงาม

นอกจากเนื้อเรื่องที่สนุกสนานแล้ว ในนิทานพื้นบ้านไทลื้อสิบสองปันนามีนิทานหลายเรื่องได้บรรยายฉากสถานและพรรณนาธรรมชาติที่สวยงาม ให้ผู้อ่านหรือผู้ฟังเกิดความบันเทิงใจและประทับใจกับฉากที่สวยงาม ฉากธรรมชาติที่ประกอบในเรื่องนั้น ๆ อาจจะเป็นธรรมชาติแห่งโลกจินตนากา รหรือธรรมชาติแห่งโลกจริงก็ตาม ต่างก็ให้ผู้อ่านหรือผู้ฟังได้ความบันเทิงใจและประทับใจได้ด้วยเช่นกัน ดังตัวอย่างเช่น

> “น้องสาวที่ดี อย่าร้องไห้อีก พี่ชายจะพาไปที่ที่สวยงาม มีทะเลสาบที่สดใสซึ่งมีดอกบัวทองพันกลีบบานอยู่ริมฝั่งทะเลสาบปกคลุมไปด้วยดอกไม้และพืชพรรณแปลกตา ไม่ไกลจากทะเลสาบมีป่า และในป่ามีไก่ตัวผู้สีทองตัวน้อยที่ร้องเพลงได้ตลอดเวลา ไก่ทองส่ายปีกสีทองสวยงามและร้องเพลงไพเราะ ดอกบัวทองในทะเลสาบจะเปล่งประกายงดงาม”
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> (Ai, น. 210)

การบรรยายและพรรณนาฉากที่สวยงามปรากฏเด่นชัดในนิทานต้นฉบับลายลักษณ์ และเป็นเรื่องยาว ดังเรื่อง ช้างงาคำ เจ้าหงส์ผาคำ เจ้าสุธน-นางมโนราห์ และ กันทากุรี เป็นต้น การรับรู้การพรรณนาฉากที่สวยงามจะช่วยสร้างบรรยากาศในการฟังนิทาน และช่วยให้ผู้ฟังเกิดจินตนาการตามเนื้อเรื่องที่ดำเนินไปด้วยความเพลิดเพลินและสนุกสนาน

ความบันเทิงใจและความประทับใจในบทบาทของตัวละครเอก

ในนิทานพื้นบ้านไทลื้อสิบสองปันนา มักพรรณนาความงามของตัวละครเอกในลักษณะที่มีรูปร่างงดงาม มีความสามารถพิเศษ ความประพฤติดีและคุณธรรม จึงทำให้ผู้อ่านหรือผู้ฟังเกิดความบันเทิงใจและความประทับใจในบทบาทของตัวละครเอกที่ผู้ฟังหรือผู้อ่านคาดหวังและมีความเป็นอุดมคติ ดังตัวอย่างเช่น

> “...ดวงตาของเขาเปล่งประกายราวกับลูกหยดสีทอง และรูปลักษณ์ของเขางดงามยิ่งกว่าใบหน้าของเทวดาอีก เมื่อเขาพูด มันช่างไพเราะเหมือนระฆังที่มีเสียงก้องแจ่มใส เมื่อสาว ๆ เห็นเขา พวกสาว ๆ ไม่สามารถปิดปากและหลับตาได้”
>
> (Ai, น. 59)

ความบันเทิงใจและสุขใจจากการปิดเรื่อง แบบสุขนาฏกรรมที่สมความปรารถนาของผู้ฟังหรือผู้อ่าน

ในการอ่านหรือการฟังนิทาน ไม่ว่าผู้อ่านหรือผู้ฟังต่างก็มีความปรารถนาจะได้ยินเรื่องราวที่เปี่ยมด้วยความสุข และความสมหวังในตอนจบของเรื่อง ส่วนมากปรารถนาให้ตัวละครเอกได้ครองรักกันหรือตัวละครเอกได้ชนะตัวละครฝ่ายร้าย ถ้านิทานเรื่องใดมีการปิดเรื่องสอดคล้องกับความปรารถนาของผู้ฟัง ก็ยิ่งจะทำให้ผู้ฟังเกิดความปิติสุขยิ่งขึ้น ในเรื่อง นางแมว เจ้าจันทร์ดาได้ฟันฝ่าอุปสรรคต่าง ๆ นานามากมายจนกว่าจะได้รับการยอมรับจากกษัตริย์ ยินยอมให้อภิเษกสมรสกันได้ ในตอนจบเรื่อง ดังตัวอย่างเช่น

> “เมื่อได้ยินคำพูดของเจ้าจันทร์ดา กษัตริย์รู้สึกละอายใจอย่างยิ่งและหลั่งน้ำตา เขารีบลุกขึ้นจากเตียงและช่วยเจ้าชายและลูกสะใภ้ของเขาที่เดินอยู่ข้างหน้าเขา กษัตริย์รีบสั่งให้เสนาจัดงานต้อนรับและพิธีอภิเษกสมรส ดูเหมือนว่าจะเป็นวันปีใหม่อีกครั้งในเมืองพาราณสี การฆ่าหมูและวัวควาย ช่างขับส่งเสียงร้อง และเสียงกลองเสียงฆ้องล้วนเต็มไปด้วยความสุข”
>
> (Ai, น. 190)

1.2 ความบันเทิงใจในมุกตลกของนิทานพื้นบ้านไทลื้อสิบสองปันนา

นิทานพื้นบ้านไทลื้อสิบสองปันนามีนิทานหลายเรื่องที่เน้นเล่าเรื่องเพื่อความตลก มีความตลกที่เกี่ยวข้องกับวิถีชีวิตความเป็นอยู่ พฤติกรรมที่อาจจะตรงข้ามกับบรรทัดฐานของสังคม ความฉลาดแกมโกง ความโง่ สถานภาพทางสังคมที่แตกต่างกัน และเรื่องตลกระหว่างสามี ภรรยาและคนในครอบครัวเดียวกัน เป็นต้น ดังในเรื่อง ไอ้สุขกับไอ้สี เป็นนิทานที่มีความยาว 200 กว่าตอน มีเนื้อเรื่องคล้ายนิทานไทยเรื่อง ศรีธนญชัย ซึ่งตัวละครเอกคือสองพี่น้อง ชื่อ ไอ้สุขกับไอ้สี ที่มีความเฉลียวฉลาดแกมโกง มักถูกพญาเจ้าเมืองกลั่นแกล้งเสมอ ๆ แต่ไอ้สุขกับไอ้สีก็แก้ปัญหาได้และเป็นฝ่ายชนะพญาเจ้าเมืองทุกครั้ง ดังในตอน “แทะกระดูกไก่” พญาเจ้าเมืองต้องการจะให้ไอ้สีเสียหน้าต่อผู้คนในงานเลี้ยง จึงเชิญไอ้สีมาทานอาหารในงานเลี้ยง แต่เตรียมกระดูกไก่ไว้ให้ไอ้สีโดยเฉพาะ ส่วนพญาเจ้าเมืองชอบกินกึ๋นไก่จึงตักมาไว้ที่จานของตน เมื่อถึงเวลาก็บอกให้ไอ้สีแทะกระดูกไก่พร้อมทั้งพูดเย้ยหยันเพื่อให้ไอ้สีรู้สึกเสียหน้า ไอ้สีผู้มีความเฉลียวฉลาดจึงพูดยอกย้อนพญาเจ้าเมืองไปจนพญาเจ้าเมืองได้ความอับอาย ดังตัวอย่าง

> “...วันนี้ข้าถือว่าเอ็งเป็นแขกผู้มีเกียรติ และเชิญมากินโต๊ะพิเศษ พูดแล้วก็ผลักชามกระดูกไก่มาไว้ต่อหน้าไอ้สี...จงกินให้เต็มที่สักมื้อ

พูดแล้วเจ้าเมืองก็คีบกึ๋นไก่ในชามของตนขึ้นรับประทานเพื่ออวดไอ้สี ไอ้สีหยิบกระดูกไก่ในชามขึ้นมาแทะและกองกระดูกไก่ไว้ตั้งครึ่งค่อนชาม เจ้าเมืองเห็นดังนั้นก็หัวเราะ แล้วพูดกับบรรดาแขกในโต๊ะอาหารว่า พวกท่านดูเถอะ แม้แต่กระดูกไก่ไอ้สีก็แทะอย่างมีรสมีชาติ กระดูกน่ะเป็นของที่หมากินพวกท่านว่าไอ้สีมันตะกละเหมือนหมาไหม... ไอ้สีชี้ไปที่กึ๋นไก่ในชามของเจ้าเมือง พร้อมกับพูดขึ้นอย่างดูถูกว่า แขกผู้มีเกียรติทุกท่านรู้ดีอยู่แล้วว่า ไม่ว่าหมาตัวไหนเมื่อมันได้กลิ่นขี้ไก่ต้องเดินหนีทั้งนั้น แต่สมเด็จพระผู้เป็นเจ้ากลับเอากึ๋นไก่ซึ่งเป็นที่เก็บขี้ไก่มากิน อย่างนี้สมเด็จจะไม่ได้ชื่อว่าตะกละกว่าหมาหรือ บรรดาแขกที่ได้ฟัง...ก็พากันหัวเราะขึ้น...”

(Ai, น. 151-152)

ในด้านบทบาทหน้าความบันเทิงของนิทานไทลื้อสิบสองปันนา พบว่ามีนิทานตลกจำนวน 27 เรื่อง โดยมีเรื่องไอ้สุขกับไอ้สี มากถึง 16 ตอน ลักษณะของเรื่องเล่าคล้ายกับเรื่องศรีธนญชัยของไทย เพราะเป็นเรื่องเล่าที่เป็นการแสดงไหวพริบ และความฉลาดแกมโกงระหว่างไอ้สุข ไอ้สี และเจ้าเมือง ซึ่งตอนจบของเรื่องไอ้สุขกับไอ้สีก็จะเป็นผู้ได้รับชัยชนะ หรือได้เปรียบเจ้าเมืองทุกครั้ง นิทานดังกล่าวเป็นเรื่องที่ตลกขบขันกับระหว่างกลุ่มผู้เล่าและผู้ฟัง แต่หากวิเคราะห์อีกนัยหนึ่งก็เป็นเรื่องของการระบายความเก็บกด หรือความคับข้องใจของบุคคลที่ผู้ใต้อำนาจบังคับบัญชาของชนชั้นเจ้าเมือง ซึ่งในสภาพความเป็นจริงในวิถีชีวิตของชาวบ้าน หรือสามัญชนอาจจะไม่สามารถ โต้แย้ง หรือขัดขืน ต่อผู้ที่มีอำนาจเหนือกว่า เพราะด้วยเรื่องของกฎหมาย และกฎระเบียบของสังคมเป็นสิ่งควบคุมพฤติกรรมอันไม่เหมาะไม่ควร เรื่องเล่าเหล่านี้จึงเสมือนเป็นการระบายความคับข้องใจผู้ชนชั้นผู้น้อยหรือสามัญชนได้ประการหนึ่ง

2. นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการให้การศึกษาแก่ชาวไทลื้อสิบสองปันนา

ในสมัยโบราณ ระบบการศึกษาของสังคมชาวไทลื้อเป็นการศึกษาที่วัด เมื่อเด็กผู้ชายไทลื้อถึงอายุเหมาะสมแล้ว พ่อแม่ก็จะให้ลูกผู้ชายออกบวชเป็นสามเณร ซึ่งชาวไทลื้อสิบสองปันนาเรียกว่าเณรแก้วหรือพระแก้ว ได้ศึกษาความรู้ต่าง ๆ แต่ผู้หญิงก็มีสิทธิ์ได้เข้าศึกษาที่วัดมีค่อนข้างน้อยซึ่งแตกต่างกับยุคปัจจุบัน และในสมัยโบราณ ทรัพยากรทางการศึกษามีน้อย คนที่ไม่ได้เรียนหนังสือเป็นจำนวนมาก ดังนั้นการให้ศึกษาและการอบรมจะบอกกล่าวกันโดยตรงด้วยคำพูดและเลียนแบบจากการประพฤติปฏิบัติของผู้ปกครองเป็นส่วนมาก ผู้ปกครองจะถ่ายทอดเรื่องราวต่าง ๆ ตลอดจนการเล่านิทานเพื่อเป็นอุทาหรณ์เป็นคติสอนใจ และปลูกฝังค่านิยมด้านต่าง ๆ แก่ลูกหลานของตน ให้ลูกหลานรุ่นใหม่ได้เกิดการเรียนรู้และการเข้าใจบรรทัดฐานและค่านิยมของสังคมเองได้ดียิ่งขึ้น ดังเช่น

ค่านิยมเรื่องการทำบุญ

สังคมชาวไทลื้อสิบสองปันนานับถือศาสนาพุทธ และถือปฏิบัติเรื่องการทำบุญ ในฐานะพุทธศาสนิกชน มีความเชื่อว่าการทำบุญ คือการสะสมบุญทั้งในชาตินี้และชาติหน้า ดังในเรื่อง เจ้าหงส์ผาคำ นางจันทร์ดาปะตุมา เกิดมาชาตินี้มีรูปร่างหน้าตางดงามเพราะเกิดจากการสะสมบุญมาแต่ชาติบางก่อน ดังตัวอย่างเช่น

> “...พญายักษ์อนุหะปืนก็มีลูกสาวคนหนึ่งเหมือนกัน ชื่อว่านาง จันทร์ดาปะตุมา เจ้าหญิงผู้ที่สง่างาม เพราะด้วยบุญจากชาติที่แล้วมา ซึ่งเป็นที่รักของบิดามารดา มีนางในแสนสวยมากมายคอยอยู่เคียงข้างเขา...”
>
> (Ai, น. 34)

ค่านิยมเรื่องรักษาศีล 5

การนับถือศีล 5 เป็นคำสอนที่ได้ยินได้ฟังเสมอเมื่อมีการรับศีล ในขณะที่ทำบุญในโอกาสต่าง ๆ ชาวไทลื้อสิบสองปันนาส่วนมากยึดมั่นถือมั่น และเคร่งครัดในการประพฤติปฏิบัติตน อยู่ในศีลในธรรม คำสั่งสอนเกี่ยวกับศีลห้ามักปรากฏในนิทานเสมอ ดังในเรื่อง ขโมยเล็กกับขโมยใหญ่ ได้กล่าวอ้างคำสอนของพระพุทธเจ้าไว้ดังนี้

> “...พระพุทธเจ้าบอกเราว่า หนึ่งไม่ฆ่าสิ่งที่มีชีวิต สองไม่ขโมยหรือปล้น ข้าปฏิบัติตามพุทธบัญญัติ ดังนั้นจิตใจของข้าจึงบริสุทธิ์ยิ่งกว่าดวงดาว จิตวิญญาณของข้ากำลังนั่งอยู่บนเมฆมงคลไปสู่แดนสวรรค์”
>
> (Ai, น. 244)

ค่านิยมเรื่องความกตัญญูเวที

เรื่องความกตัญญูเวที เป็นค่านิยมสำคัญที่บรรพชนชาวไทลื้อที่จะปลูกฝังให้ลูกหลานของตนสอนให้ลูกหลานได้ตอบแทนบุญคุณของผู้ปกครอง ในนิทานพื้นบ้านไทลื้อมักจะได้กล่าวตัวละครเอกเป็นผู้ที่มีความกตัญญูเวทีต่อผู้ปกครอง ให้ลูกหลานได้ปฏิบัติตาม อย่างเรื่อง เจ้าหงส์ผาคำ เมื่อเจ้าหงส์ผาคำกลับมาเป็นเจ้าชายแล้ว ก็ไม่เคยลืมบุญคุณของแม่ที่อยู่ในป่าดง เมื่อได้ดีมีสุขแล้วก็ไปรับแม่ของตนเข้ามาอยู่ในเมืองด้วยกัน ดังตัวอย่างเช่น

> “...ในเวลานี้เจ้าหงส์ผาคำกราบทูลว่าพ่อที่รัก ตามความเห็นของลูก เราต้องไปเชิญแม่ด้วยตนเอง แล้วแม่ถึงจากยอม พระราชาเห็นด้วยและวันรุ่งขึ้นเขากับเจ้าชาย พาเหล่าเสนาบดีและบริวารไปที่สวนเพื่อรับมเหสีกลับวังเป็นการส่วนตัว...”
>
> (Ai, น. 46)

ค่านิยมเรื่องความซื่อสัตย์

เรื่องความซื่อสัตย์ถือเป็นเรื่องสำคัญ ในสังคมชาวไทลื้อสิบสองปันนาค่อนข้างเคร่งครัดในเรื่องของความซื่อสัตย์ เช่น ภรรยาต้องซื่อสัตย์ต่อสามี และสามีต้องซื้อสัตย์ต่อภรรยา ดังในเรื่อง ความเป็นมาของยาหญ้าลาน อ้ายคำแสงมีความรักและซื่อสัตย์ต่อภรรยาของเขามาก ดังตัวอย่างเช่น

> “ครอบครัวของอ้ายแสงคำไม่ได้ร่ำรวยมากนัก และทั้งหมดขึ้นอยู่กับเขาในการเพาะปลูกข้าวเพื่อเลี้ยงดูแม่ที่ชรา แต่เขาเป็นคนใจดีทำงานหนัก และซื่อสัตย์ ผู้หญิงหลายคนในหมู่บ้านชอบเขา แต่เขารักน้องลานเท่านั้น...”
>
> (Ai, น. 157)

ในสังคมชาวไทลื้อเดิมเป็นสังคมเกษตรกรรม นับถือศาสนาพุทธนิกายเถรวาทเป็นหลัก ในขณะเดียวกันการปฏิบัติตนในสังคมก็ต้องปฏิบัติตนตามค่านิยมของชาวจีนส่วนใหญ่ด้วยเช่นกัน ชาวไทลื้อสิบสองปันนาจึงมีค่านิยมที่หลากหลาย และสะท้อนผ่านนิทานพื้นบ้าน เพื่อเป็นแบบแผนให้ชาวไทลื้อได้ยึดถือและนำไปประพฤติปฏิบัติ และใช้ชีวิตร่วมกันในสังคม

บทบาทหน้าที่ในด้านการให้การศึกษาแก่บุคคลในสังคมไทลื้อ ทั้งในด้านข้อคิด และค่านิยมในด้านต่าง ๆ มีสอดแทรกอยู่ในนิทานคติทั้ง 5 เรื่อง และนิทานประเภทอื่นอีกเป็นจำนวนมาก ทั้งนิทานชาดก นิทานสัตว์ นิทานมหัศจรรย์ และนิทานชีวิต เป็นต้น

3. นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการควบคุมและรักษาแบบแผนของสังคม

นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการเป็นเครื่องมือที่ควบคุมและรักษาแบบแผนของสังคม นิทานพื้นบ้านอาจจะไม่ใช่กฎระเบียบ หรือข้อบังคับโดยตรง แต่นิทานพื้นบ้านเล่าเพื่อเป็นอุทาหรณ์ช่วยให้ผู้อ่านหรือผู้ฟังได้ตระหนักรู้ถึงความถูกต้องในพฤติกรรมของตัวละคร และขนบธรรมเนียมประเพณีที่สะท้อนความสมจริงของคนในสังคม และเชื่อมโยงกับการดำรงชีวิตของชาวไทลื้อ เหตุการณ์ในนิทานพื้นบ้านไทลื้อ จะเป็นแนวทางในการประพฤติปฏิบัติตนในสังคม เพื่อให้เกิดความถูกต้อง ดำรงอยู่ในครรลองครองธรรม เกิดความยุติธรรมและความเท่าเทียมกันของคนในสังคม ดังในนิทานเรื่อง ทำให้ข้าวเสีย นกยูงก็ต้องรับโทษเช่นเดียวกับนกกระจอก เล่าถึงพญาเจ้าเมืองแห่งเมืองเวทิหระรักนกยูงมาก วันหนึ่งนกยูงของเขาหนีออกจากวังบินมาถึงทุ่งนาและจิกเมล็ดข้าวของชาวนา ชาวนาจับนกยูงแล้วฆ่านกยูงตาย เมื่อพญาเจ้าเมืองตามหานกยูงถึงบ้านชาวนา เห็นว่า นกยูงถูกฆ่าตาย โกรธมากจึงอยากจะประหารชีวิตชาวนา จุลาบดีก็ออกมาช่วยชาวนาแก้ต่าง หากใครทำผิดก็ต้องรับโทษ แม้ว่านกยูงก็ต้องรับโทษเช่นเดียวกันกับนกกระจอก ดังตัวอย่าง

> “นกตัวใดก็ตามที่ทำให้ข้าวเสียก็สมควรได้รับโทษที่สมควรได้รับ เราจะแยกนกกระจอกหรือนกยูงได้อย่างไร เป็นเรื่องถูกต้องตามกฎหมายสำหรับเกษตรกรในการปกป้องข้าวและฆ่านก ถ้านกยูงสำคัญกว่าข้าว ทุกคนและเจ้าเมืองจะหิวไม่ใช่หรือ...”
>
> (Ai, น. 259)

นิทานพื้นบ้านเรื่อง “ทำให้ข้าวเสีย นกยูงก็ต้องรับโทษเช่นเดียวกับนกกระจอก” นกยูงเป็นตัวละครที่เปรียบเหมือนกับผู้คนที่มีอำนาจสูง แม้ว่าตนเองที่ทำผิดกฎเกณฑ์ทางสังคม ก็ไม่สามารถหลีกหนีโทษผิดที่ตนได้กระทำไว้ได้ ผู้กระทำความผิดไม่ว่าจะมีสถานภาพใดก็ต้องรับโทษเช่นเดียวกันกับผู้คนธรรมดาอย่างนกกระจอก เรื่องราวดังกล่าวจึงเสมือนเน้นย้ำให้ชาวไทลื้อได้ตระหนักในแบบแผนทางสังคมที่ดำรงไว้ซึ่งความยุติธรรม

ในนิทานไทลื้อหลายเรื่องสะท้อนให้เห็นถึงการกระทำของผู้มีอำนาจที่ใช้อำนาจเอารัดเอาเปรียบผู้ที่อยู่ใต้อำนาจปกครองของตน มีปรากฏเรื่องราวดังกล่าวทั้งในนิทานเรื่องไอ้สุขกับไอ้สี และนิทานชาดกอีกหลายเรื่อง เช่น เรื่องเจ้าหงส์ผาคำ คนหน้าจักจั่น ชามแสง และกุนทากุรี เป็นต้น ซึ่งเรื่องดังกล่าวอาจจะไม่ใช่กฎระเบียบแบบแผนในเชิงปฏิบัติ แต่เป็นเรื่องราวที่ชี้ให้เห็นบาปบุญคุณโทษอันเกิดจากการกระทำชั่ว พฤติกรรมของตัวละครและเหตุการณ์สำคัญในเรื่องจะเป็นอุทาหรณ์ให้ผู้อ่านและผู้ฟังได้ตระหนักรู้ว่าสิ่งใดควร หรือมิควรปฏิบัติตาม ในสภาพสังคมที่ผู้คนนับถือศาสนาพุทธก็ย่อมเข้าใจถึงผล

กรรมและเกรงกลัวต่อบาป สิ่งเหล่านี้จึงเสมือนคติเตือนใจ ช่วยให้บุคคลในสังคมประพฤติปฏิบัติตนอยู่ในครรลองครองธรรมได้อีกประการหนึ่งด้วย

4. นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในแสดงอัตลักษณ์ของกลุ่มชุมชนไทลื้อสิบสองปันนา

นิทานพื้นบ้านไทลื้อมีหลายเรื่องแสดงถึงลักษณะเฉพาะ หรืออัตลักษณ์ความเป็นชนชาติไทลื้อสิบสองปันนา นิทานพื้นบ้านไทลื้อที่แสดงอัตลักษณ์ของชาวไทลื้อสิบสองปันนาที่ปรากฏเด่นชัดมี 4 ประเภทใหญ่ คือ นิทานที่แสดงอัตลักษณ์เกี่ยวกับชื่อบ้านนามเมืองและที่อยู่อาศัยของชาวไทลื้อ เช่น เรื่อง กวางทองคำ เชียงรุ่ง-เมืองแห่งรุ่งอรุณ และพญาสัมพาที นิทานที่แสดงอัตลักษณ์ด้านการแต่งกายของชาวไทลื้อสิบสองปันนา เช่น เรื่อง ผ้าถุงลายดอก นิทานที่แสดงอัตลักษณ์ที่เกี่ยวกับความเชื่อและพิธีกรรมสำคัญ ๆ ของชาวไทยลื้อ เช่น เรื่อง ความเป็นมาของการจุดบั้งไฟ ทำไมวันปีใหม่ต้องสาดน้ำ วันสงกรานต์ กำเนิดประเพณีการแข่งเรือ กฎเกณฑ์สำหรับการดื่มเหล้าและเคี้ยวหมาก ทำไมผู้ชายไทลื้อต้องมีรอยสักต้นไม้ เทพเจ้า ความเป็นมาของการผูกข้อมือในงานแต่ง และไข่เซ่นสรวง เป็นต้น และนิทานที่แสดงแสดงอัตลักษณ์ที่เกี่ยวกับการแสดงพื้นบ้าน เช่น เรื่อง ฟ้อนกวางทอง นกกระรางคอกับช่างขับ ช่างขับกับนกโกลก

ตัวอย่างเรื่อง ไข่เซ่นสรวง เล่าว่า การทำพิธีเซ่นสรวงในทุก ๆ ปี ตอนข้าวออกรวงขณะที่เทไข่ลงในแอ่งมังกรนั้น โดยพิธีนี้เพื่อแสดงความระลึกถึงไอ้หัวหงอนผู้ที่เก่งกล้าหาญ จิตใจเมตตา เป็นลูกของนาคากับมนุษย์ที่ช่วยเหลือชาวบ้าน สละชีวิตของตนตอนที่ลงน้ำเก็บเสาซุงขึ้นมา ก็มีคนร้ายแจ้งพระเจ้าแผ่นดินว่าไอ้หัวหงอนจะมาแย่งอำนาจ จึงตั้งใจอยากฆ่าไอ้หัวหงอนตาย เมื่อเขาลงน้ำก็บอกภรรยาว่าใช้ไข่ร้อยฟองมาเซ่นสรวงเขาที่นี่ทุกปี จนกลายเป็นพิธีกรรมของชาวไทยลื้อที่ต้องยึดถือและปฏิบัติมาจนปัจจุบัน ดังตัวอย่าง

> “ไอ้หัวหงอนจากไปแล้ว บรรดาชาวบ้านชนชาติไตในที่ราบต่างก็คิดถึง เขามากเพื่อที่จะให้ผู้คนทุกรุ่นทุกสมัยไม่ลืมไอ้หัวหงอน ชาวบ้านทั้งหลายจึง พากันมาชุมนุมที่ริมแอ่งมังกรเพื่อทำพิธีเซ่นสรวงไข่ในทุก ๆ ปี ตอนข้าวออกรวง ขณะที่เทไข่ลงในแอ่งมังกรนั้น ชาวบ้านจะทำด้วยความระมัดระวัง ซึ่งเป็นการแสดงความระลึกถึงและอาลัยอาวรณ์ต่อไอ้หัวหงอน ตามที่พูดกันก็ว่า หลังจากร้อยวันแล้ว ไข่ไก่ร้อยฟองนั้นก็จะ ลอยขึ้นมาบนผิวน้ำร้อยแห่งใน สิบสองปันนา เมื่อผู้คนเห็นไข่ลอยขึ้นมา บนพื้นน้ำ ก็เหมือนได้เห็นหน้าไอ้ หัวหงอนผู้กล้าหาญ เที่ยงธรรม และมีจิตใจเมตตาอารี”
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> (Ai, น.32)

นิทานพื้นบ้านไทลื้อเรื่อง “ไข่เซ่นสรวง” เป็นเรื่องเล่าที่เกี่ยวข้องกับพิธีกรรมของชาวไทลื้อสิบสองปันนา ชาวไทลื้อสิบสองปันนายังมีความเชื่อดั้งเดิมที่เกี่ยวกับสิ่งเหนือธรรมชาติ และมักเกี่ยวข้องกับวิถีชีวิตและสังคมเกษตรกรรม ดังเรื่องราวที่เกี่ยวกับตัวละครเอกไอ้หัวหงอนกลายเป็นจุดกำเนิดของพิธีกรรมเกี่ยวกับความอุดมสมบูรณ์ เป็นต้น

บทสรุป

จากการรวบรวมนิทานพื้นบ้านไทลื้อลายลักษณ์ ที่ตีพิมพ์เผยแพร่ทั้งฉบับแปลภาษาไทย และต้นฉบับภาษาจีน จำนวน 91 เรื่อง พบว่ามี นิทานตลก 27 เรื่อง นิทานประจำถิ่น 17 เรื่อง ตำนานปรัมปรา 11 เรื่อง นิทานอธิบายเหตุ 8 เรื่อง นิทานมหัศจรรย์ 7 เรื่อง นิทานสัตว์ 7 เรื่อง นิทานชาดก 6 เรื่อง นิทานคติ 5 เรื่อง นิทานเรื่องผี 2 เรื่อง และนิทานชีวิต 1 เรื่อง นิทานพื้นบ้านไทลื้อดังกล่าวเป็นที่รับรู้กันในสังคมไทลื้อสิบสองปันนา ถือว่าเป็นร่องรอยวัฒนธรรมที่มีการรวบรวมและเผยแพร่มาสู่สังคมปัจจุบัน ทั้งศึกษาเรื่องราวของนิทานพื้นบ้านและการลงภาคสนามเพื่อสัมภาษณ์ชาวไทยที่มีความรู้และเข้าใจเกี่ยวกับนิทานพื้นบ้านและวัฒนธรรมชาวไทลื้อสิบสองปันนา พบว่า นิทานพื้นบ้านไทลื้อมีบทบาทหน้าที่ของนิทานพื้นบ้านไทลื้อที่มีต่อชาวไทลื้อสิบสองปันนาได้ คือ นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการให้ความบันเทิงแก่กลุ่มชุมชนไทลื้อสิบสองปันนาในหลาย ๆ โอกาส เช่น ในโอกาสฟังเทศน์ฟังธรรมในงานบุญเข้าพรรษาในงานบุญประเพณีทานธรรม ซึ่งจะจัดขึ้นหลังวันเข้าพรรษา และในงานบุญทานธรรมให้แก่ญาติที่ตายไปแล้ว ผู้ฟังนิทานจากการเทศน์ จะได้รับรู้เรื่องราวของนิทานที่สนุกสนานความบันเทิงจากฉากเหตุการณ์ที่น่าตื่นเต้น เร้าใจ ปัญหาขัดแย้งต่าง ๆ ที่อาจจะสะท้อนภาพของสังคมไทลื้อ และความบันเทิงใจที่เกิดจากความประทับใจในบทบาทของตัวละครสำคัญ ตลอดจนการจบเรื่องด้วยความสุขสมหวังของเรื่องราวในนิทาน นอกจากนี้ยังมีความบันเทิงที่เกิดจากการได้รับฟังนิทานตลกโดยตรง ซึ่งนิทานตลกที่ปรากฏในเอกสารพบว่า เป็นนิทานตลกในเชิงการแสดงความฉลาด และไหวพริบเพื่อเอาชนะกันระหว่างเจ้าเมืองกับสามัญชน ซึ่งมีลักษณะเนื้อเรื่องคล้ายเรื่องศรีธนญชัยของไทย นิทานตลกดังกล่าว เสมือนเป็นการระบายความเก็บกดของชนชั้นผู้อยู่ใต้อำนาจการปกครองของเจ้าเมืองในสภาพความเป็นจริงในสังคมผู้ที่มีอำนาจเหนือกว่าอาจจะใช้อำนาจในการบังคับหรือกดขี่ผู้ที่อยู่ใต้อำนาจของตน ซึ่งผู้ที่อยู่ใต้อำนาจไม่สามารถตอบโต้ได้ในทางปฏิบัติ ดังนั้นเรื่องเล่าที่ปรากฏในนิทานจึงสะท้อนเป็นการระบายความเก็บกดและความคับข้องใจของชาวบ้านหรือสามัญชนนั่นเอง นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการให้การศึกษาแก่กลุ่มชุมชนไทลื้อสิบสองปันนา ในยุคสมัยที่สังคมยังไม่เจริญ การจัดการศึกษายังไม่ทั่วถึงนิทานพื้นบ้านไทลื้อที่เทศน์ในโอกาสต่าง ๆ มีความสำคัญอย่างยิ่ง เพราะเรื่องราวในนิทานแฝงด้วยคติข้อคิด เรื่องราวที่เป็นอุทาหรณ์แก่ผู้ฟัง นิทานยังมีบทบาทหน้าที่ในการช่วยปลูกฝังค่านิยมที่เป็นบรรทัดฐานของสังคม เช่น การปลูกฝังเรื่องการถือศีลฟังธรรม การสร้างกุศลผลบุญ ความกตัญญูรู้คุณคน และความซื่อสัตย์ เป็นต้น นิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการควบคุมและรักษาแบบแผนของสังคม นิทานพื้นบ้านแม้จะมิใช่กฎระเบียบและข้อบังคับในการประพฤติปฏิบัติตนโดยตรง แต่เรื่องเล่าดังกล่าวก็เป็นวิถีแนวทางที่สามารถยึดถือและปฏิบัติตามได้ นิทานบางเรื่องช่วยชี้แนะแนวทางการปฏิบัติตนอยู่ร่วมกันในสังคมด้วยความเสมอภาค และเกิดความยุติธรรมของผู้คนในสังคม และนิทานพื้นบ้านไทลื้อสิบสองปันนามีบทบาทหน้าที่ในการแสดงอัตลักษณ์ของกลุ่มชุมชนไทลื้อสิบสองปันนา นิทานพื้นบ้านไทลื้อมีลักษณะเฉพาะที่แสดงอัตลักษณ์เกี่ยวกับการสร้างบ้านแปลงเฮือนของชาวไทลื้อสิบสองปันนา เช่นเรื่อง กวางทองคำ และเรื่องเชียงรุ่ง-เมืองแห่งรุ่งอรุณ นอกจากนี้ยังมีนิทานพื้นบ้านไทลื้อที่แสดงอัตลักษณ์การแต่งกายของชาวไทลื้อสิบสองปันนา เช่น นิทานเรื่อง ผ้าถุงลายดอก และ นิทานแสดงอัตลักษณ์เกี่ยวกับความเชื่อพิธีกรรม วัฒนธรรมและประเพณีของชาวไทลื้อ เช่น นิทานเรื่อง ความเป็นมาของการจุดบั้งไฟ กำเนิดประเพณีการแข่งเรือและทำไมผู้ชายไทลื้อต้องมีรอยสัก เป็นต้น

อภิปรายผล

จากการศึกษาวิเคราะห์นิทานพื้นบ้านไทยลื้อสิบปันนาโดยประยุกต์ใช้ทฤษฎีบทบาทหน้าที่ที่นิยม ดังกล่าวพบว่า สามารถประยุกต์ใช้บทบาทหน้าที่ของนิทานไทลื้อสิบสองปันนาได้ 4 ประการ โดยเฉพาะในด้านบทบาทหน้าที่ในการให้ความบันเทิง การให้การศึกษา หรือการปลูกฝังค่านิยม การประพฤติปฏิบัติในสังคม และยังมีนิทานบางเรื่องยังมีส่วนชี้นำและเป็นอุทาหรณ์ในการดำรงรักษาแบบของสังคม ช่วยให้สังคมสงบสุข ลดความเหลื่อมล้ำ ดำรงไว้ซึ่งความยุติธรรมและยังมีนิทานหลายเรื่องเน้นย้ำความเป็นตัวตนหรืออัตลักษณ์ของชาวไทลื้อสิบสองปันนา

นิทานพื้นบ้านไทลื้อเป็นมรดกภูมิปัญญาวัฒนธรรมที่สืบทอดกันมาแต่โบราณ ในปัจจุบันมีนักวิชาการชาวจีนและชาวต่างชาติต่างให้ความสนใจ รวบรวมและมีการตีพิมพ์เผยแพร่อยู่ทั้งในประเทศและต่างประเทศ นิทานพื้นบ้านมีเรื่องราวสะท้อนสภาพสังคมของผู้เป็นเจ้าของวัฒนธรรมทั้งสภาพสังคมในอดีต และอาจจะเกี่ยวข้องกับสังคมปัจจุบันด้วย

ในปัจจุบันสื่อและเทคโนโลยีเจริญก้าวหน้าอย่างมาก การเข้าถึงเรื่องราวนิทานพื้นบ้านก็ยิ่งขยายวงกว้างมากขึ้น โดยเฉพาะเรื่องการจัดการศึกษา และการจัดการเรียนการสอนตามโรงเรียนต่าง ๆ ของชาวไทลื้อนิทานไทลื้อเข้ามามีบทบาทสำคัญในกิจกรรมการเรียนการสอน ซึ่งเป็นการปลุกจิตสำนึกของเยาวชนรุ่นใหม่ให้ตระหนักรู้ถึงมรดกทางวัฒนธรรมของตนเองมากยิ่งขึ้น ผู้วิจัยสังเกตเห็นว่า มีหนังสือนิทานตีพิมพ์วางขายในสังคมชาวไทลื้อจำนวนมาก ซึ่งลักษณะดังกล่าวยิ่งช่วยทำให้นิทานพื้นบ้านไทลื้อดังกล่าวจะดำรงอยู่ในสังคมชาวไทลื้อไปอีกยาวนาน

ข้อเสนอแนะ

ผู้วิจัยได้ศึกษาวิเคราะห์บทบาทหน้าที่ของนิทานพื้นบ้านไทลื้อที่มีต่อกลุ่มชุมชนชาวไทลื้อสิบสองปันนา ยังมีกลุ่มข้อมูลทั้งวรรณกรรมและคติชนในด้านอื่น ๆ อีกหลายอย่างที่สามารถนำมาใช้ในการศึกษาต่อไปได้ เช่น การเปรียบเทียบนิทานพื้นบ้านไทลื้อสิบสองปันนากับนิทานพื้นบ้านของกลุ่มชาติพันธ์ไทอื่นในแง่มองต่าง ๆ

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(ระดับชาติ)

กลุ่มสังคมศาสตร์

การปรับเปลี่ยนวัฒนธรรมสู่การเป็นสินค้าทางวัฒนธรรมสมัยนิยมของวิถีอเมริกันคาวบอย
Commoditizing the American cowboy way to be a cultural popular product.

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาอิทธิพลของวัฒนธรรมคาวบอยในศตวรรษที่ 21 สู่การพัฒนาในรูปแบบสินค้า เป็นการศึกษาในรูปแบบวิธีการวิจัยเชิงเอกสาร (Documentary Research) โดยศึกษาค้นคว้า รวมรวมข้อมูลจากบทความหนังสือ ข่าว เอกสารตำราต่าง ๆ วิดีทัศน์ และงานวิจัยที่เกี่ยวข้องที่ว่าด้วยวิถีอเมริกันคาวบอยในศตวรรษที่ 21 โดยเป็นการลงพื้นที่สัมภาษณ์ที่ผู้วิจัยได้สร้างขึ้น แล้วนำไปสู่การเชื่อมโยงข้อมูลเข้าด้วยกัน ซึ่งการวิจัยอิทธิพลของวัฒนธรรมคาวบอยในศตวรรษที่ 21 อยู่ในรูปแบบของสินค้า พบว่า 1) ภาพยนตร์คาวบอยในศตวรรษที่ 21 จะมีกลิ่นอายของสังคมเกษตรของวิถีอเมริกันคาวบอย มีการต่อสู้ แย่งชิง ทั้งในเรื่องของพื้นที่ทำกิน การขโมย และอาชญากรรมต่าง ๆ ในพื้นที่ 2) เกมคาวบอยในศตวรรษที่ 21 โดยเฉพาะเกม Red Dead Redemption ภาคที่ 1 และ 2 เป็นเกมพูดถึงวัฒนธรรมการเลี้ยงสัตว์ในวิถีอเมริกันคาวบอย และเป็นเกมที่ได้รับความนิยมอย่างมากในหมู่ผู้ที่นิยมชมชอบกับวิถีอเมริกันคาวบอย 3) เพลงคาวบอยในศตวรรษที่ 21 เป็นแนวเพลงที่สะท้อนถึงวิถีอเมริกันคาวบอย จะมีลักษณะสำคัญอยู่ 2 แบบคือ Country Folk Song และ Theme Song เพลงที่สะท้อนถึงวิถีเกษตรของสังคมอเมริกัน เช่น Take me home country road, Sutter's Mill และ Cotton Fields เป็นต้น 4) สถาปัตยกรรมคาวบอยในศตวรรษที่ 21 เป็นงานสถาปัตยกรรมรูปแบบที่กลายมาเป็นแนวสมัยนิยม สะท้อนถึงวัฒนธรรมคาวบอย โดยการนำเอารูปแบบของ Saloon bar มาตกแต่งร้านไม่ว่าจะเป็นร้านกาแฟ ผับบาร์ รวมถึงปั๊มน้ำมันตามท้องถนน 5) การส่งออกวัฒนธรรมคาวบอยสู่พื้นที่เกษตร เป็นสังคมเกษตรในต่างถิ่นที่ได้รับอิทธิพลจากวิถีอเมริกันคาวบอย คือ การทำฟาร์มปศุสัตว์ การท่องเที่ยวเชิงเกษตร ธุรกิจโคนม และแปรรูปอาหารที่มาจากฟาร์ม และ 6) เครื่องแต่งกายคาวบอยในศตวรรษที่ 21 เครื่องแต่งกายยังเป็นที่นิยมกันมากในกิจกรรมงานเลี้ยงสังสรรค์ ไม่ว่าจะเป็นงานเลี้ยงภายในหน่วยงาน งานแต่งงาน หรืองานเฉลิมฉลองอื่น ๆ มักจะมีการแต่งกายในแบบของวิถีอเมริกันคาวบอย

คำสำคัญ: การแปลงวัฒนธรรมให้เป็นสินค้า, วิถีอเมริกันคาวบอย, สินค้าทางวัฒนธรรมสมัยนิยม

Abstract

This research aims to study the influence of cowboy culture in the 21st century on the development of products. It is a study in the form of documentary research (Documentary Research) by researching Gathering information from articles, books, news, various textbooks, videos, and related research on the American cowboy way of the 21st century by visiting the interview area created by the researcher. Then it leads to linking data together. Research on the influence of cowboy culture in the 21st century in the form of products found that 1) Cowboy movies in the 21st century will have an aura of an agricultural society of the American cowboy way. There will be fights and competition in terms of arable land, Theft and various crimes in the area 2) Cowboy games in the 21st century, especially Red Dead Redemption Parts 1 and 2, are games that talk about the culture of raising animals in the American cowboy way. And it is a game that is very popular among people who like the American cowboy way. 3) Cowboy music in the 21st century is a music genre that reflects the American cowboy way. There will be 2 important characteristics: Country Folk Song and Theme Song, songs that reflect the agricultural way of American society, such as Take me home country road, Sutter's Mill and Cotton Fields, etc. 4) Cowboy architecture in the 21st century is a form of architecture that It has become a trend. Reflects cowboy culture by using the Saloon Bar style to decorate the shop, whether it be a coffee shop, pub bar, or gas station on the street. 5) Exporting cowboy culture to agricultural areas. It is an agricultural society in a foreign country that is influenced by the American cowboy way of farming livestock. Agricultural tourism, dairy farming and food processing that comes from farms, and 6) Cowboy costumes in the 21st century. Costumes are still very popular at party events. Whether it's an internal corporate party, a wedding, or any other celebration, there is always an American cowboy style of dress.

Keywords: Commoditization of Culture**,** American cowboy way, Cultural Popular Product

บทนำ

คาวบอย หรือที่เรียกอีกอย่างก็คือ โคบาล อันแปลตามตัวได้ว่า คนเลี้ยงวัว แต่เรานิยมใช้ตามความหมายในภาษาอังกฤษซึ่งมีนัยแฝงถึง ผู้ชายที่อาศัยอยู่ในแถบตะวันตกของอเมริกา ในยุคที่การปักเขตแดนยังไม่มีกฎหมายรับรอง พกปืนสั้นไว้ป้องกันตัว มีอาชีพต้อนวัว ใช้ชีวิตส่วนใหญ่บนหลังม้า นุ่งกางเกงยีนสวมหมวกมีปีก นอกจากนี้ยังเชี่ยวชาญในการปราบม้าป่าและวัวเถื่อนแล้ว คาวบอยยังได้รับยกย่องให้เป็นอัศวินแห่งทุ่งราบภาคตะวันตก ผู้ไม่รีรอที่จะเสี่ยงชีวิตช่วยเหลือเด็กและสตรี ให้รอดพ้นจากอินเดียแดงผู้ร้าย และภัยธรรมชาตินานา (อารยา กลางสาทร, 2555) หากจะกล่าวถึงวัฒนธรรมคาวบอยแล้ว ต้องย้อนรอยไปในช่วง Christopher Columbus ค้นพบทวีปอเมริกา ในช่วง ค.ศ.1492 โดยการนำชาวสเปนไปตั้งถิ่นฐานและดำรงชีวิตด้วยการนำวัฒนธรรมแบบดั้งเดิม คือ การทำปศุสัตว์ และทำการเกษตรในการ

ดำรงชีพ (ลองแมน, 2544) ในประเทศ Mexico และย้ายถิ่นฐานขึ้นไปยัง Texas จนกระทั่งได้มีการตั้งหลักปักฐานและเป็นจุดเริ่มต้นของยุค Wild West หรือ Old West หรือ American Frontier (ธนู แก้วโอภาส, 2549) (Thai PBS, 2563) และ (Q-VOB, 2565) เมื่อเข้ามาในช่วงการตื่นทองในรัฐ California กลายเป็นจุดกำเนิดของอาชีพ เช่น การทำเหมืองแร่, Bounty Hunter, Sheriff รวมไปถึงต้นกำเนิดของกางเกงยีนส์ ศิลปวัฒนธรรม เพลง และดนตรี ประโยชน์ของการศึกษาวัฒนธรรมอเมริกันคาวบอย พบว่า 1) เป็นการฟื้นฟู ส่งเสริมและรักษาศิลปวัฒนธรรมอเมริกันคาวบอย ให้สังคมได้จักมากขึ้น 2) สามารถนำวัฒนธรรมอเมริกันคาวบอย มาบูรณาการต่อยอดในรูปแบบของการทำเกษตรพอเพียง 3) เกิดนักเขียนมือใหม่เพื่อนำมาสร้างเป็นตำรา นวนิยาย หรือสื่อการเรียนการสอน 4) สามารถนำวัฒนธรรมอเมริกันคาวบอยมาสร้างสินค้าเชิงพาณิชย์ หรือสินค้าเชิงวัฒนธรรม 5) เป็น Landmark point หรือแหล่งสถานที่ท่องเที่ยวแห่งใหม่ของกลุ่มวัยหนุ่มสาว และกลุ่มนิยมวัฒนธรรมคาวบอย

ปัจจุบันวัฒนธรรมคาวบอยเริ่มเป็นที่นิยมกันอย่างแพร่หลาย อันเนื่องมาจากการนำวัฒนธรรมคาวบอยมาสร้างในรูปแบบของภาพยนตร์ เพลง เกม และการออกแบบเครื่องแต่งกายให้ดูทันสมัยขึ้น แต่ยังคงรักษาแบบดังเดิม นอกจากนี้วัฒนธรรมคาวบอยสามารถสร้างเป็นอาชีพได้ เช่น ร้านอาหาร การทำฟาร์มปศุสัตว์ การท่องเที่ยว หรือการผสมผสานในรูปแบบเศรษฐกิจพอเพียง เป็นต้น

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาอิทธิพลของวัฒนธรรมคาวบอยในศตวรรษที่ 21 สู่การพัฒนาในรูปแบบสินค้า

แนวคิด ทฤษฎี กรอบแนวคิด

1. การแปลงวัฒนธรรมให้เป็นสินค้า (Commoditization of Culture)

การทำวัฒนธรรมให้เป็นสินค้านั้น เป็นการทำให้วัฒนธรรมมีราคา ทำให้เป็นที่ต้องการของตลาด และเป็นการกระตุ้นการผลิต การที่จะทำให้วัฒนธรรมเป็นสินค้าก็คือ ระบบเศรษฐกิจในรูปแบบทุนนิยม ที่จะสามารถผลักดันให้วัฒนธรรมเป็นสินค้าและออกสู่ตลาด และในขณะเดียวกันตลาดก็เป็นปัจจัยสำคัญ ในการกำหนดราคาของวัฒนธรรม ซึ่งจะผันผวนไปตามระบบกลไกตลาด และความต้องการของตลาด รวมไปถึงอุปสงค์ต่อสินค้าในตลาดได้ (ชัชพล ทรงสุนทรวงศ์ และ พิทักษ์ ศิริวงศ์, 2560) ซึ่ง MacCannell (1973) นั้นให้ความเห็นว่า บริบททางการท่องเที่ยวในมิติต่าง ๆ ในปัจจุบันพยายามจะใช้วัฒนธรรมของตนเป็นจุดขายทางการตลาด และแสดงอัตลักษณ์ของท้องถิ่นหรือแม้กระทั่งการใช้วัฒนธรรมดั้งเดิมของท้องถิ่นเป็นจุดดึงดูด นักท่องเที่ยวที่แสวงหาความแปลกใหม่ในชีวิตหรือเสาะหาสิ่งที่พวกเขาไม่มี สอดคล้องกับ ธเนศ วงศ์ยานนาวา มองว่าคนรุ่นใหม่มักจะเชื่อว่าการเดินทางเป็นการแสวงหาความหมายของชีวิต และพยายามเติมเต็มในสิ่งที่ตนรู้สึกขาดหายไปหรือไม่ได้มีอยู่ในชีวิตประจำวัน ไม่ว่าสิ่งนั้นมันจะเป็นสิ่งที่ดีหรือไม่ดีตามค่านิยมดั้งเดิมก็ตาม (อันโตนิโอ โฉมชา, 2017) ทั้งนี้การแปลงวัฒนธรรมให้เป็นสินค้าถือเป็นการจัดการในขั้นตอนการผลิต การแลกเปลี่ยนสินค้า การจัดการ และการกำหนดมาตรฐานของผลิตภัณฑ์ รวมไปถึงการตอบสนองต่อรสนิยมของผู้บริโภคอีกด้วย (Cohen, 1988)

2. ประวัติศาสตร์อเมริกาหลังการค้นพบ

การค้นพบอเมริกาของคริสโตเฟอร์ โคลัมบัส

ในปี ค.ศ.1492 การค้นพบทวีปอเมริกาของชาวยุโรป แท้จริงแล้วเป็นการค้นพบโดยบังเอิญ ทั้งนี้เพราะแท้จริง Christopher Columbus ในนามกษัตริย์สเปน นำกองทัพเรือ 3 ลำ ของเขาไปในเส้นทางที่คาดหวังว่าจะพบกับเอเชีย (ศิริวรรณ คุ้มโห้, 2552) ขณะที่ชาวโปรตุเกสซึ่งมีการพัฒนาการในเรื่อง การเดินเรือมาก่อนใครในบรรดาชาติยุโรปกำลังคร่ำเคร่งอยู่กับการมุ่งตะวันออก Christopher Columbus ในนามของสเปนได้ออกสำรวจโลกไปทางมหาสมุทรแอตแลนติก จนไปพบดินแดนใหม่ในปัจจุบัน คือ เม็กซิโกและรัฐฟลอริดา Christopher Columbus เข้าใจผิดว่าคือ อินเดีย สาเหตุสำคัญในการเดินเรือสำรวจพื้นที่ใหม่ เนื่องจาก 1) ชาวยุโรปอยู่ในภาวะความลำบากจากการเมือง ความวุ่นวายหลายศตวรรษในการล่มสลายของกรุงโรมด้วยฝีมือกลุ่มอนารยชน 2) การรุกรานและแผ่ขยายอำนาจของชาวมุสลิมจากตะวันออก (อนันตชัย จินดาวัฒน์, 2556) จากนั้นก็ได้พบเห็นกับกลุ่มชนพื้นเมืองที่มีผิวสีน้ำตาลแดงเลยเรียกพวกเขาว่า ชาวอินเดียนแดง ต่อมาในช่วงปี ค.ศ.1501 – 1502 เรือสำรวจของ Amerigo Vespucci ของโปรตุเกสได้เดินทางมาสำรวจโลกใหม่ หลังจากการค้นพบบราซิล Amerigo Vespucci มีความเห็นว่า ผืนแผ่นดินใหญ่มหึมาที่ Christopher Columbus คิดว่า เป็นส่วนหนึ่งของทวีปเอเชีย ความจริง คือ ผืนแผ่นดินของอีกทวีปที่ 4 ของโลก ซึ่งในขณะนั้นโลกมีอยู่เพียง 3 ทวีป คือ ยุโรป เอเชีย และแอฟริกา การค้นพบทวีปใหม่ และการที่ Amerigo Vespucci คนแรกที่ก้าวเท้าลงไปบนทวีปอเมริกาใต้ ทำให้ Amerigo Vespucci มีชื่อเสียงโด่งดังทั่วยุโรป Martin Waldseemuller นักภูมิศาสตร์ชาวเยอรมันจึงได้ให้เกียรติแก่ Amerigo Vespucci โดยตั้งชื่อบริเวณบราซิลบนแผนที่โลกว่า อเมริกา ต่อมาจนถึงปัจจุบัน (ธนู แก้วโอภาส, 2549) ซึ่งการตั้งหลักปักฐานนั้นทำให้เกิดการประกอบอาชีพที่สำคัญ คือ อาชีพเกษตรกรรมและการปศุสัตว์ นำมาสู่วิถีชีวิตในลักษณะของการเป็นเกษตรกรและผู้เลี้ยงสัตว์ในทุ่งหญ้าที่ราบกว้าง

3. ลักษณะที่สำคัญของยุคคาวบอยในสหรัฐอเมริกา

กำเนิดคาวบอยในเม็กซิโก

การกำเนิดของคาวบอยอเมริกันนั้น เริ่มต้นมาจากชาวสเปนที่ไปตั้งถิ่นฐานในเม็กซิโก โดยมีการใช้ชีวิต ความเป็นอยู่พฤติกรรมที่หลากหลายต่าง ๆ ที่เป็นของคาวบอยอเมริกัน ไม่ได้เป็นหนี้ผู้ใดหรือลอกเลียนแบบอย่างประเทศใดมา เพราะคนอเมริกันเอามาจากแหล่งเดิมของคนเม็กซิกัน ที่ได้รับความรู้และถ่ายทอดมาจากคนสเปนอีกทีหนึ่งแทบทุกสิ่งอย่าง ตั้งแต่การทำมาหากิน เกษตรกรรม การเลี้ยงปศุสัตว์ การเรียกใช้เครื่องมือเครื่องใช้ เครื่องแต่งกายคาวบอย รวมไปถึงวิถีชีวิตทั้งด้านดีและไม่ดี (ลองแมน, 2544) ก่อนการก่อกำเนิดของยุคคาวบอยในปี ค.ศ.1519 และปีต่อๆมา คนสเปนผู้รุกรานและครอบครองเม็กซิโก ได้นำม้าและวัวเพียงไม่กี่ตัวเข้ามาด้วย โดยเฉพาะม้า ที่เป็นแน่ชัดตามประวัติศาสตร์ชาวทวีปอเมริกาดั้งเดิมเพิ่งจะพบเห็น และได้รู้จักรูปร่างหน้าตาของมันเป็นครั้งแรก เมื่อคนสเปนเอาเข้ามานี่เอง ในภาษาสเปนคำว่า Vaqueros หมายถึง หนุ่มเลี้ยงวัวที่ทำหน้าที่ดูแลฝูงวัวจากบนหลังม้า และได้เรียกเพี้ยนเป็น Buckaroo ต่อมาม้าและวัวได้กำเนิดลูกหลานกระจายพันธุ์แพร่หลาย กระจัดกระจายทั่วท้องทุ่งกว้าง ทั้งเม็กซิโกและภาคตะวันตกอเมริกา (ลองแมน, 2544) เมื่อผ่านไปประมาณ 300 ปี คนสเปนบางส่วนได้อพยพย้ายถิ่นฐานขึ้นเหนือสู่ดินแดนอเมริกา ต่างก็ต้อนฝูงวัวไปด้วย จนกระทั่งได้มีการตั้งหลักปักฐานอยู่ในภาคตะวันตกเฉียงใต้ของอเมริกา นั้นคือ Texas จนถึงทุกวันนี้ จนปรากฏให้เห็นได้ว่ามีการทำไร่เกษตรและทำปศุสัตว์ เลี้ยงวัว โดยมีผู้ดูแลโดยใช้ชีวิตบนหลังม้า คอยดูแลวัวปล่อยให้หากินหญ้าใน

ทุ่งที่ใครที่มัน (ธนู แก้วโอภาส, 2549) จึงกลายเป็นจุดเริ่มต้นของยุค Wild West หรือ Old West หรือ American Frontier ในอเมริกา

ยุค Wild West หรือ Old West หรือ American Frontier

ยุคของคาวบอยหรือที่รู้จักกันว่า Wild West หรือ Old West หรือ American Frontier นั้นมีต้นกำเนิดมาจากทางทิศตะวันตกของแม่น้ำมิสซิสซิปปี ซึ่งไหลไปทาง Minnesota และลงสู่อ่าวเม็กซิโก ตัดขวางประเทศแบ่งออกเป็น 2 ฝั่ง คือ ฝั่งตะวันออกและฝั่งตะวันตก ที่เป็นจุดเริ่มต้นของคาวบอยนั้น อาจจะเรียกได้ว่าเป็นดินแดนที่ไม่มีกฎหมายเข้มงวดมากเท่าไหร่ หรือเรียกง่าย ๆ ก็บ้านป่าเมืองเถื่อนนั่นเอง และบ่อยครั้งที่เรื่องราวจากดินแดนเหล่านี้มักจะถูกเผยแพร่ไปตามหน้าหนังสือพิมพ์อยู่บ่อยครั้ง และเมื่อถึงวัฒนธรรมของยุคอาณานิคมมาถึง ก็ทำให้วัฒนธรรมแบบ Wild West ได้รับความนิยมมากขึ้น และมันก็กลายเป็นสิ่งที่ฝังลึกลงไปในจิตวิญญาณของผู้คน (Thai PBS, 2563) และ (Q-VOB, 2565)

กำเนิดรถไฟในอเมริกา

การขนส่งทางรางมีบทบาทมากในอเมริกา ตั้งแต่มีการปฏิวัติอุตสาหกรรมในภาคตะวันออกเฉียงเหนือ ในทศวรรษที่ 1810 -1850 และในภาคตะวันตกในทศวรรษที่ 1850 - 1890 กระแสนิยมรถไฟของอเมริกาเริ่มขึ้นเมื่อมีทางรถไฟบอลทิมอร์และโอไฮโอใน ค.ศ. 1828 และเฟื่องฟูจนกระทั่งเกิดวิกฤตเศรษฐกิจ ในปี ค.ศ. 1873 การสร้างทางรถไฟมีจุดเริ่มต้นทางตอนใต้ของอเมริกา โดยเป็นทางรถไฟสายสั้น ๆ ซึ่งเชื่อมแหล่งผลิตฝ้ายไปยังท่าเรือทะเลหรือท่าเรือแม่น้ำ โครงข่ายทางรถไฟจึงไม่ค่อยเชื่อมต่อกัน ภาคเหนือและภาคตะวันตกตอนกลางเริ่มมีการก่อสร้างทางรถไฟซึ่งเชื่อมระหว่างเมืองขึ้นในปี ค.ศ. 1860 ทำให้มีความสะดวกในการขนส่งผลิตผลและปศุสัตว์ไปยังตลาดในประเทศและต่างประเทศ และทำให้ระบบรถไฟเกิดความเฟื่องฟูด้วย (วิกิพีเดีย สารานุกรมเสรี, 2566) ในช่วงกลางทศวรรษ 1850 สมัยที่อเมริกาตัดสินใจบุกเบิกพื้นที่รกร้างของทวีปด้วยการสร้างรางรถไฟ คาวบอยในฐานะชายหนุ่มผู้ดูแลฝูงวัว จึงมีบทบาทอย่างมากในการพาฝูงปศุสัตว์เดินทางไปขายยังพื้นที่ต่าง ๆ ทั่วอเมริกา การทำปศุสัตว์ได้เจริญเติบโตมากใน California และทางตะวันตกเฉียงใต้ในอเมริกา โรงผลิตเนื้อสัตว์ หนังสัตว์ และไขสัตว์สำหรับทำเทียนไขผุดขึ้นมากมาย พร้อมกับฝูงวัวที่เพิ่มสูงอย่างรวดเร็ว และในช่วงนี้กลุ่มชาวยุโรปที่มาใหม่ได้มีการปรับตัวให้เข้ากับสไตล์ของ Vaqueros ได้นำมาสู่ความต้องการเพิ่มบริโภคเนื้อวัวมากขึ้น ในทางภาคเหนือและภาคตะวันออกของอเมริกา ขณะที่อุตสาหกรรมปศุสัตว์ขยายตัวใน Oregon, Idaho และ Nevada ทำให้เกิดการขนส่งวัวทางรถไฟขึ้น (วนัท ผุดมาก, 2561)

กลุ่มพวกนอกกฎหมาย หรือ Out Law

ระยะเวลาในยุค Wild West ก็มีกลุ่มโจรและผู้ร้ายมือปืน หรือที่เรียกกันว่า กลุ่มพวกนอกกฎหมาย หรือ Out Law ที่รวมตัวกันเป็นแก๊งขึ้น เพื่อปล้นธนาคาร รถไฟ ฝูงปศุสัตว์ คนที่มีฐานะร่ำรวย และผู้คนที่เดินทาง ซึ่งทำให้เกิดทั้งในด้านที่ดีและด้านไม่ดีขึ้นมาจนกลายเป็นตำนานคาวบอยเป็นจำนวนมาก (คนเหนือ, 2556) ในการกระทำของกลุ่มพวกนอกกฎหมาย มีวัตถุประสงค์ในการปล้น 1) เพื่อเลี้ยงชีพในกลุ่มแก๊งพวกเดียวกัน 2) เพื่อความสะดวกสบายโดยไม่ต้องออกไปทำงาน 3) เพื่อแสวงหาความร่ำรวยในทางลัด และ 4) เพื่อต่อต้านกฎหมายทางภาครัฐของอเมริกา

Billy the Kid หรือ William H. Bonney เด็กหนุ่มผู้กลายเป็นโจรค่าหัวสูงถึง 5,000 เหรียญ หรือประมาณ 1,700,000 บาท มีความสามารถในการยิงปืนได้แม่นและเร็ว เป็นหนึ่งในตำนานของคาวบอยที่ได้รับการกล่าวถึงเสมอ ๆ โดยเริ่มต้นใช้ชีวิตในแดนเถื่อนด้วยการเป็นเด็กรับใช้ในคาราวานต้อนวัว และเป็นเสือปืนไวด้วยการสังหารคาวบอยอีกคนหนึ่ง หลังจากเกิดการทะเลาะวิวาทกันขึ้นในบาร์

จำนวนตัวเลขของเหยื่อจากกระสุนปืนของเขานั้นไม่ชัดเจนนัก เพราะบางแห่งบอกว่าเขาสังหารคนไปถึง 21 คน แต่บางแห่งบอกไว้แค่ 9 คน เหตุการณ์หนึ่งที่ทำให้เขาโด่งดังขึ้นมา คือ การหลบหนีออกจากห้องขังระหว่างที่คอยการรับโทษด้วยการแขวนคอที่เรือนจำลินคอล์น นิวเม็กซิโก แต่ก็เช่นเดียวกับเสือปืนไวที่มีค่าหัวคนอื่น ๆ ในปี ค.ศ.1881 บิลลี่ถูกยิงตายด้วยวัยเพียง 21 ปี โดยนายอำเภอ Pat Garrett ในปัจจุบัน Billy the Kid ได้นำมาสร้างเป็นรายการโทรทัศน์ในปี พ.ศ.2565 เขียนเรื่องโดย Michael Hirst นำแสดงโดย Tom Blyth รับบทเป็น William H. Bonney เริ่มออกฉายครั้งแรกเมื่อวันที่ 4 เมษายน พ.ศ. 2565 ได้รับกระแสนิยม 8.6/10 คะแนน (IMDb, 2565)

กำเนิดอาชีพ Sheriff ในอเมริกา

คำว่า Sheriff ในสหรัฐอเมริกาเปรียบเสมือนตำรวจในท้องถิ่น ใช้อำนาจรัฐในการรักษาความสงบเรียบร้อยและความมั่นคง คำว่า Sheriff นี้มาจากคำในภาษาอังกฤษดั้งเดิม 2 คำ คือ Shire หมายถึงสิ่งหรือบุคคลที่อยู่คู่กับเมืองหรืออาจแปลว่าประจำเมือง ส่วน Rieve หมายถึง หัวหน้าผู้บังคับใช้กฎหมายของท้องที่ เมื่อรวม 2 คำนี้ เป็น Sheriff แล้วจะมีความหมายว่าหัวหน้าผู้ปกครองท้องที่ประจำท้องที่ผู้มีอำนาจบังคับใช้กฎหมายนั่นเอง (สัณฐิติ ธรรมใจ, 2559) Sheriff เป็นอาชีพที่มีความสำคัญมากในอเมริกา โดยมีจุดเริ่มต้นตั้งแต่ช่วงท้ายศตวรรษที่ 18 จากกลุ่มการล่าอาณานิคมของอังกฤษ ที่จัดตั้งตามชายฝั่งด้านตะวันออกของเอมริกาเหนือมีทั้งหมด 13 แห่ง สาเหตุของการล่าอาณานิคม 1) ผู้คนในยุโรปเริ่มเสื่อมศรัทธาของศาสนาคริสต์ อันเนื่องจากสงครามศาสนา 2) เพื่อจัดตั้งสถานีการค้า 3) เพื่อทำการเกษตรโดยเฉพาะการปลูกใบชา 4) กลุ่มคนในยุโรปเกิดแนวคิดมนุษยนิยม และ 5) เพื่อต้องการเก็บภาษีไปยังประเทศอังกฤษ (อนันตชัย จินดาวัฒน์, 2556) การทำหน้าที่หลักของ Sheriff ในอาณานิคมของอังกฤษ คือ การเรียกเก็บภาษีอากรซึ่งมิได้มีกฎหมายหรือข้อบังคับให้พนักงานผู้อื่นเก็บและการรักษาความปลอดภัยและความสงบในเมืองที่ตนเองดูแล Sheriff เริ่มมีการขยายไปยังเมืองต่าง ๆ โดยเฉพาะทางตอนใต้และตะวันตกเฉียงใต้ของอเมริกา จะทำหน้าที่อยู่ประจำในหน่วยการปกครองที่เป็นแขนขาของมลรัฐที่เรียกว่า County หรือ การปกครองส่วนภูมิภาค โดยจะมี County Sheriff ทำหน้าที่บังคับใช้และดำเนินคดีอาญาทั่วไป มีหน้าที่ในการปราบปรามผู้กระทำความผิดและโจรผู้ร้ายเหมือนกับ Police ด้วย แต่มีการแบ่งแยกความรับผิดชอบในการใช้อำนาจหน้าที่เดียวกันระหว่าง Police และ Sheriff ตามลักษณะพื้นที่ กล่าวคือ Sheriff จะทำหน้าที่ในเมืองในระดับ County หรือในชนบท ส่วน Police จะทำหน้าที่ในเมืองที่เรียกว่า City ซึ่งเป็นการปกครองส่วนท้องถิ่นที่มีการบริหารค่อนข้างเป็นอิสระ บทบาทและหน้าที่ Sheriff ทางตอนใต้และตะวันตกเฉียงใต้ของอเมริกา มีดังนี้ 1) เป็นผู้พิทักษ์ประชาชนในทุกประเด็นเรื่องความอยุติธรรม และมีหน้าที่รักษาความสงบเรียบร้อยในทุกเรื่อง 2) ดำเนินคดีอาญาและคดีแพ่งทุกประเภทที่เกิดขึ้นระหว่างท้องที่ 3) ควบคุมดูแลสถานที่กักขัง 4) เจ้าหน้าที่ชันสูตร 5) เก็บค่าธรรมเนียมต่างๆ ของผู้ต้องขัง เช่น การประกัน ค่าพาหนะ เป็นต้น 6) เป็นเจ้าหน้าที่จัดการทรัพย์สินผู้ตายที่ไม่ได้ทำพินัยกรรม และ7) ดำเนินการพินัยกรรมให้กับผู้ประสงค์จะทำพินัยกรรม ทั้งด้วยวาจาและเอกสาร (สัณฐิติ ธรรมใจ, 2559)

ในปัจจุบันประเทศไทยและประเทศอื่น ๆ ได้รับความนิยมนำวัฒนธรรม Sheriff มาใช้ในการจัดระเบียบของภูมิภาคต่าง ๆ โดยการจัดตั้งสถานีตำรวจในตำบล หรือชุมชนต่าง ๆ เพื่อทำหน้าที่ดูแลความปลอดภัย การให้ความช่วยเหลือหรือแม้กระทั่งการให้บริการประชาชน เช่น การร้องทุกข์ ในตลอดเวลา 24 ชั่วโมง เป็นต้น

กำเนิดนักล่าค่าหัว หรือ Bounty Hunter

Bounty Hunter คือ อาชีพที่ทำหน้าที่ไล่ล่า หรือจับ ให้กับผู้ว่าจ้างโดยเฉพาะ Sheriff เพื่อของรางวัลตอบแทน ลักษณะของงานผู้ว่าจ้างจะมอบเอกสารสำคัญให้กับนักล่าเพียงคนเดียว หรือกลุ่มเดียว ความเสี่ยงในอาชีพนี้จะถึงตายหรือไม่ก็แล้วแต่ดวง เพราะในบางรัฐ ผู้มีใบอนุญาตเป็นนักล่าจะไม่ได้รับใบอนุญาตพกอาวุธ ถึงแม่ว่าจะมีอำนาจจับกุมร่วมกับเจ้าหน้าที่ตำรวจท้องที่ แต่ในบางรัฐ ก็ยังได้รับอนุญาตให้พกอาวุธออกไปตะครุบตัวได้เอง บุกเข้าบ้านโดยไม่ต้องอาศัยหมายศาล จับกุมโดยไม่ต้องอ่านสิทธิให้ฟัง ในยุคคาวบอย Bounty Hunter จะมีบทบาทหน้าที่คอยไล่ล่า จับกุมผู้ที่กระทำความผิดโดยเฉพาะกลุ่มโจรนอกกฎหมาย หรือกลุ่ม Out Law โดยจะได้รับการว่าจ้างจากเจ้าหน้าที่ Sheriff ในท้องถิ่น หรือผู้ว่าจ้างที่เงินรางวัลให้เป็นของตอบแทน คุณสมบัติของ Bounty Hunter มีดังนี้ 1) มีความสามารถในการใช้อาวุธโดยเฉพาะปืน 2) มีความเชี่ยวชาญทางด้านภูมิศาสตร์หรือพื้นที่ต่าง ๆ อย่างชำนาญ 3) มีทักษะการเอาตัวรอดจากอันตรายได้ 4) รู้จักการสังเกต และร่องรอยต่าง ๆ เช่น รอยเท้าสัตว์ รอยเท้าของคน และ 5) กล้าเสี่ยงในเหตุการณ์อันตราย ในเรื่องรางวัลที่ได้รับจะจ่ายให้แก่ผู้จับกุมเท่านั้น ส่วนสินบน จะจ่ายให้แก่ผู้ให้เบาะแสหรือสายลับ โดยไม่ต้องปรากฏตัว เพราะจะเป็นอันตรายอาจมีคนเบิกเงินแทน หรือเจ้าหน้าที่ในสายงานรับให้แทนก็ได้ (ศิริบูรณ์ เนาว์ถิ่นสุข, 2558) ในปัจจุบันอาชีพของ Bounty Hunter ได้มีการนำมาใช้ด้วยเช่นกัน แต่อาจจะปรับเปลี่ยนในรูปแบบของลักษณะงานที่รับผิดชอบ เช่น การเป็นสายลับให้กับทางเจ้าหน้าที่ตำรวจ องค์กรต่าง ๆ และในอาชีพนี้ยังมีหลักสูตรที่เปิดสอน IDDC (International Detective Development Center) โรงเรียนนักสืบแห่งแรกในประเทศไทย ที่ก่อกำเนิดขึ้นและอาจกล่าวได้ว่า เป็นโรงเรียนนักสืบแห่งแรกของอาเซียนที่สำคัญ สามารถทำ Dual Degree คือสามารถได้รับวุฒิบัตรจนถึงระดับปริญญา (AST) ทั้งของ IDDC และของ Lion Investigation Academy ได้พร้อมกันโดยไม่ต้องเดินทางไปเรียนที่รัฐ Pennsylvania สหรัฐอเมริกา (International Detective Thailand, Online)

ยุคตื่นทอง

การตื่นทอง เริ่มขึ้นเมื่อวันที่ 24 มกราคม 1848 เมื่อทองคำถูกค้นพบโดย James W. Marshall ที่โรงเลื่อยซัตเตอร์ใน Coloma รัฐ California บุคคลกลุ่มแรกที่ทราบข้อมูลยืนยันการตื่นทอง คือ ประชาชนใน Oregon หมู่เกาะแซนด์วิช (ฮาวาย) และละตินอเมริกา ผู้ที่เป็นกลุ่มแรกที่เริ่มแห่กันเข้ามาใน California ในปลายปี ค.ศ. 1848 ข่าวทองคำดึงดูดประชาชนราว 300,000 คนมายัง California จากทั่วสหรัฐอเมริกาและต่างประเทศ ในจำนวนนี้ประมาณครึ่งหนึ่งมาทางทะเล และอีกครึ่งมาทางบกจากทิศตะวันออกตามเส้นทางแคลิฟอร์เนียและเส้นทางแม่น้ำฮีลา (วิกิพีเดีย สารานุกรมเสรี, 2565) ส่งผลให้ 1) เกิดเศรษฐกิจเนื้อวัวในย่านนั้น 2) เกิดกลุ่มอาชีพใหม่ คือ นักแสวงโชค หรือ นักขุดทอง 3) เกิดอุตสาหกรรมเหมืองแร่ และ 4) พัฒนาการขนส่งแบบใหม่ คือ เรือไอน้ำ และทางรถไฟ ผลของการตื่นทองนั้นทำให้ San Francisco เติบโตขึ้นจากนิคมเล็ก ๆ ที่มีผู้อยู่อาศัยราว 200 คนในปี 1846 มาเป็นเมืองที่เติบโตอย่างรวดเร็วที่มีประชากรราว 36,000 คนในปี 1852 ถนน โบสถ์ โรงเรียน และเมืองอื่นถูกสร้างขึ้นทั่ว California ในปี 1849 รัฐธรรมนูญของรัฐถูกเขียนขึ้น มีการเลือกตั้งผู้ว่าการและสภานิติบัญญัติ และแคลิฟอร์เนียกลายเป็นรัฐหนึ่งในปี 1850 อันเป็นส่วนหนึ่งของข้อประนีประนอม ค.ศ. 1850 (ลองแมน, 2544) และ (Timeless History, 2562) ในปี ค.ศ.1985 เกิดการแต่งเพลงสากลแนว Country ชื่อเพลง Sutter's Mill ของ Dan Fogelberg อัลบั้ม High Country Snows ยอดนิยมการฟังเพลงอยู่ที่ 22 ล้านครั้ง โดยเนื้อหาของเพลง จะบอกเรื่องราวชีวิตจริงของผู้คนและสถานที่ในยุคแสวงหาทองคำ ที่นำมาซึ่ง

การสูญเสียของชนพื้นเมืองอินเดียนแดง ก็คือ โรงเลื่อย ของนักบุกเบิกชาวอเมริกันในยุคศตวรรษที่ 19 ที่ชื่อ John Sutter ผู้เป็นหุ้นส่วนร่วมธุรกิจกับ James W. Marshall ซึ่งสถานที่นี้ตั้งอยู่บริเวณแถบ California (ทิตศาสตร์ สุด แสน, 2562) และ (The Legend, 2561)

อาวุธติดตัวของคาวบอย

ย้อนไปในช่วงศตวรรษที่ 16 ก่อนที่ชาวยุโรปจะเข้าไปตั้งรกรากในอเมริกา ชาวสเปนที่ยึดครองดินแดนทางใต้ของเม็กซิโก ได้นำวิธีการทำมาหากินโดยการปลูกพืช เลี้ยงสัตว์ ทำเหมืองแร่ และที่พักอาศัย ชีวิตการเดินทางเร่ร่อนไปกลางทุ่งและป่าเขาของคาวบอย เป็นสิ่งที่คาดเดาไม่ได้ว่าเขาจะต้องเจอกับอะไร สิ่งที่คาวบอยต้องมีติดตัวเสมอคือ ปืน ที่ถือว่าเป็นสิ่งศักดิ์สิทธิ์ สัตว์ป่านานาชนิดที่ดุร้าย อีกทั้งชาวอินเดียนแดงเจ้าถิ่นที่ไม่ใคร่จะเป็นมิตร แถมพูดกันไม่รู้เรื่อง อินเดียนแดง มีหอก พกธนู พกมีดสั้น เก่งเรื่องการใช้ขวาน อเมริกันคาวบอยจึงต้องพกปืนสั้น ปืนยาวติดตัวไว้เสมอ แม้กระทั่งตอนที่คาวบอยต้องเข้าเมืองไปดื่มเหล้า ไปสังสรรค์ ไปติดต่อค้าขาย อเมริกันคาวบอยทุกคนมีสิทธิพกพาอาวุธเท่าๆ กัน กลุ่มคาวบอยด้วยกันเองก็ใช่ว่าจะรักเดียวเหนียวแน่น ยังมีการแก่งแย่ง คดโกง รังแกกันเองตามกฎธรรมชาติของมนุษย์ ในยุคบุกเบิกต้องแย่งชิงที่ดิน จึงมีเหตุต้องขัดผลประโยชน์ ไม่รู้ใครเป็นใคร ทุกคนคือคนแปลกหน้า เมื่อมีปัญหาเกิดขึ้นและกฎหมายเอื้อมไปไม่ถึง ถ้ามีความขัดแย้งเกิดขึ้น พระผู้เป็นเจ้าก็ไม่สามารถบอกได้ว่าใครผิดใครถูก การต่อสู้ด้วยอาวุธคือทางออก การดวลปืนเพื่อรักษาเกียรติยศ (Affairs of Honor) และเป็นการพิสูจน์ความบริสุทธิ์ของลูกผู้ชายของสังคมในยุคนั้น (นิพัทธ์ ทองเล็ก, 2560) อาวุธที่คาวบอยนิยมมีติดตัว มีดังนี้ (วิกิพีเดีย สารานุกรมเสรี, 2566) 1) ปืนสั้น หรือปืนลูกโม่ เป็นปืนพกทั่วๆ ไป นิยมเหน็บตรงบริเวณเข็มขัด อาจจะมี 1 – 2 กระบอก 2) ปืนไรเฟิล หรือปืนเล็กยาว เป็นอาวุธที่มีขนาดยาว ถูกออกแบบมาเพื่อการยิงทำลายเป้าหมายที่อยู่ในระยะไกลโดยเฉพาะ โดยจะมีพานท้ายสำหรับใช้ประทับร่องไหล่ เพื่อช่วยในการเล็งหาเป้าหมาย 3) ปืนคานเหวี่ยง มีขนาดยาวคล้ายไรเฟิล เป็นปืนระบบต่อสู้ป้องกันตัวไม่ใช่ปืนสำหรับยิงเป้า 4) มีดล่าสัตว์ เป็นมีดที่ใช้ในการต่อสู้เพื่อป้องกันตัว หรือใช้ในการล่าสัตว์เพื่อทำอาหาร และ 5) เชือก หรือ Lesso เป็นเชือกถักยาว ปลายเชือกจะทำเป็นบ่วงเพื่อใช้ในการคล้องสัตว์ หรือจับผู้ร้าย

คุณธรรม และจริยธรรมของคาวบอย

คุณธรรม เป็นพฤติกรรมที่แสดงถึงมาตรฐานทางศีลธรรม และเป็นรูปแบบของความคิดและการกระทำบนพื้นฐานของมาตรฐานทางศีลธรรม คุณธรรมอาจนับรวมในบริบทกว้าง ๆ ของค่านิยม บุคคลแต่ละคนจะมีแก่นของค่านิยมภายในใจที่เป็นหลักของความเชื่อ ความคิด ความเห็นของคน ๆ นั้น คุณธรรมตามภาพพจน์ของคาวบอยที่กระแสหลักของสังคมอเมริกันยอมรับ คือ ความซื่อสัตย์ (honesty), ความซื่อสัตย์ต่อตนเองและหลักการ (integrity), ความกล้าหาญ (courage), และความพึ่งพาตัวเองได้ (self-reliance) เมื่อประมาณปี ค.ศ.1930 - 1950 มีนักร้องคาวบอยอเมริกันชื่อ Gene Autry ได้ปลูกฝังคุณธรรมให้เยาวชนของเขา ด้วยการสร้างแนวคิดว่าคาวบอย ควรมีอุดมการณ์ 10 ข้อดังนี้ (ปรีชา กมลบุตร, 2555) 1) คาวบอยต้องไม่ยิงก่อน ไม่ชกต่อยคนที่เล็กกว่า ไม่เอาเปรียบผู้อื่นอย่างไม่มีคุณธรรม 2) คาวบอยต้องไม่กลับคำพูด หรือทำลายความไว้วางใจที่ผู้อื่นมอบให้เขา 3) คาวบอยต้องรักษาสัตย์ 4) คาวบอยต้องอ่อนโยนต่อเด็ก คนแก่ และการุณต่อสัตว์ทั่วไป 5) คาวบอยต้องไม่คิดและไม่สนับสนุนการแบ่งแยกเผ่าพันธุ์หรือศาสนา 6) คาวบอยต้องช่วยผู้ที่กำลังเดือดร้อนทุกข์ยาก 7) คาวบอยต้องเป็นคนงานที่ดี 8) คาวบอยต้องมีความสะอาดทั้งความคิด คำพูด การกระทำ และนิสัยส่วนตัว 9) คาวบอยต้องให้เกียรติผู้หญิง เคารพพ่อแม่ และเคารพกฎหมาย และ 10) คาวบอยต้องเป็นผู้รักชาติ นอกจากนี้ชาวคาวบอยและ

ชนพื้นเมืองอเมริกา ยังถือคติในเรื่องความดีและความชั่ว โดยจินตนาการเปรียบเสมือนสัตว์ป่า 2 ชนิด คือ กวาง และหมาป่า ซึ่งมีความหมายแฝงดังนี้ (แชมโป้ แอคเค่อ, 2561)

คนดีเปรียบเสมือนกวาง มีความหมายว่า ผู้มีนิสัยอ่อนโยน อ่อนไหว ความหยั่งรู้ ความตื่นตัว ตอบสนองต่อสิ่งรอบข้างได้ดี เป็นคนเชื่อมั่นในสัญชาตญาณของตัวเอง ในการพาตัวเองก้าวผ่านความยากลำบากต่าง ๆ ที่จะเข้ามา และเป็นคนหนักแน่น แต่สุภาพนุ่มนวลในทุกๆ โอกาสอีกด้วย

คนชั่วเปรียบเสมือน หมาป่า มีความหมายว่า ผู้มีนิสัยเห็นแก่ตัว ความกระหาย แข็งแกร่ง ฉลาดหลักแหลม รักอิสระ ป่าเถื่อน และมีความรักเพื่อนรักฝูง อาจจะสื่อได้ถึงความน่าเกรงขาม และความน่าเชื่อถือ

ยุคสุดท้ายของคาวบอย

อาชีพคาวบอยในฐานะคนเลี้ยงวัวค่อย ๆ สิ้นสุดลง เมื่อสหรัฐอเมริกา เริ่มขยายอาณาเขตได้สำเร็จในช่วงปลายทศวรรษ 1890 หลังจากที่สงครามกลางเมืองยุติและเริ่มมีการให้สิทธิครอบครองที่ดิน เจ้าของที่ดินเริ่มมีการล้อมรั้วด้วยลวดหนาม และการทำปศุสัตว์แบบเร่ร่อนค่อย ๆ สูญหายลงไปในช่วงปี 1886 - 1887 ด้วยเหตุผลดังนี้ (วนัท ผุดมาก, 2561), (Q-VOB, 2565) และ (History World, 2564) 1) พื้นที่แถบตะวันตกของสหรัฐอเมริกา เผชิญกับฤดูหนาวรุนแรง ฝูงวัวในพื้นที่เปิดโล่งหนาวตายเป็นจำนวนมาก นักวิชาการเชื่อว่าฤดูหนาวนั้นทำให้ยุคของคาวบอยสิ้นสุดลง 2) เจ้าของปศุสัตว์ส่วนใหญ่เริ่มมีฐานะที่ร่ำรวยขึ้น อันเนื่องจากการทำอุตสาหกรรมปศุสัตว์ ทำให้ตนเองมีเงินซื้อที่ดินเป็นของตัวเอง เพื่อสร้างที่อยู่อาศัยเลี้ยงปศุสัตว์ และเกษตรกรรม 3) ภูมิประเทศบางพื้นที่มีความอุดมสมบูรณ์มาก การต้อนวัวไปกินหญ้ายังสถานที่อื่น ๆ จึงไม่มีความจำเป็นอีกต่อไป 4) เจ้าของที่ดินเริ่มการทำรั้วกันสัตว์ หรือกั้นลวดหนามเพื่อปกป้องวัวไม่ให้ออกไปข้างนอก อีกทั้งเพื่อป้องกันการขโมยวัว และสัตว์ร้ายมาทำร้าย ทำให้ดูแลได้ง่ายขึ้น และ 5) คนอเมริกันบางส่วน เริ่มมีการนำเอาสุนัขมาใช้ในการต้อนวัว ซึ่งให้ความสะดวกสบายมาก ทำให้ไม่จำเป็นต้องจ้างคาวบอยมาดูแล

งานวิจัยที่เกี่ยวข้อง

Ronnie Dean Homann (2006) ได้ทำการศึกษาเรื่อง Contemporary cowboy culture and the rise of American postmodern solidarity จากการศึกษา ผู้วิจัยได้ศึกษาทฤษฎีร่วมสมัยเพื่อตีความลักษณะเฉพาะของวัฒนธรรมคาวบอย โดยกำหนดเป้าหมายของคาวบอยที่เกี่ยวข้องกับความสามัคคี วัฒนธรรมคาวบอยร่วมสมัย เกมส์ภาษา รูปภาพ และปรากฏการณ์หลังสมัยใหม่อื่น ๆ อีกมากมาย ดังนั้นงานวิจัยฉบับนี้ ผู้วิจัยได้ทำการอภิปรายเชิงทฤษฎี การวิเคราะห์เชิงคุณภาพ การสังเกตและตีความเพื่อให้การศึกษานี้สำเร็จในการมีส่วนร่วมทางวัฒนธรรม การบูรณาการความก้าวหน้าและความสัมพันธ์ในความสมัยใหม่ ผลวิจัยพบว่า สังคมในสมัยใหม่เปิดโอกาสกับสิ่งใหม่ที่มีประโยชน์และการพัฒนาความผูกพันทางสังคม เป็นผลให้วัฒนธรรมคาวบอยยังคงมีการสืบทอดและดำเนินการต่อไปอย่างแท้จริง และการศึกษาเรื่องลักษณะเฉพาะของคาวบอย

Gibson (2014) ได้ทำการศึกษา เรื่อง Cowboy masculinities: Relationality and rural identity จากการศึกษา ผู้วิจัยกล่าวถึงลักษณะผู้ชายคาวบอยในมุมมองทางภูมิศาสตร์ทางประวัติศาสตร์ การเปรียบเทียบอำนาจเหนือกว่าที่เกี่ยวข้อง ในมุมมองเชิงสัมพันธ์ โดยมีวัตถุประสงค์ 1) เพื่อต้องการการวิพากษ์วิจารณ์ทางการค้าและอนุรักษ์นิยมทางสังคม 2) เพื่อสังเกตการทำงานในการสร้างเชิงบรรทัดฐานการเป็นตัวแทน สินค้าโภคภัณฑ์ นวนิยาย และ 3) เพื่อศึกษาปฏิสัมพันธ์ทางวัฒนธรรมทางที่มีความหลากหลาย ผลการศึกษาพบว่า 1) ช่วงเวลาและสถานที่ระหว่างชายและหญิง ผู้ชายใช้ชีวิตเป็นคนงาน

เลี้ยงวัวในชนบท บางส่วนนำวัวเร่ร่อนไปตามสถานที่อุดมสมบูรณ์ 2) การนำวัฒนธรรมมาสร้างภาพยนตร์ละครเวทีหรือในเวทีโรดีโอ รูปแบบไนต์คลับ งานเทศกาลในอเมริกา 3) วัฒนธรรมร่วมถูกสร้างขึ้นในรูปแบบอัตลักษณ์สมัยนิยม เพื่อเป็นแนวคิดของความเป็นคาวบอยในชนบทตามทางภูมิศาสตร์ที่สำคัญ

ชัชพล ทรงสุนทรวงศ์ และ พิทักษ์ ศิริวงศ์ (2560) ได้ทำการศึกษาเรื่อง การสร้างและการปรับเปลี่ยนวัฒนธรรมสู่การเป็นสินค้าทางการท่องเที่ยวของชาวมอญ เกาะเกร็ด จังหวัดนนทบุรี จากการศึกษา ผู้วิจัยศึกษาถึงการสร้างและการปรับเปลี่ยนวัฒนธรรมของชาวมอญ เกาะเกร็ด ให้กลายเป็นสินค้าทางการท่องเที่ยว โดยใช้กระบวนการวิจัยเชิงคุณภาพ เก็บรวบรวมข้อมูลจากการศึกษาเอกสารและงานวิจัยที่เกี่ยวข้อง การสังเกต การสัมภาษณ์แบบไม่เป็นทางการ การสัมภาษณ์แบบเจาะลึก ผู้ให้ข้อมูลประกอบด้วย ปราชญ์ชาวบ้าน ผู้ประกอบการร้านอาหาร ผู้ผลิตเครื่องปั้นดินเผา ซึ่งเป็นชาวมอญในตำบลเกาะเกร็ด และเจ้าหน้าที่องค์การบริหารส่วนตำบลเกาะเกร็ด ผลการวิจัยพบว่า มรดกทางภูมิปัญญาด้านอาหาร ศิลปหัตถกรรม มีการพัฒนาให้เข้ากับการท่องเที่ยวและความต้องการของลูกค้า แต่ยังเป็นการผลิตและจำหน่ายแบบพอเพียง สร้างรายได้ให้ครอบครัวสามารถดำรงชีพอยู่ได้ และมีการแบ่งหน้าที่กันทำตามความชำนาญ ส่วนวัฒนธรรมและประเพณีนั้น ชาวมอญยังคงธำรงรักษาไว้เป็นอย่างดี มีบางประเพณีได้ปรับให้เข้ากับยุคสมัย

วิธีดำเนินการวิจัย

การศึกษา เรื่อง อิทธิพลของวัฒนธรรมคาวบอยในศตวรรษที่ 21 เป็นการศึกษาโดยใช้รูปแบบวิธีการวิจัยเชิงเอกสาร (Documentary Research) โดยศึกษาค้นคว้า รวมรวมข้อมูลจากบทความหนังสือข่าว เอกสารตำราต่างๆ วีดิทัศน์ และงานวิจัยที่เกี่ยวข้องที่ว่าด้วยวิถีอเมริกันคาวบอย แล้วนำมาวิเคราะห์เพื่อการวิจัย

แหล่งข้อมูล

1. แหล่งข้อมูลจากการศึกษาค้นคว้า รวบรวมข้อมูลจากเอกสารตำราต่าง ๆ ภาพยนตร์ สื่อวีดิทัศน์และงานวิจัยที่เกี่ยวข้อง

2. แหล่งข้อมูลทุติยภูมิ (Secondary Data) ด้วยการเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่าง วิธีการสอบถาม/สัมภาษณ์ ที่มีความชื่นชอบวัฒนธรรมคาวบอย

การเก็บรวบรวมข้อมูล

1. จากการเก็บรวบรวมข้อมูลทุติยภูมิ โดยการใช้แบบสัมภาษณ์จากกลุ่มตัวอย่าง

2. จากเอกสาร โดยเก็บรวมรวมข้อมูลจากหนังสือทางวิชาการ เอกสาร งานวิจัย และเอกสารอื่นๆ ที่เกี่ยวข้อง

เครื่องมือที่ใช้ในการวิจัย

1. แบบสัมภาษณ์ โดยใช้ระบบสอบถามที่เป็นมาตรฐานเดียวกัน (standardized questionnaire)

2. เก็บรวบรวมข้อมูลจากหนังสือ วารสาร เอกสารทางวิชาการต่าง ๆ และสืบค้นข้อมูลจาก Internet ที่เกี่ยวข้องกับแนวคิด ทฤษฎีและผลงานวิจัยที่เกี่ยวข้อง

การวิเคราะห์ข้อมูล

1. ผู้ศึกษาจะนำข้อมูลที่ได้จากการสัมภาษณ์ มาเปรียบเทียบความเหมือนและความต่างของแต่ละบุคคล และจัดลำดับความสำคัญและคุณลักษณะของข้อมูล

2. นำข้อมูลจากการสัมภาษณ์ จัดลำดับความสำคัญแล้วนำมาเปรียบเทียบกับข้อมูลทางเอกสารต่าง ๆ ที่เกี่ยวข้อง ไม่ว่าจะเป็นแนวคิดทฤษฎีและผลงานวิจัยที่เกี่ยวข้อง

3. นำข้อมูลที่ได้จากการสัมภาษณ์ และจากการศึกษาต่าง ๆ มาทำการวิเคราะห์ข้อมูลร่วมกันอย่างเป็นระบบ และนำไปสู่การเชื่อมโยงข้อมูลเข้าด้วยกัน เพื่อสะดวกในการวิเคราะห์และเขียนรายงาน ข้อมูลที่ได้จากการศึกษาจะไม่ใช้ข้อมูลตัวเลข แต่จะเป็นรูปแบบข้อมูลเชิงพรรณนา

การตรวจสอบข้อมูล

1. การวิเคราะห์ข้อมูลภายหลังจากที่ได้ทำการสัมภาษณ์ เพื่อเก็บรวบรวมข้อมูลจากกลุ่มผู้ให้ข้อมูลจนครบตามจำนวนที่กำหนดไว้ ผู้วิจัยจะนำข้อมูลที่ได้จากผู้ให้ข้อมูลทั้งหมด มาวิเคราะห์เข้าด้วยกันโดยการเปรียบเทียบข้อมูล

2. ภายหลังการเก็บรวบรวมข้อมูลในส่วนของเอกสาร ผู้วิจัยศึกษาเอกสารเกี่ยวกับอิทธิพลของวัฒนธรรมคาวบอยในศตวรรษที่ 21 ซึ่งประกอบไปด้วย

2.1 ภาพยนตร์คาวบอยในศตวรรษที่ 21

2.2 เกมคาวบอยในศตวรรษที่ 21

2.3 เพลงคาวบอยในศตวรรษที่ 21

2.4 สถาปัตยกรรมคาวบอยในศตวรรษที่ 21

2.5 การส่งออกวัฒนธรรมคาวบอยสู่พื้นที่เกษตรอื่นๆ

2.6 เครื่องแต่งกายคาวบอยในศตวรรษที่ 21

ผลการวิจัย

วัฒนธรรมคาวบอย ถึงแม้ว่าจะสิ้นสุดลงด้วยหลายปัจจัย ไม่ว่าจะเป็นรูปแบบการเมืองการปกครอง การพัฒนาประเทศ ภูมิประเทศ หรือการพัฒนาวิถีชีวิตของคนอเมริกา แต่เมื่อเข้ามาในยุคปัจจุบัน วัฒนธรรมคาวบอยก็ยังมีหลายคนยังให้ความสนใจเป็นอย่างมาก เช่น การสร้างภาพยนตร์ การสร้างเกม บทเพลง เครื่องแต่งกาย งานสถาปัตยกรรม เป็นต้น ซึ่งจะอธิบายไว้ดังนี้

1) ภาพยนตร์คาวบอยในศตวรรษที่ 21

หนังคาวบอย จะมีกลิ่นอายของชาวตะวันตก มีการต่อสู้ แย่งชิง ทั้งในเรื่องของพื้นที่ทำกิน การขโมย และอาชญากรรมต่าง ๆ ในพื้นที่ ที่ตำรวจและกฎหมายเข้าไม่ถึง เราจึงจะเห็นในหนังสไตล์นี้เสมอ กับฉากต่อสู้แอคชั่น การดวลปืนเพื่อศักดิ์ศรี โดยมีม้าเป็นพาหนะ มีฉากต่อสู้สุดคลาสสิค และการใช้กำลังอย่างป่าเถื่อน ในพื้นที่ที่ทุกคนสามารถพกปืนและฆ่าคนได้อย่างไม่กลัวตำรวจ ภาพยนตร์ได้แก่ The Ridiculous 6 (2015), The Magnificent Seven (2016), Concrete Cowboy (2020), The Harder They Fall (2021), Django Unchained (2023) ฯลฯ ในปัจจุบันภาพยนตร์คาวบอย ไม่ได้เพียงแค่ความบันเทิงเพียงอย่างเดียว แต่ยังมีการสอดแทรกในด้านประวัติศาสตร์ ขนบธรรมเนียมประเพณี งานสถาปัตยกรรม ระบบสังคม การเมืองการปกครอง หรือแม้กระทั่งการดำรงชีวิตของสังคมยุค Wild West ทำให้ผู้ชมได้รับความรู้ผ่านการแสดง และนอกจากนั้น ตัวละครก็มีบทบาทสำคัญทางด้านตลาด เช่น เสื้อผ้า เครื่องแต่งกาย จึงเป็นแรงบันดาลใจทำให้ผู้คนส่วนใหญ่มีความสนใจ โดยการแต่งตัวเลียนแบบตามตัวละครนั้น ๆ เป็นต้น

2) เกมคาวบอยในศตวรรษที่ 21

เกมที่มีชื่อเสียงมากที่สุด คือ Red Dead Redemption1 – 2 เป็นหนึ่งในเกมอันทรงคุณค่าและเป็นที่จดจำ ผลงานของทีมงาน Rockstar Games สื่อบันเทิงที่เป็นมากกว่าเกม ที่ได้รับรายได้ทะลุ 725 ล้านดอลลาร์ ลักษณะของเกมจะเป็นการเล่าเรื่องผ่านตัวละครที่มีชื่อว่า Arthur Morgan ที่อยู่ในกลุ่มแก๊ง Van der Linde ซึ่งเป็นกลุ่มคนนอกกฎหมาย โดยเหตุการณ์ดำเนินเรื่องใน ปี ค.ศ. 1911 ประเทศอเมริกาในช่วงปลายของยุคคาวบอยรุ่งเรือง ที่จะให้ผู้เล่นเหมือนได้ย้อนเวลากลับไปยุคเถื่อน การใช้ปืนในการตัดสินปัญหา บรรยากาศสังคมอเมริกันในอดีตเมื่อ 100 ปีก่อน (Webmaster Nott, 2561) ในปัจจุบันเกม Red Dead Redemption ยังมีการวางจำหน่ายบนโลกออนไลน์ เช่น Stream Xbox Epic และยังเป็นที่นิยมเนื่องจากเป็นเกมที่ภาพสวย บรรยากาศมีความสมจริง มีการดำเนินเนื้อเรื่องเหมือนกับการชมภาพยนตร์ นอกจากนี้เกม Red Dead Redemption ยังมีการสอกแทรกข้อคิดในเรื่องคุณธรรม จริยธรรม ความดี ความชั่ว หรือแม้กระทั่งสามารถเล่นแบบ Online ได้ คือ การพบปะพูดคุย ทำให้เกิดสังคมออนไลน์ และเกมนี้ทำให้ผู้เล่นไม่รู้สึกเบื่อหน่าย

3) เพลงคาวบอยในศตวรรษที่ 21

เป็นเพลงที่ทุกคนนิยมฟังกันมาก เพลงส่วนใหญ่จะมี 2 แบบ คือ Country Folk Song เป็นเพลงที่มีบทร้อง เพลงที่นิยมกันมาก ได้แก่ Take me home country road, Sutter mill, Stony, Thank God for the radio, Livin' on Love เป็นต้น และ Theme Song เป็นเพลงที่ไม่มีเนื้อร้อง บรรเลงดนตรีเพียงอย่างเดียว ได้แก่ Mountain Banjo, On My Way Home, Harvest Time เป็นต้น เพลงคาวบอย เป็นเพลงที่มีอิทธิพลต่อความคิด ความรู้สึก และพฤติกรรมของผู้ฟัง อีกทั้งเพลงคาวบอยมีประโยชน์ต่อจิตใจ ช่วยทำให้จิตใจผ่อนคลาย เพิ่มพลังงานให้แก่ผู้ฟัง ช่วยให้ผู้ฟังสามารถจัดการกับความเครียด ช่วยเพิ่มสุขภาวะทางจิตได้ดีขึ้น นอกจากนี้เพลงคาวบอยได้ถูกนำมาใช้ในการส่งเสริมสุขร้านอาหาร หรือการสร้างอรรถรสในเกม Red Dead Redemption หรือ ภาพยนตร์ เป็นต้น

4) สถาปัตยกรรมคาวบอยในศตวรรษที่ 21

หากพูดงานสถาปัตยกรรมของวัฒนธรรมคาวบอย นั้นคือ Saloon bar ซึ่งอาจหมายถึงห้องโถงใหญ่ ร้านจำหน่ายสุรา อาหาร บาร์ โรงแรม โดยจะมี Bartender ทำหน้าที่บริการดูแลลูกค้า โดยลักษณะตัวอาคารจะทำจากไม้ มีลักษณะ 2 ชั้น โดยชั้นล่างจะใช้สำหรับจำหน่ายสุรา อาหาร บรรเลงดนตรี ส่วนชั้นที่ 2 จะเป็นโรงแรมที่พัก ไว้สำหรับพักผ่อน ในปัจจุบันมีการนำเอารูปแบบของ Saloon bar มาสร้างเป็นร้านค้าและบริการ สำหรับคนที่สนใจสไตล์ตะวันตกอเมริกา มีการสร้างบรรยากาศและตกแต่งแบบตะวันตก ตัวอาคารส่วนใหญ่ทำมาจากไม้ การสร้างอาคารมีลักษณะเป็นรูปเรขาคณิต นิยมสร้าง 1 – 2 ชั้น ในชั้นที่ 2 ของอาคารจะมีระเบียงยื่นออกมา รูปแบบของ Saloon bar ยังคงกลิ่นอายแบบดั้งเดิม คือ ขายอาหาร เครื่องดื่ม มีห้องพัก ดนตรี และนันทนาการ

5) การส่งออกวัฒนธรรมคาวบอยสู่พื้นที่เกษตรอื่น ๆ

ในสมัยยุค Wild west ได้ตั้งหลักปักฐานมีการดำรงชีวิตด้วยการการทำไร่เกษตร และทำปศุสัตว์ เลี้ยงวัว โดยมีผู้ดูแลโดยใช้ชีวิตบนหลังม้า จนการเป็นอุตสาหกรรมปศุสัตว์ และอุตสาหกรรมการเกษตร เช่น การนำเนื้อวัวมาสร้างเป็นอาหาร ผลิตภัณฑ์จากนมวัว ใบชา และใบยาสูบ ในปัจจุบันได้นำรูปแบบวัฒนธรรมคาวบอย มาพัฒนาและบูรณาการในรูปแบบของเศรษฐกิจพอเพียง เพื่อเป็นการสร้างรายได้ให้กับตัวเอง เช่น การทำฟาร์มปศุสัตว์ การท่องเที่ยว ธุรกิจโคนม และการแปรรูปอาหาร ตัวอย่าง เช่น ฟาร์มโชคชัย จังหวัดนครราชสีมา ฟาร์มโคนมไทย-เดนมาร์ค จังหวัดสระบุรี สมชายฟาร์มโคนม

จังหวัดพัทลุง และผลิตภัณฑ์นมหนองโพ จังหวัดราชบุรี เป็นต้น

6) เครื่องแต่งกายคาวบอยในศตวรรษที่ 21

ในปัจจุบันเครื่องแต่งกายคาวบอยยังเป็นที่นิยมกันมากในวัยหนุ่มสาว มักใส่เพื่อแฟชั่นหรือ Theme งานต่าง ๆ อีกทั้ง ยังสามารถใส่เพื่อทำการเกษตร หรืออาชีพที่เกี่ยวข้องได้ เช่น การทำฟาร์มปศุสัตว์ การทำไร่เกษตรกรรม การท่องเที่ยว เป็นต้น เครื่องแต่งกายประกอบด้วย เสื้อเชิ้ตแขนยาว หรือเสื้อสักหลาดลายตาราง หมวกปีก เสื้อแจ็คเกต ผ้าปิดจมูก สายเอี๊ยม หรือ Suspender หัวเข็มขัดและสายเข็มขัด กางเกงยีนส์ หรือเดนิม และรองเท้าบูทยาว (Forn Golf, 2566) อิทธิพลของเครื่องกายคาวบอยนั้นมาจากภาพยนตร์และเกมเป็นหลัก เนื่องจากตัวละครมีบทบาทมากในการทำการตลาด ทำให้เกิดแรงบันดาลใจของผู้ที่รับชมภาพยนตร์ ด้วยการแต่งตัวเลียนแบบตามตัวละครนั้น ๆ ส่งผลให้มีการจับจ่ายซื้อขายกันทั่วไป นอกจากนี้ ยังมีหุ่นโมเดลจำลอง ในกลุ่มคนที่ชอบสะสมอีกด้วย

สรุปและอภิปรายผล

วัฒนธรรมคาวบอย เป็นวิถีชีวิตที่มีรากเหง้ามาจากชาวสเปนในทวีปยุโรป ซึ่งนำเอาวัฒนธรรมแบบดั้งเดิมมาใช้ในการดำรงชีวิตของชาวสเปน โดยทำหน้าที่บนหลังม้าคอยดูแลวัว พาวัวไปหาหญ้ากินตามสถานที่ต่าง ๆ ที่มีความอุดมสมบูรณ์ ในปัจจุบันวัฒนธรรมคาวบอยได้รับความนิยมมากขึ้นกันอย่างแพร่หลาย โดยเฉพาะการสร้างเป็นภาพยนตร์ การสร้างในรูปแบบเกม เครื่องแต่งกาย บทเพลง หรือแม้กระทั่งนำรูปแบบของสถาปัตยกรรมมาสร้างเป็นร้านค้า นอกจากนี้ ยังสามารถมาสร้างเป็นอาชีพเป็นของตนเองได้ ด้วยการผสมผสานกับหลักปรัชญาเศรษฐกิจพอเพียง การสร้างเป็นแหล่งท่องเที่ยว ซึ่งมีความสอดคล้องกับแนวคิดของ ชัชพล ทรงสุนทรวงศ์ และ พิทักษ์ ศิริวงศ์ (2560) พบว่า มรดกทางภูมิปัญญาของชาวมอญเกาะเกร็ด จังหวัดนนทบุรี ด้านอาหาร ศิลปหัตถกรรม มีการพัฒนาให้เข้ากับการท่องเที่ยวและความต้องการของลูกค้า แต่ยังเป็นการผลิตและจำหน่ายแบบพอเพียง สร้างรายได้ให้ครอบครัวสามารถดำรงชีพอยู่ได้ และมีการแบ่งหน้าที่กันทำตามความชำนาญ ส่วนวัฒนธรรมและประเพณีนั้นชาวมอญยังคงธำรงรักษาไว้เป็นอย่างดี มีบางประเพณีได้ปรับให้เข้ากับยุคสมัย สอดคล้องกับแนวคิดของ Ronnie Dean Homann (2006) พบว่า สังคมในสมัยใหม่ได้เปิดโอกาสกับการรับวัฒนธรรมสิ่งใหม่ ที่มีประโยชน์และการพัฒนาความผูกพันทางสังคม เป็นผลให้วัฒนธรรมคาวบอยยังคงมีการสืบทอดและดำเนินการต่อไปอย่างแท้จริง และการศึกษาเรื่องลักษณะเฉพาะของคาวบอย สอดคล้องกับแนวคิดของ ธัญพัชร ศรีมารัตน์ (2558) พบว่า วัฒนธรรมท้องถิ่นหรือวัฒนธรรมล้านนา ได้ถูกนำมาแปรรูป ดัดแปลงให้เป็นสินค้าที่สามารถให้คุณค่าแก่ผู้บริโภค และยังสามารถเพิ่มมูลค่าให้แก่ผู้ประกอบการ โดยอาศัยปัจจัยที่สัญญะของการทำโรงแรมบูติก โฮเทล คือ ประวัติศาสตร์ ธรรมชาติ และวัฒนธรรม มาทำให้กลายเป็นสินค้า โดยมีการนำเอาอัตลักษณ์ของวัฒนธรรมล้านนาที่มีอยู่มานานแล้ว และศิลปะทางตะวันตก มาผสมผสานกับความร่วมสมัย เพื่อมาผลิตสร้างความหมายและมาต่อยอดเพื่อเป็นการเพิ่มมูลค่าให้กับสินค้า

ข้อเสนอแนะ

1. การวิจัยในครั้งนี้ทำให้ทราบว่าวัฒนธรรมคาวบอย ยังคงเป็นที่นิยมเป็นอย่างดี แต่ก็ยังศึกษาหาข้อมูลของวัฒนธรรมความบอยค่อนข้างยาก โดยเฉพาะเนื้อหาที่ยังไม่มีในบทเรียนของรายวิชาประวัติศาสตร์ หรือตำรา เนื่องจากยังไม่มีผู้เขียนตำราทำให้ค่อนข้างจะหาซื้อยาก ดังนั้นผู้วิจัยมองว่าควรจะมีการรื้อฟื้นวัฒนธรรมคาวบอยในลักษณะที่เป็นการให้ความรู้แก่สาธารณะ เพื่อเป็นการรักษาวัฒนธรรมอันดีงามและให้บุคคลที่สนใจสามารถศึกษาค้นคว้าหาข้อมูลได้

2. ความสำคัญของวัฒนธรรมคาวบอย สามารถนำมาบูรณาการในรูปแบบของเศรษฐกิจพอเพียง หรือการท่องเที่ยว เช่น การขี่ม้าชมเมือง การสร้างเมืองจำลองคาวบอย ฟาร์มปศุสัตว์ เป็นต้น เพื่อเป็นการส่งเสริมอาชีพทางเลือก การส่งเสริมด้านการท่องเที่ยว มรดกทางวัฒนธรรม ซึ่งจะต้องอาศัยความร่วมมือทุกภาคส่วนทั้งคนในชุมชน องค์กรทั้งภาครัฐ และเอกชน ในการพัฒนาสนับสนุนวัฒนธรรมคาวบอยในรูปแบบของสินค้าทั้งทางด้านการท่องเที่ยว ด้านวัฒนธรรม และด้านการประกอบอาชีพทางเลือก

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รูปแบบการป้องกัน แก้ไข และบำบัดผู้ติดยาเสพติด ภายใต้การมีส่วนร่วมของชุมชน และภาคีเครือข่ายในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา

Model of Prevention, Solving and Treatment of Drug Addict by Communities and Network Partners Participation in Ban Thung Mae Bua, Khlong Hoi Khong District, Songkhla Province

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บทคัดย่อ

การศึกษารูปแบบการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติด ภายใต้การมีส่วนร่วมของชุมชน และภาคีเครือข่ายในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา มีวัตถุประสงค์เพื่อ 1) ศึกษารูปแบบการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติด ภายใต้การมีส่วนร่วมของชุมชน และภาคีเครือข่าย และ 2) เสนอแนวทางการใช้รูปแบบการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติด ภายใต้การมีส่วนร่วมของชุมชนและภาคีเครือข่าย ในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา ใช้วิธีรวบรวมข้อมูลจากการศึกษา แนวคิดทฤษฎี นโยบายของรัฐบาล บทความทางวิชาการ และงานวิจัยที่เกี่ยวข้องและการสัมภาษณ์ผู้ที่มีส่วนเกี่ยวข้อง ผลการศึกษาพบว่า รูปแบบและแนวทางการมีส่วนร่วมของครอบครัว ชุมชนและภาคีเครือข่าย ในการป้องกันและแก้ไขปัญหายาเสพติด ในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา มีขั้นตอนการสร้างการมีส่วนร่วมของเครือข่ายในการแก้ไขปัญหายาเสพติด ได้แก่ 1) มีการร่วมกันรับรู้ปัญหา ร่วมคิด ร่วมตัดสินใจ 2) มีการจัดทำแผนร่วมกับชุมชน 3) การร่วมการปฏิบัติตามที่ได้วางแผน 4) มีส่วนร่วมในการรับผลประโยชน์ร่วมกัน และ 5) ร่วมกันประเมินผลจากการดำเนินกิจกรรม

คำสำคัญ: การป้องกัน, การแก้ไข, การบำบัด, ผู้ติดยาเสพติด, การมีส่วนร่วม

Abstract

The objectives study of prevention, solving and treatment model of drug addict by communities and network partners participation in Ban Thung Mae Bua, Khlong Hoi Khong District, Songkhla Province is to 1) study the prevention, solving and treatment model of drug addict and 2) propose guidelines of prevention, solving, and treatment model. Data collection from studies, concepts, theory, government policy, academic articles and in-depth interviews. The results showed that 5 steps of the model and guidelines to prevention, solving and treatment of drug addict by 1) recognize the problem, co-think,

and make decisions with communities and networks 2) plan collaboration with the communities 3) participating the implementation plan 4) participating of mutual benefits, and 5) follow-up evaluation of the activities.

Keywords: Prevention, Correction, Therapy, Addiction, Engagement

บทนำ

ปัญหายาเสพติดนับวันจะเพิ่มความรุนแรงมากขึ้น ก่อให้เกิดความเสียหายต่าง ๆ ทั้งผู้เสพ ครอบครัว สังคม และประเทศชาติ ในปี พ.ศ. 2563 ข้อมูลผู้ใช้ยาเสพติดจากรายงาน World Drug Report ของสำนักงานว่าด้วยยาเสพติดและอาชญากรรมแห่งสหประชาชาติ พบว่า มีจำนวนประชากรกว่า 284 ล้านคนจากทั่วโลก ในช่วงอายุ 15 - 64 ปี ส่วนใหญ่เป็นเพศชาย มีการใช้สารเสพติด ซึ่งเทียบได้กับจำนวน 1 ในทุก ๆ 18 คน จากช่วงอายุดังกล่าว อีกทั้งยังพบว่า จำนวนผู้ใช้ยาเสพติดเพิ่มมากขึ้นถึง 26% เมื่อเทียบกับสิบปีที่ผ่านมา (United Nation, 2022) โดยเอเชียตะวันออก และเอเชียตะวันออกเฉียงใต้เป็นที่ตั้งของตลาดค้ายาบ้าที่ใหญ่ที่สุดแห่งหนึ่งของโลก และมีแนวโน้มที่จะขยายตัวอย่างต่อเนื่อง โดยเฉพาะในพื้นที่ลุ่มแม่น้ำโขงตอนล่าง ได้แก่ ราชอาณาจักรกัมพูชา สาธารณรัฐประชาธิปไตยประชาชนลาว ประเทศพม่า ประเทศเวียดนาม และประเทศไทย สัดส่วนการจับกุมแอมเฟตามีนสูงถึงร้อยละ 89 ของการจับกุม ทั้งปี พ.ศ. 2564 (กนิษฐา ไทยกล้า, 2565)

จังหวัดสงขลา ประสบกับปัญหาการระบาดของยาเสพติด เป็นพื้นที่ที่มีปัญหาการค้าและแพร่ระบาดของยาเสพติดมากที่สุด จากสถิติคดียาเสพติดของประเทศไทยพบว่า จังหวัดสงขลามีสถิติคดียาเสพติด และคดีผู้ต้องหายาเสพติดเป็นอันดับ 1 ของประเทศ (สำนักงานคณะกรรมการป้องกันและปราบปรามยาเสพติด, 2564) มีการนำเข้ายาเสพติดอย่างต่อเนื่อง ซึ่งรูปแบบการนำเข้ายังคงเป็นรูปแบบการนำเข้ามาพร้อมตัวบุคคล และการซุกซ่อนในยานพาหนะ เพื่อนำมาแบ่งจำหน่ายให้กับลูกค้าในพื้นที่ภาคใต้ตอนล่าง โดยพื้นที่ที่มีการลักลอบนำเข้ายาเสพติด และสามารถจับกุมผู้กระทำความผิดได้อย่างต่อเนื่อง ส่วนใหญ่ยังคงเป็นพื้นที่ชายแดน ซึ่งรูปแบบการนำเข้ามีทั้งการนำเข้ามาพร้อมตัวบุคคล การลำเลียงขนส่งมาทางรถโดยสารรถไฟ การซุกซ่อนภายในรถยนต์ส่วนบุคคล การลักลอบส่งยาเสพติดและยาประเภทต่าง ๆ ซึ่งมีการนำมาใช้ในทางที่ผิดมาในรูปแบบของสินค้าทางขนส่งของเอกชนทั่วไป และทางรูปแบบของพัสดุสิ่งของที่ฝากส่งทางไปรษณีย์แบบปกติ ทั้งนี้รูปแบบการลักลอบลำเลียงยาเสพติดครั้งละจำนวนมากจากพื้นที่ชายแดนยังไม่เปลี่ยนแปลง กลุ่มขบวนการยังนิยมใช้การลำเลียงโดยรถยนต์ส่วนบุคคลในรูปขบวนลำเลียง รถบรรทุกขนาดใหญ่ (บรรทุกพืชผลทางการเกษตร สินค้าอุปโภคบริโภค และน้ำมัน) และรถยนตกระบะดัดแปลงติดตู้บรรทุกสินค้าเป็นหลัก และยังพบในบางกรณีมีการใช้บริษัทขนส่งพัสดุภัณฑ์เอกชน ลำเลียงยาเสพติดจำนวนมากจากพื้นที่ชายแดน เข้าสู่พื้นที่ตอนในและจังหวัดทางภาคใต้ (สำนักปราบปรามยาเสพติด, 2564)

อำเภอคลองหอยโข่ง จังหวัดสงขลา มีพื้นที่ติดต่อกับอำเภอหาดใหญ่ จังหวัดสงขลา และอำเภอสะเดา จังหวัดสงขลา ซึ่งใช้เป็นเส้นทางลำเลียงและแหล่งพักยาเสพติดและส่งต่อยาในพื้นที่ เนื่องจากมีเส้นทางสัญจรหลบเลี่ยงยากต่อการจับกุมเป็นปัจจัยสำคัญที่ส่งเสริมให้เกิดการแพร่ระบาดของยาเสพติดมากขึ้นในพื้นที่ จากข้อมูลสถิติการจับกุมของตำรวจในพื้นที่อำเภอคลองหอยโข่งย้อนหลัง 3 ปี พ.ศ. 2563 ถึง พ.ศ. 2565 พบว่า มีผู้ถูกจับกุม จำนวน 154 คน 218 คน และ 249 คน ตามลำดับ อยู่ในกลุ่มเด็กเยาวชน และกลุ่มวัยทำงาน มีจำนวนเพิ่มจำนวนขึ้นทั้งชายและหญิง

จากความสำคัญและที่มาของปัญหาที่กล่าวข้างต้น ผู้วิจัยมีแนวคิดที่จะศึกษารูปแบบการมีส่วนร่วมของชุมชน และภาคีเครือข่ายในการป้องกันและรักษายาเสพติด ในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา อันจะช่วยเพิ่มประสิทธิภาพในดำเนินงานให้บรรลุตามเป้าหมายที่เชื่อมโยงมิติทางด้านผู้ป่วยยาเสพติด ครอบครัวของผู้ป่วยยาเสพติด และคนในชุมชน ช่วยให้ผู้เสพยาเสพติดเข้าถึงบริการเพิ่มขึ้น สามารถป้องกันบำบัด และรักษายาเสพติดได้อย่างเหมาะสม และแก้ไขปัญหายาเสพติดได้อย่างยั่งยืน

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษารูปแบบการมีส่วนร่วมของครอบครัว ชุมชนและภาคีเครือข่าย ในการป้องกันและแก้ไขปัญหายาเสพติด ในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา
2. เพื่อเสนอแนวทางการใช้รูปแบบการบำบัดผู้ติดยาเสพติดวัยทำงาน ในการป้องกันและแก้ไขปัญหายาเสพติด ในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของยาเสพติด

พระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 ได้ให้ความหมายของยาเสพติดไว้ในมาตรา 4 แก้ไขเพิ่มเติมโดยพระราชบัญญัติยาเสพติดให้โทษ (ฉบับที่20) พ.ศ. 2528 ว่ายาเสพติดให้โทษ หมายความว่า สารเคมีหรือวัตถุชนิดใดๆ ซึ่งเมื่อเสพเข้าร่างกายไม่ว่าจะโดยรับประทาน ดม สูบหรือฉีดหรือด้วยประการใดๆแล้ว ทำให้เกิดผลต่อร่างกายและจิตใจในลักษณะสำคัญเช่น ต้องเพิ่มขนาดการเสพขึ้นเป็นลำดับ มีอาการถอนยาเมื่อขาดยา มีความต้องการเสพทั้งร่างกายและจิตใจอย่างรุนแรงตลอดเวลาและสุขภาพทั่วไปจะทรุดโทรมลง รวมตลอดถึงพืชหรือส่วนของพืชที่เป็นหรือให้ผลผลิตเป็นยาเสพติดให้โทษหรืออาจใช้ผลิตเป็นยาเสพติดให้โทษและสารเคมีที่ใช้ในการผลิตยาเสพติดให้โทษด้วย ทั้งนี้ไม่หมายความถึงยาสามัญประจำบ้านบางตำรับตามกฎหมายว่าด้วยยาที่มีสารเสพติดผสมอยู่

นอกจากนี้ โดมธราดล อนันตศาล (2555) ได้กล่าวถึง ความหมายของสารเสพติด คือ สารใดก็ตามที่เกิดขึ้นตามธรรมชาติหรือสารที่สังเคราะห์ขึ้น เมื่อนำเข้าสู่ร่างกายไม่ว่าจะด้วยวิธีรับประทาน ดม สูบ ฉีดหรือด้วยวิธีการใด ๆ แล้วทำให้เกิดผลต่อร่างกายและจิตใจนอกจากนี้ยังทำให้เกิดการเสพติดได้หากให้สารนั้นเป็นประจำทุกวันหรือวันละหลาย ๆ ครั้ง

ประเภทของยาเสพติด

พระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 ได้แบ่งประเภทของยาเสพติดเป็น 5 ประเภท ได้แก่

1. ยาเสพติดให้โทษชนิดร้ายแรงประเภทที่ 1 เช่น เฮโรอีน แอลเอสดี แอมเฟตามีน หรือยาบ้า ยาอี ยาเลิฟ
2. ยาเสพติดให้โทษทั่วไปประเภทที่ 2 ยาเสพติดประเภทนี้เป็นยาเสพติดที่สามารถนำมาใช้เพื่อประโยชน์ทางการแพทย์ได้แต่ต้องใช้ภายใต้การควบคุมของแพทย์ เช่น ฝิ่น มอร์ฟีน โคเคน และเมทาโดน
3. ยาเสพติดให้โทษประเภทที่ 3 ยาเสพติดให้โทษที่มีลักษณะเป็นตำรับยาและมียาเสพติดให้โทษในประเภท 2 ผสมอยู่ มีประโยชน์ทางการแพทย์ การนำไปใช้เพื่อเสพมีบทลงโทษกำกับไว้ ยาเสพติดประเภทนี้ ได้แก่ ยาแก้ไอที่มีตัวยาโคเคอีน ยาแก้ท้องเสียที่มีฝิ่นผสมอยู่ด้วย ยาฉีดระงับปวดต่าง ๆ เช่น มอร์ฟีน เพทีดีน ซึ่งสกัดมาจากฝิ่น เป็นต้น

4. ยาเสพติดให้โทษประเภทที่ 4 คือ สารเคมีที่ใช้ในการผลิตยาเสพติดให้โทษประเภทที่ 1 หรือประเภทที่ 2 เช่น น้ำยาอะเซติกแอนไฮไดรย์ และอะเซติลคลอไรด์ ซึ่งใช้ในการเปลี่ยนมอร์ฟีนวัตถุออกฤทธิ์ต่อจิตประสาท 12 ชนิด ที่สามารถนำมาผลิตยาอี และยาบ้าได้

5. ยาเสพติดให้โทษประเภทที่5 คือ ยาเสพติดให้โทษที่มิได้เข้าอยู่ในประเภท 1 - 4

สาเหตุของการเสพยาเสพติด

พิชเยศ ชูเมือง (2563) ได้กล่าวถึงสาเหตุของการติดยาเสพติดมีอยู่หลายสาเหตุ โดยขึ้นอยู่กับปัจจัยแวดล้อมต่างๆ ไม่ว่าจะเป็นสถานศึกษา ครอบครัว การเปลี่ยนแปลงทางวัฒนธรรม และสังคมหรือปัญหาจากทางร่างกายและจิตใจของคนผู้นั้น ซึ่งเกิดได้จากหลายปัจจัยดังนี้

1. อยู่ใกล้ชิดกับแหล่งที่เกี่ยวข้องกับยาเสพติดไม่ว่าจะเป็น แหล่งจำหน่าย แหล่งผลิต หรืออยู่ใกล้ชิดผู้จำหน่าย ผู้ผลิตทำให้มีโอกาสในการใช้สารเสพติดและยาเสพติดมากกว่าคนปกติทั่วไป

2. อยู่ใกล้ชิดกับผู้เสพสิ่งเสพติด อาจเกิดจากการที่มีพ่อแม่ พี่น้อง เพื่อน หรือคนรักที่เสพสารเสพติด ซึ่งจะทำให้ผู้นั้นได้เห็นพฤติกรรมและวิธีใช้สารเสพติดไปด้วยหรืออาจได้รับการชักชวนจากบุคคลใกล้ชิดจนทำให้เกิดพฤติกรรมการเลียนแบบและเห็นว่าเป็นสิ่งที่น่าลองหรืออาจเสพเพราะต้องการที่จะได้รับการยอมรับจากกลุ่มคนหรือบุคคลที่ใกล้ชิดนั้น

3. การประชดชีวิต เพราะมีความผิดหวังในชีวิตตนเอง ผิดหวังในชีวิตครอบครัวหรือผิดหวังต่อการใช้ชีวิตในสังคมส่งผลให้ขาดความยั้งคิด ไตร่ตรอง จึงใช้สารเสพติดประชดตนเองหรือคนอื่น

4. การอยากรู้อยากลอง ซึ่งการอยากรู้อยากลองนับว่าเป็นนิสัยของคนปกติทั่วไปของมนุษย์โดยไม่คำนึงถึงผลกระทบที่เกิดขึ้นจากการใช้สารเสพติดนั้นๆซึ่งเมื่อลองแล้วมีความรู้สึกที่ดีเนื่องจากฤทธิ์ของสารเสพติดจึงทำให้มีความต้องการที่จะใช้สารเสพติดนั้นอีกและใช้ในปริมาณที่เพิ่มขึ้นเรื่อย ๆ

5. ความคึกคะนอง โดยเฉพาะในวัยรุ่นมักมีนิสัยที่ชอบแสดงความเก่งกล้าของตนในกลุ่มเพื่อนและมองว่าการใช้สารเสพติดเป็นเรื่องสนุกสนาน น่าตื่นเต้นทำให้เป็นที่ยอมรับในกลุ่มเพื่อน ๆ ว่าตนนั้นเก่งโดยมิได้คำนึงว่าอาจส่งผลให้ตนติดสารเสพติดในที่สุด

6. เกิดจากการเจ็บป่วยทางกาย เจ็บป่วยทางจิต หรืออาจเกิดจากการปฏิบัติไม่ถูกต้องในการใช้ยา

7. การได้รับข้อมูลหรือความเชื่อที่ผิดเกี่ยวกับการใช้สารเสพติด การเสพยาไอซ์ทำให้ผอม หุ่นดี และผิวขาว หรือการเสพยาบ้าจะทำให้สมรรถภาพทางเพศดีขึ้น (ทำให้มีเซ็กซ์ได้นานขึ้น)

การบำบัดฟื้นฟูผู้ติดยาเสพติด

วิชัย โปษยะจินดา (2552) ได้สรุปหลักการบำบัดรักษาผู้ติดสารเสพติด (Principles of Drug Dependence Treatment) ที่มีประสิทธิภาพไว้ 13 หลักการดังนี้

1. ไม่มีการบำบัดรักษาใดอย่างเดียวที่เหมาะกับทุกคน จึงต้องมีการปรับสภาพแวดล้อม มาตรการและบริการบำบัดให้เข้ากับปัญหา และความต้องการของผู้ป่วยแต่ละคน

2. ต้องมีความพร้อมที่จะให้บริการบำบัดรักษาอยู่เสมอ

3. การบำบัดที่ดีช่วยแก้ไขปัญหาที่เป็นความจำเป็นในชีวิตหลายอย่างของผู้เข้ารับการบำบัดไม่ใช่แค่เรื่องยาเสพติด

4. แผนการบำบัดรักษาของผู้เข้ารับการบำบัดแต่ละคน ต้องได้รับการประเมินอย่างต่อเนื่องและอาจปรับปรุงตามความจำเป็น

5. การอยู่รับการบำบัดเป็นเวลานานพอเป็นสิ่งสำคัญของการบำบัดที่ดี

6. การให้คำปรึกษาและพฤติกรรมบำบัดแบบต่าง ๆ เป็นองค์ประกอบสำคัญของการบำบัดยาเสพติดที่ดี ผู้ป่วยต้องมีแรงจูงใจ มีทักษะในการปฏิเสธการเสพยา และพัฒนาความสามารถในการแก้ปัญหา การปรับเปลี่ยนพฤติกรรม ตลอดจนการสร้างความสัมพันธ์ระหว่างบุคคล และความสามารถของบุคคลที่จะเป็นคนดี

7. การให้ยาบำบัดรักษาเป็นองค์ประกอบสำคัญสำหรับผู้ป่วยหลายราย

8. ผู้ป่วยยาเสพติดที่มีความผิดปกติทางจิตเกิดร่วม ควรได้รับการบำบัดรักษาทั้งสองปัญหา ด้วยวิธีบูรณาการ

9. การถอนพิษยาเป็นเพียงขั้นตอนแรกของการบำบัดรักษาการเสพติด และไม่สามารถเปลี่ยนแปลงการเสพติดในระยะยาวได้

10. การบำบัดรักษาไม่จำเป็นต้องเป็นแบบสมัครใจเท่านั้นถึงจะได้ผล แรงจูงใจที่ดีจะช่วยให้การบำบัดประสบความสำเร็จ

11. การเสพยาระหว่างบำบัดอาจเกิดขึ้น จึงต้องมีการตรวจสอบอย่างต่อเนื่อง

12. ในการบำบัดรักษา ควรมีการประเมินการติดเชื้อเอชไอวี/เอดส์ และโรคติดเชื้ออื่น ๆ และการให้คำปรึกษา เพื่อช่วยให้ผู้ป่วยปรับหรือเปลี่ยนแปลงพฤติกรรม เพื่อไม่ให้ตัวเขาหรือผู้อื่นเสี่ยงต่อการติดเชื้ออีก

13. การบำบัดรักษาการเสพติดเป็นกระบวนการระยะยาว และอาจต้องบำบัดหลายครั้ง คล้ายกับโรคเรื้อรังอื่น ๆ การกลับไปเสพอาจเกิดได้ทั้งระหว่างหรือภายหลังการบำบัดจนเลิกได้นานแล้ว ผู้เสพอาจต้องรับการบำบัดระยะยาวและหลายครั้ง การเข้าร่วมกิจกรรมในโปรแกรมการเสริมกำลังใจจะเป็นประโยชน์ในการคงไว้ซึ่งภาวะปลอดยาเสพติด

แนวคิดในการดำเนินงานป้องกันและแก้ไขปัญหายาเสพติด

แนวคิดในการดำเนินงานป้องกันและแก้ไขปัญหายาเสพติด มีรายละเอียดดังนี้ (เจริญ แฉกพิมาย และปนัดดา ศรีธนสาร, 2555)

1. การป้องกันตนเอง เริ่มจากการมีระเบียบวินัยในตนเองขยันหมั่นเพียรทำตัวเป็นแบบอย่างที่ดี ใช้เวลาว่างให้เกิดประโยชน์เลือกคบเพื่อนที่ดี ไม่มั่วสุมในอบายมุขและสิ่งเสพติดและไม่ใช้ยาโดยมิได้รับคำแนะนำจากแพทย์รวมทั้งอย่าทดลองเสพยาเสพติดทุกชนิดโดยเด็ดขาด

2. การป้องกันครอบครัว เริ่มจากการสร้างความสัมพันธ์อันดีต่อกันระหว่างสมาชิกในครอบครัว แบ่งเบาภาระหน้าที่แก่กันและกัน ภายในบ้านมีความรักใคร่กลมเกลียว และมีความเข้าใจกัน ช่วยเหลือซึ่งกันและกัน เมื่อมีปัญหาช่วยสอดส่องดูแลสมาชิกในครอบครัวอย่าให้เกี่ยวข้องกับยาเสพติด คอยอบรมตักเตือนสมาชิกในครอบครัวให้รู้ถึงโทษและภัยของยาเสพติด หากมีสมาชิกที่เสพติดสารเสพติดในครอบครัวควรรีบให้เข้ารับการรักษาอย่าปล่อยทิ้งไว้นาน ควรรีบดำเนินการรักษาโดยเร็วที่สุดเพื่อประโยชน์ในการรักษา

3. การป้องกันชุมชน ช่วยชี้แจงให้เพื่อนบ้านเข้าใจและเข้าถึงโทษและภัยของยาเสพติด เพื่อมิให้เพื่อนบ้านที่รู้เท่าไม่ถึงการณ์ต้องถูกหลอกลวง และหากพบว่าเพื่อนบ้านติดยาเสพติด จงช่วยแนะนำให้ไปรักษาตัวที่โรงพยาบาลภายในชุมชน หรือคนภายนอกชุมชนมีพฤติกรรมเกี่ยวข้องกับยาเสพติด โดยอาจใช้มาตราการตักเตือน การกดดันทางสังคมหรือแจ้งเจ้าหน้าที่ตำรวจ คณะกรรมการหมู่บ้าน และชุมชน

4. การป้องกันสังคม โดยให้ความร่วมมือกับทางราชการในการเป็นหูเป็นตา ช่วยสอดส่องเฝ้าระวังปัญหา เมื่อทราบว่าสถานที่ใดเป็นแหล่งแพร่ระบาดยาเสพติดมีกิจกรรมใดที่เป็นปัจจัยเสี่ยงที่จะชักนำให้เด็กและเยาวชนเข้าไปยุ่งเกี่ยว หรือมีบุคคลใดมีพฤติกรรมน่าจะเกี่ยวข้องกับการนำยาเสพติดมาแพร่ระบาด โปรดแจ้งเบาะแสให้เจ้าหน้าที่ตำรวจทุกแห่งทุกท้องที่ทราบ

หลักการของการบำบัดรักษาโดยมีส่วนร่วมของชุมชน

การบำบัดรักษาโดยมีส่วนร่วมของชุมชน หมายถึง รูปแบบการรักษาในเชิงบูรณาการโดยเฉพาะต่อผู้ใช้ยาเสพติดและติดยาในชุมชน เพื่อให้เกิดการรักษาอย่างต่อเนื่อง ตั้งแต่การรักษาในระยะเริ่มต้น ถึงการรักษาแบบการถอนพิษยาและสร้างความเสถียรภาพจนถึงการติดตามผลการรักษาและการคืนผู้ป่วยสู่สังคม รวมถึงการบำบัดด้วยยาอย่างต่อเนื่อง โดยเกี่ยวข้องถึงการประสานงานร่วมกับหลายหน่วยงานที่ให้บริการทางด้านสุขภาพ สังคม และการบริการอื่นๆ จากบุคคลที่ไม่ใช่ผู้เชี่ยวชาญ เพื่อให้เข้าใจถึงความต้องการของผู้ป่วย ตลอดจนสนับสนุนครอบครัวและชุมชนของผู้ป่วยอย่างเข็มแข็งในการแก้ปัญหายาเสพติดและเครื่องดื่มแอลกอฮอล์ เพื่อให้เกิดผลสัมฤทธิ์ในระยะยาว (United Natons Office on Drugs and Crime, 2014)

การบำบัดรักษาโดยมีส่วนร่วมของชุมชนมีหลักการดังนี้ (United Natons Office on Drugs and Crime, 2014)

หลักการที่ 1: การให้บริการรักษาได้ง่ายๆ และการเข้าถึงการบริการรักษา การให้บริการรักษาจะต้องหาได้ง่ายๆ สามารถเข้าถึงได้ ราคาไม่แพง

หลักการที่ 2: การตรวจคัดกรอง การประเมิน การวินิจฉัย และการวางแผนการรักษา เป็นพื้นฐานการรักษารายบุคคล ที่จะทำให้เข้าใจถึงความต้องการของผู้ป่วยแต่ละคน และสามารถช่วยผู้ป่วยให้มีส่วนร่วมในการรักษาได้

หลักการที่ 3: การรักษาผู้ติดยาเสพติดจากแหล่งฐานข้อมูลที่ได้รับแจ้ง ควรศึกษาข้อมูลแนวทางการปฏิบัติที่ได้รับการพิสูจน์โดยการศึกษาและความรู้ทางวิทยาศาสตร์ในการรักษาผู้ติดยาเสพติดอย่างละเอียด เพื่อเลือกวิธีการรักษา

หลักการที่ 4: การรักษาผู้ติดยาเสพติด สิทธิมนุษยชน และศักดิ์ศรีของผู้ป่วย กระบวนการรักษาแก้ไขปัญหาติดยาเสพติด โดยค่อยๆ แทรกแซงให้คำปรึกษาให้กับผู้ติดยาเสพติด ควรสอดคล้องกับข้อปฏิบัติตามพันธกรณีสิทธิมนุษยชน ให้ผู้ติดยาเสพติดสมัครใจเข้ารับการรักษา และรักษาให้ผู้ป่วยเข้าถึงมาตรฐานสุขภาพสูงสุดที่ร่างกายจิตใจตนจะรับได้

หลักการที่ 5: กลุ่มเป้าหมายกลุ่มย่อย หลายกลุ่มภายในกลุ่มประชากรขนาดที่ติดยาต้องการได้รับการดูแลเป็นพิเศษ เช่น กลุ่มวัยรุ่น กลุ่มผู้หญิง (รวมทั้งหญิงตั้งครรภ์) บุคคลที่มีโรคที่เป็นการวินิจฉัยร่วม (อาจจะทางจิตหรือร่างกาย) กรรมกร ชนกลุ่มน้อยที่มีเชื้อชาติหรือประเพณีและวัฒนธรรมที่ต่างไปจากคนกลุ่มใหญ่ และผู้คนไร้ที่อยู่อาศัย

หลักการที่ 6: การรักษาพฤติกรรมการติดยาเสพติดและระบบความยุติธรรมทางอาญา พฤติกรรมการติดยาเสพติด ควรจะถือเป็นสถานะสุขภาพ และผู้ป่วยที่ติดยาแต่ละคนควรจะได้การรักษาในระบบการดูแลสุขภาพ แทนการนำไปดำเนินคดีตามระบบยุติธรรมทางอาญา โดยใช้การบำบัดรักษาโดยมีส่วนร่วมของชุมชนเป็นทางเลือกแทนการจำคุก เมื่อเป็นไปได้

หลักการที่ 7: การมีส่วนเกี่ยวข้องของชุมชน การมีส่วนร่วม และการปฐมนิเทศผู้ป่วย การตอบสนองโดยการบำบัดรักษาโดยมีส่วนร่วมของชุมชนในเรื่องการติดยาเสพติดและเครื่องดื่มแอลกอฮอล์

สามารถส่งเสริมให้ชุมชนมีการเปลี่ยนแปลง รวมทั้งการมีส่วนร่วมของผู้มีส่วนได้เสียในท้องถิ่นที่เข้มแข็งมากขึ้น ตลอดจนการสนับสนุนการระดมทุนแบบชุมชน

หลักการที่ 8: การให้บริการการรักษาผู้ติดยา โดยวิธีปรับปรุงคุณภาพของการบริบาลผู้ป่วยอย่างเป็นระบบ เป็นสิ่งสำคัญที่การให้บริการการรักษาจะต้องมีการกำหนดข้อปฏิบัติที่ชัดเจน เช่น นโยบาย วิธีการรักษา โครงการ กระบวนการ คำจำกัดความของบทบาทหน้าที่ของผู้ประกอบวิชาชีพ การกำกับดูแลและแหล่งการเงิน

หลักการที่ 9: ระบบการรักษา: การพัฒนานโยบาย การวางแผนเชิงกลยุทธ์ และการประสานการบริการ แนวทางปฏิบัติในเชิงนโนบายจากผู้บริหารระดับสูงอย่างเป็นระบบ ในเรื่องการใช้สารเสพติดและต่อบุคคลที่ต้องการการรักษา จะมีประโยชน์สูงสุด แนวทางนี้รวมถึงขั้นตอนการดำเนินที่สมเหตุสมผลตามลำดับขั้นตอน ที่สามารถแสดงความเชื่อมโยงระหว่างนโยบายกับการประเมินความต้องการ การวางแผนการรักษา วิธีการดำเนินงาน และการติดตามและการประเมินผล

วิธีดำเนินการวิจัย

การพัฒนารูปแบบการบำบัดผู้ติดยาเสพติดวัยทำงานภายใต้การมีส่วนร่วมของชุมชนและภาคีเครือข่ายในพื้นที่ บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา ครั้งนี้ ผู้วิจัยได้ยึดแนวทางวิจัยเชิงคุณภาพ (Qualitative Research) เก็บรวบรวมข้อมูลจากการศึกษา แนวคิดทฤษฎี นโยบายของรัฐบาล บทความทางวิชาการ และงานวิจัยที่เกี่ยวข้องและการสัมภาษณ์ ผู้ที่มีส่วนเกี่ยวข้องกับการดำเนินงานบำบัดผู้ติดยาเสพติดในชุมชน

ประชากรและกลุ่มตัวอย่าง

1. ประชากร (Population) ประชากรที่ใช้ในการวิจัย คือ ผู้ที่มีส่วนร่วมในการดำเนินงานบำบัดยาเสพติดในชุมชน ประกอบด้วย กลุ่มองค์กรในชุมชน และภาคีเครือข่ายในพื้นที่ดำเนินการบ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา

2. กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ ใช้วิธีการเลือกแบบเฉพาะเจาะจง (Purposive Sampling) ประกอบด้วย

- บุคลากรสาธารณสุขที่เกี่ยวข้องที่ดำเนินงานในพื้นที่ส่งเสริมสุขภาพในระดับอำเภอ จำนวน 2 คน
- เจ้าหน้าที่ตำรวจที่เกี่ยวข้องในการดำเนินงานกิจกรรมค่ายบำบัด จำนวน 2 คน
- ผู้นำชุมชนกำนัน/ผู้ใหญ่บ้าน จำนวน 3 คน
- ผู้นำท้องถิ่น จำนวน 1 คน
- ผู้ปกครองหรือญาติผู้เข้าบำบัด จำนวน 5 คน
- คณะกรรมการดำเนินงานชุมชนบำบัด จำนวน 5 คน
- ผู้ติดยาเสพติด จำนวน 16 คน

เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยเป็นแบบสัมภาษณ์แบบมีโครงสร้างสำหรับเก็บข้อมูล โดยใช้วิธีการสัมภาษณ์เชิงลึกรายบุคคล (In – Depth Interview) เพื่อสอบถามสถานการณ์ ปัญหาการดำเนินงานการมีส่วนร่วมและแนวทางในการแก้ไขปัญหายาเสพติด ผู้วิจัยกำหนดประเด็นหลักของคำถามในการทำวิจัย โดยแบบสัมภาษณ์แบ่งออกเป็น 3 ตอน ดังนี้

ตอนที่ 1 ข้อมูลทั่วไปของผู้เข้ารับการสัมภาษณ์

ตอนที่ 2 สภาพปัญหายาเสพติด และแนวทางแก้ไขปัญหายาเสพติดของผู้เข้ารับการบำบัด

ตอนที่ 3 รูปแบบและแนวทางการมีส่วนร่วมของครอบครัวชุมชนและภาคีเครือข่าย ในการป้องกันและแก้ไขปัญหายาเสพติด ในกลุ่มวัยทำงานในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา

การเก็บรวบรวมข้อมูล

1. ข้อมูลปฐมภูมิ (Primary Data) เป็นข้อมูลที่ได้จากการสัมภาษณ์เชิงลึก โดยสัมภาษณ์ตัวแทนกลุ่มเป้าหมายที่กำหนดไว้ ได้แก่ บุคลากรสาธารณสุขที่เกี่ยวข้องที่ดำเนินงานในพื้นที่ส่งเสริมสุขภาพในระดับอำเภอ เจ้าหน้าที่ตำรวจที่เกี่ยวข้องในการดำเนินงานกิจกรรมค่ายบำบัดผู้นำชุมชนกำนัน/ผู้ใหญ่บ้าน ผู้นำท้องถิ่น ผู้ปกครองหรือญาติผู้เข้าบำบัด คณะกรรมการดำเนินงานชุมชนบำบัด และผู้ติดยาเสพติด

2. ข้อมูลทุติยภูมิ (Secondary Data) เป็นข้อมูลที่ได้จากการศึกษารวบรวมเอกสาร ทบทวนข้อมูลทฤษฎีที่เกี่ยวข้อง ตลอดจนงานวิจัยที่เกี่ยวข้อง เพื่อนำมาใช้อ้างอิงผลการวิเคราะห์ข้อมูล

การวิเคราะห์ข้อมูล

การวิเคราะห์ข้อมูลเมื่อผู้วิจัยเก็บรวบรวมข้อมูลภาคสนามจากแบบสัมภาษณ์แล้ว นำข้อมูลทั้งหมดมาวิเคราะห์เนื้อหา (Content Analysis) ใช้วิธีการ สรุปรวบรวมความคิดเห็น แล้วนำเสนอตามประเด็นข้อคำถาม เพื่อพัฒนารูปแบบการบำบัดผู้ติดยาเสพติดภายใต้การมีส่วนร่วมของชุมชนและ ภาคีเครือข่ายในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา

ผลการวิจัย

จากการศึกษาและเก็บข้อมูลการศึกษารูปแบบการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติดภายใต้การมีส่วนร่วมของชุมชน และภาคีเครือข่าย สามารถสรุปผลรูปแบบการมีส่วนร่วมของครอบครัว ชุมชน และภาคีเครือข่ายในการป้องกันและแก้ไขปัญหายาเสพติด ในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา ได้ดังนี้

ขั้นตอนการสร้างการมีส่วนร่วมของเครือข่ายในการแก้ไขปัญหายาเสพติด ดังนี้

1) มีการร่วมกันรับรู้ปัญหา ร่วมคิด ตัดสินใจโดยการสนทนากลุ่ม

2) ร่วมกันวางแผนกิจกรรมตามแนวทางการดำเนินงานในแต่ละขั้นตอน กำหนดนโยบายการทำงาน วัตถุประสงค์ของโครงการ การดำเนินงานทำแผนร่วมกับชาวบ้าน

3) การร่วมการปฏิบัติที่ได้วางแผน

4) มีส่วนร่วมในการรับผลประโยชน์ เมื่อการแก้ไขปัญหายาเสพติดสำเร็จและยั่งยืน ผลประโยชน์ตกกับหมู่บ้าน คือ มีความสงบสุข มีรายได้ดี ไม่มีอาชญากรรมในหมู่บ้าน ประชาชนกินดีอยู่ดีสงบสุขปลอดอบายมุข

5) ร่วมกันประเมินผลจากการดำเนินกิจกรรม

บทบาทเครือข่ายในการแก้ไขปัญหายาเสพติด

บทบาทเครือข่ายในการแก้ไขปัญหายาเสพติดในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา มีบทบาทในการดำเนินการ ดังนี้

1. เจ้าหน้าที่สาธารณสุข ช่วยในการตรวจคัดกรอง แนะนำให้ความรู้ ประเมินผล ตรวจปัสสาวะลงพื้นที่ นัดติดตาม ชี้แจงการบำบัด ให้ความรู้เรื่องภาวะจิตใจ ให้คติข้อคิด ร่วม x-ray ดูแลเอาใจใส่การตรวจเบื้องต้นเพื่อประเมินผู้ติดยาเสพติด และดูแลสุขภาพของผู้บำบัด

2. เจ้าหน้าที่ตำรวจ คัดกรอง ติดตาม บำบัด ตรวจสอบ ชี้แจงทำความเข้าใจ ควบคุม ประเมิน เตรียมอุปกรณ์ปราบปรามแก้ปัญหาสาเหตุ

3. ผู้นำท้องถิ่น ร่วมกิจกรรม สนับสนุนงบประมาณ อาคาร อุปกรณ์ หาอาชีพ พูดคุยทำความเข้าใจ

4. ผู้นำชุมชน เตรียมสถานการณ์ ประสานหน่วยงาน สนับสนุนงบประมาณ จัดเตรียมสถานที่ อาคาร ดูแลผู้บำบัด วางแผนแก้ปัญหาวงกว้าง สนับสนุนส่งเสริมต่อยอดอาชีพ สนับสนุน น้ำ อาหาร อาหารแห้ง ดูแลสิ่งแวดล้อม

5. ผู้ปกครอง/ญาติ ร่วมกิจกรรม สนับสนุน ร่วมพูดคุย ให้กำลังใจ ทำความเข้าใจ เรียนรู้พร้อมกับผู้บำบัด วางแผนแก้ปัญหาพร้อมกัน คอยสอดส่องดูแล ตักเตือน

6. คณะกรรมการชุมชนบำบัด ร่วมประชุมเสนอแนะข้อคิดเห็นวางแผนปรับเปลี่ยนกิจกรรมตั้งกติกา ให้ความรู้ ทำความเข้าใจครอบครัวผู้ปกครอง สนับสนุนงบประมาณสิ่งของเครื่องใช้ ประสานงานติดตามผู้บำบัด ติดตามพฤติกรรมผู้บำบัด ประสานงานเจ้าหน้าที่ เรียนรู้นอกสถานที่ จัดหางาน และติดตามโดยตรวจสารเสพติด

รูปแบบการป้องกันและแก้ไขปัญหายาเสพติด

รูปแบบการป้องกันและแก้ไขปัญหายาเสพติดในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา โดยใช้รูปแบบการมีส่วนร่วมของครอบครัว ชุมชนและภาคีเครือข่าย ในการป้องกันและแก้ไขปัญหายาเสพติด มี 4 ขั้นตอน ได้แก่ การส่งเสริมป้องกัน การคัดกรอง การบำบัดรักษาและฟื้นฟูสมรรถภาพ และการติดตามดูแลช่วยเหลือดังนี้ (ภาพที่ 1)

การส่งเสริมป้องกัน

- ชุมชน และคณะกรรมการชุมชน : ทำประชาคมเพื่อหากฎกติกาชุมชน
- รพ.คลองหอยโข่ง : สนับสนุนองค์ความรู้และแนวทางในการส่งเสริมป้องกัน
- องค์กรส่วนท้องถิ่น มูลนิธิหรือองค์กรเอกชนให้การสนับสนุนทั้ง คน เงิน วัสดุ อุปกรณ์ในการดำเนินกิจกรรม
- กำหนดกิจกรรม ระยะเวลา สถานที่ดำเนินการและเป้าหมายความสำเร็จ

การติดตามดูแลช่วยเหลือ

-สำรวจว่าสิ่งชุมชนดำเนินการได้ผลลัพธ์เป็นอย่างไร โดยผู้นำชุมชน จิตอาสา บุคลากรสุขภาพ หรือ อาสาสมัครสาธารณสุข หรือครอบครัวพี่เลี้ยง คอยสอดส่องดูแล ติดตาม สอบถามทุกข์สุข ติดตามสังเกตพฤติกรรม พูดคุยกับผู้ป่วยและครอบครัวทั้งในระหว่างการบำบัดรักษาในชุมชน และติดตามหลังการบำบัดรักษาและฟื้นฟูเพื่อให้ความช่วยเหลืออย่างเหมาะสม

การคัดกรอง

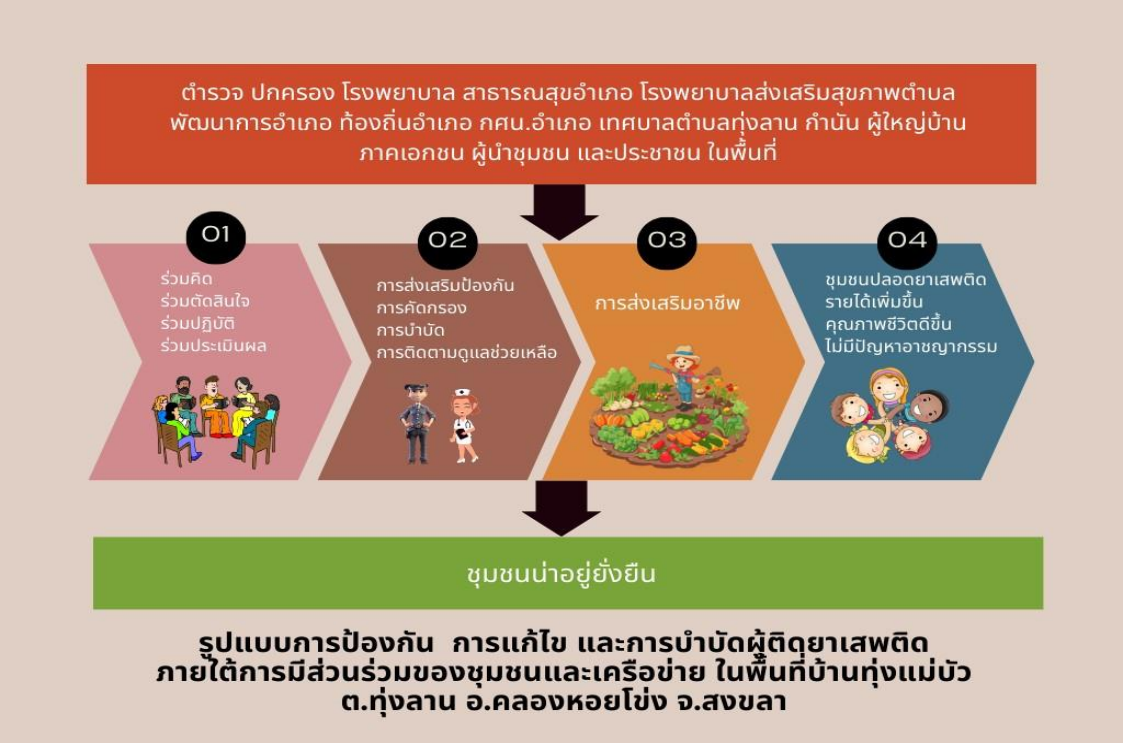
-ผู้นำชุมชนและคณะกรรมการ มีมติร่วมกันว่า พื้นที่นี้มีปัญหายาและสารเสพติดเป็นปัญหาสำคัญที่ชุมชนควรได้รับการแก้ไข
-รพ.คลองหอยโข่ง สนับสนุนองค์ความรู้ในเรื่องการคัดกรองผู้ใช้ยาและ สารเสพติด
-คณะกรรมการกำหนดกิจกรรม ระยะเวลา และสถานที่คัดกรองให้เป็นรูปธรรมชัดเจน
-องค์กรส่วนท้องถิ่น และภาคีเครือข่ายต่างๆ สนับสนุนและช่วยเหลือชุมชนในการดำเนินการ
-กำหนดเป้าหมายความสำเร็จในการดำเนินการ โดยผู้เสพ ผู้ติดยาเสพติดในชุมชนได้รับการช่วยเหลืออย่างทันท่วงที และชุมชนสามารถคัดกรองผู้เสพผู้ติดยาเสพติดได้ถูกต้องร้อยละ 100

การบำบัดรักษาและฟื้นฟูสมรรถภาพ

-รพ.คลองหอยโข่ง ส่งบุคลากรมาช่วยให้ความรู้เกี่ยวกับแนวทางการบำบัดรักษาและฟื้นฟูผู้ป่วยยาและสารเสพติดแก่คณะกรรมการ หรือจิตอาสาในชุมชน
-หน่วยงานองค์กรส่วนท้องถิ่นมีนโยบายในการสนับสนุนกิจกรรมการบำบัดรักษาและฟื้นฟูสมรรถภาพในรูปแบบต่างๆ โดยอาจจะสนับสนุนทั้ง คน เงิน ของที่จำเป็น
-กำหนดกิจกรรมการบำบัดรักษาและฟื้นฟูโดยแบ่งกลุ่มผู้ใช้ยาและสารเสพติดตามระดับความรุนแรงในการใช้ยาและสารเสพติดเป็น 3 กลุ่ม คือ กลุ่มผู้ใช้ กลุ่มผู้เสพ และกลุ่มผู้ติด
-มีการกำหนดเป้าหมายของความสำเร็จที่ชัดเจน ได้แก่ ผู้เสพยาและสารเสพติดในชุมชนได้รับการบำบัดรักษาอย่างถูกต้องเหมาะสม และสามารถส่งต่อผู้ป่วยที่เกินศักยภาพ ไปยังสถานพยาบาลที่เหมาะสมได้ รูปแบบการบำบัดรักษาและฟื้นฟูโดยชุมชนมีส่วนร่วม เป้าหมาย 100%

ภาพที่ 1 ขั้นตอนการป้องกัน แก้ไข และบำบัดยาเสพติด

ทั้งนี้ ในการดำเนินการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติดในพื้นที่บ้านทุ่งแม่บัว ต.ทุ่งลาน อ.คลองหอยโข่ง จ.สงขลา มีรูปแบบในการดำเนินการดังนี้ (ภาพที่ 2)



ภาพที่ 2 รูปแบบการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติด ภายใต้การมีส่วนร่วมของชุมชนและเครือข่ายในพื้นที่บ้านทุ่งแม่บัว อ.คลองหอยโข่ง จ.สงขลา

สรุปผล

ชุมชนในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา เห็นความสำคัญของปัญหายาเสพติด และมีความต้องการแก้ไขปัญหายาเสพติด โดยบริบทพื้นที่บ้านทุ่งแม่บัวพบว่าชุมชนในพื้นที่ส่วนใหญ่มีอาชีพเกษตรกร รับจ้างตัดยางพารา ต้องออกไปตัดยางพาราในช่วงเวลาเช้ามืด จึงใช้ยาเสพติดเพื่อให้สามารถทำงานได้นานขึ้น มีการใช้สารเสพติดมากในกลุ่มแรงงาน ทำให้คนในชุมชนไม่ยอมรับการปฏิสัมพันธ์ไม่เหมือนเดิมส่งผลเสียต่อสุขภาพ เกิดความขัดแย้ง มีปากมีเสียงกันในครอบครัว หลายครอบครัวมักมีปัญหาการเงิน ขาดความคล่องทางเศรษฐกิจ จึงหันไปพึ่งยาเสพติด มีการทำลายทรัพย์สินก่ออาชญากรรม ทำร้ายร่างกายคนในครอบครัว ทำร้ายร่างกายพ่อแม่ คนในชุมชนเกิดความหวาดกลัวไม่กล้าเดินไปไหนมาไหนในหมู่บ้าน ดังนั้นชุมชนในพื้นที่บ้านทุ่งแม่บัว จึงเข้าร่วมเครือข่ายเพื่อแก้ไขปัญหายาเสพติดร่วมกับภาครัฐ

ปัญหาที่เกิดตามมาจากปัญหายาเสพติดในชุมชนบ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา ได้แก่

1) ปัญหาด้านสาธารณสุข ร่างกายของผู้ที่เสพยาเสพติดทรุดโทรม อ่อนแอ เสียสุขภาพ มีผลต่อระบบสมองและประสาท

2) ปัญหาด้านสังคม ทำให้สังคมเสื่อมโทรม เนื่องจากผู้เสพจำนวนมาก ไม่ยอมทำงาน ไม่เรียนหนังสือ และอาจเกิดความขัดแย้งระหว่างกลุ่มผู้เสพยากับกลุ่มคนปกติ

3) ปัญหาด้านเศรษฐกิจ เนื่องจากสภาพเศรษฐกิจไม่ดี ส่งผลให้มีคนตกงาน ชุมชนขาดรายได้ ทำให้มีผู้ใช้ยาเสพติดเพื่อแก้ปัญหา และบางส่วนหันมาประกอบอาชีพจำหน่ายยาเสพติด

ทั้งนี้ในพื้นที่บ้านทุ่งแม่บัวได้มีการจัดโครงการชุมชนยั่งยืน บ้านทุ่งแม่บัว โดย สภ.คลองหอยโข่ง คัดเลือกหมู่บ้านทุ่งแม่บัว หมู่ที่ 2 ตำบลทุ่งลาน อำเภอคลองหอยโข่ง จังหวัดสงขลา เข้าร่วมโครงการฯ เนื่องจากหมู่บ้านทุ่งแม่บัวยังมีปัญหายาเสพติดระบาดในพื้นที่ มีผู้ที่ต้องได้รับการบำบัดรักษาในหมู่บ้านและต้องได้รับการแก้ไขปัญหายาเสพติดโดยเร่งด่วน ประกอบกับผู้นำชุมชน คนในหมู่บ้าน มีความต้องการให้หมู่บ้านปลอดยาเสพติด โดยมีความตั้งใจให้ความร่วมมือ ต้องการให้ชุมชนบ้านทุ่งแม่บัวเป็นชุมชนต้นแบบเรื่องการปลอดยาเสพติด และกระจายโครงการไปยังหมู่บ้านใกล้เคียงจนครอบคลุมทั้งอำเภอคลองหอยโข่ง ชุดปฏิบัติการชุมชนยั่งยืน สภ.คลองหอยโข่ง จึงได้ลงพื้นที่สืบสภาพชุมชน ประชาสัมพันธ์ สร้างความเข้าใจกับชุมชน และสร้างแกนนำ โดยการดำเนินการจะร่วมบูรณาการกับภาคีเครือข่ายทุกภาคส่วนในพื้นที่อำเภอคลองหอยโข่ง เช่น ตำรวจ ปกครอง โรงพยาบาล สาธารณสุขอำเภอ โรงพยาบาลส่งเสริมสุขภาพตำบล พัฒนาการอำเภอ ท้องถิ่นอำเภอ กศน.อำเภอ เทศบาลตำบลทุ่งลาน กำนัน ผู้ใหญ่บ้าน ภาคเอกชน ผู้นำชุมชน และประชาชนในพื้นที่ได้ร่วมกันทำประชาคม โดยทุกภาคส่วนมีความมุ่งมั่นตั้งใจให้ชุมชนบ้านทุ่งแม่บัวปลอดยาเสพติด ทำให้ประชาชนในพื้นที่ และนอกพื้นที่เกิดความเชื่อมั่น และให้ความร่วมมือ ช่วยเหลือ และสนับสนุนทำให้ทุกภารกิจสำเร็จลุล่วงเป็นอย่างดี โดยรูปแบบและแนวทางการมีส่วนร่วมของครอบครัว ชุมชนและภาคีเครือข่าย ในการป้องกันและแก้ไขปัญหายาเสพติดในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา

การป้องกันและแก้ไขปัญหายาเสพติดในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา โดยใช้รูปแบบการมีส่วนร่วมของครอบครัว ชุมชนและภาคีเครือข่าย ในการป้องกันและแก้ไขปัญหายาเสพติด มี 4 ขั้นตอน ได้แก่ การส่งเสริมป้องกัน การคัดกรอง การบำบัดรักษาและฟื้นฟูสมรรถภาพและการติดตามดูแลช่วยเหลือ ทำให้ปัญหายาเสพติดได้รับการแก้ไข ซึ่งจุดแข็งที่ทำให้ปัญหายาเสพติดได้รับการแก้ไข ได้แก่

1. ชุมชนบ้านทุ่งแม่บัวมีความสามัคคี และให้ความร่วมมือเป็นอย่างดี
2. ภาคีเครือข่ายเห็นความสำคัญของโครงการชุมชนยั่งยืน ร่วมกันดำเนินงานอย่างเต็มความสามารถโดยมีเป้าหมายเดียวกันเพื่อให้ยาเสพติดหมดไปจากหมู่บ้าน/ชุมชน
3. ผกก.สภ.คลองหอยโข่ง และชุดปฏิบัติการชุมชนยั่งยืน มุ่งมั่นตั้งใจปฏิบัติหน้าที่สุดความสามารถ

อภิปรายผล

การแก้ไขปัญหายาเสพติดในพื้นที่บ้านทุ่งแม่บัว ตำบลทุ่งลาน อำเภอคลองหอยโข่ง จังหวัดสงขลา เป็นการบำบัดรักษายาเสพติดโดยชุมชนมีส่วนร่วม มีการบูรณาการการดำเนินงานจากภาคส่วนต่าง ๆ เพื่อให้เกิดการรักษาอย่างต่อเนื่อง จนถึงการติดตามผลการรักษาและการคืนผู้ป่วยสู่สังคม สอดคล้องกับหลักการบำบัดรักษาโดยมีส่วนร่วมของชุมชนของ United Nations Office on Drugs and Crime (2014) อีกทั้งการดำเนินงานป้องกันและแก้ไขปัญหายาเสพติด ได้ใช้แนวคิดในการดำเนินงานป้องกันและแก้ไข ปัญหายาเสพติด มีการป้องกันตนเอง การป้องกันครอบครัว การป้องกันชุมชน และการป้องกันสังคม (เจริญ แฉกพิมาย และปนัดดา ศรีธนสาร, 2555)

นอกจากนี้ ข้อค้นพบจากการศึกษาพบว่า การแก้ไขปัญหายาเสพติดเกิดจากการระเบิดจากข้างในชุมชน การหนุนเสริมจากหน่วยภายนอกชุมชน และการประสานความร่วมมือจากทั้งภายในและภายนอกชุมชน สามารถสรุปได้ว่าปัจจัยความสำเร็จของรูปแบบในการป้องกัน การแก้ไข และการบำบัดผู้ติดยาเสพติดในพื้นที่บ้านทุ่งแม่บัว มีดังนี้

1.ชุมชนให้ความร่วมมืออย่างเต็มที่ในการป้องกันและแก้ไขปัญหายาเสพติดในพื้นที่

2. หน่วยงานในพื้นที่ มีการบูรณาการการทำงานร่วมกัน ทำให้การดำเนินงานมีความต่อเนื่องคล่องตัว และสามารถแก้ปัญหาได้อย่างเป็นรูปธรรม

3. มีการติดตามและประเมินผลการดำเนินงานอย่างต่อเนื่อง ส่งผลให้ปัญหาที่เกิดขึ้นระหว่างการดำเนินการได้รับการแก้ไข และปรับปรุงให้ดียิ่งขึ้น

4.ผู้ที่ได้รับการบำบัดการติดยาเสพติด มีอาชีพก่อให้เกิดรายได้ เนื่องจากมีการส่งเสริมอาชีพ ทำให้ไม่กลับมาเสพยาเสพติดอีก

5. มีหน่วยงานเฝ้าระวัง (ม้าเร็ว) ที่คอยตรวจตราและดูแล ทำให้ชุมชนปลอดยาเสพติด

6. ช่องทางในการติดต่อสื่อสารของเครือข่าย โดยใช้ไลน์กลุ่มชุมชนยั่งยืนบ้านทุ่งแม่บัว ช่วยให้การติดต่อสื่อสารการดำเนินงานมีประสิทธิภาพ

7. มีการตรวจเช็คสุขภาพให้ผู้ที่ได้รับการบำบัดอย่างต่อเนื่อง ช่วยให้สุขภาพดีขึ้น

ข้อเสนอแนะ

เพื่อให้การแก้ไขปัญหายาเสพติดในพื้นที่บ้านทุ่งแม่บัว อำเภอคลองหอยโข่ง จังหวัดสงขลา ควรมีการบรรจุแผนงาน โครงการ และจัดสรรงบประมาณให้มีการดำเนินงานอย่างต่อเนื่อง ขยายผลการดำเนินงานไปยังพื้นที่อื่น ๆ เพื่อให้สามารถแก้ปัญหายาเสพติดได้อย่างยั่งยืนต่อไป

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ถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา

Knowledge Capturing of Organing Rice Farming in the Process of Participatory Guarantee System (PGS) in Songkhla Province

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษา 1) การทำนาอินทรีย์ และความคิดเห็นของเกษตรกรต่อกระบวนการรับรองนาข้าวอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา 2) ถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา เลือกผู้ให้ข้อมูลเป็นแบบเจาะจง 13 ราย เครื่องมือการวิจัยเป็นแบบสัมภาษณ์แบบมีโครงสร้าง ผลการศึกษาพบว่า 1) เกษตรกรทำนาอินทรีย์มีพื้นที่เฉลี่ย 17 ไร่ นิยมปลูกข้าวนาปี มีการทำแนวกันชนป้องกันสิ่งปนเปื้อนจากมลพิษและสารเคมีสังเคราะห์ ความคิดเห็นของเกษตรกรต่อกระบวนการรับรองนาข้าวอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลาด้านความเชื่อมั่นโดยรวมอยู่ในระดับมาก ด้านความโปร่งใสโดยรวมอยู่ในระดับมากและด้านการมีส่วนร่วมอยู่ในระดับปานกลาง 2) ถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา พบว่า ความรู้ในการทำนาอินทรีย์ภายใต้มาตรฐานการรับรองแบบมีส่วนร่วม PGS เกษตรกรต้องมีความรู้ในการทำนาอินทรีย์และกระบวนการรับรองมาตรฐานการมีส่วนร่วม PGS คณะกรรมการตรวจเยี่ยมแปลง คณะกรรมการกลั่นกรอง และคณะกรรมการพิจารณาผล ต้องมีความรู้และสร้างกระบวนการมีส่วนร่วมให้เกิดขึ้นจริงเป็นสำคัญ และผู้นำกลุ่มควรมีวิสัยทัศน์และกระบวนการมีส่วนร่วม และความโปร่งใส เพื่อสร้างความเชื่อมั่นให้กับผู้มีส่วนได้เสีย

คำสำคัญ: ถอดองค์ความรู้, การทำนาอินทรีย์, กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม

Abstract

The objectives of this research were to 1) observe the organic rice farming and farmers' perspectives toward the Participatory Guarantee System of organic rice in Songkhla province and 2) capture the knowledge of organic rice farming under the framework of the Participatory Guarantee System of organic rice in Songkhla province. Thirteen respondents were recruited through purposive sampling. The structured interview

was selected as the research tool. The Findings revealed that 1) the organic rice farmers have an average of 17 Rai of land called major rice, which they usually grow annually in mid-June, and harvest in February the next year. The rice field is established with an buffer zone to protect the field from pollutions and synthetic chemicals. Moreover, the perspective of the farmers toward the Participatory Guarantee System of organic rice in Songkhla province in terms of trust and transparency is relatively high while the participation is at a moderate level. 2) The knowledge capturing of the Participatory Guarantee System of organic rice in Songkhla province concluded that to conduct organic rice farming according to the PGS standard, the farmers must understand the principles of organic rice farming and the PGS to fulfill the requirements.

Keywords: Knowledge capturing, organic rice farming, Participatory Guarantee System: PGS of Organic Standard

บทนำ

การทำนาในปัจจุบันเน้นการทำนาเชิงพาณิชย์และใช้สารเคมีในการผลิต จากข้อมูลการนำเข้าปุ๋ยและยากำจัดศัตรูพืชของประเทศไทย ในปี พ.ศ. 2542 มูลค่า 23,607.4 ล้านบาท เพิ่มเป็น 53,112 ล้านบาท ในปี พ.ศ. 2565 (ศูนย์เทคโนโลยีสารสนเทศและการสื่อสาร กรมวิชาการเกษตร, 2565) แต่ผลผลิตข้าวกลับลดลง จากข้อมูลในปี พ.ศ. 2555 ค่าเฉลี่ยผลผลิตต่อพื้นที่ปลูก 463 กิโลกรัมต่อไร่ ลดเป็น 440 กิโลกรัมต่อไร่ ในปี พ.ศ. 2564 (สำนักงานเศรษฐกิจการเกษตร, 2564) เมื่อเกษตรกรซื้อสารเคมีมาใช้ แต่ราคาผลผลิตไม่ได้สูงขึ้น ทำให้เกษตรกรประสบปัญหาขาดทุน รัฐบาลจึงมุ่งส่งเสริมให้เกษตรกรผลิตสินค้าเกษตรอินทรีย์ ซึ่งแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 13 ได้ใช้หลักปรัชญาของเศรษฐกิจพอเพียงและการพัฒนาเศรษฐกิจชีวภาพ เศรษฐกิจหมุนเวียน มากำหนดทิศทาง โดยมีหลักการดำเนินงานเชื่อมโยงกับการทำเกษตรอินทรีย์ และแผนยุทธศาสตร์การพัฒนาเกษตรอินทรีย์แห่งชาติ พ.ศ. 2565-2569 ระบุว่า เกษตรอินทรีย์เป็นแนวทางการผลิตที่ให้ความสำคัญกับคุณภาพและความปลอดภัยของทั้งผู้ผลิต ผู้บริโภค รวมทั้งการอนุรักษ์ทรัพยากรธรรมชาติอย่างยั่งยืน (คณะกรรมการพัฒนาเกษตรอินทรีย์แห่งชาติ, 2560) ทำให้การขยายตัวของตลาดสินค้าเกษตรอินทรีย์เกิดขึ้นอย่างรวดเร็วจนเกิดการปลอมปนสินค้า (กรมการค้าภายใน กระทรวงพาณิชย์, 2560) อีกทั้งการรับรองมาตรฐานเกษตรอินทรีย์ต้องได้รับการรับรองระบบงานเกษตรอินทรีย์ จากสหพันธ์เกษตรอินทรีย์นานาชาติ (IFOAM) โดย International Organic Accreditation Service (IOAS) ทำหน้าที่ในการตรวจประเมินและรับรองระบบงาน ซึ่งมีความยุ่งยากและเสียค่าใช้จ่ายโดยรวมประมาณ 20,000 บาทต่อครั้งต่อปี ใบรับรองมีอายุ 1 ปี นับตั้งแต่วันที่ได้รับการรับรอง และการต่ออายุต้องมีการตรวจรับรองใหม่ตามดุลพินิจของคณะกรรมการตรวจรับรอง

(สำนักงานมาตรฐานเกษตรอินทรีย์, 2562) จึงไม่ดึงดูดใจให้เกษตรกรหันมาผลิตพืชอินทรีย์ แต่มาตรฐานเกษตรอินทรีย์ถือเป็นการสร้างความมั่นใจให้ผู้บริโภคและมีการยอมรับอย่างกว้างขวาง ส่วนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมโดยชุมชนรับรอง (Participatory Guarantee System: PGS) มีความเหมาะสมกับการจำหน่ายสินค้าอินทรีย์ในตลาดท้องถิ่น ช่วยให้ผู้บริโภคมีความมั่นใจและเป็นการส่งเสริมการตลาดให้ผลิตภัณฑ์ที่ผ่านการรับรองเกษตรอินทรีย์แบบมีส่วนร่วม (PGS) อีกช่องทางหนึ่ง (อาภา หวังเกียรติ และ สมภพ ดอนดี, 2562)

ข้าวอินทรีย์ (Organic Rice) เป็นข้าวที่ได้จากการผลิตโดยหลีกเลี่ยงการใช้สารเคมีในทุกขั้นตอน การส่งเสริมการเพาะปลูกข้าวอินทรีย์ในประเทศไทย พบปัญหา คือ นาข้าวอินทรีย์ซึ่งได้การรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม ยังไม่เป็นที่เชื่อมั่นในกลุ่มผู้บริโภค (สำนักวิชาการและแผนงานและสำนักพัฒนาและถ่ายทอดเทคโนโลยี สำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม (ส.ป.ก.), 2561) แต่เกษตรกรมีมุมมองว่า มาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม สามารถเข้าถึงได้ง่าย จึงมีเกษตรกรบางส่วนมีแนวทางยกระดับผลิตผลทางการเกษตรของตนเองผ่านการขับเคลื่อนมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม (สหพันธ์เกษตรอินทรีย์แบบมีส่วนร่วม SDGsPGS, 2563)

จังหวัดสงขลามีเกษตรกรผู้ปลูกข้าวปีการผลิต 2564/2565 (นาปี) พื้นที่ 167,700 ไร่ (สำนักงานปลัดกระทรวงเกษตรและสหกรณ์, 2565) และมีเกษตรกรผู้ข้าวอินทรีย์ปีการผลิต 2565/2566 (นาปี) พื้นที่ 391 ไร่ (ศูนย์เมล็ดพันธุ์ข้าวปัตตานี, 2566) ซึ่งจังหวัดสงขลาเป็นจังหวัดแรกของภาคใต้ที่มีการขับเคลื่อนมาตรฐานอินทรีย์แบบมีส่วนร่วมอย่างเป็นรูปธรรม ในปี พ.ศ. 2562 (สำนักงานสภาเกษตรกรจังหวัดสงขลา, 2563) แต่ชาวนาในจังหวัดสงขลา เข้าร่วมกระบวนการรับรองมาตรฐานเกษตรเกษตรอินทรีย์แบบมีส่วนร่วมเพียง จำนวน 13 ราย (สำนักงานสภาเกษตรกรจังหวัดสงขลา, 2563) จึงสนใจศึกษาการถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา โดยมุ่งหวังให้ผลการศึกษาเป็นส่วนหนึ่งในการสะท้อนการทำนาอินทรีย์และความคิดเห็นของเกษตรกรต่อกระบวนการรับรองนาข้าวอินทรีย์แบบมีส่วนร่วมที่ทำให้เกษตรกร หน่วยงานภาครัฐ สมาพันธ์เกษตรกรรมยั่งยืนสงขลา มีความเข้าใจและนำไปใช้ปรับปรุงและพัฒนากระบวนการทำนาข้าวอินทรีย์มาตรฐานการมีส่วนร่วม ให้เป็นที่ยอมรับของผู้บริโภคในจังหวัดสงขลาและจังหวัดใกล้เคียงได้ต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาการทำนาอินทรีย์ และความคิดเห็นของเกษตรกรต่อกระบวนการรับรองนาข้าวอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา
2. เพื่อถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา

แนวคิด ทฤษฎี กรอบแนวคิด

เกษตรอินทรีย์ หมายถึง ระบบการจัดการการผลิตด้านการเกษตรแบบองค์รวมที่เกื้อหนุนต่อระบบนิเวศ โดยเน้นการใช้วัสดุธรรมชาติ หลีกเลี่ยงการใช้วัตถุดิบจากการสังเคราะห์ มีการจัดการกับผลิตภัณฑ์ โดยเน้นการแปรรูปด้วยความระมัดระวัง เพื่อรักษาสภาพการเป็นเกษตรอินทรีย์และคุณภาพที่สำคัญของผลิตภัณฑ์ในทุกขั้นตอน (คณะกรรมการพัฒนาเกษตรอินทรีย์แห่งชาติ, 2560)

ข้าวอินทรีย์ เป็นข้าวที่ได้จากวิธีการผลิตที่ไม่ใช้สารเคมีทุกชนิดในทุกขั้นตอนการผลิต โดยเกษตรกรใช้วัสดุจากธรรมชาติ และสารสกัดจากพืชที่ไม่มีสารพิษตกค้าง ทำให้ผลิตผลข้าวมีคุณภาพดี (ศูนย์สารสนเทศ กรมส่งเสริมการเกษตร, ม.ป.ป.) โดยหลักการผลิตข้าวอินทรีย์ มีขั้นตอนดังนี้

1. พื้นที่ปลูก หากเป็นพื้นที่ใช้สารเคมีมาก่อนควรตรวจวิเคราะห์ สารพิษตกค้างในดิน

2. พันธุ์ข้าวมีคุณภาพดี ทนทานต่อสภาพแวดล้อม

3. เมล็ดพันธุ์ ได้จากการปลูกโดยวิธีเกษตรอินทรีย์ ไม่คลุกเมล็ดด้วยสารเคมี เมล็ดสะอาด ปราศจากโรคแมลงและสิ่งเจือปนต่าง ๆ กรณีปลูกปีแรกและไม่สามารถหาเมล็ดพันธุ์ได้ อนุญาตให้ใช้เมล็ดพันธุ์ข้าวปกติ

4. การเตรียมดิน ไถดะ ไถแปร ตากแดดไม่ใช้สารควบคุมวัชพืช

5. วิธีปลูก ควรพิจารณาสภาพพื้นที่และการใช้อัตราเมล็ดพันธุ์ที่เหมาะสม ซึ่งการปลูกโดยวิธีปักดำและหว่านข้าวแห้งเป็นวิธีการที่เหมาะสม (โชษิตา เปสตันยี, 2558)

6. การจัดการดิน ไม่เผาฟางข้าวและตอซังควรไถกลบเพื่อปรับปรุงบำรุงดิน

7. ควรใช้ปุ๋ยอินทรีย์ เช่น ปุ๋ยคอก ปุ๋ยหมัก และปุ๋ยพืชสด เพื่อปรับปรุงบำรุงดิน ควรใช้อินทรียวัตถุที่หาได้ง่ายในพื้นที่ ที่เกษตรกรทำเองในพื้นที่นาหรือบริเวณบ้าน

8. การจัดการน้ำ ตามระยะเวลาเจริญเติบโตของต้นข้าว

9. จัดระบบการปลูกพืชในนาข้าว ปลูกพืชหมุนเวียนโดยเฉพาะพืชตระกูลถั่ว

10. การควบคุมวัชพืช เช่น การเตรียมดินที่เหมาะสม วิธีการทำนาที่ลดปัญหาวัชพืช การใช้น้ำควบคุมวัชพืช การใช้วัสดุคลุมดิน การถอนด้วยมือ การปลูกพืชหมุนเวียน เป็นต้น

11. การควบคุมศัตรูพืช การใช้วิธีเขตกรรม ใช้พันธุ์ต้านทาน กำหนดช่วงปลูกที่เหมาะสม ใช้อัตราเมล็ดพันธุ์และระยะปลูกที่เหมาะสมและการปลูกพืชหมุนเวียนเพื่อตัดวงจรชีวิตเพื่อลดการระบาดของศัตรูพืชในนาข้าว

12. การเก็บเกี่ยวผลผลิต ควรเก็บเกี่ยวในระยะพลับพลึง คือ เก็บเกี่ยวผลผลิตนับจากวันที่ข้าวออกดอกไปแล้ว 28-30 วัน ในสภาพที่นาแห้งเป็นช่วงที่เหมาะสม และนวดลดความชื้นทำความสะอาดเมล็ด

13. การเก็บรักษาผลผลิต ควรแยกจากข้าวที่ปลูกโดยใช้สารเคมี ตากแดด ลดความชื้นเมล็ดข้าวเปลือก ให้ต่ำกว่า 14 เปอร์เซ็นต์ และเก็บรักษาไว้ในสภาพแวดล้อมที่เหมาะสม เช่น ในยุ้งฉางเฉพาะไม่ปะปนกับข้าวที่ปลูกโดยใช้สารเคมี

14. การแปรสภาพจากข้าวเปลือกอินทรีย์เป็นข้าวสารโดยใช้เครื่องสีสำหรับข้าวอินทรีย์โดยเฉพาะ หากต้องใช้โรงสีร่วมกับข้าวที่ปลูกโดยใช้สารเคมี ควรทำความสะอาดเครื่องสีก่อน

15. การบรรจุหีบห่อ บรรจุในถุงพลาสติกโดยใช้วิธีอัดก๊าซคาร์บอนไดออกไซด์หรือสุญญากาศ

ระบบการรับรองมาตรฐานแบบมีส่วนร่วม (Participatory Guarantee Systems: PGS)

สหกรณ์กรีนเนท และมูลนิธิสายใยแผ่นดิน (2562) กล่าวว่า ระบบ "ชุมชนรับรอง" เป็นการรับรองมาตรฐานเกษตรอินทรีย์ที่เกิดจากการรับรองเกษตรกรที่เป็นสมาชิกของกลุ่มองค์กรผู้ผลิตเอง โดยระบบชุมชนรับรองริเริ่มขึ้นโดยสมาพันธ์เกษตรอินทรีย์นานาชาติ หรือที่รู้จักกันในชื่อย่อว่า IFOAM (International Federation of Organic Agriculture Movements) ซึ่งได้สนับสนุนให้มีการพัฒนาระบบที่สมาชิกกลุ่มผู้ผลิต/ชุมชนมีส่วนร่วมในการตรวจสอบกันเอง ซึ่งเรียกว่า Participatory Guarantee System (PGS) หรือชุมชนรับรอง เป็นระบบรับรองมาตรฐานระดับท้องถิ่นที่ให้การรับรองผู้ผลิตบนฐาน

การมีส่วนร่วมของผู้มีส่วนเกี่ยวข้องและถูกสร้างจากรากฐานของความเชื่อใจเครือข่ายทางสังคมและการแลกเปลี่ยนความรู้ โดยมีองค์ประกอบสำคัญของระบบชุมชนรับรอง PGS คือ

1. วิสัยทัศน์ร่วม (shared vision) ระหว่างเกษตรกรผู้ผลิตและผู้บริโภคในหลักการพื้นฐานของระบบชุมชนรับรอง ซึ่งการมีส่วนร่วมอาจแตกต่างกันไปในแต่ละโครงการก็ได้

2. การมีส่วนร่วม (participatory) ใช้หลักการและมาตรฐานการผลิตที่เกิดขึ้นจากการมีส่วนร่วมของผู้มีส่วนเกี่ยวข้อง ทั้งผู้ผลิต ที่ปรึกษา ผู้บริโภค ซึ่งทำให้ระบบมีความน่าเชื่อถือ

3. ความโปร่งใส (transparency) เกิดจากการที่ผู้มีส่วนเกี่ยวข้องได้รับรู้ถึงกลไกและกระบวนการในการตรวจรับรองทั้งหมด แต่ก็ไม่ได้หมายความว่า ทุกคนจำเป็นต้องรู้รายละเอียดทุกอย่างเท่ากัน และในขณะเดียวกันต้องปกป้องข้อมูลส่วนตัวหรือข้อมูลที่เป็นความลับทางการค้า

4. ความเชื่อมั่นต่อกัน (trust) ระบบชุมชนรับรองตั้งอยู่บนฐานความเชื่อว่าเราสามารถเชื่อถือเกษตรกรได้ และการใช้กลไกควบคุมทางสังคม/วัฒนธรรมเป็นเครื่องมือในการตรวจรับรองมาตรฐานเกษตรอินทรีย์ได้

5. กระบวนการเรียนรู้ (learning process) ระบบชุมชนรับรองไม่ใช่มีเป้าหมายเพียงเพื่อให้การรับรองผลผลิต แต่เป็นเครื่องมือการพัฒนาการเรียนรู้ เพื่อพัฒนาชุมชนและเกษตร

6. ความเชื่อมโยงในแนวราบ (horizontality) ที่เป็นการแบ่งปันอำนาจและความรับผิดชอบอินทรีย์ของผู้คนที่เกี่ยวข้อง ไม่ใช่เป็นเรื่องของคนเพียง 2 - 3 คนเท่านั้น

ระบบการรับรองมาตรฐานแบบมีส่วนร่วม (Participatory Guarantee Systems: PGS) ในจังหวัดสงขลา ของกลุ่มสมาพันธ์เกษตรกรรมยั่งยืนจังหวัดสงขลา

อนุรักษ์ เรืองรอบ (2561) ได้กล่าวถึงกระบวนการรับรองมาตรฐาน ดังนี้

(1) เกษตรกรที่เป็นสมาชิกและคณะกรรมการต้องเรียนรู้ทำความเข้าใจเกษตรอินทรีย์

(2) เกษตรกรที่เป็นสมาชิกและคณะกรรมการต้องเรียนรู้กระบวนการรับรองมาตรฐานแบบมีส่วนร่วม

(3) เกษตรกรที่เป็นสมาชิกต้องจัดทำเอกสารที่จำเป็น

(4) คณะกรรมการตรวจเยี่ยมแปลงและเกษตรกรต้องรวบรวมข้อมูลแปลงเกษตร

(5) คณะกรรมการตรวจเยี่ยมแปลงร่วมกันตรวจเยี่ยมฟาร์ม

(6) คณะกรรมการกลั่นกรองรับรองแปลงตามเอกสาร

(7) คณะกรรมการพิจารณาการรับรองมาตรฐานให้การรับรองแปลงที่ผ่านมาตรฐาน

วิธีดำเนินการวิจัย

1. ประชากร คือ เกษตรกรที่ทำนาอินทรีย์ในปีการผลิต 2563/2564 โดยมีเกษตรกร จำนวน 13 ราย ในจังหวัดสงขลาที่ได้รับการรับรองนาข้าวอินทรีย์มาตรฐานแบบมีส่วนร่วม (PGS) ของกลุ่มสมาพันธ์เกษตรกรรมยั่งยืนจังหวัดสงขลา SDGsPGS ซึ่งในการวิจัยครั้งนี้ใช้ประชากรทั้งหมดในการศึกษา

2. เครื่องมือการวิจัย ใช้แบบสัมภาษณ์แบบมีโครงสร้าง (structured interview) โดยแบ่งออกเป็น 3 ส่วน ดังนี้

ส่วนที่ 1 ข้อมูลส่วนบุคคลของเกษตรกรทำนาอินทรีย์ ประกอบด้วย เพศ อายุ สถานภาพ ระดับการศึกษา อาชีพ รายได้เฉลี่ยต่อเดือน และภูมิลำเนา

ส่วนที่ 2 ข้อมูลการทำนาอินทรีย์ของเกษตรกร ประกอบด้วย การเตรียมพื้นที่เพาะปลูก การเตรียมพันธุ์ข้าว การเตรียมปัจจัยการผลิต การบำรุง ดูแล และรักษาข้าวเปลือก

ส่วนที่ 3 ข้อมูลคำถามเกี่ยวกับการศึกษาปัญหากระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) ในจังหวัดสงขลา ซึ่งเป็นคำถามแบบประมาณค่า (rating scale) คะแนนแบ่งเป็น 5 ระดับ คือ มากที่สุด มีคะแนน = 5, มาก มีคะแนน = 4, ปานกลาง มีคะแนน = 3, น้อย มีคะแนน = 2 และน้อยที่สุด มีคะแนน = 1

3. การเก็บรวบรวมข้อมูล ผู้วิจัยดำเนินการประสานงานไปยังเกษตรกรที่ได้รับการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) จำนวน 13 ราย หลังจากนั้นลงพื้นที่ตามวันและเวลาที่นัดเกษตรกรไว้ แจ้งวัตถุประสงค์ของการวิจัย แล้วให้เกษตรกรลงลายมือชื่อในการยินดีให้ข้อมูล หลังจากนั้นจึงทำการสัมภาษณ์ด้วยตนเอง และจดบันทึกคำตอบทั้งหมด

4. การตรวจสอบคุณภาพเครื่องมือในการวิจัย

4.1 การตรวจสอบความเที่ยงตรงตามเนื้อหา (Content Validity) ดำเนินการให้ผู้เชี่ยวชาญจำนวน 3 ท่าน ตรวจสอบความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์ และประเด็นหลักของเนื้อหาตามโครงสร้าง โดยค่า IOC (Index of Item objective Congruence : IOC) ที่ผ่านเกณฑ์สามารถนำไปใช้ได้ควรมีค่า 0.50 ขึ้นไป (สุรพงษ์ คงสัตย์ และ ธีรชาติ ธรรมวงค์, 2551) ซึ่งในการวิจัยครั้งนี้ได้ค่า 0.33 – 1.00 โดยข้อที่ได้ค่าน้อยกว่า 0.5 ดำเนินการใน 2 ลักษณะ คือ ตัดออกหรือปรับปรุงภาษาของข้อคำถามให้เหมาะสมกับบริบทการทำนาข้าวอินทรีย์

4.2 การตรวจสอบความเชื่อมั่นของแบบสัมภาษณ์ (Reliability) นำแบบสัมภาษณ์ที่ได้ปรับปรุงแก้ไขเรียบร้อยแล้วไปทดลองใช้ (try out) กับเกษตรกรทำนาอินทรีย์ในจังหวัดพัทลุง จำนวน 20 ราย แล้วนำมาหาค่าสัมประสิทธิ์อัลฟาของครอนบาค (α-coefficient) โดยกำหนดเกณฑ์ความเหมาะสม 0.70 ขึ้นไป ซึ่งแบบสัมภาษณ์ได้ค่าความเชื่อมั่นทั้งฉบับเท่ากับ 0.856 จึงสามารถนำไปใช้ในการเก็บรวบรวมข้อมูลต่อไปได้

5. การวิเคราะห์ข้อมูลและสถิติที่ใช้ในการวิจัย ผู้วิจัยได้ตรวจสอบความสมบูรณ์ของแบบสัมภาษณ์หลังจากเก็บข้อมูลในแต่ละชุดแล้วเสร็จ โดยนำข้อมูลที่ได้มาวิเคราะห์ทางสถิติ ด้วยโปรแกรมสำเร็จรูปทางสถิติ

5.1 การวิเคราะห์ข้อมูลเชิงปริมาณ เกี่ยวกับข้อมูลส่วนบุคคล ข้อมูลการทำนาข้าวอินทรีย์ บัญหากระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) จังหวัดสงขลา ใช้สถิติเชิงพรรณนา (descriptive statistics) ได้แก่ ค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน และระดับคะแนนเฉลี่ยในแต่ละระดับชั้น ใช้สูตรพิสัย ซึ่งมี เกณฑ์ประเมินระดับความคิดเห็นต่อปัญหากระบวนการรับรองนาข้าวอินทรีย์มาตรฐานการรับรองแบบมีส่วนร่วม (PGS) จังหวัดสงขลา ใช้เกณฑ์ความคิดเห็นดังนี้

คะแนนเฉลี่ย 4.21 - 5.00 = มากที่สุด
คะแนนเฉลี่ย 3.41 - 4.20 = มาก
คะแนนเฉลี่ย 2.61 - 3.40 = ปานกลาง
คะแนนเฉลี่ย 1.81 - 2.60 = น้อย
คะแนนเฉลี่ย 1.00 - 1.80 = น้อยที่สุด

ผลการวิจัย

1. การทำนาอินทรีย์ และความคิดเห็นของเกษตรกรต่อกระบวนการรับรองนาข้าวอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา

1.1 ข้อมูลส่วนบุคคลของเกษตรกร พบว่า ส่วนใหญ่เป็นเพศชาย ร้อยละ 53.85 และเพศหญิง ร้อยละ 46.15 อายุเฉลี่ย 56 ปี รายได้จากการทำนาอินทรีย์เฉลี่ย 9,384 บาทต่อไร่ต่อปี ต่ำสุด 6,000 บาทต่อไร่ต่อปี และสูงสุด 20,000 บาทต่อไร่ต่อปี ค่าใช้จ่ายในการทำนาอินทรีย์เฉลี่ย 2,093 บาทต่อไร่ต่อปี ต่ำสุด 393 บาทต่อไร่ต่อปี และสูงสุด 3,050 บาทต่อไร่ต่อปี เกษตรกรมีประสบการณ์ทำนาเฉลี่ย 15 ปี และประสบการณ์ทำนาอินทรีย์เฉลี่ย 9 ปี

1.2 การทำนาอินทรีย์ของเกษตรกร พบว่า ส่วนใหญ่ทำนาอินทรีย์ปีละ 1 ครั้ง นิยมปลูกข้าวนาปี ระยะเวลาการปลูกอยู่ในช่วงกลางเดือนมิถุนายน – ปลายกุมภาพันธ์ของทุกปี เกษตรกรทุกคนมีการทำแนวกันชนครบทั้ง 4 ด้าน รูปแบบกันชน ประกอบด้วย (1) รูปแบบกันชนที่มีอยู่เดิม ใช้โครงสร้างพื้นฐานจากหน่วยงานภาครัฐ ได้แก่ คูน้ำชลประทาน คลองไส้ไก่ บ่อน้ำขนาดเล็ก เหมืองน้ำ ถนน และสภาพแวดล้อมพื้นฐานรอบแปลงเกษตร ได้แก่ แปลงนาข้าวอินทรีย์ สวนพืชเศรษฐกิจอินทรีย์ ไร่นาสวนผสม พื้นที่นาร้าง อาคารสถานที่ที่อยู่อาศัย (ภาพที่ 1) (2) รูปแบบกันชนที่เกษตรกรสร้างขึ้นเพื่อเป็นแนวกันชนในการทำนาอินทรีย์โดยเฉพาะ ได้แก่ การยกคันดิน (ภาพที่ 2)

ภาพที่ 1 แนวกันชนที่มีอยู่เดิม

ภาพที่ 2 แนวกันชนที่เกษตรกรสร้างขึ้น

1.2.1 พื้นที่ทำนาอินทรีย์ และผลผลิตข้าวเปลือกอินทรีย์ของเกษตรกร พบว่า ส่วนใหญ่มีพื้นที่ทำนาอินทรีย์เฉลี่ย 17 ไร่ พื้นที่ทำนาอินทรีย์ต่ำสุดอยู่ที่ 2 ไร่ และสูงสุดอยู่ที่ 80 ไร่ โดยได้ผลผลิตเฉลี่ย 454 กิโลกรัมต่อไร่ ผลผลิตต่ำสุดอยู่ที่ 400 กิโลกรัมต่อไร่ และสูงสุดอยู่ที่ 600 กิโลกรัมต่อไร่

1.2.2 สภาพพื้นที่ ลักษณะดิน และแหล่งน้ำในการทำนาข้าวอินทรีย์ พบว่า แปลงนาข้าวอินทรีย์ส่วนใหญ่เป็นพื้นที่ราบ ร้อยละ 69.23 รองลงมาเป็นพื้นที่ลุ่ม ร้อยละ 23.08 และพื้นที่ดอน ร้อยละ 7.69 ดินมีลักษณะเป็นดินเหนียว ร้อยละ 76.92 และดินร่วนปนทราย ร้อยละ 23.08 เกษตรกรใช้น้ำฝนช่วงทำนาปี ร้อยละ 100.00 ส่วนเกษตรกรบางรายที่ใช้น้ำชลประทาน ร้อยละ 38.46 ได้สูบน้ำเข้ามาขังไว้เป็นระยะเวลา 10 วัน ก่อนปล่อยเข้าแปลงนาอินทรีย์ และใช้น้ำจากบ่อน้ำส่วนบุคคล ร้อยละ 7.69 ในช่วงทำนาปรังหรือฝนทิ้งช่วง

1.2.3 วิธีการปลูกข้าวอินทรีย์ ปุ๋ยและการใช้น้ำหมักชีวภาพในการทำนาข้าวอินทรีย์ พบว่า เกษตรกรปลูกข้าวอินทรีย์โดยการหว่านแห้งมากที่สุด ร้อยละ 53.85 รองลงมา คือ การทำนาดำและหว่านเปียก ร้อยละ 38.46 และ 7.69 ตามลำดับ เกษตรกรบำรุงต้นข้าวโดยใช้ปุ๋ยคอกที่ได้จากมูลไก่ มูลเป็ด มูลสุกร และมูลนกนางแอ่น ร้อยละ 53 ประมาณ 40 กระสอบต่อไร่ รองลงมา คือ ใช้ปุ๋ยคอกร่วมกับทำปุ๋ยอินทรีย์ของตนเอง ร้อยละ 23.08 เกษตรกรทุกรายใช้น้ำหมักชีวภาพในการทำนาข้าวอินทรีย์

โดยแบ่งเป็น 2 กลุ่ม คือ กลุ่มที่ให้ธาตุอาหารและกลุ่มที่ใช้ป้องกันกำจัดแมลง ซึ่งเกษตรกรทำเอง ร้อยละ 100.00 โดยเกษตรกรกลุ่มที่ให้ธาตุอาหารจะใส่น้ำหมักชีวภาพช่วงเตรียมดินก่อนหว่านหรือดำนา 7 วัน และดูแลต้นข้าวเมื่อต้นข้าวอายุ 25 – 30 วัน และ 60 วัน ส่วนการป้องกันกำจัดแมลงจะฉีดเมื่อข้าวอายุ 25 วัน หรือ 45-50 วัน หรือ 75 วัน

1.2.4 การจัดการน้ำระหว่างการทำนาข้าว กรณีน้ำแล้ง พบว่า ส่วนใหญ่ไม่มีการจัดการน้ำ ร้อยละ 61.54 รองลงมา คือ มีการจัดการน้ำ 1 ครั้ง ตอนเริ่มปลูกข้าว ร้อยละ 23.08 และมีการจัดการน้ำ 2 ครั้ง ช่วงก่อนหว่านเมล็ดพันธุ์และช่วงปักดำ เมื่อต้นข้าวมีอายุ 30 – 45 วัน ร้อยละ 15.38 กรณีน้ำท่วม พบว่า เกษตรกรส่วนใหญ่ไม่มีการจัดการน้ำ ร้อยละ 84.62 รองลงมา คือ มีการจัดการน้ำ ร้อยละ 15.38 โดยการฝังท่อ PVC ไว้ที่คันนาและเปิดระบายน้ำออกให้เหลือไว้ในปริมาณที่ต้องการ และการทำกาลักน้ำ

1.2.5 การเก็บเกี่ยวข้าวเปลือกอินทรีย์ พบว่า เกษตรกรส่วนใหญ่เก็บเกี่ยวเอง ร้อยละ 46.15 รองลงมา คือ จ้างรถเก็บเกี่ยว ร้อยละ 38.46 สำหรับการลงแขกเกี่ยวข้าวและลงแขกเกี่ยวข้าวรวมทั้งเก็บเกี่ยวเอง ร้อยละ 7.69

1.3 ความคิดเห็นของเกษตรกรต่อกระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม

1.3.1 ด้านความเชื่อมั่น พบว่า เกษตรกรมีความเชื่อมั่นโดยรวมอยู่ในระดับมาก ซึ่งประเด็นการจัดการงานที่เกี่ยวกับมาตรฐานและข้อกำหนดการตรวจรับรองมาตรฐาน มีค่าเฉลี่ยความเชื่อมั่นมากที่สุด (μ=3.92) รองลงมาคือ ความเชื่อมั่นต่อผู้นำกลุ่มด้านความสัมพันธ์ (μ=3.85) ความเชื่อมั่นว่าผู้นำกลุ่มจะดำเนินการตามขั้นตอนการตรวจรับรองมาตรฐาน และการควบคุมมาตรฐานแปลง (μ=3.77) ความเชื่อมั่นต่อผู้นำกลุ่มด้านการบริหารงานกลุ่ม (μ=3.69) และความเชื่อมั่นต่อผู้นำกลุ่มด้านความซื่อสัตย์ (μ=3.62) ตามลำดับ สำหรับความเชื่อมั่นว่าผู้นำกลุ่มจะมีบทลงโทษสำหรับผู้ไม่ปฏิบัติตามข้อกำหนด (μ=3.23) อยู่ในระดับปานกลาง

1.3.2 ด้านความโปร่งใส พบว่า กระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) ในจังหวัดสงขลา มีความโปร่งใสในระดับมาก จำนวน 8 ประเด็น เรียงลำดับรายประเด็นได้ดังนี้ ปัญหาในการให้ข้อมูลจากผู้นำหรือกรรมการกลุ่ม (μ=4.08) ความโปร่งใสในการเปิดเผยข้อมูลในระบบสารสนเทศเครือข่ายเกษตรอินทรีย์แบบมีส่วนร่วม PGS (μ=4.00) ความโปร่งใสในการเปิดเผยข้อมูลข้อกำหนดการทำเกษตรอินทรีย์แบบมีส่วนร่วมในกลุ่ม (μ=3.85) ความโปร่งใสในการขอตรวจสอบข้อมูลในขั้นตอนและกระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=3.77) ความโปร่งใสในการเปิดเผยข้อมูลต่าง ๆ ของกลุ่ม (μ=3.62) ความโปร่งใสในการเปิดเผยข้อมูลขั้นตอนกระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในกลุ่ม (μ=3.54) ความโปร่งใสในการเปิดเผยข้อมูลการพิจารณารับรองฯ แปลงของเกษตรกรเอง (μ=3.46) และความโปร่งใสในการขอตรวจสอบข้อมูลในขั้นตอนและกระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=3.46) ตามลำดับ กระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) ในจังหวัดสงขลามีความโปร่งใสในระดับปานกลาง จำนวน 3 ประเด็น เรียงลำดับรายประเด็นได้ดังนี้ ความโปร่งใสในการเปิดเผยข้อมูลการกลั่นกลองแปลงของเกษตรกรเอง (μ=3.38) ความโปร่งใสในการเปิดเผยข้อมูลการตรวจประเมิน/ตรวจเยี่ยมแปลงของท่านจากผู้ตรวจแปลง (μ=3.31) และความโปร่งใสในการเปิดเผยข้อมูลผู้นำกรรมการและแนวทางการทำงานของกลุ่ม (μ=3.23) ตามลำดับ

1.3.3 ด้านการมีส่วนร่วม พบว่า เกษตรกรได้รับประโยชน์ในการมีส่วนร่วมดำเนินงานในกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่มอยู่ในระดับมาก (μ=3.46) การมีส่วนร่วมในกระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) ในจังหวัดสงขลาอยู่ในระดับปานกลาง จำนวน 5 ประเด็น เรียงลำดับรายประเด็นได้ดังนี้ การมีส่วนร่วมกันกำหนดการรับผิดชอบ กระบวนการรับรองกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=3.23) การมีส่วนร่วมในการคิดค้นปัญหา คิดหาสาเหตุ และคิดหาแนวทางแก้ไขปัญหาของกลุ่ม (μ=3.00) การมีส่วนร่วมในการคิดพัฒนากระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=2.92) การมีส่วนร่วมในการติดตามและประเมินผล กระบวนการรับรองกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=2.85) และการมีส่วนร่วมดำเนินงานในกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=2.77) ตามลำดับ การมีส่วนร่วมในกระบวนการรับรองมาตรฐานนาข้าวอินทรีย์แบบมีส่วนร่วม (PGS) ในจังหวัดสงขลาอยู่ในระดับน้อย จำนวน 2 ประเด็น เรียงลำดับรายประเด็นได้ดังนี้ การมีส่วนร่วมการวางแผนดำเนินงานในการกำหนดการตรวจรับรองกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=2.38) และการมีส่วนร่วมในการตัดสินใจการพัฒนากระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่ม (μ=2.38)

2. การถอดองค์ความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา

การถอดองค์ความรู้การทำนาอินทรีย์ภายใต้ข้อกำหนดการรับรองมาตรฐานการรับรองแบบมีส่วนร่วม PGS สามารถจัดกลุ่มบุคคลที่เกี่ยวข้องได้เป็น 3 กลุ่มหลัก คือ เกษตรกร ผู้นำ และคณะกรรมการรับรองแปลงเกษตรอินทรีย์

1. เกษตรกรต้องเรียนรู้การทำนาอินทรีย์ กระบวนการรับรองมาตรฐานแบบมีส่วนร่วม ข้อกำหนดการรับรองมาตรฐาน การจัดทำเอกสารที่จำเป็น และการรวบรวมข้อมูลแปลงเกษตร ซึ่งการทำนาอินทรีย์เป็นการทำนาที่ไม่ใช้สารเคมีทุกชนิด และทุกขั้นตอนการผลิตใช้วัสดุจากธรรมชาติ ไม่มีสารพิษตกค้าง เพื่อให้ผลิตผลข้าวมีคุณภาพดี เกษตรกรควรมีความรู้ความเข้าใจในกระบวนการ ดังนี้

1.1 พื้นที่ทำนาอินทรีย์ที่สามารถเข้าร่วมการรับรองมาตรฐานแบบมีส่วนร่วมได้มีองค์ประกอบ 2 ประเภท คือ 1) ต้องพิสูจน์ได้ว่าเป็นพื้นที่รกร้างว่างเปล่าก่อนทำเกษตรอินทรีย์เป็นระยะเวลาไม่น้อยกว่า 3 ปี 2) พิสูจน์ได้ว่ามีการทำเกษตรอินทรีย์มาแล้วไม่น้อยกว่า 3 ปี โดยเกษตรกรต้องรวบรวมเอกสารให้คณะกรรมการตรวจประเมินแปลงเห็นอย่างประจักษ์ เช่น ภาพถ่ายระบุวันในการทำนาอินทรีย์ ใบเสร็จรับเงินที่มีการระบุการซื้อสารชีวภัณฑ์หรือปุ๋ยคอก เป็นต้น และแปลงนาอินทรีย์ควรอยู่ห่างจากแปลงเคมีอย่างน้อยระยะห่าง 3-5 เมตร หรือมีการจัดทำแนวกันชนป้องกันการปนเปื้อน ทั้งรูปแบบกันชนที่มีอยู่เดิมโดยใช้โครงสร้างพื้นฐานจากหน่วยงานภาครัฐ เช่น คูน้ำชลประทาน ถนน การใช้สภาพแวดล้อมพื้นฐานรอบแปลงเกษตรกร เช่น สวนพืชอินทรีย์ พื้นที่นาร้าง และเกษตรกรอาจสร้างแนวกันชนขึ้นโดยการยกคันดิน หรือปลูกพืชเป็นแนวกันชน เช่น กล้วย ไผ่ หญ้าแฝก เป็นต้น แต่พืชที่ปลูกเป็นแนวกันชนไม่สามารถขายเป็นอินทรีย์ได้

1.2 เมล็ดพันธุ์ เกษตรกรควรใช้เมล็ดพันธุ์จากเกษตรกรที่ทำนาข้าวอินทรีย์ เพราะทราบแหล่งที่มาชัดเจน และเกษตรกรควรมีการเก็บพันธุ์ข้าวอินทรีย์ของตนเองไว้เพื่อปลูกต่อและมั่นใจได้ว่าไม่มีการคลุกสารเคมี

1.3 ปุ๋ยบำรุงต้นข้าว เกษตรกรใช้ปุ๋ยคอกที่ได้จากมูลไก่ มูลเป็ด มูลสุกร มูลนกนางแอ่น หรือวัตถุดิบอื่นที่หาได้จากในพื้นที่ การใช้ปุ๋ยคอกต้องทำให้แห้งก่อนนำมาใช้ ไม่ควรใช้มูลสด เนื่องจากอาจมีเชื้อที่มาจากมูลสัตว์ได้ การใส่ปุ๋ยในช่วงแรกอาจเกิดปัญหาต้นข้าวเขียวช้า ต้นข้าวโตช้า และผลผลิตน้อยลงเล็กน้อย ต่อมาจะเกิดการเปลี่ยนแปลง คือ ต้นข้าวเขียวนาน เจริญเติบโตดีตามระยะเวลาเก็บเกี่ยว ดินร่วนซุย เก็บน้ำไว้ในดินได้ดี มีธาตุอาหาร และจุลินทรีย์ที่เหมาะสม

1.4 น้ำหมักชีวภาพบำรุงต้นข้าว เกษตรกรสามารถนำวัตถุดิบเหลือใช้จากครัวเรือนหรือแปลงเกษตร เช่น เศษชิ้นส่วนปลา เศษผักผลไม้ มาผสมกับกากน้ำตาลและน้ำสะอาด เกษตรกรจะใส่น้ำหมักชีวภาพเมื่อมีการปล่อยน้ำเข้าแปลงนาอินทรีย์

1.5 การจัดการน้ำ หากแปลงนาข้าวอินทรีย์เกิดน้ำท่วม เกษตรกรใช้วิธีฝังท่อ PVC ไว้ที่คันนาและเปิดระบายน้ำออกให้เหลือไว้ในปริมาณที่ต้องการ หรือทำกาลักน้ำ เพื่อช่วยไม่ให้เกิดน้ำท่วมขังในแปลงนาอินทรีย์ ซึ่งถือเป็นหัวใจสำคัญของการทำนาข้าวอินทรีย์ และหากการน้ำของเกษตรกรไม่ทันท่วงทีอาจส่งผลกระทบต่อการได้รับการรับรองมาตรฐานอินทรีย์แบบมีส่วนร่วม PGS ในปีถัดไป

1.6 การปรับปรุงบำรุงดิน เกษตรกรมีการปลูกพืชหลังนาหรือพืชหมุนเวียน เช่น ถั่วเขียว ถั่วลิสง ปอเทือง เป็นต้น เป็นการเพิ่มความชุ่มชื้นให้ดิน ลดการระบาดของศัตรูพืช ทำให้ดินมีความอุดมสมบูรณ์

1.7 จัดทำบันทึกฟาร์ม บัญชีฟาร์ม สมุดเยี่ยมฟาร์มโดยละเอียด เพื่อนำไปให้ผู้ตรวจแปลงพิจารณาว่ามีความเสี่ยงจากการปนเปื้อนสารเคมีสังเคราะห์ในปัจจัยการผลิตหรือไม่ และใช้เป็นหลักฐานขอรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม PGS

1.8 การเข้าร่วมกระบวนการรับรองมาตรฐานของกลุ่ม เกษตรกรต้องมีส่วนร่วมกับกิจกรรมกลุ่ม คือ ร่วมประชุมกำหนดกติกาเพื่อวางกรอบในการตรวจรับรองมาตรฐานพื้นที่นาข้าว วางแผนการปลูก กำหนดเวลาการลงพื้นที่ตรวจแปลง ลงพื้นที่ตรวจเยี่ยมฟาร์ม และกลั่นกรองการรับรองแปลงตามเอกสาร เพื่อให้ตนเองได้รับประโยชน์ในกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมมากยิ่งขึ้น ซึ่งเกษตรกรต้องอาศัยกระบวนการเรียนรู้และพัฒนาตนเองอย่างเป็นระบบ ผ่านกลไกและกระบวนการ และรายละเอียดทุกอย่างของกลุ่มจากข้อมูลที่ผู้นำและคณะกรรมการได้แนะนำและเปิดเผยให้ทราบ ผ่านความโปร่งใส เพื่อให้การดำเนินการทำนาอินทรีย์แบบมีส่วนร่วมของตนเองเกิดความเชื่อมั่นต่อบุคคลภายนอก เช่น หน่วยงานภาครัฐ ภาคเอกชน ผู้บริโภค ที่เกษตรกรมีความต้องการจำหน่ายผลผลิตข้าวอินทรีย์ให้เกิดรายได้ต่อตนเองเพิ่มขึ้น

2. ผู้นำกลุ่มที่ดีควรมีวิสัยทัศน์ในการวางแผนดำเนินงานและตัดสินใจในการพัฒนากระบวนการรับรองมาตรฐานการมีส่วนร่วมและขับเคลื่อนกิจกรรมทั้งหมดของกลุ่ม ผ่านกระบวนการมีส่วนร่วมอย่างแท้จริง เช่น การคิดค้นปัญหา สาเหตุ และคิดหาแนวทางแก้ไขปัญหาของกลุ่ม เพื่อให้คณะกรรมการมีส่วนร่วมในกระบวนการติดตามและประเมินผลการรับรอง พร้อมทั้งให้เกษตรกรได้มีส่วนร่วมรับประโยชน์ในกระบวนการทำนาอินทรีย์มาตรฐานการมีส่วนร่วมของกลุ่ม โดยผู้นำกลุ่มต้องแนะนำองค์ความรู้ต่างๆ ให้แก่สมาชิกทุกคน เช่น จัดหลักสูตรอบรมความรู้ที่เกี่ยวข้อง เพื่อให้สมาชิกในกลุ่มทุกคนได้รับรู้ผ่านกระบวนการเรียนรู้ เพื่อยกระดับและพัฒนาความรู้ให้กับสมาชิกทุกคน ทั้งคณะกรรมการตรวจประเมินแปลงเกษตรกร และผู้มีส่วนได้ส่วนเสียทุกคนต้องรับรู้ข้อมูลตามกระบวนการรับรองมาตรฐานแบบมีส่วนร่วมอย่างเท่าเทียมกัน โดยต้องเปิดเผยข้อมูลและกิจกรรมทุกอย่างต่อสาธารณะ เช่น แผนการดำเนินงาน การจัดอบรมความรู้ ช่วงระยะเวลาการตรวจประเมินแปลง การกลั่นกรองแปลง ที่ชัดเจนตลอดปี เพื่อให้เกษตรกรและคณะกรรมการสามารถดำเนินการจัดการตรวจประเมินแปลงในแต่ละอำเภอได้อย่างเป็น

ระบบ รวมถึงเปิดเผยข้อมูลการทำงานของกลุ่ม การประเมินและตรวจเยี่ยมแปลง การกลั่นกรองแปลงและข้อมูลพิจารณาผลการรับรองแปลงในระบบสารสนเทศเครือข่ายเกษตรกรอินทรีย์แบบมีส่วนร่วมอย่างชัดเจน เพื่อให้เกิดความเชื่อมั่นในการจัดการงานเกี่ยวกับมาตรฐาน ข้อกำหนด และการตรวจรับรอง และด้านการบริหารงานกลุ่มต่อสมาชิกทุกคนในกลุ่ม และบุคคลอื่นที่อยู่ภายนอก เช่น หน่วยงานภาครัฐ ภาคเอกชน ผู้บริโภค เป็นต้น

3. คณะกรรมการควรสร้างความเชื่อมั่นด้วยการสร้างความสัมพันธ์ที่ดีกับสมาชิกในกลุ่ม พร้อมชี้แจงบทลงโทษสำหรับผู้ที่ไม่ปฏิบัติตามข้อกำหนดผ่านกระบวนการมีส่วนร่วมในการคิดหาแนวทางแก้ไขปัญหาของกลุ่ม โดยใช้องค์ความรู้ภายใต้กระบวนการเรียนรู้ของสมาชิกกลุ่มที่ดำเนินกิจกรรมในขณะเดียวกัน เกษตรกรผู้รับการตรวจประเมินสามารถเสนอความคิดเห็นได้อย่างอิสระ โดยต้องใช้การมีส่วนร่วมเข้ามาดำเนินงาน เช่น การร่วมคิด ร่วมวิเคราะห์ ร่วมพิจารณา และร่วมรับผิดชอบ เพราะข้อมูลทุกอย่างจะถูกส่งต่อให้คณะกรรมการกลั่นกรองและคณะกรรมการพิจารณารับรองแปลงเกษตรอินทรีย์ต่อไป ทุกขั้นตอนต้องมีการเปิดเผยข้อมูลให้ชัดเจน โปร่งใส และสามารถตรวจสอบได้ จึงส่งผลให้เกิดความเชื่อมั่นต่อการดำเนินตามขั้นตอนตรวจรับรองมาตรฐานและการควบคุมแปลงของกลุ่ม ที่หน่วยงานภาครัฐ ภาคเอกชน และผู้บริโภคต้องการ

สรุปและอภิปรายผล

การถอดองค์ความรู้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา ประกอบด้วย

1. การทำนาอินทรีย์ของเกษตรกรในจังหวัดสงขลา เกษตรกรปลูกข้าวโดยวิธีหว่านแห้ง หว่านเปียก และทำนาดำ ซึ่งอาศัยน้ำฝนเป็นหลัก มีการทำแนวกันชน ใน 2 ลักษณะ คือ 1) รูปแบบกันชนที่มีอยู่เดิม 2) รูปแบบกันชนที่เกษตรกรสร้างขึ้นโดยเฉพาะ เพื่อลดการปนเปื้อนในแปลงนาอินทรีย์ สอดคล้องกับงานวิจัยของ เดือนแรม บ่อเงิน (2562) ศึกษาการเข้าสู่การผลิตข้าวอินทรีย์ที่ได้รับการรับรองมาตรฐานเกษตรอินทรีย์ของเกษตรกรในจังหวัดเชียงใหม่ พบว่า เกษตรกรต้องมีมาตรการในการลดการปนเปื้อน เช่น การจัดทำแนวกันชนรอบแปลงเกษตรอินทรีย์ที่มีพื้นที่ติดกับแปลงเกษตรเคมีที่มีการใช้สารเคมีต้องห้าม การใส่ปุ๋ยอินทรีย์ระยะแรกส่งผลให้ต้นข้าวใบเขียวช้า โตช้า และผลผลิตน้อยลง แต่เมื่อใช้อย่างต่อเนื่องต้นข้าวสามารถเติบโตดี ดินร่วนซุย และมีธาตุอาหาร การบำรุงต้นข้าวเกษตรกรนำวัตถุดิบที่หาได้ง่ายในท้องถิ่นมาใช้ผลิตปุ๋ยอินทรีย์ เช่น ปุ๋ยคอก น้ำหมักชีวภาพ น้ำหมักสมุนไพร ทำให้สามารถลดต้นทุนการผลิตลงได้ สอดคล้องกับบทความวิจัยของ พักตร์เพ็ญ ภูมิพันธ์ และคณะ (2560) ศึกษาเรื่องผลของปุ๋ยอินทรีย์คุณภาพสูงต่อการผลิตข้าวพันธุ์สุพรรณบุรี1 พบว่า การใส่ปุ๋ยอินทรีย์อัตราสูง ทำให้พืชดูดซับไนโตรเจนได้มากขึ้น จึงมีผลทำให้การเจริญเติบโตและผลผลิตมากขึ้น ตรงกันข้ามกับการใส่ปุ๋ยอินทรีย์อัตราต่ำ ทำให้พืชได้รับไนโตรเจนน้อย จึงมีการเจริญเติบโตและให้ผลผลิตน้อย การเก็บเกี่ยวมีทั้งเก็บเกี่ยวเองหรือใช้รถเก็บเกี่ยว

2. ความคิดเห็นของเกษตรกรต่อกระบวนการรับรองนาข้าวอินทรีย์ พบว่า เกษตรกรมีส่วนร่วมในการวางแผนดำเนินงาน การกำหนดการตรวจรับรองกระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่มและการตัดสินใจการพัฒนากระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่มอยู่ในระดับน้อย ทั้งนี้เพราะผู้นำและคณะกรรมการได้จัดทำร่างข้อกำหนดไว้แล้วตามรูปแบบที่ใช้กันทั่วประเทศ ทำให้เกษตรกรมีส่วนร่วมในการปรับเปลี่ยนแนวทางการทำงานและข้อกำหนดน้อย ส่งผลกระทบต่อกระบวนการมีส่วนร่วม

ตามความต้องการของสมาชิกกลุ่ม ทำให้ข้อมูลในกระบวนการคิดและวิเคราะห์ของเกษตรกรไม่สามารถนำมาเข้าสู่กระบวนการและเปิดเผยได้ ซึ่งไม่สอดคล้องกับแนวคิด/ทฤษฎีการมีส่วนร่วม โกวิทย์ พวงงาม (2545) ได้สรุปถึงการมีส่วนร่วมที่แท้จริงของประชาชนในการพัฒนา คือ การมีส่วนร่วมในการค้นหาปัญหาและสาเหตุของปัญหา การวางแผนดำเนินกิจกรรม การปฏิบัติงาน การติดตามและประเมินผลงาน ดังนั้น เพื่อให้เกษตรกรเกิดความเชื่อมั่นในขั้นตอนการดำเนินงาน ข้อกำหนด การควบคุม และบทกำหนดโทษของกลุ่ม ผู้นำควรจัดทำร่างข้อกำหนดเข้าที่ประชุมให้สมาชิกทุกคนพิจารณาให้เกิดความเหมาะสมกับบุคคลและพื้นที่ พร้อมทั้งนำเสนอแนวทางการเปลี่ยนแปลงข้อกำหนดให้ส่วนกลางพิจารณาปรับเปลี่ยนแก้ไขต่อไป

อีกทั้งผู้นำต้องชี้แจงเงื่อนไขการปรับเปลี่ยนข้อกำหนดให้สมาชิกรับทราบด้วย ซึ่งก่อให้เกิดความโปร่งใสและได้รับความไว้วางใจจากสมาชิก สอดคล้องกับ ปิ่นกนก วงศ์ปิ่นเพ็ชร์ (2552) เรื่องความเชื่อมั่น พบว่า ความไว้ใจ ความเชื่อถือ การให้การยอมรับหรือความคาดหวังในทางบวกของบุคคลหนึ่งที่มีต่อบุคคลอื่น โดยการปฏิบัติที่คาดหวังนั้นเป็นสิ่งที่เอื้อต่อบุคคลอื่น และเอื้อต่อความสำเร็จในเป้าหมายของกลุ่ม และผู้นำ นอกจากนี้คณะกรรมการควรเปิดเผยข้อมูลที่สะท้อนถึงความโปร่งใสของกระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม โดย พิฐุวรรณ กิติคุณ (ม.ป.ป.) ได้สรุปถึงความโปร่งใส คือ การตัดสินใจในเรื่องต่างๆ การกำหนดกติกา หลักเกณฑ์ และกระบวนการทำงาน ที่ต้องจัดให้มีการเปิดเผยและเปิดโอกาสให้ผู้ได้เสียทั้งภายในและภายนอกหน่วยงาน สามารถเข้าถึงข้อมูลดังกล่าวด้วยวิธีการต่าง ๆ

3. การถอดความรู้การทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา พบว่า เกษตรกรใช้รูปแบบโครงสร้างพื้นฐานจากหน่วยงานรัฐหรือสภาพแวดล้อมพื้นฐานรอบแปลงเกษตรเพื่อเป็นการลดต้นทุนเพราะการทำแนวกันชนแบบยกคันดินมีค่าใช้จ่ายสูง เกษตรกรมีการเพาะปลูกเมล็ดพันธุ์เอง โดยเก็บเมล็ดพันธุ์ส่วนหนึ่งไว้ปลูกรอบต่อไป เกษตรกรมีการใส่ปุ๋ยคอกก่อนการหว่านเมล็ดหรือปักดำ เพราะปุ๋ยคอกช่วยให้ดินร่วนซุย เมล็ดพันธุ์ขยายรากได้เร็วขึ้น รวมถึงการทำน้ำหมักบำรุงต้นข้าวจะนำวัตถุดิบในท้องถิ่น เช่น เศษผัก เศษปลา มาผสมกับกากน้ำตาลและน้ำสะอาด เพื่อเพาะเลี้ยงให้เกิดจุลินทรีย์พันธุ์ดี สามารถช่วยย่อยธาตุอาหารที่ต้นข้าวต้องการได้ ในกรณีแปลงนามีน้ำท่วมขัง เกษตรกรจะใช้ท่อ PVC ฝังไว้บริเวณคันนาเพื่อระบายน้ำ เพราะถ้าเกิดน้ำท่วมจะส่งผลให้ต้นข้าวตายและไม่ได้รับการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม ซึ่งระหว่างการทำนาอินทรีย์เกษตรกรมีการบันทึกฟาร์ม เช่น จดบันทึกในสมุด บันทึกในโทรศัพท์มือถือ เพื่อเป็นหลักฐานให้คณะกรรมการตรวจรับรองมาตรฐานฯแปลง และเป็นสถิติเพื่อวิเคราะห์ผลการทำนารอบต่อไปให้ดีขึ้น สอดคล้องกับอนุรักษ์ เรืองรอบ (2561) ได้กล่าวถึงกระบวนการและข้อกำหนดการรับรองมาตรฐานของกลุ่มสมาพันธ์เกษตรกรรมยั่งยืนจังหวัดสงขลา ไว้ว่า เกษตรกรต้องจัดทำบันทึกฟาร์ม บัญชีฟาร์ม สมุดเยี่ยมฟาร์ม โดยละเอียด จะต้องนำมาให้ผู้ตรวจแปลงพิจารณาว่ามีความเสี่ยงจากการปนเปื้อนสารเคมีสังเคราะห์ในปัจจัยการผลิตและกิจกรรมที่ทำหรือไม่ นอกจากนี้ยังมีความสำคัญอย่างยิ่งในการใช้เป็นหลักฐานขอรับรองมาตรฐานระดับสากลควบคู่กันไปด้วย ส่วนการขับเคลื่อนกระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมในจังหวัดสงขลา ผู้นำกลุ่ม คณะกรรมการฯ เกษตรกร และผู้มีส่วนได้เสีย ต้องมีส่วนร่วมในกิจกรรม เช่น การกำหนดหลักสูตรอบรมเรียนรู้ การร่วมวางแผนตรวจประเมินแปลงในช่วงระยะเวลาที่สอดคล้องกับการทำนา การคิดค้นปัญหา สาเหตุ และแนวทางแก้ไข พร้อมทั้งร่วมรับประโยชน์และรับผิดชอบ ซึ่งข้อมูลทั้งหมดที่กลุ่มมีการดำเนินการจะต้องเปิดเผยต่อสาธารณะที่ทุกคนสามารถเข้าถึงและตรวจสอบได้ เพื่อให้เกิดความโปร่งใสและความเชื่อมั่นในผู้นำกลุ่ม

คณะกรรมการฯ เกษตรกร และผู้มีส่วนได้เสียในทุกภาคส่วน ในกระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วมมากขึ้น

ข้อเสนอแนะ

1. ข้อเสนอแนะทั่วไป

1.1 ข้อเสนอแนะต่อหน่วยงานต่อกระบวนการทำนาอินทรีย์ของเกษตรกร

1.1.1 ศูนย์วิจัยข้าวปัตตานี มีบทบาทหน้าที่ในการถ่ายทอดและสนับสนุนเทคโนโลยีการผลิตและการจัดการผลผลิตข้าวครอบคลุม 5 จังหวัดชายแดนภาคใต้ โดยมีจังหวัดสงขลาเป็นองค์ประกอบ สำนักวิจัยและพัฒนาการเกษตรเขตที่ 8 มีภารกิจหลักในการวิเคราะห์ ทดสอบ ตรวจสอบและรับรองดิน น้ำ พืช ปุ๋ย สารเคมีการเกษตร ผลิตผล ผลิตภัณฑ์พืช และมาตรฐานสินค้าเกษตร โดยการให้ความรู้ในพื้นที่ 7 จังหวัดภาคใต้ตอนล่าง โดยมีจังหวัดสงขลาเป็นองค์ประกอบ ควรมีการบูรณาการให้ความรู้ในการจัดการแปลงข้าวอินทรีย์ตามหลักวิชาการที่ถูกต้องแก่เกษตรกรเพื่อลดต้นทุนและเพิ่มผลผลิต อีกทั้งควรประชาสัมพันธ์ข้าวอินทรีย์ในเว็บไซต์ของแต่ละหน่วยงานให้มากขึ้น เพื่อให้ประชาชนรู้จักและรู้แหล่งที่มาของข้าวอินทรีย์ที่ผ่านการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม ก่อให้เกิดความน่าเชื่อถือต่อผู้บริโภค

1.1.2 สถานีพัฒนาที่ดินสงขลา ควรส่งเสริมองค์ความรู้การทำปุ๋ยอินทรีย์และสนับสนุนหัวเชื้อจุลินทรีย์ทำน้ำหมักชีวภาพ เพื่อใช้ในการปรับสภาพดินเหนียวและดินแข็งให้มีความเหมาะสมต่อการเพาะปลูกข้าว

1.1.3 ศูนย์วิจัยข้าวปัตตานี มีบทบาทหน้าที่ในการถ่ายทอดและสนับสนุนเทคโนโลยีการผลิตและการจัดการผลผลิตข้าวครอบคลุม 5 จังหวัดชายแดนภาคใต้ โดยมีจังหวัดสงขลาเป็นองค์ประกอบ ควรสนับสนุนเครื่องจักรสำหรับเก็บเกี่ยบข้าวอินทรีย์ให้เกษตรกรให้ยืมใช้งาน เพื่อลดต้นทุนค่าเก็บเกี่ยวข้าวเปลือกและเพื่อความเหมาะสมในการแบ่งแยกการเก็บเกี่ยวข้าวอินทรีย์และข้าวทั่วไป เพื่อให้เกิดความเชื่อมั่นแก่ผู้บริโภค

1.2 ข้อเสนอแนะต่อผู้นำและผู้ประเมินแปลงเกี่ยวกับความเชื่อมั่น ความโปร่งใส และการมีส่วนร่วม

1.2.1 ผู้นำและผู้ประเมินแปลงควรสร้างความเชื่อมั่น ความไว้ใจ ความเชื่อถือให้เกษตรกรที่เข้าร่วมกระบวนการตรวจรับรองนาข้าวอินทรีย์มาตรฐานแบบมีส่วนร่วม PGS ในจังหวัดสงขลา โดยจัดทำขั้นตอนดำเนินงาน ข้อกำหนด การควบคุม และบทกำหนดโทษ ตามแนวทางการตรวจรับรองมาตรฐานแบบมีส่วนร่วม PGS และเผยแพร่ในสื่อประชาสัมพันธ์ออนไลน์ เช่น ไลน์กลุ่ม เฟซบุ๊ก ซึ่งทุกคนเข้าถึงได้ให้ดียิ่งขึ้นต่อไป

1.2.2 ผู้นำและผู้ประเมินแปลงควรมีการปรับปรุงเรื่องการเปิดเผยข้อมูลการตรวจประเมินแปลง การตรวจเยี่ยมแปลง การกลั่นกรองแปลง และแนวทางการทำงานของกลุ่มให้ผ่านสื่อประชาสัมพันธ์ออนไลน์ เช่น ไลน์กลุ่ม เฟซบุ๊ก ซึ่งสมาชิกทุกคนสามารถเข้าตรวจสอบข้อมูลได้ทั้งหมด (ยกเว้นข้อมูลเฉพาะส่วนบุคคล) เพื่อก่อให้เกิดความโปร่งใสต่อกระบวนการทำงาน การรับรองมาตรฐานอินทรีย์แบบมีส่วนร่วม

1.2.3 ผู้นำและผู้ประเมินแปลงควรมีการปรับปรุงช่องทางให้เกษตรกรได้เข้ามามีส่วนร่วมในเรื่องในการกำหนดการตรวจรับรองและการตัดสินใจการพัฒนากระบวนการทำนาอินทรีย์แบบมีส่วนร่วมของกลุ่มมากยิ่งขึ้น เพื่อช่วยกันพัฒนากระบวนการรับรองให้มีมาตรฐานและเป็นที่ยอมรับ

1.3 ข้อเสนอแนะต่อเกษตรกร

1.3.1 เกษตรกรที่เข้าร่วมการทำนาอินทรีย์ภายใต้กระบวนการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม ควรมีการศึกษาหาความรู้เกี่ยวกับข้าวอินทรีย์และเทคนิคการผลิตเพื่อผลิตข้าวอินทรีย์ให้มีคุณภาพมากขึ้น และช่องทางการสื่อสารที่ก่อให้เกิดความน่าเชื่อถือต่อผู้บริโภคและผู้มีส่วนได้เสีย

1.3.2 เกษตรกรควรยึดหลักการปฏิบัติตามข้อกำหนดการรับรองมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม เพื่อให้กระบวนการรับรองมีการพัฒนามาตรฐานไปได้อย่างรวดเร็ว

2. ข้อเสนอแนะสำหรับผู้วิจิยที่สนใจศึกษาข้อมูลขั้นต่อไป

2.1 การศึกษาครั้งต่อไปควรขยายขอบเขตของประชากร เพื่อศึกษาประชากรในกลุ่มที่กว้างขึ้น เช่น ความคิดเห็นของผู้บริโภคต่อการยอมรับมาตรฐานเกษตรอินทรีย์แบบมีส่วนร่วม

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การทดสอบเทคโนโลยีใช้ปุ๋ยที่เหมาะสมสำหรับผลิตปาล์มน้ำมัน กรณีศึกษาชุมชนชะแล้ จังหวัดสงขลา

Testing Suitable Fertilizer Technology for Oil Palm Production; case study of Chalae Community, Songkhla Province

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บทคัดย่อ

การจัดการปุ๋ยเป็นปัจจัยสำคัญต่อการให้ผลผลิตของปาล์มน้ำมัน การทดสอบเทคโนโลยีที่เหมาะสมในการผลิตปาล์มน้ำมันชุมชนชะแล้ จังหวัดสงขลา มีวัตถุประสงค์เพื่อทดสอบเทคโนโลยีการใช้ปุ๋ยที่เหมาะสมเพื่อการผลิตปาล์มน้ำมันและผลตอบแทนทางด้านเศรษฐกิจ ทำการทดสอบในแปลงปาล์มน้ำมันของเกษตรกรในพื้นที่ตำบลชะแล้ อำเภอสิงหนคร จังหวัดสงขลา จำนวน 10 แปลง ๆ ละ 4 ไร่ ต้นปาล์มอายุ 4 - 8 ปี ประกอบด้วย 2 กรรมวิธี คือ กรรมวิธีแนะนำใส่ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร และกรรมวิธีใส่ปุ๋ยตามวิธีเกษตรกร เปรียบเทียบผลผลิตทะลายสด และผลตอบแทนทางเศรษฐกิจ พบว่า กรรมวิธีแนะนำใส่ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร และกรรมวิธีใส่ปุ๋ยตามวิธีเกษตรกร ให้ผลผลิตไม่มีความแตกต่างกันทางสถิติ ($p>0.05$) ทั้งนี้ การปฏิบัติตามวิธีที่แนะนำให้ผลผลิตสูงกว่าร้อยละ 13.82 ต้นทุนต่ำกว่า 1.04 บาทต่อกิโลกรัม รายได้สุทธิสูงกว่าร้อยละ 72.71 และอัตราส่วนรายได้ต่อต้นทุนสูงกว่า 0.44 สะท้อนว่าการใส่ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร ให้ผลผลิตปาล์มน้ำมันเทียบเท่ากับกรรมวิธีของเกษตรกร แต่สามารถลดต้นทุนและเพิ่มผลกำไรสุทธิได้สูงกว่า แนวทางดังกล่าวจึงเป็นการลดต้นทุนของเกษตรกรโดยไม่กระทบกับปริมาณผลผลิต

คำสำคัญ: ปาล์มน้ำมัน, การใช้ปุ๋ย

Abstrac

In agricultural production, fertilizer management plays a crucial role in influencing the yield of oil palm. The development of suitable technologies for oil palm production in the local community of Chalae, Songkhla Province, is aimed at researching to test appropriate fertilizer use technology for oil palm production and economic returns. The study was conducted in oil palm plantations owned by farmers in the Chalae sub-district, Songkhla District, Songkhla Province. A total of 10 plots, each measuring 4 rai, with oil palms aged between 4 - 8 years, were involved in the study. Two fertilization methods were employed: the recommended method following the guidelines of the Department

of Agriculture and the farmer's method based on their practices. The comparison of fresh fruit bunch yields and economic returns revealed no statistically significant differences between the recommended fertilization method and the farmer's method ($p>0.05$). Furthermore, the Benefit-Cost Ratio (BCR) for the recommended fertilizer application method and the farmer's practice averaged 1.94 and 1.50, respectively. This suggests that following the fertilizer recommendations of the Department of Agriculture results in oil palm yields comparable to the farmer's method. However, it can effectively reduce costs and increase net profits. Therefore, adopting the recommended fertilizer application approach not only maintains oil palm production but also contributes to lowering the overall expenses for farmers without compromising yield quantities.

Keywords: Oil palm, fertilizer application

บทนำ

จังหวัดสงขลามีพื้นที่ปลูกปาล์มน้ำมันมากเป็นอันดับ 4 ของภาคใต้ตอนล่าง และเป็นพืชเศรษฐกิจสำคัญอันดับที่ 3 ของจังหวัดสงขลา รองจากยางพาราและข้าว โดยมีพื้นที่ปลูกปาล์มน้ำมัน 85,204 ไร่ พื้นที่ให้ผลผลิต 80,160 ไร่ ให้ผลผลิตรวม 213,298 ตัน ผลผลิตเฉลี่ย 2,661 กิโลกรัมต่อไร่ (สำนักงานเศรษฐกิจการเกษตร, 2566) และเนื่องมาจากยางพารามีราคาตกต่ำลงอย่างต่อเนื่อง ทำให้เกษตรกรขยายพื้นที่ปลูกปาล์มน้ำมันเพิ่มมากขึ้น

การผลิตปาล์มน้ำมันในปัจจุบัน เกษตรกรผู้ปลูกปาล์มน้ำมันส่วนใหญ่มีปัญหาด้านปริมาณผลผลิตและราคาปุ๋ยเคมีที่สูงขึ้น ทำให้ต้นทุนในการผลิตสูง เนื่องจากปาล์มน้ำมันเป็นพืชที่ต้องการธาตุอาหารสูง ประกอบกับเกษตรกรมีการใช้ปุ๋ยไม่ถูกต้องทั้งสูตรปุ๋ย ปริมาณ ช่วงเวลา และวิธีการใส่ปุ๋ย ทำให้ผลผลิตต่อไร่ต่ำและต้นทุนในการผลิตสูง โดยต้นทุนการผลิตปาล์มน้ำมันอยู่ที่ 8,131.56 บาทต่อไร่ต่อปี (สำนักงานเศรษฐกิจการเกษตร, 2564) ทั้งนี้ต้นทุนการผลิตปาล์มน้ำมัน 60 เปอร์เซ็นต์มาจากปุ๋ยเคมี (Rankine & Fairhurst, 1998) เป็นสาเหตุสำคัญที่ทำให้การผลิตมีอัตราผลตอบแทนต่ำกระทบต่อความมั่นคงของเศรษฐกิจฐานราก

ดังนั้นจึงจำเป็นที่จะต้องปรับปรุงประสิทธิภาพการผลิต โดยการพัฒนาและทดสอบประสิทธิภาพการใช้ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร และนำผลลัพธ์จากการวิจัยส่งกลับสู่เกษตรกร พัฒนาเกษตรกรต้นแบบและเครือข่ายการถ่ายทอดความรู้ของกลุ่มเกษตรกรแปลงใหญ่ กระตุ้นให้เกิดการรับรู้และตระหนักถึงความสำคัญของการจัดการปุ๋ยอย่างเหมาะสม ดังนั้น การศึกษานี้จึงมีวัตถุประสงค์เพื่อทดสอบเทคโนโลยีที่เหมาะสมในการผลิตปาล์มน้ำมัน เปรียบเทียบกรรมวิธีการใส่ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร และกรรมวิธีใส่ปุ๋ยตามวิธีเกษตรกร

วัตถุประสงค์ของการวิจัย

1. เพื่อทดสอบเทคโนโลยีการใช้ปุ๋ยที่เหมาะสมเพื่อการผลิตปาล์มน้ำมันและผลตอบแทนทางด้านเศรษฐกิจ

วิธีดำเนินการวิจัย

คัดเลือกแปลงปาล์มน้ำมันลูกผสมเทเนอร่าในพื้นที่ของเกษตรกรรายย่อย ตำบลชะแล้ อำเภอสิงหนคร จังหวัดสงขลา จำนวน 10 ราย รายละ 4 ไร่ รวม 40 ไร่ ปาล์มน้ำมันอายุ 4- 8 ปี เพื่อวิเคราะห์พื้นที่ ได้แก่ สภาพพื้นที่ปลูก พันธุ์ อายุ ระยะปลูก การจัดการสวนปาล์มน้ำมัน อาการขาดธาตุอาหาร ผลผลิต โดยการสำรวจพื้นที่ และสัมภาษณ์เกษตรกร วางแผนและดำเนินการทดสอบ ซึ่งจะเป็นการทดสอบเชิงเปรียบเทียบระหว่างเทคโนโลยีการผลิตปาล์มน้ำมันจากงานวิจัย กับวิธีการที่เกษตรกรปฏิบัติอยู่เดิม วางแผนการทดลองแบบ RCBD 2 กรรมวิธี 2 ซ้ำ ใช้ต้นปาล์มน้ำมัน 22 ต้นต่อกรรมวิธีที่ 1 ซ้ำใช้ต้นปาล์มน้ำมัน 44 ต้นต่อซ้ำ ประกอบด้วย กรรมวิธีที่ 1 กรรมวิธีแนะนำ การใส่ปุ๋ยปาล์มน้ำมันตามคำแนะนำของกรมวิชาการเกษตร กรรมวิธีที่ 2 กรรมวิธีเกษตรกร การใส่ปุ๋ยตามที่เกษตรกรปฏิบัติอยู่เดิม ทำการทดลองในช่วงเดือนตุลาคม 2565 ถึงเดือนกันยายน 2566 กรรมวิธีแนะนำ ใส่ปุ๋ยเคมีตามคำแนะนำของกรมวิชาการเกษตร ดังนี้ ใส่แม่ปุ๋ยสูตร 21-0-0 อัตรา 4 กิโลกรัมต่อต้นต่อปี ใส่แม่ปุ๋ยสูตร 0-0-60 อัตรา 3 กิโลกรัมต่อต้นต่อปี ใส่แม่ปุ๋ยสูตร 0-3-0 อัตรา 1.5 กิโลกรัมต่อต้นต่อปี ใส่กีเซอร์ไรท์อัตรา 1 กิโลกรัมต่อต้นต่อปี และใส่โบเรทอัตรา 130 กรัมต่อต้นต่อปี กรรมวิธีเกษตรกร ใส่ปุ๋ยตามวิธีเกษตรกร ซึ่งเกษตรกรแต่ละรายมีการใส่ปุ๋ยสูตรที่แตกต่างกัน ได้แก่ ปุ๋ยสูตรผสม 14-7-35, 13-13-21, 10-10-30, 16-16-16, 15-15-15, 15-10-30 และแม่ปุ๋ย ได้แก่ 46-0-0, 21-0-0, 0-0-60, 0-3-0 ใส่แมกนีเซียมโดโลไมท์ และมีการใส่โบเรท การจัดการสวนของเกษตรกรเหมือนกันทุกราย

การบันทึกข้อมูล

1. ผลวิเคราะห์สมบัติทางเคมีของดินก่อนการทดลอง ได้แก่ ค่าปฏิกิริยาดิน ไนโตรเจน ฟอสฟอรัส โพแทสเซียม แคลเซียม และแมกนีเซียม เก็บตัวอย่างดินรายละ 2 ตัวอย่าง

2. ผลวิเคราะห์ธาตุอาหารในใบ (ทางใบที่ 17) ก่อนการทดลอง ได้แก่ ไนโตรเจน ฟอสฟอรัส โพแทสเซียม แมกนีเซียม และโบรอน เก็บตัวอย่างใบรายละ 2 ตัวอย่าง

3. น้ำหนักผลผลิต เก็บข้อมูล 18 ครั้ง

4. เก็บข้อมูลทางด้านเศรษฐศาสตร์ ได้แก่ ต้นทุนการผลิต รายได้ ผลตอบแทน

การวิเคราะห์ข้อมูล

วิเคราะห์ข้อมูลทางสถิติโดยการเปรียบเทียบความแตกต่างของค่าเฉลี่ย โดยวิธี t-test ใช้วิธีการหาค่าเฉลี่ย และอัตราผลตอบแทนต่อการลงทุน

ผลการวิจัย

1. ข้อมูลพื้นฐานเกษตรกรที่เข้าร่วมโครงการ

การสำรวจและสัมภาษณ์เกษตรกรที่เข้าร่วมในโครงการวิจัย จำนวน 10 ราย พบว่า พื้นที่ปลูกปาล์มน้ำมันโดยส่วนใหญ่อยู่ในชุดดินที่ไม่มีความเหมาะสมสำหรับปลูกปาล์มน้ำมัน ได้แก่ ชุดดินระแงะ ระโนด และพื้นที่แฉะ ซึ่งมีสมบัติดินเป็นดินเปรี้ยวจัด และดินเป็นกรดมาก การระบายน้ำอยู่ในระดับเลว การปลูกปาล์มน้ำมันต้องมีการปลูกแบบขุดยกร่องและในดินที่เป็นดินเปรี้ยวดินป่าพรุต้องมีการปรับปรุงดินโดยการเติมปูนก่อนการปลูกพืช (กรมพัฒนาที่ดิน, 2563) (ตารางที่ 1) ปาล์มน้ำมันอายุ 4 - 8 ปี ประกอบด้วย พันธุ์ลูกผสมสุราษฎร์ธานีของกรมวิชาการเกษตร จำนวน 9 ราย และ พันธุ์นิวเทอร์ร่า จำนวน 1 ราย ใช้ระยะปลูก 9×9×9 เมตร และ 8×8×8 เมตร การใช้น้ำอาศัยน้ำฝน กำจัดวัชพืชโดยการตัด และใช้สารเคมีกำจัดวัชพืช เกษตรกรใส่ปุ๋ยสูตรผสม ได้แก่ 13-13-21, 10-10-30, 15-15-15, 14-

7-35, 15-15-18 และ 15-10-30 บางรายใส่แม่ปุ๋ย ได้แก่ 21-0-0, 46-0-0, 0-0-60 ไม่มีการใส่โบรอน และแมกนีเซียม มีการใส่มูลไก่ จำนวน 2 ราย อัตราปุ๋ยที่ใช้ 0.5 - 4.0 กิโลกรัมต่อต้นต่อครั้ง ใส่ปุ๋ยจำนวน 1 - 4 ครั้งต่อปี (ตารางที่ 2) ปริมาณการใช้ปุ๋ยเมื่อวิเคราะห์เปรียบเทียบกับคำแนะนำของกรมวิชาการเกษตร พบว่า มีทั้งรายที่ใช้มากเกินความต้องการและบางรายที่ใช้น้อยกว่าความต้องการของปาล์มน้ำมัน จึงทำให้ปาล์มน้ำมันแสดงอาการขาดธาตุอาหารพืช ได้แก่ โพแทสเซียม โบรอน แมกนีเซียม และความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียม ส่งผลให้ผลผลิตทะลายสดต่ำ ปริมาณผลผลิต 750 – 2,700 กิโลกรัมต่อไร่ (ตารางที่ 2) อย่างไรก็ตามเกษตรกรไม่ได้บันทึกอัตราการใส่ปุ๋ย และปริมาณผลผลิตทะลายสด ข้อมูลผลผลิตจึงเป็นข้อมูลประมาณการจากการสัมภาษณ์

ตารางที่ 1 รายชื่อเกษตรกรและที่ตั้งแปลงทดสอบปาล์มน้ำมันในอำเภอสิงหนคร จังหวัดสงขลา

แปลงเกษตรกร	ที่ตั้งแปลง		
	พิกัดภูมิศาสตร์	ชุดดิน	สมบัติดิน
นายประสิทธิ์ เพชรจำรัส	47 N E 659279 N 806141	ระแงะ	ดินเปรี้ยวจัด
นายสุทิน บูรพัฒ	47 N E 659034 N 806603	ระแงะ	ดินเปรี้ยวจัด
นางโอภาส ชัยสงคราม	47 N E 658547 N 807074	พื้นที่แฉะ	ดินเปรี้ยวจัด
นายนำพล จอกลอย	47 N E 657996 N 807387	พื้นที่แฉะ	ดินเปรี้ยวจัด
นายบัญชา จอกลอย	47 N E660102 N 808414	ระโนด	ดินเป็นกรดมาก
นางผิน พุมประไพ	47 N E 659854 N 806788	ระโนด	ดินเป็นกรดมาก
นางสรวง สุวรรณะ	47 N E 659814 N 806751	ระโนด	ดินเป็นกรดมาก
นายเจริญ รัตนกุล	47 N E 659318 N 808461	ระโนด	ดินเป็นกรดมาก
นายสมนึก รัตนสุวรรณ	47 N E 659646 N 807347	ระโนด	ดินเป็นกรดมาก
นายประเสริฐ สุวรรณโณ	47 N E 658865 N 807171	พื้นที่แฉะ	ดินเปรี้ยวจัด

ตารางที่ 2 ข้อมูลพื้นฐานแปลงทดสอบการใส่ปุ๋ยปาล์มน้ำมันตามคำแนะนำกรมวิชาการเกษตรในพื้นที่อำเภอสิงหนครก่อนการทดลอง

แปลงเกษตรกร	พันธุ์ปาล์มน้ำมัน	อายุ (ปี)	ระยะปลูก (เมตร)	การจัดการสวนปาล์มน้ำมันก่อนการทดสอบ					อาการขาดธาตุอาหารใบปาล์มน้ำมัน	ผลผลิต (กก./ไร่/ปี)
				ระบบน้ำ	การใส่ปุ๋ย			กำจัดวัชพืช		
					ชนิด	กก./ต้น	ครั้ง/ปี			
นายประสิทธ์ เพชรจำรัส	ลูกผสมสุราษฎร์ธานี	5	9×9×9	ฝน	13-13-21	1.5	4	ตัด	-	2,000
นายสุทิน บูรพัฒ	ลูกผสมสุราษฎร์ธานี 2	7	9×9×9	ฝน	0-0-60 21-0-0	2 0.5	2 1	ตัด	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียมแมกนีเซียม	1,000
นางโอภาส ชัยสงคราม	ลูกผสมสุราษฎร์ธานี 7	4	8×8×8	ฝน	13-13-21	2	3	ตัด	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียมโบรอน	1,800
นายนำพล จอกลอย	ลูกผสมสุราษฎร์ธานี	7	9×9×9	ฝน	10-10-30 มูลไก่	2 2	3 2	ตัด, ไกลโฟเซส	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียมโบรอน	2,400
นายบัญชา จอกลอย	ลูกผสมสุราษฎร์ธานี 2	6	9×9×9	ฝน	10-10-30	2	3	ตัด, ไกลโฟเซส	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียมโบรอน	1,714

ตารางที่ 2 (ต่อ)

แปลงเกษตรกร	พันธุ์ปาล์มน้ำมัน	อายุ (ปี)	ระยะปลูก (เมตร)	การจัดการสวนปาล์มน้ำมันก่อนการทดสอบ					อาการขาดธาตุอาหารใบปาล์มน้ำมัน	ผลผลิต (กก./ไร่/ปี)
				ระบบน้ำ	การใส่ปุ๋ย			กำจัดวัชพืช		
					ชนิด	กก./ต้น	ครั้ง/ปี			
นางผิน พุมประไพ	ลูกผสม สุราษฎร์ธานี	5	9×9×9	ฝน	10-10-30 13-13-21 0-0-60 21-0-0 46-0-0	2 2 3 สูตรผสม 2.5	2 2 1	ตัด	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียม	2,700
นางสรวง สุวรรณะ	ลูกผสม สุราษฎร์ธานี	5	9×9×9	ฝน	0-0-60 15-15-15	1 1	2 2	ตัด	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียม โบรอน โพแทสเซียม	750
นายเจริญ รัตนกุล	นิวเทอร์ร่า	8	9×9×9	ฝน	14-7-35 0-0-60	2.5 2.5	3 1	ตัด	-	2,000
นายสมนึก รัตนสุวรรณ	ลูกผสม สุราษฎร์ธานี 2	4.5	9×9×9	ฝน	15-15-18	1.5	4	ตัด	ความไม่สมดุลระหว่างไนโตรเจนและโพแทสเซียม โบรอน	2,000
นายประเสริฐ สุวรรณโณ	ลูกผสม สุราษฎร์ธานี 7	6	9×9×9	ฝน	15-10-30 มูลไก่	4 40	2 1	ตัด	โบรอน	2,400

2. ผลการวิเคราะห์ดินและใบก่อนการทดลอง

2.1 ผลวิเคราะห์ดิน

2.1.1 ผลการวิเคราะห์ดินก่อนการทดลอง พบว่า พื้นที่ปลูกปาล์มน้ำมันในการทดลองมีเนื้อดิน 2 ประเภท ได้แก่ ดินเหนียว และดินเหนียวปนทรายแป้ง แปลงที่ดำเนินการทดลองส่วนใหญ่เนื้อดินไม่ค่อยเหมาะสม ความเป็นกรด-ด่างของดิน (pH) มีค่าระหว่าง 3.41 - 4.35 ซึ่งเป็นดินกรดจัดมาก มีความเหมาะสมสำหรับปลูกปาล์มน้ำมันในระดับต่ำมากถึงระดับปานกลาง อินทรียวัตถุเท่ากับ 1.64 - 4.77 เปอร์เซ็นต์ ปริมาณไนโตรเจนมีปริมาณธาตุอาหารร้อยละ 0.08 - 0.24 อยู่ในระดับที่ต่ำมากถึงสูง ปริมาณฟอสฟอรัสที่พืชสามารถนำไปใช้ได้ 6.38 – 167.48 มิลลิกรัมต่อกิโลกรัม อยู่ในระดับต่ำมากถึงสูงมาก ปริมาณโพแทสเซียมที่พืชสามารถจะนำมาใช้ได้มีค่า 122.30 - 517.82 มิลลิกรัมต่อกิโลกรัม อยู่ในระดับสูงมาก ปริมาณแมกนีเซียมที่แลกเปลี่ยนได้ 1.77 - 7.57 มิลลิกรัมต่อกิโลกรัม (ตารางที่ 3) ซึ่งตามกรมวิชาการเกษตร (2561) รายงานว่า ดินที่เหมาะสมในการปลูกปาล์มน้ำมันเป็นดินร่วนปนทราย ดินร่วน ดินร่วนเหนียวปนทราย ดินร่วนปนเหนียว ดินร่วนเหนียวปนทรายแป้ง ดินเหนียวปนทราย ดินทรายปนร่วน ดินเหนียวปนทรายแป้ง และดินที่ระดับความลึก 0 - 20 เซนติเมตร ควรมี pH 5.5

ตารางที่ 3 สมบัติทางเคมีและปริมาณธาตุอาหารพืชในดินก่อนการทดลอง

แปลงเกษตรกร	สมบัติทางเคมีและปริมาณธาตุอาหารพืชในดิน						
	เนื้อดิน	Ph (1:1)	OM (%)	T-N (%)	Avail.P (mg/kg)	Avail.K (mg/kg)	Exch.Mg (mg/kg)
นายประสิทธิ์ เพชรจำรัส	ดินเหนียว	3.80	3.78	0.19	11.38	122.30	2.16
นายสุทิน บูรพัฒ	ดินเหนียว	3.84	4.77	0.24	6.38	156.00	1.90
นางโอภาส ชัยสงคราม	ดินเหนียว	3.41	3.49	0.17	47.89	175.29	1.77
นายนำพล จอกลอย	ดินเหนียว	4.04	3.86	0.19	82.74	323.33	2.58
นายบัญชา จอกลอย	ดินเหนียวปนทรายแป้ง	5.40	2.22	0.11	50.56	212.37	7.57
นางผิน พุมประไพ	ดินเหนียว	4.16	1.96	0.10	167.48	415.85	6.86
นางสรวง สุวรรณะ	ดินเหนียว	3.66	2.61	0.13	76.23	296.93	2.84
นายเจริญ รัตนกุล	ดินเหนียว	3.94	1.64	0.08	24.81	517.82	6.56
นายสมนึก รัตนสุวรรณ	ดินเหนียว	4.35	2.10	0.10	134.74	482.11	5.96
นายประเสริฐ สุวรรณโณ	ดินเหนียวปนทรายแป้ง	3.51	4.04	0.20	71.61	325.57	1.87

2.1.2 ผลวิเคราะห์ตัวอย่างใบปาล์มน้ำมันทางใบที่ 17 ก่อนดำเนินการทดลอง เพื่อประเมินความต้องการธาตุอาหารของปาล์มน้ำมัน พบว่า แปลงที่ทำการทดลองมีความเข้มข้นของธาตุไนโตรเจน ฟอสฟอรัส โพแทสเซียมส่วนใหญ่อยู่ในเกณฑ์ที่ขาดธาตุอาหาร แมกนีเซียมส่วนใหญ่อยู่ในระดับเกินความเหมาะสม มีธาตุแมกนีเซียมเหมาะสม 3 แปลง สำหรับธาตุโบรอนส่วนใหญ่อยู่ในระดับเหมาะสม ธาตุโบรอนอยู่ในระดับเกิน 2 แปลง (ตารางที่ 4)

ผลการวิเคราะห์และทดสอบถ่ายทอดเทคโนโลยีการประเมินปริมาณการใส่ปุ๋ยตามค่าวิเคราะห์ดินและใบ ให้แก่เกษตรกร พบว่า การยอมรับเทคโนโลยีในระดับไร่นายากต่อการปรับใช้ของเกษตรกร เนื่องมาจากวิธีการมีความยุ่งยาก จึงได้ปรับการทดสอบให้ใส่ปุ๋ยตามคำแนะของกรมวิชาการเกษตร ดังนี้ ใส่ปุ๋ยสูตร 21-0-0 อัตรา 4 กิโลกรัมต่อต้นต่อปี สูตร 0-3-0 อัตรา 1.50 กิโลกรัมต่อต้นต่อปี

สูตร 0-0-60 อัตรา 3 กิโลกรัมต่อต้นต่อปี แมกนีเซียมอัตรา 1 กิโลกรัมต่อต้นต่อปี ส่วนโบรอนใส่อัตรา 130 กรัมต่อต้นต่อปี แบ่งใส่อย่างน้อย 3 ครั้งต่อปี เปรียบเทียบกับวิธีการที่เกษตรกรปฏิบัติอยู่เดิม

ตารางที่ 4 ความเข้มข้นของธาตุอาหารพืชในใบปาล์มน้ำมันทางใบที่ 17 ก่อนการทดลอง

แปลงเกษตรกร	ความเข้มข้นของธาตุอาหารพืชในใบปาล์มน้ำมัน				
	N (%)	P (%)	K (%)	Mg (%)	B (mg/kg)
นายประสิทธิ์ เพชรจำรัส	1.81	0.12	0.29	0.53	17.51
นายสุทิน บูรพัฒ	1.63	0.12	0.34	0.54	20.19
นางโอภาส ชัยสงคราม	1.96	0.13	0.86	0.39	25.45
นายนำพล จอกลอย	2.04	0.14	0.75	0.41	18.32
นายบัญชา จอกลอย	1.95	0.13	0.32	0.48	16.98
นางผิน พุมประไพ	2.33	0.14	0.38	0.48	19.42
นางสรวง สุวรรณะ	2.09	0.14	0.60	0.62	23.53
นายเจริญ รัตนกุล	2.15	0.14	0.37	0.54	57.00
นายสมนึก รัตนสุวรรณ	2.43	0.19	0.63	0.58	16.44
นายประเสริฐ สุวรรณโณ	2.39	0.17	0.80	0.42	30.77

3. ปริมาณธาตุอาหารพืชและอัตราปุ๋ยที่ใส่ให้กับปาล์มน้ำมัน

ปริมาณธาตุอาหารพืชและอัตราปุ๋ยที่ใส่ให้กับปาล์มน้ำมันต่อปี พบว่า กรรมวิธีแนะนำ ใส่ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร มีการใส่ปุ๋ย 0.84-0.30-1.84 N-P_2O_5-K_2O กิโลกรัมต่อต้นต่อปี รวมทั้งใส่ 0.26 MgO กิโลกรัมต่อต้นต่อปี และใส่ 182 B กรัมต่อต้นต่อปี คิดเป็นอัตราปุ๋ยสูตร 21-0-0 สูตร 0-3-0 สูตร 0-0-60 และกีเซอร์ไรท์ 4, 1.50, 3 และ 1 กิโลกรัมต่อต้นต่อปี ตามลำดับ และโบเรท 130 กรัมต่อต้นต่อปี (ตารางที่ 5) โดยวิธีแนะนำมีการใส่ปุ๋ย N-P_2O_5-K_2O ในปริมาณที่ต่ำกว่ากรรมวิธีเกษตรกร และใส่ปุ๋ย MgO B ในปริมาณที่สูงกว่ากรรมวิธีเกษตรกร โดยวิธีเกษตรกรมีการใส่ปุ๋ย 0.92-0.56-2.16 8 N-P_2O_5-K_2O กิโลกรัมต่อต้นต่อปี รวมทั้งใส่ 0.015 MgO กิโลกรัมต่อต้นต่อปี และใส่ 120 B กรัมต่อต้นต่อปี (ตารางที่ 5) คิดเป็นอัตราปุ๋ยสูตร 21-0-0 สูตร 0-3-0 สูตร 0-0-60 และกีเซอร์ไรท์ 4.36, 2.80, 3.60 และ 0.058 กิโลกรัมต่อต้นต่อปี ตามลำดับ และโบเรท 86 กรัมต่อต้นต่อปี (ตารางที่ 5)

4. ผลผลิต

การเปรียบเทียบงานทดสอบเทคโนโลยีใช้ปุ๋ยที่เหมาะสมสำหรับผลิตปาล์มน้ำมัน ระหว่างวิธีแนะนำและวิธีเกษตรกร พบว่า ผลผลิตของทั้งกรรมวิธีแนะนำและกรรมวิธีเกษตรกรไม่มีความแตกต่างกันทางสถิติ ซึ่งกรรมวิธีแนะนำให้ผลผลิตเฉลี่ย 2,791 กิโลกรัมต่อไร่ และกรรมวิธีเกษตรกรให้ผลผลิตเฉลี่ย 2,452 กิโลกรัมต่อไร่ (ตารางที่ 6)

ตารางที่ 5 อัตราปุ๋ยแต่ละชนิดเฉลี่ยในกรรมวิธีต่าง ๆ ที่ใส่ให้กับแปลงทดสอบปาล์มน้ำมัน

แปลงเกษตรกร	กรรมวิธีแนะนำ					กรรมวิธีเกษตรกร				
	21-0-0	0-3-0	0-0-60	กีเซอร์ไรท์	โบเรท	21-0-0	0-3-0	0-0-60	กีเซอร์ไรท์	โบเรท
	(กก./ต้น/ปี)					(กก./ต้น/ปี)				
นายประสิทธิ์ เพชรจำรัส	4.00	1.50	3.00	1.00	0.130	5.52	1.75	2.92	0.000	0.000
นายสุทิน บูรพัฒ	4.00	1.50	3.00	1.00	0.130	1.10	0.00	6.40	0.000	0.041
นางโอภาส ชัยสงคราม	4.00	1.50	3.00	1.00	0.130	4.24	4.45	1.48	0.000	0.000
นายนำพล จอกลอย	4.00	1.50	3.00	1.00	0.130	4.86	1.65	4.95	0.188	0.025
นายบัญชา จอกลอย	4.00	1.50	3.00	1.00	0.130	6.05	2.80	6.20	0.308	0.400
นางผิน พุมประไพ	4.00	1.50	3.00	1.00	0.130	2.81	2.95	1.58	0.000	0.000
นางสรวง สุวรรณะ	4.00	1.50	3.00	1.00	0.130	4.19	5.70	2.83	0.023	0.001
นายเจริญ รัตนกุล	4.00	1.50	3.00	1.00	0.130	4.52	0.00	0.60	0.056	0.000
นายสมนึก รัตนสุวรรณ	4.00	1.50	3.00	1.00	0.130	4.19	4.40	4.73	0.000	0.000
นายประเสริฐ สุวรรณโณ	4.00	1.50	3.00	1.00	0.130	6.10	4.25	4.25	0.000	0.390
เฉลี่ย	**4.00**	**1.50**	**3.00**	**1.00**	**0.130**	**4.36**	**2.80**	**3.60**	**0.058**	**0.086**

ตารางที่ 6 ศึกษาเปรียบเทียบงานทดสอบเทคโนโลยีใช้ปุ๋ยที่เหมาะสมสำหรับผลิตปาล์มน้ำมันระหว่างวิธีแนะนำและวิธีเกษตรกร

แปลงเกษตรกร	ผลผลิต (กก./ไร่)		ผลต่าง
	วิธีแนะนำ	วิธีเกษตรกร	(กก./ไร่)
นายประสิทธิ์ เพชรจำรัส	1,857	1,790	67
นายสุทิน บูรพัฒ	984	885	99
นางโอภาส ชัยสงคราม	4,339	3,301	1,038
นายนำพล จอกลอย	2,065	2,918	-853
นายบัญชา จอกลอย	3,586	1,923	1,663
นางผิน พุมประไพ	2,540	2,103	437
นางสรวง สุวรรณะ	1,963	2,067	-104
นายเจริญ รัตนกุล	2,248	2,235	13
นายสมนึก รัตนสุวรรณ	4,730	3,543	1,187
นายประเสริฐ สุวรรณโณ	3,600	3,759	-159
เฉลี่ย	**2,791**	**2,452**	
t-test			**0.15^{ns}**

5. ผลตอบแทนทางด้านเศรษฐกิจ

ในกรรมวิธีแนะนำมีผลผลิตปาล์มน้ำมันเฉลี่ย 2,791 กิโลกรัมต่อไร่ รายได้เฉลี่ย 14,849 บาทต่อไร่ ต้นทุนในการผลิตเฉลี่ย 2.99 บาทต่อกิโลกรัม ทำให้เกษตรกรมีรายได้สุทธิเฉลี่ย 7,532 บาทต่อไร่ มีค่าอัตราส่วนรายได้ต่อการลงทุน (BCR) เฉลี่ย 1.94 ส่วนในกรรมวิธีเกษตรกร มีผลผลิตเฉลี่ย 2,452 กิโลกรัมต่อไร่ รายได้เฉลี่ย 13,047 บาทต่อไร่ ต้นทุนการผลิตเฉลี่ย 4.03 บาทต่อกิโลกรัม และทำให้เกษตรกรมีรายได้สุทธิเฉลี่ย 4,361 บาทต่อไร่ มีค่าอัตราส่วนรายได้ต่อการลงทุน (Benefit Cost Ratio) เฉลี่ย 1.50 (ตารางที่ 7)

การศึกษาโดย กลอยใจ คงเจี้ยง และคณะ (2562) พบว่า การจัดการปุ๋ยในสวนปาล์มน้ำมันตามคำแนะนำของกรมวิชาการเกษตร ให้ผลสอดคล้องกับการศึกษานี้ โดยการจัดการปุ๋ยในสวนปาล์มน้ำมันตามค่าวิเคราะห์ธาตุอาหารดินและใบ หรือการประเมินความต้องการธาตุอาหาร และการปรับปรุงสมบัติดินช่วยส่งเสริมให้ผลผลิตมีแนวโน้มเพิ่มสูงขึ้น และมีผลต่อการลดต้นทุนการผลิต ซึ่งเป็นปัจจัยสำคัญต่อการเพิ่มประสิทธิภาพการผลิต เช่นเดียวกับการศึกษาของ กลอยใจ คงเจี้ยง และเมืองสรวง เรืองขนาบ (2564) ทดสอบเทคโนโลยีการใช้ปุ๋ยตามค่าวิเคราะห์ดิน และใบ 5 ปี พบว่า วิธีใส่ปุ๋ยตามค่าวิเคราะห์ใบทำให้ได้ผลผลิตรวม 15,511 กิโลกรัมต่อไร่ สูงกว่าวิธีเกษตรที่ให้ผลผลิต 12,650 กิโลกรัมต่อไร่ หรือสูงกว่าร้อยละ 22.62 สำนักวิจัยและพัฒนาการเกษตรเขตที่ 8 (2563) ได้ทำการขยายผลเทคโนโลยีการเพิ่มประสิทธิภาพการผลิตปาล์มน้ำมันในจังหวัดสงขลา ปัตตานี และนราธิวาส โดยการใส่ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร ได้ผลผลิตเฉลี่ย 3,008 กิโลกรัมต่อไร่ต่อปี ทำให้เกษตรกรมีรายได้สุทธิ

เฉลี่ย 6,190 บาทต่อไร่ต่อปี การวิจัยและพัฒนาการผลิตปาล์มน้ำมันอย่างยั่งยืนและเป็นมิตรกับสิ่งแวดล้อมในเขตพื้นที่ภาคใต้ตอนบน พบว่า การจัดปุ๋ยตามค่าวิเคราะห์ใบร่วมกับการจัดการสวนที่เหมาะสมตามคำแนะนำของกรมวิชาการเกษตร ให้ผลผลิตทะลายสดเฉลี่ยและรายได้สุทธิเฉลี่ยสูง 4,492 กิโลกรัมต่อไร่ต่อปี และ 13,165 บาทต่อไร่ต่อปี (สุธีรา ถาวรรัตน์ สุชาดา โภชาดม, จินตนาพร โคตรสมบัติ, สญชัย ขวัญเกื้อ, สมคิด ดำน้อย, อัญชลี ม่านทอง และคณะ, 2565) นอกจากนี้ สุทธินันท์ ประสาธน์สุวรรณ์ และอภิชาติ พลปัถพี (2564) รายงานว่า การยกระดับผลผลิตโดยการจัดการสวนปาล์มน้ำมันที่เหมาะสมระดับชุมชนตามศักยภาพพื้นที่จังหวัดอุดรธานี พบว่า กรรมวิธีของกรมวิชาการเกษตรที่ใส่ปุ๋ยตามค่าวิเคราะห์ใบให้ผลผลิตเฉลี่ย คือ 1,460 กิโลกรัมต่อไร่ และกรรมวิธีเกษตรกรให้ผลผลิตเฉลี่ย คือ 1,351 กิโลกรัมต่อไร่ สอดคล้องกับ บุญณิศา ฆังคมณี (2566) พบว่า การใช้เทคโนโลยีการจัดการธาตุอาหารพืชที่เหมาะสมสำหรับปาล์มน้ำมัน คือ การใส่ปุ๋ยตามผลวิเคราะห์ใบ เป็นวิธีการที่ทำให้ปาล์มน้ำมันมีผลผลิตทะลายสดและผลตอบแทนสูงกว่าการใส่ปุ๋ยตามวิธีเกษตรกร โดยให้ผลผลิตสูงกว่าวิธีเกษตรกร 39.96 เปอร์เซ็นต์ และทำให้มีรายได้สุทธิสูงกว่าวิธีเกษตรกร 33.93 เปอร์เซ็นต์ และมีความคุ้มทุน โดยมีอัตราผลตอบแทนส่วนเพิ่ม (Marginal Rate of Return) 134.60 เปอร์เซ็นต์ นั่นย่อมยืนยันได้เป็นอย่างดีว่า การประเมินการใช้ปุ๋ยตามแนวทางแนะนำของกรมวิชาการเกษตร ช่วยส่งเสริมให้เกษตรกรสามารถลดต้นทุนการผลิต เพิ่มประสิทธิภาพการผลิตปาล์มน้ำมัน และการดำเนินการในรูปแบบของเกษตรแปลงใหญ่ในการจัดหาปัจจัยการผลิต อาจเป็นแนวทางที่ช่วยยกระดับมูลค่าของกำไรสุทธิให้แก่เกษตร

ตารางที่ 7 ผลผลิตและผลตอบแทนทางด้านเศรษฐกิจในการผลิตปาล์มน้ำมันของตำบลชะแล้ อำเภอสิงหนคร จังหวัดสงขลา

แปลงเกษตรกร	วิธีแนะนำ					วิธีเกษตรกร				
	ผลผลิต (กก./ไร่)	รายได้ (บาท/ไร่)	ต้นทุน (บาท/กก.)	รายได้สุทธิ (บาท/ไร่)	BCR	ผลผลิต) (กก./ไร่)	รายได้ (บาท/ไร่)	ต้นทุน (บาท/กก.)	รายได้สุทธิ (บาท/ไร่)	BCR
นายประสิทธิ์ เพชรจำรัส	1,857	9,879	3.44	3,487	1.55	1,790	9,523	3.68	2,933	1.45
นายสุทิน บูรพัฒ	984	5,235	5.61	-284	0.94	885	4,708	8.52	-2,831	0.62
นางโอภาส ชัยสงคราม	4,339	23,083	2.05	14,209	2.60	3,301	17,561	2.67	8,747	1.99
นายนำพล จอกลอย	2,065	10,986	3.20	4,386	1.66	2,918	15,524	3.65	4,866	1.46
นายบัญชา จอกลอย	3,586	19,078	2.26	10,957	2.35	1,923	10,230	5.76	-838	0.92
นางผิน พุมประไพ	2,540	13,513	2.79	6,438	1.9	2,103	11,187	2.82	5,251	1.88
นางสรวง สุวรรณะ	1,963	10,443	3.31	3,945	1.61	2,067	10,996	4.31	2,096	1.23
นายเจริญ รัตนกุล	2,248	11,959	3.02	5,176	1.76	2,235	11,890	3.56	3,932	1.49
นายสมนึก รัตนสุวรรณ	4,730	25,164	1.96	15,899	2.72	3,543	18,849	2.70	9,276	1.97
นายประเสริฐ สุวรรณโณ	3,600	19,152	2.26	11,017	2.35	3,759	19,998	2.61	10,179	2.03
เฉลี่ย	**2,791**	**14,849**	**2.99**	**7,532**	**1.94**	**2,452**	**13,047**	**4.03**	**4,361**	**1.50**

หมายเหตุ ราคาผลผลิตเฉลี่ยกิโลกรัมละ 5.32 บาท

ต้นทุนการผลิต = ปุ๋ย+ ค่าจ้างแรงงาน

สรุปและอภิปรายผล

การทดสอบเทคโนโลยีที่เหมาะสมในการผลิตปาล์มน้ำมันของชุมชนชะแล้ จังหวัดสงขลา พบว่า การดูแลจัดการปุ๋ยของเกษตรกรมีความหลากหลาย ส่งผลต่อปริมาณธาตุอาหารในดินและในใบของปาล์มน้ำมัน และกรรมวิธีการให้ปุ๋ยตามคำแนะนำให้ผลผลิต ไม่มีความแตกต่างกันทางสถิติกับกรรมวิธีเกษตรกร แต่อัตราส่วนรายได้ต่อการลงทุน (BCR) สูงกว่ากรรมวิธีเกษตรกร ซึ่งชี้ถึงการลดต้นทุนในการผลิตในกรรมวิธีให้ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร

ข้อเสนอแนะ

การทำงานวิจัยการจัดการปุ๋ยปาล์มน้ำมันควรทำอย่างน้อย 3 ปี เพื่อที่จะได้เห็นชัดเจนว่าปุ๋ยส่งผลต่อผลผลิตปาล์มน้ำมัน

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การพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตสละของชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหารในจังหวัดพัทลุง

The Appropriate Technology Developing for Salak (*Salacca zalacca*) production to Income Stability and Food Access in Phatthalung Province

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บทคัดย่อ

การพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตสละเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร จังหวัดพัทลุง ดำเนินการตั้งแต่เดือนตุลาคม 2564 - กันยายน 2566 มีวัตถุประสงค์ 1) เพื่อพัฒนาเทคโนโลยีการผลิตสละที่เหมาะสมต่อการสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร 2) เพื่อพัฒนาชุมชนต้นแบบการถ่ายทอดเทคโนโลยีการผลิตสละ ดำเนินการในชุมชนบ้านสายกลาง-ในกอย หมู่ที่ 9 ตำบลหนองธง อำเภอป่าบอน จังหวัดพัทลุง โดยคัดเลือกเกษตรกรต้นแบบ จำนวน 13 ราย โดยการเปรียบเทียบวิธีการผลิตสละตามกรรมวิธีแนะนำ (กรมวิชาการเกษตร) และกรรมวิธีของเกษตรกร (ปฏิบัติอยู่เดิม) ผลการศึกษา พบว่า กรรมวิธีแนะนำ มีผลผลิตและรายได้สูงกว่ากรรมวิธีของเกษตรกร โดยกรรมวิธีแนะนำมีผลผลิตสละ 2,679 กก./ไร่ มีรายได้ 107,149 บาท/ไร่ และมีต้นทุนการผลิต 10,812 บาท/ไร่ และมีรายได้สุทธิ 96,338 บาท/ไร่ กรรมวิธีเกษตรกร มีผลผลิตสละ 2,464 กก./ไร่ มีรายได้ 98,546 บาท/ไร่ ต้นทุน 18,932 บาท/ไร่ และมีรายได้สุทธิ 79,614 บาท/ไร่ โดยกรรมวิธีแนะนำมีรายได้สุทธิสูงกว่ากรรมวิธีของเกษตรกร 16,724 บาท/ไร่ นอกจากนี้ในด้านคุณภาพของสละยังพบว่า กรรมวิธีแนะนำให้ผลผลิตที่มีคุณภาพมากกว่า โดยพิจารณาจากจำนวนกระปุกต่อทะลาย และน้ำหนักของผล

คำสำคัญ: สละ, เสถียรภาพด้านรายได้, พืชเศรษฐกิจชุมชน

Abstract

The Appropriate Technology Developing for *Salacca zalacca* production to Income Stability and Food Access in Phatthalung Province. This project was established in October 2021-September 2023. The objectives were 1) to develop the suitable technology of salak production for the income stability created and food access and 2) to develop the model community transferring of salak production technology. It was conducted in Ban Sai Klang-Nai Koi community, Nong Thong subdistrict, Pa Bon district, Phatthalung province. The 13 model farmers were selected for this project. It was compared between the recommended methods. (Department of Agriculture) and farmers' methods (Previously practiced). It was

found that the recommended methods had higher yields and higher income than farmers' methods. By the recommended method, the yield was 2,679 kg./rai, income was of 107,149 baht/rai. and cost was 10,812 baht/rai and the net income was of 96,338 baht/rai. The farmer's method, the yield was 2,464 kg./rai, income was 98,546 baht/rai, cost was 18,932 baht/rai and the net income was 79,614 baht/rai. The recommended method had a higher net income than the farmer's method about 16,724 baht/rai. In addition, in terms of the quality of *Salacca zalacca*, it was found that the recommended method produced higher quality products. By considering the number of jars per bunch and weight of the fruit.

Keywords: Sala *(Salacca zalacca)*, income stability, Community economic crops,

บทนำ

ด้านประเด็นปัญหาเรื่องเสถียรภาพทางรายได้และสร้างความมั่นคงทางอาหารของชุมชนของพื้นที่จังหวัดพัทลุง พบว่า เกษตรกรผลิตพืชเชิงเดี่ยวมาเป็นเวลานาน คือ ยางพารา ปาล์มน้ำมันและข้าว ซึ่งเกิดปัญหาราคาผลผลิตตกต่ำต่อเนื่อง ทำให้ขาดเสถียรภาพทางรายได้ การผลิตพืชได้รับผลกระทบจากน้ำท่วมเป็นประจำ ทำให้ชุมชนยังต้องพึ่งพาผลิตผลจากภายนอกเป็นหลักและไม่มีการจัดการที่เป็นระบบความมั่นคงทางอาหารชุมชน (สำนักงานเกษตรและสหกรณ์จังหวัดพัทลุง, 2563) จากนโยบายของรัฐบาลและทิศทางการพัฒนาประเทศเพื่อให้สอดคล้องกับบริบทของการพัฒนาเชิงพื้นที่ จังหวัดพัทลุง ได้กำหนดจุดยืนทางยุทธศาสตร์ ซึ่งเป็นจุดยืนหลักของการพัฒนาจังหวัดพัทลุงการเพิ่มขีดความสามารถภาคเกษตรอุตสาหกรรมต่อเนื่องจากการเกษตรและผลิตภัณฑ์ชุมชนและท้องถิ่น พัฒนายกระดับจังหวัดสู่เมืองเศรษฐกิจทางการเกษตร ศูนย์กลางแห่งอาหารคุณภาพปลอดภัยของภาคใต้ ประเทศ อาเซียน และระดับโลก จังหวัดพัทลุงได้ร่วมลงนามในบันทึกข้อตกลงความร่วมมือการขับเคลื่อนเกษตรกรรมยั่งยืน (สำนักงานเศรษฐกิจการเกษตร, 2560) นอกจากนี้จังหวัดพัทลุงได้ประกาศเจตนารมณ์ในการขับเคลื่อนเกษตรกรรมยั่งยืน โดยการลดพื้นที่เกษตรเชิงเดี่ยว ซึ่งมีสูงถึงร้อยละ 42.6 โดยส่วนใหญ่ปลูกยางพารา (ร้อยละ 64.93) ข้าว (ร้อยละ 8.84) ปาล์มน้ำมัน (ร้อยละ 6.44) และไม้ผล (ร้อยละ 2.56) และเพิ่มพื้นที่เกษตรผสมผสานให้เพิ่มมากกว่าที่มีอยู่เพียงร้อยละ 7.4 เพื่อเพิ่มพื้นที่เกษตรอินทรีย์ของจังหวัดพัทลุง และการประกาศเจตนารมณ์การขับเคลื่อนเกษตรกรรมยั่งยืนของจังหวัดพัทลุง (สำนักงานสถิติจังหวัดพัทลุง, 2562) ซึ่งเกิดปัญหาราคาผลผลิตตกต่ำต่อเนื่อง ทำให้ขาดเสถียรภาพทางรายได้ และความมั่นคงด้านอาหารของชุมชน อีกทั้งยังไม่สอดคล้องกับนโยบายของจังหวัดที่ประกาศให้เป็นเกษตรกรรมยั่งยืน

ในยุทธศาสตร์การพัฒนาของจังหวัดได้กำหนดให้พัฒนาขีดความสามารถของชุมชนโดยการพัฒนาที่จะต้องสร้างชุมชนให้มีขีดความสามารถในการพึ่งตนเอง และการจัดการตนเองได้บนฐานปรัชญาเศรษฐกิจพอเพียง โดยประเด็นที่ให้ความสำคัญในอันดับแรก ๆ คือ การยกระดับรายได้ การสร้างความมั่นคงทางอาหาร การสร้างคุณภาพชีวิตมีอาหารที่ปลอดภัย และขุมชนนวัตกรรมที่เข้มแข็ง การผลิตพืชชนิดต่าง ๆ ยังมีประสิทธิภาพต่ำ ขาดการพัฒนาคุณภาพให้ได้มาตรฐานสินค้า มีการสร้างมูลค่าเพิ่มน้อย หากมีการพัฒนาการจัดการผลิตพืชให้มีเทคโนโลยีการปฏิบัติที่เหมาะสมกับภูมิสังคม สามารถเพิ่มรายได้ เพิ่มความหลากหลายของพืชใช้ประโยชน์ ผลิตได้มาตรฐาน ก็จะช่วยทำให้ชุมชนมีความเข้มแข็ง พึ่งตนเองได้ การพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และ

การเข้าถึงอาหาร (Food access) (วิรัลพัชร ประเสริฐศักดิ์, 2552) เทคโนโลยีที่เหมาะสม/นวัตกรรมสำหรับชุมชนเกษตร ในการผลิตและสร้างมูลค่าพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้ ชุดนวัตกรรม องค์ความรู้ หรือเทคโนโลยีใหม่ในการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้ ผลิตภาพการผลิตของภาคเกษตรเพิ่มขึ้น (คณะกรรมการอาหารแห่งชาติ, 2551) จากการนำเอาองค์ความรู้ เทคโนโลยี และนวัตกรรมด้านการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้ของชุมชนไปจัดการกับกลุ่มปัญหาการเกษตร ได้อย่างเป็นรูปธรรม (Food and Agricultural Organization (FAO), 2017) และเป็นชุมชนนวัตกรรมที่จะถ่ายทอดเทคโนโลยีและขยายผลไปสู่ชุมชนอื่นๆได้ และการผลิตสละของชุมชนก่อนดำเนินโครงการ เกษตรกรมีการผลิตโดยใช้ภูมิปัญญาที่มีอยู่ทำให้ผลผลิตต่ำ เกษตรกรบางรายไม่มีการใส่ปุ๋ยหรือปัจจัยการผลิตที่เหมาะสม หรือมีการใช้สารเคมีมากเกินไป มีการใช้ปัจจัยการผลิตที่ไม่มีความจำเป็นในการผลิตสละ เช่น ฮอร์โมนพืชต่าง ๆ เพื่อเร่งการออกดอก เหล่านี้ทำให้การผลิตสละของเกษตรกร มีต้นทุนที่สูง แต่ผลผลิตต่ำ มีการใช้สารเคมีที่ห้ามใช้จากข้อกำหนดของกรมวิชาการเกษตร ดังนั้น หากมีการใช้เทคโนโลยีการผลิตสละที่เหมาะสมจะสามารถสร้างแปลงต้นแบบการผลิตสละคุณภาพให้มีต้นทุนการผลิตที่ลดลง และผลผลิตสูงขึ้นได้ นอกจากนี้สามารถปรับและแก้ปัญหาการผลิตสละของเกษตรกรแบบเดิม และนำเทคโนโลยีการผลิตสละที่เหมาะสมไปปรับใช้ในการผลิตสละของตนเองได้อย่างถูกต้องเหมาะสมตามหลักวิชาการ และปรับวิธีการในการผลิตผลผลิตให้ถูกต้องมีคุณภาพมากขึ้น พร้อมออกสู่ตลาดอย่างมีคุณภาพได้

วัตถุประสงค์ของการวิจัย

1. เพื่อพัฒนาเทคโนโลยีการผลิตสละที่เหมาะสม ในการผลิตพืชเศรษฐกิจหลักของท้องถิ่นเพื่อสร้างเสถียรภาพด้านรายได้และความมั่นคงทางอาหาร ส่งผลให้เกษตรกรในชุมชนเข้าถึงอาหารได้อย่างพอเพียง ในจังหวัดพัทลุง
2. เพื่อพัฒนาชุมชนต้นแบบในการถ่ายทอดเทคโนโลยี ด้านการผลิตพืชเศรษฐกิจ ที่จะเป็นศูนย์ถ่ายทอดเทคโนโลยีด้านการผลิตสละ เพื่อสร้างเสถียรภาพด้านรายได้และความมั่นคงทางอาหารและขยายผลไปสู่ชุมชนอื่น ๆ ในจังหวัดพัทลุง

กรอบแนวคิดในการศึกษา

การสร้างความมั่นคงรายได้และอาหารให้กับครัวเรือนเกษตรกรและชุมชน จะเน้นการสร้างเสถียรภาพด้านรายได้ของเกษตรกร เพื่อให้สามารถเข้าถึงอาหารอย่างเพียงพอและเหมาะสม สนับสนุนให้ชุมชนทำการเกษตรของท้องถิ่น เพื่อเป็นแหล่งอาหารของชุมชน ลดการพึ่งพาอาหารจากภายนอกส่งเสริมการทำการเกษตรตามหลักการปรัชญาของเศรษฐกิจพอเพียง เพื่อให้ครัวเรือนสามารถพึ่งพาตนเองได้และเป็นฐานในการพัฒนาเศรษฐกิจและสังคมอย่างยั่งยืน สนับสนุนให้หน่วยงานของรัฐหรือท้องถิ่นในพื้นที่มีบทบาทดำเนินการให้เกิดความมั่นคงด้านอาหารในมิติต่าง ๆ รวมถึงการดูแลโภชนาการของประชาชนในทุกช่วงวัย รวมทั้งการมีมาตรการรองรับสำหรับผู้มีรายได้น้อยให้สามารถเข้าถึงสินค้าเกษตรและอาหารได้อย่างทั่วถึง แนวคิดนี้ได้นำมาใช้ในการวิจัยและพัฒนาด้านการจัดการผลิตพืชที่จะสร้างเสถียรภาพด้านรายได้แก่เกษตรกร และสร้างความมั่นคงทางอาหารในภาพรวม การเพิ่มเสถียรภาพทางรายได้และเพิ่มความมั่นคงทางอาหารของชุมชนเกษตร จะมีมากน้อยจะขึ้นกับระดับความสำเร็จในการพัฒนาการจัดการผลิตพืชทั้งระบบของชุมชน ใน 6 ด้าน คือ 1) การผลิตพืชเศรษฐกิจชุมชนที่จะมาสร้างรายได้หลัก

และรายได้รอง 2) การผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียงเพื่อตอบสนองความต้องการด้านอาหารและในทุกมิติการดำรงชีพ 3) การผลิตพืชอินทรีย์เพื่อความปลอดภัยด้านอาหาร 4) การผลิตพืชที่ลดความเสี่ยงจากการเปลี่ยนแปลงสภาพภูมิอากาศ 5) การพัฒนาแพลตฟอร์มระบบความมั่นคงทางอาหารของชุมชนโดยการมีส่วนร่วมของภาคส่วนต่าง ๆ 6) การสร้างความเข้มแข็งของชุมชนในการจัดการพืช

สำนักงานเกษตรและสหกรณ์จังหวัดพัทลุง (2563) รายงานว่า สละ ได้รับคัดเลือกให้เป็นสินค้าอัตลักษณ์ของจังหวัดพัทลุง ภายใต้โครงการส่งเสริมการผลิตสินค้าเกษตรที่อัตลักษณ์และเหมาะสมกับศักยภาพพื้นที่ภาคใต้ เหมาะสำหรับส่งเสริมเพื่อเป็นทางเลือกของเกษตรกรในจังหวัดพัทลุง เนื่องจากตลาดมีความต้องการสูง สามารถเก็บเกี่ยวผลผลิตได้ตลอดทั้งปี และราคาไม่ตก นอกจากนี้ยังสามารถนำผลผลิตไปแปรรูปเพื่อสร้างมูลค่าเพิ่มได้ดี ปัญหาเดิมของชุมชน คือ ในการผลิตสละของชุมชนก่อนการดำเนินโครงการนั้น เกษตรกรยังขาดความรู้เรื่องเทคโนโลยีการผลิตสละที่เหมาะสม มีเพียงแค่การผลิตโดยใช้ภูมิปัญญาที่มีอยู่ส่งผลให้ผลผลิตสละต่ำ และเกษตรกรบางรายไม่มีการใส่ปุ๋ยหรือปัจจัยการผลิตที่เหมาะสมหรือใส่ไม่เพียงพอ หรือมีการใช้สารเคมีมากเกินไป มีการใช้ปัจจัยการผลิตที่ไม่มีความจำเป็นในการผลิตสละ เช่น ฮอร์โมนพืชเร่งกิจกรรมต่าง ๆ ตามคำโฆษณาชวนเชื่อ เร่งการผสมเกสรติดดี เร่งการดูดซึมปุ๋ย เหล่านี้ทำให้การผลิตสละของเกษตรกร มีต้นทุนที่สูงมาก แต่ให้ผลผลิตต่ำ มีการใช้สารเคมีที่ห้ามใช้จากข้อกำหนดของกรมวิชาการเกษตร ดังนั้น หากมีการใช้เทคโนโลยีการผลิตสละที่เหมาะสมจะสามารถสร้างแปลงต้นแบบการผลิตสละคุณภาพให้มีต้นทุนการผลิตที่ลดลง และผลผลิตสูงขึ้นได้ นอกจากนี้สละเป็นผลไม้ที่มีรสชาติหวานอมเปรี้ยว มีคุณภาพดี เป็นพืชที่เกษตรกรนิยมปลูกทดแทน ในสวนยางพารา สายพันธุ์สละที่มีการปลูกในจังหวัดพัทลุง ได้แก่ สละพันธุ์สุมาลี สละพันธุ์เนินวง และสละพันธุ์อินโด สละพันธุ์สุมาลีซึ่งมีลักษณะเด่น คือ เนื้อมีรสชาติหวานแหลม และมีกลิ่นหอม เมล็ดใหญ่ เนื้อหนา ผลมีขนาดเล็กเมื่อเทียบกับผลสละเนินวง สำหรับปี 2562 จังหวัดพัทลุงมีพื้นที่ปลูกสละ 2,938.65 ไร่ คิดเป็นร้อยละ 0.19 ของพื้นที่การเกษตรทั้งหมด พื้นที่สละที่มีการปลูกมากที่สุดใน อ.ป่าบอน เนื้อที่ปลูก 2,082.15 ไร่ มูลค่ารวมจากการจำหน่ายสละ คิดเป็น 297.21 ล้านบาท โดยตำบลหนองธง และตำบลทุ่งนารี อ. ป่าบอน มีการผลิตสละได้รับมาตรฐานการผลิตสินค้าเกษตร GAP กรมวิชาการเกษตร ช่วงปี 2559-2562 จำนวน 52 ราย การกระจายปริมาณผลผลิตสละในจังหวัดพัทลุง แยกรายอำเภอ พบว่า อ.ป่าบอน มีผลผลิตออกสู่ตลาดมากที่สุด จำนวน 4,165.35 ตัน สำหรับมูลค่ารวมของสละในปี 2561 มีมูลค่ารวม 185 ล้านบาท และในปี 2562 มีมูลค่า 297.21 ล้านบาท โดยมูลค่ารวมของสละจากปี 2561-2562 เพิ่มขึ้นคิดเป็นร้อยละ 60.65 มูลค่าผลิตภัณฑ์มวลรวมจังหวัด (GPP) (สำนักงานสถิติจังหวัดพัทลุง, 2562 , สำนักงานเกษตรและสหกรณ์จังหวัดพัทลุง. 2563) นอกจากนี้การสร้างมูลค่าเพิ่มของสละ โดยการแปรรูป เช่น ผลิตภัณฑ์สละลอยแก้ว แยมสละ สละแช่อิ่มอบแห้ง ไอศกรีมสละ เยลลี่สละ และสละน้ำปลาหวาน เป็นต้น มีการจำหน่ายทางออนไลน์ ได้แก่ ทางเฟสบุ๊ค ไลน์แอพลิเคชั่น แล้วขนส่งทางไปรษณีย์ วางจำหน่าย ณ แหล่งท่องเที่ยว ร้านจำหน่ายสินค้า OTOP ซึ่งจะมีผลทำให้ชุมชนสามารถพึ่งพาตนเองได้และมีความยั่งยืนตลอดไป อีกทั้งสามารถเชื่อมโยงภาคการเกษตรและการท่องเที่ยวไว้ด้วยกัน เพื่อให้เกษตรกรสามารถสร้างรายได้เพิ่มขึ้นจากรายได้ภาคเกษตรและเป็นการอนุรักษ์พื้นที่การเกษตรของชุมชนให้คงอยู่ต่อไปได้

วิธีดำเนินการวิจัย

ขั้นตอนที่ 1 การสำรวจ ศึกษาวิเคราะห์ จำแนกระบบนิเวศเกษตร คัดเลือกพื้นที่วิจัย และวิเคราะห์พื้นที่วิจัย ในจังหวัดพัทลุง

ศึกษาจุดเด่น ปัญหา ของสภาพพื้นที่ เพื่อเรียงลำดับพื้นที่ระดับตำบลที่จะนำไปสู่การคัดเลือกตำบล โดยการคัดเลือกตำบลหรืออำเภอที่มีการผลิตสละที่สำคัญในจังหวัดพัทลุง จากนั้นลงพื้นที่เพื่อสัมภาษณ์จากเกษตรกรผู้นำ และเกษตรกรที่มีการผลิตสละอยู่แล้ว เช่น เป็นเกษตรกรแปลงใหญ่การผลิตสละของจังหวัด จากนั้นทำการสำรวจสภาพพื้นที่จริง สภาพภูมิประเทศ แหล่งน้ำ การผลิตพืช ระบบการจัดการส่งเสริมการเกษตรของท้องถิ่น และคัดเลือกผู้นำชุมชน เพื่อให้การดำเนินโครงการตลอดระยะเวลา 3 ปี (ปี2565-2567) ประสบความสำเร็จ

ขั้นตอนที่ 2 การพัฒนาเทคโนโลยีการผลิตพืชที่เหมาะสม โดยการนำเทคโนโลยีด้านการผลิตสละของกรมวิชาการเกษตร ไปปรับใช้กับเกษตรกรที่ผลิตสละของชุมชน

สิ่งที่ใช้ในการทดลอง

1. พันธุ์พืชเป็นไม้ผลยืนต้นที่ให้ผลผลิตแล้วเป็นหลักทางเศรษฐกิจของชุมชน คือ สละ แปลงปลูกสละของเกษตรกร ในเขตพื้นที่หมู่ที่ 9 ชุมชนบ้านสายกลาง-ในกอย ตำบลหนองธง อำเภอป่าบอน จังหวัดพัทลุง
2. ปุ๋ยเคมี สูตร 15-15-15, 13-13-21 และ ปุ๋ยคอก
3. สารป้องกันกำจัดศัตรูพืช เช่นสารกำจัดด้วงจิ๋วกัดกินเกสรดอกตัวผู้ และด้วงเจาะผลสละ
4. อุปกรณ์เก็บตัวอย่างดิน ได้แก่ จอบ และตะกร้าพลาสติก ถุงพลาสติก
5. อุปกรณ์เก็บผลผลิต เช่น กรรไกรตัดแต่ง
6. พลาสติกปูรองกันหญ้าขึ้นสำหรับปูรองทะลายสละ
7. แบบบันทึกข้อมูล

แบบและวิธีการทดลอง

โดยการเปรียบเทียบระหว่างกรรมวิธีวิธีตามคำแนะนำ (เทคโนโลยีกรมวิชาการเกษตร) และกรรมวิธีเดิมของเกษตรกร ในพื้นที่เกษตรกร 1 ชุมชน จากนั้นในการดำเนินงานปีที่ 2 นั้น คัดเลือกเกษตรกรต้นแบบเหลือ จำนวน 13 ราย ที่ยังมีการปฏิบัติตามการดำเนินงานของโครงการ (ปีที่ 1 จำนวน 29 ราย) และบันทึกข้อมูลผลผลิตของสละ และข้อมูลอื่น ๆ ใน 2 กรรมวิธี ดังกล่าว โดยสุ่มเลือกสละจากแปลง จำนวน 8 ต้น/กรรมวิธี (จำนวน 2 ซ้ำ)

วิธีปฏิบัติการทดลอง

เป็นการเปรียบเทียบเทคโนโลยีการผลิตสละ 2 กรรมวิธี

กรรมวิธีที่ 1 วิธีตามคำแนะนำ (เทคโนโลยีการผลิตสละของกรมวิชาการเกษตร) โดยใช้องค์ความรู้เรื่องเทคโนโลยีการผลิตสละให้มีคุณภาพ ของกรมวิชาการเกษตร (กรมวิชาการเกษตร,2558)

กรรมวิธีที่ 2 กรรมวิธีเดิมของเกษตรกร

โดยวิธีปฏิบัติการทดลอง ในการใช้เทคโนโลยีการผลิตสละในกรรมวิธี 1 และกรรมวิธีที่ 2 แสดงรายละเอียดดังตารางที่ 1

ตารางที่ 1 วิธีปฏิบัติการทดลอง การผลิตสละด้วยกรรมวิธีตามคำแนะนำของกรมวิชาการเกษตรและกรรมวิธีเดิมของเกษตรกร

วิธีปฏิบัติ	กรรมวิธี 1 กรรมวิธีแนะนำ	กรรมวิธี 2 กรรมวิธีเดิม เกษตรกร
การใส่ปุ๋ย	-สละอายุ ไม่เกิน 1 ปี ปุ๋ยเคมี สูตร 15-15-15 อัตรา 0.3 กก./ต้น/ปี แบ่งใส่ 3 ครั้ง/ปี ปุ๋ยคอก 7.5 กก./ต้น/ปี แบ่งใส่ 3 ครั้ง -สละอายุ เกิน 3 ปี ปุ๋ยเคมี สูตร 15-15-15 อัตรา 2 กก./ต้น/ปี แบ่งใส่ 2 ครั้ง/ปี ปุ๋ยสูตร 13-13-21 อัตรา 3 กก./ต้น/ปี แบ่งใส่ 6 ครั้ง/ปี (ครั้งละ 0.5 กก./ต้น/ปี) ปุ๋ยคอก 52.5 กก./ต้น/ปี แบ่งใส่ 3 ครั้ง	-สละอายุ ไม่เกิน 1 ปี ปุ๋ยเคมี สูตร 15-15-15 อัตรา 0.3 กก./ต้น/ปี ปุ๋ยคอก 2 กก./ต้น/ ครั้ง/ปี -สละอายุ เกิน 3 ปี ปุ๋ยเคมี สูตร 15-15-15 อัตรา 1 กก./ต้น/ปี แบ่งใส่ 2 ครั้ง/ปี ปุ๋ยสูตร 13-13-21หรือ 0-0-60 อัตรา 1 กก./ต้น/ปี แบ่งใส่ 3 ครั้ง/ปี ปุ๋ยคอก 17.5 กก./ต้น/ปี ใส่ 1 ครั้ง
		เกษตรกรส่วนมากไม่ใส่ปุ๋ยเคมี หรือใส่ปริมาณน้อยมาก
การตัดแต่งทางใบ	2 ครั้ง/ปี	1 ครั้ง/ปี หรือไม่ตัดแต่งเลย
การตัดแต่งกระปุก	8-10 กระปุก/ทะลาย	ไม่ตัดแต่งกระปุก
การตัดแต่งผล	ดำเนินการช่วงผลสละมีอายุ 3-6 เดือนหลังติดผล โดยเฉลี่ยไว้ผลประมาณ 15-20 ผล/กระปุก	ไม่ตัดแต่งผล
การไว้หน่อ	เพื่อควบคุมทรงต้น ไม่เกิน 2 ต้น/กอ (สละที่มีระยะการปลูก 4*4 เมตร) และ ไม่เกิน 3-4 ต้น/กอ (สละที่มีระยะการปลูก 5*5 เมตร)	ไม่ควบคุมทรงต้น
การเก็บเกี่ยว	เก็บผลผลิตสละเมื่อกระปุก มีอายุ 7 เดือน 20 วัน ถึง 8 เดือน หลังจากผสมเกสรตัวผู้	เก็บผลผลิตสละเมื่อกระปุกมีอายุ 7 เดือน หลังจากผสมเกสรตัวผู้

ในปีที่ 2 (ปี 2566) ของการดำเนินโครงการมีการพัฒนาสร้างมูลค่าเพิ่มสินค้า โดยจัดให้มีกิจกรรมต่าง ๆ ของโครงการเพื่อยกระดับคุณภาพผลผลิตสละของเกษตรกร โดยนำผลผลิตสละคุณภาพร่วมการประกวดช่อผลสละ การจัดงานถ่ายทอดเทคโนโลยีด้านการผลิตพืชเศรษฐกิจหลักของชุมชน คือ สละ ไปยังชุมชนอื่น ๆ 5 ชุมชนในเครือข่ายของโครงการงานวิจัย และการนำกลุ่มเกษตรกรในโครงการเข้าร่วมกิจกรรมการจัดงานวันถ่ายทอดเทคโนโลยีการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ณ ชุมชนในเครือข่าย จำนวน 5 ครั้ง ได้แก่ 1. ชุนชนควนกาหลง (จังหวัดสตูล) 2. ชุมชนเขาพระ (อำเภอรัตภูมิ จังหวัดสงขลา) 3. ชุมชนตาชี (จังหวัด

ยะลา) 4. ชุมชนพ่อมิ่ง (จังหวัดปัตตานี) และ 5. ชุมชนชะแล้ (จังหวัดสงขลา) และเป็นเจ้าภาพหลักจัดงานกิจกรรมวันถ่ายทอดเทคโนโลยีฯ จำนวน 1 ครั้ง ประจำปี 2566 มีกิจกรรมต่าง ๆ ให้ชุมชนในเครือข่ายเกษตรกร และเจ้าหน้าที่ภาครัฐมาเยี่ยมชม ศึกษาดูงานของชุมชนบ้านสายกลาง -ในกอย นอกจากนั้นพัฒนาผลผลิตให้ได้รับรองมาตรฐานสินค้า GAP จากกรมวิชาการเกษตร จัดกิจกรรมการแปรรูปผลผลิตสละสร้างมูลค่าเพิ่มสินค้า โดยพัฒนาบรรจุภัณฑ์ เชื่อมโยงสินค้ากับตลาด หรือการท่องเที่ยวเชิงเกษตรที่เหมาะสมชุมชนต่อไป หลังจากการพัฒนาเทคโนโลยีการผลิต และพัฒนาสร้างมูลค่าเพิ่มสินค้า เชื่อมโยงสินค้ากับตลาดในชุมชน นอกชุมชน ในและนอกจังหวัดตลอดจนเชื่อมโยงตลาดระดับประเทศในลำดับต่อไป

การบันทึกข้อมูล

1. บันทึกข้อมูลของผลผลิตสละต่อต้น หรือน้ำหนักต่อทะลาย สุ่มตัวอย่างผลผลิตในแต่ละกรรมวิธี ทดลอง 2 กรรมวิธี ๆ ละ 2 ซ้ำ ซ้ำละ 4 ต้นหรือกอ เก็บข้อมูลผลผลิต ระยะเวลา 12 ครั้ง /ปี
2. บันทึกวิธีการปฏิบัติดูแลรักษา ปัญหาการผลิต การตลาด ราคา ต้นทุน และรายได้
3. วิเคราะห์ผลตอบแทนการลงทุน เช่น ต้นทุน รายได้ รายได้สุทธิ โดยหาอัตราผลตอบแทนต่อการลงทุน (BCR=Benefit Cost Ratio) คำนวณได้จากสูตรดังนี้

อัตราผลตอบแทนต่อการลงทุน = รายได้/ต้นทุนผันแปร

BCR <1 รายได้น้อยกว่ารายจ่าย กิจกรรมที่ดำเนินการนั้นขาดทุน ไม่ควรทำการผลิต

BCR =1 รายได้เท่ากับรายจ่าย กิจกรรมที่ดำเนินการนั้นไม่มีกำไรและไม่ขาดทุน มีความเสี่ยงในการผลิตไม่ควรทำการผลิต

BCR >1 รายได้มากกว่ารายจ่าย กิจกรรมที่ดำเนินการนั้นมีกำไร มีความเสี่ยงน้อย สามารถทำการผลิตได้

การวิเคราะห์ข้อมูล

โดยวิธีการหาค่าเฉลี่ย และอัตราผลตอบแทนต่อการลงทุน (BCR=Benefit Cost Ratio)

ผลการวิจัย

เกษตรกรที่เข้าร่วมพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตสละ จากปีที่ 1 จำนวน 29 ราย และในปีที่ 2 คัดเลือกเป็นต้นแบบ จำนวน 13 ราย โดยเกษตรกรต้นแบบ คือ เกษตรกรที่มีการปฏิบัติโดยนำเทคโนโลยีการผลิตสละของกรมวิชาการเกษตรไปปรับใช้ มีการบันทึกข้อมูลผลผลิตสละ ราคา การใช้ปัจจัยการผลิต ตลอดจนการปฏิบัติการจัดการสวนในแปลงสละ เช่น การใช้ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร การใส่ปุ๋ยคอก การตัดแต่งผล การไว้หน่อ การป้องกันกำจัดโรคและแมลง การปูพลาสติกรองทะลายสละ เป็นต้น และเกษตรกรต้นแบบยังหมายถึงเกษตรกรที่เข้าร่วมกิจกรรมกลุ่มในการทำเวทีวิจัยย่อยตามวิธีการดำเนินโครงการในแต่ละครั้งที่จัดขึ้นร่วมกันกับเกษตรกรในโครงการเพื่อแลกเปลี่ยนเรียนรู้ การติดตามงานและร่วมกันแก้ไขปัญหาที่เกิดขึ้นระหว่างการดำเนินงานโครงการ

พบว่าการปูพลาสติกรองทะลายสละรอบโคนต้นสละเพื่อรองรับทะลายของสละเมื่อมีพัฒนาการของทะลายอายุตั้งแต่ 5 เดือนเป็นต้นไป หรือทะลายสละยาวแตะพื้นผิวดินสำหรับลำต้นที่มีความสูงเพื่อให้ทะลายลดการสัมผัสผิวดินโดยตรงนั้นช่วยให้กระปุกสะอาดทำความสะอาดง่ายก่อนส่งจำหน่าย ลดระยะเวลาการล้างกระปุกได้ และขึ้นลดความเสี่ยงต่อโรคที่เกิดจากเชื้อโรคทางดิน

ผลผลิตสละของเกษตรกร รายได้เฉลี่ย ต้นทุนเฉลี่ย และรายได้สุทธิเฉลี่ยต่อปีของเกษตรกรในกรรมวิธีแนะนำเปรียบเทียบกับกรรมวิธีของเกษตรกรในปี 2566 นั้นพบว่า กรรมวิธีแนะนำให้ผลผลิตสละ 2,676 กิโลกรัมต่อไร่ต่อปี สร้างรายได้ 107,149 บาทต่อไร่ มีต้นทุนการผลิตรวมอยู่ที่ 10,812 บาทต่อไร่ ทำให้มีรายได้สุทธิเท่ากับ 96,338 บาท เมื่อเทียบกับกรรมวิธีเกษตรกร พบว่ากรรมวิธีเกษตรกรให้ผลผลิต 2,464 กิโลกรัมต่อไร่ต่อปี สร้างรายได้ 98,546 บาทต่อไร่ มีต้นทุนการผลิตรวมอยู่ที่ 18,932 บาทต่อไร่ ส่งผลให้มีรายได้สุทธิเท่ากับ 79,614 บาท ทำให้มีผลต่างของรายได้สุทธิในกรรมวิธีแนะนำ (โดยเฉลี่ยจากเกษตรกร จำนวน 13 ราย) สูงกว่ากรรมวิธีของเกษตรกรถึง 16,724 บาท/ไร่ (ตารางที่2)

ผลตอบแทนทางด้านเศรษฐกิจ

ในกรรมวิธีแนะนำ ค่าอัตราส่วนรายได้ต่อการลงทุน (BCR) เฉลี่ย 9.93 ส่วนในกรรมวิธีเกษตรกร ค่าอัตราส่วนรายได้ต่อการลงทุน (Benefit Cost Ratio) เฉลี่ย 8.26 BCR กรรมวิธีแนะนำสูงกว่ากรรมวิธีเกษตรกร 1.67

เนื่องจากต้นทุนในการผลิตสละของเกษตรกรกรรมวิธีแนะนำโดยเฉลี่ยต่ำกว่ากรรมวิธีของเกษตรกร แต่ให้ผลผลิตสละต่อไร่มากกว่ากรรมวิธีเดิมของเกษตรกร นั่นคือ ลดต้นทุน เพิ่มรายได้ (ต้นทุนต่ำผลผลิตสูง) รายได้สูง เกษตรกรบางรายที่ต้นทุนสูง เพราะว่าปัญหาเดิมของชุมชน คือ ในการผลิตสละของชุมชนก่อนการดำเนินโครงการนั้น เกษตรกรยังขาดความรู้เรื่องเทคโนโลยีการผลิตสละที่เหมาะสม มีเพียงแค่การผลิตโดยใช้ภูมิปัญญาที่มีอยู่ส่งผลให้ผลผลิตสละต่ำ และเกษตรกรบางรายไม่มีการใส่ปุ๋ยหรือปัจจัยการผลิตที่เหมาะสมหรือใส่ไม่เพียงพอ หรือมีการใช้สารเคมีมากเกินไป มีการใช้ปัจจัยการผลิตที่ไม่มีความจำเป็นในการผลิตสละ เช่น ฮอร์โมนพืชเร่งกิจกรรมต่าง ๆ ตามคำโฆษณาชวนเชื่อจากร้านค้าหรือเซลล์ขายที่ไปตามชุมชน ซึ่งมีราคาสูงมาก เช่น เร่งการผสมเกสรติดดี เร่งการดูดซึมปุ๋ย เหล่านี้ทำให้การผลิตสละของเกษตรกร มีต้นทุนที่สูงมาก แต่ให้ผลผลิตต่ำเมื่อเทียบกับต้นทุน ต้นทุนคำนวณจากต่อต้นแปลงเป็นข้อมูลต่อไร่ แต่เกษตรกรแต่ละรายมีจำนวนต้นสละต่อไร่ไม่เท่ากัน ระยะปลูกแตกต่างกันมาก บางราย 18 ต้นต่อไร่ บางรายมี 30-40 ต้นต่อไร่มีความแปรปรวนมากเนื่องจากการสร้างสวนสละในช่วงแรก ๆ ของชุมชนนั้นเกษตรกรขาดพื้นฐานความรู้ในการผลิต และมีการปลูกแซมพืชหลักเดิม

นอกจากนี้ในด้านคุณภาพของสละยังพบว่า กรรมวิธีแนะนำให้ผลผลิตที่มีคุณภาพมากกว่า โดยพิจารณาจากจำนวนกระปุกต่อทะลาย และน้ำหนักของผล เมื่อเปรียบเทียบกับกัน พบว่า จำนวนกระปุก/ทะลาย น้ำหนักกระปุก และจำนวนผล/กระปุก น้ำหนัก/ผลโดยเฉลี่ยจากเกษตรกร 13 รายนั้น คุณภาพทะลายสละสูงกว่ากรรมวิธีเกษตรกร โดยจำนวนกระปุก/ทะลาย คือ 9 กระปุก ขนาดผล 42 กรัม/ผล ส่วนน้ำหนักกระปุก คือ 1กก./กระปุก (ภาพที่1) ซึ่งเป็นผลจากการปฏิบัติตามคำแนะนำ เรื่องการตัดแต่งกระปุก และตัดแต่งผลต่อกระปุกนั่นเอง (กรมวิชาการเกษตร, 2558)

ตารางที่ 2 ผลผลิตผลตอบแทนทางด้านเศรษฐกิจในการผลิตสละของเกษตรกร จำนวน 13 ราย กรรมวิธีแนะนำเปรียบเทียบกับกรรมวิธีของเกษตรกรชุมชนบ้านสายกลาง-ในกอย พื้นที่หมู่ที่ 9 ตำบลหนองธง อำเภอป่าบอน จังหวัดพัทลุง ปี 2566

เกษตรกรต้นแบบผลิตสละ	กรรมวิธีแนะนำ					กรรมวิธีเกษตรกร				
	ผลผลิต (กก./ไร่)	รายได้ (บาท/ไร่)	ต้นทุน (บาท/ไร่)	รายได้สุทธิ (บาท)	BCR	ผลผลิต (กก./ไร่)	รายได้ (บาท/ไร่)	ต้นทุน (บาท/ไร่)	รายได้สุทธิ (บาท)	BCR
เกษตรกรคนที่ 1	4,290	171,600	10,582	161,018	16.22	4,193	167,700	32,300	135,400	5.19
เกษตรกรคนที่ 2	1,860	74,400	12,210	62,190	6.09	1,643	65,700	6,870	58,830	9.56
เกษตรกรคนที่ 3	2,876	115,050	12,210	102,840	9.42	2,880	115,200	37,000	78,200	3.11
เกษตรกรคนที่ 4	2,048	81,900	14,652	67,248	5.59	2,034	81,360	6,550	74,810	12.42
เกษตรกรคนที่ 5	2,025	81,000	8,140	72,860	9.95	1,913	76,500	38,350	38,150	1.99
เกษตรกรคนที่ 6	1,517	60,675	6,105	54,570	9.94	1,303	52,125	35,060	17,065	1.49
เกษตรกรคนที่ 7	8,083	323,307	15,195	308,112	21.28	6,655	266,187	12,800	253,387	20.80
เกษตรกรคนที่ 8	765	30,600	12,210	18,390	2.51	743	29,700	18,550	11,150	1.60
เกษตรกรคนที่ 9	1,710	68,400	9,768	58,632	7.00	1,674	66,960	10,250	56,710	6.53
เกษตรกรคนที่ 10	3,331	133,245	8,547	124,698	15.59	3,029	121,170	9,600	111,570	12.62
เกษตรกรคนที่ 11	2,610	104,400	16,280	88,120	6.41	2585	103,400	29,700	73,700	3.48
เกษตรกรคนที่ 12	906	36,225	6,105	30,120	5.93	836	33,450	2,600	30,850	12.87
เกษตรกรคนที่ 13	2,804	112,140	8,547	103,593	13.12	2,541	101,640	6,480	95,160	15.69
เฉลี่ย	**2,679**	**107,149**	**10,812**	**96,338**	**9.93**	**2,464**	**98,546**	**18,932**	**79,614**	**8.26**

หมายเหตุ ราคาผลผลิตเฉลี่ยกิโลกรัมละ 40 บาท

ต้นทุนการผลิตกรรมวิธีเกษตรกร= ค่าปุ๋ย+ ค่าจ้างแรงงาน + ค่าสารเคมี ฮอร์โมนเร่งต่าง ๆ ต้นทุนการผลิตกรรมวิธีแนะนำ=ค่าปุ๋ยอัตราคำแนะนำ/ต้น/ปี+ ค่าจ้างแรงงาน

ภาพที่ 1 ลักษณะผลผลิตสละที่ได้จากการตัดแต่งดอกและกระปุกและตัดแต่งผลตามกรรมวิธีที่ 1 ตามคำแนะนำของกรมวิชาการเกษตร เปรียบเทียบกับกรรมวิธีที่ 2 วิธีเดิมเกษตรกร

ชุมชนบ้านสายกลาง-ในกอย พื้นที่หมู่ที่ 9 ตำบลหนองธง อำเภอป่าบอน จังหวัดพัทลุง มีสละเป็นพืชเศรษฐกิจสำคัญของชุมชน ราคาผลผลิตสละพันธุ์สุมาลีเฉลี่ย ราคา 40-50 บาท/กก. มีการแปรรูปเป็นสละลอยแก้ว สละทรงเครื่อง จุดเด่นของชุมชน เกษตรกรบางรายสามารถกำหนดราคาผลผลิตได้เองในช่วงการผลิตสละ 2-3 ปีที่ผ่านมา และการคมนาคมขนส่งสะดวก ส่งผลให้การจำหน่ายผลผลิตและกระจายออกสู่ตลาดนอกชุมชน และจังหวัดอื่น ๆ ได้ดีมากขึ้น โดยภาพรวมเกษตรกรสามารถจัดการสวนสละได้ค่อนข้างดี การพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร จังหวัดพัทลุงนั้น การเกษตรกรที่เข้าร่วมโครงการในปีที่ 1 ถูกคัดเลือกเป็นแปลงต้นแบบ จำนวน 13 ราย สำหรับเกษตรกรรายที่ร่วมพัฒนาวิธีการหรือเทคโนโลยีการผลิตสละซึ่งเป็นพืชเศรษฐกิจชุมชนเพื่อสร้างรายได้ของชุมชน (เทคโนโลยีกรมวิชาการเกษตร) เช่น การใช้ปุ๋ยตามคำแนะนำของกรมวิชาการเกษตร การใส่ปุ๋ยคอก การตัดแต่งผล กระปุก การไว้หน่อ การป้องกันกำจัดโรคและแมลง การปูพลาสติกรองทะลายสละ การเก็บเกี่ยวระยะที่เหมาะสม เป็นต้น และกรรมวิธีการใช้เทคโนโลยีการผลิตแบบเดิมของเกษตรกร ทดสอบไปด้วยกันในแปลงเกษตรกร ร่วมระดมความคิดเห็นจัดเวทีวิจัยสัญจร เพื่อผลิตสละคุณภาพร่วมกัน ในปีที่ 2-3 ร่วมกิจกรรมต่าง ๆ เพื่อยกระดับคุณภาพผลผลิตสละ เช่น ร่วมการประกวดช่อผลสละระดับภาคใต้ โดยคัดเลือกเกษตรกรที่สามารถพัฒนาเพื่อเป็นผู้นำด้านการผลิต เกษตรต้นแบบที่ถูกคัดเลือกเบื้องต้นนั้นต้องปฏิบัติตามวิธีการหรือเทคโนโลยีการผลิตสละ (เทคโนโลยีกรมวิชาการเกษตร) ส่วนการคัดเลือกคุณภาพกระปุกสละก่อนการส่งประกวดนั้น จะจัดเวทีวิจัยสัญจรร่วมกันในชุมชนร่วมระดม ใช้เกณฑ์การตัดสิน ให้คะแนน ทะลายและกระปุกสละคุณภาพ

ที่เกษตรนำมา ทั้ง 13 ราย คัดเลือกเหลือ 3 ราย เพื่อส่งประกวดระดับภาคใต้ ในกิจกรรมของโครงการเพื่อยกระดับคุณภาพผลผลิตสละของเกษตรกร โดยนำผลผลิตสละคุณภาพร่วมการประกวดช่อผลสละในระดับภาคใต้ ในงานวันถ่ายทอดเทคโนโลยีการผลิตพืชภาคใต้ ณ ศูนย์วิจัยและพัฒนาการเกษตรกระบี่ จังหวัดกระบี่ วันที่ 29 เมษายน 2566 ผลการประกวด พบว่า เกษตรกรต้นแบบของโครงการ ชนะการประกวดได้รางวัลลำดับที่ 2 คือ นางโสพิศ แก้วหนู (สวนสละโสรยา) (ภาพที่2) รับโล่ห์รางวัลจากรัฐมนตรีว่าการกระทรวงเกษตรและสหกรณ์

ภาพที่ 2 ภาพกิจกรรมการพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตสละและเกษตรกรต้นแบบ นางโสพิศ แก้วหนู (สวนสละโสรยา) ชุมชนบ้านสายกลาง-ในกอย ต.หนองธง อ.ป่าบอน จ.พัทลุง

ในปีที่ 2 เมื่อคัดเลือกแปลงและเกษตรกรต้นแบบ 13 รายที่ร่วมพัฒนาวิธีการหรือเทคโนโลยีการผลิตสละตามคำแนะนำ ซึ่งเป็นพืชเศรษฐกิจชุมชนเพื่อสร้างรายได้ของชุมชน (เทคโนโลยีตามคำแนะนำกรมวิชาการเกษตร) ในสละ เช่น การใช้ปุ๋ยตามคำแนะนำ การใส่ปุ๋ยคอก การตัดแต่งผล การไว้หน่อ การป้องกันกำจัดโรคและแมลง การปูพลาสติกรองทะลายสละ เมื่อผลผลิตสละมีคุณภาพมากขึ้น ได้มีกระจายผลผลิตสละไปสู่ภายนอกชุมชน ไปจังหวัดอื่น ๆ ภาคอื่น ๆ ระดับประเทศ พบว่า สามารถกระจายผลผลิตไปสู่ภายนอกชุมชน ระดับประเทศได้จากการจำหน่ายหลาย ๆ รูปแบบ เช่น ในปี 2566 สามารถส่งผลผลิตสละ กว่า 10 ตัน (ภาพที่ 3) ส่งจำหน่ายในพื้นที่กรุงเทพมหานคร กระทรวงเกษตรและสหกรณ์ ออกร้านจำหน่ายผลผลิตในงานกิจกรรมต่าง ๆ ของชุมชนทั้งในและนอกจังหวัดพัทลุง เพื่อให้ผลผลิตของชุมชนเป็นที่รู้จักแพร่หลายมากขึ้นจากรสชาติที่หวานหอม อร่อยเนื่องจากการเก็บเกี่ยวผลผลิตในระยะที่เหมาะสม ขนาดผลน้ำหนัก/กระปุก ได้คุณภาพ ได้แปลงต้นแบบการผลิตสละคุณภาพ และมีการมาดูงานของชุมชนเครือข่าย อีก 5 ชุมชน มีความสามารถในการแก้ปัญหาการผลิตพืชของตนเอง ชุมชนบ้านสายกลาง-ในกอย จังหวัดพัทลุง มีการนำผลการดำเนินงาน ในปีงบประมาณ 2565 มาปรับใช้ในการผลิตพืชของตนเอง ได้อย่างถูกต้องเหมาะสมตามหลักวิชาการ และปรับวิธีการในการผลิตพืชของตนเองให้ถูกต้อง

ภาพที่ 3 ภาพกิจกรรมการพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตสละ และกิจกรรมการกระจายผลผลิตของชุมชนบ้านสายกลาง-ในกอย ต.หนองธง อ.ป่าบอน จ.พัทลุง

สรุปและอภิปรายผล

ตามวัตถุประสงค์ของโครงการวิจัยฯ และได้ผลผลิตดังนี้

ได้พัฒนาต้นแบบชุดเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชน (สละ) เปรียบเทียบกรรมวิธีการใช้เทคโนโลยีการผลิตตามคำแนะนำ และการผสมผสานกับองค์ความรู้และ ภูมิปัญญาท้องถิ่น โดยใช้เทคโนโลยีการผลิตสละให้มีคุณภาพ กรมวิชาการเกษตร การป้องกันกำจัดโรคและแมลง การเก็บเกี่ยวสละในระยะที่เหมาะสมได้ผลผลิตคุณภาพตรงกับความต้องการของตลาด เป็นต้น (กรมวิชาการเกษตร, 2557) และกรรมวิธีการใช้เทคโนโลยีการผลิตสละของเกษตรกร เก็บข้อมูลการเก็บเกี่ยวผลผลิต ต้นทุนและรายได้จากการบันทึกข้อมูลเกษตรกรต้นแบบ 13 ราย มีผลต่างของรายได้สุทธิ ในกรรมวิธีแนะนำ เฉลี่ย 13 ราย คือ อัตราส่วนรายได้ต่อการลงทุน (BCR) สูงกว่ากรรมวิธีเกษตรกร

ผลผลิต เทคโนโลยีที่เหมาะสม/นวัตกรรมสำหรับชุมชนเกษตร ในการผลิตและสร้างมูลค่าพืชสละ ซึ่งเป็นพืชเศรษฐกิจหลักของชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงจากบุคคลภายนอกได้มากขึ้น เทคโนโลยีที่เหมาะสม/นวัตกรรมสำหรับชุมชนเกษตร ในการผลิตและสร้างมูลค่าพืชเศรษฐกิจชุมชนได้องค์ความรู้หรือเทคโนโลยีใหม่ในการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชน ได้ถูกนำไปใช้ในทางปฏิบัติ และนำไปใช้ขยายผลต่อยอดจากชุมชนต้นแบบไปยังพื้นที่อื่นหรือกลุ่มเป้าหมายอื่น เพื่อการแก้ไขปัญหาหรือยกระดับการพัฒนาอย่างยั่งยืน

ผลกระทบ ผลิตภาพการผลิตของภาคเกษตรเพิ่มขึ้น จากการนำเอาองค์ความรู้ เทคโนโลยี และนวัตกรรมด้านการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนไปจัดการกับกลุ่มปัญหาการเกษตร ได้อย่างเป็นรูปธรรม ถ่ายทอดและขยายผลการใช้ประโยชน์ให้กลุ่มเป้าหมายและพื้นที่เพื่อสร้างความยั่งยืนในการแก้ปัญหาและการพัฒนาต่อไปได้ เกษตรกรต้นแบบที่มีการนำผลการดำเนินงาน ในปีงบประมาณ 2565 มาปรับใช้ในการผลิตพืชของตนเอง ได้อย่างถูกต้องเหมาะสมตามหลักวิชาการ และปรับวิธีการในการผลิตพืชของตนเองให้ถูกต้องมากขึ้น

สำหรับการวิจัยเพื่อพัฒนาเป็นชุมชนต้นแบบที่จะเป็นศูนย์ถ่ายทอดเทคโนโลยีด้านการผลิตพืชเพื่อสร้างเสถียรภาพด้านรายได้และความมั่นคงทางอาหารและขยายผลไปสู่ชุมชนอื่นๆในจังหวัดพัทลุงนั้น ได้มีการนำผลงานวิจัยไปใช้ประโยชน์ต่อผู้ที่มีส่วนเกี่ยวข้องโดยตรง คือ เกษตรกรหรือชุมชนหมู่ที่ 9 ตำบลหนองธง อำเภอป่าบอน จังหวัดพัทลุง และประโยชน์ทางวิชาการ ความรู้เรื่องการใช้เทคโนโลยีที่เหมาะสมในการผลิตสละของชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร จังหวัดพัทลุง 1 ชุมชน และขยายผลการใช้ประโยชน์ให้กลุ่มเป้าหมายและพื้นที่ใกล้เคียง เพื่อสร้างความยั่งยืนในการแก้ปัญหาและการพัฒนาต่อไป จากการนำเทคโนโลยีที่เหมาะสม/นวัตกรรมสำหรับชุมชนเกษตร สร้างมูลค่าพืชเศรษฐกิจชุมชนได้องค์ความรู้ หรือเทคโนโลยีใหม่ในการจัดการผลิตพืช ๆ ได้ถ่ายทอดเทคโนโลยีด้านการผลิตพืชเศรษฐกิจหลักของชุมชน (สละ) ไปยังชุมชนอื่น ๆ 5 ชุมชนในเครือข่ายงานวิจัย จากการเข้าร่วมกิจกรรมวันถ่ายทอดเทคโนโลยี โดย 5 ชุมชนในเครือข่ายดังกล่าว ได้แก่ 1.ชุนชนควนกาหลง (จังหวัดสตูล) 2.ชุมชนเขาพระ (อำเภอรัตภูมิ จังหวัดสงขลา) 3.ชุมชนตาชี (จังหวัดยะลา) 4.ชุมชนพ่อมิ่ง (จังหวัดปัตตานี) และ 5.ชุมชนชะแล้ (จังหวัดสงขลา) จากการมาศึกษาดูงานของชุมชนในงานกิจกรรมวันถ่ายทอดเทคโนโลยีการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ประจำปี 2566 วันที่ 28 กุมภาพันธ์ 2566 ณ ศาลาประชาคม หมู่ที่ 9 ต.หนองธง อ. ป่าบอน จ. พัทลุง (ภาพที่ 4) มีกิจกรรมการถ่ายทอดเทคโนโลยีความมั่นคงทางด้านอาหารของชุมชนบ้านสายกลาง-ในกอย จังหวัดพัทลุง สู่ชุมชนอื่น ๆ โดยการนำเทคโนโลยีการผลิตพืชจากกรมวิชาการ

เกษตรและประยุกต์ให้เข้ากับบริบทของชุมชน มีฐานการเรียนรู้การผลิตสละคุณภาพ โดยเกษตรกรต้นแบบนางโสพิศ แก้วหนู และนางนงลักษณ์ ชูเอียด มีการปลูกสละสุมาลีคุณภาพ ซึ่งเป็นพืชเศรษฐกิจของชุมชนบ้านสายกลาง พบว่า เกษตรกรในชุมชนมีพัฒนาการจากการเรียนรู้จากชุมชนอื่น ๆ ที่แตกต่างจากชุมชนของตัวเอง และนำมาพัฒนาระบบการทำงานทัศนคติเพื่อประโยชน์ในชุมชนตัวเองเพิ่มขึ้น มีความสัมพันธ์ระหว่างเกษตรกรเครือข่ายที่เหนียวแน่นขึ้น เกิดการสร้างเครือข่ายที่แท้จริงจากการมีกิจกรรมระหว่างชุมชนในจังหวัดต่าง ๆ

นอกจากนี้ยังมีกิจกรรมที่ต่อยอดสำคัญของโครงการ เพื่อยกระดับคุณภาพผลผลิตสละของเกษตรกรโดยการนำผลผลิตสละคุณภาพของเกษตรกรเข้าร่วมการประกวดช่อผลสละในระดับภาคใต้ในงานวันถ่ายทอดเทคโนโลยีการผลิตพืชภาคใต้ ส่งผลให้เกษตรกรต้นแบบของโครงการได้ลำดับที่ 2 คือ นางโสพิศ แก้วหนู (สวนสละโสรยา) เชื่อมโยงตลาดนำการผลิต โดยการกระจายผลผลิตไปสู่ภายนอกชุมชน ระดับประเทศได้จากการจำหน่ายหลาย ๆ รูปแบบ

ภาพที่ 4 กิจกรรมวันถ่ายทอดเทคโนโลยีการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ประจำปี 2566 วันที่ 28 กุมภาพันธ์ 2566 ณ ศาลาประชาคม หมู่ที่ 9 ต.หนองธง อ.ป่าบอน จ.พัทลุง

ข้อเสนอแนะ

1. เพื่อการจัดการที่สร้างการมีส่วนร่วมของสมาชิกในชุมชนอื่น ๆ การมีส่วนร่วมกับหน่วยงานสนับสนุนอื่น ๆ ในการต่อยอดและยกระดับคุณภาพผลผลิตสละของเกษตรกรในชุมชนที่สนใจการผลิตสละคุณภาพ สามารถเข้ามาศึกษาดูงานและเยี่ยมชม แปลงต้นแบบได้ระดับภาคสนาม และเกษตรกรต้นแบบของกลุ่มผลิตสละชุมชนบ้านสายกลาง-ในกอย รายได้การแปรรูปสินค้าเกษตร และปริมาณผลผลิตพืช ที่ผ่านการรับรอง GAP พัฒนาคุณภาพของผลผลิต และราคาสินค้าพืชที่จำหน่ายโดยติดต่อผ่าน

หน่วยงาน ศูนย์วิจัยและพัฒนาการเกษตรพัทลุง หมู่ 15 ต. ควนมะพร้าว อ. เมือง จ. พัทลุง หรือประธานกลุ่ม กำนันประเจือบ มลยงค์ กำนันตำบลหนองธง อำเภอป่าบอน จังหวัดพัทลุงได้โดยตรง

2. ผลการวิจัยนี้จะเป็นประโยชน์ต่อหน่วยงานอื่น ๆ ที่เกี่ยวข้องและนักวิจัยที่สนใจ สามารถนำผลงานวิจัยไปใช้ประโยชน์และต่อยอดได้ โดยผลผลิต (Output) ของโครงการวิจัยจะได้เทคโนโลยี/กระบวนการใหม่ระดับภาคสนาม 1 กระบวนการ และเมื่อสิ้นสุดโครงการ ปี 2567 ได้หนังสือเรื่อง การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรในจังหวัดพัทลุง 1 เล่ม เรื่อง การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้ และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ในจังหวัดพัทลุง

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การรับข้อพิพาทนอกศาล: ศึกษากรณีศูนย์ดำรงธรรมหาดใหญ่

Receiving Disputes Outside of Court: A Study of the Case of Damrongtham Hatyai Center.

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาอำนาจหน้าที่ในการรับเรื่องร้องเรียนร้องทุกข์ปัญหาและอุปสรรคในการปฏิบัติงานด้านการรับเรื่องราวร้องเรียน/ร้องทุกข์ แนวทางการแก้ปัญหาและข้อเสนอแนะในการปฏิบัติงานด้านการรับเรื่องราวร้องเรียนร้องทุกข์ของศูนย์ดำรงธรรม กรณีศึกษา ศูนย์ดำรงธรรมหาดใหญ่ โดยใช้วิธีวิจัยเชิงปริมาณและคุณภาพ เก็บรวบรวมข้อมูลและวิธีการสัมภาษณ์ผู้ให้ข้อมูลสำคัญจำนวน 100 คน เมื่อประชาชนเกิดความเดือดร้อนหรือมีข้อสงสัยในการดำเนินการในด้านต่าง ๆ ก็จะมาติดต่อยื่นคำร้องต่อศูนย์ดำรงธรรมอำเภอ เนื่องจากเป็นหน่วยงานที่มีความใกล้ชิดและคุ้นเคยในการติดต่อราชการต่าง ๆ อยู่เป็นประจำ และมีการบูรณาการร่วมกันขึ้นระหว่างส่วนราชการ เพื่อแก้ไขปัญหาทุกข์สุขของประชาชน ซึ่งเป็นภารกิจของกรมการปกครองเพื่อจะบำบัดทุกข์บำรุงสุขแก่ประชาชน จากผลการวิจัยที่ได้นำมาพัฒนาการรับเรื่องร้องเรียนร้องทุกข์ให้มีประสิทธิภาพรวดเร็วทันต่อสถานการณ์สามารถแก้ไขข้อขัดข้องหรือความขัดแย้งได้หรือลดจำนวนการเกิดคดีความต่าง ๆ ในชั้นศาลต่าง ๆ เพื่อเกิดประโยชน์แก่ประชาชนส่งผลให้ประชาชนมีความเป็นอยู่ที่ดี

คำสำคัญ : การรับข้อพิพาทนอกศาล, ศูนย์ดำรงธรรมหาดใหญ่

Abstract

This research aims to study the authority and duties in receiving complaints, problems, and obstacles in the operation of receiving complaints or grievances. Guidelines for solving problems and suggestions for the operation of receiving complaints at the Damrongtham Center Case study of Damrongtham Hatyai Center using quantitative and qualitative research methods to collect data and interviewing 100 . When people are in trouble or have doubts about operations in various areas, they will contact and file a complaint with the Damrongtham District Center. Because it is an agency that is close and familiar with dealing with various government agencies regularly. and there is integration between government agencies. To solve the problems of people's happiness This is the

mission of the Department of Provincial Administration to relieve suffering and promote happiness for the people. From the results of research that has been used to develop the receipt of complaints and complaints to be efficient, fast, and timely with the situation, able to solve problems or conflicts or reduce the number of cases in various courts for the benefit of the people, resulting The people are living well.

Keywords : Receiving disputes outside of court, Damrongtham Hatyai Center

บทนำ

การก่อตั้ง "ศูนย์ดำรงธรรมอำเภอ" เป็นการอำนวยความสะดวกให้กับประชาชนที่มีปัญหาความเดือดร้อนจะได้แจ้งให้ภาครัฐได้รับรู้แล้วนำปัญหาต่าง ๆ ไปกระจายให้หน่วยงานที่รับผิดชอบไปแก้ไขได้โดยตรงถือเป็นอีกช่องทางหนึ่งที่จะได้รับรู้ปัญหาของชาวบ้าน ที่ผ่านมาประชาชนจะต้องเดินทางเข้ามาร้องเรียนร้อง ทุกข์ที่ส่วนกลาง กรุงเทพมหานคร ซึ่งก็มีความยากลำบาก หรือจะเข้าจังหวัดก็เช่นกัน เมื่อมีการขยายออกไปสู่ะดับอำเภอ จึงเป็นการอำนวยความสะดวกให้กับประชาชนโดยตรง ที่ผ่านมาจะเกิดปัญหาเมื่อไปร้องเรียน หรือแจ้งปัญหาให้หน่วยงานที่รับผิดชอบในระดับจังหวัด มักจะเป็นลักษณะ "รับเรื่องไว้" แต่ยังไม่ได้รับการแก้ไขอย่างทันท่วงที ประชาชนจึงเกิดความรู้สึกว่าในระดับจังหวัดยังไม่สามารถแก้ไขเยียวยาได้ สุดท้ายก็ต้องเดินทางเข้ามาร้องเรียน ร้องทุกข์ที่ส่วนกลาง กรุงเทพมหานคร รวมทั้งประชาชนไม่เชื่อมั่นว่าเจ้าหน้าที่ระดับจังหวัดจะรับรู้หรือไม่ และอาจจะถูกกลุ่มผู้มีอิทธิพลขัดขวางก็ต้องเดินขบวนเข้ามาเพื่อแจ้งให้รัฐบาลได้รับรู้เรื่องเหล่านี้ ซึ่งนับว่าเป็นช่องว่างระหว่างรัฐกับประชาชนที่ไม่สามารถสื่อสารถึงกันได้ และสร้างความรู้สึกที่ไม่ดีต่อภาครัฐ หลายปัญหาหลายเรื่องราวในแต่ละจังหวัดนั้นมีความแตกต่างกัน เช่น การบุกรุกพื้นที่ป่า นายทุนเข้าไปรังแกชาวบ้านโรงงานปล่อยน้ำเสีย ปัญหาผู้มีอิทธิพลและอื่น ๆ อีกหลายเรื่องที่เกิดขึ้น ถ้าหากผู้ว่าราชการจังหวัด นายอำเภอ ฝ่ายปกครองท้องถิ่นต่าง ๆ รับรู้และแก้ไขแต่เบื้องต้น จากปัญหาที่สามารถรีบแก้ไขได้ก็จะไม่เป็นเรื่องใหญ่โตบานปลายอย่างที่ไม่ควรจะเกิดขึ้น ดังนั้น “การจัดตั้งศูนย์ดำรงธรรมอำเภอ” ขึ้นมา ถือเป็นแนวทางหนึ่งในการอำนวยความเป็นธรรมให้เกิดผลเป็นรูปธรรม และเป็นศูนย์กลางให้ความช่วยเหลือและแก้ไขปัญหาความเดือดร้อนของประชาชนในทุก ๆ เรื่อง เพื่อลดความขัดแย้งในพื้นที่ โดยเน้นการปฏิบัติการในเชิงรุก ทั้งนี้หากพบพฤติกรรมไม่ถูกต้องชอบธรรม หรือมีข้อเสนอแนะดี ๆ ที่เป็นประโยชน์ต่อสังคมไทย หรือไม่ได้รับความสะดวก มีปัญหาเดือดร้อนคับข้องใจ สามารถไปศูนย์ดำรงธรรมจังหวัด อำเภอได้ทั่วประเทศ รวมทั้งเป็นเครื่องมือสำคัญที่จะสื่อถึงกันระหว่างผู้ปกครองกับประชาชน อีกทั้งเจ้าหน้าที่จะสามารถรู้ถึงปัญหาความเดือดร้อน สภาพความเป็นไปต่าง ๆ ของพื้นที่ ซึ่งจะเป็นประโยชน์ต่อภาครัฐ เมื่อศูนย์ดำรงธรรมอำเภอ ได้รับรู้ถึงปัญหาต่างๆ ก็จะต้องเร่งแก้ไขเยียวยา สร้างความเข้าใจด้วยการชี้แจงด้วยเหตุด้วยผล ซึ่งเป็นแบบอย่างที่นักปกครองต้องนำไปปฏิบัติเพื่อ “บำบัดทุกข์ บำรุงสุข” ให้กับประชาชนซึ่งเป็นเรื่องสำคัญที่สุด

ส่วนการไกล่เกลี่ยข้อพิพาท คือ การระงับข้อพิพาทที่จะต้องมีคนกลางหรือบุคคลที่สามเข้ามามีบทบาทร่วมในการชักจูงคู่พิพาทให้หันหน้าเข้าหากันตลอดจนอาจจะต้องเป็นผู้เสนอแนะแนวทางแก้ไขข้อพิพาท ซึ่งเป็นที่ยอมรับทั้งสองฝ่ายบุคคลที่เข้ามาทำหน้าที่นี้เรียกว่า “ผู้ไกล่เกลี่ย” ในการไกล่เกลี่ยข้อพิพาทผู้ไกล่เกลี่ยอาจเป็นบุคคลหรือองค์กรก็ได้ ขึ้นอยู่กับความยินยอมของคู่กรณีและระบบกฎหมายที่ใช้อยู่ว่าจะเปิดโอกาสให้เพียงใด ดังนั้น พระราชบัญญัติการไกล่เกลี่ยข้อพิพาท พ.ศ. 2562 จึงมี

ความสำคัญเพราะจะเป็นกลไกที่ช่วยให้กระบวนการไกล่เกลี่ยข้อพิพาททางแพ่งซึ่งมีทุนทรัพย์ไม่มากนักและข้อพิพาททางอาญาบางประเภทมีระบบและมาตรฐานเดียวกัน โดยกำหนดคุณสมบัติและลักษณะต้องห้ามของผู้ไกล่เกลี่ยและการขึ้นทะเบียนเป็นผู้ไกล่เกลี่ย เพื่อจัดระเบียบการประกอบอาชีพผู้ไกล่เกลี่ยและคุ้มครองประโยชน์ของคู่กรณีและบุคคลอื่นที่มีส่วนเกี่ยวข้องกับข้อพิพาท ซึ่งจะช่วยลดคดีขึ้นสู่ศาลให้น้อยลง ลดปัญหาความขัดแย้ง เกิดความสมานฉันท์ขึ้นในสังคม ลดงบประมาณแผ่นดิน และเสริมสร้างสังคมให้อยู่ร่วมกันอย่างปกติสุข การทำวิจัยเล่มนี้เพื่อศึกษาถึงปัญหาการไกล่เกลี่ยข้อพิพาทนอกศาลโดยศูนย์ดำรงธรรม โดยมองเห็นปัญหาของศูนย์ดำรงธรรมมีอำนาจรับเรื่องร้องเรียนของผู้เสียหายหรือคู่ความที่พิพาทกันในทางแพ่งเพื่อเป็นคนกลางในกระบวนการยุติธรรมไกล่เกลี่ยข้อพิพาททางแพ่งโดยการรับเรื่องร้องเรียนและดำเนินการส่งหนังสือไปยังคู่กรณี เพื่อเรียกคู่กรณีมาไกล่กันศูนย์ดำรงธรรมโดยคู่กรณีที่ได้รับหนังสือจะประสงค์เข้าไกล่เกลี่ยหรือไม่ก็ได้ หากไม่ประสงค์ไกล่เกลี่ยศูนย์ดำรงธรรมไม่มีอำนาจบังคับและไม่สามารถทำการไกล่เกลี่ยได้ การร้องเรียนของผู้เสียหายจึงไม่เกิดผลจึงทำให้ประชาชนไม่สามารถเข้าถึงกระบวนการยุติธรรมได้ในเบื้องต้น

ศูนย์ดำรงธรรมหาดใหญ่เป็นส่วนหนึ่งของการพัฒนาระบบยุติธรรมในประเทศ ศูนย์ดำรงธรรมมีบทบาทสำคัญในการเสริมสร้างความเป็นธรรมและเร่งด่วนในการแก้ไขข้อพิพาทและปัญหาที่เกี่ยวข้องกับความยุติธรรมในสังคม โดยมุ่งเน้นให้มีการแก้ไขข้อพิพาททางกฎหมายของจังหวัดหรืออำเภอ อย่างรวดเร็วและมีความเป็นธรรม มีทีมงานที่ประสานงานร่วมกับหน่วยงานที่เกี่ยวข้อง เช่น ตำรวจ ศาล องค์กรสังคมสงเคราะห์ ฯลฯ เพื่อให้การแก้ไขข้อพิพาทเป็นไปอย่างมีประสิทธิภาพและเป็นธรรมต่อทุกฝ่าย นอกจากนี้ ศูนย์ดำรงธรรมหาดใหญ่ยังเป็นที่รวมของข้อมูลและข่าวสารเกี่ยวกับกระบวนการแก้ไขข้อพิพาทและการให้คำปรึกษาทางกฎหมายในชุมชน ทำให้ประชาชนสามารถเข้าถึงข้อมูลและบริการต่าง ๆ ได้อย่างสะดวกสบาย การจัดตั้งศูนย์ดำรงธรรมหาดใหญ่เป็นการรับรู้ถึงความสำคัญของการมีสถานที่และเครื่องมือที่ให้บริการด้านยุติธรรมและการแก้ไขข้อพิพาทให้แก่ประชาชนในพื้นที่ ทั้งนี้เพื่อให้การแก้ไขข้อพิพาทเกิดผลลัพธ์ที่ดีและเป็นธรรมในระดับท้องถิ่น เช่น งานบริการข้อมูลข่าวสาร และรับเรื่องราวร้องเรียน/ร้องทุกข์ งานบริการงานบัตรประจำตัวประชาชน งานบริการรับสมัครงาน ขึ้นทะเบียนคนว่างงาน งานบริการเกี่ยวกับประกันสังคม งานบริการต่อทะเบียนรถและอื่น ๆ

จากปัญหาดังกล่าว ผู้วิจัยจึงเห็นว่าจะต้องทำการศึกษาวิจัยในประเด็นเรื่องของอำนาจศูนย์ดำรงธรรมในการไกล่เกลี่ยข้อพิพาทคดีนอกศาล เนื่องจากไม่มีมาตรการทางกฎหมายในการให้อำนาจศูนย์ดำรงธรรมในการไกล่เกลี่ยอย่างแท้จริง

วัตถุประสงค์ของการวิจัย

1) เพื่อศึกษาปัญหาและอุปสรรคในการไกล่เกลี่ยข้อพิพาทนอกศาลโดยศูนย์ดำรงธรรมอำเภอหาดใหญ่และในกระบวนการพิจารณาของศาล

2) เพื่อเสนอแนวทางในการแก้ไขปรับปรุงกฎหมายที่เกี่ยวกับอำนาจการไกล่เกลี่ยข้อพิพาททางแพ่งของศูนย์ดำรงธรรม

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดทฤษฎีเกี่ยวกับศูนย์ดำรงธรรม

แนวคิดในการทำงานของศูนย์ดำรงธรรม กระทรวงมหาดไทย เน้นการมีส่วนร่วมระหว่างภาคราชการ องค์กรปกครองส่วนท้องถิ่น องค์กรพัฒนาเอกชน มูลนิธิชมรม สมาคม สถาบัน อาสาสมัครและองค์กรภาคเอกชนต่าง ๆ ที่เกี่ยวข้องในการประสานความร่วมมือของทุกองค์กร ส่วนรูปแบบการดำเนินงานของ “ศูนย์ดำรงธรรม กระทรวงมหาดไทย” นั้น มีการจัดตั้งครอบคลุมทั่วประเทศ เพื่ออำนวยความเป็นธรรมให้กับประชาชน ทั้งในส่วนกลางและส่วนภูมิภาค โดยส่วนกลาง จะแบ่งออกเป็น 2 ระดับ คือ ศูนย์ดำรงธรรม กระทรวงมหาดไทย มีที่ตั้งบริเวณชั้น 1 อาคารศาลาว่าการกระทรวงมหาดไทย และศูนย์ดำรงธรรมหรือศูนย์ให้บริการประชาชน ในลักษณะเดียวกับศูนย์ดำรงธรรมกระทรวง ของหน่วยงานระดับกรม และรัฐวิสาหกิจมีที่ตั้งอยู่ในกรมและหน่วยงานรัฐวิสาหกิจแต่ละแห่ง ส่วนภูมิภาค จะแบ่งออกเป็น 2 ระดับ คือศูนย์ดำรงธรรมจังหวัด ณ ศาลากลาง จังหวัดทุกจังหวัด และศูนย์ดำรงธรรมอำเภอ/กิ่งอำเภอ ณ ที่ว่าการอำเภอและกิ่งอำเภอทุกแห่ง บทวิเคราะห์ศูนย์ดำรงธรรมอำเภอ

ธมกร ศรีหะจันทร์ (2561) กล่าวว่า “ศูนย์ดำรงธรรมอำเภอ” ถือเป็นเครื่องมือหลักในการบริหารงานของรัฐบาลพลเอกประยุทธ์ จันทร์โอชา ในการปรับเปลี่ยนบทบาทใหม่ โดยเพิ่มอำนาจให้มีการจัดตั้ง “ศูนย์ดำรงธรรมอำเภอ” ในแต่ละจังหวัดตามประกาศคณะรักษาความสงบแห่งชาติฉบับที่ 96/ 25 ร7 โดยกำหนดอำนาจหน้าที่ของศูนย์ ดังกล่าวเพิ่มขึ้น ทั้งในส่วนกลางและระดับจังหวัดขึ้นตรงกับกระทรวงมหาดไทย เพื่อให้ประสิทธิภาพการบริหารงานระดับจังหวัด และการปฏิบัติงานของส่วนราชการในการบริการประชาชนมีคุณภาพรวดเร็ว และลดขั้นตอนในการปฏิบัติงาน รวมถึงรับเรื่องร้องเรียนจากประชาชน และการปฏิรูปประเทศ ทั้งนี้กระทรวงมหาดไทยได้มีการจัดประชุมระดับผู้บริหารของกระทรวงและผู้ว่าราชการจังหวัดทั่วประเทศ เพื่อขับเคลื่อนตามนโยบายของคณะรักษาความสงบแห่งชาติ (กสช.) โดยเห็นว่า การเพิ่มอำนาจให้กับศูนย์ดำรงธรรมให้กลายเป็น “ศูนย์ที่สั่งการเบ็ดเสร็จ” หลังจากเปิดศูนย์ดำรงธรรมมาแล้วตั้งแต่ปี 2537 แต่ค่อยๆ หมดบทบาทลง เมื่อรัฐบาลที่มาจากการเลือกตั้งเลือกใช้ศูนย์บริการประชาชนที่ทำเนียบรัฐบาล และร้องเรียนผ่านทางสมาชิกสภาผู้แทนราษฎร (สส.) ดังนั้นรัฐบาลพลเอก ประยุทธ์ จันทร์โอชา จึงได้มีประกาศ

คณะรักษาความสงบแห่งชาติหรือคำสั่งดังกล่าว โดยมีเหตุผล ดังต่อไปนี้

1. ต้องการให้ผู้ว่าราชการจังหวัดมีอำนาจเพิ่มขึ้น ศูนย์ดำรงธรรมเป็น “ศูนย์สั่งการเบ็ดเสร็จ” เพื่อแก้ปัญหาในพื้นที่ ส่วนในเรื่องของโครงสร้างบริหารจัดการมีข้อเสนอว่าควรจัดกลุ่มงานดำรงธรรมให้ขึ้นกับสำนักงานจังหวัด การที่ศูนย์ดำรงธรรมเป็นด่านแรกในการรับเรื่องราวทั้งหมดของทุกกระทรวง

2. จะต้องมีการรับ ส่ง ติดตามช่วยเหลือ และรายงานผลส่วนกลางงานปกติ ได้แก่ การรับเรื่องราวร้องทุกข์การให้คำปรึกยาการให้บริการข้อมูลการจัดตั้งบอร์ดบริหารและกำหนดเป็นคณะทำงาน 4 กลุ่ม และอีกประเภทหนึ่ง คือ งานกรณีพิเศษ ขึ้นอยู่กับบอร์ดบริหารในการพิจารณาเป็นกรณีไป เช่น ปัญหาน้ำปัญหาภัยพิบัติปัญหายาเสพติด เป็นต้น โดยให้ศูนย์ดำรงธรรมอำเภอ และองค์กรปกครอง ส่วนท้องถิ่น (อปท) ได้มีชุดปฏิบัติการเคลื่อนที่เร็วเพื่อแก้ปัญหาเร่งด่วน

แนวคิดทฤษฎีเกี่ยวกับการไกล่เกลี่ยข้อพิพาท

ตามพจนานุกรมฉบับราชบัณฑิตสถาน พ.ศ. 2555 ได้ให้คำนิยามของคำว่า ไกล่เกลี่ย ไว้ว่า “พูดจาให้ปรองดองกัน พูดจาให้ตกลงกัน ทำให้เรียบร้อย ทำให้เสมอกัน” บทบาทของผู้ไกล่เกลี่ยนั้นไม่ได้เป็นผู้ชี้ขาดตัดสินให้ฝ่ายใดฝ่ายหนึ่งเป็นฝ่ายแพ้หรือฝ่ายชนะ แต่ผู้ไกล่เกลี่ยหรือคนกลางเป็นเพียง

ผู้ช่วยเหลือให้คู่พิพาทตกลงระงับข้อพิพาทด้วยของคู่พิพาทเอง ดังนั้น การไกล่เกลี่ยข้อพิพาท หมายถึง วิธีการระงับข้อพิพาทโดยบุคคลที่สาม ที่เรียกว่า ผู้ไกล่เกลี่ยในการทำหน้าที่ช่วยเหลือเสนอแนะแนวทาง และหาทางออกให้กับคู่พิพาทเพื่อตกลงประนีประนอมยอมความกัน

พระราชบัญญัติ การไกล่เกลี่ยข้อพิพาท พ.ศ. 2562 มาตรา 3 ในพระราชบัญญัตินี้

“การไกล่เกลี่ยข้อพิพาท” หมายความว่า การดำเนินการเพื่อให้คู่กรณีมีโอกาสเจรจาตกลงกันระงับข้อพิพาททางแพ่งและทางอาญาโดยสันติวิธีและปราศจากการวินิจฉัยชี้ขาดข้อพิพาท ทั้งนี้ ไม่รวมถึงการไกล่เกลี่ยข้อพิพาทที่ดำเนินการในชั้นศาลและในชั้นการบังคับคดี

“ผู้ไกล่เกลี่ย” หมายความว่า บุคคลซึ่งได้รับการขึ้นทะเบียนและได้รับการแต่งตั้งให้ทำหน้าที่ในการไกล่เกลี่ยข้อพิพาท

“ข้อตกลงระงับข้อพิพาท” หมายความว่า ข้อตกลงที่คู่กรณีตกลงให้มีผลผูกพันโดยชอบ

ด้วยกฎหมายเพื่อระงับข้อพิพาทหรือข้อเรียกร้องใด ๆ ที่แต่ละฝ่ายมีอยู่ และให้คู่กรณีแต่ละฝ่ายต่างมีสิทธิหน้าที่หรือความรับผิดเพียงเท่าที่กำหนดไว้ในข้อตกลงนั้น

“หน่วยงานซึ่งดำเนินการไกล่เกลี่ยข้อพิพาท” หมายความว่า หน่วยงานของรัฐซึ่งดำเนินการระงับข้อพิพาทโดยวิธีการไกล่เกลี่ยข้อพิพาท

“หน่วยงานของรัฐ” หมายความว่า ราชการส่วนกลาง ราชการส่วนภูมิภาค สำนักงานศาล

ยุติธรรม สำนักงานอัยการสูงสุด หรือหน่วยงานอื่นของรัฐตามที่รัฐมนตรีว่าการกระทรวงยุติธรรมกำหนดในกฎกระทรวง

“นายทะเบียน” หมายความว่า หัวหน้าหน่วยงานของรัฐซึ่งดำเนินการไกล่เกลี่ยข้อพิพาท

ยุทธพงศ์ ปิ่นอนงค์ (2562) กล่าวว่า การไกล่เกลี่ยข้อพิพาท สามารถแบ่งออกได้เป็น 2 ประเภท ดังต่อไปนี้

1. การไกล่เกลี่ยข้อพิพาทนอกศาล คือ การไกล่เกลี่ยข้อพิพาทก่อนมีการฟ้องร้องคดีต่อศาล หรือแม้จะฟ้องร้องคดีต่อศาลแล้ว แต่คู่ความดำเนินการให้มีการไกล่เกลี่ยข้อพิพาทกันเอง โดยไม่ดำเนินการในศาลก็ได้

2. การไกล่เกลี่ยข้อพิพาทในศาล คือ การไกล่เกลี่ยข้อพิพาทหรือคดีที่อยู่ระหว่างการพิจารณาของศาล โดยศาลเป็นผู้ดำเนินการให้ ซึ่งหากคู่ความตกลงกันได้ก็จะมีการทำสัญญาประนีประนอมยอมความและศาลจะมีคำพิพากษาไปตามที่คู่ความตกลงกัน โดยมีข้อยกเว้นเพียงบางประการเท่านั้น หรือหากตกลงกันได้เพียงบางส่วน ศาลก็จะสืบพยานและมีคำพิพากษาในเฉพาะประเด็นที่ตกลงกันไม่ได้เท่านั้น

งานวิจัยที่เกี่ยวข้อง

ธมกร ศรีหะจันทร์ (2561) ได้ทำการศึกษาวิจัย เรื่อง การดำเนินงานการไกล่เกลี่ยของศูนย์ดำรงธรรมอำเภอศรีราชา จังหวัดชลบุรี งานวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อศึกษาการดำเนินงานการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรมอำเภอศรีราชา ระหว่างปี พ.ศ. 2558-2560 และ 2) เพื่อศึกษาปัญหาและอุปสรรคในการดำเนินงานการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรม อำเภอศรีราชา เป็นงานวิจัยเชิงคุณภาพ โดยศึกษาจากกลุ่มผู้ให้ข้อมูลสำคัญ จำนวน 17 คน เก็บรวบรวมข้อมูลใช้แบบสัมภาษณ์แบบมีโครงสร้าง และวิเคราะห์ข้อมูลตามประเด็นเนื้อหา 1. การดำเนินงานการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรม อำเภอศรีราชา จังหวัดชลบุรี พบว่า (1) ด้านปัจจัยนำเข้า มีการจัดการที่ยังไม่เหมาะสมและสอดคล้องกับการดำเนินงาน มีข้อจำกัดในการดำเนินงานที่เกิดจาก บุคลากร วัสดุ อุปกรณ์ เทคโนโลยีที่ยัง

ไม่ทันสมัย มีไม่เพียงพอต่อการปฏิบัติงาน (2) ด้านกระบวนการดำเนินงานไกล่เกลี่ยพิพาท บทบาท หน้าที่ โครงสร้าง อำนาจ ของศูนย์ดำรงธรรมอำเภอในปัจจุบันนั้นมีความเหมาะสม โดยขั้นตอนการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรมมีทั้งสิ้น 5 ขั้นตอน และ (3) ผลการดำเนินงานระหว่างปี พ.ศ. 2558-2560 พบว่า มีเรื่องเข้าสู่กระบวนการไกล่เกลี่ยข้อพิพาททางแพ่ง จำนวน 756 เรื่อง ดำเนินการแล้วเสร็จ จำนวน 738 เรื่อง คิดเป็นร้อยละ 97.62 โดยผู้เข้าสู่กระบวนการไกล่เกลี่ยมีความพึงพอใจต่อการดำเนินงานของศูนย์ดำรงธรรม อำเภอศรีราชา 2. ปัญหาและอุปสรรคในการดำเนินงานการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรม พบว่า (1) บุคลากร ไม่เพียงพอ (2) วัสดุอุปกรณ์ไม่เพียงพอและเทคโนโลยีไม่ทันสมัย (3) บุคลากรยังขาดความรู้และทักษะทางด้านของกฎหมาย (4) อำนาจของศูนย์ดำรงธรรมนั้นยังไม่สามารถจัดการปัญหาได้จนถึงที่สุด ยังมีข้อจำกัดในด้านกฎหมายในบางกรณี และ (5) คู่พิพาทไม่ให้ความร่วมมือในการเข้าสู่กระบวนการไกล่เกลี่ย

ชาญวิทย์ คิดอ่าน (2566) ได้ทำการศึกษาวิจัยเรื่อง ศูนย์ไกล่เกลี่ยข้อพิพาทภาคประชาชน"มิติใหม่ในการไกล่เกลี่ยข้อพิพาทตามพระราชบัญญัติการไกล่เกลี่ยข้อพิพาท พ.ศ. 2562 พบว่า การพัฒนากระบวนการยุติธรรมทางเลือกของประเทศไทย ก่อให้เกิดกระบวนการไกล่เกลี่ยข้อพิพาทขึ้นในระดับชุมชนและระดับจังหวัด เช่น การไกล่เกลี่ยของศูนย์ดำรงธรรมตำบล/อำเภอ/จังหวัด, การไกล่เกลี่ยข้อพิพาทขององค์กรปกครองส่วนท้องถิ่นระดับชุมชน ซึ่งเป็นการนำกระบวนการยุติธรรมกระแสรองมาใช้ภายใต้ระเบียบปฏิบัติของประกาศกระทรวงมหาดไทย จนกระทั่งในช่วง 3-4 ปี ที่ผ่านมา ฝ่ายนิติบัญญัติได้ออกกฎหมายสำคัญ คือ พระราชบัญญัติการไกล่เกลี่ยข้อพิพาท พ.ศ. 2562 ถือเป็นกฎหมายกลางที่ใช้เป็นแม่แบบในการไกล่เกลี่ยข้อพิพาท ส่งผลให้เกิดองคาพยพใหม่ คือ “ศูนย์ไกล่เกลี่ยข้อพิพาทภาคประชาชน” (ศกช.) ซึ่งเปิดโอกาสให้ประชาชนรวมตัวกันจัดตั้งขึ้นได้ เพื่อวัตถุประสงค์ในการไกล่เกลี่ยข้อพิพาทภาคประชาชน โดยกฎหมายกำหนดอำนาจหน้าที่ให้กรมคุ้มครองสิทธิและเสรีภาพ กระทรวงยุติธรรม ช่วยส่งเสริมและสนับสนุนให้ ศกช. ทำงานได้อย่างประสบผลสำเร็จตามเจตนารมณ์ของกฎหมาย เพื่อช่วยลดปริมาณคดีในชั้นศาล ลดงบประมาณแผ่นดิน โดยคู่กรณีสามารถยุติข้อพิพาทโดยผ่านความช่วยเหลือและอำนวยการของ ศกช. อย่างเหมาะสมและไม่ขัดต่อกฎหมาย เพื่อช่วยรักษาความสัมพันธ์ระหว่างกันและก่อให้เกิดความสัมพันธ์อันดีในระยะยาว ส่งผลให้คนในสังคมอยู่ร่วมกันอย่างสันติ ในการศึกษาค้นคว้าครั้งนี้ พบว่า การไกล่เกลี่ยข้อพิพาทใน ศกช. ยังมีปัญหาในขั้นตอนการปฏิบัติ สาเหตุมาจากความรู้ความเข้าใจในการไกล่เกลี่ยข้อพิพาทของผู้ไกล่เกลี่ยที่ไม่เพียงพอ กระบวนการของ ศกช. ที่มีขั้นตอนและเอกสารมากมาย และปัญหาเกี่ยวกับบันทึกข้อตกลงระงับข้อพิพาท การกำหนดคุณสมบัติผู้ไกล่เกลี่ยที่ยังไม่เหมาะกับสภาพความเป็นจริงเท่าที่ควร อีกทั้งปัญหาความพร้อมต่อการรับรองบันทึกข้อตกลงระงับข้อพิพาท เนื่องจากกฎหมายให้อำนาจผู้ไกล่เกลี่ยในการทำบันทึกข้อตกลงระงับข้อพิพาทซึ่งมีผลบังคับกันได้ในทางกฎหมาย โดยให้กรมคุ้มครองสิทธิและเสรีภาพเป็นผู้ดูแลและรับรองบันทึกข้อตกลงระงับพิพาทโดยผ่านทางยุติธรรมจังหวัด ซึ่งแต่ละจังหวัดก็มีเจ้าหน้าที่ของกรมคุ้มครองสิทธิและเสรีภาพ ที่ประจำการจำนวนไม่มาก ดังนั้น จึงควรปรับปรุงกฎหมายในส่วนต่างๆ เช่น กำหนดคุณสมบัติผู้ไกล่เกลี่ยของ ศกช. ให้เหมาะสมยิ่งขึ้น ส่งเสริมให้มีการจัดอบรมเพิ่มพูนทักษะของผู้ไกล่เกลี่ยและคณะทำงานของ ศกช. อย่างสม่ำเสมอ สนับสนุนอัตรากำลังเจ้าหน้าที่ของกรมคุ้มครองสิทธิและเสรีภาพในแต่ละจังหวัดให้มีปริมาณเพียงพอ เพื่อให้การรับรองบันทึกข้อตกลงระงับข้อพิพาทเกิดความรวดเร็ว และการไกล่เกลี่ยข้อพิพาทเป็นไปตามวัตถุประสงค์หลักของพระราชบัญญัติการไกล่เกลี่ยข้อพิพาท พ.ศ. 2562

วิธีดำเนินการวิจัย

วิจัยเรื่องนี้เป็นการศึกษาโดยวิจัยเชิงปริมาณและคุณภาพ ซึ่งได้ทำการศึกษาข้อมูลจากเอกสารทั้งที่เป็นแนวคิด ทฤษฎี บทความ ตัวบทกฎหมาย และงานวิจัยที่เกี่ยวข้องและเก็บข้อมูลและการสัมภาษณ์ โดยสัมภาษณ์ความคิดเห็นจากผู้ปฏิบัติงานและผู้ที่เกี่ยวข้อง ได้แก่ ปลัดอำเภอ เจ้าหน้าที่ทั่วไปและประชาชน รวม 100 คน วิธีการเก็บรวบรวมข้อมูล จำแนกออกเป็น 2 ลักษณะ ดังนี้

1. ข้อมูลทุติยภูมิ : เป็นข้อมูลที่ได้จากเอกสารตำรา วารสาร บทความ วิชาการตลอดจนงานวิจัยต่างๆ ที่เกี่ยวข้องโดยทำการศึกษาเอกสาร

2.ข้อมูลปฐมภูมิ : เป็นข้อมูลที่เก็บโดยวิธีการทำแบบสอบถามและสัมภาษณ์

ผลการวิจัย

ส่วนที่ 1 ข้อมูลทั่วไป

จากการสัมภาษณ์ พบว่า เจ้าหน้าที่ทั่วไปส่วนใหญ่รู้จักศูนย์ดำรงธรรมหาดใหญ่ คิดเป็นร้อยละ 80.00 และ ไม่รู้จัก คิดเป็นร้อยละ 20.00 และประชาชนโดยทั่วไปรู้จักและไม่รู้จักศูนย์ดำรงธรรมหาดใหญ่เท่ากัน คิดเป็นร้อยละ 50 นอกจากนี้ เจ้าหน้าที่ทั่วไปส่วนใหญ่ไม่เคยเข้าสู่กระบวนการไกล่เกลี่ยของศูนย์ดำรงธรรมหาดใหญ่ คิดเป็นร้อยละ 90.00 และ เคย คิดเป็นร้อยละ 10.00 และประชาชนโดยทั่วไปส่วนใหญ่ไม่เคยเข้าสู่กระบวนการไกล่เกลี่ยของศูนย์ดำรงธรรมหาดใหญ่ คิดเป็นร้อยละ 60.00 และ เคย คิดเป็นร้อยละ 40.00 ตลอดจน เจ้าหน้าที่ทั่วไปและประชาชน มีเห็นความคิดเห็นว่า ศูนย์ดำรงธรรมควรมีอำนาจหน้าที่มากกว่าเดิม คิดเป็นร้อยละ 100.00 และเจ้าหน้าที่ทั่วไป มีความคิดเห็นว่าการที่ศูนย์ดำรงธรรมขาดอำนาจในการตัดสินใจทำให้กระบวนการทำงานของศูนย์ดำรงธรรมขาดประสิทธิภาพ ส่วนประชาชนมีความคิดเห็นว่า กระบวนการทำงานของศูนย์ดำรงธรรมหาดใหญ่มีความล่าช้า และเจ้าหน้าที่ทั่วไปมีความคิดเห็นว่า ศูนย์ดำรงธรรมหาดใหญ่ ควรมีหน้าที่ในการไกล่เกลี่ยเบื้องต้น เนื่องจากทำให้ข้อพิพาททางแพ่งสามารถยุติลงได้ในเวลาอันรวดเร็วโดยไม่จำเป็นต้องมีการฟ้องคดี อีกทั้งยังเป็นการประหยัดเวลาและประชาชน มีความคิดเห็นว่า ศูนย์ดำรงธรรมหาดใหญ่ควรมีหน้าที่ในการไกล่เกลี่ยเบื้องต้น เพราะทำให้ประหยัดเงินในการจ้างทนาย

ส่วนที่ 2 คำถามความคิดเห็นอื่น ๆ

เนื่องจากปัจจุบันยังไม่มีมาตรการทางกฎหมายในการให้อำนาจศูนย์ดำรงธรรมในการไกล่เกลี่ยอย่างแท้จริง กลุ่มตัวอย่าง จึงไม่เห็นด้วยในการที่ยังไม่มีมาตรการทางกฎหมายในการให้อำนาจศูนย์ดำรงธรรม เนื่องจากการก่อตั้งศูนย์ดำรงธรรมขึ้นมา โดยมีเป้าหมายเพื่อให้บริการรับเรื่องร้องเรียน/ร้องทุกข์ให้แก่ประชาชน แต่การที่ศูนย์ดำรงธรรมขาดอำนาจในการตัดสินใจจึงทำให้ประชาชนห่างไกลคำว่ายุติธรรมและต้องการให้มีมาตรการทางกฎหมายในการเพิ่มอำนาจให้แก่ศูนย์ดำรงธรรมทุกจังหวัด เพราะการที่ศูนย์ดำรงธรรมมีอำนาจในการตัดสินใจมากขึ้นทำให้เกิดผลดีหลายอย่าง อาทิ ทำให้เรื่องที่ประชาชนร้องเรียน/ร้องทุกข์เสร็จสิ้นภายในกระบวนการไกล่เกลี่ยเบื้องต้น ไม่ต้องถึงศาล ทำให้ประหยัดเวลา ประหยัดเงิน

ส่วนที่ 3 ข้อเสนอแนะอื่น ๆ

กลุ่มตัวอย่าง ต้องการมีมาตรการทางกฎหมายในการเพิ่มอำนาจให้ศูนย์ดำรงธรรม โดยพบปัญหาและอุปสรรคในการดำเนินงานการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรม คือ

(1) บุคลากรที่เกี่ยวข้องกับการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรมมีจำนวนไม่เพียงพอเมื่อเทียบกับจำนวนเรื่องร้องเรียนในพื้นที่อำเภอหาดใหญ่ที่มีมาก

(2) บุคลากรที่เกี่ยวข้องมีจำนวนเพียงพอแต่ยังขาดความรู้และทักษะในการรับเรื่องราวร้องทุกข์เนื่องจากขาดการฝึกอบรมว่าอำนาจและขอบเขตของศูนย์ดำรงธรรมมีแค่ไหนรวมถึงความรู้ด้านการไกล่เกลี่ยที่ถูกต้อง

(3) เรื่องอำนาจมีน้อยเกินไป ไม่สามารถบังคับใช้กฎหมายได้ หากตกลงกันไม่ได้ก็ไม่สามารถบังคับได้ต้องจำหน่ายเรื่องต่อไป

(4) ปัญหาและอุปสรรคจากการดำเนินงานไกล่เกลี่ย คือ ผู้ถูกร้องไม่ยอมเข้าสู่กระบวนการไกล่เกลี่ย จึงทำให้ผู้ร้องต้องเจอกับปัญหา ทางอำเภอต้องจำหน่ายเรื่องออกไป และให้ผู้ร้องดำเนินการตามกฎหมายต่อไป

สรุปและอภิปรายผล

จากการศึกษาวิจัยฉบับนี้พบว่าการรับข้อพิพาทนอกศาลโดยศูนย์ดำรงธรรม ถือได้ว่าเป็นระบบที่ส่งเสริมในการระงับข้อพิพาททางเลือกให้แก่ผู้ที่มีกรณีพิพาทเพื่อใช้เป็นช่องทางในการยุติข้อพิพาทก่อนที่จะมีการฟ้องคดีโดยคู่กรณีสามารถร้องขอให้ศาลแต่งตั้งผู้ประนีประนอมดำเนินการไกล่เกลี่ยและหากตกลงกันได้ก็อาจขอให้ศาลมีคำพิพากษาได้ทันที ทำให้ข้อพิพาททางแพ่งสามารถยุติลงได้ในเวลาอันรวดเร็วโดยไม่จำเป็นต้องมีการฟ้องคดีทั้งเป็นการประหยัดเวลา ประหยัดทรัพยากรต่าง ๆ ที่ต้องสูญเสียในการดำเนินคดี อีกทั้งเป็นการเพิ่มทางเลือกให้แก่คู่ความและประชาชนในการยุติข้อพิพาทด้วยหลักสมานฉันท์และสันติวิธีด้วยวิธีการที่สะดวก รวดเร็ว ประหยัด และเป็นธรรมแก่ทุกฝ่าย เป็นมาตรการที่สร้างความเชื่อมั่นให้แก่ประชาชนต่อกระบวนการยุติธรรม และทำให้ศาลอำนวยความยุติธรรมแก่ประชาชนได้อย่างมีประสิทธิภาพยิ่งขึ้น อันจะยังประโยชน์แก่ระบบเศรษฐกิจและสังคมต่อไปและส่วนที่พบเป็นปัญหา คือ เรื่องของการให้อำนาจศูนย์ดำรงธรรมในการไกล่เกลี่ยข้อพิพาทคดีนอกศาล เนื่องจากไม่มีมาตรการทางกฎหมายในการให้อำนาจศูนย์ดำรงธรรมในการไกล่เกลี่ยอย่างแท้จริง เช่นนี้ควรปรับปรุงแก้ไขเพิ่มเติมในส่วนนี้ ซึ่งสอดคล้องกับ ธมกร ศรีหะจันทร์ (2561) ได้ทำการศึกษาวิจัย เรื่อง การดำเนินงานการไกล่เกลี่ยของศูนย์ดำรงธรรม อำเภอศรีราชา จังหวัดชลบุรี พบว่า มีการจัดการที่ยังไม่เหมาะสม และสอดคล้องกับการดำเนินงาน มีข้อจำกัดในการดำเนินงานที่เกิดจาก บุคลากร วัสดุ อุปกรณ์ เทคโนโลยีที่ยังไม่ทันสมัย มีไม่เพียงพอต่อการปฏิบัติงาน โดยพบว่า ปัญหาและอุปสรรคในการดำเนินงานการไกล่เกลี่ยข้อพิพาทของศูนย์ดำรงธรรม พบว่า (1) บุคลากรไม่เพียงพอ (2) วัสดุอุปกรณ์ไม่เพียงพอและเทคโนโลยีไม่ทันสมัย (3) บุคลากรยังขาดความรู้และทักษะทางด้านของกฎหมาย (4) อำนาจของศูนย์ดำรงธรรมนั้นยังไม่สามารถจัดการปัญหาได้จนถึงที่สุด ยังมีข้อจำกัดในด้านกฎหมายในบางกรณี และ (5) คู่พิพาทไม่ให้ความร่วมมือในการเข้าสู่กระบวนการไกล่เกลี่ย และสอดคล้องกับ ชาญวิทย์ คิดอ่าน (2566) ได้ทำการศึกษาวิจัยเรื่อง ศูนย์ไกล่เกลี่ยข้อพิพาทภาคประชาชน"มิติใหม่ในการไกล่เกลี่ยข้อพิพาทตามพระราชบัญญัติการไกล่เกลี่ยข้อพิพาท พ.ศ. 2562 พบว่า กฎหมายให้อำนาจผู้ไกล่เกลี่ยในการทำบันทึกข้อตกลงระงับข้อพิพาทซึ่งมีผลบังคับกันได้ในทางกฎหมาย โดยให้กรมคุ้มครองสิทธิและเสรีภาพเป็นผู้ดูแล

และรับรองบันทึกข้อตกลงระงับพิพาทโดยผ่านทางยุติธรรมจังหวัด ซึ่งแต่ละจังหวัดก็มีเจ้าหน้าที่ของกรมคุ้มครองสิทธิและเสรีภาพที่ประจำการจำนวนไม่มาก ดังนั้น จึงควรปรับปรุงกฎหมายในส่วนต่าง ๆ เช่น กำหนดคุณสมบัติผู้ไกล่เกลี่ย ส่งเสริมให้มีการจัดอบรมเพิ่มพูนทักษะของผู้ไกล่เกลี่ย และคณะทำงานอย่างสม่ำเสมอ สนับสนุนอัตรากำลังเจ้าหน้าที่ของกรมคุ้มครองสิทธิและเสรีภาพในแต่ละจังหวัดให้มีปริมาณเพียงพอ เพื่อให้การรับรองบันทึกข้อตกลงระงับข้อพิพาทเกิดความรวดเร็ว และการไกล่เกลี่ยข้อพิพาทเป็นไปตามวัตถุประสงค์หลักของพระราชบัญญัติการไกล่เกลี่ยข้อพิพาท พ.ศ. 2562

ข้อเสนอแนะ

จากผลการศึกษาบทบาทของศูนย์ดำรงธรรมอำเภอในการจัดการเรื่อง ร้องเรียน /ร้องทุกข์ : กรณีศึกษาศูนย์ดำรงธรรมหาดใหญ่ ทำให้ทราบบทบาทและความสำคัญของศูนย์ดำรงธรรมต่อประชาชนในการแก้ปัญหาความซับซ้อนอย่างมาก รวมไปถึงปัญหาที่เกิดขึ้นในการปฏิบัติงานของศูนย์ดำ รงธรรมอำเภอหาดใหญ่ จึงมีข้อเสนอแนะในการปฏิบัติงานและเพิ่มประสิทธิภาพของอำเภอหาดใหญ่ดังนี้

(1) ควรกำหนดระเบียบ รูปแบบ ขั้นตอนการดำเนินการในภารกิจสำคัญให้ชัดเจน โดยเฉพาะภารกิจการรับเรื่อง ร้องเรียน/ร้องทุกข์ รวมถึงการเพิ่มอำนาจบทบาทในการไกล่เกลี่ย การระงับข้อพิพาท การส่งต่อเรื่อง การประสานในการแก้ปัญหาที่สำคัญ คือ การมีชุดเคลื่อนที่เร็วเคลื่อนลงไปเผชิญเหตุแก้ไขปัญหาได้อย่างทันท่วงที

(2) พัฒนาบุคลากรที่มีประสิทธิภาพในการทำงาน เช่น ทางด้านจิตวิทยามวลชน การสื่อสาร และต้องมีคุณสมบัติของบุคคลที่ปฏิบัติงานในศูนย์ดำรงธรรม มีความรู้ความสามารถโดยเฉพาะด้านให้คำปรึกษาแก่ประชาชนและยุติเรื่องได้

(3) ควรมีระบบติดต่อสื่อสารที่ทันสมัย สำหรับประชาชนเพื่อให้เข้าถึง อย่างสะดวก มีบริการข้อมูลข่าวสารที่เป็นปัจจุบัน ทันสมัย และรวดเร็ว

(4) ในอนาคตบทบัญญัติกฎหมายของประเทศไทยควรจะรองรับให้มีการระงับข้อพิพาทโดยไกล่เกลี่ยข้อพิพาทก่อนที่คดีจะขึ้นสู่กระบวนพิจารณาของศาล

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มาตรการทางกฎหมายในการควบคุมสุนัขจรจัด
Legal measures to control stray dogs

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บทคัดย่อ

ปัญหาการก่อความเดือดร้อนรำคาญของสุนัข ทั้งที่เป็นสุนัขจรจัดและสุนัขที่มีเจ้าของเป็นปัญหาที่อยู่กับสังคมไทยมานานส่งผลกระทบต่อสังคมในด้านต่าง ๆ ไม่ว่าจะเป็นผลกระทบทางด้านสุขภาพ ความปลอดภัยในชีวิตร่างกายและทรัพย์สิน เศรษฐกิจ สังคม และสิ่งแวดล้อม ปัจจุบันถึงแม้ว่าจะมีการจัดการปัญหาสุนัขจรจัดของทางราชการอยู่บ้าง แต่จำนวนสุนัขยังมีแนวโน้มเพิ่มขึ้นเรื่อย ๆ โดยมีสาเหตุหลักมาจากคนในสังคมเองที่ทอดทิ้ง การไม่คุมกำเนิด รวมถึงขาดมาตรการทางกฎหมายควบคุมดูแลที่ไปในทิศทางเดียวกัน ในต่างประเทศ เช่น ประเทศออสเตรเลีย สุนัขและแมวต้องได้รับการฝังไมโครชิพเมื่อมีอายุ 12 สัปดาห์ขึ้นไป โดยจะต้องได้รับการฝังไมโครชิพ ณ สถานที่จำหน่ายสัตว์หรือเมื่อมีการเปลี่ยนเจ้าของ แล้วแต่ว่าจะเกิดเหตุใดขึ้นก่อนจากนั้นจะต้องนำสัตว์ไป ขึ้นทะเบียนกับหน่วยงานท้องถิ่นเมื่อสัตว์นั้นมีอายุหกเดือน สัตว์เลี้ยงที่ไม่ได้รับการขึ้นทะเบียนจะถูกควบคุมโดยรัฐ ซึ่งต่างกับประเทศไทยที่ยังขาดมาตรการที่เด่นชัด ด้วยเหตุนี้จึงควรอย่างยิ่งที่จะต้องมีมาตรการทางกฎหมาย มาควบคุมการเลี้ยงสุนัขเพื่อลดปัญหาอันเกิดละเมิด การก่อความเดือดร้อนรำคาญ จากสุนัขทั้งสุนัขที่มีเจ้าของและจากสุนัขจรจัด

คำสำคัญ: สุนัขจรจัด, มาตรการทางกฎหมายการเลี้ยงสุนัข

Abstract

The problem of causing nuisance to dogs Both stray dogs and dogs with owners It is a problem that has been with Thai society for a long time, affecting society in various aspects, whether it be health effects. Safety of life, body and property, economy, society and environment. Currently, there is some government management of the stray dog problem. But the number of dogs continues to increase, mainly due to people in society abandoning them. not using birth control Including the lack of legal measures to control and control in the same direction. In countries such as Australia, dogs and cats must be microchipped when they are 12 weeks of age or older. This must be microchipped at the pet's sales location or when there is a change of owner. Whichever happens first. Then the animal must be taken. Register with local authorities when the animal is six months old. Pets that are not registered are controlled by the state. which is different from

Thailand For this reason, it is highly recommended that legal measures be taken. Come take care of dogs.

Keywords: Stray Dog, Legal Measures for Keeping Dogs

บทนำ

ในปัจจุบันคนไทยนิยมนำสุนัขมาเลี้ยงเป็นเพื่อนแก้เหงาหรือเฝ้าบ้านเป็นจำนวนมาก ด้วยเหตุนี้หากเจ้าของสุนัขไม่ดูแลเอาใจใส่ให้ดี ทั้งในด้านการป้องกันโรค การคุมกำเนิด การป้องกันไม่ให้เกิดเหตุละเมิดต่อบุคคลรอบข้าง จะทำให้เป็นปัญหาสังคม และอาจสร้างความเดือดร้อนความรำคาญให้แก่ประชาชนในเขตพื้นที่ โดยเฉพาะปัญหาด้านการคุมกำเนิด ที่หากผู้เลี้ยงปล่อยปละละเลยปล่อยให้มีสุนัขกำเนิดเกิดขึ้นจำนวนมากจนเลี้ยงดูไม่ไหว นำไปทอดทิ้ง จนกลายเป็นสุนัขจรจัดที่สร้างผลกระทบด้านต่างๆ มากมายทั้งเสียงร้อง เห่าหอนสร้างมลภาวะทางเสียง กีดขวางบนท้องถนน ทำให้เกิดอุบัติเหตุบนท้องถนน ไล่กัดผู้คน คุ้ยเขี่ยขยะมูลฝอยสกปรกเรี่ยราด ขับถ่ายไม่เป็นที่เป็นทางส่งกลิ่นไม่พึงประสงค์ที่สำคัญยังถูกมองเป็นพาหะทำให้เกิดโรคระบาด โดยเฉพาะโรคพิษสุนัขบ้า (อินทรชัย พาณิชกุล, 2558)

ปัญหาสุนัขจรจัดกับสุนัขเลี้ยงตามบ้านเป็นปัญหาที่มีความเชื่อมโยงกันอย่างยิ่ง เนื่องจากสาเหตุที่เกิดปัญหาสุนัขจรจัดนั้นแบ่งออกได้สองสาเหตุ ซึ่งสาเหตุหลักมาจากสุนัขเลี้ยงที่ถูกทอดทิ้งทำให้กลายเป็นสุนัขจรจัด และอีกเหตุหนึ่งคือสุนัขจรจัดอยู่แล้วที่ขยายพันธุ์เพิ่มจำนวนสุนัขจรจัดขึ้น ด้วยเหตุนี้การแก้ปัญหาสุนัขจรจัดนั้นจะโฟกัสที่สุนัขจรจัดเพียงอย่างเดียวไม่ได้ แต่ต้องมุ่งเป้าไปที่สุนัขเลี้ยงด้วย มาตรการทางกฎหมายต้องบังคับใช้ทั้งสุนัขจรจัดและสุนัขเลี้ยง จึงจะสามารถแก้ปัญหาสุนัขจรจัดได้อย่างมีประสิทธิภาพ

ปัญหาการเพิ่มขึ้นของจำนวนสุนัขจรจัดไม่ว่าจะเกิดจากการทอดทิ้ง โดยเจ้าของสัตว์เลี้ยงเองหรือโดยการเพิ่มจำนวนตามธรรมชาติ ล้วนเป็นปัญหาที่เกิดขึ้นกับหลาย ๆ ประเทศทั่วโลก ซึ่งในแต่ละประเทศก็ต่างมีมุมมองและวิธีการแก้ปัญหาของตัวเอง รวมถึงปัจจัยที่ส่งผลต่อความสำเร็จ ในการแก้ปัญหาก็แตกต่างกัน ปัจจุบันประเทศไทยพบปัญหาเรื่องสุนัขจรจัดซึ่งเป็นปัญหาสำคัญที่ส่งผลกระทบต่อสังคมสิ่งแวดล้อม ด้านสาธารณสุข และเป็นการทำลายภาพลักษณ์โดยรวมของประเทศ

กรณีสุนัขจรจัด ไปสร้างความเสียหายให้กับผู้อื่น ศาลปกครองสูงสุด ก็เคยมีคำวินิจฉัยตัดสินให้ส่วนราชการที่รับผิดชอบดูแลสัตว์จรจัด ชดใช้ค่าเสียหายให้เอกชน เช่น คำพิพากษาศาลปกครองสูงสุดที่ อ.1751/2559 กรณีเจ้าของฟาร์มนกกระจอกเทศ อ้างว่า สุนัขจรจัดที่อาศัยอยู่ที่บ่อขยะนั้น เป็นความรับผิดชอบขององค์การบริหารส่วนตำบล การที่องค์การบริหารส่วนตำบลละเลยหน้าที่ทำให้สุนัขมารบกวนไล่ต้อน และรุมกัดจนทำให้นกกระจอกเทศเสียหาย มีรายได้จากการประกอบการลดลงนั้น (มติชนสุดสัปดาห์, 2561) ศาลปกครองสูงสุดตัดสินว่า องค์การบริหารส่วนตำบลมีอำนาจหน้าที่ ในการจัดการดูแลสุนัขจรจัด ซึ่งถือว่า สุนัขเป็นสัตว์ควบคุมตามพระราชบัญญัติโรคพิษสุนัขบ้า พ.ศ. 2535 สัตว์จำต้องมีเครื่องหมายประจำตัว เมื่อพบเห็นแล้วโดยไม่ปรากฏเครื่องหมายประจำตัวสัตว์เจ้าพนักงานท้องถิ่นย่อมมีอำนาจจับสัตว์ควบคุมนั้นเพื่อกักขัง ถ้าไม่มีเจ้าของรับคืนภายใน 5 วัน ให้เจ้าพนักงานเจ้าหน้าที่มีอำนาจทำลายสัตว์ควบคุมนั้นได้ ตามพระราชบัญญัติโรคพิษสุนัขบ้า มาตรา 9 แต่ไม่ดำเนินการในการควบคุมสุนัขจรจัด เพื่อประโยชน์ในการรักษาสภาวะความเป็นอยู่ที่เหมาะสม กับการดำรงชีพของประชาชนในท้องถิ่นหรือเพื่อป้องกันโรคที่เกิดจากสัตว์ หรือเพื่อป้องกันระงับโรคติดต่อ หรือบำรุงรักษาทรัพยากรธรรมชาติและสิ่งแวดล้อม หรือเพื่อบำรุงและส่งเสริมการประกอบอาชีพของราษฎรในเขต

องค์การบริหารส่วนตำบล ตามมาตรา 67 และ มาตรา 68 แห่ง พ.ร.บ.สภาตำบลและองค์การบริหารส่วนตำบล พ.ศ.2537 ให้ราชการผู้ถูกฟ้องคดีต้องรับผิดชดใช้ค่าเสียหายให้กับเอกชนผู้ฟ้องคดีนั้น

แต่อย่างไรก็ดีปัจจุบันไม่มีกฎหมายใดบัญญัติเพื่อเป็นการป้องกันโรคหรือให้อำนาจเจ้าหน้าที่ที่เกี่ยวข้องเพื่อที่จะเอาผิดกับเจ้าของสัตว์ดังกล่าว เป็นกรณีเฉพาะเนื่องจากการขับถ่ายสิ่งปฏิกูลของสัตว์ทำให้แหล่งชุมชนและสถานที่ท่องเที่ยวที่ไม่น่าอยู่อาศัย และที่สำคัญยังมีผลกระทบต่อสุขภาพอนามัยและอาจร้ายแรงถึงขั้นเป็นแหล่งเพาะพันธุ์เชื้อโรคอันอาจก่อให้เกิดโรคระบาดต่อคนในชุมชน ในประมวลกฎหมายแพ่งและพาณิชย์ที่บังคับใช้อยู่ในปัจจุบัน ได้มีมาตรการลงโทษแก่เจ้าของสัตว์ที่ไปก่อเหตุเดือดร้อน ซึ่งเป็นความผิดตามประมวลกฎหมายแพ่งและพาณิชย์ลักษณะละเมิด ซึ่งหากจะต้องเรียกร้องให้รับผิดชอบ ต้องมีการฟ้องร้องคดีต่อศาลทำให้สูญเสียค่าใช้จ่ายและเสียเวลา อีกทั้งเรื่องการควบคุมสัตว์เลี้ยงหรือปล่อยสัตว์ มิได้มีการกำหนดมาตรการ และบทลงโทษที่เป็นการเฉพาะหรือชัดเจนทำให้มาตรการทางกฎหมายที่มีอยู่ในขณะนี้ไม่เพียงพอในการควบในกรณีต่างๆ และมีบทลงโทษที่ถือว่าเบามากซึ่งอาจเป็นเหตุหนึ่งที่ทำให้ผู้กระทำผิดมิได้เกรงกลัวต่อการกระทำดังกล่าว (ขจร กระจ่างพลาการ, 2557)

ทุกวันนี้ในปัจจุบันประเทศไทยไม่มีกฎหมายการควบคุมการเลี้ยงสัตว์ โดยเฉพาะสุนัข บางคนเลี้ยงแล้วเบื่อเอามาปล่อยกลางถนน จะทำให้เกิดอุบัติเหตุได้ และขณะที่บางคนเลี้ยงสุนัขไม่เป็น ทำให้สุนัขก้าวร้าว เป็นอันตรายต่อผู้คน ดังนั้นแล้วควรมีการขึ้นทะเบียนสัตว์เลี้ยงเพื่อควบคุมเจ้าของสัตว์เลี้ยงเวลาที่สัตว์เลี้ยงของตนไปทำร้ายผู้อื่นจะได้รู้ว่าเป็นสัตว์เลี้ยงของผู้ใดจะได้ลงโทษเจ้าของได้ หรือเมื่อสัตว์เลี้ยงที่หนีออกมานอกบ้าน กลายเป็นสุนัขจรจัด ถ้าเจ้าหน้าที่พบเห็นจะได้จับส่งเจ้าของเพื่อให้ดูแลต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาแนวคิด ทฤษฎีเกี่ยวกับการควบคุมสุนัขจรจัด
2. เพื่อศึกษาเปรียบเทียบมาตรการทางกฎหมายในการควบคุมดูแลสุนัขจรจัดในพื้นที่สาธารณะของประเทศไทยและต่างประเทศ
3. เพื่อศึกษาหาแนวทาง และข้อเสนอแนะในการแก้ไขปัญหาการควบคุมสุนัขจรจัดในพื้นที่สาธารณะ

แนวคิด ทฤษฎี กรอบแนวคิด

1.แนวคิดเกี่ยวกับสุนัขจรจัด

สุนัขที่ถูกทอดทิ้งในที่สาธารณะหรือที่เรียกกันว่า สุนัขจรจัด เป็นสุนัขที่ไม่มีเจ้าของดูแล มักเห็นได้ทั่วไป ในทุกพื้นที่ของประเทศไทย โดยเกือบทั้งหมดมาจากสุนัขบ้าน หรือสุนัขที่มีเจ้าของซึ่งไม่สามารถให้การดูแล เลี้ยงดูสุนัขเหล่านั้นได้ จึงได้นำมาปล่อยตามสถานที่ต่าง ๆ สุนัขมีการผสมพันธุ์ตามสัญชาตญาณของสัตว์ทำให้เกิดการขยายเผ่าพันธุ์ และเพิ่มจำนวนสุนัขจรจัด

สุนัขจรจัดในสังคมนั้นได้ให้ความหมายของสุนัขจรจัดต่างกันออกไป ส่งผลให้เกิดความขัดแย้งทางความคิดซึ่งส่งผลกระทบในการแก้ไขปัญหา ทั้งนี้ ตามพจนานุกรมไทย ฉบับราชบัณฑิตสถาน คำว่า จรจัด หมายถึง เร่ร่อนและไม่มีที่อยู่เป็นหลักเป็นแหล่ง แต่อย่างไรก็ตาม ได้มีผู้ให้นิยามของคำว่า สุนัขจรจัด ไว้ดังนี้

สุนัขจรจัด หมายถึง สุนัขที่ไม่มีเจ้าของ ขาดผู้ดูแลรับผิดชอบ ไม่มีบ้านอยู่อาศัยเป็นประจำหรืออาจแต่เดิมเคยมีเจ้าของ ภายหลังพลัดหลง เร่ร่อน หรือถูกทอดทิ้ง

สุนัขจรจัด หมายถึง สุนัขที่ปราศจากการควบคุมให้อยู่ในพื้นที่ที่กำหนด ไม่ว่าจะมีเจ้าของหรือไม่ก็ตาม

สุนัขจรจัด หมายถึง สุนัขไม่มีสังกัด คือไม่ได้ถูกควบคุมให้อยู่ในพื้นที่ที่กำหนด และไม่มีเจ้าของไม่มีผู้เอาใจใส่ดูแล ส่วนสุนัขที่ไม่มีที่พักอาศัยในบ้านคน หรือในอาคารสถานที่ แต่มีคนเลี้ยงมีคนให้อาหาร หรือบางครั้งมีการนำไปตรวจ ดูแลสุขภาพหรือทำหมันให้ ไม่ได้เรียกสุนัขจรจัด จัดเป็นสุนัขชุมชน (สมปอง เจริญสุข, 2556)

2. แนวคิดว่าด้วยเรื่องสิทธิสัตว์สิทธิสัตว์

เนื่องจากปัจจุบันในกระแสโลกาภิวัฒน์เป็นที่ยอมรับโดยสากล และโดยคุณธรรม ว่าสัตว์เป็นสิ่งมีชีวิต แล้วเป็นองค์ประกอบสำคัญของสิ่งแวดล้อมที่จะต้องได้รับความคุ้มครองสิทธิตามธรรมชาติของสัตว์ และได้รับการดูแลมิให้ถูกกระทำการทารุณกรรม หรือมีการฆ่าสัตว์โดยไม่จำเป็น โดยเจ้าของสัตว์และผู้เลี้ยงสัตว์ ต้องจัดสวัสดิภาพให้แก่สัตว์ให้เหมาะสมตามชนิดและประเภทสัตว์ อีกทั้งสัตว์ที่ไม่มีเจ้าของจะต้องได้รับการคุ้มครองมิให้ถูกทารุณกรรมเช่นกัน ซึ่งในปัจจุบันมีการนำสัตว์มาเลี้ยง เพื่อการค้า การแสดง การประกอบ กิจการดังกล่าวต้องคำนึงถึงสวัสดิภาพ และการป้องกัน มิให้สัตว์ได้รับบาดเจ็บทุกข์ทรมาน ที่อาจเกิดแก่สัตว์ทั้งในระหว่างดูแล การใช้ สัตว์ประกอบกิจการ และการทำให้สัตว์ตายอย่างสลบด้วย ซึ่งอาจจะกระทบต่อจารีตประเพณีและศีลธรรมอันดีของสังคมไทยและชื่อเสียงของประเทศรวมถึงการค้าระหว่างประเทศ

สิทธิสัตว์ (Animal Rights) หมายถึง สิทธิของสัตว์ที่จะมีชีวิตอยู่ได้อย่างอิสระ(Animal Liberation) ปราศจากการหาผลประโยชน์ของมนุษย์ หรือถูกละเมิด ทารุณกรรม หน่วงเหนี่ยวกักขังจากมนุษย์ และยังมีนักสิทธิสัตว์แบบขวาจัด เห็นว่า มนุษย์ไม่มีสิทธิที่จะใช้สัตว์ไม่ว่ากรณีใด ๆ ทั้งสิ้น ตลอดจนต่อต้านการใช้สัตว์ทุกรูปแบบ ถึงแม้จะเป็นการใช้อย่างมีมนุษยธรรมและมีความรับผิดชอบก็ตาม ดังนั้นการใช้สัตว์เพื่อความบันเทิง นันทนาการจึงไม่สมควรอย่างยิ่ง ซึ่งสอดคล้องกับพจนานุกรม English Oxford Living Dictionaries ได้ให้นิยามคำว่า สิทธิสัตว์ (Animal Rights) คือ สิทธิของสัตว์ที่จะมีชีวิตอยู่โดยปราศจากการแสวงประโยชน์และการล่วงละเมิดของมนุษย์ (ศิริชนก วิริยเกื้อกูล,2559)

โดยแนวคิดเรื่องสิทธิสัตว์ (Animal Rights) เริ่มเกิดขึ้นและพัฒนาเรื่อย ๆ มาจนถึงปัจจุบัน ซึ่งเห็นว่า เราควรพิจารณาถึงสิทธิสัตว์โดยพิจารณาว่า สิ่งมีชีวิตทุกชนิดมีวิวัฒนาการการเกิดเหมือนกัน ดังนั้นสิ่งมีชีวิตทุกชนิดจึงมีสิทธิตามธรรมชาติ เพราะสัตว์เป็นสิ่งมีชีวิตที่มีระบบประสาทที่มีประสิทธิภาพในการรับรู้และมีความรู้สึกเช่นเดียวกับมนุษย์ มนุษย์ต้องเคารพสิทธิสัตว์ และหลักสิทธิสัตว์ในปัจจุบันยังกำหนดด้านการใช้สัตว์เพื่อทำงานด้วยว่า จะต้องทำงานได้ภายในระยะเวลาที่จำกัด และก็ต้องไม่ใช้สัตว์จนหมดแรง ตลอดจนต้องจัดให้สัตว์เหล่านั้นมีอาหารเพียงพอ และได้รับการพักผ่อนที่เพียงพอ (Universal Declaration of Animal Rights, มปป.)

แนวคิดเรื่องสิทธิสัตว์เป็นประเด็นที่ได้กล่าวถึงในมุมมองต่าง ๆ แต่เป็นที่ยอมรับกันว่าสัตว์เป็นสิ่งมีชีวิต ที่มีความรู้สึก มีสถานะเป็นสิ่งมีชีวิตที่ไม่ใช่มนุษย์ (Non-Human Person) หากแต่ดำรงอยู่ในสังคมจริยธรรม (Moral Community) เช่นเดียวกับมนุษย์ ดังนั้นมนุษย์จึงควรเปลี่ยนทัศนคติว่า สัตว์เป็นทรัพย์สินของมนุษย์ หรืออย่างน้อยควรปฏิบัติต่อทรัพย์สินนั้นอย่างมีเมตตากรุณา

วิธีดำเนินการวิจัย

การวิจัยในครั้งนี้เป็นการศึกษารูปแบบวิจัยเชิงคุณภาพ เป็นการศึกษาเกี่ยวกับมาตรการควบคุมการเลี้ยงสัตว์และการแก้ปัญหาสุนัขจรจัด เพื่อเป็นการป้องกันการเกิดสุนัขจรจัดในพื้นที่สาธารณะหรือสถานที่ท่องเที่ยวในจังหวัดสงขลา โดยให้มีมาตรการทางกฎหมายในการควบคุม ดูแล แก้ไขปัญหาสุนัขจรจัด โดยใช้วิธีการศึกษาดังนี้

1. เชิงเอกสาร โดยวิธีพัฒนาเชิงวิเคราะห์ ใช้กระบวนการศึกษาค้นคว้า และรวบรวมข้อมูลจากตำรา หนังสือ บทความ วารสาร เอกสาร ที่เผยแพร่ทางราชการหรือหน่วยงานต่าง ๆ ของเอกชน รวมทั้งข้อมูลข่าวสารจากอินเตอร์เน็ต

2. ศึกษาเชิงลงพื้นที่ โดยศึกษาหาข้อมูลจากการสอบถามนักท่องเที่ยว หรือกลุ่มพ่อค้า แม่ค้าในบริเวณดังกล่าว

ผลการวิจัย

ปัญหาการขาดมาตรการทางกฎหมายเพื่อควบคุมสัตว์เลี้ยง ทำให้เกิดการปล่อยปะละเลยจนนำไปสู่การเกิดสุนัขจร เป็นปัญหาให้ที่กระทบต่อประชาชนทุกคนเป็นวงกว้าง ความรับผิดชอบในการดูแลสุนัขที่ตัวเองเป็นเจ้าของ รวมไปถึงความสงสารความเมตตาตามอุปนิสัยของคนไทย ที่ในการเลี้ยงดูสงเคราะห์สุนัขจรจัดตามข้างทาง แม้ตนไม่ได้เป็นเจ้าของ ดังนั้นจึงทำให้สุนัขจรจัดมีจำนวนเพิ่มขึ้นมาก การที่คนไทยนั้นมีจิตใจที่เมตตาหรือเรียกว่าเป็นเมืองพุทธนั้น จึงไม่สามารถที่จะกำจัดหรือทำลายสุนัขได้ เพราะขัดกับศีลธรรมอันดีของคนไทยอีกทั้งยังมีกฎหมายห้ามทารุณกรรมสัตว์ยิ่งทำให้ไม่มีใครกล้าทำอะไรที่ล้ำเส้น

ประเทศไทยขาดมาตรการทางกฎหมายเฉพาะด้านแตกต่างกับต่างประเทศที่มีมาตรการทางกฎหมายเป็นการเฉพาะ ทำให้การแก้ปัญหาไม่เป็นไปในทิศทางเดียวกัน ขาดประสิทธิภาพ เมื่อสัตว์เลี้ยงก่อเหตุความเดือดร้อนขาดเจ้าของแสดงตัวรับผิดชอบ บางครั้งพิสูจน์ตัวบุคคลผู้เป็นเจ้าของไม่ได้ ยิ่งไปกว่านั้นผู้ที่เลี้ยงสุนัขขาดความรับผิดชอบไม่คุมกำเนิด เมื่อเลี้ยงไม่ไหวก็ทิ้งให้เป็นภาระสังคม

สรุปและอภิปรายผล

การเลี้ยงสุนัขจำเป็นต้องขอรับการขึ้นทะเบียนเป็นสถานสงเคราะห์สัตว์ตามกฎหมายว่าด้วยการป้องกันการทารุณกรรมและการจัดสวัสดิภาพสัตว์ และในการขึ้นทะเบียนนั้นจะได้รับการสนับสนุนจากกรมปศุสัตว์และหน่วยงานอื่นของรัฐในด้านความรู้เกี่ยวกับการป้องกัน และการทารุณกรรมการจัดสวัสดิภาพสัตว์การควบคุมปริมาณการป้องกันโรคระบาดหรืออื่นใดที่เกี่ยวข้อง และในการสร้างสถานสงเคราะห์ศาสตร์ของบุคคลธรรมดาขึ้นนั้น ช่วยลดปัญหาความเดือดร้อนและการถูกร้องเรียนภายใต้กฎหมายว่าด้วย การสาธารณสุขรวมถึงปัญหาการขัดแย้งต่าง ๆ ได้ด้วย ในส่วนของประชาชนจุดเริ่มต้นจากสุนัขจรจัดนั้นเกิดจากประชากรหรือบุคคลที่เลี้ยงสุนัขบ้าง ทำสุนัขหายบ้าง เลี้ยงสุนัขดังกล่าวไม่ไหวหรือการเพิ่มจำนวนประชากรของสุนัขมากขึ้น จึงทำให้ทางเจ้าของไม่สามารถที่จะเลี้ยงไหว จึงนำไปปล่อยในสถานที่ต่าง ๆ จึงทำให้เป็นสาเหตุหลักของการเกิดปัญหาสุนัขจรจัด

ข้อเสนอแนะ

ด้านการป้องกันและควบคุมโรคนั้นให้ทางองค์กรปกครองส่วนท้องถิ่นมีการสำรวจประชากรของสุนัข และสุนัขจรจัดในแต่ละพื้นที่เขตความรับผิดชอบของตน และจัดการฉีดวัคซีนป้องกันพิษสุนัขบ้าโดยให้กลุ่มปศุสัตว์ มีหน้าที่หรือภารกิจหลักในการกำหนดแผนดำเนินงานเกี่ยวกับการป้องกัน และควบคุมโรค และทำหน้าที่จัดหาวัคซีนต่าง ๆ ให้แก่องค์กรปกครองส่วนท้องถิ่น

การลงทะเบียนสุนัข

ในการลงทะเบียนสุนัขนั้น สุนัขมีเจ้าของให้เป็นหน้าที่ขององค์กรปกครองส่วนท้องถิ่น ในการเปิดศูนย์รับขึ้นทะเบียนสุนัขมีเจ้าของขึ้น เพื่อเป็นการควบคุมจำนวนและทราบเมื่อสุนัขถูกทอดทิ้ง สามารถดำเนินการกับเจ้าของสุนัขนั้นได้ โดยต้องส่งข้อมูลไปให้กรมปศุสัตว์เป็นส่วนกลาง และในกรณีที่สุนัขไม่มีเจ้าของนั้น องค์กรปกครองส่วนท้องถิ่นจะต้องลงพื้นที่สำรวจและขึ้นทะเบียนให้เป็นสุนัขภายใต้การดูแลขององค์กรปกครองส่วนท้องถิ่น และดำเนินการตามกระบวนการด้านการจัดการสุนัขจรจัดต่อไป

สุนัขต้องได้รับการฝังไมโครชิพเมื่อมีอายุ 12 สัปดาห์ ขึ้นไป โดยจะต้องได้รับการฝังไมโครชิพ ณ สถานที่จำหน่ายสัตว์หรือเมื่อมีการเปลี่ยนเจ้าของ (แล้วแต่ว่าจะเกิดเหตุใดขึ้นก่อน) จากนั้นจะต้องนำสัตว์ไป ขึ้นทะเบียนกับหน่วยงานท้องถิ่นเมื่อสัตว์นั้นมีอายุหกเดือน

1. เจ้าของสุนัขต้องมีความระมัดระวังตามสมควรเพื่อห้ามไม่ให้สุนัขหลบหนีออก นอกเคหสถานซึ่งเป็นสถานที่ควบคุมสุนัขนั้น ในการนี้ "เจ้าของ" จะหมายรวมถึงบุคคลใดซึ่งมีหน้าที่ดูแลสุนัขในขณะนั้นด้วย

2. ห้ามมิให้มีสุนัข (ยกเว้นกรณีเป็นสุนัขช่วยเหลือ) ในบริเวณดังต่อไปนี้

- บริเวณสนามเด็กเล่น
- สถานที่ที่ใช้ในการจัดเตรียมอาหาร สถานที่รับประทานอาหาร
- สถานที่สันทนาการ ซึ่งได้มีการห้ามสุนัขไม่ให้เข้าไปในบริเวณนั้นอย่างชัดแจ้ง
- สถานที่อาบน้ำสาธารณะ ซึ่งได้มีการห้ามสุนัขไม่ให้เข้าไปในบริเวณนั้นอย่างชัดแจ้ง
- บริเวณโรงเรียนหรือบริเวณศูนย์รับเลี้ยงเด็ก
- สถานที่ขายสินค้า ซึ่งได้มีการห้ามสุนัขไม่ให้เข้าไปในบริเวณนั้นอย่างชัดแจ้ง
- เขตสงวนและคุ้มครองสัตว์ป่า ซึ่งได้มีการห้ามสุนัขไม่ให้เข้าไปในบริเวณนั้นอย่างชัดแจ้ง
- ในสถานที่สาธารณะ สุนัขจะต้องมีปลอกคอเพื่อระบุชื่อสนัข ที่อยู่หรือหมายเลขโทรศัพท์ติดต่อเจ้าของสุนัขและต้องมีการใช้โซ่หรือสายลากจูง เว้นแต่กรณีมีการจัดงานโชว์สุนัข กรณีมีการแสดงความสามารถของสุนัข กรณีอยู่ในกรงขังหรือในยานพาหนะ หรือกรณีอยู่ในสถานที่ที่มีการอนุญาตให้ปล่อยสุนัขจากสายลากจูง

3. เมื่อสุนัขขับถ่ายในสถานที่สาธารณะ เจ้าของสุนัขจะต้องเก็บมูลสุนัขไปทิ้งทันที

4. ห้ามเจ้าของจูงสุนัขเกินกว่าสี่ตัวในสถานที่สาธารณะ

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มาตรการทางกฎหมายเกี่ยวกับปัญหาการกำหนดฐานความผิดของผู้กระทำความผิดในกรณีมียาเสพติดไว้ในครอบครอง ตามพระราชบัญญัติยาเสพติด พ.ศ.2564 มาตรา 145 วรรคแรก

Legal Measures Regarding the Problem of Determining the Basis of an offender's Guilt. In the case of Drug Possession According to the Narcotics Act 2021, Section 145, First Paragraph

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บทคัดย่อ

ตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 ที่ได้มีการกำหนดลักษณะการกระทำความผิดเกี่ยวกับการมีไว้ซึ่งยาเสพติด โดยกำหนดปริมาณของยาเสพติดไว้อย่างชัดเจน เพื่อเป็นบทสันนิษฐานเบื้องต้น ว่าได้กระทำความผิดในลักษณะใด โดยระบุว่า การมียาเสพติดชนิดเมตแอมเฟตามีน ไว้ในครอบครอง โดยมีจำนวนน้ำหนักสุทธิ เกินกว่า 375 มิลิกรัม หรือมีจำนวนหน่วย เกินกว่า 15 หน่วย ให้สันนิษฐานไว้ก่อนว่า มียาเสพติดไว้ในครอบครองเพื่อจำหน่าย โดยกำหนดฐานกระทำความผิด ตามมาตรา 15 (2) แต่ปัจจุบัน ได้มีการยกเลิกพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 และได้บังคับใช้พระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2564 ได้มีการแก้ไขเพิ่มเติมตามมาตรา 145 วรรคแรก โดยไม่ได้ระบุจำนวนปริมาณของยาเสพติดเอาไว้ว่าจำนวนเท่าไหร่ แต่ให้สันนิษฐานไว้ก่อนว่ามียาเสพติดไว้ในครอบครอง จึงเป็นการบัญญัติกฎหมายกำหนดลักษณะการกระทำความผิดของผู้กระทำความผิดที่ยังไม่ชัดเจน ทำให้ส่งผลกระทบต่อผู้กระทำความผิดที่จะต้องได้รับโทษตามความเหมาะสม ตามหลักกฎหมายกระทำความผิดแค่ไหนรับโทษแค่นั้น เพราะไม่ได้กำหนดปริมาณของยาเสพติดเอาไว้ เช่นนี้ ควรมีการปรับปรุงแก้ไขเพิ่มเติม ศึกษาแนวคิดและทฤษฎีเกี่ยวกับการกำหนดฐานความผิดของผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครอง ศึกษาเปรียบเทียบกฎหมายการกำหนดฐานความผิดของผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครอง ของประเทศไทยกับต่างประเทศ มาตรการให้ผู้กระทำความผิดฐานมียาเสพติดไว้ในครอบครอง และการครอบครองเพื่อเสพ แยกให้ชัดเจน เพื่อความยุติธรรมต่อผู้กระทำความผิดเทียบเคียงตามบทบัญญัติกฎหมายยาเสพติดต่างประเทศ เช่น สิงคโปร์ สหรัฐอเมริกา และญี่ปุ่น ได้กำหนดปริมาณของยาเสพติดไว้อย่างชัดเจน และกำหนดฐานความผิดของผู้กระทำความผิดมียาเสพติดไว้ในครอบครองไว้ชัดเจนแล้ว เพื่อเป็นการคุ้มครองสิทธิ์ของผู้ต้องหาหรือจำเลย ตามเจตนารมณ์ของกฎหมาย อันบุคคลจะต้องรับผิดทางอาญาก็ต่อเมื่อได้กระทำโดยเจตนา ภายใต้หลักกระทำแค่ไหนรับผิดแค่นั้น

คำสำคัญ: แอมเฟตามีน, ผู้กระทำความผิดฐานมียาเสพติดไว้ในครอบครอง, การครอบครองเพื่อเสพ

Abstract

According to the Narcotics Act, B.E. 2522 (1979), the amount has been determined. of drugs clearly to be a preliminary assumption that he had committed the offense in what manner, stating that he had amphetamine-type drugs in possession with a net weight of more than 375 milligrams or more than 15 units (it is assumed that Possession of drugs for sale) is defined as an offense according to Section 15 (2). But currently it has been cancelled. And the Narcotics Act 2021 has been enforced, with additional amendments according to Section 145, first paragraph, without specifying the quantity of narcotics. How much is that? But let's assume first that Possession of drugs or possession of drugs for use Therefore, it is a law Determine the nature of the perpetrator's offense that is not yet clear causing an impact on the offender that must be punished as appropriate According to the law, no matter how much offense you commit, you will receive only that punishment. Because the amount of drugs was not specified

As such, further improvements should be made.A study of concepts and theories regarding the establishment of offenses in cases where herbs are held as property. A study of laws determining offenses in cases of possession of chemicals in Thailand and abroad. Measures for those convicted of drug possession and possession for consumption are clearly separated to ensure justice for offenders. According to the provisions of foreign drug laws, such as Singapore, the United States, and Japan, the quantity of drugs is set and clearly defines the offenses of offenders in possession of drugs. In order to protect the rights of the accused or defendant. according to the spirit of the law A person will be criminally liable only if he has done it intentionally. Under the principle, no matter how much you do, you will only be liable.

Keywords: amphetamine-type, Those who commit crimes for possession of drugs, possession for consumption

บทนำ

ปัญหายาเสพติดเป็นปัญหาความมั่นคงของมนุษย์ชาติที่ส่งผลกระทบต่อประชาคมโลกอย่างต่อเนื่องและทวีความรุนแรงขึ้น และประเทศไทยเน้นการใช้นโยบายการปราบปราม ผู้เกี่ยวข้องกับยาเสพติดเป็นมาตรการหลักในการแก้ไขปัญหาจึงส่งผลให้การกระทำความผิดเกี่ยวกับยาเสพติด เกือบทุกกรณีเป็นความผิดทางอาญา และมีการนำคดียาเสพติดเข้าสู่กระบวนการยุติธรรมทางอาญาที่เกินความจำเป็น

ความผิดอาญาที่เกี่ยวกับยาเสพติดเป็นเรื่องที่มีความสำคัญ เพราะการลงโทษทางอาญามีผลกระทบต่อเนื้อตัว ร่างกาย สิทธิและเสรีภาพ ในปัจจุบัน ได้มีแนวคิดในการดำเนินการป้องกันและแก้ไขปัญหายาเสพติดอยู่ 4 แนวทาง คือ (1) การไม่ยอมรับให้มีการเสพ การผลิต การค้าและการแพร่ระบาดของยาเสพติด หากผู้ใดละเมิดไม่ว่าจะด้วย เหตุใดจะต้องถูกลงโทษ (2) การทำให้ถูกกฎหมายยอมรับให้มีการค้าและเสพยาเสพติดบางชนิดได้แต่ต้องอยู่ภายใต้เงื่อนไขและกฎเกณฑ์ที่กำหนด (3) การใช้ทางเลือกอื่นในกระบวนการยุติธรรม อาทิ การลดทอนความผิดทางอาญา

กฎหมายรัฐธรรมนูญ พ.ศ. 2560 ได้มีการรองรับเสรีภาพของมนุษย์ว่าจะถูกจำกัดเสรีภาพไม่ได้ การลงโทษทางอาญาต้องเป็นการกำหนดโทษเฉพาะความผิดร้ายแรงเท่านั้น (รัฐธรรมนูญแห่งราชอาณาจักรไทย, 2560) การลงโทษต้องได้สัดส่วนกับความผิดที่ได้กระทำ และต้องใช้โทษจำคุกกับบุคคลที่มีความเป็นอาชญากรที่แท้จริง เช่น กลุ่มผู้ผลิต กลุ่มผู้ค้า แต่บุคคลที่เป็นผู้เสพ หรือครอบครองเพื่อเสพ มิได้มีนิสัยเป็นอาชญากรรมอยู่เป็นประจำ บุคคลเหล่านี้ควรได้รับการแก้ไข ปรับปรุงกลับตัวกลับใจเพื่อกลับมาใช้ชีวิตในสังคมได้อย่างปกติ โดยผิดมาตรา 15 (2) เดิมตาม พระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522

ประเภทของยาเสพติดตามบทบัญญัติของกฎหมายไทย แบ่งออกเป็น 5 ประเภท คือ

1. ยาเสพติดให้โทษประเภทที่ 1 เฮโรอีน แอลเอสดี แอมเฟตามีน ยาบ้า เป็นต้น

2. ยาเสพติดให้โทษประเภทที่ 2 ยาเสพติดประเภทนี้สามารถนำมาใช้ประโยชน์ทางการแพทย์ได้ แต่ต้องใช้ภายใต้การควบคุมของแพทย์ และใช้เฉพาะกรณีที่จำเป็นเท่านั้น ได้แก่ ฝิ่น มอร์ฟีน โคเคน หรือโคคาอีน โคเคอีน เพทิดีน และเมทาโดน

3. ยาเสพติดให้โทษประเภทที่ 3 ยาเสพติดประเภทนี้เป็นยาเสพติดให้โทษที่มียาเสพติดประเภทที่ 2 ผสมอยู่ด้วยมีประโยชน์ทางการแพทย์การนำไปใช้เพื่อจุดประสงค์อื่นหรือเพื่อเสพติดจะมีบทลงโทษกำกับไว้ยาเสพติดประเภทนี้ ได้แก่ ยาแก้ไอ ที่มีตัวยาโคเคอีน ยาแก้ท้องเสีย ที่มีฝิ่นผสมอยู่ด้วย ยาฉีดระงับปวดต่าง ๆ เช่น มอร์ฟีน เพทิดีน ซึ่งสกัดมาจากฝิ่น

4. ยาเสพติดให้โทษประเภทที่ 4 คือ สารเคมีที่ใช้ในการผลิตยาเสพติดให้โทษประเภทที่ 1 หรือประเภทที่ 2 ยาเสพติดประเภทนี้ ไม่มีการนำมาใช้ประโยชน์ในการบำบัดโรคแต่อย่างใดและมีบทลงโทษกำกับไว้ด้วยได้ แก่ น้ำยาอะเซติคแอนไฮไดรย์ และ อะเซติลคลอไรด์ ซึ่งใช้ในการเปลี่ยนมอร์ฟีนเป็นเฮโรอีน สารคลอซูไดอีเฟครีน สามารถใช้ในการผลิต ยาบ้าได้ และวัตถุออกฤทธิ์ต่อจิตประสาทอีก 12 ชนิด ที่สามารถนำมาผลิตยาอีและยาบ้าได้

5. ยาเสพติดให้โทษ ประเภทที่ 5 เป็นยาเสพติดให้โทษที่มิได้เข้าข่ายอยู่ในยาเสพติด ประเภทที่ 1 ถึง 4 ได้แก่ ทุกส่วนของพืช กัญชา ทุกส่วนของพืช กระท่อมเห็ดขี้ควาย เป็นต้น

เดิมตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 ตามมาตรา 15 (2) แอมแฟตามีนหรืออนุพันธ์หรือแอมเฟตามีน มีปริมาณคำนวณเป็นสารบริสุทธิ์ ตั้งแต่สามร้อยเจ็ดสิบห้ามิลลิกรัมขึ้นไปหรือมียาเสพติดที่มีสารดังกล่าวผสมอยู่ จำนวนสิบห้าหน่วยการใช้ขึ้นไป หรือมีน้ำหนักสุทธิตั้งแต่สามร้อยมิลลิกรัมขึ้นไป แต่ปัจจุบันมีการแก้ไขตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2564 มาตรา 145 วรรคแรก ผู้ใดผลิต นำเข้า ส่งออก จำหน่าย หรือมีไว้ในครอบครอง ซึ่งยาเสพติดให้โทษในประเภท 1 อันเป็นการฝ่าฝืนมาตรา 90 ต้องระวางโทษจำคุกไม่เกินสิบห้าปี และปรับไม่เกินหนึ่งล้านห้าแสนบาท

แต่ตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2564 ตามมาตรา 145 วรรคแรก ผู้ใดผลิต นำเข้า ส่งออก จำหน่าย หรือมีไว้ในครอบครองซึ่งยาเสพติดให้โทษในประเภท 1 อันเป็นการฝ่าฝืนมาตรา 90 ต้องระวางโทษจำคุกไม่เกินสิบห้าปี และปรับไม่เกินหนึ่งล้านห้าแสนบาท

เมื่อเปรียบเทียบกับ พระราชบัญญัติยาเสพติด ให้โทษ พ.ศ. 2522 ตามมาตรา 15 (2) แอมแฟตามีนหรืออนุพันธ์หรือแอมเฟตามีน มีปริมาณคำนวณเป็นสารบริสุทธิ์ตั้งแต่สามร้อยเจ็ดสิบห้ามิลลิกรัมขึ้นไปหรือมียาเสพติดที่มีสารดังกล่าวผสมอยู่ จำนวนสิบห้าหน่วยการใช้ขึ้นไป หรือมีน้ำหนักสุทธิตั้งแต่สามร้อยมิลลิกรัมขึ้นไป ซึ่งเป็นการกำหนดปริมาณการครอบครองยาเสพติดไว้โดยชัดเจน ทำให้สามารถจำแนกความผิดของผู้กระทำความผิดฐานมียาเสพติดไว้ในครอบครอง เพื่อลงโทษตามสัดส่วน

ตามความเป็นจริง แต่ตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2564 มิได้กำหนดปริมาณการมียาเสพติดไว้ในครอบครอง จึงไม่สามารถแยกได้ว่าผู้กระทำความผิดมียาเสพติดไว้ในครอบครองหรือมีไว้เพื่อเสพ จึงเป็นการบัญญัติกฎหมาย กำหนดลักษณะการกระทำความผิดของผู้กระทำความผิดที่ยังไม่ชัดเจน ทำให้ส่งผลกระทบต่อผู้กระทำความผิด ที่จะต้องได้รับโทษตามความเหมาะสม ตามหลักกฎหมายกระทำความผิดแค่ไหนรับโทษแค่นั้น เพราะไม่ได้กำหนดปริมาณของยาเสพติดเอาไว้ จึงไม่สามารถแยกได้ว่าผู้กระทำความผิดมียาเสพติดไว้ในครอบครอง หรือมียาเสพติดไว้เพื่อเสพ

จากสภาพปัญหาที่กล่าวข้างต้น จึงมีความสนใจที่จะศึกษาวิจัยเรื่อง มาตรการทางกฎหมายเกี่ยวกับปัญหาการกำหนดฐานความผิดของผู้กระทำความผิดในกรณีมียาเสพติดไว้ในครอบครอง ตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2564 มาตรา 145 วรรคแรก เป็นบทบัญญัติที่คุ้มครองสิทธิของผู้ต้องหาตามเจตนารมณ์ของกฎหมาย แล้วหรือไม่

วัตถุประสงค์การวิจัย

1. เพื่อศึกษาแนวคิดและทฤษฎีเกี่ยวกับการกำหนดฐานความผิดของผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครอง
2. เพื่อศึกษาเปรียบเทียบกฎหมายการกำหนดฐานความผิดของผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครอง ของประเทศไทยกับต่างประเทศ
3. เพื่อเสนอแนะแนวทาง การกำหนดมาตรการทางกฎหมายเกี่ยวกับฐานความผิดของผู้กระทำความผิด กรณีมียาเสพติดไว้ในครอบครอง

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดทฤษฎีเกี่ยวกับหลักเกณฑ์การกำหนดฐานความผิดของผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครอง

ตามแนวคิดในเรื่องที่มาของปัญหาการกำหนดฐานความผิดของผู้กระทำความผิด ในกรณีมียาเสพติดไว้ในครอบครอง ตามพระราชบัญญัติยาเสพติดให้โท ของประเทศไทยและต่างประเทศ ซึ่งศึกษากรณีกำหนดโทษมียาเสพติดไว้ในครอบครอง และเพื่อหาแนวทางแก้ไขการกำหนดโทษของกฎหมายยาเสพติดเพื่อให้เหมาะสมแก่ผู้กระทำความผิด โดยใช้แนวคิดทฤษฎีของประเทศไทยและต่างประเทศทั้งหมด 5 ทฤษฎี แนวคิดทฤษฎีหลักการคุ้มครองมนุษยชน , ทฤษฎีความยุติธรรม , แนวคิดทฤษฎีการลงโทษเพื่อข่มขู่ยับยั้ง , ทฤษฎีการลงโทษเพื่อแก้ไขฟื้นฟู และแนวคิดทฤษฎีการบำบัดการกลับคืนสู่สังคม แบ่งตามประเทศไทย ประเทศสิงคโปร์, อเมริกา, ญี่ปุ่น ดังนี้

แนวคิดทฤษฎีกฎหมายไทย

ยาเสพติดหรืออนุพันธ์ยาบ้า หมายถึง สารเคมีหรือวัตถุชนิดใดๆ ซึ่งเมื่อเสพเข้าสู่ร่างกายไม่ว่าจะโดยรับประทาน ดม สูบ ฉีด หรือด้วยประการใดๆ แล้วทำให้เกิดผลต่อร่างกายและจิตใจในลักษณะสำคัญ เช่น ต้องเพิ่มขนาดการเสพ ขึ้นเป็นลำดับ มีอาการถอนยาเมื่อขาดยา มีความต้องการเสพทั้งทางร่างกายและจิตใจอย่างรุนแรงตลอดเวลา และสุขภาพโดยทั่วไปจะทรุดโทรมลง รวมถึงพืช หรือส่วนของพืชที่ใช้ผลผลิตเป็นยาเสพติดให้โทษ หรืออาจใช้ผลิตเป็นยาเสพติดให้โทษ และสารเคมีที่ใช้ในการผลิตยาเสพติดให้โทษด้วย เป็นสารกระตุ้นประสาทในกลุ่มแอมเฟตามีน ออกฤทธิ์ทำให้ร่างกายตื่นตัวอยู่

ตลอดเวลา และลดความอยากอาหาร มีผลต่อระบบหัวใจ และหลอดเลือด คือ เพิ่มความดันโลหิต และทำให้หัวใจเต้นไม่เป็นจังหวะ ตามพระราชบัญญัติยาให้โทษ พ.ศ. 2564

มาตรา 1 ในประมวลกฎหมายนี้ วางหลักไว้ว่า...

“ยาเสพติด” หมายความว่า ยาเสพติดให้โทษ วัตถุออกฤทธิ์ หรือสารระเหย

“ยาเสพติดให้โทษ” หมายความว่า สารเคมี พืช หรือวัตถุชนิดใด ๆ ซึ่งเมื่อเสพแล้วทำให้เกิดผลต่อร่างกาย และจิตใจในลักษณะสำคัญ เช่น ต้องเพิ่มขนาดการเสพขึ้นเป็นลำดับ มีอาการถอนยาเมื่อขาดยา มีความต้องการเสพทั้งทางร่างกาย และจิตใจอย่างรุนแรงตลอดเวลา และสุขภาพโดยทั่วไปจะทรุดโทรมลง กับให้รวมถึงสารเคมีที่ใช้ในการผลิตยาเสพติดให้โทษด้วย แต่ไม่หมายความรวมถึงยาสามัญประจำบ้าน บางตำรับที่มียาเสพติดให้โทษผสมอยู่ตามกฎหมายว่าด้วยยา

“วัตถุออกฤทธิ์” หมายความว่า วัตถุที่ออกฤทธิ์ต่อจิต และประสาทที่เป็นสิ่งธรรมชาติหรือที่ได้จากสิ่งธรรมชาติ หรือวัตถุที่ออกฤทธิ์ต่อจิตและประสาทที่เป็นวัตถุสังเคราะห์

“สารระเหย” หมายความว่า สารเคมีหรือผลิตภัณฑ์ที่อาจนำไปใช้เพื่อสนองความต้องการของร่างกายหรือจิตใจซึ่งทำให้สุขภาพโดยทั่วไปทรุดโทรมลง

“ความผิดเกี่ยวกับยาเสพติด” หมายความว่า ความผิดตามที่บัญญัติไว้ในประมวลกฎหมาย

“ความผิดร้ายแรงเกี่ยวกับยาเสพติด” หมายความว่า ความผิดเกี่ยวกับการผลิต นำเข้า ส่งออก จำหน่าย หรือมีไว้ในครอบครอง เว้นแต่มีไว้ในครอบครองเพื่อเสพ และให้หมายความรวมถึงการสมคบ สนับสนุน ช่วยเหลือ หรือพยายามกระทำความผิดดังกล่าวด้วย

“ผลิต” หมายความว่า เพาะ ปลูก ทำ ผสม ปรุง แปรสภาพ เปลี่ยนรูป และสังเคราะห์ทางวิทยาศาสตร์

“นำเข้า” หมายความว่า นำหรือสั่งเข้ามาในราชอาณาจักร

“ส่งออก” หมายความว่า นำหรือส่งออกนอกราชอาณาจักร

“จำหน่าย” หมายความว่า ขาย แลกเปลี่ยน จ่าย แจก หรือให้โดยมีสิ่งตอบแทน หรือผลประโยชน์อย่างอื่น และให้หมายความรวมถึงมีไว้เพื่อจำหน่าย

“นำผ่าน” หมายความว่า นำหรือส่งผ่านราชอาณาจักร แต่ไม่รวมถึงการนำหรือส่งยาเสพติด ผ่านราชอาณาจักร โดยมิได้มีการขนถ่ายออกจากอากาศยานที่ใช้ในการขนส่งสาธารณะระหว่างประเทศ

“เสพ” หมายความว่า การรับยาเสพติดเข้าสู่ร่างกายโดยรู้อยู่ว่าเป็นยาเสพติดไม่ว่าด้วยวิธีใด

แนวคิดทฤษฎีเกี่ยวกับหลักเกณฑ์การใช้ในการกำหนดฐานความผิดของไทย การกำหนดโทษตามแนวคำพิพากษาของไทย ในส่วนของการใช้ดุลพินิจในการกำหนดโทษของไทยนั้น มีนักวิชาการและคณาจารย์ ผู้ทรงคุณวุฒิ ได้ให้ความหมายไว้อย่างสนใจ ทางตำราหลักดุลยพินิจในการลงโทษ

1. โทษจะต้องเป็นไปตามกฎหมาย กล่าวคือ กฎหมายกำหนดโทษไว้อย่างไร ศาลจะต้องลงโทษอย่างนั้น จะลงโทษอย่างอื่นนอกจากที่กฎหมายกำหนด ไว้ไม่ได้ ทั้งนี้เว้นแต่ กฎหมายนั้นเองจะยอมให้เปลี่ยนโทษได้ เช่น ให้เปลี่ยนโทษจำคุกเป็นโทษกักขัง เป็นต้น

2. ในความผิดทุกความผิด กฎหมายได้จำกัดดุลยพินิจของศาล โดยกำหนดโทษสูงสุด ให้ ศาลจะลงโทษให้หนักกว่ากำหนดโทษขั้นสูงสุดที่กฎหมายกำหนดไว้ไม่ได้ เว้นแต่จะมีเหตุเพิ่ม โทษตามกฎหมาย เช่น เพราะกระทำความผิดซ้ำขึ้นอีก เป็นต้น

3. ความผิดบางความผิดกฎหมายได้จำกัดดุลยพินิจของศาลโดยกำหนดโทษขั้นต่ำไว้ศาลจะกำหนดโทษต่ำกว่าโทษขั้นต่ำที่กฎหมายกำหนดไว้ไม่ได้ เว้นแต่จะมีเหตุผลโทษตามกฎหมาย ซึ่งอาจเป็นการลดมาตราส่วนโทษ หรือการลดโทษที่จะลง

4. ในระหว่างอัตราโทษขั้นต่ำและขั้นสูงที่กฎหมายกำหนดไว้ ศาลย่อมมีอำนาจใช้ดุลพินิจกำหนดโทษตามแต่ศาลจะเห็นสมควร

การกำหนดโทษที่ได้สัดส่วนเหมาะสมกับผู้กระทำความผิดในคดียาเสพติดของประทศไทย มีพันธกรณี ตามสนธิสัญญาระหว่างประเทศ ต้องปฏิบัติตามหลักแห่งการกำหนดโทษที่ได้สัดส่วน กับความผิด และถือเป็นสิทธิมนุษยชนอย่างหนึ่ง ที่ปรากฏอยู่ในปฏิญญาสากลว่า ด้วยสิทธิมนุษยชน นอกจากนี้ อนุสัญญาระหว่างประเทศที่เกี่ยวข้องกับการควบคุมยาเสพติด ทั้ง 3 ฉบับ คือ อนุสัญญาว่าด้วยยาเสพติด ค.ศ. 1961 อนุสัญญาว่าด้วยวัตถุที่ออกฤทธิ์ต่อจิตและประสาท ค.ศ. 1971 อันเป็นที่มาของพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 รวมตลอด ค. ศ . 1988 ที่ประเทศไทยเป็นภาคี

แนวคิดทฤษฎีกฎหมายสิงคโปร์

กฎหมายยาเสพติดของสิงคโปร์นั้นเข้มงวดมาก ซึ่งเป็นที่รู้จักว่าเป็นหนึ่งในประเทศที่เข้มงวดที่สุดในโลก ศาลต้องตัดสินลงโทษประหารชีวิต สำหรับผู้กระทำความผิด ความผิดคดียาเสพติดตามปริมาณยาเสพติดที่กำหนดไว้ในบัญชียาเสพติด สิงคโปร์เป็นหนึ่งในไม่กี่ประเทศที่ยังใช้โทษประหารชีวิตสำหรับผู้กระทำความผิดความผิดคดียาเสพติด ในปัจจุบัน แนวปฏิบัติเช่นนี้ ขัดต่อกฎหมายสิทธิมนุษยชนระหว่างประเทศ และทำให้สิงคโปร์อยู่ในอันดับเดียวกับจีน อิหร่าน ซาอุดีอาระเบีย และเวียดนาม ซึ่งประเทศเหล่านี้ล้วนลงโทษประหารชีวิต สำหรับผู้กระทำความผิด คดียาเสพติดเป็นปกติอยู่แล้ว

เมื่อในปี พ.ศ. 2518 มีกฎหมายการใช้ยาในทางที่ผิด ได้ครอบครองยาบางชนิด และกำหนดโทษของการครอบครอง กฎหมายการใช้ยาในทางที่ผิดยังให้ผู้อำนวยการสำนักงานยาเสพติดกลางในการสั่ง ให้บุคคลใดก็ตามที่ พบว่าเป็นผู้ครอบครองยาเสพติด หรือผู้ติดยาเสพติด เข้ารับการบำบัดรักษาและและการฟื้นฟูสมรรถภาพบังคับในสถานพยาบาลที่ได้รับความเห็นชอบ

“แอมเฟตามีน” เป็นกลุ่มของสารกระตุ้นระบบประสาทส่วนกลางที่มีโครงสร้างทางเคมีคล้ายกัน รวมถึงแอมเฟตามีน เมทแอมเฟตามีน เดกซ์โปรแอมเฟตามีน อีเฟดรีน และอื่น ๆ โดยทั่วไปยาเหล่านี้ ก่อให้เกิดผลกระทบทางอารมณ์ ความรู้ความเข้าใจ และทางกายภาพ เช่น พลังงานและสมาธิที่เพิ่มขึ้น และความอยากอาหารลดลง อาจถูกกำหนดตามกฎหมายสำหรับการรักษาโรคสมาธิสั้น เฉียบหรือเงื่อนไขอื่น ๆ พวกเขายังถูกใช้อย่างผิดกฎหมายเพื่อปรับปรุงประสิทธิภาพ ลดน้ำหนัก หรือเพื่อสร้าง "ความสูง

ยาบ้าหลายชนิดเป็นยากระตุ้นประเภทที่ 2 ซึ่งหมายความว่ายาบ้า มีศักยภาพสูงที่จะถูกนำไปใช้ในทางที่ผิด และมีจำหน่ายตามกฎหมายเมื่อมีใบสั่งยาเท่านั้น เมื่อใช้เพื่อวัตถุประสงค์ทางการแพทย์ ปริมาณจะต่ำกว่าปริมาณปกติของผู้เสพยา

ในบรรดายาบ้า ยาบ้ามีแนวโน้มที่จะถูกนำไปใช้ในทางที่ผิดมากที่สุด การใช้ เมทแอมเฟตามีนในทางที่ผิด อาจทำให้สมองเสียหายเป็นเวลานานพร้อมกับปัญหาอื่น ๆ โดยทั่วไปยานี้ผลิตในห้องปฏิบัติการลับ ซึ่งมีส่วนผสมที่จำหน่ายหน้าเคาน์เตอร์ราคาไม่แพงนัก เมทแอมเฟตามีนได้รับการพัฒนาในช่วงต้นศตวรรษที่ 20 จากยาหลัก คือ แอมเฟตามีน และเดิมใช้ในยาแก้คัดจมูกและยาสูดพ่นหลอดลม เมทแอมเฟตามีนทำให้กิจกรรมเพิ่มขึ้น ลดความอยากอาหาร และรู้สึกเป็นอยู่ที่ดีโดยทั่วไป มันเริ่มทำงานอย่างรวดเร็ว และผลกระทบอาจอยู่ได้ 6-8 ชั่วโมง โดยทั่วไปจะมีอาการปั่นป่วนสูงในบางคน

อาจนำไปสู่พฤติกรรมรุนแรงได้ เมทแอมเฟตามีนมีโครงสร้างคล้ายคลึงกับสารสื่อประสาท โดปามีน แม้ว่าผลกระทบด้านพฤติกรรม แต่ก็มีความแตกต่าง ที่สำคัญบางประการในกลไกพื้นฐานของวิธีการทำงานของยาเหล่านี้ในระดับเซลล์ แต่เมทแอมเฟตามีนก็เหมือนกับโคเคน ส่งผลให้เกิดการสะสมของสารสื่อประสาทโดปามีน ซึ่งดูเหมือนจะกระตุ้นให้เกิดความรู้สึกอิ่มเอิบ เมทแอมเฟตามีนมีระยะเวลาออกฤทธิ์นานกว่ามาก และเปอร์เซ็นต์ของยาที่มากขึ้น ยังคงไม่เปลี่ยนแปลงในร่างกาย ส่งผลให้มียาบ้าอยู่ในสมองนานขึ้น ซึ่งท้ายที่สุดจะนำไปสู่ผลกระตุ้นที่ยืดเยื้อยาวนาน

การครอบครองยาเสพติดในสิงคโปร์เป็นอาชญากรรมร้ายแรง อาจนำไปสู่การจำคุกระยะยาว หรือแม้กระทั่งเผชิญกับโทษประหารชีวิต

แนวคิดทฤษฎีกฎหมายสิงคโปร์

สิงคโปร์มีกฎระเบียบด้านยาเสพติดที่เข้มงวดที่สุดในโลก การบังคับใช้พระราชบัญญัติการใช้ยาในทางที่ผิดอย่างแข็งขัน ของประเทศทำให้การครอบครองยาเสพติดที่ผิดกฎหมายในปริมาณเล็กน้อยถือเป็นสิ่งผิดกฎหมาย หากมีผู้ครอบครองยาเสพติดจำนวนมาก รัฐบาลจะกดดันให้มีการลงโทษ นโยบายต่อต้านยาเสพติดและสารเสพติดผิดกฎหมายของสิงคโปร์เป็นที่รู้จักกันดีในขณะนี้ สิงคโปร์มีระบบการลงโทษที่รุนแรง ซึ่งช่วยให้ประเทศควบคุมการครอบครองและเสพยาเสพติดอย่างเข้มงวด สาธารณรัฐสิงคโปร์เป็นประเทศที่บังคับใช้กฎหมายอย่างรุนแรง และจริงจังโดยยึดนโยบายความสงบเรียบร้อยของสังคมเป็นหลักในการบังคับใช้กฎหมาย และลดมิติของการคุ้มครองสิทธิมนุษยชน เช่น มีโทษเฆี่ยนตีอีกทั้งสิงคโปร์ไม่ได้เป็นรัฐภาคีของกติการะหว่างประเทศ ว่าด้วยสิทธิพลเมืองและสิทธิทางการเมือง โดยกฎหมายยาเสพติดของสิงคโปร์ คือ Misuse of Drug Act กำหนดทั้งฐานความผิด บทลงโทษและวิธีพิจารณาคดีรวมทั้งมาตรการในการป้องกันและปราบปรามยาเสพติด โดยกฎหมายสิงคโปร์ลงโทษยาเสพติดอย่างรุนแรงในกรณีของการครอบครองยาเสพติด

ยาเสพติดรับโทษขั้นรุนแรงในสิงคโปร์ การผลิต กรณีปกติ และกรณีมีปริมาณมาก โทษประหารชีวิต การนำเข้า ส่งออกกรณีปกติโทษจำคุก 5-30 ปี จำคุกตลอดชีวิตและเฆี่ยน 5-15 ที

ส่วนกรณีปริมาณมาก 10-15 กรัม = จำคุก 30 ปี หรือ จำคุกตลอดชีวิตและเฆี่ยน 15 ที มากกว่า 15 กรัม= ประหารชีวิต

จำหน่ายกรณีปกติจำคุก 5-20 ปี เฆี่ยน 5-15 ที ส่วนกรณีปริมาณมาก 10-15 กรัม = จำ คุก 20-30 ปี จำคุกตลอดชีวิต และเฆี่ยน 15 ที มากกว่า 15 กรัม = ประหารชีวิต ครอบครอง

กรณีปกติ จำคุก 10 ปี ปรับ 20,000 เหรียญ ส่วนกรณีปริมาณมากกว่า 2 กรัม สันนิษฐานว่าครอบครองเพื่อจำหน่าย

เสพกรณีปกติ จำคุก 10 ปี ปรับ 20,000 เหรียญ

ในสิงคโปร์ หากมีปริมาณยาเสพติดเกินกำหนดต่อไปนี้จะถูกลงโทษประหารชีวิตสถานเดียว ฝิ่น 1,200 กรัม , มอร์ฟิน 30 กรัม , เฮโรอีน 15 กรัม , กัญชา 500 กรัม , โคเคน 30 กรัม และ แอมเฟตามีน 250 กรัม

ดังนั้น เป็นการใช้แนวคิดทฤษฎีการลงโทษเพื่อข่มขู่ยับยั้ง และทฤษฎีการลงโทษเพื่อแก้ไขฟื้นฟู

แนวคิดทฤษฎีกฎหมายสหรัฐอเมริกา

สหรัฐอเมริกาถือเป็นประเทศที่มีการแพร่ระบาดของยาเสพติด เป็นอย่างมาก และมีการปราบปรามยาเสพติดที่เข้มข้น ประเทศหนึ่งแต่ในปัจจุบัน สหรัฐอเมริกาได้กำลังพยายามที่จะหาทางออก

ปัญหายาเสพติดให้เกิดความเป็นเหมาะสมกับสภาพปัญหาที่เกิดขึ้น ในปัจจุบันซึ่งเกิดเป็นนโยบายที่จะผ่อนปรน ในการลงโทษผู้กระทำ ความผิดคดียาเสพติด แต่ยาเสพติดก็ยังคงเป็นสิ่ง ผิดกฎหมาย โดยสามารถเห็นได้จากนโยบายลดทอนความผิดคดียาเสพติด หรือเป็นการลดทอน บทลงโทษ เช่น การครอบครองและเสพเฉพาะตัว ในปริมาณเล็กน้อย อาจเพียงแค่ตักเตือน ให้ทำงานบริการสังคม หรือปรับ และยังมีการจัดตั้งศาลยาเสพติด (Drug Court) หรือศาลเพื่อการบำบัดรักษายาเสพติด (Drug Treatment Court) เพื่อเพิ่มประสิทธิภาพในการดำเนินคดียาเสพติด ในเชิงบำบัดฟื้นฟูโดยเฉพาะ แต่ปัจจุบันกฎหมายและมาตรการของประเทศสหรัฐอเมริกามีความน่าสนใจ เนื่องจากมีวิธีการจัดการกับผู้ใช้ที่น่าสนใจอีกประเทศหนึ่ง

ประเทศสหรัฐอเมริกานั้น มีกฎหมายที่เกี่ยวกับจัดประเภทสารเสพติด เป็นประเทศที่ ให้ความสำคัญกับปัญหาด้านยาเสพติดหรือสารเสพติด เนื่องจากตลอดระยะเวลาหลายสิบปีที่ผ่านมาประเทศสหรัฐอเมริกาก็ประสบปัญหาเรื่องยาเสพติดหรือสารเสพติดมาโดยตลอด

1. กฎหมายที่เกี่ยวข้องกับสารแอมเฟตามีนและอนุพันธ์

ประเทศสหรัฐอเมริกานั้นมีกฎหมายเกี่ยวกับยาเสพติด คือ พระราชบัญญัติสารควบคุมตามประมวลกฎหมายสหรัฐอเมริกา มาตรา 812 ได้บัญญัติคำ นิยามว่า “สารเสพติด” ว่า ไม่ว่าจะผลิตโดยตรงหรือโดยอ้อม โดยการสกัดจากสารของพืชต้นกำเนิด หรือสังเคราะห์ด้วยกรรมวิธีทางเคมี หรือโดยการผสมสารสกัดหรือสารเคมีสังเคราะห์ มีการจัดประเภทไว้ใน ข้อ 17 (A) – (F) มีสารเสพติด ดังต่อไปนี้

(A) ฝิ่น อนุพันธ์ฝิ่นและรวมทั้งสารอินทรีย์ เป็นต้น

(B) ฝิ่นแห้ง

(C) ใบโคคา

(D) โคเคน ผลึกโคเคน

(E) ecgonine และอนุพันธ์

(F) สารผสมหรือการเตรียมการใด ๆ ที่มีปริมาณของสารใด ๆ ที่อ้างถึงใน (A) ถึง (E) ส่วนสารต่าง ๆ จะถูกกำหนดแบ่งแยก แต่ละประเภทไว้ในหมวดของสารควบคุมที่จะถูกบัญญัติอยู่ในมาตรา 812 ของกฎหมายฉบับนี้ จะมีการแบ่งประเภทและระดับของสาร

แนวคิดทฤษฎีกฎหมายสหรัฐอเมริกา

การกำหนดโทษประเทศสหรัฐอเมริกานอกจากมีโทษทางอาญาแล้ว ยังมีโทษทางแพ่งอีกด้วย แต่โทษทางแพ่งนั้นจะได้ก็ต่อเมื่อเป็นการครอบครองสารเสพติดจำนวนเพียงเล็กน้อยเท่านั้น การกำหนดโทษทางแพ่งนั้นเป็นไปตามระเบียบอัยการสูงสุด ซึ่งอัยการสูงสุดจะเป็นผู้พิจารณาความผิดคดียาเสพติดแต่ละมลรัฐมีความแตกต่างกันไป เช่น การครอบครอง และจำหน่ายโคเคน ยาบ้า ยาอีจะขึ้นอยู่กับปริมาณยาเสพติด เป็นการใช้แนวคิดทฤษฎีหลักความยุติธรรม

วิธีดำเนินการวิจัย

ในการศึกษาวิจัยนี้ ใช้รูปแบบการศึกษาเชิงคุณภาพ (Qualitative Research) เป็นการวิจัยเอกสาร (Documentary Research) ศึกษาและวิเคราะห์กฎหมายและระเบียบที่เกี่ยวข้อง

การวิจัยเอกสาร (Document research) สำหรับการกำหนดระเบียบวิธีการวิจัยหรือกระบวนการวิธีการวิจัย โดยการใช้กระบวนวิธีการวิจัยเชิงคุณภาพ (Qualitative research) ด้วยวิธีกระบวนวิธีการวิจัยเชิงเอกสาร (Documentary research) โดยการทบทวนแนวความคิด และทฤษฎีที่เกี่ยวข้อง

การสัมภาษณ์เชิงลึก (In-depth interview) การวิจัยในครั้งนี้ได้กำหนดให้มีกระบวนวิธีการวิจัยโดยเป็นการสัมภาษณ์พูดคุยและเก็บรวบรวมข้อมูลโดยการจดบันทึกและการบันทึกเสียง และยังมีการสัมภาษณ์แบบดิจิตอล โดยการใช้แบบสัมภาษณ์แบบมีโครงสร้างลักษณะเป็นการใช้คำถามถามเหมือนกันทุกคนเป็นการสัมภาษณ์แบบปลายเปิด ซึ่งเป็นกระบวนวิธีการวิจัยที่มีความยืดหยุ่นและเปิดกว้าง ทั้งนี้เพื่อให้ทราบถึงความคิดเห็นและทรรศนะที่เกี่ยวกับมาตรการทางกฎหมายเกี่ยวกับการจำหน่ายบุหรี่ไฟฟ้าในประเทศไทยเพื่อเป็นแนวทางในการแก้ไขปัญหาการนำเข้าและการจำหน่ายบุหรี่ไฟฟ้าให้ถูกต้อง โดยดำเนินการคัดเลือกสอบถามความคิดเห็นของกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) อันเป็นบุคคลที่มีความรู้ที่เกี่ยวกับทางกฎหมาย จาก ทนายความผู้ทรงคุณวุฒิทางด้านกฎหมาย จำนวน 10 ท่าน และเจ้าหน้าที่ตำรวจผู้มีประสบการณ์ จำนวน 10 ท่าน

วิธีการเก็บรวบรวมข้อมูล

การวิเคราะห์ข้อมูลเชิงคุณภาพผู้ศึกษามีลำดับขั้นตอนในการวิเคราะห์ดังนี้

(1) ผู้วิจัยนำข้อมูลที่ได้จากการสัมภาษณ์ โดยนำคำตอบที่สัมภาษณ์จากผู้ที่ถูกสัมภาษณ์มาเปรียบเทียบความเหมือนและความแตกต่างของแต่ละบุคคล มาจัดลำดับความสำคัญและคุณลักษณะของข้อมูล

(2) นำข้อมูลจากการสัมภาษณ์และการสอบถามที่จัดลำดับความสำคัญแล้วนำมาเปรียบเทียบกับข้อมูลทางเอกสารต่างๆที่เกี่ยวข้องไม่ว่าจะเป็นแนวคิดทฤษฎีผลงานวิจัยที่เกี่ยวข้องเพื่อที่จะทราบถึงลักษณะที่คล้ายคลึงกันและแตกต่างกันของข้อมูล

(3) นำข้อมูลที่ได้จากการสัมภาษณ์และการศึกษาต่าง ๆ มาทำการวิเคราะห์ข้อมูลร่วมกันอย่างเป็นระบบและนำไปสู่การเชื่อมโยงข้อมูลเข้าด้วยกัน แสดงความสำคัญของข้อมูลได้ชัดเจนยิ่งขึ้น เพื่อสะดวกในการวิเคราะห์และเขียนรายงานข้อมูลที่ได้จากการศึกษาแบบสัมภาษณ์ลักษณะปลายปิด (Close Ended Question)

ผลการวิจัย

1. ผลการศึกษาเอกสาร

กฎหมายไทย ความผิดฐานมียาเสพติดไว้ในครอบครองตามพระราชบัญญัติยาเสพติด พ.ศ. 2522 มาตรา 15 (2) แอมแฟตามีนหรืออนุพันธ์หรือแอมเฟตามีน มีปริมาณคำนวณเป็นสารบริสุทธิ์ตั้งแต่สามร้อยเจ็ดสิบห้ามิลลิกรัมขึ้นไป หรือมียาเสพติดที่มีสารดังกล่าวผสมอยู่จำนวนสิบห้าหน่วยการใช้ขึ้นไป หรือมีน้ำหนักสุทธิตั้งแต่สามร้อยมิลลิกรัมขึ้นไป แต่ปัจจุบันมีการแก้ไขตามพระราชบัญญัติยาเสพติด พ.ศ. 2564 มาตรา 145 วรรคแรก ผู้ใดผลิต นำเข้า ส่งออก จำหน่าย หรือมีไว้ในครอบครองซึ่งยาเสพติดให้โทษในประเภท 1 อันเป็นการฝ่าฝืน มาตรา 90 ต้องระวางโทษจำคุกไม่เกินสิบห้าปี และปรับไม่เกินหนึ่งล้านห้าแสนบาท

การกำหนดโทษที่ได้สัดส่วนอย่างเหมาะสมกับผู้กระทำความผิด ในคดียาเสพติดของประทศไทยมีพันธกรณีตามสนธิสัญญาระหว่างประเทศต้องปฏิบัติตามหลักแห่งการกำหนดโทษที่ได้สัดส่วนกับความผิด และถือเป็นสิทธิมนุษยชน อย่างหนึ่งที่ปรากฏอยู่ในปฏิญญาสากลว่า ด้วยสิทธิมนุษยชน นอกจากนี้ อนุสัญญาระหว่างประเทศที่เกี่ยวข้องกับการควบคุมยาเสพติด ทั้ง 3 ฉบับ คือ อนุสัญญาว่าด้วยยาเสพติด ค.ศ. 1961 อนุสัญญาว่าด้วยวัตถุที่ออกฤทธิ์ต่อจิตและประสาท ค.ศ. 1971 อันเป็นที่มาของพระราชบัญญัติยาเสพติดให้โทษ พ.ศ. 2522 รวมตลอด ค.ศ. 1988 ที่ประเทศไทยเป็นภาคี

กฎหมายสิงคโปร์ สิงคโปร์มีกฎระเบียบด้านยาเสพติดที่เข้มงวดที่สุดในโลก การบังคับใช้พระราชบัญญัติการใช้ยาในทางที่ผิดอย่างแข่งขันของประเทศ ทำให้การครอบครองยาเสพติดที่ผิดกฎหมายในปริมาณเล็กน้อย ถือเป็นสิ่งผิดกฎหมาย หากมีผู้ครอบครองยาเสพติด จำนวนมาก รัฐบาลจะกดดันให้มีการลงโทษ นโยบายต่อต้านยาเสพติดและสารเสพติดผิดกฎหมายของสิงคโปร์ กฎหมายการใช้ยาในทางที่ผิด พ.ศ. 2518 ได้ครอบครองยาบางชนิดและกำหนดโทษของการครอบครอง กฎหมายการใช้ยาในทางที่ผิด ยังให้ผู้อำนวยการสำนักงานยาเสพติดกลาง ในการสั่งให้บุคคลใดก็ตามที่เป็นผู้ครอบครองยาเสพติดหรือผู้ติดยาเสพติด เข้ารับการบำบัดรักษาและและการฟื้นฟูสมรรถภาพ บังคับในสถานพยาบาลที่ได้รับความเห็นชอบ การครอบครองยาเสพติดในสิงคโปร์เป็นอาชญากรรมร้ายแรง และต้องได้รับโทษการจำคุกระยะยาวหรือแม้กระทั่งเผชิญกับโทษประหารชีวิตได้

กฎหมายสหรัฐอเมริกา บุคคลใดก็ตามที่ถูกตัดสินว่ามีความผิดเกี่ยวกับยาเสพติดของรัฐบาลกลางซึ่งมีโทษจำคุกมากกว่าหนึ่งปี จะต้องถูกริบทรัพย์สินส่วนบุคคลหรืออสังหาริมทรัพย์ใด ๆ ที่เกี่ยวข้องกับการละเมิดของสหรัฐอเมริกา

การกำหนดความผิด และบทลงโทษในความผิดฐานครอบครองยาเสพติดหรือเป็นการค้านั้นจะพิจารณาความผิดประกอบการลงโทษนั้นพิจารณาจากประเภทของยาเสพติด , ปริมาณ การครอบครองของยาเสพติด และการกระทำ ความผิดซ้ำ โดยแบ่งเป็น การกระทำ ความผิดครั้งที่ 1 ครั้งที่ 2 และครั้งที่ 3 ซึ่งการลงโทษก็จะหนักและรุนแรงมากขึ้นตามการกระทำ ความผิดที่เกิดซ้ำ กฎหมายยาเสพติด ของสหรัฐอเมริกามีการกำหนดปริมาณ การครอบครองยาเสพติดที่ชัดเจน แต่การลงโทษในเรื่องยาเสพติด ในความผิดฐานครอบครองยาเสพติด ที่จะเป็นความผิด ฐานครอบครอง หรือครอบครองเพื่อจำหน่าย มิได้มีการพิจารณาเพียงแค่ปริมาณการครอบครองยาเสพติดเป็นหลัก แต่ยังได้มีการพิจารณาทั้งชนิดยาเสพติด ปริมาณการครอบครองพร้อมทั้งพฤติการณ์ในการครอบครองเพื่อพิจารณาการลงโทษ

รัฐบัญญัติควบคุมยาเสพติด (The Controlled Substances Act: CSA) เป็นกฎหมายควบคุมยาเสพติดของรัฐบาลกลางสหรัฐฯ ภายใต้การควบคุมการผลิต นำเข้า ครอบครอง การใช้ และการกระจายตัวของสารบางชนิด กฎหมายนี้ผ่านรัฐสภาคองเกรสแห่งสหรัฐอเมริกาครั้งที่ 91 ปี ค.ศ. 1970 และลงนามในกฎหมาย โดยประธานาธิบดีริชาร์ด นิกสัน รัฐบัญญัตินี้เป็นส่วนหนึ่งของชุด การปฏิรูปการเปิดเสรีนโยบายยาเสพติด การบังคับใช้กฎหมาย และวิธีการที่เป็นระบบในการควบคุมการใช้ยาที่ออกฤทธิ์ต่อจิตและประสาท นอกจากนี้กฎหมาย CSA นี้ยังทำหน้าที่เป็นผู้ดำเนินการสำหรับการประชุมอนุสัญญาเดี่ยวว่าด้วยยาเสพติด (the Single Convention on Narcotic Drugs) (Pub.L. 91–513, 84 Stat. 1236, enacted October 27, 1970, codified at 21 U.S.C. § 801 et. seq.) กว่าสามทศวรรษ สภาคองเกรสของสหรัฐฯ ได้มีการแก้ไขเพิ่มเติมกฎหมายส่วนของการลงโทษมากขึ้น การแก้ไขนี้ซึ่งทำให้หน่วยงานบังคับใช้กฎหมาย (the Drug Enforcement Administration) ใหญ่กว่าสำคัญกว่าหน่วยเยียวยารักษายาเสพติดและการลงโทษเพิ่มขึ้น

กฎหมายญี่ปุ่น ประเทศญี่ปุ่น มีนโยบายมุ่งปราบปรามการเสพยาเสพติดอย่างหนักเป็นไปตามแบบทางยุติธรรม (Justice Model) ที่เน้นการใช้กฎหมายนำหน้า เน้นที่การบังคับใช้กฎหมายควบคู่ไปกับระบบสาธารณสุข รวมถึงการทำงานเชิงป้องกัน (Prevention) มากกว่า โดยเฉพาะในหมู่เยาวชน การใช้การควบคุมทางสังคมผ่านระบบความเชื่อและระเบียบวินัยของประชาชน

2. ผลการสัมภาษณ์

จากการสัมภาษณ์เชิงลึกต่อผู้ทรงคุณวุฒิด้านกฎหมายผู้ประกบวิชาชีพตำรวจ ผู้พิพากษา อัยการ ทนายความ และประชาชนจังหวัดนครศรีธรรมราช คือ ตำรวจ 20 คน ผู้พิพากษา 3 คน อัยการ 3 คน ทนายความ 15 คน และประชาชน 20 คน ความคิดเห็นของอัยการ ผู้พิพากษา ทนายความ ตำรวจ ประชาชน ที่มีความรู้ความเข้าใจเกี่ยวกับการกระทำความผิดฐานมียาเสพติดไว้ในครอบครอง ตาม พ.ร.บ. ยาเสพติด พ.ศ. 2564 มาตรา 145 วรรคแรก

4.2.1 การนำเสนอผลการวิเคราะห์ข้อมูล ผู้วิจัยเสนอเป็น 2 ตอน ตามลำดับดังนี้

ตอนที่ 1 ความคิดเห็นของ ตำรวจ ทนายความ ประชาชนที่มีต่อมาตราทางกฎหมายเกี่ยวกับการกระทำความผิดฐานมียาเสพติดไว้ในครอบครอง ตาม พ.ร.บ. ยาเสพติด พ.ศ. 2564 มาตรา 145 วรรคแรก

ตำรวจ: เห็นด้วย ผู้ถูกกล่าวหาว่ากระทำความผิด ต้องมีพยานหลักฐานเพื่อให้ศาลตัดสินก่อนว่าเป็นผู้กระทำความผิด

ทนายความ: เห็นด้วยอย่างยิ่ง เมื่อบุคคลนั้นได้ถูกกล่าวหาว่าการกระทำความผิด แต่ยังไม่ได้รับการวินิจฉัยหรือการพิจารณาจากศาลให้สันนิษฐานให้บุคคลนั้นเป็นผู้บริสุทธิ์

ประชาชน: เห็นด้วย

อัยการ: เห็นด้วยอย่างยิ่ง

ผู้พิพากษา: เห็นด้วย ตราบใดที่ยังไม่มีคำวินิจฉัย ก็ต้องสันนิษฐานไว้ก่อนว่าบุคคลนั้นบริสุทธิ์

ตอนที่ 2 ความคิดเห็นอื่น ๆ

4.2.2. ผลการวิเคราะห์ข้อมูล (ตำรวจ ทนายความ ประชาชน)

ตอนที่ 1 คำถามปลายเปิด

จากผลการวิจัยที่ให้ผู้พิพากษา ทนายความ ประชาชน จังหวัดนครศรีธรรมราช ตอบแบบสัมภาษณ์ชนิดมีโครงสร้าง โดยสรุปผลดังนี้

ตอนที่ 2 ข้อเสนอแนะอื่นๆ

ตำรวจ: บทลงโทษความผิดเกี่ยวกับยาเสพติดควรมีบทลงโทษ ที่รุนแรง เนื่องจากยาเสพติดนำไปสู่การก่ออาชญากรรม

ทนายความ: ควรมีการออกกฎกระทรวงกำหนดจำนวนปริมาณในการมีไว้เพื่อครอบครองและข้อสันนิษฐานให้ชัดเจนกว่านี้

ประชาชน: บทลงโทษแต่ละความผิดต้องมีความชัดเจนและเป็นธรรม

สรุปและอภิปรายผล

จากการศึกษาวิจัยฉบับนี้ การศึกษาสอดคล้องกับสมมติฐานของการวิจัย คือ พระราชบัญญัติยาเสพติด พ.ศ. 2564 ได้บัญญัติอัตรากับรับโทษการมียาเสพติดไว้ในครอบครอง ในคดีอาญา ไว้ดีแล้ว ประเด็นที่เป็นปัญหา คือ ตามพระราชบัญญัติยาเสพติด พ.ศ. 2564 มาตรา 145 วรรคแรก ที่มิได้กำหนดปริมาณ คำนวณเป็นสารบริสุทธ์ หรือมียาเสพติดที่มีสารดังกล่าวผสมอยู่ มิได้กำหนดจำนวนหน่วยการใช้ หรือมิได้กำหนดน้ำหนักบริสุทธิ์ เป็นผู้กระทำความผิดฐานมียาเสพติดไว้ในครอบครอง เช่นนี้ ควรปรับปรุงแก้ไขเพิ่มเติมมาตราการให้ผู้กระทำความผิดฐานครอบครองยาเสพติดไว้ในครอบครอง และการครอบครองเพื่อเสพ แยกให้ชัดเจนเพื่อความยุติธรรมต่อผู้กระทำความผิด และการบังคับใช้กฎหมายให้เป็นไปตามเจตนารมณ์ของกฎหมาย

ข้อเสนอแนะ

จากการวิจัยเสนอแนะให้เพิ่มเติมกฎหมายในการกระทำความผิดฐานมียาเสพติดไว้ในครอบครองครอบครองเพื่อเสพ หรือ จำหน่ายตามพระราชบัญญัติยาเสพติด พ.ศ. 2522 (ฉบับเดิม) เป็นการกำหนดโทษอย่างชัดเจน ต่ออัตราการรับโทษของผู้กระทำความผิด โดยพระราชบัญญัติยาเสพติด พ.ศ. 2564 (ฉบับใหม่) เป็นการกำหนดลักษณะการกระทำความผิดที่ไม่ชัดเจน และไม่ระบุจำนวนสารบริสุทธิ์อย่างชัดเจน แต่ต้องรับโทษในอัตราที่สูงขึ้น จึงเห็นควรกำหนดปริมาณสารเสพติดตามพระราชบัญญัติยาเสพติด พ.ศ. 2522 (ฉบับเดิม) ให้ชัดเจน เทียบเคียงกับกฎหมายต่างประเทศ

มาตรา 15 ห้ามมิให้ผู้ใดผลิต นำเข้า ส่งออก จำหน่ายหรือมีไว้ในครอบครองซึ่งยาเสพติดให้โทษใน ประเภท 1 เว้นแต่รัฐมนตรีจะได้อนุญาตเฉพาะในกรณีจำเป็นเพื่อประโยชน์ของทางราชการ การผลิต นำเข้า ส่งออก หรือมีไว้ในครอบครองซึ่งยาเสพติดให้โทษในประเภท 1 ตามปริมาณดังต่อไปนี้ ให้ถือว่าเป็นการผลิต นำเข้า ส่งออก หรือมีไว้ในครอบครองเพื่อจำหน่าย

(1) เด็กซ์โตรไลเซอร์ไยด์ หรือ แอล เอส ดี มีปริมาณคำนวณเป็นสารบริสุทธิ์ตั้งแต่ 0.5 มิลลิกรัมขึ้นไป หรือมียาเสพติดที่มีสารดังกล่าวผสมอยู่จำนวน 15 หน่วยการใช้ขึ้นไป หรือมีน้ำหนักสุทธิตั้งแต่ 300 มิลลิกรัมขึ้นไป

(2) แอมเฟตามีนหรืออนุพันธ์แอมเฟตามีน มีปริมาณคำนวณเป็นสารบริสุทธิ์ตั้งแต่สามร้อยเจ็ดสิบห้ามิลลิกรัม ขึ้นไปหรือมียาเสพติดที่มีสารดังกล่าวผสมอยู่จำนวนสิบห้าหน่วยการใช้ขึ้นไป หรือมีน้ำหนักสุทธิตั้งแต่หนึ่งจุดห้ากรัมขึ้นไป

(3) ยาเสพติดให้โทษในประเภท 1 นอกจาก (1) และ (2) มีปริมาณคำนวณเป็นสารบริสุทธิ์ตั้งแต่สามกรัมขึ้น ไปมีไว้ในครอบครอง / ไม่ถึงการจำหน่าย

ครอบครอง / ไม่ถึงการจำหน่าย

อัตราโทษ จำคุก 1 – 10 ปี หรือ ปรับ 20,000 – 200,000 บาท หรือทั้งจำทั้งปรับ

ครอบครองเพื่อเสพ

อัตราโทษ จำคุก 6 เดือน – 3 ปี หรือ ปรับ 10,000 - 60,000 บาท หรือทั้งจำทั้งปรับ

จำหน่าย มี 3 ประเภท

- มียาเสพติดไม่เกิน 15 เม็ด หรือสารบริสุทธิ์ไม่เกิน 0.375 มิลลิกรัม โดยอัตราโทษ จำคุก 4-15 ปี ปรับ 80,000 - 300,0000 บาท หรือทั้งจำทั้งปรับ (หากมียาไม่เกิน 15 เม็ด ให้สันนิษฐานไว้ว่า มียาเสพติดไว้ในครอบครองเพื่อจำหน่าย)

- มียาเกิน 15 เม็ด หรือ สารบริสุทธิ์เกิน 0.375 มิลลิกรัม แต่ไม่เกิน 20 กรัม อัตราโทษจำคุก 4 ปี ตลอดชีวิต ปรับตั้งแต่ 40,0000 – 50,0000 บาท หรือทั้งจำทั้งปรับ

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Problems in the Performance of Duties by Police Officers Persons Performing Duties in the Surat Thani Provincial CourtAfter Coming into Force Act Prevent and Suppress Torture and Enforced Disappearances 2022

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บทคัดย่อ

การซ้อมทรมานและการกระทำที่โหดร้ายไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ และการกระทำให้บุคคลสูญหายเป็นการใช้ความรุนแรงเพื่อใช้ในการปราบปรามกลุ่มบุคคลที่มีความเห็นต่างหรือเพื่อกำจัดผู้ต้องสงสัย ซึ่งเป็นการกระทำนอกเหนือหลักกระบวนการยุติธรรม และหลักสิทธิมนุษยชน โดยข้อมูล ณ วันที่ 28 สิงหาคม พ.ศ. 2562 ขององค์การสหประชาชาติ ระบุว่ามี คนหายสาบสูญในประเทศไทย 86 คน ทั้งจากเหตุการณ์ทางการเมือง เหตุการณ์พฤษภาทมิฬ พ.ศ. 2535 ความขัดแย้งในพื้นที่จังหวัดชายแดนใต้ สงครามยาเสพติดช่วงปี พ.ศ. 2546 ถึง พ.ศ. 2558 ล้วนเป็นเหตุการณ์ที่ก่อให้เกิดพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ซึ่งมีผลใช้บังคับเมื่อวันที่ 22 กุมภาพันธ์ พ.ศ. 2566 เป็นต้นมา กฎหมายฉบับนี้เป็นกฎหมายที่มุ่งให้ความคุ้มครองสิทธิของผู้ถูกควบคุมตัว ในกระบวนการยุติธรรมทางอาญา จึงเป็นเหตุผลให้สำนักงานตำรวจแห่งชาติต้องปรับกระบวนการและวิธีการในการจับกุมและควบคุมตัวผู้ถูกควบคุมตัว เพื่อให้เป็นไปตามกฎหมายฉบับนี้บัญญัติไว้ ซึ่งหากไม่ปฏิบัติตามตามกฎหมายฉบับนี้แล้วเจ้าหน้าที่ตำรวจอาจถูกดำเนินคดีทั้งทางอาญาและทางแพ่ง

การศึกษาวิจัยนี้มีวัตถุประสงค์ เพื่อศึกษากฎหมายที่เกี่ยวข้องกับการป้องกันและปราบปรามการซ้อมทรมาน และการกระทำที่โหดร้ายไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ และการกระทำให้บุคคลสูญหายทั้งในประเทศไทยและต่างประเทศ และศึกษาปัญหาในการปฏิบัติงานของเจ้าหน้าที่ตำรวจผู้ปฏิบัติตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ทั้งนี้เพื่อจัดข้อเสนอแนะเกี่ยวกับปัญหาการปฏิบัติหน้าที่ของเจ้าหน้าที่ตำรวจที่จะปฏิบัติตามเงื่อนไขของกฎหมายฉบับนี้

จากการศึกษาพบว่า พระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ในส่วนของมาตรา 22 วรรคหนึ่ง บัญญัติว่า ในการควบคุมตัว เจ้าหน้าที่ของรัฐผู้รับผิดชอบต้องบันทึกภาพและเสียง อย่างต่อเนื่องในขณะจับและควบคุมจนกระทั่งส่งตัวให้พนักงานสอบสวนหรือปล่อยตัวบุคคลดังกล่าวไป เว้นแต่มีเหตุสุดวิสัยที่ไม่สามารถกระทำได้ ก็ให้บันทึกเหตุนั้นเป็นหลักฐานไว้ในบันทึกการควบคุมตัว การวิจัยพบว่า (1) เจ้าหน้าที่ตำรวจกลุ่มตัวอย่างยังไม่สามารถปฏิบัติตามบทบัญญัติของกฎหมายฉบับนี้ได้เนื่องจากเจ้าหน้าที่ตำรวจยังไม่มีความพร้อมในด้านเครื่องมือและอุปกรณ์การบันทึกภาพและเสียงตามที่กฎหมายบัญญัติไว้ (2) เจ้าหน้าที่ตำรวจยังไม่มีความรู้และทักษะการใช้เครื่องมือและอุปกรณ์การบันทึกภาพและเสียงเท่าที่ควร (3) ปัจจุบันยังไม่มีระเบียบและแนวทางการปฏิบัติที่เป็นมาตรฐานกลางสำหรับเจ้าหน้าที่ตำรวจ ซึ่งอาจทำให้เจ้าหน้าที่ตำรวจผู้ปฏิบัติหน้าที่ผู้ทำการจับกุมและควบคุมตัวบุคคลตามกฎหมายอาจมีลักษณะการกระทำที่เข้าข่ายเป็นการการกระทำความผิดตามกฎหมายฉบับนี้ซึ่งอาจถึงกับต้องถูกดำเนินคดีทั้งทางแพ่งและทางอาญา

คำสำคัญ: การทรมาน, การกระทำที่โหดร้ายไร้มนุษยธรรม

Abstract

The purpose of this research was to study legal measures to address the problem of selling e-cigarettes. At present, smoking is widely used among teenagers, and there is an increasing trend toward smoking. At present, there is no such measure in Thai law. The only e-cigarette products available are those listed in an announcement from the Ministry of Commerce on Prohibited Products to be Brought Through the Kingdom. B.E. direct to consumers There is smuggling and trading through various channels, such as shops that sell e-cigarettes in particular or online stores. And according to various websites, it is seen a lot. which will lead to illegal purchases and non-formal economic conditions, allowing the government to lack income from taxes that should be obtained from electric cigarette products, which are imported products and luxury products.

This research study has the objective to study laws related to prevention and suppression torture and cruel and inhumane acts or degrading human dignity and the act of causing a person to disappear both in Thailand and abroad and study problems in the work of police officers those who comply with the Prevention and Suppression of Torture Act and acts of disappearance of persons 2022 to provide recommendations regarding problems in the performance of duties by police officers.

From research studies When the Prevention and Suppression of torture and disappearance Act B.E. 2022 it came into effect on February 22, 2023. the sample police officers were 55. those who comply with the provisions of this law there are obstacles in performing duties. is considered to be committing an offense prevention and Suppression of torture and disappearance Act B.E. 2022 as follows: (1) Police officers must wear cameras. to record arrests and detentions the accused person at all times It was found that the police were not yet prepared with audio and video recording equipment. and (2)

Police officers still don't have knowledge and skills in using tools and equipment and (3) there are no standardized regulations and guidelines for police officers. Police officers on duty who arrest and detain people according to law the police may even face civil and criminal prosecution.

Keywords: torture, cruel and inhumane act

บทนำ

ปัญหาการซ้อมทรมาน การกระทำที่โหดร้ายไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์และการกระทำให้บุคคลสูญหายนั้นเป็นปัญหาที่ทั่วโลกกำลังเผชิญอยู่จึงก่อให้เกิดการผลักดัน และเรียกร้องจากนานาประเทศให้จัดการกับปัญหาดังกล่าว ด้วยเหตุนี้องค์การสหประชาชาติ (United Nations) จึงต้องกำหนดให้มีอนุสัญญาระหว่างประเทศว่าด้วยการคุ้มครองบุคคลทุกคนจากการหายสาบสูญโดยถูกบังคับ ค.ศ. 2006 (International Convention for the Protection of All Persons from Enforced Disappearance) ซึ่งวัตถุประสงค์กำหนดให้การกระทำดังกล่าวเป็นความผิดอาญาซึ่งตามอนุสัญญาฉบับนี้ถือได้ว่าเป็นกลไกที่สำคัญในการแก้ไขปัญหากรณีการทำให้บุคคลให้สาบสูญโดยถูกบังคับและเป็นการกำหนดมาตรฐานขั้นต่ำในการคุ้มครองบุคคลมิให้หายสาบสูญโดยถูกบังคับ และองค์การสหประชาชาติเองก็ได้เรียกร้องให้ประเทศต่าง ๆ เข้ามาเป็นภาคีเพื่อป้องกันการบังคับให้บุคคลสูญหาย โดยอนุสัญญาฉบับนี้มีผลใช้บังคับเมื่อวันที่ 23 ธันวาคม พ.ศ. 2553 และประเทศไทยได้ร่วมลงนามในอนุสัญญาฉบับนี้เมื่อวันที่ 9 มกราคม พ.ศ. 2555 ซึ่งการลงนามดังกล่าวไม่อาจมีผลใช้บังคับกับประเทศไทยก็ตามเนื่องจากยังไม่ได้ให้สัตยาบันเป็นรัฐภาคีก็เป็นการแสดงเจตนารมณ์และท่าทีของประเทศไทยที่แสดงถึงความตั้งใจในการส่งเสริม ป้องกัน และคุ้มครองสิทธิมนุษยชน ทั้งเป็นการเห็นความสำคัญของการแก้ไขปัญหาเกี่ยวกับการบังคับให้บุคคลสูญหาย ข้อมติสมัชชาสหประชาชาติ สมัยสามัญ (United Nations General Assembly : UNGA) สมัยที่ 61 ได้รับรองอนุสัญญาฉบับนี้ เมื่อวันที่ 20 ธันวาคม พ.ศ. 2549 โดยไม่เปิดให้มีการลงนามตั้งแต่ 6 กุมภาพันธ์ พ.ศ. 2550 และมีผลใช้บังคับ ตั้งแต่ 23 ธันวาคม พ.ศ. 2553 ปัจจุบันมีประเทศลงนามแล้ว จำนวน 93 ประเทศ และประเทศที่เป็นภาคีแล้ว จำนวน 40 ประเทศ (คมกฤช หาญพิชาญชัย, 2551)

ปัญหาการหายสาบสูญโดยถูกบังคับหรือการอุ้มหาย (Enforced Disappearance) ถือเป็นปัญหาที่เกิดขึ้นอย่างแพร่หลายและเป็นปัญหาที่นานาประเทศกำลังประสบอยู่ และให้ความสนใจเป็นอย่างมากเนื่องจากเป็นการละเมิดสิทธิมนุษยชนที่ร้ายแรงอันเป็นสิทธิขั้นพื้นฐานของมนุษย์ทุกคนที่ไม่ว่าจะเป็นผู้ใดหรือมีที่อยู่อาศัยที่ใด ทั้งไม่ว่าจะมีความเชื่อหรือนับถือศาสนาใดก็ตาม ย่อมมีสิทธิที่จะได้รับความรับรองและคุ้มครองศักดิ์ศรีความเป็นมนุษย์ของตนโดยไม่อาจมีผู้ใดพรากไปได้ ตามปฏิญญาสากลว่าด้วยสิทธิมนุษยชน (Universal Declaration of Human Rights) ซึ่งเป็นรากฐานของกฎหมายสิทธิมนุษยชนระหว่างประเทศที่ได้รับรองและคุ้มครองสิทธิดังกล่าวไว้ก็ตาม (พรเพ็ญ คงขจรเกียรติ, 2550) แต่การบังคับบุคคลสูญหาย อันเป็นการกระทำของผู้เป็นเจ้าหน้าที่ของรัฐที่มีหน้าที่ในการรักษาความสงบเรียบร้อยของประชาชนกลับเป็นผู้กระทำเสียเองโดยการลักพาตัวบุคคลไป คุมขัง กักขัง หรือกระทำการใด ๆ ที่มีลักษณะลิดรอนเสรีภาพ โดยไม่ให้ญาติหรือพี่น้องหรือครอบครัวทราบถึงชะตากรรม ประเทศไทยมีการประกาศใช้พระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 และมีผลใช้บังคับนับตั้งแต่วันที่ 22 กุมภาพันธ์ พ.ศ. 2566 เป็นต้นมานั้น ฝ่ายปฏิบัติการตาม

กฎหมายฉบับนี้ โดยเฉพาะเจ้าหน้าที่ตำรวจนั้นมีปัญหาเกี่ยวกับการดำเนินการตามกฎหมายฉบับนี้ คือ ปัญหาเกี่ยวกับหน่วยงานของรัฐยังไม่มีอุปกรณ์บันทึกภาพและเสียง อย่างเพียงพอแก่การปฏิบัติงานของเจ้าหน้าที่ มาตรา 22 วรรคแรก แห่งตามกฎหมายฉบับนี้ บัญญัติว่า “ในการควบคุมตัวเจ้าหน้าที่ของรัฐผู้รับผิดชอบต้องบันทึกภาพและเสียงอย่างต่อเนื่องในขณะจับและควบคุมจนกระทั่งส่งตัวให้พนักงานสอบสวนหรือปล่อยตัวบุคคลดังกล่าวไป เว้นแต่มีเหตุสุดวิสัยที่ไม่สามารถกระทำได้ ก็ให้บันทึกเหตุนั้นเป็นหลักฐานไว้ในบันทึกการควบคุมตัว” จากบทบัญญัติข้างต้น มีเจตนารมณ์ที่จะคุ้มครองสิทธิของผู้ถูกจับให้การจับเป็นไปตามหลักสากล และป้องกันการล่วงละเมิดสิทธิของผู้ถูกกล่าวหาจากการปฏิบัติโดยมิชอบของเจ้าหน้าที่ (รณกรณ์ บุญมี, 2562) อย่างไรก็ตาม การปฏิบัติตามกฎหมายโดยการบันทึกภาพและเสียงเจ้าหน้าที่ของรัฐต้องมีอุปกรณ์อิเล็กทรอนิกส์อย่างเพียงพอ ซึ่งต้องใช้งบประมาณจำนวนมากในการจัดซื้อทำให้เจ้าหน้าที่อาจยังไม่พร้อมที่จะปฏิบัติตามกฎหมาย แต่กฎหมายฉบับนี้มิได้กล่าวถึงความไม่พร้อมของรัฐในการจัดหาเครื่องมือและอุปกรณ์ให้กับเจ้าหน้าที่ตำรวจเพื่อปฏิบัติตามกฎหมายแต่ประการใด

ด้วยเหตุผลข้างต้น ผู้วิจัยจึงเห็นความจำเป็นที่จะต้องทำการศึกษาปัญหาหรือผลกระทบต่อการปฏิบัติหน้าที่ของเจ้าหน้าที่ตำรวจในการปฏิบัติตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 เพื่อที่จะได้หาทางแก้ไขปัญหาให้กับเจ้าหน้าที่ตำรวจสามารถปฏิบัติหน้าที่ได้อย่างถูกต้องและมีความสะดวกตามกฎหมายต่อไป

วัตถุประสงค์ของการวิจัย

(1) เพื่อศึกษากฎหมายที่เกี่ยวกับการป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหายทั้งประเทศไทยและระหว่างประเทศ

(2) เพื่อศึกษาปัญหาการปฏิบัติงานของเจ้าหน้าที่ตำรวจผู้ปฏิบัติตามบทบัญญัติพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565

(3) เพื่อจัดทำข้อเสนอแนะให้แก่หน่วยงานที่เกี่ยวข้องเกี่ยวกับการแก้ไขปัญหาการปฏิบัติตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565

ประโยชน์ที่จะได้รับ

(1) ได้ทราบหลักเกณฑ์เกี่ยวกับที่เกี่ยวกับการป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหายทั้งประเทศไทยและระหว่างประเทศ

(2) ได้ทราบปัญหาการปฏิบัติงานของเจ้าหน้าที่ตำรวจผู้ปฏิบัติตามบทบัญญัติพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565

(3) มีข้อเสนอแนะให้แก่หน่วยงานที่เกี่ยวข้องเกี่ยวกับการแก้ไขปัญหาการปฏิบัติตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ซึ่งหากปฏิบัติตามข้อเสนอแนะแล้วจะช่วยให้ผู้ถูกควบคุมตัวได้รับการปฏิบัติจากเจ้าหน้าที่ตำรวจตามที่พระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ได้บัญญัติไว้และเจ้าหน้าที่ตำรวจผู้ปฏิบัติหน้าที่จับกุมควบคุมตัวก็ไม่ต้องเสี่ยงกับการถูกดำเนินคดีทั้งแพ่งและอาญา

แนวคิด ทฤษฎี และกรอบแนวคิด

แนวคิดการคุ้มครองสิทธิมนุษยชน สิทธิมนุษยชนนั้นหมายถึง สิทธิของทุกคนที่เกิดมาเป็นมนุษย์ ซึ่งเป็นสิทธิที่ติดตัวมาแต่เกิด และหมายรวมถึงที่ได้รับการรับรองไว้เป็นลายลักษณ์อักษร ทั้งในรูปกฎหมายภายในประเทศและกฎหมายระหว่างประเทศ องค์การสหประชาชาติ ได้มีความพยายามที่จะให้การคุ้มครองและส่งเสริมสิทธิมนุษยชน เพื่อนำไปสู่การอยู่ร่วมกันอย่างสงบ มีสันติภาพเกิดขึ้นบนโลกนี้ ความพยายามสร้างหลักเกณฑ์ระหว่างประเทศเพื่อการคุ้มครองและส่งเสริมสิทธิมนุษยชน จึงเกิดขึ้นนับแต่มีการก่อตั้งองค์การสหประชาชาติ เมื่อ พ.ศ. 2488 หลักเกณฑ์ที่ถือเป็นจุดเริ่มต้นที่เป็นลายลักษณ์อักษรขององค์การสหประชาชาติดังกล่าว เรียกว่า เอกสารระหว่างประเทศว่าด้วยการคุ้มครองสิทธิมนุษยชนหรือ The International Bill of Human Rights ประชาคมโลกจึงได้เพียรพยายามที่จะกำหนดให้สิทธิมนุษยชนเป็นมาตรฐานร่วมกันที่จะประกันให้ประชาชนทุกคนได้รับการปกป้องคุ้มครองโดยถ้วนหน้ากัน และถือเป็นปณิธาน 6 ประการ สูงสุดที่ประชาชนในโลกปรารถนาให้บังเกิดขึ้น ทั้งในระดับประเทศและระดับระหว่างประเทศ ดังนั้นองค์การสหประชาชาติในฐานะองค์การระหว่างประเทศจึงได้กำหนดข้อตกลงระหว่างประเทศว่าด้วยสิทธิมนุษยชน เพื่อเป็นมาตรฐานเบื้องต้นในการให้ประชาคมโลกนำไปปฏิบัติและพัฒนาสิทธิมนุษยชนให้ดียิ่งขึ้น ข้อตกลงระหว่างประเทศว่าด้วยสิทธิมนุษยชนที่สำคัญมีหลายฉบับ เช่น ปฏิญญาสากลว่าด้วยสิทธิมนุษยชน (Universal Declaration of Human Right : UDHR) รัฐบาลของหลายประเทศ ในประชาคมโลกได้นำข้อตกลงว่าด้วยสิทธิมนุษยชนเหล่านี้เป็นแนวทางในการพัฒนาคุณค่าความเป็นมนุษย์ให้บริบูรณ์ยิ่งขึ้น ประเด็นสิทธิมนุษยชนในสังคมไทยเกิดขึ้นภายหลังจากที่สังคมไทยได้รับอิทธิพลจากแนวคิดการพัฒนาในแนวความทันสมัย (Modernization) โดยเฉพาะในช่วงหลังจากที่ประเทศเข้าสู่การปกครองในระบอบประชาธิปไตยหลังการปฏิวัติในปี พ.ศ. 2475 และรัฐธรรมนูญแห่งราชอาณาจักรไทย พุทธศักราช 2560 ก็ได้บัญญัติคุ้มครองไว้ในมาตรา 4 เช่นกัน ได้มีรัฐธรรมนูญอย่างน้อย 2 ประเทศที่บัญญัติรับรอง “ศักดิ์ศรีความเป็นมนุษย์” ไว้กล่าวคือ รัฐธรรมนูญของประเทศเยอรมนี และรัฐธรรมนูญของประเทศแอฟริกาใต้ โดยทั้ง 2 ประเทศนั้น ต่างมีปัญหาเรื่องการกระทำของมนุษย์ในลักษณะที่แตกต่างกันออกไป ซึ่งอาจกล่าวได้ว่าที่มาของคำว่า “ศักดิ์ศรีความเป็นมนุษย์” ในรัฐธรรมนูญทั้ง 2 ประเทศนั้น ล้วนแต่มีที่มาอันเจ็บปวดของมนุษย์ โดยที่มาของคำว่า “ศักดิ์ศรีความเป็นมนุษย์” ของประเทศเยอรมนี นั้น สืบเนื่องมาจากเหตุการณ์ในระหว่างสงครามโลกครั้งที่ 2 (ค.ศ. 1944 - 1945) ในสังคมยุโรปและสิทธิมนุษยชนระหว่างชาวอเมริกัน ซึ่งการบังคับให้บุคคลสูญหายนั้นต้องถือได้ว่าเป็นอาชญากรรมที่ร้ายแรงที่สุดที่คุกคามมวลมนุษยชาติ เพราะการบังคับให้บุคคลสูญหายไม่ใช่เป็นการกระทำที่ละเมิดสิทธิที่จะดำรงชีวิตอยู่เท่านั้น แต่การกระทำดังกล่าวยังคงขยายวงกว้างไปสู่การละเมิดสิทธิมนุษยชนหลายด้าน อาทิ สิทธิที่จะมีความมั่นคงและศักดิ์ศรีในความเป็นมนุษย์ สิทธิที่จะไม่ถูกทรมานหรือกระทำด้วยการปฏิบัติที่โหดร้ายทารุณ สิทธิที่จะอยู่ภายใต้การคุมขังในสภาพที่มีมนุษยธรรม สิทธิความเป็นบุคคลตามกฎหมายและสิทธิที่จะได้รับการพิจารณาการไต่สวนอย่างเป็นธรรมและมีชีวิตครอบครัว การบังคับให้บุคคลสูญหายคือปรากฏการณ์ที่เกิดขึ้นมาจากหลายแง่มุม และมีลักษณะที่ซับซ้อน ประเด็นทางกฎหมายของแต่ละประเทศ คือ สิ่งที่สำคัญที่จะเป็นตัวเชื่อมโยงกับการบังคับให้บุคคลสูญหายรวมถึงสามารถนำไปพัฒนากฎหมายภายในของตนเองที่มีอยู่นั้น เพื่อนำไปใช้เป็นเครื่องมือที่จะทำให้กฎหมายสามารถป้องกันและคุ้มครองการกระทำการบังคับให้บุคคลสูญหายได้ โดยจะมุ่งเน้นไปที่คำจำกัดความทางกฎหมายของการหายตัวไปโดยถูกบังคับและการพัฒนาจะกระทำได้โดยการ

นำตัวบทกฎหมายไปวิเคราะห์หาหลักสาระสำคัญ เพื่อที่จะสามารถนำไปใช้บังคับได้กับกรณีของการสูญหายโดยถูกบังคับ

ในประเทศไทย ก็มีเหตุการณ์บังคับให้บุคคลต้องสูญหายเกิดขึ้นมากมายและเหตุการณ์ดังกล่าวยังคงดำเนินอยู่เรื่อยมาซึ่งการบังคับให้บุคคลสูญหายเป็นการใช้ความรุนแรงที่ผู้กระทำได้จงใจให้การกระทำดังกล่าวมีความคลุมเครือ ต่อมาประเทศไทยมีการประกาศใช้พระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ซึ่งหลักการของกฎหมายฉบับนี้กล่าวคือ (1) เพื่อป้องกันไม่ให้เจ้าหน้าที่รัฐทรมาน หรือกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชนหรืออุ้มหาย (2) เพื่อปราบปรามเจ้าหน้าที่รัฐที่กระทำผิดในลักษณะดังกล่าว โดยใช้กำเจ้าหน้าที่ทุกหน่วยงานของรัฐโดยไม่จำกัด (3) เพื่อเยียวยาประชาชนที่ได้รับความเสียหายจากการกระทำจากเจ้าหน้าที่รัฐ (เพลินตา ตันรังสรรค์, 2558) และประโยชน์จากกฎหมายฉบับนี้มีประโยชน์ต่อทุกคนที่อยู่ในประเทศไทย รวมทั้งกลุ่มเปราะบาง เช่น คนยากจน แรงงานข้ามชาติ ผู้ลี้ภัย ผู้ใช้ยาเสพติด กลุ่มชาติพันธุ์ ผู้ต้องสงสัยในคดีเล็กคดีน้อย ฯลฯ โดยลักษณะความผิดตามกฎหมายฉบับนี้ประกอบด้วย 3 มูลฐานความผิด ได้แก่ (1) ความผิดฐานกระทำทรมาน (อุ้มทรมาน) (2) ความผิดฐานกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ และ (3) ความผิดฐานกระทำให้บุคคลสูญหาย (อุ้มหาย) ผู้กระทำความผิดทั้ง 3 มูลฐานความผิดนั้น จะต้องเป็นเจ้าหน้าที่รัฐที่ปฏิบัติหน้าที่หรืออ้างอำนาจหน้าที่โดยตรง เพื่อกระทำการบางอย่าง นอกจากนี้ผู้ที่ไม่ได้เป็นเจ้าหน้าที่รัฐแต่ร่วมมือหรือสนับสนุนเจ้าหน้าที่ในการกระทำผิด ก็อาจถูกดำเนินคดีตามกฎหมายนี้ได้เช่นกัน ซึ่งถ้าเจ้าหน้าที่รัฐกระทำด้วยประการใดๆ ที่มีลักษณะอย่างใดอย่างหนึ่งต่อไปนี้ (1) โหดร้าย ไร้มนุษยธรรม หรือ (2) ย่ำยีศักดิ์ศรีความเป็นมนุษย์จนมีผลทำให้ผู้ถูกกระทำถูกลดทอนคุณค่าความเป็นมนุษย์ หรือถูกละเมิดสิทธิขั้นพื้นฐานของความเป็นมนุษย์ หรือเกิดความเจ็บปวดหรือทุกข์ทรมานแก่ร่างกายหรือจิตใจ และผู้บังคับบัญชานั้นมีความผิดเช่นกัน โดยต้องรับโทษด้วย ซึ่งจะเห็นว่าโทษตามกฎหมายฉบับนี้ ผู้กระทำผิดฐานกระทำทรมาน มีโทษจำคุกตั้งแต่ 5 - 15 ปี และปรับตั้งแต่ 1 - 3 แสนบาท และหากผู้ถูกกระทำรับอันตรายสาหัสจะมีโทษหนักขึ้นจำคุก 10 - 25 ปี และปรับตั้งแต่ 2 - 5 แสนบาท และจะต้องรับโทษหนักขึ้น หากถึงขั้นเสียชีวิต มีโทษจำคุก 15 - 30 ปี หรือจำคุกตลอดชีวิต และปรับตั้งแต่สามแสนบาทถึงหนึ่งล้านบาท นอกจากตามกฎหมายฉบับนี้ มาตรา 5 – 7 ข้างต้น ยังระบุโทษถึงผู้ให้การสนับสนุน ผู้สมคบ รวมถึงผู้บังคับบัญชาที่ทราบการกระทำผิด ซึ่งมีโทษหนักเบาต่างกันออกไป ถือว่าเป็นบทกำหนดโทษที่สูงและส่งผลต่อเจ้าหน้าที่ตำรวจถึงขั้นถูกจำคุกและถูกไล่ออกจากราชการ โดยที่ความผิดตามกฎหมายฉบับนี้มีอายุความสูงสุดถึง 20 ปี

วิธีดำเนินการวิจัย

ในการศึกษาวิจัยนี้ ใช้รูปแบบการศึกษาเชิงคุณภาพ (Qualitative Research) เป็นการวิจัยเอกสาร (Documentary Research) ศึกษาและวิเคราะห์กฎหมาย ระเบียบที่เกี่ยวข้อง และการศึกษาเชิงปริมาณ (Quantitative)

การวิจัยเอกสาร สำหรับการกำหนดระเบียบวิธีการวิจัย ผู้วิจัยได้ดำเนินกระบวนการศึกษาตามระเบียบวิธีการวิจัยหรือกระบวนวิธีการวิจัย โดยการใช้กระบวนวิธีการวิจัยเชิงคุณภาพด้วยกระบวนการศึกษาและวิเคราะห์ข้อมูลจากเอกสารหรือการวิจัยเชิงเอกสาร โดยการทบทวนแนวความคิด และทฤษฎีที่เกี่ยวข้อง

การสัมภาษณ์เชิงลึก (In-depth Interview) สำหรับการกำหนดระเบียบวิธีการวิจัยหรือกระบวนการวิธีการวิจัย โดยกระบวนการวิจัยเชิงคุณภาพ ด้วยการสัมภาษณ์เชิงลึกนั้น ซึ่งในการกำหนดกระบวนการการวิจัยในครั้งนี้นั้น ได้กำหนดให้มีกระบวนวิธีการวิจัยโดยเป็นการสัมภาษณ์พูดคุยและเก็บรวบรวมข้อมูลโดยการจดบันทึกและการบันทึกเสียง และยังมีการสัมภาษณ์แบบดิจิทัล โดยการใช้แบบสัมภาษณ์แบบมีโครงสร้างลักษณะเป็นการใช้คำถามถามเหมือนกันทุกคนเป็นการสัมภาษณ์แบบปลายเปิด ซึ่งเป็นกระบวนการวิธีการวิจัยที่มีความยืดหยุ่นและเปิดกว้าง ทั้งนี้เพื่อให้ทราบถึงความคิดเห็นและทรรศนะที่เกี่ยวกับมาตรการทางกฎหมายเกี่ยวกับปัญหาของเจ้าหน้าที่ตำรวจภายหลัง พระราชบัญญัติพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 มีผลใช้บังคับ โดยดำเนินการคัดเลือกสอบถามความคิดเห็นของกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) อันเป็นบุคคลที่มีการใช้อำนาจตามกฎหมายและอยู่ภายใต้บังคับกฎหมายฉบับนี้ โดยสุ่มเลือกเจ้าหน้าที่ตำรวจผู้ปฏิบัติหน้าที่ในศาล จำนวน 100 คน และพนักงานอัยการผู้ปฏิบัติหน้าที่ในศาล จำนวน 10 คน

วิธีการเก็บรวบรวมข้อมูล

การวิเคราะห์ข้อมูลเชิงคุณภาพผู้ศึกษามีลำดับขั้นตอนในการวิเคราะห์ดังนี้

(1) ผู้วิจัยนำข้อมูลที่ได้จากการสัมภาษณ์ โดยนำคำตอบที่สัมภาษณ์จากผู้ที่ถูกสัมภาษณ์มาเปรียบเทียบความเหมือนและความแตกต่างของแต่ละบุคคลมาจัดลำดับความสำคัญ

(2) นำข้อมูลจากการสัมภาษณ์ที่จัดลำดับความสำคัญแล้วนำมาเปรียบเทียบกับข้อมูลทางเอกสารต่างๆ ที่เกี่ยวข้องไม่ว่าจะเป็นแนวคิด ทฤษฎี และผลการวิจัยที่เกี่ยวข้องเพื่อที่จะทราบถึงลักษณะที่คล้ายคลึงกันและแตกต่างกันของข้อมูล

(3) นำข้อมูลที่ได้จากการสัมภาษณ์และการศึกษาต่าง ๆ มาทำการวิเคราะห์ข้อมูลร่วมกันอย่างเป็นระบบและนำไปสู่การเชื่อมโยงข้อมูลเข้าด้วยกัน แสดงความสำคัญของข้อมูลได้ชัดเจนยิ่งขึ้น เพื่อสะดวกในการวิเคราะห์ และเขียนรายงานข้อมูลที่ได้จากการศึกษาแบบสัมภาษณ์ลักษณะปลายปิด (Close Ended Question) เป็นเครื่องมือสำหรับเก็บข้อมูลแล้วนำมาวิเคราะห์ตามหลักวิชาการ

ผลการวิจัย

(1) ผลการศึกษาเอกสาร

พระราชบัญญัติพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 พบว่ากฎหมายฉบับนี้มีเจตนารมณ์

1) เพื่อป้องกันไม่ให้เจ้าหน้าที่รัฐทรมาน หรือกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชน หรืออุ้มหาย เช่น กำหนดให้เจ้าหน้าที่รัฐทุกหน่วยงานทั้งตำรวจ ทหาร เจ้าหน้าที่กรมป่าไม้ กรมสรรพสามิต เจ้าหน้าที่สำนักงานป้องกันและปราบปรามยาเสพติด หากจับกุมใครต้องแจ้งพนักงานอัยการและฝ่ายปกครองทันที ต้องบันทึกวิดีโอการจับและควบคุมตัวบุคคลตลอดเวลาจนกว่าจะส่งตัวให้พนักงานสอบสวน และต้องทำบันทึกการจับกุมและควบคุมตัวโดยละเอียด เพื่อให้ตรวจสอบได้

2) เพื่อปราบปรามเจ้าหน้าที่รัฐที่กระทำผิด โดยกำหนดให้เจ้าหน้าที่รัฐ ไม่ว่าจะหน่วยงานใดก็ตาม หากทรมาน กระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชน หรืออุ้มหาย จะต้องถูกดำเนินคดีและถูกลงโทษ

3) เพื่อเยียวยาประชาชนที่ถูกเจ้าหน้าที่รัฐทรมาน ถูกกระทำอย่างกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชน หรืออุ้มหาย หรือครอบครัวผู้ที่ถูกเจ้าหน้าที่รัฐกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชน หรืออุ้มหาย นอกจากมีสิทธิได้รับค่าเสียหายจากรัฐ ยังมีสิทธิได้รับการเยียวยาประการอื่น เช่น การฟื้นฟูร่างกายและจิตใจ นอกจากนั้นหากคนในครอบครัวถูกเจ้าหน้าที่รัฐอุ้มหาย ตำรวจหรือพนักงานสอบสวนคดีพิเศษ หรือนายอำเภอจะต้องสืบค้นจนกว่าจะมีหลักฐานที่เชื่อได้ว่าผู้ถูกอุ้มนั้นเสียชีวิต หรือหากยังมีชีวิตอยู่ที่ใดอย่างไรอีกด้วย โดยประโยชน์จากพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 มีประโยชน์ต่อทุกคนที่อยู่ในประเทศไทย รวมทั้งกลุ่มเปราะบาง เช่น คนยากจน แรงงานข้ามชาติ ผู้ลี้ภัย ผู้ใช้ยาเสพติด กลุ่มชาติพันธุ์ ผู้ต้องสงสัยในคดีเล็กคดีน้อย ฯลฯ ซึ่งคนกลุ่มนี้เสี่ยงต่อการถูกทรมาน ถูกปฏิบัติอย่างโหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ หรือถูกอุ้มหายโดยเจ้าหน้าที่รัฐ เช่น อาจถูกจับเป็นผู้บริสุทธิ์ และถูกกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชน หรืออุ้มหาย ให้รับสารภาพ หากถูกทรมานจนเสียชีวิต หรือเป็นผู้ที่ทราบการกระทำผิดของเจ้าหน้าที่รัฐ ก็อาจถูกเจ้าหน้าที่รัฐอุ้มหายไป เช่น กรณีของบิลลี่ ผู้นำกะเหรี่ยงบางกลอย ที่หายไปหลังจากถูกเจ้าหน้าที่อุทยานแก่งกระจานจับกุม นอกจากนี้กฎหมายยังคุ้มครองคนไทยที่อยู่ต่างประเทศ หากมีหลักฐานว่า เขาถูกทรมาน ถูกกระทำกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ต่อประชาชน หรืออุ้มหาย โดยมีเจ้าหน้าที่ไทยเกี่ยวข้อง กฎหมายสามารถลงโทษเจ้าหน้าที่ไทยได้ และยังคุ้มครองคนไทยที่ตกเป็นผู้เสียหายตามประมวลกฎหมายวิธีพิจารณาความอาญา สำหรับในต่างประเทศ ให้สามารถลงโทษผู้กระทำความผิดในประเทศไทยได้ด้วย

ลักษณะความผิดตามพระราชบัญญัติป้องกัน และปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ประกอบด้วย 3 มูลฐานความผิด ได้แก่ (1) ความผิดฐานกระทำทรมาน (อุ้มทรมาน) (2) ความผิดฐานกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ และ (3) ความผิดฐานกระทำให้บุคคลสูญหาย (อุ้มหาย) ผู้กระทำความผิดทั้ง 3 ฐาน ต้องเป็นเจ้าหน้าที่รัฐที่ปฏิบัติหน้าที่หรืออ้างอำนาจหน้าที่โดยตรง เพื่อกระทำการบางอย่าง เช่น เป็นตำรวจหรือทหาร ที่ปฏิบัติหน้าที่เข้าจับกุมผู้ต้องหา หรือเจ้าหน้าที่นอกเครื่องแบบจับและซ้อมคู่อริ โดยอ้างว่าคู่อรินั้นค้ายาเสพติด เป็นต้น นอกจากนี้ผู้ที่ไม่ได้เป็นเจ้าหน้าที่รัฐ แต่สนับสนุนเจ้าหน้าที่ในการกระทำผิด ก็อาจถูกดำเนินคดีตามกฎหมายนี้ได้เช่นกัน การนำเสนอบทบัญญัติมาตรา 5 กำหนดความผิดฐานกระทำทรมานว่า ผู้ใดเป็นเจ้าหน้าที่ของรัฐ กระทำด้วยประการใด ให้ผู้อื่นเกิดความเจ็บปวดหรือความทุกข์ทรมานอย่างร้ายแรงแก่ร่างกายหรือจิตใจ โดยมี “มูลเหตุจูงใจ” เพื่อ (1) ให้ได้มาซึ่งข้อมูลหรือคำรับสารภาพจากผู้ถูกทรมานหรือจาก (2) ลงโทษผู้ถูกทรมานโดยมีสาเหตุจากการกระทำของผู้นั้นหรือผู้อื่น (3) ข่มขู่หรือขู่เข็ญผู้ที่ถูกทรมานหรือผู้อื่น หรือ (4) เป็นการเลือกปฏิบัติไม่ว่ารูปแบบใดก็ตาม เจ้าหน้าที่รัฐผู้นั้นทำผิด “ฐานกระทำการทรมาน” การนำเสนอบทบัญญัติมาตรา 6 ความผิดฐานกระทำการที่โหดร้ายไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ ว่าถ้าเจ้าหน้าที่รัฐกระทำด้วยประการใด ๆ ที่มีลักษณะอย่างใดอย่างหนึ่งต่อไปนี้ คือ (1) โหดร้าย ไร้มนุษยธรรม หรือ (2) ย่ำยีศักดิ์ศรีความเป็นมนุษย์ จนมีผลทำให้ผู้ถูกกระทำถูกลดทอนคุณค่าความเป็นมนุษย์ หรือถูกละเมิดสิทธิขั้นพื้นฐานของความเป็นมนุษย์ หรือเกิดความเจ็บปวดหรือทุกข์ทรมานแก่ร่างกายหรือจิตใจ แต่ไม่ถึงขั้นร้ายแรงหรือไม่มี “มูลเหตุจูงใจ” ตามมาตรา 5 เจ้าหน้าที่ผู้นั้นมีความผิดฐานกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ ซึ่งความหมายการกระทำ “โหดร้าย” กับ “ไร้มนุษยธรรม” คือ การกระทำที่ก่อให้เกิดความเจ็บปวดหรือทุกข์ทรมานต่อ

ร่างกายหรือจิตใจแก่ผู้ถูกกระทำ เช่น บังคับให้อดนอน ให้ยืนขาเดียวเป็นเวลานาน ๆ ส่วน “ย่ำยีศักดิ์ศรี” คือ การเหยียดหยาม การทำให้ไร้ศักดิ์ศรี ไม่เคารพ ทำให้เกิดความรู้สึกด้อยค่ากว่า ต่ำกว่า และมาตรา 7 วรรคหนึ่ง หากเจ้าหน้าที่รัฐคนใดเอาตัวบุคคลไป แต่ปฏิเสธว่าไม่ได้ทำหรือปกปิดชะตากรรมหรือสถานที่ควบคุมตัวบุคคลนั้น ทำให้บุคคลนั้นไม่ได้รับการคุ้มครองตามกฎหมาย ถือว่าเจ้าหน้าที่รัฐนั้นกระทำผิด “ฐานกระทำให้บุคคลสูญหาย” โดยมาตรา 42 ผู้บังคับบัญชาเจ้าหน้าที่รัฐ หากทราบว่าผู้ใต้บังคับบัญชาของตนจะกระทำผิดหรือได้กระทำความผิดตามกฎหมายฉบับนี้ ไม่ห้ามหรือป้องกัน หรือระงับการกระทำผิด หรือไม่ส่งตัวเจ้าหน้าที่ที่กระทำผิดไปดำเนินคดี ผู้บังคับบัญชานั้นมีความผิดเช่นกัน โดยต้องรับโทษกึ่งหนึ่งของโทษที่กำหนดไว้สำหรับความผิดนั้นแม้กฎหมายฉบับนี้จะเป็นกฎหมายที่อนุวัติการตามอนุสัญญาต่อต้านการทรมานและการปฏิบัติหรือการลงโทษอื่นที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรี แต่ตามอนุสัญญาดังกล่าวข้างต้นและกฎหมายฉบับนี้มิได้นิยามความหมายของการทรมานหรือการปฏิบัติหรือการลงโทษอื่นที่โหดร้ายไว้ มีเพียงแต่กำหนดองค์ประกอบของความผิดฐานดังกล่าวไว้เท่านั้น โดยความแตกต่างที่สำคัญระหว่างความผิดทั้ง 2 มาตรา คือ การกระทำทรมาน จะต้องเป็นการกระทำใดก็ตามที่ก่อให้เกิดความเจ็บปวดหรือทุกข์ทรมานอย่าง “ร้ายแรง” ซึ่งการใช้ระดับความร้ายแรงก็มิได้มีการกำหนดไว้ในอนุสัญญา เช่นกัน ในบริบทของกฎหมายระหว่างประเทศ มีตัวอย่างของการกระทำความผิดฐานกระทำทรมานและการปฏิบัติ หรือการลงโทษอื่นที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ไว้หลายตัวอย่าง ซึ่งมาตรา 5 คือ การที่เจ้าหน้าที่ของรัฐใช้กำลังทำร้ายร่างกายให้บุคคลที่ถูกควบคุมตัวบาดเจ็บ มีบาดแผล เจ็บปวดร่างกาย และทุกข์ทรมานจนส่งผลกระทบไปถึงจิตใจและชีวิตประจำวันที่จะต้องใช้ในอนาคต เช่น สอบปากคำโดยใช้ถุงดำคลุมหัวและใช้ไม้ตีทรมานเพื่อให้รับสารภาพ ทำร้ายร่างกายจนพิการหรือใช้ชีวิตได้ไม่เหมือนเดิม เรียกว่า “การทรมาน” และมาตรา 6 คือ การที่เจ้าหน้าที่ของรัฐใช้วิธีการทำร้ายผู้ถูกควบคุมตัว แม้โดยที่ไม่ทำให้ร่างกายของบุคคลนั้นมีบาดแผล แต่ทำให้เจ็บปวดและทุกข์ทรมานด้วยวิธีการบางอย่าง เช่น พูดข่มขู่ให้เกิดความหวาดกลัว ดูหมิ่นเหยียดหยาม จนเกิดความทุกข์ทรมาน หรือผู้ต้องขังป่วยแต่ผู้คุมกลั่นแกล้งไม่นำตัวส่งโรงพยาบาล จนเกิดความทุกข์ทรมาน ซึ่งความผิดฐานกระทำการทรมานและความผิดฐานกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์เอาผิดย้อนหลังไม่ได้ หมายความว่า หากเกิดขึ้นก่อนวันที่ 22 กุมภาพันธ์ พ.ศ. 2566 ซึ่งเป็นวันที่กฎหมายมีผลใช้บังคับดำเนินคดีเจ้าหน้าที่ในข้อหาตามกฎหมายนี้ไม่ได้ แต่เจ้าหน้าที่ก็อาจต้องรับผิดตามกฎหมายอาญาอื่น เช่น ในข้อหาทำร้ายร่างกาย กักขังหรือหน่วงเหนี่ยว หรือปฏิบัติหน้าที่โดยมิชอบประมวลกฎหมายอาญา มาตรา 157 เป็นต้น ส่วนการกระทำให้บุคคลสูญหายหรืออุ้มหาย นอกจากเจ้าหน้าที่จะต้องสืบสวนจนกว่าจะรู้ชะตากรรม อีกปัญหา คือ จะดำเนินคดีได้หรือไม่ ถ้าปัจจุบันยังไม่ทราบชะตากรรมผู้สูญหาย ประเด็นนี้เป็นเรื่องที่คนในวงการกฎหมายยังถกเถียงกัน โดยส่วนหนึ่งเห็นว่าเป็นกฎหมายพิเศษที่ใช้ป้องกันและปราบปราม จึงจะต้องตีความไปในทางคุ้มครองสิทธิผู้สูญหาย โดยให้ถือว่า ความผิดที่เริ่มเกิดขึ้นก่อน วันที่ 22 กุมภาพันธ์ พ.ศ. 2566 ถ้าดำเนินมาเรื่อย ๆ จนถึงหลังวันที่ วันที่ 22 กุมภาพันธ์ พ.ศ. 2566 แล้ว ยังไม่ทราบชะตากรรม น่าจะยังเป็นความผิดต่อเนื่องที่ดำเนินคดีต่อผู้กระทำความผิดได้ หากมีหลักฐานว่า เจ้าหน้าที่ผู้นั้นเอาตัวไปเพื่อปกปิดชะตากรรม ข้อถกเถียง คือ ความผิดของบุคคลนั้นจะเริ่มนั้นเมื่อใด โดยกฎหมายฉบับนี้ระบุไว้เพิ่มเติม ในมาตรา 7 ว่า ผู้ใดเป็นเจ้าหน้าที่ของรัฐควบคุมตัว หรือลักพาบุคคลใด โดยเจ้าหน้าที่ของรัฐปฏิเสธว่ามิได้กระทำการดังกล่าวหรือปกปิดชะตากรรมหรือสถานที่ปรากฏตัวของบุคคลนั้น จนส่งผลให้บุคคลนั้นไม่ได้รับการคุ้มครองตามกฎหมาย ซึ่งการกระทำความผิดดังกล่าวข้างต้นให้ถือเป็นความผิดต่อเนื่องจนกว่าจะทราบชะตากรรมของ

บุคคลนั้น นอกจากนี้จะต้องสืบสวนจนกว่าจะพบบุคคลที่ถูกกระทำให้สูญหาย ตามมาตรา 10 ที่กำหนดให้ดำเนินการสอบสวนจนกว่าจะพบบุคคลที่ถูกกระทำให้สูญหาย หรือปรากฏหลักฐานอันน่าเชื่อว่าบุคคลนั้นถึงแก่ความตาย ถ้าเป็นภาษาชาวบ้าน หมายถึง ต้องหาจนกว่าจะเจอ คำว่า รู้ว่าตาย รู้ว่าอยู่ คือ การบ่งบอกว่า ทราบชะตากรรม และต้องมีหลักฐานให้ชัดเจนเกี่ยวกับเรื่องนี้ เช่น รู้ว่าไม่ได้ไปไหน แต่หนีไปอยู่ประเทศออสเตรเลีย หรือเป็นศพลอยแม่น้ำโขง แบบนี้เรียกว่าทราบชะตากรรม หรือมีหลักฐานว่าถูกขังอยู่ในเรือนจำประเทศกัมพูชาอันนี้เรียกว่ารู้ชะตากรรมเช่นกัน

โทษตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ผู้กระทำผิดฐานกระทำการทรมาน มีโทษจำคุกตั้งแต่ 5 - 15 ปี และปรับตั้งแต่ 1 - 3 แสนบาท และหากผู้ถูกกระทำรับอันตรายสาหัส จะมีโทษหนักขึ้นจำคุก 10 - 25 ปี และปรับตั้งแต่ 2 - 5 แสนบาท และจะต้องรับโทษหนักขึ้น หากถึงขั้นเสียชีวิต มีโทษจำคุก 15 - 30 ปี หรือจำคุกตลอดชีวิต และปรับตั้งแต่ 3 แสนบาทถึงหนึ่งล้านบาท นอกจากพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 มาตรา 5 – 7 ยังระบุโทษถึงผู้ให้การสนับสนุน ผู้สมคบ รวมถึงผู้บังคับบัญชาที่ทราบการกระทำผิด ซึ่งมีโทษหนักเบาต่างกันออกไป

อนึ่งความผิดตามกฎหมายฉบับนี้ หมายความว่า หากเจ้าหน้าที่กระทำความผิดฐานใด ต้องรับโทษฐานนั้น ผู้บังคับบัญชารู้เห็นเป็นใจ ไม่ห้ามปราม ต้องได้รับโทษกึ่งหนึ่งของโทษที่กำหนดไว้สำหรับความผิดนั้นพิสูจน์ทราบได้ว่าเป็นคนสั่ง ผู้บังคับบัญชาจะต้องรับโทษเต็มอัตราโทษที่กำหนดในฐานะตัวการในการกระทำความผิดหรือผู้ใช้ให้กระทำความผิด แล้วแต่กรณี

อายุความตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ใช้ตามประมวลกฎหมายอาญา กล่าวคือ อายุความใน ป.อ. มาใช้ผ่านมาตรา 17 แห่ง ป.อ. ทั้งนี้ อายุความใน ป.อ. มาตรา 95 นั้นมีตั้งแต่ 1 - 20 ปี ซึ่งความผิดแต่ละฐานจะมีอายุความเท่าใดนั้นขึ้นอยู่กับอัตราโทษของความผิดฐานนั้นๆ หากเป็นความผิดตาม พ.ร.บ. ฐานกระทำทรมานมาตรา 5 ประกอบมาตรา 35 วรรคหนึ่ง อายุความคือ 15 ปี ฐานกระทำให้บุคคลสูญหายมาตรา 7 ประกอบมาตรา 37 วรรคหนึ่ง อายุความคือ 15 ปี และฐานกระทำให้บุคคลสูญหายมาตรา 7 ประกอบมาตรา 37 วรรคสองหรือวรรคสาม อายุความคือ 20 ปี แต่ให้เริ่มนับอายุความเมื่อทราบชะตากรรมของผู้เสียหายไว้อยู่ ซึ่งตามกฎหมายฉบับนี้ มาตรา 42 บัญญัติว่า ผู้บังคับบัญชาผู้ใดทราบว่าผู้ใต้บังคับบัญชาซึ่งอยู่ภายใต้การบังคับบัญชาของตน จะกระทำหรือได้กระทำความผิดตามมาตรา 35 มาตรา 36 มาตรา 37 หรือมาตรา 38 และไม่ดำเนินการที่จำเป็นและเหมาะสม เพื่อป้องกันหรือระงับการกระทำความผิด หรือไม่ดำเนินการหรือส่งเรื่องให้ดำเนินการสอบสวนและดำเนินคดีตามกฎหมาย ต้องระวางโทษกึ่งหนึ่งของโทษที่กำหนดไว้สำหรับความผิดนั้น เช่น ทราบว่าผู้ใต้บังคับบัญชากระทำความผิดตามกฎหมายฉบับนี้ แต่ไม่ยับยั้ง ไม่ห้าม ไม่แก้ไข แล้วผู้ใต้บังคับบัญชากระความผิด ผู้บังคับบัญชากึ่งหนึ่งของโทษที่กำหนดไว้สำหรับความผิดฐานกระทำให้บุคคลสูญหาย แต่ถ้าอ้างว่าไม่รู้เห็นกับการกระทำที่เกิดขึ้น ต้องไปดูที่พยานหลักฐาน แต่สุดท้ายต้องมาดูความจริงก่อนว่าเกิดอะไรขึ้น เช่น เรารู้ว่าคนนี้ถูกอุ้มไปโดยเจ้าหน้าที่ แต่เราหาพยานหลักฐานไม่ได้ ก็ไม่สามารถลงโทษได้ จึงเป็นหน้าที่ของพนักงานสอบสวนที่ต้องหาความจริงว่าเขาอุ้มไปไหนเมื่อไหร่ อย่างไร ที่สำคัญคือต้องพูดถึงข้อเท็จจริงก่อน และสืบสวนหาพยานหลักฐาน และมาตรา 22 บัญญัติว่า การควบคุมตัวทุกครั้งเจ้าหน้าที่ของรัฐผู้รับผิดชอบจะต้องบันทึกภาพและเสียงอย่างต่อเนื่องในขณะจับและควบคุม กระทั่งส่งตัวให้พนักงานสอบสวนหรือปล่อยตัวบุคคลดังกล่าวไป ยกเว้นเหตุสุดวิสัยที่ไม่สามารถกระทำได้ แต่ต้องลงบันทึกเหตุการณ์เป็นหลักฐานไว้ในบันทึกการควบคุมตัว

เพื่อป้องกันเหตุการณ์ที่เกิดขึ้นระหว่างทาง เช่น การทรมาน การย่ำยีศักดิ์ศรีจากจุดที่ถูกจับในที่ลับตาคน หรือแวะไปในที่ใดที่หนึ่งเพื่อรีดไถเอาเงินต่อรองหรือรีดเอาข้อมูล เพื่อให้ได้คำรับสารภาพ เมื่อถึงสถานีตำรวจจะได้ง่ายต่อการดำเนินคดีหากไม่บันทึก เจ้าหน้าที่อาจมีความผิดฐานปฏิบัติหน้าที่โดยมิชอบตามประมวลกฎหมายอาญา มาตรา 157 หากจับกุมโดยไม่มีกล้องเป็นเหตุสุดวิสัย หากเกิดความรุนแรงจะต้องตั้งคณะกรรมการสอบสวน หากถูกจับกุมหรือควบคุมตัวแล้วเจ้าหน้าที่รัฐไม่มีกล้องติดตัวตำรวจ (Body Camera) กล้องติดตัวตำรวจ (Body Camera) ผู้ถูกจับกุมสามารถใช้โทรศัพท์มือถือบันทึกภาพในจุดเกิดเหตุระหว่างการถูกจับกุมเองได้ ในกรณีนี้ถือว่าไม่ผิดกฎหมาย เพราะโทรศัพท์มือถือไม่ใช่ของกลาง และหากเราเป็นผู้พบเห็นเหตุการณ์สามารถบันทึกภาพเหตุการณ์ได้ด้วยเช่นกันโดยที่ไม่ผิดกฎหมาย และถ้าการจับกุมตัวโดยไม่มีกล้องติดตัวเป็นเหตุสุดวิสัย การไม่มีกล้องติดตัว เจ้าหน้าที่อาจมีความผิดตามประมวลกฎหมายอาญา มาตรา 157 ฐานปฏิบัติหน้าที่โดยมิชอบและผิดวินัย และเมื่อถูกจับกุมตัวเจ้าหน้าที่ของรัฐต้องทำบันทึกอย่างละเอียดเกี่ยวกับการควบคุมตัว เช่น บันทึกเกี่ยวกับอัตลักษณ์ผู้ถูกควบคุมตัว วันเวลา และสถานที่ของผู้ถูกควบคุมตัว ใครเป็นคนออกคำสั่ง ใครเป็นคนสั่ง วันเวลาสถานที่ปล่อยตัว สภาพร่างกายและจิตใจผู้ถูกควบคุมตัว ทั้งก่อนและหลังถูกปล่อยตัว “ต้องบันทึกละเอียด” โดยเฉพาะสภาพร่างกายและจิตใจ ว่ามีบาดแผลหรือไม่ เป็นบาดแผลที่เกิดจากการถูกควบคุมตัวหรือไม่ โดยกฎหมายฉบับนี้ กำหนดว่า เมื่อเจ้าหน้าที่รัฐจับกุมและควบคุมตัวผู้ต้องสงสัยแล้ว เจ้าหน้าที่ของรัฐจะต้องแจ้งฝ่ายปกครอง นายอำเภอ หรือพนักงานอัยการทันทีว่าบุคคลที่จับคือใคร จับด้วยข้อหาอะไร และใช้วิธีการจับกุมอย่างไร เพื่อให้หน่วยงานในพื้นที่รับทราบเรื่อง เพื่อบันทึกข้อมูลเอาไว้ในสารบบป้องกันการเกิดเหตุการณ์ฉุกเฉินไม่คาดคิด โดยผู้ถูกควบคุมหรือถูกจับตัวมีสิทธิตั้งคำถามว่าแจ้งฝ่ายปกครอง พนักงานอัยการ หรือนายอำเภอหรือยัง เพราะประชาชนมีสิทธิที่จะต้องรับรู้ เช่น หากเกิดเหตุในกรุงเทพมหานคร เจ้าหน้าที่ของรัฐจะต้องแจ้งให้กับพนักงานอัยการและผู้อำนวยการสำนักการสอบสวนและนิติการ กรมการปกครอง ส่วนต่างจังหวัดแจ้งกับนายอำเภอในพื้นที่รับผิดชอบ เช่น สมมติว่าญาติเราถูกจับ เราไม่รู้ว่าใครจับ เราสามารถไปหานายอำเภอหรือติดต่อพนักงานอัยการเพื่อสอบถามว่าใครจับอยู่ที่ไหน หน่วยงานจะต้องชี้แจงเหตุการณ์ที่เกิดขึ้นได้ ถ้าไม่แจ้งอาจเข้าข่ายเป็นการปฏิบัติหน้าที่โดยมิชอบ มีพิรุธ ฉะนั้นคนใกล้ชิดหรือคนในครอบครัวควรสอบถามที่นี่ก่อน เพื่อเป็นหลักฐานซึ่งคนที่รู้เบาะแสเกี่ยวกับการทรมาน การกระทำโหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ หรือการอุ้มหาย สามารถแจ้งทุกฝ่ายได้ ไม่ว่าจะเป็นพนักงานอัยการ พนักงานฝ่ายปกครอง เจ้าหน้าที่ตำรวจ ถ้าเข้าใจโดยสุจริตสามารถแจ้งความได้ ต่อมาถ้าพบว่า ไม่ได้เกิดขึ้นจริง ผู้แจ้งไม่มีความผิด ไม่ถูกดำเนินคดีใด ๆ กฎหมายฉบับนี้มีเจตนารมณ์เชิญชวนให้คนช่วยเป็นหูเป็นตา เช่น เราสงสัยว่า เห็นคนถูกจับกุมก็ไปแจ้งตำรวจ แจ้งนายอำเภอได้ทันที โดยญาติพี่น้อง พนักงานอัยการ พนักงานฝ่ายปกครอง ทนายความหากเห็นว่า มีการถูกทรมาน หรือการกระทำโหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์หรือบังคับให้เป็นบุคคลสูญหาย สามารถร้องต่อศาลในท้องที่เพื่อให้ไต่สวนได้ทันที ไม่ว่าจะเป็นใครศาลจะทำการไต่สวน แล้วสั่งให้เจ้าหน้าที่พาตัวผู้ถูกจับมาตรวจสอบ เช่น ให้แพทย์ตรวจสอบและถ้าศาลเห็นว่าคนเหล่านี้ถูกทรมาน ถูกละเมิดศักดิ์ศรีความเป็นมนุษย์ ศาลจะสั่งให้เยียวยา เช่น เปลี่ยนที่คุมขัง ส่งรักษาตัวโรงพยาบาล หรือถ้าจับโดยมิชอบจะสั่งให้ปล่อยตัวได้ โดยผู้แจ้งจะต้องมีพยานหลักฐานให้แน่ชัด ถ้าไม่มีหลักฐานชัดเจนศาลจะยุติการสอบสวนทันที

2. ผลการสัมภาษณ์

จากการสัมภาษณ์เชิงลึกต่อเจ้าหน้าที่ตำรวจผู้มาปฏิบัติหน้าที่ในศาลจังหวัดสุราษฎร์ธานี จำนวน 100 ท่าน พบว่า มีอุปสรรคและข้อขัดข้องในการปฏิบัติหน้าที่ดังนี้

1) ด้านการจัดเตรียมงบประมาณ พบว่า ปริมาณกล้องบันทึกภาพเคลื่อนไหวให้กำลังพลเพื่อใช้ปฏิบัติงานยังไม่เพียงพอ โดยกล้องติดตัวเจ้าหน้าที่จะต้องมีการจัดซื้อเพิ่มอีกจำนวนมากและต้องจัดซื้อกล้องติดรถยนต์ควบคุมผู้ถูกจับเพิ่มจำนวนมากและกล้องติดสถานที่ควบคุมผู้ถูกจับเพิ่มอีกจำนวนมาก ซึ่งจะต้องใช้งบประมาณในการดำเนินการ ทั้งนี้ปัจจุบันสถานีตำรวจในพื้นที่จังหวัดสุราษฎร์ธานียังมีจำนวนอุปกรณ์เหล่านี้ไม่เพียงพอ และยังไม่รวมค่าใช้จ่ายในการจัดทำระบบหรืออุปกรณ์จัดเก็บข้อมูลหน่วยความจำ ระบบ Cloud (ประเภททำประกันภัยเก็บข้อมูล) ซึ่งงบประมาณในการจัดหาอุปกรณ์และจัดทำระบบดังกล่าวไม่ได้ถูกกำหนดอยู่ในแผนหรือรายการงบประมาณ ปีงบประมาณ พ.ศ. 2566 โดยจะต้องดำเนินการตั้งคำของบประมาณอย่างเร็วที่สุดในปีงบประมาณ พ.ศ. 2567

2) ด้านการจัดเตรียมความพร้อมให้บุคลากร พบว่า สำนักงานตำรวจแห่งชาติ มีกำลังพลในสายงานปฏิบัติการ ประมาณ 250,000 นาย จากจำนวน 17 หน่วยงานในสังกัดของสำนักงานตำรวจแห่งชาติ จากการสำรวจความพร้อมของข้าราชการตำรวจทั่วประเทศ นอกจากการขาดความพร้อมในด้านอุปกรณ์แล้ว เจ้าหน้าที่ตำรวจยังขาดความรู้และทักษะในการปฏิบัติงานให้สอดคล้องกับบทบัญญัติในพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 เนื่องจากเทคโนโลยีของอุปกรณ์ที่ใช้บันทึกภาพและเสียงในปัจจุบันได้พัฒนาก้าวล้ำไปมาก และผลิตภัณฑ์มีหลากหลายยี่ห้อ มีวิธีการใช้งานแตกต่างกัน ทำให้เจ้าหน้าที่ผู้ปฏิบัติงานไม่มีความรู้และทักษะในการใช้อุปกรณ์ดังกล่าว จำเป็นต้องใช้ระยะเวลาในการฝึกอบรมใช้งานอุปกรณ์บันทึกภาพและเสียง ฝึกปฏิบัติเพื่อให้เกิดความรู้และทักษะในการปฏิบัติงานในพื้นที่จริง เพื่อให้ปฏิบัติหน้าที่ได้อย่างถูกต้องและสัมฤทธิผล

จากการสัมภาษณ์เชิงลึกต่อพนักงานอัยการที่ปฏิบัติงานในศาลจังหวัดสุราษฎร์ธานี จำนวน 10 ท่าน สรุปได้ว่า อุปสรรคและข้อขัดข้องในการปฏิบัติหน้าที่ของเจ้าหน้าที่ตำรวจในปัจจุบัน ได้แก่ ปัญหาข้อขัดข้องในการปฏิบัติหน้าที่เพราะตามกฎหมายฉบับนี้ มาตรา 22 วรรคหนึ่ง และที่สำคัญการขาดระเบียบและแนวทางการปฏิบัติที่เป็นมาตรฐานกลางสำหรับเจ้าหน้าที่ตำรวจ โดยยังไม่มีระเบียบหรือแนวทางการปฏิบัติอันเป็นมาตรฐานกลาง เพื่อให้หน่วยงานของรัฐที่มีอำนาจหน้าที่ ในการจับกุมและควบคุมยึดถือปฏิบัติ อันจะส่งผลให้แต่ละหน่วยงานของรัฐปฏิบัติหน้าที่ในแนวทางที่แตกต่างกัน เกิดความหลากหลายของมาตรฐานและการตีความที่แตกต่างกัน จะส่งผลให้เกิดความสับสนกับทั้งเจ้าหน้าที่ผู้ปฏิบัติและประชาชนที่เกี่ยวข้อง นอกจากนี้หน่วยงานของรัฐแต่ละหน่วยงานมีขอบเขตอำนาจหน้าที่แตกต่างกัน จึงต้องมีการกำหนดระเบียบหรือแนวทางการปฏิบัติอันเป็นมาตรฐานเดียวกัน ซึ่งตามพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 มาตรา 19 (10) กำหนดให้เป็นอำนาจของคณะกรรมการป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย ซึ่งปัจจุบันยังไม่มีความชัดเจนลงมาจากคณะกรรมการป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย

สรุปและอภิปรายผล

จากการเก็บข้อมูลจากการศึกษาเอกสาร พบว่า หลักการของพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 เจตนารมณ์กฎหมายฉบับนี้ประกอบด้วย 2 ประเด็นหลัก คือ 1) เพื่อป้องกันไม่ให้เจ้าหน้าที่รัฐทรมาน หรือกระทำการที่โหดร้ายไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ หรืออุ้มหาย 2) เพื่อเยียวยาประชาชนที่ถูกเจ้าหน้าที่รัฐทรมาน ถูกกระทำอย่างโหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ หรืออุ้มหาย นอกจากมีสิทธิได้รับค่าเสียหายจากรัฐ ยังมีสิทธิได้รับการเยียวยาประการอื่น โดยลักษณะความผิดตามกฎหมายฉบับนี้ ได้แก่ 1) ความผิดฐานกระทำทรมาน (อุ้มทรมาน) 2) ความผิดฐานกระทำการที่โหดร้าย ไร้มนุษยธรรม หรือย่ำยีศักดิ์ศรีความเป็นมนุษย์ และ 3) ความผิดฐานกระทำให้บุคคลสูญหาย (อุ้มหาย) ผู้กระทำความผิดทั้ง 3 ฐาน ต้องเป็นเจ้าหน้าที่ของรัฐ และผู้ที่ไม่ได้เป็นเจ้าหน้าที่ของรัฐ แต่ร่วมหรือสนับสนุนเจ้าหน้าที่ในการกระทำผิด ก็อาจถูกดำเนินคดีตามกฎหมายนี้ได้เช่นกัน และโทษตามกฎหมายฉบับนี้ ผู้กระทำผิดฐานกระทำการทรมาน มีโทษจำคุกตั้งแต่ 5 - 15 ปี และปรับตั้งแต่ 1 - 3 แสนบาท และหากผู้ถูกกระทำรับอันตรายสาหัส จะมีโทษหนักขึ้นจำคุก 10 - 25 ปี และปรับตั้งแต่ 2 - 5 แสนบาท และจะต้องรับโทษหนักขึ้น หากถึงขั้นเสียชีวิต มีโทษจำคุก 15 - 30 ปี หรือจำคุกตลอดชีวิต และปรับตั้งแต่สามแสนบาทถึงหนึ่งล้านบาท นอกจากตามกฎหมายฉบับนี้ มาตรา 5 – 7 ถึงข้างต้น ยังระบุโทษถึงผู้ให้การสนับสนุน ผู้สมคบ รวมถึงผู้บังคับบัญชาที่ทราบการกระทำผิดด้วย โดยอายุความตามกฎหมายฉบับนี้ใช้ตามประมวลกฎหมายอาญากล่าวคือ มีอายุความสูงสุด 20 ปี

จากการสัมภาษณ์เชิงลึกต่อเจ้าหน้าที่ตำรวจผู้มาปฏิบัติหน้าที่ในศาลจังหวัดสุราษฎร์ธานีและพนักงานอัยการที่ปฏิบัติหน้าที่ในศาลจังหวัดสุราษฎร์ธานี สรุปความได้ว่า อุปสรรคและข้อขัดข้องในการปฏิบัติหน้าที่ดังนี้

(1) ด้านการจัดเตรียมงบประมาณ

(2) ด้านการจัดเตรียมความพร้อมของบุคลากร

(3) ด้านความชัดเจนของบทบัญญัติในพระราชบัญญัติป้องกันและปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 รวมทั้งระเบียบและแนวทางการปฏิบัติอันเป็นมาตรฐานกลาง

ผู้วิจัยเห็นว่าปัญหาที่เกิดขึ้นภายหลังการบังคับใช้พระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ไม่ได้เกิดจากข้อกฎหมายที่บัญญัติขึ้นแต่เกิดจากการบริหารจัดการ ซึ่งสามารถแก้ไขได้ในอนาคตต่อไป

ข้อเสนอแนะ

อุปสรรคและข้อขัดข้องในการปฏิบัติหน้าที่ของเจ้าหน้าที่ตำรวจที่ได้จากผลการสัมภาษณ์มีทั้งหมด 3 ด้าน ผู้เขียนต้องให้ข้อเสนอแนะที่เป็นแนวทางการแก้ไขปัญหาให้ครบทั้ง 3 ด้าน โดยอาจให้ขอเสนอแนะดังต่อไปนี้

ด้านงบประมาณในการจัดหาเครื่องมือและอุปกรณ์บันทึกภาพและเสียง = รัฐบาลต้องจัดสรรงบประมาณให้เพียงพอต่อการจัดหาเครื่องมือและอุปกรณ์บันทึกภาพและเสียงให้แก่เจ้าหน้าที่ตำรวจ

ด้านความรู้และทักษะในการใช้เครื่องมือและอุปกรณ์บันทึกภาพและเสียง = กรมคุ้มครองสิทธิและเสรีภาพต้องประสานงานและร่วมมือกับสำนักงานตำรวจแห่งชาติจัดให้มีการให้ความรู้และฝึกอบรมเจ้าหน้าที่ตำรวจเกี่ยวกับการใช้เครื่องมือและอุปกรณ์บันทึกภาพและเสียง

ด้านความชัดเจนของบทบัญญัติในพระราชบัญญัติป้องกันและปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 รวมทั้งระเบียบและแนวทางการปฏิบัติอันเป็นมาตรฐานกลาง = ดำเนินการแก้ไขเพิ่มเติมบทบัญญัติในพระราชบัญญัติป้องกันและปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565 ที่มีความไม่ชัดเจน หรือคลุมเครือ รวมทั้งคณะกรรมการป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหายต้องวางระเบียบเพื่อใช้เป็นแนวทางการปฏิบัติอันเป็นมาตรฐานกลางสำหรับเจ้าหน้าที่ตำรวจโดยเร็ว

ข้อเสนอแนะสำหรับการวิจัยต่อไป คือ การศึกษาการปฏิบัติหน้าที่ของเจ้าหน้าที่อื่นที่เกี่ยวข้องกับพระราชบัญญัติป้องกันและปราบปรามการทรมานและการกระทำให้บุคคลสูญหาย พ.ศ. 2565

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การศึกษาภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา

A study of Depression Among first-year Undergraduate Students at a University in Songkhla Province.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา เก็บข้อมูลโดยการสำรวจกับนักศึกษา จำนวน 180 คน เครื่องมือที่ใช้ในการวิจัย คือ แบบประเมินภาวะซึมเศร้าในวัยรุ่น The Patient Health Questionnaire for Adolescents (PHQ-A) ของสถาบันสุขภาพจิตเด็กและวัยรุ่นราชนครินทร์ วิเคราะห์ข้อมูลด้วยโปรแกรมคอมพิวเตอร์เพื่อวิเคราะห์หาค่าความถี่ และค่าร้อยละ ผลของการวิจัยพบว่า นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีภาวะซึมเศร้าระดับเล็กน้อย จำนวน 119 คน คิดเป็นร้อยละ 66.11 มีภาวะซึมเศร้าระดับปานกลาง จำนวน 41 คน คิดเป็นร้อยละ 22.78 มีภาวะซึมเศร้าระดับมาก จำนวน 13 คน คิดเป็นร้อยละ 7.22 และมีภาวะซึมเศร้าในระดับรุนแรง จำนวน 7 คน คิดเป็นร้อยละ 3.89

คำสำคัญ: ภาวะซึมเศร้า, วัยรุ่นตอนปลาย, นักศึกษาระดับปริญญาตรีชั้นปีที่ 1

Abstract

The purpose of this research was to study depression among first-year undergraduate students at a university in Songkhla Province. Data were collected by surveying 180 students. The research tool was the Patient Health Questionnaire for Adolescents (PHQ-A) of Rajanagarindra Institute for Child and Adolescent Mental Health. Data were analyzed using a computer program to analyze frequencies and percentages. The results found that 119 first-year undergraduate students had a mild level of depression, accounting for 66.11 percent; 41 had a moderate level of depression, accounting for 22.78 percent; 13 had a high level of depression, accounting for 7.22

percent; and 7 had a severe level of depression, accounting for 3.89 percent.

Keywords: depression, late adolescence, first-year undergraduate students

บทนำ

ภาวะซึมเศร้าเป็นปัญหาด้านสุขภาพที่สำคัญของประเทศไทย ปัจจุบันประชากรไทยประสบปัญหาการป่วยด้วยโรคซึมเศร้าแล้วมากกว่า 1 ล้านคน โรคซึมเศร้าเป็นโรคทางจิตเวชชนิดหนึ่งที่พบได้บ่อยและเป็นปัญหาด้านสาธารณสุขที่สำคัญ เป็นความเจ็บป่วยที่ก่อให้เกิดผลกระทบทางด้านสุขภาพและเป็นปัญหาหาสุขภาพจิตที่สำคัญเกี่ยวเนื่องไปถึงการใช้ชีวิต การเข้าสังคม และอาจทวีความรุนแรงไปถึงการคิดฆ่าตัวตาย (กรมสุขภาพจิต กระทรวงสาธารณสุข, 2022) จากข้อมูลรายงานการเข้าถึงบริการของผู้ป่วยโรคซึมเศร้าในระหว่างปี 2009-2021 โดยกรมสุขภาพจิต ระบุว่าจำนวนผู้ป่วยคาดประมาณจากที่ได้จากการสำรวจในประเทศไทยมีจำนวนถึง 1,439,710 คน ต่อประชากรทั้งหมดของประเทศที่มีอายุตั้งแต่ 15 ปีขึ้นไป จำนวน 48,986,657 คน (รัตนา มาฆะสวัสดิ์, 2021) และแนวโน้มโรคซึมเศร้าในไทยมีความเป็นไปได้ที่จะเพิ่มมากขึ้น โดยจากการสำรวจพบว่า วัยรุ่นไทยที่มีอายุตั้งแต่ 15 -24 ปี มีภาวะซึมเศร้าร้อยละ 11.50 ของประชากรทั้งประเทศ (กรมสุขภาพจิต กระทรวงสาธารณสุข, 2017) ภาวะซึมเศร้าในวัยรุ่นตอนปลายเป็นปัญหาสุขภาพจิตที่พบได้บ่อยในประเทศไทย อีกทั้งพบว่าวัยรุ่นไทยอายุระหว่าง 10–19 ปีเสี่ยงต่อการเกิดโรคซึมเศร้ามากกว่า 3 ล้านคน นอกจากนี้จากข้อมูลสายด่วน ปรึกษาปัญหาสุขภาพจิตของวัยรุ่นอายุ 11–19 ปี พบว่า มีการโทรศัพท์มาขอคำปรึกษาในปี 2019 จำนวน 10,120 ครั้ง และในปีพ.ศ. 2020 มีการโทรศัพท์มาขอคำปรึกษา จำนวน 11,112 ครั้ง (อัญมณี มณีนิล, 2020)

นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 เป็นวัยรุ่นตอนปลาย อายุ 18-19 ปี ช่วงวัยแห่งการเปลี่ยนแปลง จากการเรียนระดับมัธยมศึกษามาสู่การศึกษาระดับอุดมศึกษา จึงมีภาระหน้าที่ที่ต้องพยายามปฏิบัติให้ลุล่วงหลายด้าน อาทิ การสร้างแบบแผนการปรับตัวและบุคลิกภาพที่ดี การต่อสู้ดิ้นรนเพื่อเรียนได้สำเร็จและปรับตัวเข้ากับสังคมใหม่ได้ (จรวยพร กาญจนโชติ, 1993) แต่หากนักศึกษาไม่สามารถปรับตัวได้ก็จะทำให้มีความเครียดเกิดขึ้นและอาจนำไปสู่ปัญหาทางจิต คือ ภาวะซึมเศร้า ซึ่งภาวะซึมเศร้าในนักศึกษาเป็นปัญหาทางสุขภาพจิตที่เกิดขึ้นได้บ่อยในนักศึกษาที่กำลังศึกษาอยู่ในระดับอุดมศึกษา (Davies, Morriss, & Glazebrook, 2014) เห็นได้จากการศึกษาของ เอกลักษณ์ สรวมศิริ (2021) เรื่องปัจจัยที่มีความสัมพันธ์กับภาวะซึมเศร้าในนักศึกษามหาวิทยาลัยราชภัฏมหาสารคาม พบว่านักศึกษามีภาวะซึมเศร้ากว่าร้อยละ 36.4

จากการสำรวจ มหาวิทยาลัยกลุ่มเป้าหมายในการเก็บข้อมูลกลุ่มตัวอย่าง เป็นมหาวิทยาลัยแห่งหนึ่งในภาคใต้ ซึ่งมีเกณฑ์คัดเลือกเนื่องจากการเป็นมหาวิทยาลัยชั้นนำของภาคใต้ และที่เป็นที่รู้จักระดับประเทศ ทั้งในการศึกษาและการวิจัย ติดอันดับมหาวิทยาลัยหรือสถาบันอุดมศึกษาทั่วโลกทั้งหมด 3,000 อันดับ ในปี 2020-2021 โดย URAP ประกาศผลการจัดอันดับมหาวิทยาลัยโลกตามสมรรถนะทางวิชาการสำหรับปี ค.ศ. 2020-2021 University Ranking By Academic Performance (URAP) 2020-2021 ซึ่งมหาวิทยาลัยกลุ่มเป้าหมายมีนักศึกษาเข้าใหม่ระดับปริญญาตรี ชั้นปีที่ 1 จำนวนกว่า 4,000 – 10,000 คน ทุกปีการศึกษา (สถิตินักศึกษามหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา, 2022) ซึ่งผู้วิจัยยังไม่พบรายงานทางการศึกษาเกี่ยวกับภาวะซึมเศร้าในนักศึกษาชั้นปีที่ 1 ของมหาวิทยาลัยของกลุ่มตัวอย่าง ดังนั้น ผู้วิจัยจึงสนใจศึกษาภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา โดยผลคาดหวังของงานวิจัยเมื่อเสร็จสมบูรณ์จะสามารถทำให้ทราบถึงสถานการณ์ทาง

สุขภาพจิตของนักศึกษาในปัจจุบันและนำผลการวิจัยที่ได้มาเป็นข้อมูลพื้นฐานในการวางแผนและเฝ้าระวังการเกิดภาวะซึมเศร้าเพื่อป้องกันการนำไปสู่โรคซึมเศร้า รวมถึงการส่งเสริมด้านสุขภาพจิตเพื่อลดการเกิดภาวะซึมเศร้าให้กับนักศึกษาอย่างมีประสิทธิภาพต่อไป

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา

วิธีดำเนินการวิจัย

การวิจัยในครั้งนี้เป็นการวิจัยเชิงปริมาณ (Quantitative Research) มีวัตถุประสงค์เพื่อศึกษาภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา

1. ประชากรและกลุ่มตัวอย่าง

ประชากร คือ นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 ปีการศึกษา 2566 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา รวมทั้งสิ้น 3,931 คน

กลุ่มตัวอย่าง คือ นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา จำนวน 180 คน โดยใช้การสุ่มแบบแบ่งชั้น (Stratified Random Sampling) โดยแยกคณะออกตามสายการศึกษา ได้แก่ กลุ่มการศึกษาสายสังคมศาสตร์ กลุ่มการศึกษาสายวิทยาศาสตร์สุขภาพ และกลุ่มการศึกษาสายวิทยาศาสตร์เทคโนโลยี

2. เครื่องมือที่ใช้วิจัย

ได้แก่ แบบประเมินภาวะซึมเศร้าในวัยรุ่นพัฒนามาจาก The Patient Health Questionnaire for Adolescents (PHQ-A) (สถาบันสุขภาพจิตเด็กและวัยรุ่นราชนครินทร์, 2018) เป็นแบบประเมินแบบ self-report ประกอบด้วยข้อคำถาม 9 ข้อ เพื่อบอกความรุนแรงของอาการของภาวะซึมเศร้าในช่วง 2 สัปดาห์ที่ผ่านมา แบ่งเป็น 4 ระดับ ได้แก่ ไม่มีเลย มีบางวัน มี มากกว่า 7 วัน และมีแทบทุกวัน โดยมีคะแนนรวม ตั้งแต่ 0 – 27 คะแนน ซึ่งการให้คะแนนจะให้ตามระดับความถี่ของอาการที่เกิดขึ้น คะแนนประกอบด้วย ไม่มีเลย 0 คะแนน; มีบางวัน 1 คะแนน; มีมากกว่า 7 วัน 2 คะแนน และมีแทบทุกวัน 3 คะแนน โดยนับคะแนนในทุกคำถามทุกข้อรวมกัน คะแนนรวมของแบบประเมินทั้งฉบับอยู่ระหว่าง 0-27 คะแนน ถ้าคะแนนสูงแสดงว่ามีภาวะซึมเศร้าสูง และยังแบ่งภาวะซึมเศร้าออกเป็น 5 ระดับ ดังนี้ 0–4 คะแนน ไม่มีภาวะซึมเศร้า 5-9 คะแนน มีภาวะซึมเศร้าระดับน้อย 10-14 คะแนน มีภาวะซึมเศร้าระดับปานกลาง 15-19 มีภาวะซึมเศร้าระดับมาก และ 20-27 มีภาวะซึมเศร้าระดับรุนแรงมาก ควรปรึกษาแพทย์ เพื่อวินิจฉัยและบำบัดรักษา

3. วิธีการเก็บรวบรวมข้อมูล

ผู้วิจัยนำหนังสือขอความอนุเคราะห์เข้าไปเก็บข้อมูลในพื้นที่ เพื่อเก็บข้อมูลจากกลุ่มตัวอย่างด้วยตนเอง พร้อมนัดวันรับแบบสอบถามคืน โดยได้ให้แบบสอบถามกลุ่มตัวอย่างตามเกณฑ์ที่ได้กำหนดเอาไว้เพื่อตอบคำถาม ชี้แจงวัตถุประสงค์ของการวิจัยและขอความร่วมมือในการวิจัย หากผู้ตอบคำถามยินดีให้ความร่วมมือ ผู้วิจัยจึงจะเริ่มแจกแบบสอบถามให้กลุ่มตัวอย่าง หลังจากนั้นมีการตรวจสอบความเรียบร้อย

ของแบบสอบถามที่ได้รับคืนจากกลุ่มตัวอย่างและตรวจให้คะแนนแบบสอบถามที่สมบูรณ์ ตามเกณฑ์ที่กำหนดไว้เพื่อวิเคราะห์ข้อมูลทางสถิติต่อไป

4. การวิเคราะห์ข้อมูล

ผู้วิจัยวิเคราะห์ข้อมูลโดยใช้โปรแกรมสำเร็จรูป เพื่อวิเคราะห์ข้อมูลค่าความถี่ และค่าร้อยละของภาวะซึมเศร้าของนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา

ผลการวิจัย

1. จากกลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ จำนวน 180 คน เป็นเพศชายร้อยละ 23.90 เพศหญิงร้อยละ 76.10 มีผลการเรียนเฉลี่ยในปีการศึกษาล่าสุดเท่ากับ 2.98 (SD.= .63) กลุ่มตัวอย่างร้อยละ 67.20 อาศัยอยู่กับบิดา มารดา และบิดามารดาของกลุ่มตัวอย่างมีสถานภาพสมรสและอาศัยอยู่ด้วยกันมากที่สุด คิดเป็นร้อยละ 65.60 กลุ่มตัวอย่างร้อยละ 64.40 มีรายได้เฉลี่ยเท่ากับ 5,000 – 7,000 บาทต่อเดือน กลุ่มตัวอย่างร้อยละ 77.20 มีรายได้ที่เพียงพอต่อค่าใช้จ่าย โดยกลุ่มตัวอย่างส่วนใหญ่ร้อยละ 74.40 ไม่ทำงานเสริมใดๆระหว่างเรียน และไม่มีประวัติว่ามีบุคคลในครอบครัวมีภาวะซึมเศร้า คิดเป็นร้อยละ 88.30

2. นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีผลการประเมินภาวะซึมเศร้า โดยแยกตามอาการของภาวะซึมเศร้าที่มากที่สุด ได้ดังนี้

2.1 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีความรู้สึกซึม เศร้า หงุดหงิด หรือสิ้นหวังเพียงบางวัน มากที่สุด คิดเป็นร้อยละ 71.7

2.2 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีอาการเบื่อ ไม่ค่อยสนใจหรือไม่เพลิดเพลิน เวลาทำสิ่งต่างๆเพียงบางวัน มากที่สุด คิดเป็นร้อยละ 69.4

2.3 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 ไม่มีความคิดว่าถ้าตายไปเสียจะดีกว่า หรือคิดจะทำร้ายตัวเอง ด้วยวิธีใดวิธีหนึ่งเลย มากที่สุด คิดเป็นร้อยละ 69.4

2.4 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีความรู้สึกเหนื่อยล้า หรือไม่ค่อยมีพลังเพียงบางวัน มากที่สุด คิดเป็นร้อยละ 63.3

2.5 นักศึกษานักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีความรู้สึกแย่กับตัวเอง หรือรู้สึกว่าตัวเองล้มเหลว หรือทำให้ ตัวเองหรือครอบครัวผิดหวังเพียงบางวัน มากที่สุด คิดเป็นร้อยละ 57.8

2.6 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีอาการไม่อยากอาหาร น้ำหนักลด หรือกินมากกว่าปกติเพียงบางวัน มากที่สุด คิดเป็นร้อยละ 54.4

2.7 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีอาการจดจ่อกับสิ่งต่างๆ ได้ยาก เช่น ทำการบ้าน อ่านหนังสือ หรือดูโทรทัศน์เพียงบางวัน มากที่สุด คิดเป็นร้อยละ 53.3

2.8 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีอาการนอนหลับยาก รู้สึกง่วงทั้งวัน หรือนอนมากเกินไปเพียงบางวัน มากที่สุด คิดเป็นร้อยละ 50.0

2.9 นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 ไม่มีการพูดหรือทำอะไรช้าลงมากจนคนอื่นสังเกตเห็นได้ หรือในทางตรงกันข้าม คือ กระสับกระส่ายหรือ กระวนกระวาย จนต้องเคลื่อนไหวไปมามากกว่าปกติเลย มากที่สุด คิดเป็นร้อยละ 48.3

ตารางที่ 1 จำนวนและร้อยละของจำนวนนักศึกษาแยกตามอาการของภาวะซึมเศร้า (n=180)

อาการภาวะซึมเศร้าของนักศึกษา ในช่วง 2 สัปดาห์	จำนวน (คน)	ร้อยละ
1. รู้สึกซึม เศร้า หงุดหงิด หรือสิ้นหวัง		
ไม่มีเลย	32	17.8
มีบางวัน	129	71.7
มีมากกว่า 7 วัน	10	5.6
มีแทบทุกวัน	9	5.0
2. เบื่อ ไม่ค่อยสนใจหรือไม่เพลิดเพลิน เวลาทำสิ่งต่างๆ		
ไม่มีเลย	20	11.1
มีบางวัน	125	69.4
มีมากกว่า 7 วัน	23	12.8
มีแทบทุกวัน	12	6.7
3. นอนหลับยาก รู้สึกง่วงทั้งวัน หรือนอนมากเกินไป		
ไม่มีเลย	11	6.1
มีบางวัน	90	50.0
มีมากกว่า 7 วัน	46	25.6
มีแทบทุกวัน	33	18.3
4. ไม่อยากอาหาร น้ำหนักลด หรือกินมากกว่าปกติ		
ไม่มีเลย	45	25.0
มีบางวัน	98	54.4
มีมากกว่า 7 วัน	30	16.7
มีแทบทุกวัน	7	3.9
5. รู้สึกเหนื่อยล้า หรือไม่ค่อยมีพลัง		
ไม่มีเลย	13	7.2
มีบางวัน	114	63.3
มีมากกว่า 7 วัน	39	21.7
มีแทบทุกวัน	14	7.8
6. รู้สึกแย่กับตัวเอง หรือรู้สึกว่าตัวเองล้มเหลว หรือทำให้ ตัวเองหรือครอบครัวผิดหวัง		
ไม่มีเลย	43	23.9
มีบางวัน	104	57.8
มีมากกว่า 7 วัน	19	10.6
มีแทบทุกวัน	14	7.8
7. จดจ่อกับสิ่งต่างๆ ได้ยาก เช่น ทำการบ้าน อ่านหนังสือ หรือดูโทรทัศน์		
ไม่มีเลย	31	17.2
มีบางวัน	96	53.3
มีมากกว่า 7 วัน	38	21.1

อาการภาวะซึมเศร้าของนักศึกษา ในช่วง 2 สัปดาห์	จำนวน (คน)	ร้อยละ
มีแทบทุกวัน	15	8.3
8. พูดหรือทำอะไรช้าลงมากจนคนอื่นสังเกตเห็นได้ หรือในทางตรงกันข้ามคือ กระสับกระส่ายหรือกระวนกระวาย จนต้องเคลื่อนไหวไปมามากกว่าปกติ		
ไม่มีเลย	87	48.3
มีบางวัน	72	40.0
มีมากกว่า 7 วัน	15	8.3
มีแทบทุกวัน	6	3.3
9. คิดว่าถ้าตายไปเสียจะดีกว่า หรือคิดจะทำร้ายตัวเอง ด้วยวิธีใดวิธีหนึ่ง		
ไม่มีเลย	125	69.4
มีบางวัน	41	22.8
มีมากกว่า 7 วัน	8	4.4
มีแทบทุกวัน	6	3.3

3. นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีภาวะซึมเศร้าระดับเล็กน้อย จำนวน 119 คน คิดเป็นร้อยละ 66.11 มีภาวะซึมเศร้าระดับปานกลาง จำนวน 41 คน คิดเป็นร้อยละ 22.78 มีภาวะซึมเศร้าระดับมาก คิดเป็นร้อยละ 7.22 และมีภาวะซึมเศร้าในระดับรุนแรง จำนวน 7 คน คิดเป็นร้อยละ 3.89 ดังตารางที่ 2

ตารางที่ 2 จำนวนและร้อยละของจำนวนนักศึกษาแยกตามระดับความรุนแรงของภาวะซึมเศร้า (n=180)

ภาวะซึมเศร้า	จำนวน (คน)	ร้อยละ
มีภาวะซึมเศร้าเล็กน้อย	119	66.11
มีภาวะซึมเศร้าปานกลาง	41	22.78
มีภาวะซึมเศร้ามาก	13	7.22
มีภาวะซึมเศร้ารุนแรง	7	3.89
รวม	**180**	**100.00**

สรุปและอภิปรายผล

จากผลการวิจัยในครั้งนี้ทำให้ได้ข้อค้นพบที่สำคัญว่า นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีอาการนอนหลับยาก รู้สึกง่วงทั้งวัน หรือนอนมากเกินไปบ่อยมากที่สุด โดยนักศึกษามีอาการแทบทุกวัน 33 คน คิดเป็นร้อยละ 18.3 ซึ่งคุณภาพการนอนหลับจะส่งผลต่อคุณภาพชีวิตเป็นสำคัญ โดยคุณภาพการนอนหลับที่ไม่ดี เช่น ความยากลำบากในการล้มตัวลงนอน การนอนหลับยาก และการนอนหลับไม่สม่ำเสมอ หรือการตกใจตื่นตอนกลางคืน ส่งผลให้รู้สึกอ่อนเพลีย การขาดสมาธิ น้ำหนักเพิ่มขึ้น ขาดการสร้างภาวะสมดุลและการประสานในการทำงาน และภาวะซึมเศร้า (Dai et al, 2019) สอดคล้องกับการศึกษาของ ยุทธภูมิ มีประดิษฐ์, ภักดี สุขพรสวรรค์ และฐิตินันท์ เอื้ออำนวย. (2022) เรื่อง ความสัมพันธ์ระหว่างคุณภาพ

การนอนกับภาวะซึมเศร้าของอาจารย์ นิสิต และพนักงานของมหาวิทยาลัยบูรพา พบว่า คุณภาพการนอนมีความสัมพันธ์ในทางลบกับภาวะซึมเศร้า อย่างมีนัยสำคัญทางสถิติ

นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มีภาวะมีเศร้าอยู่ในระดับเล็กน้อย ร้อยละ 66.11 มีภาวะซึมเศร้าระดับปานกลาง ร้อยละ 22.78 ทั้งนี้อาจเกิดจากหลายปัจจัย สอดคล้องกับการศึกษาของสุนันท์ เสียงเสนาะ, ดวงใจ วัฒนสินธุ์, ภรภัทร เฮงอุดมทรัพย์ และเวทิส ประทุมศรี. (2017) ที่ศึกษาอิทธิพลของปัจจัยด้านสัมพันธภาพระหว่างบุคคลต่อภาวะซึมเศร้าของวัยรุ่นตอนปลาย พบว่า กลุ่มตัวอย่างมีภาวะซึมเศร้า คิดเป็นร้อยละ 46.40 มีภาวะซึมเศร้าระดับเล็กน้อยถึงปานกลาง ร้อยละ 23.40 ร่วมกับการศึกษาปัจจัยที่มีผลต่อภาวะซึมเศร้าในวัยรุ่น กรณีศึกษา: มหาวิทยาลัยเทคโนโลยีราชมงคลสุวรรณภูมิ ของนันทยา คงประพันธ์ (2020) พบว่า นักศึกษามีอาการซึมเศร้าในระดับปานกลางและมีอารมณ์แปรปรวนไปเล็กน้อย ร้อยละ 24.50 และร้อยละ 22.50 ตามลำดับ ผลของภาวะซึมเศร้าไม่แตกต่างกันมาก จากการศึกษาครั้งนี้ เนื่องจากกลุ่มตัวอย่างเป็นช่วงวัยรุ่นตอนปลาย ซึ่งมีสภาวะความเป็นอยู่ในช่วงวัยเดียวกัน โดยจากผลการวิจัยที่พบว่านักศึกษามีภาวะซึมเศร้ารุนแรง จำนวน 7 คน คิดเป็นร้อยละ 3.89 ซึ่งเป็นกลุ่มคนที่จำเป็นต้องเข้าสู่กระบวนการรักษาทางการแพทย์ รวมทั้งการสนับสนุนจากสถาบันการศึกษา เช่น การประเมินภาวะซึมเศร้าของนักศึกษาให้ทั่วถึงอยู่เสมอ และมีบริการให้คำปรึกษาโดยผู้เชี่ยวชาญด้านสุขภาพจิตเพื่อเป็นที่พึ่งให้แก่นักศึกษาที่กำลังเผชิญความเครียด หรือกำลังตกอยู่ในภาวะซึมเศร้า

ข้อเสนอแนะ

ข้อเสนอแนะในการนำผลวิจัยไปใช้

จากผลการวิจัยครั้งนี้ พบว่า นักศึกษาระดับปริญญาตรีชั้นปีที่ 1 มหาวิทยาลัยแห่งหนึ่งในจังหวัดสงขลา ภาวะซึมเศร้าในระดับเล็กน้อยมากที่สุด รองลงมา คือ ระดับปานกลาง ระดับมาก และระดับรุนแรง ตามลำดับ ดังนั้นองค์กรหรือสถาบันต่างๆ ที่เกี่ยวข้องกับการดูแลนักศึกษาสามารถใช้เป็นข้อมูลพื้นฐานในการวางแผนและเฝ้าระวังภาวะซึมเศร้าโดยให้ความสำคัญกับการส่งเสริมด้านสุขภาพจิตแก่นักศึกษา เพื่อลดการเกิดภาวะซึมเศร้าให้กับนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 ได้อย่างมีประสิทธิภาพต่อไป

ข้อเสนอแนะในการวิจัยครั้งต่อไป

ควรมีการศึกษาภาวะซึมเศร้าในนักศึกษาระดับปริญญาตรีชั้นปีที่ 1 และชั้นปีอื่นๆ เชิงคุณภาพ สัมภาษณ์เชิงลึกกับบุคคลที่มีภาวะซึมเศร้าในระดับจากปานกลางถึงรุนแรงมาก เพื่อให้การช่วยเหลือและติดตามประเมินผลต่อไป

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การศึกษาปัจจัยความสำเร็จของการดำเนินนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในประเทศไทย

The Study of Key Success Factors Affecting Agri-Tourism Policy Implementation In Thailand

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บทคัดย่อ

การวิจัยครั้งนี้ใช้ระเบียบวิธีวิจัยเชิงคุณภาพ (Qualitative Research) มีวัตถุประสงค์ 1) เพื่อศึกษาปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีต และ 2) เพื่อวิเคราะห์ปัจจัยท้าทายความสำเร็จเพื่อการพยากรณ์แนวทางการดำเนินนโยบายด้านการท่องเที่ยวเชิงเกษตรให้สอดรับกับการขยายตัวเพิ่มของแหล่งท่องเที่ยวเชิงเกษตรอย่างน้อย 15 ชุมชนในอนาคตโดยมีผู้ให้ข้อมูลสำคัญ ได้แก่ 1) หน่วยงานภาครัฐ ประกอบด้วย ผู้แทนจากกระทรวงเกษตรและสหกรณ์ ผู้แทนจากกระทรวงการท่องเที่ยวและกีฬา และผู้แทนจากการท่องเที่ยวแห่งประเทศไทย (ททท.) 2) ภาคเอกชน ประกอบด้วย ตัวแทนจากกลุ่มวิสาหกิจชุมชนและตัวแทนจากผู้ประกอบการด้านการท่องเที่ยว โดยผู้วิจัยใช้การศึกษาวิเคราะห์จากเอกสารและแบบสัมภาษณ์เชิงลึก และทำการวิเคราะห์โดยทำการตีความและวิเคราะห์จากเนื้อหา (Content Analysis) และวิธีการอธิบายเชิงพรรณนา (Descriptive research) เพื่อนำมาสรุปผลการศึกษาเพื่อเป็นประโยชน์ต่อไป

ผลการศึกษาพบว่า ปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีต กรณีศึกษา มิติการท่องเที่ยวเชิงเกษตรโดยชุมชน ในด้านปัจจัยสนับสนุน ได้แก่ 1) วัตถุประสงค์ของนโยบาย 2) หน่วยงานราชการและเอกชนมีการบูรณาการร่วมกัน 3) บุคลากรเพียงพอและมีองค์ความรู้ 4) ภารกิจของหน่วยงานที่ได้รับมอบหมายมีความชัดเจน 5) การนำเทคโนโลยีมาใช้ประโยชน์ 6) ประชาชนให้ความสนใจมากขึ้น และ 7) การสนับสนุนจากฝ่ายการเมือง ด้านปัจจัยอุปสรรคในอดีต ได้แก่ 1) การวัดผลโครงการยังไม่มีความชัดเจน 2) นโยบายเน้นส่งเสริมด้านการท่องเที่ยวมากกว่าด้านการเกษตร 3) การจัดสรรงบประมาณ และ 4) สภาพอากาศ/ภาวะโลกร้อน ปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอนาคตในด้านปัจจัยสนับสนุน ได้แก่ 1) กระแสความนิยมเพิ่มขึ้นอย่างต่อเนื่อง 2) เกิดเครือข่ายและมีการบูรณาการร่วมกัน และ 3) การประยุกต์ใช้เทคโนโลยีเพิ่มมากขึ้น และอุปสรรคที่ท้าทายในอนาคต ได้แก่ 1) ข้อจำกัดของการจัดทำ

นโยบาย 2) องค์ความรู้ของเกษตรกร 3) การไม่มีหน่วยงานรับผิดชอบหลักในด้านของการท่องเที่ยวเชิงเกษตรโดยตรง 4) ความสามารถในการรองรับนักท่องเที่ยวของพื้นที่ 5) วาระการสนับสนุนจากฝ่ายการเมือง 6) นายทุนแสวงหาผลกำไรจากพื้นที่ของเกษตรกร 7) สภาพอากาศ/ภาวะโลกร้อน และ 8) เทคโนโลยี

คำสำคัญ: ปัจจัยความสำเร็จ, นโยบาย, การท่องเที่ยวเชิงเกษตร

Abstract

This research applied the qualitative research approach to 1) To study the factors that have influenced the success in driving agricultural tourism promotion policies in the past. And 2) To analyze the challenging factors for success and forecast policy directions for agricultural tourism in response to the expansion of at least 15 agricultural tourism communities in the future. Key informants involved in the research include Government agencies, comprising representatives from the Ministry of Agriculture and Cooperatives, the Ministry of Tourism and Sports, and the Tourism Authority of Thailand (TAT). And the private sector, consisting of representatives from community enterprise groups and tourism entrepreneurs. The researchers utilized document analysis and conducted in-depth interviews. They analyzed the data through content analysis and descriptive research methods to interpret and analyze the findings. The results of the study will be summarized for future benefit. The researchers employed document analysis and in-depth interviews. They conducted analysis by interpreting and analyzing the content through content analysis and descriptive research methods to bring about conclusions for future benefit.

The study found that the factors influencing the success of driving agricultural tourism promotion policies in the past, in terms of supportive factors, include 1) Clear objectives of the policy. 2) Collaboration between government agencies and the private sector. 3) Sufficient and knowledgeable personnel. 4) Clearly defined missions of the assigned organizations. 5) Utilization of technology. 6) Increased interest from the public. And 7) Political support. As for the hindering factors in the past, they include 1) Lack of clear project evaluation. 2) Policies focusing more on tourism promotion rather than agriculture. 3) Budget allocation. And 4) Weather/climate change. For future success in driving agricultural tourism promotion policies, supportive factors include 1) Continuous increase in popularity. 2) Networking and collaboration. And Increased application of technology. Challenges for the future include 1) Limitations in policy development. 2. Agricultural knowledge of farmers. 3) Lack of direct responsibility of organizations in agricultural tourism. 4) Capacity to accommodate tourists in the area. 5) Duration of political support. 6) Investors seeking profit from agricultural areas. 7) Weather/climate change. And 8) Technology.

Keywords: Key Success Factors, Policy, Agri-Tourism

บทนำ

ประเทศไทยมีพื้นที่อุดมสมบูรณ์และมีความหลากหลายของพันธุ์พืชเขตร้อน ทำให้เกิดลักษณะอาชีพทางการเกษตรเป็นหลักในประชากรส่วนใหญ่ แต่เมื่อเข้าสู่ยุคโลกาภิวัฒน์ มีการเปลี่ยนแปลงทั้งในระดับประเทศและระดับโลก ทั้งด้านวิถีชีวิต เศรษฐกิจ การเมือง สังคม และวัฒนธรรม ซึ่งเกิดผลกระทบที่มีมิติต่าง ๆ โดยเฉพาะในด้านเกษตรกรรมซึ่งมีบทบาทสำคัญต่อประเทศไทย (เจษฎา นกน้อย, 2559) จึงเกิดการพัฒนาด้านการเกษตรเกิดขึ้นเนื่องจากสัดส่วนของเกษตรกรและภาคเกษตรกรในประเทศมีความสำคัญมากที่สุด แต่เกษตรกรก็ยังพบปัญหาในเรื่องของรายได้ที่ไม่เพียงพอสำหรับการดำรงชีวิตอย่างมั่นคง (รัชฎาพร บุญเรือง, 2564) ดังนั้นการส่งเสริมอนุรักษ์วิถีชีวิตแบบเกษตรกรรมของสังคมไทยที่เป็นแกนหลักของประเทศที่มีมาอย่างยาวนานไม่ให้หายไปกับการเปลี่ยนแปลง ในปัจจุบันเป็นสิ่งจำเป็นอย่างยิ่งในมิติการสร้างจุดขายให้วิถีเกษตรกรรมไทย เพื่อเป็นจุดดึงดูดให้ผู้คนทั้งในและนอกพื้นที่หันมาสนใจมากขึ้น โดยวิธีการที่จะเพิ่มแรงดึงดูดและสร้างการรับรู้ขนาดใหญ่ได้นั้น คือ การท่องเที่ยวเป็นการท่องเที่ยวเชิงเกษตรที่เน้นการกระจายรายได้สู่เกษตรกรและท้องถิ่นเกษตรกรรม ช่วงปี พ.ศ. 2541 - พ.ศ. 2542 จึงเกิดนโยบายในการส่งเสริมการท่องเที่ยวเชิงเกษตรในประเทศไทยด้วยวัตถุประสงค์เพื่อเสริมสร้างรายได้ให้แก่เกษตรกรในชนบท ในปี พ.ศ. 2548 โดยมีแหล่งท่องเที่ยวเชิงเกษตรกระจายอยู่ในทุกจังหวัดของประเทศ รวมทั้งมีจำนวนนักท่องเที่ยวเข้าชมแหล่งท่องเที่ยวเชิงเกษตรมากถึง 531,562 คน และได้รับรายได้ประมาณ 44,951,006 บาท ซึ่งเป็นตัวอย่างที่ชัดเจนเกี่ยวกับผลกระทบที่ดีที่สุดของนโยบายการท่องเที่ยวเชิงเกษตรในช่วงเวลานั้น โดยการสร้างความร่วมมือและเป็นกันเองระหว่างภาครัฐและเอกชนมีบทบาทสำคัญในความสำเร็จของโครงการดังกล่าว (กรมส่งเสริมการเกษตร, 2548) ถัดมาได้เกิดการปรับเปลี่ยนรูปแบบของนโยบายรัฐบาลในปี พ.ศ. 2559 เพื่อตอบสนองความเปลี่ยนแปลงและบริบทสังคมที่เพิ่มขึ้น โดยในปีนี้มีการนำเสนอนโยบาย Thailand 4.0 ซึ่งเป็นการปรับโครงสร้างและเปลี่ยนรูปแบบการเกษตรจากแบบเดิมไปสู่การเกษตรแบบทันสมัยที่ใช้เทคโนโลยีและนวัตกรรมใหม่เพื่อเพิ่มมูลค่าให้กับผลผลิต นโยบายนี้มีเป้าหมายในการเพิ่มรายได้และสร้างคุณภาพชีวิตที่ดีขึ้นให้กับเกษตรกร ในปี พ.ศ. 2561 กรมส่งเสริมการเกษตรร่วมกับการท่องเที่ยวแห่งประเทศไทยได้ร่วมบูรณาการข้อมูลระหว่างหน่วยงาน และใช้ Big Data ในการพัฒนาการท่องเที่ยวเชิงเกษตรให้ทันสมัยและตอบโจทย์ความต้องการของนักท่องเที่ยว รวมถึงมีการจัดนิทรรศการมหกรรมต่าง ๆ เพื่อสร้างการรับรู้ในการส่งเสริมการท่องเที่ยวเชิงเกษตรของประเทศไทย การเติบโตของการท่องเที่ยวเชิงเกษตรในประเทศไทย มีการขยายตัวอย่างต่อเนื่อง และมีการพัฒนาอย่างต่อเนื่องตั้งแต่ปี พ.ศ. 2541 ถึง 2561 โดยมีแหล่งท่องเที่ยวเชิงเกษตรมากกว่า 1,200 แห่งทั่วประเทศไทย รวมทั้งมีรายได้จากการท่องเที่ยวเชิงเกษตรประมาณ 1.6 หมื่นล้านบาทในปี 2561 โดยการวิจัยชั้นนำ Technavio ได้รายงานว่าในปี พ.ศ. 2562 - 2566 ทั่วโลกจะเห็นการขยายตัวของตลาดการท่องเที่ยวเชิงเกษตรที่เติบโตและขยายตัวอย่างต่อเนื่องประมาณร้อยละ 18 ต่อปี (สุวัชรีภรณ์ จิตใจ และคณะ, 2564)

ดังนั้นเห็นได้ว่าการเปลี่ยนแปลงในมิติของการท่องเที่ยวได้เกิดขึ้นอย่างหลากหลายในปัจจุบันและอนาคต เนื่องจากการเกิดวิกฤตเศรษฐกิจ ความตระหนักในภาวะโลกร้อนและการแพร่ระบาดของโควิด-19 ได้ทำให้นักท่องเที่ยวมีความสนใจมากขึ้นในด้านธรรมชาติและสิ่งแวดล้อมทำให้เกิดอุปสงค์ด้านการท่องเที่ยวเชิงเกษตรมากขึ้น หน่วยงานราชการได้แสดงความตระหนักถึงความสำคัญของการเปลี่ยนแปลงนี้และเกิดการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรขึ้น โดยมีกิจกรรมส่งเสริมการท่องเที่ยวเชิงเกษตรในจังหวัดต่าง ๆ ทั่วประเทศไทย นอกจากนี้ การพัฒนาศักยภาพในการเข้าสู่การ

ท่องเที่ยวเชิงเกษตรในรูปแบบใหม่ในยุค New Normal เพื่อให้สอดรับกับมาตรการป้องกันการแพร่ระบาดของโควิด-19

จากที่กล่าวมาข้างต้น ทำให้ผู้วิจัยมีความสนใจและต้องการที่จะศึกษาปัจจัยที่สนับสนุนต่อความสำเร็จในการดำเนินนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรและปัจจัยที่เป็นอุปสรรคที่ส่งผลต่อการดำเนินนโยบายดังกล่าวในอดีต รวมถึงการศึกษาปัจจัยท้าทายความสำเร็จในอนาคตเพื่อการพยากรณ์แนวทางการดำเนินนโยบายด้านการท่องเที่ยวเชิงเกษตรเพื่อช่วยในการตอบรับกับความเปลี่ยนแปลงในอนาคตได้ดียิ่งขึ้น และสามารถสอดรับกับนโยบายการส่งเสริมการท่องเที่ยวเชิงสร้างสรรค์ภายใต้กระทรวงการท่องเที่ยวและกีฬาในการขยายตัวตามหมุดหมายการขยายตัวเพิ่มของแหล่งท่องเที่ยวเชิงเกษตรอย่างน้อย 15 แหล่งในอนาคต

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีต
2. เพื่อวิเคราะห์ปัจจัยท้าทายความสำเร็จเพื่อการพยากรณ์แนวทางการดำเนินนโยบายด้านการท่องเที่ยวเชิงเกษตร

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของนโยบายสาธารณะ

ศุภชัย ยาวะประภาษ (2533) สรุปความหมายของนโยบายสาธารณะว่าคือ แนวทาง ดำเนินกิจกรรมของรัฐบาลโดยการปฏิบัติที่รัฐบาลกำหนดขึ้นเพื่อแก้ไข บรรเทาหรือป้องกันปัญหาต่าง ๆ ตามภาระหน้าที่ของรัฐบาล มีองค์ประกอบหลัก คือ การกำหนดเป้าหมาย การกำหนดแนวทางใหม่ ๆ และการกำหนดการสนับสนุนต่าง ๆ เพื่อให้เป้าหมายหรือวัตถุประสงค์นั้นเป็นจริง นโยบายนั้นอาจมีลักษณะเฉพาะเจาะจงหรือครอบคลุมกว้างขวางขึ้นอยู่กับระดับการกำหนดนโยบายและภาระหน้าที่ของรัฐบาล นอกจากนี้ กิจกรรมของรัฐบาล หมายความว่า เป็นการดำเนินการหรือควบคุมดูแลการดำเนินการโดยองค์กรของรัฐ เพื่อประโยชน์สุขของสาธารณชน เช่น หน่วยงานระดับกระทรวง ทบวง กรม รัฐวิสาหกิจ และกองงานที่เกี่ยวข้อง โดยองค์กรของรัฐที่รับผิดชอบหรือเข้ามาเกี่ยวข้องอาจมีมากกว่าหนึ่งองค์กรได้

ปัจจัยที่มีอิทธิพลต่อความสำเร็จของการดำเนินนโยบาย

การศึกษาปัจจัยที่มีอิทธิพลต่อความสำเร็จของการนำนโยบายสาธารณะไปปฏิบัติผ่านตัวแบบต่าง ๆ อาทิ ตัวแบบการนำนโยบายไปปฏิบัติของแวน มีเตอร์ และแวน ฮอร์น ตัวแบบการนำนโยบายไปปฏิบัติของซาบาเตียร์ และแมซมาเนียน ตัวแบบการนำนโยบายไปปฏิบัติของแฮมเบอร์ตัน (Hambleton) ตัวแบบการนำนโยบายไปปฏิบัติของ Ernest R. Alexander และตัวแบบการนำนโยบายไปปฏิบัติของ วรเดช จันทรศร ดังที่นักวิชาการทั้งในประเทศและต่างประเทศได้นำเสนอมานั้น ช่วยให้เกิดการวิเคราะห์และสังเคราะห์ในการปฏิบัตินโยบายได้หนึ่ง ๆ ได้ชัดเจนและครบถ้วนมากยิ่งขึ้น เนื่องจากปัจจัยต่าง ๆ ที่ได้นำเสนอมานั้น ล้วนส่งผลกระทบกับการปฏิบัตินโยบายไม่ทางใดก็ทางหนึ่ง นอกจากนั้นแล้วยังสามารถช่วยให้เห็นข้อจำกัดของนโยบายอีกด้วย โดยแต่ละตัวแบบได้นำเสนอในมิติที่เหมือนและแตกต่างกัน โดยขึ้นอยู่กับบริบทของแต่ละนโยบายว่าเหมาะสมในการนำตัวแบบใดมาใช้เป็นเครื่องมือในการวิเคราะห์เพื่อเกิดความถูกต้องแม่นยำมากยิ่งขึ้น (วรเดช จันทร์ศร, 2554)

แนวคิดเรื่องการท่องเที่ยวเชิงเกษตร

การท่องเที่ยวเชิงเกษตรนั้น หมายถึง การท่องเที่ยวรูปแบบหนึ่งที่เกิดขึ้นในพื้นที่ที่ประกอบเกษตรกรรมและการปศุสัตว์ เพื่อให้นักท่องเที่ยวที่เดินทางไปท่องเที่ยวได้ชื่นชมวิถีชีวิตของชุมชนและความงามของธรรมชาติ อีกทั้งยังมีกิจกรรมที่ก่อให้เกิดการมีส่วนร่วมร่วมกันระหว่างนักท่องเที่ยวและคนในพื้นที่ทั้งด้านความบันเทิง รื่นรมย์ และความรู้ด้านการเกษตรและการปศุสัตว์อีกด้วย โดยองค์ประกอบของแหล่งท่องเที่ยวเชิงเกษตร ประกอบด้วย แหล่งท่องเที่ยวที่เกี่ยวข้องกับกิจกรรมเกษตรกรรมทั้งในด้านธรรมชาติและเทคโนโลยี รวมถึงการเรียนรู้และการถ่ายทอดวิถีชีวิตของชุมชนท้องถิ่น ซึ่งเป็นการบริการที่ตอบสนองความต้องการของนักท่องเที่ยวที่สนใจเข้ามาเรียนรู้และสัมผัสประสบการณ์ในพื้นที่ในลักษณะดังกล่าว (กรมการท่องเที่ยว, 2559)

การท่องเที่ยวเชิงเกษตรในแต่ละภูมิภาคของประเทศไทย

สำนักงานสภาพัฒนาการเศรษฐกิจและสังคมแห่งชาติ (2560) ได้อธิบายการท่องเที่ยวเชิงเกษตรในแต่ละภูมิภาคของประเทศไทย ไว้ดังนี้

ภาคเหนือ มีสภาพภูมิอากาศที่เหมาะสมสำหรับการเพาะปลูกและการเลี้ยงสัตว์ต่าง ๆ ซึ่งเป็นที่มาของการท่องเที่ยวเชิงเกษตร ในพื้นที่นี้มีการเปิดโอกาสให้ผู้เข้าชมได้เรียนรู้เกี่ยวกับกระบวนการเกษตรแบบดั้งเดิมและวิถีชีวิตของชาวสวน อาทิ เช่น ไร่สตรอเบอร์รี่ในเชียงใหม่ ไร่ชาบ้านเขาหลักในเชียงราย และไร่สวนส้มในลำปาง เป็นต้น ทั้งนี้เพื่อเสริมสร้างรายได้ให้แก่ชุมชนท้องถิ่นและส่งเสริมการท่องเที่ยวในพื้นที่ดังกล่าว

ภาคใต้ มีภูมิปัญญาท้องถิ่นและวัฒนธรรมที่เฉพาะเจาะจง โดยเฉพาะในการเกษตรและการเลี้ยงสัตว์ที่ปรับตัวให้เหมาะกับสภาพอากาศและภูมิประเทศของภาคใต้ สถานที่ท่องเที่ยวเชิงเกษตรที่น่าสนใจในภาคใต้อาจรวมถึงไร่สวนข้าวโพดในสุราษฎร์ธานี ไร่สวนกาแฟในจังหวัดชุมพร และไร่สวนโกโก้ในปัตตานี เป็นต้น ผู้เข้าชมสามารถเรียนรู้กระบวนการปลูกสร้างและการเก็บเกี่ยวผลผลิตต่าง ๆ ได้จากการท่องเที่ยวในพื้นที่เหล่านี้

ภาคกลาง มีทัศนียภาพที่เหมาะสมสำหรับการเกษตรและการเลี้ยงสัตว์ในบางพื้นที่ เช่น ภูเขาที่ราบสูง และแม่น้ำที่มีน้ำอุดมสมบูรณ์ สถานที่ท่องเที่ยวเชิงเกษตรที่น่าสนใจในภาคกลางอาจรวมถึงไร่สวนชมพูในสุพรรณบุรี ไร่สวนทุเรียนในราชบุรี และไร่สวนองุ่นในลพบุรี เป็นต้น

ภาคตะวันออกเฉียงเหนือ มีลักษณะภูมิประเทศที่เป็นพื้นที่ที่ราบสูง มีสภาพอากาศหนาวเย็นในฤดูหนาว และเป็นพื้นที่ที่เหมาะสมแก่การเพาะปลูกข้าว เนื่องจากน้ำไม่สามารถท่วมถึงได้ ส่งผลให้เกิดแหล่งท่องเที่ยวเชิงเกษตร อาทิ แหล่งปลูกข้าวหอมมะลิดินภูเขาไฟบุรีรัมย์ ไร่สวนผักในจังหวัดขอนแก่น ไร่สวนสตรอเบอร์รี่ในบุรีรัมย์ เป็นต้น

การท่องเที่ยวเชิงเกษตรมีลักษณะและความแตกต่างที่น่าสังเกตในแต่ละภูมิภาค โดยแปรเปลี่ยนไปตามภูมิประเทศ และอัตลักษณ์ของท้องถิ่นนั้น ๆ โดยสามารถหมุนเวียนการท่องเที่ยวไปในแต่ฤดูกาล การท่องเที่ยวได้ตลอดทั้งปี ทั้งนี้ ขึ้นอยู่กับสภาพภูมิอากาศที่เหมาะสมกับช่วงเวลาของผลิตผลและผลิตภัณฑ์ ความพร้อมของพื้นที่นั้น ๆ ด้วยเช่นกัน

นโยบายและแผนเกี่ยวกับการท่องเที่ยวเชิงเกษตร

กรมส่งเสริมการเกษตรและกรมการท่องเที่ยว ได้อธิบายถึงนโยบายและแผนเกี่ยวกับการท่องเที่ยวเชิงเกษตร ไว้ดังนี้

1. แผนปฏิบัติราชการกรมส่งเสริมการเกษตร ระยะ 3 ปี (พ.ศ. 2563 - 2565) ในแผนงานที่ 5 การบูรณาการสร้างรายได้จากการท่องเที่ยว มุ่งเน้นการบูรณาการสร้างรายได้จากการท่องเที่ยวโดยมีนโยบายในการส่งเสริมและพัฒนาแหล่งท่องเที่ยววิถีเกษตร โครงการเน้นการส่งเสริมการท่องเที่ยวชุมชนและกิจกรรมเพื่อพัฒนาแหล่งท่องเที่ยววิถีเกษตร โดยจัดกิจกรรมย่อยเพื่อพัฒนาศักยภาพเกษตรด้านการบริหารจัดการและการท่องเที่ยวเชิงเกษตรให้มีมาตรฐานและปลอดภัยทั่วประเทศ (กรมส่งเสริมการเกษตร , 2563)

2. แผนปฏิบัติราชการกระทรวงการท่องเที่ยวและกีฬา ระยะ 3 ปี (พ.ศ. 2563 – 2565) มุ่งเน้นการท่องเที่ยวให้เป็นจุดหมายปลายทางของการท่องเที่ยวระดับโลก โดยเน้นพัฒนาการท่องเที่ยวที่หลากหลายและมุ่งเน้นการพัฒนาในสาขาที่มีศักยภาพ เพื่อสร้างมูลค่าได้ต่อเนื่อง โดยยึดถือมาตรฐานและคุณภาพระดับสากล และควบคู่กับการสร้างเอกลักษณ์ไทยทางวัฒนธรรมและการให้ค่ากับสิ่งแวดล้อม ในระยะแรกมุ่งเน้นการสร้างรายได้จากการท่องเที่ยวอย่างต่อเนื่องและวางรากฐานการท่องเที่ยวที่มีมาตรฐานและคุณภาพ (กรมการท่องเที่ยว, 2553)

แผนการพัฒนาการท่องเที่ยวเชิงเกษตรในแต่ละภูมิภาคของประเทศไทย

โดยข้อมูลจาก สำนักงานสภาพัฒนาการเศรษฐกิจและสังคมแห่งชาติ (2560) ได้ระบุแผนการพัฒนาการท่องเที่ยวเชิงเกษตรในแต่ละภูมิภาคของประเทศไทย ไว้ดังนี้

ภาคเหนือ เป็นฐานทรัพยากรด้านการท่องเที่ยวที่หลากหลาย รายได้จากการท่องเที่ยวเป็นรายได้สำคัญของภาค ภาคเหนือมีแหล่งท่องเที่ยวหลากหลายที่สามารถพัฒนาเชื่อมโยงการท่องเที่ยวภายในภาคและเชื่อมโยงกับกลุ่มประเทศลุ่มน้ำโขง โดยเฉพาะการจัดกลุ่มการท่องเที่ยว (Cluster) มีการการเชื่อมโยงโครงข่ายเส้นทางคมนาคม ส่งผลให้เกิดโอกาสในการขยายตลาดการค้าการท่องเที่ยวจากการเชื่อมโยงโครงข่ายการคมนาคมตามเส้นทาง R3A ผ่าน สปป.ลาว สู่จีนตอนใต้

ภาคกลาง มีการจัดตั้งโครงการส่งเสริมการท่องเที่ยวเชื่อมโยงแหล่งประวัติศาสตร์วิถีชีวิตชุมชน พัฒนาและส่งเสริมการท่องเที่ยวเชื่อมโยงทางประวัติศาสตร์วัฒนธรรมประเพณีและวิถีชีวิตชุมชน โดยเน้นการเชื่อมโยงแหล่งท่องเที่ยวเชิงประวัติศาสตร์ เมืองมรดกโลกโบราณสถานที่สอดคล้องกัน รวมทั้งพัฒนากิจกรรมและบริการ และการท่องเที่ยวรูปแบบใหม่ให้กับนักท่องเที่ยว เช่น การท่องเที่ยวเชิงเกษตร การท่องเที่ยวโดยชุมชน การท่องเที่ยวเชิงนิเวศ เป็นต้น

ภาคตะวันออกเฉียงเหนือ เน้นการจัดทำโซนนิ่งระบบเกษตรอินทรีย์อย่างเป็นรูปธรรม โดยนำร่องในพื้นที่ที่มีความพร้อมและเหมาะสม และเชื่อมโยงไปสู่การท่องเที่ยวเชิงเกษตรหรือการท่องเที่ยววิถีไทยเพื่อขยายฐานรายได้ พร้อมทั้งจัดทำฐานข้อมูลเกษตรอินทรีย์เพื่อเป็นข้อมูลในการวางแผนการผลิตที่เหมาะสม สนับสนุนการวิจัยและพัฒนานวัตกรรมใหม่ ๆ ให้ตอบสนองตลาดสินค้าเพื่อสุขภาพและการส่งออก จัดตั้งกองทุนเกษตรอินทรีย์ ตลอดจนมาตรการส่งเสริมตลาดสีเขียวในชุมชนและท้องถิ่น

ภาคใต้ ส่งเสริมการท่องเที่ยวชุมชนให้มีความเข้มแข็งและสอดคล้องกับศักยภาพของพื้นที่โดยการพัฒนาแหล่งท่องเที่ยวชุมชนที่มีศักยภาพให้มีมาตรฐาน สนับสนุนด้านวิชาการสร้างนวัตกรรมและสนับสนุนการพัฒนาและเสริมสร้างศักยภาพคน เพื่อให้องค์กรเครือข่ายชุมชนมีความเข้มแข็งและสามารถพึ่งพาตนเอง ร่วมทั้งเป็นผู้ประกอบการที่มีส่วนร่วมในการบริหารจัดการการท่องเที่ยวของชุมชน ใช้อัตลักษณ์ความโดดเด่นบนฐานของทุนทางวัฒนธรรมและภูมิปัญญาของชุมชนเป็นจุดขายยกระดับการให้บริการด้านการท่องเที่ยวที่มีมาตรฐานของชุมชน สร้างเครือข่ายการท่องเที่ยวชุมชน

ให้เชื่อมโยงกับผู้ประกอบการท่องเที่ยวรายใหญ่และสินค้าที่ระลึกเพื่อสนับสนุนการท่องเที่ยว

กรอบแนวคิดการวิจัย

ภาพที่ 1 แสดงกรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ระเบียบวิธีวิจัยในการศึกษาครั้งนี้นั้น เป็นการวิจัยเชิงคุณภาพ (Qualitative Research) โดยมีการเก็บข้อมูลจากเอกสาร (Documentary research) และแบบสัมภาษณ์แบบเจาะลึก (In-dept Interview) มีวิธีการและขั้นตอนการเก็บข้อมูล ดังนี้

1. ผู้ให้ข้อมูลสำคัญ (Key Informants) จะทำการศึกษาโดยใช้วิธีการเลือกกลุ่มตัวอย่างแบบเฉพาะเจาะจง (Purposive Sampling) เพื่อตอบวัตถุประสงค์ข้อที่หนึ่งและข้อที่สอง ผู้ให้ข้อมูลหลักในการวิจัยทั้งหมด จำนวน 9 ท่าน ได้แก่ 1.ตัวแทนจากกลุ่มส่งเสริมและพัฒนาการท่องเที่ยวชุมชน กรมส่งเสริมการเกษตร กระทรวงเกษตรและสหกรณ์ จำนวน 1 ท่าน ตัวแทนจากกรมการท่องเที่ยว กระทรวงการท่องเที่ยวและกีฬา จำนวน 1 ท่าน ตัวแทนจากการท่องเที่ยวแห่งประเทศไทย (ททท.) จำนวน 2 ท่าน เนื่องจากเป็นผู้ที่เกี่ยวข้องหลักในการปฏิบัติตามแผนการพัฒนาการส่งเสริมการท่องเที่ยวเชิงเกษตรภายใต้หน่วยงานแต่ละกระทรวง ตัวแทนจากสภาอุตสาหกรรมการท่องเที่ยว จำนวน 1 ท่าน ตัวสมาคมธุรกิจท่องเที่ยวภายในประเทศ จำนวน 1 ท่าน และกลุ่มวิสาหกิจชุมชนท่องเที่ยวเชิงเกษตร จำนวน 2 ท่าน ได้แก่ ตัวแทนจากชุมชนบ้านห้วยห้อม จ.แม่ฮ่องสอน จำนวน 1 ท่าน เนื่องจากเป็นชุมชนท่องเที่ยวเชิงเกษตรยอดเยี่ยมอันดับ 1 ในปี พ.ศ. 2563 ตัวแทนจากกลุ่มวิสาหกิจริเช่ฟาร์ม จ.ชัยนาท จำนวน 1 ท่าน เนื่องจากเป็นชุมชนที่ได้รับมาตรฐานการท่องเที่ยวเชิงเกษตรชุมชน ในระดับดีเยี่ยม จากกรมการท่องเที่ยวในปีพ.ศ. 2565 และ บริษัท อาร์ แอนด์ ดี ครีเอชั่น จำกัด จำนวน 1 ท่าน เนื่องจากเป็นผู้ประกอบการด้านการท่องเที่ยวเชิงเกษตรที่มีประสบการณ์การส่งเสริมการท่องเที่ยวเชิงเกษตรมากกว่า 10 ปี

2. เครื่องมือที่ใช้ในการวิจัย

2.1 แบบบันทึกข้อมูลจากเอกสาร (Documentary Research) ที่สะท้อนให้เห็นสถานการณ์การขับเคลื่อนนโยบายการท่องเที่ยวเชิงเกษตรในประเทศไทย ในส่วนที่เกี่ยวข้องกับส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีตและอนาคต

2.2 แบบสัมภาษณ์แบบเจาะลึก (In-dept Interview Form) จากผู้ให้ข้อมูลสำคัญ (Key Informants)

3. การเก็บรวบรวมข้อมูล

3.1 การเก็บรวบรวมข้อมูลทุติยภูมิ โดยการค้นคว้าข้อมูลด้านเอกสาร (Documentary Research) จะช่วยให้ผู้วิจัยได้รับข้อมูลที่ครอบคลุมและนำมาใช้ในการวิเคราะห์และตัดสินใจอย่างมีประสิทธิภาพในการสนับสนุนการพัฒนาและการปรับตัวของการท่องเที่ยวเชิงเกษตรในประเทศไทย

3.2 การเก็บรวบรวมข้อมูลปฐมภูมิ ด้วยการสัมภาษณ์แบบเจาะลึก (In-dept Interview) จากผู้ให้ข้อมูลสำคัญ (Key Informant) โดยใช้วิธีการเลือกกลุ่มตัวอย่างแบบเฉพาะเจาะจง (Purposive Sampling) แบ่งออกเป็นแต่ละกลุ่ม ได้แก่ 1) หน่วยงานภาครัฐ และ 2) หน่วยงานนอกภาครัฐ เนื่องจากเป็นเป็นตัวแสดงที่มีบทบาทในการดำเนินงานเกี่ยวกับการท่องเที่ยวเชิงเกษตร เพื่อสะท้อนประเด็นการดำเนินกิจกรรมในพื้นที่ทั้งในอดีตและเพื่อการคาดการณ์การท่องเที่ยวเชิงเกษตรในอนาคต

4. การวิเคราะห์ข้อมูล หลังจากที่ผู้ศึกษาได้ทำการรวบรวมข้อมูลจากเอกสาร (Documentary Research) และข้อมูลจากการสัมภาษณ์เชิงลึก มาสรุปความเพื่อให้เห็นถึงประเด็นต่าง ๆ ที่ หลังจากนั้นจึงนำข้อมูลที่ศึกษาได้ทั้งหมดมาวิเคราะห์ตามทฤษฎีที่เกี่ยวข้อง โดยทำการตีความและวิเคราะห์จากเนื้อหา (Content Analysis) และวิธีการอธิบายเชิงพรรณนา (Descriptive research) เพื่อนำมาสรุปผลการศึกษาเพื่อเป็นประโยชน์ต่อไป

ผลการวิจัย

การศึกษาปัจจัยความสำเร็จของการดำเนินนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในประเทศไทย ประกอบไปด้วยวัตถุประสงค์สองประการ ได้แก่ 1) เพื่อศึกษาปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีต และ 2) เพื่อวิเคราะห์ปัจจัยท้าทายความสำเร็จในอนาคตเพื่อการพยากรณ์แนวทางการดำเนินนโยบายด้านการท่องเที่ยวเชิงเกษตร ดังตารางต่อไปนี้

ตารางที่ 1 แสดงปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีตและอนาคต

ปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรใน**อดีต**		ปัจจัยท้าทายความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรใน**อนาคต**	
ปัจจัยสนับสนุน	**ปัจจัยอุปสรรค**	**ปัจจัยสนับสนุน**	**ปัจจัยอุปสรรค**
1.วัตถุประสงค์ของนโยบาย	1.การวัดผลโครงการยังไม่มีความชัดเจน	1.กระแสความนิยมเพิ่มขึ้นอย่างต่อเนื่อง	1.ข้อจำกัดของการจัดทำนโยบาย
2.หน่วยงานราชการและเอกชนมีการบูรณาการร่วมกัน	2.นโยบายเน้นส่งเสริมด้านการท่องเที่ยวมากกว่าด้านการเกษตร	2.เกิดเครือข่ายและมีการบูรณาการร่วมกัน	2.องค์ความรู้ของเกษตรกร
3.บุคลากรเพียงพอและมีองค์ความรู้	3.การจัดสรรงบประมาณ	3.การประยุกต์ใช้เทคโนโลยีเพิ่มมากขึ้น	3.การไม่มีหน่วยงานรับผิดชอบหลักในด้านของการท่องเที่ยวเชิงเกษตรโดยตรง

ปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรใน**อดีต**		ปัจจัยท้าทายความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรใน**อนาคต**	
ปัจจัยสนับสนุน	**ปัจจัยอุปสรรค**	**ปัจจัยสนับสนุน**	**ปัจจัยอุปสรรค**
4.ภารกิจของหน่วยงานที่ได้รับมอบหมายมีความชัดเจน	4.สภาพอากาศ/ภาวะโลกร้อน		4.ความสามารถในการรองรับนักท่องเที่ยวของพื้นที่
5.การนำเทคโนโลยีมาใช้ประโยชน์			5.วาระการสนับสนุนจากฝ่ายการเมือง
6.ประชาชนให้ความสนใจมากขึ้น			6.นายทุนแสวงหาผลกำไรจากพื้นที่ของเกษตรกร
7.การสนับสนุนจากฝ่ายการเมือง			7.สภาพอากาศ/ภาวะโลกร้อน
			8.เทคโนโลยี

ดังนั้นสามารถสะท้อนได้ว่า ปัจจัยที่ส่งผลต่อความสำเร็จในการขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในอดีตและในอนาคตนั้นมีจุดร่วมกันในมิติของกระแสความนิยมด้านการท่องเที่ยวเชิงเกษตรที่มีแนวโน้มเพิ่มขึ้นอย่างต่อเนื่อง ทำให้การท่องเที่ยวเชิงเกษตรได้เป็นที่นิยมและเติบโตมากขึ้นจากอดีตสู่ปัจจุบันและในอนาคตอันใกล้นี้ และในด้านของหน่วยงานราชการก็ได้มีการบูรณาการร่วมกันทั้งในระหว่างหน่วยงานราชการกับหน่วยงานราชการ และหน่วยงานราชการกับภาคเอกชน จึงเกิดเครือข่ายที่กว้างและแข็งแรงมากขึ้นในด้านการท่องเที่ยวเชิงเกษตร รวมถึงการนำเทคโนโลยีมาประยุกต์ใช้ในมิติต่าง ๆ ของการส่งเสริมการท่องเที่ยวเชิงเกษตรทั้งในภาครัฐและภาคเอกชน

อย่างไรก็ตาม ข้อจำกัดหรือปัจจัยท้าทายจากอดีตสู่การพยากรณ์ในอนาคต กล่าวคือ ด้านข้อจำกัดของนโยบายไม่ว่าจะเป็นด้านความชัดเจนของการวัดผลโครงการ วัตถุประสงค์ของนโยบายและหน่วยงานที่ตอบรับนโยบายการท่องเที่ยวเชิงเกษตร เนื่องจากยังไม่มีหน่วยงานหลักในการรับผิดชอบเรื่องการท่องเที่ยวเชิงเกษตรโดยตรง อีกทั้งสิ่งที่สำคัญอีกอย่างหนึ่ง คือ สภาพภูมิอากาศและภาวะโลกร้อน ซึ่งส่งผลโดยตรงกับผลผลิตทางธรรมชาติ และฤดูกาลท่องเที่ยว ทำให้เป็นสิ่งที่จำเป็นอย่างมากต่อแรงจูงใจนักท่องเที่ยวในการเลือกจุดหมายปลายทางของแหล่งท่องเที่ยวเชิงเกษตร

สรุปและอภิปรายผล

จากผลการวิจัยข้างต้นสามารถอภิปรายผลแบ่งออกเป็น 4 ส่วน ดังนี้

1. ปัจจัยสนับสนุนในอดีตและยังคงเป็นปัจจัยสนับสนุนในอนาคต

1.1 การเชื่อมโยงและบูรณาการระหว่างหน่วยงานราชการและภาคเอกชนเพื่อสนับสนุนการท่องเที่ยวเชิงเกษตรเป็นเรื่องที่สำคัญและเกิดขึ้นอย่างต่อเนื่อง โดยมีการทำในหลายมิติ เช่น การร่วมกันระหว่างหน่วยงานราชการ ระหว่างภาคเอกชน และระหว่างราชการกับภาคเอกชน เพื่อจัดกิจกรรมการส่งเสริมการท่องเที่ยวเชิงเกษตร เช่น การจัดโครงการและการประชาสัมพันธ์ ทำให้กิจกรรมการส่งเสริมการท่องเที่ยวเชิงเกษตรเป็นไปได้อย่างเรียบร้อยและประสบความสำเร็จในการจัดทำโครงการได้ดีเยี่ยมโดยสอดคล้องกับงานวิจัยของ ธนเทพ ทองชมภู (2561) เรื่อง ปัจจัยที่ส่งผลต่อความสำเร็จในการนำนโยบายเกี่ยวกับความโปร่งใสและเสริมสร้างคุณธรรมและจริยธรรมกรมพัฒนาที่ดินไปปฏิบัติที่ได้กล่าว

ไว้ว่า ความสำเร็จที่เกิดขึ้นนั้น ล้วนเป็นผลมาจากปัจจัยทางด้านต่าง ๆ ความร่วมมือภายในองค์กร ตั้งแต่ระดับผู้นำและผู้ปฏิบัติในทุกระดับ ประกอบกับการให้ความสำคัญกับการสร้างและสนับสนุนเครือข่ายความร่วมมือกับภาคส่วนต่าง ๆ

1.2 หลังจากวิกฤตการณ์โควิด-19 ลดลง ความนิยมในการกลับสู่ธรรมชาติมีการเพิ่มขึ้น ทำให้การท่องเที่ยวเชิงเกษตรเป็นที่นิยมมากขึ้น เนื่องจากนักท่องเที่ยวและประชาชนต้องการใกล้ชิดธรรมชาติมากยิ่งขึ้น การท่องเที่ยวเชิงเกษตรดังกล่าวตอบสนองความต้องการดังกล่าวอย่างดี โดยเน้นการให้ประสบการณ์ใกล้ชิดธรรมชาติผ่านการเรียนรู้และกิจกรรมต่าง ๆ จากผลิตผลและผลิตภัณฑ์ท้องถิ่นที่เป็นเครื่องมือสำคัญ ซึ่งเชื่อมโยงกับแนวคิดการเกษตรวิถีใหม่ของกรมส่งเสริมการเกษตร ในการพัฒนาและปรับเปลี่ยนภาคการเกษตรเพื่อเสริมสร้างเศรษฐกิจชุมชน โดยการสร้างคลัสเตอร์การท่องเที่ยวเพื่อสร้างโอกาสเพิ่มรายได้และงานอาชีพให้กับพื้นที่การเกษตรอย่างมากขึ้น

1.3 เทคโนโลยีเป็นสิ่งจำเป็นมากในปัจจุบัน เพราะสามารถเป็นสื่อกลางในการสื่อสารระหว่างบุคคลและองค์กรได้อย่างสะดวกและรวดเร็ว หน่วยงานราชการได้ปรับตัวและใช้เทคโนโลยีในการประชาสัมพันธ์และเป็นแหล่งข้อมูลท่องเที่ยวเชิงเกษตรได้ ในภาคเอกชนเจ้าของพื้นที่และผู้ประกอบการท่องเที่ยวได้ใช้ช่องทางออนไลน์เพิ่มขึ้น เช่น Facebook TikTok และ Youtube เพื่อสร้างการรับรู้และประชาสัมพันธ์เกี่ยวกับท่องเที่ยวเชิงเกษตร ทำให้การท่องเที่ยวเชิงเกษตรเป็นที่รู้จักมากขึ้นทั้งในกลุ่มนักท่องเที่ยวและประชาชนทั่วไป ซึ่งสอดคล้องกับงานวิจัยของ วัชรินทร์ สุทธิศัย (2557) เรื่อง ปัจจัยที่มีผลต่อความสำเร็จในการนำนโยบายมหาวิทยาลัยราชภัฏไปปฏิบัติ: กรณีศึกษามหาวิทยาลัยราชภัฏกลุ่มภาคตะวันออกเฉียงเหนือ ที่ได้กล่าวไว้ว่า ความเจริญก้าวหน้าทางเทคโนโลยีมีผลความสำเร็จ เพื่อให้ความก้าวหน้าและพัฒนาการให้ทันสมัย ทันเหตุการณ์ และสามารถนำไปปรับใช้ในการดำเนินงานมากขึ้น ซึ่งเทคโนโลยีมีผลช่วยให้การทำงานคล่องตัวรวดเร็วขึ้น การสื่อสารสะดวกขึ้น ทำให้การประสานงานได้รวดเร็วการเข้าถึงข้อมูลที่เป็นประโยชน์ต่อการดำเนินงานมากยิ่งขึ้น

2. ปัจจัยสนับสนุนในอดีตแต่ไม่ได้สนับสนุนในอนาคต

2.1 นโยบายการท่องเที่ยวในช่วงเวลาที่ผ่านมามุ่งเน้นการจัดโครงการหรือกิจกรรมส่งเสริมการท่องเที่ยวในมิติต่าง ๆ โดยมีเป้าหมาย เช่น ส่งเสริมผลิตภัณฑ์และการท่องเที่ยวเมืองรอง และการสร้างและกระจายรายได้สู่ชุมชนโดยเน้นการพัฒนาจากฐานราก อย่างไรก็ตาม วัตถุประสงค์ของแต่ละนโยบายไม่ค่อยชัดเจนมากพอ เนื่องจากการจัดตั้งโครงการหรือนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรมักเป็นเพียงการจัดทำเพียงครั้งคราว ซึ่งไม่สามารถคาดการณ์ได้ว่าจะไปสู่ทิศทางหรือรูปแบบที่ชัดเจนได้เช่นเดิม เนื่องจากมีความเป็นไปได้ที่มุมมองและสถานการณ์โลกอาจเปลี่ยนแปลงได้ตลอดเวลาในการปฏิบัติตามนโยบายนั้น การกำหนดวัตถุประสงค์และมาตรฐานของนโยบายเป็นสิ่งสำคัญในการกำหนดทิศทางและความสำเร็จของโครงการ แต่การสำเร็จของโครงการนั้นขึ้นอยู่กับวัตถุประสงค์ของแต่ละนโยบายว่ามีความชัดเจนมากน้อยเพียงใด ซึ่งเป็นองค์ประกอบพื้นฐานที่สำคัญในการกำหนดการปฏิบัติตามนโยบายและความก้าวหน้าของแผนงาน โครงการต่าง ๆ ที่ได้ปฏิบัติขึ้นจึงสามารถสำเร็จได้มากน้อยเช่นเดียวกับวัตถุประสงค์ของนโยบายนั้น ๆ

2.2 เนื่องจากการจัดสรรงบประมาณมักเป็นเรื่องรายปี ซึ่งต้องได้รับการอนุมัติจากคณะกรรมการที่เกี่ยวข้อง การจัดสรรงบประมาณเช่นนี้อาจทำให้บางกิจกรรมไม่ได้รับการจัดสรรงบประมาณเหมือนเดิมหรือบางกิจกรรมอาจไม่ได้รับงบประมาณเลย ซึ่งสร้างความไม่แน่นอนและไม่สามารถคาดการณ์ได้ล่วงหน้าซึ่งสอดคล้องกับงานวิจัยของ อรวรรณ คำมาก (2554) เรื่อง ปัจจัยที่ส่งผล

ต่อความสำเร็จของการนำนโยบายการกระจายอำนาจการบริหารและการจัดการศึกษาไปปฏิบัติในสถานศึกษาขั้นพื้นฐาน สังกัดสำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน เขตตรวจราชการกระทรวงศึกษาธิการที่ 6 ที่ได้กล่าวไว้ว่า ปัจจัยด้านทรัพยากรของนโยบาย งบประมาณยังไม่เพียงพอ มีความล่าช้าในการโอนจัดสรรงบประมาณ ขาดความคล่องตัวในการดำเนินการ สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน ได้รับการสนับสนุนสิ่งอำนวยความสะดวกต่าง ๆ ค่อนข้างน้อย ยังคงเป็นอุปสรรคและสิ่งที่ท้าทายการบริหารจัดการของภาครัฐในการดำเนินกิจกรรมภายใต้ภารกิจต่าง ๆ ซึ่งควรได้รับการพัฒนาในอนาคต

2.3 บุคลากรที่เกี่ยวข้องกับการท่องเที่ยวเชิงเกษตรมีการผลัดเปลี่ยนตามวาระงานอยู่เสมอ เช่น ผู้ว่าราชการจังหวัด หัวหน้าส่วนราชการประจำจังหวัด และข้าราชการพลเรือน เป็นต้น ในบางหน่วยงานราชการมีวาระการดำรงตำแหน่ง และบางส่วนนั้นมีการโยกย้ายอยู่เสมอ อาจทำให้เกิดความไม่ต่อเนื่องของการพัฒนาและการจัดกิจกรรมส่งเสริมการเกษตรในพื้นที่นั้น ๆ ได้อย่างไม่ต่อเนื่อง สอดรับกับ Edwards and Sharkansky (1978) ที่ได้กล่าวว่า การนำโยบายไปปฏิบัติให้เกิดผลดีนั้น จะต้องมีทรัพยากรสนับสนุน อันได้แก่ จำนวนบุคลากร ข้อมูลที่ทันสมัย การมอบอำนาจหน้าที่ในการดำเนินงานการจัดสรรงบประมาณ การให้คำแนะนำและความช่วยเหลือแก่ผู้ปฏิบัติงานในระดับล่าง

2.4 ภารกิจของหน่วยงานที่ได้รับมอบหมายในการส่งเสริมการท่องเที่ยวเชิงเกษตรมีความชัดเจนเพียงพอ แต่เนื่องจากภารกิจของแต่ละหน่วยงานที่ได้รับมอบหมายขึ้นอยู่กับคำสั่งจากส่วนกลาง ซึ่งอาจทำให้โครงการแต่ละรายการไม่มีความต่อเนื่อง และภารกิจของหน่วยงานราชการบางส่วนอาจไม่ครอบคลุมทุกด้านของการท่องเที่ยวเชิงเกษตร จึงต้องพึ่งพาการร่วมมือจากเครือข่ายการท่องเที่ยวเชิงเกษตรทั้งรัฐและเอกชน ซึ่งอาจทำให้ขาดความคล่องตัวในการพัฒนาและช้าต่อการขับเคลื่อนการท่องเที่ยวเชิงเกษตรอย่างทันท่วงที โดยเกิดการปฏิบัติตามแนวคิดแบบบนลงล่าง (Top-Down) ซึ่งเชื่อมโยงกับนโยบายและการนำไปปฏิบัติ โดยการวางแผนนโยบายเป็นการบริหารด้านบน และการปฏิบัติเป็นเรื่องของระดับล่าง โดยมีการปฏิสัมพันธ์กันอยู่ตลอดเวลาในระดับต่าง ๆ ของการบริหารงานในหน่วยงานราชการ

2.5 ในช่วงเวลาที่ผ่านมาการท่องเที่ยวเชิงเกษตร ฝ่ายการเมืองนั้นได้มีการผลัดเปลี่ยนตามวาระทางการเมืองภายใต้ระบอบการปกครองแบบประชาธิปไตย ทำให้การสนับสนุนการท่องเที่ยวเชิงเกษตรจากฝ่ายการเมืองในอนาคตนั้นเป็นสิ่งที่ยากต่อการคาดการณ์ เนื่องด้วยแต่ละพรรคการเมืองนั้นได้มีแนวทางการพัฒนาที่แตกต่างกันตามเป้าประสงค์และวิสัยทัศน์ของพรรคการเมืองนั้น ๆ ซึ่งอาจเกิดการสนับสนุนการท่องเที่ยวเชิงเกษตรในอนาคตนั้นมากขึ้นหรือลดน้อยลงเป็นสิ่งที่ท้าทายอย่างมากในอนาคต

3. ปัจจัยที่เป็นอุปสรรคในอดีตและยังคงเป็นอุปสรรคในอนาคต

3.1 การจัดทำนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรมีข้อจำกัดหลายประการ เช่น 1) ความอ่อนไหวของพื้นที่การท่องเที่ยวเชิงเกษตร เช่น พื้นที่ชายขอบ หรือกรรมสิทธิ์ที่ดินต่าง ๆ อาจจะเป็นข้อจำกัดของการทำนโยบายในเชิงนี้ 2) การวัดผลโครงการยังไม่มีความชัดเจนและเป็นรูปธรรมมากพอในด้านตัวชี้วัดประสิทธิภาพหลัก (KPI) ทั้งในด้านผลลัพธ์เชิงคุณภาพและปริมาณของการจัดกิจกรรมส่งเสริมการท่องเที่ยวเชิงเกษตรและการทำงานของบุคลากรที่เกี่ยวข้อง และ 3) ยังไม่มีหน่วยงานที่เฉพาะเจาะจงที่รับผิดชอบในการส่งเสริมการท่องเที่ยวเชิงเกษตรโดยตรง ซึ่งทำให้การขับเคลื่อนนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรมีความล่าช้าและซับซ้อนในการปฏิบัติ และยังสร้างความสับสน

ต่อผู้ประกอบการด้านการท่องเที่ยว เกษตรกร และนักท่องเที่ยวในการติดต่อสื่อสารและขอความช่วยเหลือด้านต่างๆ ด้วยทั้งนี้ยังสอดคล้องกับงานวิจัยของ อิทธิชัย สีดำ (2553) เรื่องปัจจัยที่มีอิทธิพลต่อความสำเร็จในการนำนโยบายเสริมสร้างสันติสุขในพื้นที่จังหวัดชายแดนภาคใต้ไปปฏิบัติ: ศึกษากรณีผู้นำนโยบายไปปฏิบัติในจังหวัดปัตตานี ที่ได้กล่าวว่า ผู้นำนโยบายไปปฏิบัติรับรู้และเข้าใจวัตถุประสงค์ของนโยบายได้เป็นอย่างดี วัตถุประสงค์ของนโยบายมีความชัดเจนและสามารถเข้าใจได้ง่าย ตลอดถึงนโยบายมีตัวชี้วัดความสำเร็จที่ชัดเจนนั้น มีผลกับปัจจัยที่มีอิทธิพลต่อความสำเร็จในการนำนโยบายไปปฏิบัติ

3.2 การผันผวนของสภาพอากาศและภาวะโลกร้อนนั้นมีผลต่อทั้งมิติพื้นที่การท่องเที่ยวเชิงเกษตรและฤดูกาลการท่องเที่ยว และส่งผลต่อการตัดสินใจของนักท่องเที่ยวอย่างมาก และเป็นสิ่งที่ไม่สามารถคาดการณ์ได้ ทำให้ยังคงเป็นข้อจำกัดและเป็นสิ่งที่ท้าทายเป็นอย่างมากจากอดีตจนถึงปัจจุบันและยังส่งผลต่ออนาคตด้วยเช่นกัน สอดคล้องกับงานวิจัยของ ศุภกร ชินวรรโณ (2559) เรื่อง โครงการการจัดทำรายงานสังเคราะห์และประมวลสถานภาพองค์ความรู้ ด้านการเปลี่ยนแปลงสภาพภูมิอากาศของไทย ครั้งที่ 2 ด้านความเสี่ยงและการปรับตัวต่อการเปลี่ยนแปลงภูมิอากาศ ได้อธิบายไว้ว่า การเปลี่ยนแปลงภูมิอากาศอาจมีผลต่อสภาพของแหล่งท่องเที่ยวโดยเฉพาะอย่างยิ่งในพื้นที่เป็นระบบนิเวศที่เปราะบาง เช่น การเปลี่ยนแปลงอุณหภูมิและความชื้นในอากาศอาจทำให้พืชบางชนิดไม่สามารถรอดตามได้

4. ปัจจัยที่เป็นอุปสรรคในอดีตแต่ไม่เป็นอุปสรรคในอนาคต

4.1 การจัดสรรงบประมาณ การใช้เทคโนโลยีมีบทบาทสำคัญมากขึ้นและมีผลกระทบต่อกิจกรรมการท่องเที่ยวเชิงเกษตร บางกิจกรรมได้เปลี่ยนรูปแบบไปสู่ช่องทางออนไลน์มากขึ้น ซึ่งช่วยลดค่าใช้จ่ายทั้งในด้านค่าสถานที่ ค่าเดินทาง และค่าอาหารในขณะที่เพิ่มความสะดวกสบายในการเข้าถึงข้อมูลและบริการสำหรับนักท่องเที่ยวและผู้ประกอบการ เทคโนโลยีที่เติบโตขึ้นยังสร้างโอกาสให้บุคคลที่สร้างสรรค์เนื้อหา (Content Creator) ในภาคเอกชนสามารถสร้างความรู้สำหรับผู้คนและส่งเสริมการท่องเที่ยวเชิงเกษตรได้ผ่านสื่อออนไลน์ สอดคล้องกับงานวิจัยของ นพภัค จิตมั่นคงธรรม (2562) เรื่องการศึกษาปัจจัยที่ส่งผลต่อความสำเร็จของการนำนโยบายประกันคุณภาพการศึกษาไปปฏิบัติ: กรณีศึกษามหาวิทยาลัยวิจัยแห่งชาติได้กล่าวไว้ว่า ปัจจัยด้านทรัพยากร มีผลต่อความสำเร็จของการนำนโนบายไปปฏิบัติ ซึ่งทรัพยากรก็เป็นหนึ่งสิ่งสำคัญที่สะท้อนให้เห็นอย่างเด่นชัดว่า การมีงบประมาณหรือทรัพยากรของนโยบายที่เหมาะสมจะสามารถสอดรับกับกิจกรรมการดำเนินงานด้านนี้ให้สามารถขับเคลื่อนงานและบรรลุเป้าหมายตามวัตถุประสงค์ที่ตั้งไว้ได้

ดังนั้นจากการอภิปรายผลการศึกษาดังกล่าว ค้นพบได้ว่าการท่องเที่ยวเชิงเกษตรนั้น การมีเครือข่ายและการบูรณาการร่วมกันระหว่างคนในพื้นที่เป็นสิ่งที่จำเป็นเป็นอย่างมาก เนื่องจากการท่องเที่ยวเชิงเกษตรโดยชุมชนนั้น จำเป็นต้องอาศัยความเข้มแข็งของท้องถิ่น และภาครัฐควรปรับเปลี่ยนบทบาทเน้นการจัดการภาครัฐแนวใหม่ (New Public Management) โดยรัฐจะมีบทบาทหน้าที่เฉพาะในส่วนที่จำเป็นจะต้องทำเท่านั้น เพื่อเปิดโอกาสให้ประชาชนและชุมชนมีบทบาทมากขึ้น และให้ชุมชนมีความยั่งยืน สามารถพัฒนาและต่อยอดทรัพยากรแหล่งท่องเที่ยวเชิงเกษตรของตนเองได้โดยการมีส่วนร่วมของคนในพื้นที่ เนื่องจากแหล่งท่องเที่ยวเชิงเกษตรจำเป็นต้องอาศัยทุนทางธรรมชาติและทุนทางสังคม คนในพื้นที่จำเป็นต้องร่วมกันอนุรักษ์และรักษาอัตลักษณ์ของคนในท้องถิ่นเพื่อสร้างจุดดึงดูดให้แก่นักท่องเที่ยวเยี่ยมชมและสามารถร่วมสัมผัสวิถีชีวิตของแต่ละท้องถิ่น โดยการมีเครือข่ายทางสังคมถือเป็นทุนทางสังคม (Social capital) ที่จะเพิ่มความสำเร็จให้กับทั้งภาครัฐและเอกชน ให้มีความสัมพันธ์ที่ดีร่วมกัน มีการเชื่อมโยงประสานงานกันดีขึ้น ทั้งยังสามารถดึงทรัพยากรของแต่ละองค์กรมาประสาน

เชื่อมโยงกันเพื่อให้เกิดประโยชน์ได้อย่างมีประสิทธิภาพ และสามารถตอบสนองการการขยายตัวเพิ่มของแหล่งท่องเที่ยวเชิงเกษตรอย่างน้อย 15 ชุมชนในอนาคต เนื่องจากเมื่อแต่ละชุมชนเข้มแข็งแล้วนั้นจะสามารถเป็นต้นแบบให้ชุมชนอื่น ๆ สามารถนำมาเป็นต้นแบบหรือนำมาถอดบทเรียนจากความสำเร็จเพื่อพัฒนาชุมชนอื่น ๆ ได้ต่อไป และยังเกิดเครือข่ายการท่องเที่ยวเชิงเกษตรโดยชุมชนเพิ่มมากขึ้นอีกด้วย

ทั้งนี้ ในแต่ละภูมิภาคนั้นมีอัตลักษณ์ของตนเองอย่างเฉพาะเจาะจงและมีความแตกต่างกัน การส่งเสริมการท่องเที่ยวเชิงเกษตรของประเทศไทยในมิติการท่องเที่ยวโดยชุมชนนั้น ก็ย่อมแตกต่างกันออกไปในแต่ละท้องถิ่น แต่อย่างไรก็ตามความต้องการให้เกิดการขยายตัวเพิ่มของแหล่งท่องเที่ยวเชิงเกษตรอย่างน้อย 15 ชุมชนในอนาคตภายใต้แผนงานของภาครัฐนั้นจำเป็นต้องคำนึงถึงการจัดทำนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรในชุมชนด้วยการมีส่วนร่วมของคนในพื้นที่ และสอดคล้องกับความต้องการหลักของคนในท้องถิ่น รวมถึงความครอบคลุมของกฎหมายด้านต่าง ๆ อาทิ กรรมสิทธิ์ในที่ดินทำกิน ความอ่อนไหวของบริเวณพื้นที่ชายขอบหรือกลุ่มชาติพันธุ์ต่าง ๆ และการผันผวนของสภาพอากาศและภาวะโลกร้อน ที่มีผลโดยตรงต่อผลผลิตทางการเกษตรที่เป็นปัจจัยสำคัญในการเป็นจุดดึงดูดนักท่องเที่ยวให้เข้ามาในพื้นที่มากยิ่งขึ้น

ข้อเสนอแนะ

1. การวางนโยบายการส่งเสริมการท่องเที่ยวเชิงเกษตรควรเน้นให้ชุมชนหรือเจ้าของพื้นที่การท่องเที่ยวเชิงเกษตรมีส่วนร่วมกับภาครัฐมากขึ้น โดยการสร้างเครือข่ายในท้องถิ่นให้เข้มแข็งและเปิดโอกาสให้ประชาชนเข้าร่วมในการวางแผนโครงการส่งเสริมการท่องเที่ยวเชิงเกษตร
2. หน่วยงานราชการที่เกี่ยวข้องกับการท่องเที่ยวเชิงเกษตรควรมีนโยบายการสำรวจพื้นที่ท่องเที่ยวเชิงเกษตร เพื่อเข้าใจทรัพยากรท้องถิ่นและรับฟังความต้องการของประชาชนในการพัฒนาพื้นที่แต่ละพื้นที่มีเอกลักษณ์และความหลากหลายในสินค้าและบริการท่องเที่ยวเชิงเกษตร
3. การกำหนดนโยบายการพัฒนาในทุกระดับ จำเป็นต้องสอดคล้องกันทั้งในมิติต่าง ๆ เช่น การพัฒนาแหล่งท่องเที่ยวเชิงเกษตรต้องไปพร้อมกับการพัฒนาโครงสร้างพื้นฐาน เช่น ระบบไฟฟ้า การคมนาคม และการให้ความรู้ให้กับประชาชนในพื้นที่ การกำหนดนโยบายควรมุ่งเน้นให้มีความเชื่อมโยงกันในทุกมิติเพื่อการพัฒนาที่ยั่งยืนและเชื่อมโยงทุกระดับอย่างเหมาะสมและต่อเนื่องไปในอนาคต
4. การจัดทำนโยบายส่งเสริมการท่องเที่ยวเชิงเกษตร ควรพัฒนาในพื้นที่ภาคตะวันออกเฉียงเหนือให้มากขึ้น เนื่องจากเป็นภูมิภาคที่มีแหล่งทำการเพาะปลูกข้าวที่ใหญ่ที่สุดของประเทศ โดยข้าวซึ่งเป็นผลิตภัณฑ์หลักของประเทศ ดังนั้น ควรนำอัตลักษณ์การเกษตรของภาคตะวันออกเฉียงเหนือให้ทรงคุณค่ามากยิ่งขึ้น และสามารถเพิ่มรายได้ทางการท่องเที่ยวเชิงเกษตรให้กับภาคตะวันออกเฉียงเหนือได้เพิ่มมากขึ้นด้วยเช่นกัน

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แนวทางและปัญหาอุปสรรคในการจัดการขยะของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

Guidelines of Solid Waste Management by Kamphaengphet Subdistrict Municipality Rattaphum District, Songkhla Province

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บทคัดย่อ

การวิจัยเชิงคุณภาพนี้มีวัตถุประสงค์เพื่อศึกษาแนวทางและปัญหาอุปสรรคในจัดการขยะของเทศบาลตำบลกำแพงเพชร เก็บรวบรวมข้อมูลโดยใช้วิธีการสัมภาษณ์ ผู้บริหารเทศบาลตำบลกำแพงเพชร ได้แก่ นายกเทศมนตรี ปลัดเทศบาล และผู้อำนวยการกองสาธารณสุขและสิ่งแวดล้อม พนักงานผู้ปฏิบัติงาน ได้แก่ พนักงานขับรถเก็บขยะ พนักงานประจำรถเก็บรวบรวมขยะ และประชาชนที่อาศัยอยู่ในพื้นที่ชุมชนตลาดสด จำนวน 4 คน เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล คือ แบบสัมภาษณ์กึ่งโครงสร้าง จำนวน 3 ฉบับ ใช้การวิเคราะห์เนื้อหา

ผลการศึกษาพบว่า 1) เทศบาลตำบลกำแพงเพชรได้ดำเนินการบริหารจัดการขยะชุมชน ส่งเสริมให้ทุกครัวเรือนทำการแยกขยะตั้งแต่ต้นทาง กลางทาง และปลายทาง ทางเทศบาลได้จัดให้มีการดำเนินการเพื่อลดแหล่งผลิตปริมาณขยะมูลฝอยจากครัวเรือนลง โดยเน้นการใช้หลัก 3R คือ หลักการลดปริมาณขยะมูลฝอย R ที่ 1 Reduced R ที่ 2 คือการใช้วัสดุให้คุ้มค่า ก็คือ Reuse R ที่ 3 คือ การนำขยะมูลฝอยที่มีประโยชน์กลับมาใช้ใหม่หรือ Recycle เป็นหลัก 3R โดยการสร้างกระบวนการมีส่วนร่วมของชุมชน และมีการให้ความรู้กับประชาชน สร้างความรู้ความเข้าใจ ให้ประชาชนได้มีความรู้ถึงการคัดแยกขยะ จากครัวเรือนหรือจากต้นทางเพื่อนำไปสู่การลดปริมาณขยะมูลฝอยในอนาคต ภายใต้โครงการที่ทางเทศบาลได้จัดทำขึ้น โครงการเพิ่มศักยภาพชุมชนปลอดขยะ

2) ปัญหาและอุปสรรค ประชาชนที่อาศัยอยู่บริเวณใกล้เคียงได้นำขยะจากพื้นที่ใกล้เคียงมาทิ้งในพื้นที่เทศบาลตำบลกำแพงเพชร ปัญหาต่อเนื่องจากขยะนอกเขต คือ ขยะตกค้างในวันถัดไปในเรื่องของรถเก็บขนขยะ ซึ่งคันเล็กจะสามารถเก็บคนขยะได้ในปริมาณน้อยมาก ๆ ปัญหาที่ตามมา คือ ต้องใช้เวลานานในการเก็บขน อีกปัญหาใหญ่ คือ มีคำสั่งปิดหลุมขยะ แล้วเอาไปกำจัดที่เทศบาลเมืองบ้านพรุ ปัญหาคือต้องเพิ่มค่าใช้จ่ายในการนำขยะไปกำจัด อยู่ที่ประมาณปีละ 700,000 กว่าบาท

คำสำคัญ การจัดการ, ขยะมูลฝอย, การมีส่วนร่วมของประชาชน

Abstract

The primary objective of this research is to investigate the solid waste management procedures implemented by the Kamphaeng Phet Subdistrict Municipality, as well as to identify and analyze the associated challenges encountered within the same context. Employing qualitative research methodologies, data collection was conducted utilizing the interview method, with participants into three distinct groups: 1) Administrators of the Kamphaeng Phet Subdistrict Municipality, including key figures such as the Mayor, Municipality Permanent Secretary, and Director of the Public Health and Environment Division; 2) Employees involved in waste management operations, such as garbage collection drivers and personnel operating garbage collection vehicles; and 3) Residents residing in the vicinity of the fresh market community area, totaling four individuals. Data ollection instruments comprised three interview forms tailored to each participant group. The research instrument used for collecting data is three semi-structured interviews using content analysis.

The study's findings elucidate two primary observations:

The Kamphaeng Phe Subdistrict Municipality has instituted comprehensive community waste management strategies aimed at fostering waste segregation practices at the household level, during transportation, and at the point of disposal. Notably, these initiatives have led to a reduction in household waste generation, facilitated by organized efforts to diminish waste production sources. Central to these endeavors is the emphasis placed on the adoption of the "3R" principle—comprising waste reduction, reuse, and recycling-through community engagement initiatives and public education campaigns. These activities aim to engender public awareness and comprehension concerning proper waste segregation practices, with the overarching objective of mitigating solid waste volumes in the future. These initiatives are encapsulated within the framework of the municipality's Waste-Free Communities enhancement project.

Despite commendable efforts, the study highlights persistent challenges and obstacles. Notably, residents from neighboring areas continue to dispose of their waste within the jurisdiction of the Kamphaeng Phet Subdistrict Municipality, exacerbating waste management burdens. Furthermore, logistical challenges ensue from the limited capacity of garbage collection trucks, resulting in prolonged waste collection cycles. Additionally, the mandated closure of the local garbage pit necessitates the transportation of waste to the Ban Phru Municipality for disposal, incurring significant additional costs estimated at approximately 700,000 baht annually.

Keywords: Management, Solid Waste, Public Participation

บทนำ

ปัญหาการจัดการขยะเป็นภัยคุกคามสำคัญของการจัดการเมืองในยุคสมัยอันมีผลโดยตรงต่อความสำเร็จหรือล้มเหลวในการจัดการเมืองและส่งผลต่อการพัฒนาที่ยังยืนของเมืองด้วย (Hildebrand, Kanaley, & Roberts, 2013; National Geographic, 2021) ซึ่งการจัดการขยะถือเป็นเป้าหมายด้านหนึ่งที่มีความสำคัญตามเป้าหมายการพัฒนาที่ยั่งยืน (Sustainable Development Goals: SDGs)

โดยเฉพาะอย่างยิ่งในเรื่องของเมืองและถิ่นฐานมนุษย์ที่ยั่งยืน (SDG 11) การบริโภคและการพัฒนาที่ยั่งยืน (SDG 12) และการใช้ประโยชน์จากมหาสมุทรและทรัพยากรทางทะเล (SDG 14) เช่น SDG 11.6 จะต้องลดผลกระทบด้านลบที่เกิดจากผลกระทบของชุมชนเมืองที่มีต่อสิ่งแวดล้อม ซึ่งจะรวมถึงการให้ความใส่ใจเป็นกรณีพิเศษต่อคุณภาพของอากาศรวมทั้งการจัดการขยะชุมชนและขยะประเภทอื่น SDG 12.5 จะต้องลดการสร้างขยะได้อย่างเป็นที่ประจักษ์ด้วยการป้องกัน การลดจำนวน การนำขยะกลับมาแปรรูปเพื่อใช้ใหม่ และการนำขยะกลับมาใช้ซ้ำ SDG 14.1 จะต้องสามารถป้องกันและลดมลภาวะทุกประเภทในแม่น้ำได้อย่างเป็นที่ประจักษ์ โดยเฉพาะมลภาวะที่เกิดขึ้นจากการดำเนินการบนพื้นดินซึ่งจะรวมถึงขยะในแม่น้ำและมลภาวะที่เกิดจากธาตุอาหารพืช (ศูนย์วิจัยและสนับสนุนเป้าหมายการพัฒนาที่ยั่งยืน, 2566)

ความเจริญเติบโตอย่างรวดเร็วทางเศรษฐกิจของโลกปัจจุบัน และการเพิ่มของจำนวนประชากรทั่วโลกมีแนวโน้มสูงขึ้นทำให้เกิดการเปลี่ยนแปลงสภาพแวดล้อมตามธรรมชาติต่าง ๆ เนื่องจากประชากรมีความต้องการมากขึ้นในเรื่องที่อยู่อาศัยและเครื่องใช้อุปโภค บริโภค ทำให้เกิดปัญหาด้านสิ่งแวดล้อมหลายประการ เช่น ปัญหาภาวะโลกร้อน มลพิษทางอากาศ ป่าไม้ถูกทำลาย ปัญหาการขาดแคลนทรัพยากรน้ำและอาหาร ฯลฯ การเติบโตของเมืองที่มีขนาดใหญ่จะสัมพันธ์กับจำนวนประชากรและขยะมูลฝอยที่เพิ่มมากขึ้นไม่ว่าจะเป็นขยะมูลฝอยจากบ้านเรือน ซึ่งส่วนใหญ่จะเป็นพวกเศษอาหารที่เหลือจากการบริโภค รวมทั้งเศษอาหารจากพลาสติก ขวดนมที่ไม่ใช้แล้ว หรือจะเป็นขยะมูลฝอยที่ถูกทิ้งอยู่ตามท้องถนน แม่น้ำลำคลอง หรือสถานที่สาธารณะต่างๆ เช่น ใบไม้ เศษกระดาษ ถุงพลาสติก ของเหลือใช้ เป็นต้น ในช่วงระยะเวลา 10 ปีที่ผ่านมา มีขยะพลาสติกเกิดขึ้นโดยเฉลี่ยประมาณปีละ 2 ล้านตัน โดยมีการนำกลับไปใช้ประโยชน์ประมาณ 0.5 ล้านตัน ส่วนที่เหลือ 1.5 ล้านตัน เป็นพลาสติกแบบใช้ครั้งเดียวทิ้ง (Single Use Plastic) (กิตติ คุ้มครอง, 2564) โดยไม่มีการนำกลับไปใช้ประโยชน์เข้าสู่ระบบเศรษฐกิจหมุนเวียน ในปี 2562

ปัญหาขยะมูลฝอยมีแนวโน้มที่จะทวีความรุนแรงยิ่งขึ้น จากปริมาณขยะมูลฝอยที่เพิ่มขึ้นทุกปีตามการขยายตัวของประชากรและชุมชน รวมถึงการพัฒนาทางเทคโนโลยี ซึ่งขยะมูลฝอยส่วนใหญ่ในปัจจุบันเป็นขยะมูลฝอยที่เกิดขึ้นจากการบริโภค เช่น พลาสติก โฟม กระป๋อง แก้ว รวมถึงสารเคมีต่างๆ ขยะมูลฝอยเหล่านี้จำเป็นต้องใช้ระบบการจัดการและการกำจัดที่ถูกต้องเหมาะสม ดังนั้น หากประเทศไทยยังไม่มีระบบการจัดการมูลฝอยที่เหมาะสมจะส่งผลกระทบต่อสิ่งแวดล้อม สุขภาพอนามัยของประชาชน ทั้งยังทำให้ภาพลักษณ์ของประเทศเสื่อมเสีย (ชัยสิทธิ์ บุญโยธา และ พิทักพงษ์ กางการ, 2560) ซึ่งปัญหาการจัดการและกำจัดขยะมูลฝอยเป็นอีกหนึ่งปัญหาที่องค์กรปกครองส่วนท้องถิ่นหลายแห่งกำลังประสบอยู่ไม่ว่าจะเป็นปัญหาการเก็บขนไม่หมด มูลฝอยตกค้างวิธีการกำจัดขยะมูลฝอยอย่างไม่ถูกต้อง หรือไม่มีที่ดินสำหรับการกำจัดขยะมูลฝอย ปัญหาเหล่านี้เป็นปัญหาที่สะสมมานานและมีสาเหตุมาจากปัจจัยต่าง ๆ หลายประการ เช่น การเพิ่มขึ้นอย่างรวดเร็วของปริมาณขยะมูลฝอย ซึ่งเป็นผลมาจากการเพิ่มขึ้นของจำนวนประชากรและสภาพทางเศรษฐกิจที่ดีขึ้น ทำให้ประชาชนมีการจับจ่ายใช้สอยสินค้ามาใช้มากขึ้น

และเพิ่มปริมาณการผลิตมูลฝอย ข้อจำกัดด้านงบประมาณแต่ละบุคลากรของท้องถิ่น ซึ่งไม่เพียงพอต่อการลงทุนและปรับปรุงระบบ ระบบจัดเก็บขนส่งและระบบกำจัดขยะมูลฝอยให้มีประสิทธิภาพ (สิริมา ปกป้อง, 2561)

จากรายงานกรมควบคุมมลพิษ (2565) ประเทศไทยมีปริมาณขยะ จำนวน 70,411 ตัน/วัน เมื่อเปรียบเทียบกับจำนวนประชากรเฉลี่ยเท่ากับ 1.07 กิโลกรัม/คน/วัน ซึ่งกระจายตัวอยู่ตามภูมิภาคต่าง ๆ และในส่วนของจังหวัดสงขลา มีปริมาณขยะ จำนวน 1,207 ตัน/วัน เป็นจังหวัดที่มีปริมาณขยะมากเป็นอันดับที่ 3 ของภาคใต้ รองจากจังหวัดนครศรีธรรมราชและสุราษฎร์ธานี ปริมาณขยะที่เกิดขึ้นส่งผลกระทบโดยตรงเศรษฐกิจ สังคม และสิ่งแวดล้อม ซึ่งนับวันจะมีมีปริมาณเพิ่มขึ้น

กรมส่งเสริมการปกครองท้องถิ่น (2566) รายงานข้อมูลจำนวนองค์กรปกครองส่วนท้องถิ่น รวมทั้งสิ้น จำนวน 7,850 แห่ง แบ่งเป็น องค์การบริหารส่วนจังหวัด 76 แห่ง เทศบาล (ทุกประเภท) 2,469 แห่ง องค์การบริหารส่วนตำบล 5,303 แห่ง องค์กรปกครองท้องถิ่นรูปแบบพิเศษ 2 แห่ง ในส่วนของเทศบาล แบ่งออกเป็น เทศบาลนคร 30 แห่ง เทศบาลเมือง 192 แห่ง เทศบาลตำบล 2,247 แห่ง ซึ่งจำนวนเทศบาลตำบลมีแนวโน้มที่จะพัฒนา/ขยายตัวเป็นเมืองในอนาคต และส่งผลต่อปริมาณขยะที่จะเกิดขึ้นในอนาคตด้วยเช่นกัน

เทศบาลตำบลกำแพงเพชร เป็นหนึ่งในองค์กรปกครองส่วนท้องถิ่นจังหวัดสงขลา ตั้งอยู่ในหมู่ที่ 1 และ 3 (เต็มพื้นที่) หมู่ที่ 2, 5, 8 (บางส่วน) ของตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา แบ่งเป็นชุมชนทั้งหมด 6 ชุมชน มีประชากรทั้งสิ้น 4,912 คน มีพื้นที่ทั้งหมดประมาณ 4.8 ตารางกิโลเมตร มีปริมาณขยะ 6 ตัน/วัน จำนวนนี้รวมถึงปริมาณขยะที่มาจากประชาชนที่อาศัยอยู่นอกเขตนำมาทิ้งในเขตเทศบาลจนกลายเป็นภาระที่ทางเทศบาลต้องเก็บขนและกำจัดในทุกวัน ทำให้เทศบาลต้องจัดการบริการสาธารณะที่มากขึ้น เทศบาลตำบลกำแพงเพชรได้ดำเนินการบริหารจัดการขยะชุมชนส่งเสริมให้ทุกครัวเรือนทำการแยกขยะตั้งแต่ต้นทาง นำขยะกลับมาใช้ประโยชน์และเพิ่มรายได้ รวมถึงมีศูนย์การเรียนรู้การจัดการขยะชุมชน เพื่อให้เยาวชน ผู้สนใจ และประชาชนทั่วไปได้ใช้เป็นแหล่งเป็นแหล่งเรียนรู้และฝึกอบรมการคัดแยกขยะไปใช้ประโยชน์ เพื่อลดปริมาณขยะ และสร้างรายได้ ลดรายจ่ายแก่ประชาชนในเขตเทศบาล (เทศบาลตำบลกำแพงเพชร, 2566)

ดังนั้น คณะผู้วิจัยจึงมีความสนใจที่จะศึกษาแนวทางการพัฒนาการจัดการขยะของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา เพื่อศึกษาการดำเนินการจัดการขยะ รวมถึงปัญหาและอุปสรรคในการจัดการขยะ เพื่อนำมาปรับใช้ในการพัฒนาเกี่ยวกับขยะมูลฝอยของเทศบาลตำบลกำแพงเพชรให้ดีมากยิ่งขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาแนวทางการจัดการขยะมูลฝอย ของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา
2. เพื่อศึกษาปัญหาและอุปสรรคในการจัดการขยะมูลฝอย ของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของขยะมูลฝอย (Solid Waste)

พระราชบัญญัติสาธารณสุข พ.ศ. 2535 ได้ให้ความหมายของคำว่า ขยะมูลฝอย หมายถึง เศษกระดาษ เศษผ้า เศษอาหาร เศษสินค้า ถุงพลาสติก ภาชนะที่ใส่อาหาร เถ้า มูลสัตว์ หรือซากสัตว์ รวมตลอดถึงสิ่งอื่นใดที่เก็บกวาดจากถนน ตลาด ที่เลี้ยงสัตว์ หรือที่อื่น

สำนักงานคณะกรรมการสิ่งแวดล้อมแห่งชาติ ได้ให้ความหมายของขยะมูลฝอย หมายความถึงบรรดาสิ่งต่างๆ ซึ่งในขณะนั้นคนไม่ต้องการและทิ้งไป ทั้งนี้รวม ตลอดถึงเศษผ้า เศษอาหาร มูลสัตว์ ซากสัตว์ เถ้า ฝุ่นละอองและเศษวัสดุ สิ่งของที่เก็บกวาดจากเคหะ สถาน อาคาร ถนน ตลาด ที่เลี้ยงสัตว์ โรงงานอุตสาหกรรมและที่อื่น ๆ (สำนักงานคณะกรรมการสิ่งแวดล้อมแห่งชาติ, 2540)

ประเภทของขยะมูลฝอย

1. ขยะมูลฝอยเปียก ได้แก่ พวกเศษอาหาร เศษพืชผัก เปลือกผลไม้ อินทรีย์วัตถุ ที่สามารถย่อยสลายเน่าเปื่อยง่ายมีความชื้นสูง

2. ขยะมูลฝอยแห้ง ได้แก่ พวกเศษกระดาษ เศษหญ้า แก้ว โลหะ ไม้ ยาง พลาสติก ฯลฯ ขยะมูลฝอยชนิดนี้จะมีทั้งที่เผาไหม้ไม่ได้ ขยะแห้งเป็นมูลฝอยที่สามารถเลือกวัสดุที่ยังมีประโยชน์กลับมาใช้ได้อีก โดยทำการคัดแยกมูลฝอยก่อนนำทิ้ง ซึ่งจะช่วยให้สามารถลดปริมาณมูลฝอยที่จะต้องนำไปทำลายลงได้ และถ้านำส่วนที่ใช้ประโยชน์ได้นี้ไปขายก็จะทำให้มีรายได้กลับมา

3. ขยะมูลฝอยอันตราย ได้แก่ ของเสียที่เป็นพิษมีฤทธิ์กัดกร่อนและระเบิดได้ง่ายต้องให้กรรมวิธีในการทำลายเป็นพิเศษ เนื่องจากเป็นวัสดุที่เป็นอันตราย เช่น สารฆ่าแมลง ถ่านไฟฉาย แบตเตอรี่ รถยนต์ หลอดไฟหลอดฟลูออเรสเซนต์ สเปรย์ฉีดผม ฯลฯ

แนวคิดทฤษฎีเกี่ยวกับการจัดการมูลฝอย: 5 R ซึ่งได้แก่ Reduce, Repair Reject Reuse Recycle

R1 = Reduce เป็นการลดปริมาณขยะมูลฝอยที่แหล่งกำเนิด เพื่อให้คงเหลือขยะมูลฝอยน้อยที่สุด **R2 = Repair** เป็นการซ่อมแซมสิ่งของต่างๆ ที่เสีย แต่สามารถนำมาใช้ต่อได้หากมีการซ่อมแซมแทนที่จะทิ้งเป็นขยะมูลฝอย R3 **= Reuse** เป็นการนำขยะกลับไปใช้ใหม่ **R4 = Recycle** เป็นการนำผลิตภัณฑ์ที่ใช้แล้วกลับมาใช้ใหม่โดยเข้ากระบวนการผลิตใหม่ให้ได้ผลิตภัณฑ์ที่ใกล้เคียงของเดิม หรือของใหม่ที่สามารถนำมาใช้ได้อีก **R5 = Reject** เป็นการกำจัดขยะมูลฝอยที่ไม่สามารถนำกลับมาใช้ใหม่หรือนำไปรีไซเคิลได้หรือเป็นขยะมูลฝอยที่มีพิษ

แนวคิดและทฤษฎีการบริหารจัดการองค์การ

ทรัพยากรหรือปัจจัยสำคัญที่ทำให้การดำเนินการเป็นไปตามวัตถุประสงค์ขององค์การ มีส่วนเกี่ยวข้องและมีอิทธิพลต่อความสำเร็จในการจัดการที่นักบริหารต้องให้ความสนใจ (วีรยุทธ ประชารัตนเสรี, 2562) ประกอบด้วยปัจจัย คนหรือแรงงาน (Man) เงินทุน (Money) เครื่องจักร (Machine วัสดุอุปกรณ์ (Materials) การตัดสินใจ (Decision Making) การติดต่อสื่อสาร (Communication) การจูงใจ (Motivation) และการประสานงาน (Coordination)

แนวคิดรูปแบบการจัดบริการสาธารณะ

เทศบาลตำบลมีหน้าที่ในการจัดบริการสาธารณะตามพระราชบัญญัติเทศบาลในส่วนที่กล่าวถึงหน้าที่ของเทศบาล ระบุให้เห็นถึงการจัดบริการสาธารณะที่เกี่ยวข้องกับการกำจัดมูลฝอยและสิ่งปฏิกูล รักษาความสะอาดของถนน หรือทางเดินและที่สาธารณะ รวมถึงการรักษาความสงบเรียบร้อยของ

ประชาชนและหน้าที่อื่น ๆ (พระราชบัญญัติเทศบาล, 2562) ซึ่งเป็นจุดเริ่มต้นของการจัดทำบริการสาธารณะของเทศบาลตำบลที่สำคัญในฐานะองค์กรปกครองส่วนท้องถิ่นหนึ่งที่มีหน้าที่โดยตรง การจัดทำบริการสาธารณะของเทศบาลจำเป็นที่จะต้องคำนึงถึงความหมายและเกณฑ์ของความเป็นสาธารณะ (publicness) คือ (1) ระดับความแตกต่างระหว่างรัฐ-เอกชน (the degree of public-private distinction) (2) องค์ประกอบของผู้รับบริการ (Composition of Service recipient) (3) ธรรมชาติของบทบาท (nature of the role) (4) ความรับผิดรับชอบสาธารณะ (public accountability) และ (5) ความเชื่อมั่นสาธารณะ (public trust) (Shamsul Haque, 2001 อ้างถึงใน วุฒิสาร ตันไชย, 2559)

รูปแบบการจัดบริการสาธารณะ (วุฒิสาร ตันไชย, 2559) มีรูปแบบที่สำคัญ ดังนี้

การว่าจ้าง (Out Sourcing) เป็นการจ้างให้บุคคลภายนอกทั้งเอกชนหรือปัจเจกบุคคลเข้ามาจัดทำบริการสาธารณะบางประเภทแทนองค์กรปกครองส่วนท้องถิ่น

การร่วมมือระหว่างภาครัฐและภาคเอกชน (Public-Private Partnership - PPP) เป็นการร่วมลงทุนระหว่างภาครัฐและเอกชนอีกประเภทหนึ่งขององค์กรปกครองส่วนท้องถิ่น โดยมุ่งหวังที่ประสิทธิภาพการทำงานเพิ่มมากขึ้น

สหการ (Co-operative) เป็นรูปแบบที่องค์กรที่มีฐานะเป็นนิติบุคคลที่เกิดจากการร่วมมือกันขององค์กรปกครองส่วนท้องถิ่นตั้งแต่สองแห่งขึ้นไปหรือระหว่างองค์กรปกครองส่วนท้องถิ่นกับนิติบุคคลมหาชนอื่น มีความเป็นอิสระจากหน่วยการปกครองเดิม เพื่อจัดทำบริการสาธารณะที่อยู่ในอำนาจหน้าที่ขององค์กรปกครองส่วนท้องถิ่น (สถาบันพระปกเกล้า, 2550 อ้างถึงใน วุฒิสาร ตันไชย, 2559) สำหรับประเทศไทย สหการ หมายถึง การร่วมมือระหว่างท้องถิ่นเพื่อจัดทำบริการสาธารณะ และหมายความรวมถึงการร่วมมือกันของท้องถิ่นกับหน่วยงานของรัฐ รัฐวิสาหกิจ เพื่อจัดทำบริการสาธารณะ (โกวิทย์ พวงงาม , 2547) และ “สหการ” ได้บัญญัติไว้ในพระราชบัญญัติเทศบาลอีกด้วย

กิจการพาณิชย์และกิจการเพื่อสังคม (Local Public Enterprise and Social Enterprise) เป็นรูปแบบการจัดบริการสาธารณะอีกประเภทหนึ่งที่องค์กรปกครองส่วนท้องถิ่นนิยมทำกัน มุ่งเน้นการดำเนินกิจการธุรกิจที่องค์กรปกครองส่วนท้องถิ่นเป็นเจ้าของ เพื่อทำหน้าที่จัดทำบริการและสร้างรายได้ให้แก่ท้องถิ่นในระยะยาว ในระยะหลัง Social Enterprise รู้จักกันในชื่อ วิสาหกิจเพื่อสังคม คือ การประกอบการเพื่อส่งเสริมการพัฒนาด้านสังคมและสิ่งแวดล้อม เพื่อแก้ไขปัญหานั้น ซึ่งอาศัยการสร้างรายได้ผ่านกิจกรรมการค้า การให้บริการ เพื่อการดำเนินกิจกรรมต่อไปในอนาคต โดยมิได้มุ่งหวังแบ่งปันผลกำไรหรือผลประกอบการแก่ผู้ถือหุ้นและเจ้าของวิสาหกิจเป็นเป้าหมายสูงสุด (ติญทรรศน์ ประทีปพรณรงค์, 2566)

วิธีดำเนินการวิจัย

การวิจัยครั้งนี้เป็นการวิจัยเชิงคุณภาพ (Qualitative Research) เพื่อศึกษาแนวทางการจัดการขยะมูลฝอย ปัญหาและอุปสรรคในการจัดการขยะมูลฝอย ของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

กลุ่มผู้ให้ข้อมูลหลัก

การวิจัยครั้งนี้ใช้วิธีการเลือกตัวอย่างแบบเจาะจง โดยมีเกณฑ์สำหรับ 2 กลุ่มแรก คัดเลือกจากผู้ที่มีหน้าที่จัดการบริการสาธารณะของท้องถิ่นโดยตรง และกลุ่มที่สามคัดเลือกผู้ที่อยู่ในชุมชนตลาดสดไม่ต่ำกว่า 3 ปี และเป็นผู้ทิ้งขยะเป็นประจำ ซึ่งกลุ่มผู้ให้ข้อมูลหลักในการศึกษาครั้งนี้ แบ่งออกเป็น 3 กลุ่ม คือ

1. กลุ่มผู้บริหารเทศบาลตำบลกำแพงเพชร 3 คน ได้แก่ นายกเทศมนตรี ปลัดเทศบาลและผู้อำนวยการกองสาธารณสุขและสิ่งแวดล้อม

2. กลุ่มพนักงานผู้ปฏิบัติงาน 2 คน ได้แก่ พนักงานขับรถเก็บขยะ พนักงานประจำรถเก็บรวบรวมขยะ

3. กลุ่มประชาชนที่อาศัยอยู่ในพื้นที่ชุมชนตลาดสดเทศบาล 4 คน

เครื่องมือวิจัย

เครื่องมือที่ใช้ในการวิจัย เลือกใช้แบบสัมภาษณ์กึ่งโครงสร้าง แบ่งเป็น 3 ฉบับ ประกอบด้วย

ฉบับที่ 1 แบบสัมภาษณ์การจัดการขยะมูลฝอย กรณีศึกษา เทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา โดยใช้สัมภาษณ์ผู้บริหารเทศบาลตำบลกำแพงเพชร มีทั้งหมด 3 ตอน

ฉบับที่ 2 แบบสัมภาษณ์การจัดการขยะมูลฝอย กรณีศึกษา เทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา โดยใช้สัมภาษณ์พนักงานผู้ปฏิบัติงาน มีทั้งหมด 2 ตอน

ฉบับที่ 3 แบบสัมภาษณ์การจัดการขยะมูลฝอย กรณีศึกษา เทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา โดยใช้สัมภาษณ์ประชาชนที่อาศัยอยู่ในพื้นที่ชุมชนตลาดสด มีทั้งหมด 4 ตอน

วิธีการเก็บรวบรวมข้อมูล

วิธีการเก็บรวบรวมข้อมูลในงานวิจัย ด้วยเก็บรวบรวมข้อมูลจากเอกสารและการสัมภาษณ์เชิงลึก (In-Depth Interview)

การวิเคราะห์ข้อมูล

การวิเคราะห์ข้อมูลโดยวิเคราะห์เชิงเนื้อหา (Content Analysis) และการตรวจสอบข้อมูลแบบสามเส้า (Triangulation) จากการสัมภาษณ์ โดยมีประเด็นในการวิเคราะห์ คือ แนวทางการจัดการขยะมูลฝอย และปัญหาและอุปสรรคในการจัดการขยะมูลฝอย ของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

การตรวจสอบข้อมูล

การตรวจสอบข้อมูล (Data Verification) ซึ่งเป็นการพิสูจน์ว่าข้อมูลที่ได้มาถูกต้องหรือไม่ ด้วยการตรวจสอบแหล่งข้อมูล แหล่งที่ได้มา โดยจะพิจารณาในการตรวจสอบ ได้แก่ แหล่งเวลา แหล่งสถานที่ แหล่งบุคคล เป็นต้น โดยผู้วิจัยกระทำ 3 ส่วนหลัก ประกอบด้วย (1) การตรวจสอบสามเส้าด้านข้อมูล (Data Triangulation) คือ การตรวจสอบว่าข้อมูลที่ผู้วิจัยได้มาถูกต้องหรือไม่จะเน้นการตรวจสอบข้อมูลที่ได้มาจากแหล่งต่างๆ มีข้อความเหมือนกันหรือไม่ (2) การตรวจสอบสามเส้าด้านทฤษฎี (Theory Triangulation) คือการตรวจสอบว่าผู้วิจัยใช้แนวคิดทฤษฎีต่างไปจากเดิมจะทำให้ตีความข้อมูลแตกต่างมากน้อยเพียงใด และ (3) การตรวจสอบสามเส้าด้านวิธีการรวบรวมข้อมูล (Methodological) คือ การรวบรวมข้อมูลต่างๆกัน เพื่อรวบรวมข้อมูลเรื่องเดียวกัน

ผลการวิจัย

1. แนวทางการจัดการขยะมูลฝอย ของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

เทศบาลตำบลกำแพงเพชร มีพื้นที่ทั้งหมดประมาณ 4.8 ตารางกิโลเมตร แบ่งเป็นชุมชนทั้งหมด 6 ชุมชน มีประชากรทั้งสิ้น 4,912 คน มีปริมาณขยะ 6 ตัน/วัน โดยปริมาณขยะที่เกิดขึ้นในแต่ละวันมาจากทั้งในเขตเทศบาลและนอกเขตเทศบาล เทศบาลตำบลกำแพงเพชรได้ดำเนินการบริหารจัดการขยะชุมชน ส่งเสริมให้ทุกครัวเรือนทำการแยกขยะตั้งแต่ต้นทาง กลางทาง และปลายทาง

1.1 แนวทางการจัดการขยะต้นทาง เป็นการบริหารจัดการขยะชุมชน เทศบาลตำบลกำแพงเพชร ส่งเสริมให้ประชาชนทุกครัวเรือนแยกขยะ ประชาสัมพันธ์ให้ประชาชนสามารถนำขยะกลับมาใช้ประโยชน์ให้มากที่สุด ขยะที่มีประโยชน์ ได้แก่ ขยะที่สามารถรีไซเคิล ขยะอินทรีย์ สนับสนุนให้ประชาชนสามารถนำขยะกลับมาใช้ประโยชน์ เป็นการเพิ่มรายได้ ลดรายจ่าย โดยมีการจัดทำโครงการเพิ่มศักยภาพชุมชนปลอดขยะ ได้แก่ การจัดอบรมให้ความรู้การจัดการขยะมูลฝอยและสิ่งแวดล้อมในชุมชน การจัดกิจกรรมธนาคารขยะรับฝากขยะรีไซเคิล รวมถึงการจัดนิทรรศการแสดงผลงานชุมชนต้นแบบในเรื่องการจัดการขยะ โดยการจัดทำโครงการมีขึ้นอย่างสม่ำเสมอในแต่ละปีงบประมาณ

ส่วนขยะอันตรายจากครัวเรือน เทศบาลจะขอความร่วมมือให้นำไปใส่ไว้ในถังขยะอันตรายที่ทางเทศบาลได้จัดเตรียมไว้ให้ตามจุดต่าง ๆ 14 จุด โดยทางเทศบาลจะทำการจัดเก็บ 1-2 เดือน/ครั้ง และนำไปรวบรวมไว้ที่ศูนย์รวบรวมขยะอันตรายเพื่อรอการนำส่งไปกำจัดอย่างถูกวิธี ซึ่งกำหนดการกำจัดไว้ปีละ 1 ครั้ง ในส่วนนี้เป็นการได้รับการสนับสนุนงบประมาณจากองค์การบริหารส่วนจังหวัดสงขลาร่วมกับสำนักงานสิ่งแวดล้อมภาคที่ 16

จากการสัมภาษณ์กลุ่มผู้บริหารเทศบาล กล่าวถึงประเด็นนี้ว่า

“แนวทางในการจัดการขยะของเทศบาลตำบลกำแพงเพชร ในเรื่องของการจัดเก็บทางเทศบาลได้สร้างความตะหนักกับทุกคนในเรื่องของการรวบรวมขยะเบื้องต้น ในเรื่องของการรวบรวมขยะหรือขยะที่ควรจะนำมาทิ้งกับเทศบาล ทางเทศบาลพยายามที่จะส่งเสริมให้แต่ละบ้านเรือน คัดแยกขยะเศษขยะที่สามารถนำไป reuse นำไป recycle ก็ให้คัดแยกไว้ก่อนในครัวเรือน หลังจากนั้นแยกขยะที่เป็นขยะเปียก ขยะแห้ง ที่สามารถทำได้สำหรับบ้านที่มีบริเวณ ถ้าเป็นขยะเปียกทางเทศบาลจะแนะนำส่งเสริมให้มีการรวบรวมไปทิ้งในพื้นที่ของตนเอง จะทำถังหมัก หรือบ่อหมัก ส่วนขยะที่ไม่สามารถกำจัดได้ก็ให้รวบรวมแล้วนำมาทิ้งในถังที่เทศบาลได้จัดเตรียมให้”

(ปลัดเทศบาล, สัมภาษณ์, 9 ตุลาคม 2566)

“ทางเทศบาลได้จัดให้มีการดำเนินการเพื่อลดการเพิ่มปริมาณขยะจากครัวเรือนลง เน้นการใช้หลัก 3R คือ หลักการลดปริมาณขยะมูลฝอย R ที่ 1 reduced R ที่ 2 คือการใช้วัสดุให้คุ้มค่า ก็คือ reuse R ที่ 3 คือ การนำขยะมูลฝอยที่มีประโยชน์กลับมาใช้ใหม่หรือ recycle ก็จะเป็นหลัก 3R โดยการสร้างกระบวนการมีส่วนร่วมของชุมชน และมีการให้ความรู้กับประชาชน สร้างความรู้ความเข้าใจให้ประชาชนถึงการคัดแยกขยะจากครัวเรือนหรือจากต้นทางเพื่อนนำไปสู่การลดปริมาณขยะในอนาคตภายใต้โครงการที่ทางเทศบาล ได้จัดทำขึ้น”

(ผู้อำนวยการสำนักสาธารณสุขและสิ่งแวดล้อม, สัมภาษณ์, 10 ตุลาคม 2566)

“ในส่วนของพนักงานเก็บขยะในการจัดการขยะพนักงานเก็บขยะจะไปเก็บขยะในส่วนที่ชาวบ้านมีการจัดตั้งไว้ให้หรือนำขยะมาตั้งไว้ที่ถังขยะไปให้ และจะมีการไปตามรถขยะในทุกที่ที่รถขยะไปและเมื่อมีการจอดรถก็จะเป็นการลงไปเก็บ ส่วนมากอุปสรรคและปัญหาที่เจอคือช่วงหน้าฝนหรือในเวลาที่

ฝนตก จะทำรายการเก็บหรือขนขยะมีความลำบากขึ้น เพราะจะทำให้ขยะเปียกและทำให้สิ่งสกปรกมากยิ่งขึ้น แต่ทางพนักงานเองก็มีการป้องกันด้วยการใส่ผ้าปิดจมูกและมีการเซฟตี้เรียบร้อย และเมื่อเก็บเสร็จแล้วก็จะทำตามขั้นตอนการดำเนินงานและผ้านำขยะไปทิ้งที่หลุมขยะโดยจะมีวิธีการฝังกลบให้เรียบร้อย”

(พนักงานรวบรวมขยะ, สัมภาษณ์, 9 ตุลาคม 2566)

การจัดการขยะมูลฝอยของประชาชนในพื้นที่ สิ่งที่เป็นขยะต่างๆประชาชนมีการแยกเล็กคัดแยกขยะต่างๆเช่นขวดพลาสติก ถุงพลาสติกขยะน้ำ ขยายเร็วก็จะแยกใส่ถัง อย่างเช่น ขยะพลาสติกเค้าจะเก็บใส่ถังเล่นแนะนำไปตี ของหน่วยงานเทศบาลจะมีเจ้าหน้าที่มารับเหล็กขวดหรือแก้วที่เป็นขยะจะนำมารีไซเคิล จะมีการแยกใส่ถุงใส่กระสอบ และจะนำไปขายเพื่อเป็นรายได้อีกต่อไป

(นายเฉลิม แสงมณี, สัมภาษณ์, 17 ตุลาคม 2566)

1.2 แนวทางการจัดการขยะกลางทาง เป็นการจัดเก็บขยะโดยรถเก็บขนขยะของทางเทศบาล วิธีการจัดการขยะในเบื้องต้นนั้น เทศบาลมีรถขยะ 2 คัน คันที่ 1 รถยนต์เก็บขนขยะ ชนิด 6 ล้อ แบบอัดท้าย มีขนาดความจุ 12 ลบ.ม. เก็บขยะบริเวณถนนสายหลักและถนนสายรองบางสาย คันที่ 2 รถยนต์เก็บขนขยะ ชนิด 4 ล้อ มีขนาดความจุ 4 ลบ.ม. เก็บขยะบริเวณถนนสายรองและภายในชุมชนทุกสาย การดำเนินการในแนวทางนี้ มีค่าใช้จ่ายเกิดขึ้นในการดำเนินการ

จากการสัมภาษณ์กลุ่มผู้บริหารเทศบาล กล่าวถึงประเด็นนี้ว่า

“การจัดการขยะมูลฝอยตอนนี้เทศบาลเรามีหลุมขยะเป็นของตัวเอง เพราะฉะนั้นการจัดการขยะโดยทั่วไปก็คือ มีการจัดเก็บ เพื่อนำไปทิ้งในหลุมขยะ ในการจัดเก็บก็จะมีค่าใช้จ่าย”

(นายกเทศมนตรี, สัมภาษณ์, 6 ตุลาคม 2566)

“แนวทางของการจัดเก็บเองนั้น เรื่องของการดำเนินการของเจ้าหน้าที่เทศบาล เทศบาลให้มีการเก็บขนขยะในพื้นที่ โดยมีรถเก็บขนขยะ 2 คัน คือ 6 ล้อ 1 คัน และ รถกระบะ 4 ล้อ 1 คัน ในส่วนของการจัดเก็บขยะที่เทศบาลได้มีการจัดเก็บรวบรวมวันละ 1 เที่ยวในช่วงเวลาตี 5 เป็นต้นไป”

(ปลัดเทศบาล, สัมภาษณ์, 9 ตุลาคม 2566)

ซึ่งสอดคล้องกับกลุ่มพนักงานผู้ปฏิบัติงาน ที่กล่าวไว้ว่า

“ทางพนักงานจะออกรถไปเก็บขยะ เริ่มต้นด้วยเวลาตีสี่ครึ่ง จะเสร็จในเวลา 8 โมงครึ่งถึง 9 โมงเช้า ในเขตรับผิดชอบก็มีทั้งหมด 16 สาย ที่รับผิดชอบในแต่ละวัน การเก็บขนขยะก็จะไปในที่ที่มีถังขยะที่ชาวบ้านตั้งเอาไว้ ชาวบ้านจะมีการคัดแยกและคัดเลือกตั้งไว้ให้เรียบร้อย ทางคนขับรถก็จะขับรถไปในจุดต่าง ๆ ที่ชาวบ้านได้มีการตั้งขยะไว้ ให้แนะนำบ้าง จากนั้นเก็บขึ้นบนรถขนขยะ ตามแผนงานหรือแผนปฏิบัติการที่ต้องรับผิดชอบในแต่ละวัน ในขยะแต่ละประเภทที่ไปเก็บนั้น ประชาชนมีการขัดแยกไว้เรียบร้อยระหว่างขยะแต่ละประเภท อย่างเช่น ขยะอินทรีย์ ขยะอันตราย ขยะทั่วไป เป็นต้น ชาวบ้านจะมีการคัดแยกเริ่มต้นจากครัวเรือน”

(พนักงานขับรถเก็บขยะ, สัมภาษณ์, 9 ตุลาคม 2566)

กลุ่มประชาชนที่อาศัยอยู่ในพื้นที่ชุมชนตลาดสดเทศบาล ให้ข้อมูลที่สอดคล้องกันว่า

“การจัดการขยะมูลฝอยของประชาชนในพื้นที่ สิ่งที่เป็นขยะต่าง ๆ ประชาชนมีการคัดแยกขยะต่าง ๆ เช่น ขวดพลาสติก ถุงพลาสติก ขยะเปียก ขยะแห้งก็จะแยกใส่ถัง เช่น ขยะพลาสติก เขาจะเก็บใส่ถัง และนำไปที่หน่วยงานเทศบาล จะมีเจ้าหน้าที่มารับเหล็ก ขวด หรือแก้ว ที่เป็นขยะสามารถนำมารีไซเคิลจะมีการแยกใส่ถุงใส่กระสอบ และจะนำไปขายเพื่อเป็นรายได้อีกต่อไป”

(นายเฉลิม, สัมภาษณ์, 17 ตุลาคม 2566)

“ทางเทศบาลให้ประชาชนมีการคัดแยกขยะจากเริ่มจากในแต่ละบ้าน แต่ละประเภทของขยะต่าง ๆ มีธนาคารขยะตามชุมชน จะมีชุมชน 1 ชุมชน 4 และชุมชน 5 ที่เป็นธนาคารขยะรับซื้อ โดยจะมีการเปิดให้บริการแต่ละเดือน เดือนละ 1 วัน แล้วแต่ชุมชนจะกำหนด แล้วจะมีการนำขยะที่สามารถขายได้ จากการขายของแต่ละชุมชนหรือบุคคล ที่ไปร่วมกิจกรรมกับธนาคารขยะ และขยะอื่น ๆ ก็จะมีการแยก เช่น ขยะอินทรีย์ก็จะนำไปทำปุ๋ยหมักหรือใส่โคนต้นไม้ และขยะทั่วไปก็จะมีการทิ้งไว้ในถังขยะแล้วจะมีพนักงานเทศบาลมาเก็บทิ้งที่บ่อขยะ”

(นายพงศธร, สัมภาษณ์, 17 ตุลาคม 2566)

1.3 แนวทางการจัดการขยะปลายทาง การจัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะ สำหรับสถานที่กำจัดขยะ มีพื้นที่ 10 ไร่ อยู่ในเขตเทศบาลเมืองกำแพงเพชร ห่างจากเทศบาลตำบลกำแพงเพชร 5 กิโลเมตร ใช้วิธีการฝังกลบเพื่อที่จะทำให้ลดลงของภาวการณ์ส่งผลกระทบต่อบริเวณข้างเคียง ไม่ว่าจะเป็นขยะที่ฟุ้งกระจาย แมลงวันหรือพาหะนำโรคต่าง ๆ

2. ปัญหาและอุปสรรคในการจัดการขยะมูลฝอยของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

เทศบาลตำบลกำแพงเพชร พบปัญหาและอุปสรรคในการจัดการขยะมูลฝอย ดังนี้

2.1 ปัญหาและอุปสรรคในการจัดการขยะต้นทาง ปัญหาและอุปสรรคในการจัดการขยะมูลฝอยการบริหารจัดการขยะชุมชน พบปัญหาและอุปสรรค ในประเด็น การให้ความสำคัญและความร่วมมืออย่างจริงใจในการคัดแยกขยะ การเก็บรวบรวม ซึ่งแต่ละชุมชนยังคงมีประชาชนที่ยังไม่ให้ความสำคัญ และไม่สอดคล้องกับนโยบายของเทศบาล

2.2 ปัญหาและอุปสรรคในการจัดการขยะกลางทาง ปัญหาและอุปสรรคที่เกี่ยวข้องกับการจัดเก็บขยะโดยรถเก็บขนขยะของทางเทศบาล พบปัญหาและอุปสรรค ในประเด็น 1) อุปกรณ์เครื่องมือ งบประมาณไม่เพียงพอ 2) การทิ้งขยะจากประชาชนนอกเขตเทศบาล ทำให้ปริมาณขยะมีเพิ่มมากขึ้น

2.3 ปัญหาและอุปสรรคในการจัดการขยะปลายทาง พบปัญหาและอุปสรรคการจัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะ คือ ค่าใช้จ่ายในการจัดการขยะเพิ่มสูงขึ้น ค่าจัดเก็บ ค่าใช้จ่ายในการจัดการขยะก็จะสูงขึ้น ถึง 7 แสนกว่าบาทต่อปี เทศบาลอาจระดมความคิดหรือดำเนินร่วมกับชาวบ้านให้มากขึ้น โดยให้ชาวบ้านคัดแยกขยะด้วยตนเอง ทางเทศบาลจะให้มีการคัดแยกในครัวเรือนลดปริมาณถังขยะให้ได้น้อยลงไม่ใช่เพิ่มขึ้น ย่อมไม่ส่งผลให้ประชาชนมีภาระในการจัดเก็บค่าใช้จ่ายการเก็บขยะ อนึ่งหน่วยงานราชการส่วนกลางมีนโยบายหรือว่ามีคำสั่งให้ปิดบ่อขยะกรณีของเทศบาลตำบลกำแพงเพชร อีกในไม่ช้านี้ประมาณ 2-3 ปีข้างหน้า ก็จะต้องปิดตามนโยบายของกรมด้วย ทำให้เราจะต้องเพิ่มค่าใช้จ่ายในเรื่องของการจัดการขยะเพิ่มมากขึ้น เปิดหลุมขยะ ต้องเพิ่มค่าใช้จ่ายในการนำขยะไปกำจัด ประมาณปีละ 700,000 บาท เป็นปัญหาใหญ่ของเทศบาลตำบลที่มีขนาดเล็ก งบรายได้ของทางเทศบาลอยู่ที่ประมาณ 50 กว่าล้าน จะต้องนำมาใช้จ่ายด้านกำจัดขยะมากขึ้น

สรุปและอภิปรายผล

1. แนวทางการจัดการขยะมูลฝอย ของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

1.1 แนวทางการจัดการขยะต้นทาง เป็นการบริหารจัดการขยะชุมชน เทศบาลตำบลกำแพงเพชรส่งเสริมให้ประชาชนทุกครัวเรือนแยกขยะ ประชาสัมพันธ์ให้ประชาชนสามารถนำขยะกลับมาใช้ประโยชน์ให้มากที่สุด ขยะที่มีประโยชน์ ได้แก่ ขยะที่สามารถรีไซเคิล ขยะอินทรีย์ สนับสนุนให้ประชาชนสามารถนำขยะกลับมาใช้ประโยชน์ เป็นการเพิ่มรายได้ ลดรายจ่าย โดยมีการจัดทำโครงการเพิ่มศักยภาพชุมชนปลอดขยะ ได้แก่ การจัดอบรมให้ความรู้การจัดการขยะมูลฝอยและสิ่งแวดล้อมในชุมชน การจัดกิจกรรมธนาคารขยะรับฝากขยะรีไซเคิล รวมถึงการจัดนิทรรศการแสดงผลงานชุมชนต้นแบบในเรื่องการจัดการขยะ โดยการจัดทำโครงการมีขึ้นอย่างสม่ำเสมอในแต่ละปีงบประมาณส่วนขยะอันตรายจากครัวเรือน เทศบาลจะขอความร่วมมือให้นำไปใส่ไว้ในถังขยะอันตรายที่ทางเทศบาลได้จัดเตรียมไว้ให้ตามจุดต่าง ๆ 14 จุด โดยทางเทศบาลจะทำการจัดเก็บ 1-2 เดือน/ครั้ง และนำไปรวบรวมไว้ที่ศูนย์รวบรวมขยะอันตรายเพื่อรอการนำส่งไปกำจัดอย่างถูกวิธี ซึ่งกำหนดการกำจัดไว้ปีละ 1 ครั้ง ในส่วนนี้เป็นการได้รับการสนับสนุนงบประมาณจากองค์การบริหารส่วนจังหวัดสงขลาร่วมกับสำนักงานสิ่งแวดล้อมภาคที่ 16

เทศบาลตำบลกำแพงเพชรมุ่งเน้นการคัดแยกจากครัวเรือนเริ่มที่ต้นทาง ส่งเสริมให้ประชาชนมีการใช้หลักการ โดยการใช้ หลัก 3R สร้างความตระหนักกับทุกคนทุกครัวเรือน เรื่องการรวบรวมขยะในเบื้องต้นกับขยะที่จะนำมาทิ้งกับทางเทศบาลเพื่อนำไปสู่การลดปริมาณขยะมูลฝอยในอนาคตภายใต้โครงการที่ทางเทศบาลได้จัดทำขึ้นโครงการเพิ่มศักยภาพชุมชนปลอดขยะ

1.2 แนวทางการจัดการขยะกลางทาง เป็นการจัดเก็บขยะโดยรถเก็บขนขยะของทางเทศบาล เป็นการจัดทำบริการสาธารณะโดยเทศบาลเป็นผู้ดำเนินการด้วยตนเอง วิธีการจัดการขยะในเบื้องต้น โดยเทศบาลมีรถขยะ 2 คัน คันที่ 1 รถยนต์เก็บขนขยะ ชนิด 6 ล้อ แบบอัดท้าย มีขนาดความจุ 12 ลบ.ม. เก็บขยะบริเวณถนนสายหลักและถนนสายรองบางสาย คันที่ 2 รถยนต์เก็บขนขยะ ชนิด 4 ล้อ มีขนาดความจุ 4 ลบ.ม. เก็บขยะบริเวณถนนสายรองและภายในชุมชนทุกสาย การดำเนินการในแนวทางนี้ มีค่าใช้จ่ายเกิดขึ้นในการดำเนินการ

1.3 แนวทางการจัดการขยะปลายทาง การจัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะสำหรับสถานที่กำจัดขยะ มีพื้นที่ 10 ไร่ อยู่ในเขตเทศบาลเมืองกำแพงเพชร ห่างจากเทศบาลตำบลกำแพงเพชร 5 กิโลเมตร ใช้วิธีการฝังกลบ

โดยสรุป เทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา มีแนวทางการจัดการขยะมูลฝอยทั้งแนวทางการจัดการขยะ (1) ต้นทาง ใช้หลัก 3R สร้างความตระหนักกับทุกคนทุกครัวเรือน (2) กลางทาง การจัดเก็บขยะโดยรถเก็บขนขยะ และ (3) ปลายทาง จัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะ

อย่างไรก็ตามเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา ยังคงประสบปัญหาการจัดการขยะมูลฝอย ทั้งต้นทาง กลางทาง และปลายทาง ดังนี้

2. ปัญหาและอุปสรรคในการจัดการขยะมูลฝอยของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

2.1 ปัญหาและอุปสรรคในการจัดการขยะต้นทาง ปัญหาและอุปสรรคในการจัดการขยะมูลฝอยการบริหารจัดการขยะชุมชน พบปัญหาและอุปสรรค ในประเด็นการให้ความสำคัญในการคัดแยกขยะ การเก็บรวบรวม ซึ่งแต่ละชุมชนยังคงมีประชาชนที่ยังไม่ให้ความสำคัญ

2.2 ปัญหาและอุปสรรคในการจัดการขยะกลางทาง ปัญหาและอุปสรรคที่เกี่ยวข้องกับการจัดเก็บขยะโดยรถเก็บขนขยะของทางเทศบาล พบปัญหาและอุปสรรค ในประเด็น 1) อุปกรณ์ เครื่องมือ งบประมาณไม่เพียงพอ 2) การทิ้งขยะเข้ามาทิ้งในเขตเทศบาล จากประชาชนนอกเขตขององค์กรปกครองท้องถิ่นอื่น ทำให้ปริมาณขยะมีเพิ่มมากขึ้นและส่งผลกระทบกับงบประมาณของเทศบาล

2.3 ปัญหาและอุปสรรคในการจัดการขยะปลายทาง พบปัญหาและอุปสรรคการจัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะ คือ ค่าใช้จ่ายในการจัดการขยะเพิ่มสูงขึ้น ประกอบกับในปัจจุบันสถานที่กำจัดขยะของเทศบาลตำบลกำแพงเพชรได้รับการตรวจสอบจากกรมควบคุมมลพิษ กระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม ทางกระทรวงได้มีการจัดทำแผนแม่บทบริหารจัดการขยะมูลฝอยของประเทศ เพื่อแก้ไขปัญหาขยะมูลฝอยตามนโยบายของรัฐบาลที่กำหนดให้เป็นวาระแห่งชาติ ทางกระทรวงได้มีคำสั่งให้ปิดหลุมขยะของทางเทศบาลตำบลกำแพงเพชร และได้วางแนวทางการจัดการหรือวิธีแก้ปัญหาขยะ โดย (1) การกำจัดขยะทั่วไป ได้ขอความร่วมมือจากเทศบาลเมืองบ้านพรุในการใช้แนวทางการกำจัดขยะทั่วไปด้วยวิธีการจากหลอมเตาเผาที่ได้มาตรฐานตามที่กรมควบคุมมลพิษกระทรวงทรัพยากรและสิ่งแวดล้อมกำหนด (2) การจัดการขยะอันตรายการขอความร่วมมือในการจัดการกับขยะอันตราย โดยได้รับความร่วมมือจาก อบจ.สงขลา ในการนำขยะอันตรายไปกำจัด

จากการศึกษาแนวทางการจัดการขยะมูลฝอย ปัญหาและอุปสรรคของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา สามารถสรุปประเด็นสำคัญได้ ดังตารางที่ 1

ตารางที่ 1 สรุปแนวทางการจัดการขยะมูลฝอย ปัญหาและอุปสรรคของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา

	แนวทาง	ปัญหาและอุปสรรค
ต้นทาง	การใช้หลัก 3R สร้างความตระหนักกับทุกคนทุกครัวเรือน	-การให้ความสำคัญในการคัดแยกขยะ ซึ่งแต่ละชุมชนยังคงมีประชาชนที่ยังไม่ให้ความสำคัญ
กลางทาง	การจัดเก็บขยะโดยรถเก็บขนขยะของทางเทศบาล	1) อุปกรณ์ เครื่องมือ งบประมาณไม่เพียงพอ 2) การนำขยะเข้ามาทิ้งในเขตเทศบาล จากประชาชนนอกเขต/องค์กรปกครองท้องถิ่นอื่น ทำให้ปริมาณขยะมีเพิ่มมากขึ้น
ปลายทาง	การจัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะ สำหรับสถานที่กำจัดขยะ	1) ค่าใช้จ่ายในการจัดการขยะเพิ่มสูงขึ้น 2) มาตรฐานตามที่กรมควบคุมมลพิษกระทรวงทรัพยากรและสิ่งแวดล้อม

จากตารางที่ 1 เห็นได้ว่า เทศบาลตำบลกำแพงเพชรมีแนวทางและกำลังเผชิญปัญหาและอุปสรรคในการจัดการขยะมูลฝอย

1. การจัดการขยะมูลฝอยระยะต้นทาง การใช้หลัก 3R สร้างความตระหนักกับทุกคนทุกครัวเรือน เพื่อให้ประชาชนสามารถนำขยะกลับมาใช้ประโยชน์ให้มากที่สุด แต่ยังคงประสบปัญหาการให้ความสำคัญในการคัดแยกขยะ ซึ่งแต่ละชุมชนยังคงมีประชาชนที่ยังไม่ให้ความสำคัญเท่าที่ควร สอดคล้องกับ ฐปนัท จุลวงษ์ (2553) กล่าวถึง ความมเข้าใจของประชาชนในการแยกขยะ ว่าประชาชนยังขาดความเข้าใจในการแยกขยะ คิดว่าการทิ้งขยะลงถังที่เตรียมไว้นั้นเป็นวิธีที่ถูกต้องตามหน้าที่พลเมืองที่ดี และ ปิ่นรัตน์ สิริพันธ์พงศ์ (2566) ศึกษา การวิเคราะห์กลยุทธ์ในการจัดการขยะของเทศบาลตำบลชะมาย อำเภอทุ่งสง จังหวัดนครศรีธรรมราช พบว่า ประชาชนยังขาดความตระหนักในการคัดแยกขยะ รวมถึงประชากรแฝงไม่มีส่วนร่วมจัดการขยะ อีกทั้ง Jerin et al. (2022) กล่าวว่า ประเทศบังคลาเทศเริ่มใช้แนวคิด 3R ในปี 2010 ต่อมาพบว่าขาดประสิทธิภาพ เนื่องมากจากการขาดการประสานงานอย่างมีประสิทธิภาพ

2. การจัดการขยะมูลฝอยระยะกลางทาง มีแนวทางการจัดเก็บขยะโดยรถเก็บขนขยะของทางเทศบาล ประสบปัญหา 1) อุปกรณ์ เครื่องมือ งบประมาณไม่เพียงพอ 2) การนำขยะเข้ามาทิ้งในเขตเทศบาล จากประชาชนนอกเขต/องค์กรปกครองท้องถิ่นอื่น ทำให้ปริมาณขยะมีเพิ่มมากขึ้น สะท้อนให้เห็นว่า การจัดการขององค์กรปกครองส่วนท้องถิ่นมีความซับซ้อนและเกี่ยวข้องกับหลายภาคส่วน ทั้งเรื่องของกฎหมาย นโยบาย สิ่งแวดล้อม ซึ่งองค์ปกครองส่วนท้องถิ่นดูแลพื้นที่ในฐานะเจ้าของพื้นที่โดยตรง และการจัดการขยะมิใช่หน้าที่ขององค์กรปกครองส่วนท้องถิ่นเพียงฝ่ายเดียว นโยบายมีความสอดคล้องกับหลายภาคส่วน (อำนวย บุญรัตนไมตรี, 2560)

3. การจัดการขยะมูลฝอยระยะปลายทาง การจัดสถานที่ให้เหมาะสมสำหรับการจัดการขยะสำหรับสถานที่กำจัดขยะ ประสบปัญหา 1) ค่าใช้จ่ายในการจัดการขยะเพิ่มสูงขึ้น 2) มาตรฐานตามที่กรมควบคุมมลพิษกระทรวงทรัพยากรและสิ่งแวดล้อม ซึ่งถือเป็นปัญหาและอุปสรรคที่องค์กรปกครองส่วนท้องถิ่นไม่สามารถแก้ไขเพียงลำพัง จำเป็นที่จะต้องหาแนวทางการจัดการขยะที่เหมาะสม ด้วยรวมกลุ่มกับองค์กรปกครองส่วนท้องถิ่นใกล้เคียงที่มีปัญหาเช่นเดียวกันเพื่อจัดการขยะแบบบูรณาการ (ปิ่นรัตน์ สิริพันธ์พงศ์, 2566)

จากแนวทางการจัดการขยะมูลฝอย ปัญหาและอุปสรรคของเทศบาลตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา สะท้อนให้เห็นว่า องค์กรปกครองส่วนท้องถิ่นเผชิญปัญหาเกี่ยวข้องกับการจัดบริการสาธารณะที่รูปแบบการจัดบริการแบบเดิมไม่สามารถแก้ไขปัญหาได้ ซึ่งมีความจำเป็นที่จะต้องพิจารณารูปแบบการจัดบริการวาธารณะในรูปแบบอื่น ไม่ว่าจะเป็น การว่าจ้าง (Out Sourcing) การร่วมมือระหว่างภาครัฐและภาคเอกชน (Public-Private Partnership - PPP) สหการ (Co-operative) กิจการพาณิชย์และกิจการเพื่อสังคม (Local Public Enterprise and Social Enterprise) ซึ่งแต่ละรูปแบบมีข้อดีที่แตกต่างกัน กล่าวคือ

การว่าจ้าง (Out Sourcing) เป็นการจ้างให้บุคคลภายนอกทั้งเอกชนหรือปัจเจกบุคคลเข้ามาจัดทำบริการสาธารณะบางประเภทแทนองค์กรปกครองส่วนท้องถิ่น ซึ่งมีข้อดี คือ ช่วยในการรักษาคุณภาพและสร้างความคุ้มค่าด้านงบประมาณ (วุฒิสาร ตันไชย, 2559) สอดคล้องกับ ภิศักดิ์ กัลยาณมิตร และ วชิรวัชร งามละม่อม (2561) กล่าวถึง การว่าจ้างให้เอกชนเข้ามาลงทุนและมีส่วนร่วมในการดำเนินการ ซึ่งสามารถจัดให้อยู่ในรูปแบบการว่าจ้างให้เอกชนเข้ามาเก็บขน ขนส่ง กำจัดขยะมูลฝอย เพื่อให้เกิดการจัดการขยะที่มีประสิทธิภาพมากยิ่งขึ้น

การร่วมมือระหว่างภาครัฐและภาคเอกชน (Public-Private Partnership - PPP) องค์กรปกครองส่วนท้องถิ่นและเอกชนร่วมกันลงทุน การให้เอกชนดำเนินโครงการลงทุนที่ปกติแล้วจะดำเนินการโดยภาครัฐ เพื่อให้เกิดการลงทุนสร้างระบบจัดการขยะที่เหมาะสม (วุฒิสาร ตันไชย, 2559; ภิศักดิ์ กัลยาณมิตร และ วชิรวัชร งามละม่อม, 2561)

สหการ (Co-operative) โดยสนับสนุนองค์กรปกครองส่วนท้องถิ่นตั้งแต่สองแห่งขึ้นไปร่วมกันจัดทำบริการสาธารณะ (โกวิทย์ พวงงาม, 2547; วุฒิสาร ตันไชย, 2559; ภิศักดิ์ กัลยาณมิตร และ วชิรวัชร งามละม่อม, 2561) ประเทศที่นำรูปแบบสหการไปใช้ เช่น ประเทศฝรั่งเศส ประเทศสหรัฐอเมริกา (โกวิทย์ พวงงาม, 2547) หากพัฒนารูปแบบการจัดบริการสาธารณะรูปแบบนี้ โดยการสร้างองค์กรขึ้นมาเพื่อบริหารจัดการขยะมูลฝอยในพื้นที่เทศบาลตำบลกำแพงเพชรและพื้นที่องค์กรปกครองส่วนท้องถิ่นอื่นที่เป็นผู้มีส่วนได้ส่วนเสียตลอดแนวทางการจัดการขยะ ทั้งต้นทาง กลางทาง และปลายทาง เพื่อให้การจัดการเรื่องนี้เป็นไปอย่างมีประสิทธิภาพ และสอดคล้องกับพระราชบัญญัติเทศบาล ที่บัญญัติเรื่องสหการไว้อย่างชัดเจน

กิจการพาณิชย์และกิจการเพื่อสังคม (Local Public Enterprise and Social Enterprise) เป็นแนวทางร่วมสมัยและสอดคล้องกับแนวทางการพัฒนาอย่างยั่งยืน กำลังแพร่หลายอยู่ในปัจจุบัน มุ่งเน้นการดำเนินกิจการธุรกิจที่องค์กรปกครองส่วนท้องถิ่นเป็นเจ้าของ เพื่อทำหน้าที่จัดทำบริการเกี่ยวกับการจัดการขยะและสร้างรายได้ให้แก่ท้องถิ่นในระยะยาว (ติญทรรศน์ ประทีปพรณรงค์, 2566).

โดยองค์กรปกครองส่วนท้องถิ่นสามารถดำเนินกิจการที่องค์กรปกครองส่วนท้องถิ่นจัดตั้งเพื่อดำเนินงาน บริการสาธารณะสำหรับหารายได้ให้กับองค์กรปกครองส่วนท้องถิ่น โดยกิจการพาณิชย์สามารถจัดบริการสาธารณะได้โดยไม่จำกัดประเภทของบริการและดำเนินงานแข่งขันกับเอกชนได้ แต่การแสวงหาผลกำไรของกิจการพาณิชย์ต้องคำนึงถึงประโยชน์สาธารณะที่ให้กับชุมชนท้องถิ่น (วุฒิสาร ตันไชย , 2559)

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

องค์กรปกครองส่วนท้องถิ่นต้องทำการพิจารณารูปแบบการจัดบริการสาธารณะในรูปแบบใหม่เพื่อให้เกิดประสิทธิภาพในการจัดบริการสาธารณะและประโยชน์สูงสุดที่จะเกิดแก่ประชาชน ในกรณีการจัดการขยะมูลฝอย

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรศึกษาแนวทางการแก้ไขปัญหาการจัดการขยะ ภายใต้รูปแบบการบริการสาธารณะ เช่น สหการ และกิจการพาณิชย์และกิจการเพื่อสังคม

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ผู้อำนวยการสำนักสาธารณสุขและสิ่งแวดล้อม (ผู้ให้สัมภาษณ์), สุทธิชัย รักจันทร์ (ผู้สัมภาษณ์), ที่เทศบาลตำบลกำแพงเพชร ตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา เมื่อวันที่ 10 ตุลาคม 2566.

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การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม (GAP) ของเกษตรกร อำเภอคลองลาน จังหวัดกำแพงเพชร

Acceptance of Cassava Production According to Good Agricultural Practices (GAP) Standards by Farmers in Kling Lan Diistrict, Kamphaeng Phet Province.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษา1) สถานภาพบุคคล เศรษฐกิจ สังคม และการผลิตมันสำปะหลังของเกษตรกร 2) การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติการทำการเกษตรที่ดีและเหมาะสม (GAP) และ 3) ปัญหา ความต้องการ และการยอมรับการปลูกมันสำปะหลังเพื่อการบริโภคของมนุษย์ของเกษตรกร ประชากรที่ทำการศึกษา คือ เกษตรกรผู้ปลูกมันสำปะหลังในกลุ่มวิสาหกิจแปลงใหญ่มันสำปะหลัง ม.9 ตำบลคลองน้ำไหล อำเภอคลองลาน จังหวัดกำแพงเพชร จำนวน 50 ราย และคัดเลือกกลุ่มตัวอย่างแบบเจาะจงเกษตรกรที่มีความต้องการปลูกมันสำปะหลังแบบอินทรีย์ จำนวน 40 ราย เครื่องมือที่ใช้ในการวิจัย คือ แบบสอบถาม และวิเคราะห์ข้อมูลทางสถิติโดยการหาค่าความถี่ ค่าเฉลี่ย ค่าร้อยละ ค่าสูงสุด ค่าต่ำสุด ค่าเบี่ยงเบนมาตรฐานและการจัดลำดับ

ผลการวิจัยพบว่า 1) เกษตรกรมีอายุเฉลี่ย 48.78 ปี มีระดับการศึกษาในระดับประถมศึกษา มีประสบการณ์ในการปลูกมันสำปะหลัง เฉลี่ย 17.02 ปี มีพื้นที่ปลูกเฉลี่ยประมาณ 28.13 ไร่ พันธุ์มันสำปะหลังที่เกษตรกรนิยมปลูกกันมากที่สุด คือ พันธุ์ห้วยบง มีรายได้เฉลี่ย 8,005 บาทต่อไร่ รายจ่ายเฉลี่ย 2,304.17 บาทต่อไร่ เกษตรกรส่วนใหญ่ไม่เคยเข้ารับการอบรม ไม่เคยศึกษาดูงานเกี่ยวกับการปลูกมันสำปะหลัง และเกษตรส่วนใหญ่ไม่มีการติดต่อกับเจ้าหน้าที่ 2) เกษตรกรมีการยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม ในภาพรวมอยู่ในระดับมาก (ที่ค่าเฉลี่ย 3.56) โดยการยอมรับด้านกระบวนการผลิตก่อนการเก็บเกี่ยวจะมีระดับการยอมรับมากที่สุด (3.94) และการยอมรับด้านการบันทึกข้อมูลและการตามสอบ เกษตรกรให้การยอมรับในระดับปานกลาง (เฉลี่ย 2.87) 3) เกษตรกรส่วนใหญ่ ร้อยละ 27.5 ไม่แน่ใจว่าจะผลิตมันสำปะหลังได้ตามมาตรฐานการปฏิบัติที่ดีและเหมาะสมเนื่องจากยังขาดความรู้ความเข้าใจในการปฏิบัติ ไม่เคยได้รับการอบรม ศึกษาดูงาน และความรู้จากเจ้าหน้าที่หรือหน่วยงานต่าง ๆ ที่เกี่ยวข้อง และผู้รับซื้อผลิตภัณฑ์มันสำปะหลัง ไม่ได้กำหนดคุณสมบัติของการปลูก แต่จะรับซื้อโดยพิจารณาจากน้ำหนักและปริมาณแป้งของมันสำปะหลัง

คำสำคัญ: การยอมรับ, มันสำปะหลัง, การปฏิบัติการทางการเกษตรที่ดีและเหมาะสม

Abstract

The objectives of this research were to study 1) the personal, economic, social, and cassava production status of farmers, 2) the acceptance of cassava production according to the standards of good and appropriate agricultural practices (GAP), and 3) problems, needs, and acceptance of farmers' cultivation of cassava for human consumption. The study population was Cassava farmers in the large cassava field enterprise group, Village No. 9, Khlong Nam Lai Subdistrict, Khlong Lan District, Kamphaeng Phet Province, totaling 50 and selecting a specific sample group of 40 farmers who wish to grow cassava organically. Tools used Research is a questionnaire and statistical analysis of data by finding frequency, average, percentage, maximum, minimum, standard deviation and ranking.

The results of the research found that 1) Farmers had an average age of 48.78 years and had an education level at the primary school level. Has an average experience in growing cassava of 17.02 years, with an average planting area of approximately 28.13 rai. The cassava variety that farmers grow most commonly is the Huai Bong variety, with an average income of 8,005 baht per rai and an average expense of 2,304.17 baht per rai. Most farmers had never received training and study visit about growing cassava. Most farmers did not contact with officials. 2) Farmers accept cassava production according to good and appropriate agricultural practice standards overall at a high level. (at an average of 3.56) with acceptance of the pre-harvest production process having the highest level of acceptance (3.94) and acceptance of data recording and monitoring. Farmers accepted the least (average 2.87, moderate level). 3) Most farmers, 27.5, were not sure that they could produce cassava according to good and appropriate standards of practice because they still lacked knowledge and understanding of the practice and never received training, study tours, and knowledge from officials or various agencies and the purchaser of cassava products has never specified the qualifications for cultivation, but the purchases it based on the weight and starch content of the cassava.

Keywords: Acceptance, Good Agricultural Practices, Cassava

บทนำ

การพัฒนาที่ยั่งยืนของประเทศไทย มีประเด็นท้าทายที่สำคัญต้องเร่งดำเนินการ คือ เป้าหมายหลักที่ 2 ความมั่นคงทางอาหารประกอบด้วยเป้าหมายย่อย SDG2.1, SDG2.2 และ SDG2.4 โดยเฉพาะใน SDG2.4 ต้องสร้างหลักประกันว่าจะมีระบบการผลิตอาหารที่ยั่งยืนและดำเนินการตามแนวปฏิบัติทางการเกษตรที่มีภูมิคุ้มกัน เพื่อเพิ่มผลิตภาพและการผลิต ซึ่งจะช่วยรักษาระบบนิเวศ เสริมขีดความสามารถในการปรับตัวต่อการเปลี่ยนแปลงสภาพภูมิอากาศ สภาวะอากาศรุนแรงสุดขั้ว ภัยแล้ง อุทกภัย และภัยพิบัติอื่น ๆ และจะช่วยพัฒนาที่ดินและคุณภาพของดินและที่ดินอย่างต่อเนื่องภายในปี พ.ศ. 2573 โดยเน้นการบูรณาการความร่วมมือของทุกภาคส่วน เพื่อดำเนินการมาตรการที่มีประสิทธิภาพและเกิดผลเป็น

รูปธรรมภายใต้งบประมาณและทรัพยากรที่จำกัด โดยเฉพาะการขับเคลื่อนเป้าหมายย่อยที่เกื้อกูล และแรงหนุนให้เป้าหมายย่อยอื่น ๆ สามารถประสบความสำเร็จได้ในคราวเดียวกัน (สำนักงานสภาพัฒนาการเศรษฐกิจและสังคมแห่งชาติ, 2564)

อุตสาหกรรมมันสำปะหลังไทยเกี่ยวเนื่องกับระบบเศรษฐกิจไทยและสังคมไทยมานานกว่า 30 ปี มีเกษตรกรผู้ปลูกมันสำปะหลัง ประมาณ 500,000 ครัวเรือน เกิดการจ้างงานในอุตสาหกรรมแปรรูป (มันเส้น มันอัดเม็ด แป้งดิบ และแป้งดัดแปร) และอุตสาหกรรมต่อเนื่อง (สารให้ความหวาน แอลกอฮอล์ กรดอินทรีย์ กรดอะมิโน กระดาษและสิ่งทอ เป็นต้น ไม่ต่ำกว่า 1 ล้านคน ร้อยละ 67 ของผลผลิตมันสำปะหลังถูกใช้ในการแปรรูปเพื่อส่งออก ส่วนที่เหลือใช้ในการบริโภคและเป็นวัตถุดิบในอุตสาหกรรมต่อเนื่องในประเทศ ประเทศไทยเป็นผู้ส่งออกผลิตภัณฑ์มันสำปะหลังเป็นอันดับหนึ่งของโลกมากกว่า 20 ปี มูลค่าการส่งออกประมาณ 93,000 ล้านบาทโดยมีมูลค่ารวมของที่ใช้ในประเทศและส่งออกทั้งหมดไม่ต่ำกว่า 190,000 ล้านบาท และมูลค่าอุตสาหกรรมต่อเนื่องอีกมากกว่า 300,000 ล้านบาท ซึ่งแป้งและฟลาวมันสำปะหลังนอกจากไม่มีสี ไม่มีกลิ่น ยังปราศจากสารก่อภูมิแพ้ คือ กลูเตน จึงมีศักยภาพในการใช้ทดแทนแป้งสาลีที่มีกลูเตน จากคุณสมบัติในการใช้งานของมันสำปะหลังที่หลากหลาย รวมทั้งแนวโน้มการเปลี่ยนแปลงของโลกที่มุ่งสู่การลดผลกระทบต่อสิ่งแวดล้อม อุตสาหกรรมที่มีฐานมาจากวัตถุดิบทางการเกษตรหรือ biobased industry (Bio-economy) จึงเติบโตอย่างต่อเนื่อง ไม่ว่าพลังงานชีวภาพไบโอพลาสติก ทำให้ความต้องการมันสำปะหลังในตลาดโลกเพิ่มสูงขึ้น (สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ, 2565)

จังหวัดกำแพงเพชร เป็นแหล่งมันสำปะหลังอันดับ 2 ของประเทศ ในฤดูกาลผลิตปี พ.ศ. 2564 ถึง พ.ศ. 2565 ให้ผลผลิต 2.54 ล้านตัน โดนราคาเฉลี่ยกิโลกรัมละ 2.50 – 2.70 บาท ส่วนราคาหัวสำปะหลังเชื้อแป้ง 30% เฉลี่ยที่กิโลกรัมละ 3.00 – 3.10 บาท มีวิสัยทัศน์ในแผนจังหวัด 20 ปี (พ.ศ. 2566 – 2585) มีเป้าหมายเชิงคุณภาพต้องการให้เกษตรกรสามารถผลิตมันสำปะหลังที่มีคุณภาพดี สามารถจำหน่ายให้กับตลาดแปรรูปเพื่อเป็นสินค้าคุณภาพได้ (สำนักงานเกษตรและสหกรณ์จังหวัดกำแพงเพชร, 2565) และมีแผนการดำเนินการจำหน่ายมันเส้นสะอาด รวมทั้งภาครัฐ โดยหน่วยงานที่เกี่ยวข้องจะร่วมกันส่งเสริม สนับสนุน ผลิตภัณฑ์มันสำปะหลังให้หลากหลายมากขึ้น เช่น แป้งฟลาวมันสำปะหลัง ซึ่งอยู่ในกระแสอาหารสุขภาพ รวมทั้งส่งเสริมให้เกษตรกรเก็บเกี่ยววัสดุเหลือทิ้งจากการเก็บเกี่ยวหัวมันสำปะหลัง เช่น ใบ นำไปผลิตสินค้าประเภทต่าง ๆ นอกเหนือจากการขายหัวมันสำปะหลังสด เช่น อาหารสัตว์จากใบมันสำปะหลังอัดเม็ด เพื่อเป็นการเพิ่มรายได้แก่เกษตรกรอีกทางหนึ่ง รวมทั้งเป็นการสนับสนุนให้เกิดเศรษฐกิจหมุนเวียน (Circular Economy)

ผู้วิจัยจึงสนใจศึกษาเรื่อง การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติงานที่ดีและเหมาะสม (GAP) ของเกษตรกร เพื่อเป็นแนวทางในการดำเนินงานส่งเสริมการปฏิบัติให้ตรงกับความต้องการ สภาพปัญหาของพื้นที่ และข้อจำกัดในมิติต่าง ๆ เพื่อให้ได้ผลผลิตที่มีคุณภาพ ปลอดภัยต่อเกษตรกรและผู้บริโภค รวมทั้งเป็นการเพิ่มมูลค่าและยกระดับมาตรฐานให้กับสินค้าทางการเกษตรตามแนวทาง BCG Model และจะเป็นการเพิ่มรายได้ให้กับเกษตรกร และทำให้เกิดผลกระทบในการเพิ่มความมั่นคงทางอาหาร (SDG2) ซึ่งเป็นเป้าหมายที่ท้าทายของประเทศไทยในการบรรลุเป้าหมายพัฒนาที่ยั่งยืน

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาสถานภาพบุคคล เศรษฐกิจ สังคม และการผลิตมันสำปะหลังของเกษตรกร

2. เพื่อศึกษาการยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติการทำการเกษตรที่ดีและเหมาะสม (GAP)

3. เพื่อศึกษาปัญหา ความต้องการ และการยอมรับการปลูกมันสำปะหลังเพื่อการบริโภคของมนุษย์ของเกษตรกร

แนวคิด ทฤษฎี กรอบแนวคิด

การวิจัยครั้งนี้ผู้วิจัยได้ศึกษาค้นคว้า รวบรวมเอกสาร แนวคิดทฤษฎี และงานวิจัยที่เกี่ยวข้องดังต่อไปนี้

1. BCG ขับเคลื่อนมันสำปะหลังอินทรีย์ยั่งยืนด้วยตลาดนำการผลิต

“มันสำปะหลัง” พืชเศรษฐกิจที่สำคัญอีกชนิดหนึ่งของประเทศ เป็นพืชที่มีปริมาณแป้งสูง (Carbohydrate-rich Crops) สามารถนำไปใช้ประโยชน์ใน 4 ด้านหลัก (4F) ประกอบด้วย 1) Food อาหารสำหรับมนุษย์ 2) Feed อาหารเลี้ยงสัตว์ 3) Fuel วัตถุดิบในการผลิตเอทานอลเพื่อใช้เป็นพลังงานชีวภาพ และ 4) Factory ภาคอุตสาหกรรม อาทิเช่น แอลกอฮอล์ กรดมะนาว เครื่องนุ่งห่ม ยา กระดาษ และเคมีภัณฑ์ เป็นต้น (ธนาคารกรุงศรีอยุธยา จำกัด (มหาชน), 2564) ซึ่งไทยถือเป็นผู้ส่งออกมันสำปะหลังที่ครองอันดับหนึ่งของโลกมายาวนาน แต่ตลอดระยะเวลาที่ผ่านมา มันสำปะหลังของไทยยังคงประสบปัญหาความไม่มีเสถียรภาพ ทั้งในด้านการขาดแคลนท่อนพันธุ์และคุณภาพของท่อนพันธุ์ รวมถึงวิธีการเพาะปลูกที่ยังไม่มีประสิทธิภาพส่งผลให้มีผลผลิตที่ไม่เพียงพอต่อความต้องการ อย่างในช่วงนี้ที่เข้าสู่ฤดูกาลเก็บเกี่ยวของปี พ.ศ. 2566 ซึ่งคาดว่า ผลผลิตมันสำปะหลังของไทยจะลดลงเหลือ 31.7 ล้านตัน จากคาดการณ์เดิม 34.98 ล้านตัน อันเนื่องจากความเสียหายจากภัยธรรมชาติ ความผันผวนของสภาพอากาศ รวมถึงโรคศัตรูพืชต่าง ๆ ขณะที่ความต้องการผลผลิตมันสำปะหลังยังมีแนวโน้มที่ดีจากความต้องการบริโภคอาหาร โดยเฉพาะอาหารเพื่อสุขภาพของตลาดโลก แล้วมันสำปะหลังไทยจะคว้าโอกาสนั้นมาครอบครองอย่างยั่งยืนได้อย่างไร (บริษัทอุบลไบโอ เอทานอล จำกัด (มหาชน), 2566)

2. การปฏิบัติการทางการเกษตรที่ดีสำหรับมันสำปะหลัง (GAP)

สำนักงานมาตรฐานสินค้าเกษตรและอาหารแห่งชาติ. กระทรวงเกษตรและสหกรณ์ (2553) ได้กำหนดเกณฑการปฏิบัติด้านการผลิตมันสำปะหลัง (Cassava) ที่มีชื่อวิทยาศาสตรวา Manihot Esculenta (L.) Crantz วงศ Euphorbiaceae ตั้งแต่ในแปลงปลูกจนถึงลานตาก หรือแหล่งรับซื้อ เพื่อให้ได้มันสำปะหลังที่มีคุณภาพ ปลอดภัย เหมาะสมตอการใช้ประโยชน โดยคำนึงถึงสิ่งแวดล่อม สุขภาพ ความปลอดภัย และสวัสดิภาพของผูปฏิบัติงานด้วย มีเกณฑ์กำหนดและวิธีการตรวจประเมิน ดังตารางที่ 1

ตารางที่ 1 แสดงเกณฑ์กำหนด และวิธีตรวจประเมินมันสำปะหลัง

รายการ	เกณฑ์กำหนด	วิธีตรวจประเมิน
1. พื้นที่ปลูก	1. พื้นที่ปลูกและแหล่งน้ำไม่มีสภาพแวดล้อมที่เสี่ยงต่อการตกค้างหรือปนเปื้อนของโลหะหนักและวัตถุอันตรายทางการเกษตรในผลิตผลในระดับที่เกินมาตรฐานหรือข้อกำหนดของกฎหมายที่เกี่ยวข้อง	1. ตรวจสภาพแวดล้อมหากอยู่ในสภาวะเสี่ยงให้วิเคราะห์คุณภาพดินและ/หรือน้ำ
2. การใช้วัตถุอันตรายทางการเกษตร	2. กรณีมีความจำเป็นต้องใช้วัตถุอันตรายทางการเกษตร ผู้ปฏิบัติงานต้องมีความรู้ในการใช้ที่ถูกต้อง ใช้ตามคำแนะนำของกรมวิชาการเกษตร กระทรวงเกษตรและสหกรณ์ หรือฉลากที่ขึ้นทะเบียนอย่างถูกต้องกับกรมวิชาการเกษตร และต้องระมัดระวังไม่ให้ปนเปื้อนสู่แหล่งน้ำสาธารณะ	2. ตรวจประเมินความรู้ ความเข้าใจหรือหลักฐานการฝึกอบรมของผู้ปฏิบัติงาน หรือตรวจการปฏิบัติงาน และกรณีที่มีการใช้วัตถุอันตรายทางการเกษตรให้ตรวจบันทึกข้อมูลการใช้
3. กระบวนการผลิตก่อนการเก็บเกี่ยว	3.1 ดำเนินการอนุรักษ์และบำรุงดิน	3.1 ตรวจพินิจการเตรียมดินหรือสัมภาษณ์ และตรวจบันทึกข้อมูลการบำรุงดินตามลักษณะของพื้นที่
	3.2 คัดเลือกท่อนพันธุ์ที่ปลอดจากศัตรูพืช	3.2 ตรวจพินิจและตรวจบันทึกข้อมูลที่มาของท่อนพันธุ์
	3.3 ต้องกำจัดและควบคุมศัตรูพืชหลังการปลูกภายใน 3 เดือน อย่างมีประสิทธิภาพ	3.3 ตรวจบันทึกข้อมูล และ/หรือตรวจพินิจ
4. การเก็บเกี่ยว	4. มันสำปะหลังที่เก็บเกี่ยวต้องมีอายุระหว่าง 8 เดือน ถึง 18 เดือน	4. ตรวจบันทึกข้อมูล
5. การขนส่ง	5. ขนส่งมันสำปะหลังที่เก็บเกี่ยวแล้วถึงลานตาก หรือแหล่งรับซื้อโดยเร็ว หรืออย่างช้าไม่เกิน 2 วัน	5. ตรวจบันทึกข้อมูล
6. สุขภาพของผู้ปฏิบัติงาน	6. ผู้ปฏิบัติงานต้องได้รับการดูแลสุขภาพอย่างเหมาะสม และเพียงพอ	6. ตรวจพินิจ และสัมภาษณ์
7. การบันทึกข้อมูล	7.1 มีการบันทึกข้อมูล เพื่อให้สามารถตรวจประเมิน และตามสอบสินค้าในระดับแปลงปลูก ดังนี้ - ที่มาของท่อนพันธุ์และชื่อพันธุ์ที่ปลูก ปุ๋ย และวัตถุอันตรายทางการเกษตร - การใช้วัตถุอันตรายทางการเกษตร - การบำรุงดิน เช่น การใส่ปุ๋ยอินทรีย์ ปุ๋ยเคมี และ/ หรือการปลูกพืชหมุนเวียน	7.1 ตรวจบันทึกข้อมูล

รายการ	เกณฑ์กำหนด	วิธีตรวจประเมิน
	- การควบคุมวัชพืช และศัตรูพืชอื่น ๆ - วันที่ปลูก วันที่เก็บเกี่ยว และวันที่ขนส่ง - ข้อมูลผู้รับซื้อผลิตผล หรือแหล่งที่นำผลิตผล ในแต่ละรุ่นไปจำหน่าย	
	7.2 เก็บรักษาบันทึกข้อมูลไม่น้อยกว่า 18 เดือน นับจากวันที่ขนส่งจากแปลงปลูก	7.2 ตรวจพินิจ หรือสัมภาษณ์

ที่มา: สำนักงานมาตรฐานสินค้าเกษตรและอาหารแห่งชาติ (2553)

3. ประโยชน์ที่เกษตรกรจะได้รับจากการปลูกพืชระบบ GAP

สำนักงานปฏิรูปที่ดินเพื่อเกษตรกรรม (ส.ป.ก.) (ม.ป.ป.) ได้ระบุถึงประโยชน์ที่เกษตรกรจะได้รับจากการปลูกพืชระบบ GAP ดังนี้ 1) มีความรู้และผลิตพืชอย่างเป็นระบบ สามารถลดต้นทุน เพิ่มผลผลิตได้ 2) ได้ผลผลิตที่มีคุณภาพได้มาตรฐานปลอดภัยจากการปนเปื้อน ผลผลิตเป็นที่ต้องกา รของตลาดทั้งในและต่างประเทศ 3) ลดการใช้สารเคมี ไม่ก่อให้เกิดมลพิษต่อสภาพแวดล้อม 4) ได้การรับรองการผลิต และผลิตเป็นที่ยอมรับ สร้างความเชื่อมั่นของผู้ผลิตและผู้บริโภค และเพิ่มอำนาจในการต่อรองราคาสินค้า 5) ผู้ผลิตและผู้บริโภคมีสุขภาพแข็งแรง เพราะได้บริโภคสินค้าที่มีความปลอดภัย และ 6) มีรายได้จากการขายผลผลิต ผลผลิตคุ้มค่ากับการลงทุน

4. งานวิจัยที่เกี่ยวข้อง

ผู้วิจัยได้ทบทวนงานวิจัยที่เกี่ยวข้องกับการยอมรับการปลูกพืชภายใต้มาตรฐานการปฏิบัติการทางการเกษตรที่ดีและเหมาะสม (GAP) ของเกษตรกร ในช่วงปี พ.ศ. 2560 – พ.ศ. 2566 จากฐานข้อมูล Google Scholar โดยใช้คำค้น การยอมรับ, มาตรฐานการปฏิบัติการที่ดีและเหมาะสม และ GAP จำนวน 7 บทความ มีคุณลักษณะต่าง ๆ ดังตารางที่ 2

ตารางที่ 2 แสดงข้อมูลทั่วไป ลำดับและค่าเฉลี่ยของการยอมรับ/ปฏิบัติตามมาตรฐานการปฏิบัติการเกษตรทีดีและเหมาะสม (GAP)

ผู้วิจัย	กังสดาล	กาญจน์กนก	พุฒิสวรรค์	จักรพันธ์	วสันต์	วราภรณ์	ณัฐวุฒิ	เฉลี่ย	ลำดับ
เพศ	ชาย	ชาย	ชาย	ชาย	หญิง	หญิง	ชาย		
อายุ	39.12	56.93	47	49	56.53	54.89	45	49.78	
ศึกษา	มัธยม	ประถม	ประถม	ไม่มี	ประถม	ประถม	ประถม		
อบรม	0.67	1.37	2	1	3.04	-	1.16	1.54	
ปลูก (ปี)	7.7	7.48	14	3	19.09	.	8.52	9.97	
พื้นที่ (ไร่)	7.7	7.44	6.84	3.48	12.85	6.63	57.59	14.65	
พืช	พืชผัก	มะม่วง	พืชผัก	หม่อน	ลำไย	ผักชี	กล้วย		
ตัวอย่าง	161	195	144	154	122	168	108	150.28	
ด้าน 1	4.09	4.83	3.74	3.30	4.24	3.09	4.31	3.943	4

ด้าน 2	3.89	4.75	3.82	3.18	4.05	3.05	4.35	3.870	5
ด้าน 3	3.92	4.76	3.86	3.22	4.09	2.98	4.92	3.964	3
ด้าน 4	3.91	4.77	3.77	3.16	4.13	2.97	4.36	3.867	6
ด้าน 5	4.18	4.77	3.82	3.21	4.17	2.97	4.83	3.993	2
ด้าน 6	4.10	4.81	3.77	3.16	4.13	3.46	4.91	4.049	1
ด้าน 7	4.03	3.99	3.79	3.18	4.08	2.76	-	3.119	8
ด้าน 8	3.89	4.71	3.79	2.41	3.88	2.22	4.82	3.674	7
เฉลี่ย	4.00	4.67	3.80	3.10	4.09	2.88	4.64	3.883	

หมายเหตุ

ด้านที่ 1 คือ แหล่งน้ำ, ด้านที่ 2 คือ พื้นที่ปลูก, ด้านที่ 3 คือ การใช้วัสดุอันตรายทางการเกษตร, ด้านที่ 4 คือ การจัดการคุณภาพในกระบวนการผลิตก่อนเก็บเกี่ยว, ด้านที่ 5 คือ การเก็บเกี่ยวและการปฏิบัติหลังการเก็บเกี่ยว, ด้านที่ 6 คือ การขนย้ายการเก็บรักษา และการรวบรวมผลผลิต, ด้านที่ 7 คือ สุขลักษณะส่วนบุคคล และด้านที่ 8 คือ การบันทึกข้อมูลและการตามสอบ

มณีนิล อินขัติ, นารีรัตน์ สีระสาร และ สีนีนุช ครุฑเมิง แสนเสริม. (2566) ได้ศึกษาการยอมรับการปฏิบัติทางการเกษตรที่ดีในการผลิตหอมแดงของเกษตรกร อำเภอฟากท่า จังหวัดอุตรดิตถ์ พบว่า เกษตรกรยอมรับการผลิตหอมแดงตามการปฏิบัติทางการเกษตรที่ดีในระดับมาก (เฉลี่ย 3.68) ได้แก่ มีการจัดการก่อนและหลังการเก็บเกี่ยวที่เหมาะสม ใช้วัตถุอันตรายทางการเกษตรอย่างปลอดภัย ใช้หัวพันธุ์หอมแดงที่ปลอดโรค พื้นที่เพาะปลูกเหมาะสม มีการบันทึกข้อมูล และมีการใช้น้ำจากแหล่งน้ำที่ปลอดภัย มีข้อเสนอแนะ คือ ให้หน่วยงานที่เกี่ยวข้องควรบูรณาการร่วมกันแก้ไขปัญหา เจ้าหน้าที่ควรพัฒนาทักษะและความรู้ที่เกี่ยวกับการปฏิบัติทางการเกษตรที่ดีให้แก่เกษตรกรให้มากขึ้น

วิธีดำเนินการวิจัย

การศึกษาครั้งนี้เป็นการวิจัยเชิงสำรวจ ประชากรที่ทำการศึกษา คือ เกษตรกรผู้ปลูกมันสำปะหลังในกลุ่มวิสาหกิจแปลงใหญ่มันสำปะหลัง ม.9 ตำบลคลองน้ำไหล อำเภอคลองลาน จังหวัดกำแพงเพชร จำนวน 50 ราย และคัดเลือกกลุ่มตัวอย่างแบบเจาะจงเกษตรกรที่มีความต้องการปลูกมันสำปะหลังแบบอินทรีย์ จำนวน 40 ราย เครื่องมือที่ใช้ในการวิจัย คือ แบบสอบถาม เป็นคำถามปลายปิดและปลายเปิด มีโครงสร้างแบ่งออกเป็น 4 ตอน ได้แก่ ตอนที่ 1 สถานภาพของเกษตรกรผู้ปลูกมันสำปะหลัง ตอนที่ 2 การยอมรับการปฏิบัติการทางการเกษตรที่ดี (GAP) ตอนที่ 3 ปัญหา/ความต้องการ และการยอมรับมันสำปะหลังพันธุ์ใหม่ และตอนที่ 4 ข้อเสนอแนะ

การวิเคราะห์ข้อมูลในการวิจัยครั้งนี้ ใช้โปรแกรมสถิติสำเร็จรูปเพื่อการวิจัยทางสังคมศาสตร์ ซึ่งมีการแบ่งการวิเคราะห์ข้อมูลทางสถิติดังนี้ 1. ข้อมูลสถานภาพของเกษตรกร โดยใช้สถิติเชิงพรรณนา ได้แก่ ค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน 2. สำหรับการวิเคราะห์ข้อมูลเกี่ยวกับการยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสมทั้งหมด 7 ด้าน 30 ประเด็น โดยใช้วิธีการประเมินระดับการยอมรับ โดยใช้เกณฑ์ในการแปลความหมายค่าคะแนนเฉลี่ยดังนี้ 1) ค่าคะแนนเฉลี่ยระหว่าง 1.0 – 1.49 เท่ากับระดับการยอมรับน้อยที่สุด 2) ค่าคะแนนเฉลี่ยระหว่าง 1.50 – 2.49 เท่ากับระดับการยอมรับน้อย 3) ค่าคะแนนเฉลี่ยระหว่าง 2.50 – 3.49 เท่ากับระดับการ

ยอมรับปานกลาง 4) ค่าคะแนนเฉลี่ยระหว่าง 3.50 – 4.49 เท่ากับระดับการยอมรับมาก และ 5) ค่าคะแนนเฉลี่ยระหว่าง 4.50 – 5.00 เท่ากับระดับการยอมรับมากที่สุด (มณีนิล อินขัติ และคณะ, 2566)

ผลการวิจัย

สถานภาพส่วนบุคคล เศรษฐกิจ และสังคมของเกษตรกร

ผลการศึกษาพบว่า เกษตรกรเป็นเพศชายและหญิงมีความใกล้เคียงกัน ร้อยละ 47.5 และ 52.5 ตามลำดับ เกษตรกรเกือบครึ่งหนึ่งมีอายุอยู่ในช่วง 40 – 49 ปี (ร้อยละ 40.00) มีอายุเฉลี่ย 48.78 ปี ระดับการศึกษาเกษตรกรส่วนใหญ่เกือบครึ่งหนึ่ง มีระดับการศึกษาในระดับประถมศึกษา (ร้อยละ 42.5) รองมา มีระดับการศึกษาในระดับมัธยมปลาย/ปวช. (ร้อยละ 22.5) เกษตรกรมีประสบการณ์ในการปลูกมันสำปะหลัง เฉลี่ย 17.02 ปี โดยมีประสบการณ์ปลูกต่ำสุด 4 ปี และประสบการณ์ปลูกสูงสุด 40 ปี เกษตรกรมีพื้นที่ปลูกมันสำปะหลังเฉลี่ย 28.1 ไร่ มีพื้นที่ปลูกมันสำปะหลังน้อยที่สุด 3 ไร่ และมีพื้นที่ปลูกมันสำปะหลัง มากที่สุด 100 ไร่ โดยส่วนใหญ่เกษตรกรมีพื้นที่ปลูกมันสำปะหลังอยู่ในช่วง 1.25 ไร่ มากที่สุด (ร้อยละ 60) รองลงมามีพื้นที่ปลูกอยู่ในช่วง 26 – 50 ไร่ (ร้อยละ 32.5) มีพื้นที่ปลูกเฉลี่ยประมาณ 28.13 ไร่ พันธุ์มันสำปะหลังที่เกษตรกรนิยมปลูกกันมากที่สุดคือ พันธุ์ห้วยบง (ร้อยละ 32.5) รองลงมาคือ พันธุ์89 และพันธุ์ระยอง 5 (ร้อยละ 22.5 และ 20.0 ตามลำดับ) เกษตรกรส่วนใหญ่ประมาณครึ่งหนึ่งมีแรงงานในครัวเรือน 2 คน (ร้อยละ 50) ส่วนใหญ่มีการจ้างแรงงานเพิ่ม จำนวน 2 คน (ร้อยละ 30) มีรายได้จากการทำงานการเกษตร อยู่ในช่วง 5,001 – 10,000 บาทต่อไร่ มากที่สุด (ร้อยละ 90.0) มีค่าเฉลี่ยของรายได้ 8,005 บาทต่อไร่ เกษตรกรมีรายจ่ายจากการทำการเกษตร อยู่ในช่วง 0 – 3,000 บาทต่อไร่ มากที่สุด (ร้อยละ 75.0) โดยมีค่าเฉลี่ยของรายจ่ายประมาณ 2,304.17 บาทต่อไร่ ในการอบรมการปลูกมันสำปะหลัง เกษตรกรส่วนใหญ่ไม่เคยเข้ารับการอบรม (ร้อยละ 80.0) รองลงมาเคยเข้ารับการอบรม 5 ครั้ง (ร้อยละ 7.5) ส่วนการไปศึกษาดูงานเกี่ยวกับการปลูกมันสำปะหลัง เกษตรกรส่วนใหญ่ไม่เคยเข้าร่วมการศึกษาดูงาน (ร้อยละ 90) และเกษตรส่วนใหญ่ไม่มีการติดต่อกับเจ้าหน้าที่ ประมาณ 3 ใน 4 (ร้อยละ 75.0)

การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม (GAP)

ผลการศึกษาพบว่า เกษตรกรมีการยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม ในภาพรวมอยู่ในระดับมาก (ที่ค่าเฉลี่ย 3.56) ซึ่งจำแนกตามด้านต่าง ๆ ได้ 7 ด้านดังนี้ (ตารางที่ 3)

1. การยอมรับด้านพื้นที่ปลูก (Plantation Area) เกษตรกรมีการยอมรับพื้นที่ปลูกอยู่ในระดับมาก (ค่าเฉลี่ย 3.80) เมื่อจำแนกตามประเด็นย่อยต่าง ๆ พบว่า ประเด็นไม่ใช้น้ำเสียจากโรงงานอุตสาหกรรมหรือกิจกรรมอื่น ๆ เช่น แหล่งชุมชน โรงพยาบาล ที่ก่อให้เกิดการปนเปื้อนวัตถุหรือสิ่งที่เป็นอันตราย มีการยอมรับในระดับมาก มีค่าเฉลี่ยสูงที่สุด (ค่าเฉลี่ย 4.23) รองลงมาเป็นประเด็นพื้นที่ปลูกไม่เคยเป็นที่ตั้งของสถานที่ทิ้งขยะ และ/หรือคอกปศุสัตว์ มีการยอมรับในระดับมาก (ค่าเฉลี่ย 4.15) และประเด็นย่อยพื้นที่ไม่เคยปลูกพืชที่ใช้สารเคมีมาก ในระยะเวลา 3 ปี มีการยอมรับในระดับปานกลาง มีค่าเฉลี่ยน้อยที่สุด (ค่าเฉลี่ย 3.28)

2. การยอมรับด้านการใช้วัสดุอันตรายทางการเกษตร (Application of Pesticides) เกษตรกรมีการยอมรับด้านการใช้วัตถุอันตราย อยู่ในระดับปานกลาง (ค่าเฉลี่ย 3.38) เมื่อจำแนกตาม

ประเด็นย่อยต่าง ๆ พบว่า ประเด็นย่อยขณะฉีดสารเคมีต้องสวมเครื่องป้องกันทุกครั้ง ทำความสะอาดร่างกายและอุปกรณ์ทุกครั้ง หลังฉีดพ่นสารเคมี และไม่ฉีดพ่นสารเคมีช่วงใกล้เก็บเกี่ยวผลผลิต มีการยอมรับอยู่ในระดับมาก มีค่าเฉลี่ยมากที่สุด (ค่าเฉลี่ย 3.58) รองลงมาเป็นประเด็นย่อยในกรณีผลิตเพื่อส่งออก ห้ามใช้วัตถุอันตรายทางการเกษตรที่ประเทศคู่ค้าห้ามใช้ มีการยอมรับในระดับมาก (ค่าเฉลี่ย 3.50) และประเด็นย่อยห้ามใช้หรือมีไว้ครอบครองวัตถุอันตรายทางการเกษตรที่ขึ้นทะเบียนวัตถุอันตรายห้ามใช้ 96 ชนิด มีการยอมรับในระดับปานกลาง มีค่าเฉลี่ยน้อยที่สุด (ค่าเฉลี่ย 3.18)

3. การยอมรับด้านกระบวนการผลิตก่อนการเก็บเกี่ยว (Production Process Management) เกษตรกรมีการยอมรับด้านการผลิตก่อนการเก็บเกี่ยว อยู่ในระดับมาก (ค่าเฉลี่ย 3.94) เมื่อจำแนกตามประเด็นย่อยต่างๆ พบว่า ประเด็นย่อยมีการคัดเลือกท่อนพันธุ์ที่ปลอดจากโรคและศัตรูพืช มีการยอมรับในระดับมาก (ค่าเฉลี่ย 4.33) รองลงมาเป็นประเด็นย่อยกำจัดและควบคุมศัตรูพืชหลังการปลูกภายใน 3 เดือน อย่างมีประสิทธิภาพ มีการยอมรับในระดับมาก (ค่าเฉลี่ย 4.10) และประเด็นย่อยมีการดำเนินการอนุรักษ์และบำรุงดิน มีการยอมรับในระดับปานกลาง มีค่าเฉลี่ยต่ำที่สุด (ค่าเฉลี่ย 3.40)

4. การยอมรับด้านการเก็บเกี่ยวและการปฏิบัติหลังการเก็บเกี่ยว เกษตรกรมีการยอมรับด้านการเก็บเกี่ยวและการปฏิบัติหลังการเก็บเกี่ยว มีการยอมรับในระดับมาก (ค่าเฉลี่ย 3.78) เมื่อจำแนกตามประเด็นย่อยต่าง ๆ พบว่า ประเด็นย่อย มันสำปะหลังที่เก็บเกี่ยวต้องมีอายุระหว่าง 8 – 18 เดือน มีการยอมรับในระดับมาก มีค่าเฉลี่ยมากที่สุด (ค่าเฉลี่ย 4.25) รองลงมาเป็นประเด็นย่อยมีระบบเก็บเกี่ยวที่เหมาะสม อุปกรณ์ ภาชนะบรรจุ และวิธีการเก็บเกี่ยวต้องสะอาด ไม่ก่อให้เกิดอันตรายต่อคุณภาพผลผลิต หรือเกิดการปนเปื้อน มีการยอมรับในระดับมาก (ค่าเฉลี่ย 3.55) และประเด็นย่อยมีการป้องกันการปนเปื้อนจากวัตถุหรือสิ่งที่เป็นอันตรายสู่ผลผลิต มีการยอมรับในระดับมาก มีค่าเฉลี่ยน้อยที่สุด (ค่าเฉลี่ย 3.53)

5. การยอมรับด้านการขนย้าย การเก็บรักษา และการรวบรวมผลผลิต เกษตรกรมีการยอมรับด้านการขนย้าย การเก็บรักษา และการรวบรวมผลผลิต ในระดับมาก (ค่าเฉลี่ย 3.69) เมื่อจำแนกตามประเด็นย่อยต่าง ๆ พบว่า ประเด็นขนส่งมันสำปะหลังที่เก็บเกี่ยวแล้วถึงลานตากหรือแหล่งรับซื้ออย่างช้าไม่เกิน 2 วัน มีการยอมรับในระดับมาก (ค่าเฉลี่ย 4.05) รองลงมาเป็นประเด็นย่อย การขนย้ายถูกสุขลักษณะ เพื่อป้องกันการปนเปื้อนจากสิ่งแปลกปลอมและอันตราย มีการยอมรับในระดับมาก (ค่าเฉลี่ย 3.78) และประเด็นย่อย กรณีผลผลิตเสื่อมคุณภาพง่ายต้องมีการดูแลและป้องกันที่เหมาะสมก่อนการขนส่ง มีการยอมรับในระดับปานกลาง มีค่าเฉลี่ยต่ำสุด (ค่าเฉลี่ย 3.38)

6. การยอมรับด้านสุขลักษณะส่วนบุคคล เกษตรกรมีการยอมรับด้านสุขลักษณะส่วนบุคคลในระดับปานกลาง (ค่าเฉลี่ย 3.24) เมื่อจำแนกตามประเด็นย่อยต่าง ๆ พบว่า ประเด็นย่อย ผู้ปฏิบัติได้รับการดูแลสุขภาพอย่างเหมาะสม เพียงพอ และถูกสุขลักษณะ มีการยอมรับในระดับปานกลาง (ค่าเฉลี่ย 3.43) รองลงมาเป็นประเด็นย่อย การจัดให้มีสิ่งอำนวยความสะดวกด้านสุขลักษณะส่วนบุคคลเพียงพอ มีการยอมรับในระดับปานกลาง (ค่าเฉลี่ย 3.33) และประเด็นย่อย มีการเก็บประวัติและหลักฐานการตรวจสุขภาพ มีการยอมรับในระดับปานกลาง มีค่าเฉลี่ยต่ำสุด (ค่าเฉลี่ย 3.05)

7. การยอมรับด้านการบันทึกข้อมูลและตามสอบ เกษตรกรมีการยอมรับด้านการบันทึกข้อมูลและตามสอบ ในระดับปานกลาง (ค่าเฉลี่ย 2.87) เมื่อจำแนกตามประเด็นย่อยต่าง ๆ พบว่า ประเด็นย่อยบันทึกข้อมูลวันที่ปลูก วันที่เก็บเกี่ยว และวันที่ขนส่ง มีการยอมรับในระดับปานกลาง (ค่าเฉลี่ย 3.20) รองลงมาเป็นประเด็นย่อย บันทึกข้อมูลการบำรุงดิน เช่น การใส่ปุ๋ย การปลูกพืชหมุนเวียน การยอมรับในระดับปานกลาง (ค่าเฉลี่ย 2.85) และประเด็นย่อย บันทึกข้อมูลผู้รับซื้อผลผลิต หรือแหล่งที่นำผลผลิตในแต่ละรุ่นไปจำหน่าย และประเด็นย่อยบันทึกข้อมูลการใช้วัตถุอันตรายทางการเกษตร และ บันทึกข้อมูลผู้รับซื้อผลผลิต หรือแหล่งที่นำผลผลิตในแต่ละรุ่นไปจำหน่าย มีการยอมรับในระดับปานกลาง มีค่าเฉลี่ยต่ำสุด (ค่าเฉลี่ย 2.78)

ตารางที่ 3 ระดับการยอมรับการปฏิบัติทางการเกษตรที่ดีและเหมาะสมของเกษตรกร

ลำดับ	การยอมรับ	$\bar{X}$	S.D.	ระดับการยอมรับ	อันดับ
1	**ด้านพื้นที่ปลูก**	**3.80**	**0.95**	**มาก**	**2**
	1.1 น้ำที่ใช้ในกระบวนการผลิตต้องมาจากแหล่งน้ำที่ไม่มีสภาพแวดล้อมซึ่งก่อให้เกิดการปนเปื้อนวัตถุหรือสิ่งของที่เป็นอันตรายต่อผลผลิต	3.93	0.73	มาก	3
	1.2 ไม่ใช้น้ำเสียจากโรงงานอุตสาหกรรมหรือกิจกรรม อื่น ๆ เช่น แหล่งชุมชน โรงพยาบาล ที่ก่อให้เกิดการปนเปื้อนวัตถุหรือสิ่งที่เป็นอันตราย	4.23	1.07	มาก	1
	1.3 มีการอนุรักษ์แหล่งน้ำและสภาพแวดล้อม	3.73	0.85	มาก	4
	1.4 พื้นที่ปลูกไม่มีสภาพแวดล้อมที่เสี่ยงต่อการตกค้างหรือปนเปื้อนของโลหะหนักและวัตถุอันตรายทางการเกษตรในผลิตผล ในระดับที่เกินมาตรฐานหรือข้อกำหนดของกฎหมายที่เกี่ยวข้อง	3.53	0.85	มาก	5
	1.5 พื้นที่ไม่เคยปลูกพืชที่ใช้สารเคมีมาก ในระยะเวลา 3 ปี	3.28	0.93	ปานกลาง	6
	1.6 พื้นที่ปลูกไม่เคยเป็นที่ตั้งของสถานที่ทิ้งขยะคอกปศุสัตว์	4.15	0.95	มาก	2
2	**ด้านการใช้วัสดุอันตรายทางการเกษตร**	**3.38**	**0.89**	**ปานกลาง**	**5**
	2.1 ใช้วัตถุอันตรายทางการเกษตรตามคำแนะนำของกรมวิชาการเกษตรหรือคำแนะนำในฉลากที่ขึ้นทะเบียนกับกรมวิชาการเกษตร	3.33	0.89	ปานกลาง	3
	2.2 ห้ามใช้หรือมีไว้ครอบครองวัตถุอันตรายทางการเกษตรที่ขึ้นทะเบียนวัตถุอันตรายห้ามใช้ 96 ชนิด	3.18	0.87	ปานกลาง	4

	2.3 กรณีผลิตเพื่อส่งออก ห้ามใช้วัตถุอันตรายทางการเกษตรที่ประเทศคู่ค้าห้ามใช้	3.45	0.85	ปานกลาง	2
	2.4 ขณะฉีดพ่นสารเคมีต้องสวมเครื่องป้องกันทุกครั้ง ทำความสะอาดร่างกายและอุปกรณ์ทุกครั้งหลังฉีดพ่นสารเคมี และไม่ฉีดพ่นสารเคมีช่วงใกล้เก็บเกี่ยวผลผลิต	3.58	0.93	มาก	1
3	**ด้านกระบวนการผลิตก่อนการเก็บเกี่ยว**	**3.94**	**0.88**	**มาก**	**1**
	3.1 มีการดำเนินการอนุรักษ์และบำรุงดิน	3.40	0.87	ปานกลาง	3
	3.2 มีการคัดเลือกท่อนพันธ์ที่ปลอดจากโรคและศัตรูพืช	4.33	0.62	มาก	1
	3.3 มีการกำจัดและควบคุมศัตรูพืชหลังการปลูกภายใน 3 เดือน อย่างมีประสิทธิภาพ	4.10	0.87	มาก	2
4	**ด้านการเก็บเกี่ยวและการปฏิบัติหลังการเก็บเกี่ยว**	**3.78**	**0.81**	**มาก**	**3**
	4.1 มันสำปะหลังที่เก็บเกี่ยวต้องมีอายุระหว่าง 8 – 18 เดือน	4.25	0.74	มาก	1
	4.2 มีการป้องกันการปนเปื้อนจากวัตถุหรือสิ่งที่เป็นอันตรายสู่ผลผลิต	3.53	0.82	มาก	3
	4.3 ระบบเก็บเกี่ยวที่เหมาะสม อุปกรณ์ ภาชนะบรรจุ และวิธีการเก็บเกี่ยวต้องสะอาด ไม่ก่อให้เกิดอันตรายต่อคุณภาพผลผลิต หรือเกิดการปนเปื้อน	3.55	0.68	มาก	2
5	**ด้านการขนย้าย การเก็บรักษา และการรวบรวมผลผลิต**	**3.69**	**0.75**	**มาก**	**4**
	5.1 ขนส่งมันสำปะหลังที่เก็บเกี่ยวแล้วถึงลานตากหรือแหล่งรับซื้ออย่างช้าไม่เกิน 2 วัน	4.05	0.78	มาก	1
	5.2 การขนย้ายถูกสุขลักษณะ เพื่อป้องกันการปนเปื้อนจากสิ่งแปลกปลอมและอันตราย	3.78	0.70	มาก	2
	5.3 การใช้วัสดุปูพื้นในบริเวณพักผลผลิตที่เก็บเกี่ยวแล้วเพื่อป้องกันการปนเปื้อนจากสิ่งที่เป็นอันตราย	3.55	0.68	มาก	3
	5.4 กรณีที่ผลผลิตเสื่อมคุณภาพง่ายต้องมีการดูแลและป้องกันที่เหมาะสมก่อนการขนส่ง	3.38	0.70	ปานกลาง	4
6	**ด้านสุขลักษณะส่วนบุคคล**	**3.24**	**0.87**	**ปานกลาง**	**6**
	6.1 ผู้ปฏิบัติได้รับการดูแลสุขภาพอย่างเหมาะสม เพียงพอ และถูกสุขลักษณะ	3.43	0.84	ปานกลาง	1
	6.2 ผู้ปฏิบัติงานมีความรู้ที่เหมาะสม หรือผ่านกระบวนการอบรมการปฏิบัติที่ถูกต้องละถูกสุขลักษณะ	3.18	0.93	ปานกลาง	3

	6.3 การจัดให้มีสิ่งอำนวยความสะดวกด้านสุขลักษณะส่วนบุคคลเพียงพอ	3.33	0.83	ปานกลาง	2
	6.4 มีการเก็บประวัติและหลักฐานการตรวจสุขภาพ	3.05	0.88	ปานกลาง	4
7	**ด้านการบันทึกข้อมูลและตามสอบ**	**2.87**	**0.96**	**ปานกลาง**	**7**
	7.1 มีการบันทึกข้อมูลที่มาของท่อนพันธุ์และชื่อพันธุ์ที่ปลูก ปุ๋ย และวัตถุอันตรายทางการเกษตร	2.83	0.90	ปานกลาง	3
	7.2 บันทึกข้อมูลการใช้วัตถุอันตรายทางการเกษตร	2.78	0.86	ปานกลาง	5
	7.3 บันทึกข้อมูลการบำรุงดิน เช่น การใส่ปุ๋ย การปลูกพืชหมุนเวียน	2.85	0.95	ปานกลาง	2
	7.4 บันทึกข้อมูลการควบคุมวัชพืช และศัตรูพืช	2.80	0.88	ปานกลาง	4
	7.5 บันทึกข้อมูลวันที่ปลูก วันที่เก็บเกี่ยว และวันที่ขนส่ง	3.20	1.18	ปานกลาง	1
	7.6 บันทึกข้อมูลผู้รับซื้อผลผลิต หรือแหล่งที่นำผลผลิตในแต่ละรุ่นไปจำหน่าย	2.78	0.92	ปานกลาง	5
	ภาพรวม	**3.56**	**0.49**	**มาก**	

สภาพปัญหา ความต้องการ ในการปฏิบัติทางการเกษตรที่ดีของเกษตรกร

ผลการศึกษาพบว่า ปัญหาและความต้องการเพื่อสนับสนุนการผลิตมันสำปะหลังด้วยการปฏิบัติทางการเกษตรที่ดี มีจำนวน 8 ประเด็น ดังนี้ อันดับที่ 1 เกษตรกรยังไม่แน่ใจในการผลิตมันสำปะหลังด้วยการปฏิบัติทางการเกษตรที่ดี มากที่สุด (ร้อยละ 27.5) รองลงมา เกษตรกรต้องการท่อนพันธุ์มันสำปะหลังที่สะอาดและปลอดโรค (ร้อยละ 22.5) อันดับที่ 3 เกษตรกรต้องการระบบน้ำทั้งระบบกักเก็บ ระบบส่ง และระบบกระจายน้ำ (ร้อยละ 17.5) อันดับที่ 4 เกษตรกรต้องการตลาดรับซื้อผลผลิตที่แน่นอน (ร้อยละ 10.0) อันดับที่ 5 มี 2 ประเด็น คือ เกษตรกรต้องการการสนับสนุนจากหน่วยงานภาครัฐและการสนับสนุนวัตถุดิบในการผลิต (ปุ๋ย, สารชีวภาพ) (ร้อยละ 7.5) อันดับที่ 6 เกษตรกรต้องการความแน่นอนในปริมาณของผลผลิตที่จะได้รับ (ร้อยละ 5.0) และอันดับที่ 7 เกษตรกรต้องการน้อยที่สุด คือ การประกันราคาผลผลิต (ร้อยละ 2.5)

การส่งเสริมและสนับสนุนให้เกษตรกรปลูกมันสำปะหลังเพื่อใช้ในการบริโภคของมนุษย์

จากการศึกษาพบว่า เกษตรส่วนใหญ่ (ร้อยละ 92.5) เห็นด้วยกับการส่งเสริมและสนับสนุนให้เกษตรกรปลูกมันสำปะหลังเพื่อใช้ในการบริโภคของมนุษย์ ซึ่งเป็นทางเลือกใหม่ ๆ ให้กับเกษตรกร แต่ต้องได้ราคาที่ดีกว่าการปลูกในปัจจุบัน และควรจะต้องมีการประกันราคาหรือมีตลาดรับซื้อผลผลิตที่แน่นอน ร่วมทั้งหน่วยงานภาครัฐจะต้องส่งเสริมความรู้ให้เกษตรกรสามารถแปรรูปผลผลิตเพื่อทำเป็นอาหารในหลากหลายรูปแบบ และควรมีแปลงสาธิต ตั้งแต่ปลูก ดูแล เก็บเกี่ยวผลผลิต แปรรูปแป้งมัน และแปรรูปผลิตภัณฑ์อื่น ๆ ตามความต้องการของตลาด

สรุปและอภิปรายผล

จากการวิจัยเรื่อง การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม (GAP) ของเกษตรกร อำเภอคลองลาน จังหวัดกำแพงเพชร ขอนำเสนอการสรุปและ

อภิปรายผลดังนี้

สถานภาพส่วนบุคคล สังคม เศรษฐกิจ และการผลิตมันสำปะหลังของเกษตรกร

เกษตรกรส่วนใหญ่มีอายุอยู่ในช่วง 40 – 49 ปี (ค่าเฉลี่ย 48.78 ปี) มีระดับการศึกษาในระดับประถมศึกษา มีประสบการณ์ในการปลูกมันสำปะหลัง อยู่ในช่วง 11 – 20 ปี (เฉลี่ย 17.02 ปี) มีพื้นที่ปลูกมันสำปะหลัง อยู่ในช่วง 1 – 25 ไร่ (ร้อยละ 60.0) มีค่าเฉลี่ยประมาณ 28.13 ไร่ พันธุ์มันสำปะหลังที่เกษตรกรนิยมปลูก คือ พันธุ์ห้วยบง เป็นพันธุ์ที่ให้ผลผลิตสูงเฉลี่ย 5.7 ตันต่อไร่ และปริมาณแป้งสูง เฉลี่ยแป้งในหัวสด 25.5% แป้งมีความหนืดสูงเหมาะสำหรับการนำไปใช้กับอุตสาหกรรมต่อเนื่องได้หลายชนิด ท่อนพันธุ์แข็งแรง เปอรเซ็นต์ความงอกและความอยู่รอดสูง ต้านทานโรคใบจุดปานกลาง (มูลนิธิสถาบันพัฒนามันสำปะหลังแห่งประเทศไทย, มปป.) เกษตรกรส่วนใหญ่ประมาณครึ่งหนึ่งมีแรงงานในครัวเรือน 2 คน (ร้อยละ 50) ส่วนใหญ่มีการจ้างแรงงานเพิ่ม จำนวน 2 คน (ร้อยละ 30) มีรายได้จากการทำงานการเกษตร อยู่ในช่วง 5,001 – 10,000 บาทต่อไร่ มากที่สุด (ร้อยละ 90.0) มีค่าเฉลี่ยของรายได้ 8,005 บาทต่อไร่ เกษตรกรมีรายจ่ายจากการทำการเกษตร อยู่ในช่วง 0 – 3,000 บาทต่อไร่ มากที่สุด (ร้อยละ 75.0) โดยมีค่าเฉลี่ยของรายจ่ายประมาณ 2,304.17 บาทต่อไร่ เกษตรกรทั้งหมดมีรายได้มากกว่ารายจ่ายเฉลี่ย 5,700 บาทต่อไร่ โดยมีรายได้มากกว่ารายจ่ายต่ำสุด 2,000 บาทต่อไร่ และมีรายได้มากกว่ารายจ่ายมากที่สุด 17,500 บาทต่อไร่ ซึ่งเป็นศูนย์การเรียนรู้ในการปลูกมันสำปะหลัง ให้มีรายได้จากการเป็นวิทยากรในการอบรมให้กับกลุ่มเกษตรกรของธนาคารเพื่อการเกษตรและสหกรณ์ ส่วนในด้านการเข้ารับการอบรมและศึกษาดูงานของเกษตรกร ส่วนใหญ่มากกว่าร้อยละ 80 ไม่เคยเข้ารับการอบรมและ/หรือศึกษาดูงาน รวมทั้งยังไม่มีการติดต่อหรือขอความรู้จากเจ้าหน้าที่จากหน่วยงานภาครัฐ ทำให้เกษตรกรขาดโอกาสในการรับรู้ข่าวสาร และเตรียมการปรับตัวในการเปลี่ยนแปลงการปลูกมันสำปะหลังให้ได้คุณภาพที่เป็นไปตามที่ต้องการของตลาด

การยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม (GAP)

จากการศึกษาพบว่า เกษตรกรยอมรับการผลิตมันสำปะหลังตามมาตรฐานการปฏิบัติทางการเกษตรที่ดีและเหมาะสม ในภาพรวมอยู่ในระดับมาก (ค่าเฉลี่ย 3.56) โดยการยอมรับด้านกระบวนการผลิตก่อนการเก็บเกี่ยวจะมีระดับการยอมรับสูงที่สุด อยู่ในระดับมาก (ค่าเฉี่ย 3.94) เกษตรกรมีการคัดเลือกท่อนพันธุ์ที่มีคุณภาพ และกำจัดและควบคุมศัตรูพืชหลังจากการปลูกภายใน 3 เดือน อย่างมีประสิทธิภาพ ซึ่งเป็นต้นทางของการได้รับผลผลิตที่มีคุณภาพและปริมาณหรือน้ำหนักที่ดี รวมทั้งถ้าท่อนพันธุ์ที่ดีมีคุณภาพจะมีความสามารถในการต้านทานโรคและไม่ทำให้เกิดการแพร่กระจายของโรคไปสู่ต้นมันสำปะหลังในพื้นที่อื่น ๆ ซึ่งถ้าต้นมันสำปะหลังเกิดโรค เช่น โรคใบด่าง จะต้องมีการทำลายต้นมันสำปะหลังที่อยู่ข้างเคียง เพื่อป้องกันการระบาดของโรคทำให้สูญเสียผลผลิตจำนวนมาก และการยอมรับด้านการบันทึกข้อมูลและการตามสอบ เกษตรกรให้การยอมรับน้อยที่สุด อยู่ในระดับปานกลาง (ค่าเฉลี่ย 2.87) เนื่องจากเกษตรส่วนใหญ่มีอายุเฉลี่ยสูงถึง 48 ปี และระดับการศึกษาอยู่ในระดับประถมศึกษา และขาดความสามารถในการใช้เทคโนโลยีเพื่อบันทึกข้อมูลรายละเอียดต่าง ๆ เกี่ยวกับการปลูกมันสำปะหลังของตนเอง ร่วมทั้งขาดความเข้าใจในการบันทึกรายละเอียดต่าง ๆ จึงทำให้เกษตรกรมีการยอมรับในการปฏิบัติด้านนี้ต่ำที่สุด

สภาพปัญหา ความต้องการ ในการปฏิบัติทางการเกษตรที่ดีของเกษตรกร

จากการศึกษาพบว่า เกษตรกรส่วนใหญ่ ร้อยละ 27.5 ไม่แน่ใจว่าจะผลิตมันสำปะหลังได้ตามมาตรฐานการปฏิบัติที่ดีและเหมาะสมเนื่องจากยังขาดความรู้ความเข้าใจในการปฏิบัติ ไม่เคยได้รับการอบรม ศึกษาดูงาน และความรู้จากเจ้าหน้าที่หรือหน่วยงานต่าง ๆ ที่เกี่ยวข้อง รวมทั้งมองไม่เห็นถึงความจำเป็นที่จะต้องปฏิบัติ เนื่องจากผู้รับซื้อผลิตภัณฑ์มันสำปะหลัง ไม่ได้กำหนดคุณสมบัติของการปลูก โดยพิจารณาจากน้ำหนักและปริมาณแป้งเท่านั้น รองลงมา เกษตรกรต้องการต้นพันธุ์ที่สะอาดและปลอดโรค และความต้องการที่น้อยที่สุดคือ การประกันราคาผลผลิต ซึ่งผลผลิตมันสำปะหลังยังเป็นที่ต้องการของตลาด เนื่องจากสภาพปัญหาจากการเปลี่ยนแปลงสภาพภูมิอากาศ ทำให้ผลผลิตตกต่ำไม่เพียงพอต่อความต้องการ ดังนั้นถ้าสามารถผลิตได้ก็จะสามารถขายผลผลิตได้ในราคาตลาด

ข้อเสนอแนะ

1. เจ้าหน้าที่ควรส่งเสริมให้องค์ความรู้ เทคโนโลยีในการเลือกพันธุ์มันสำปะหลังที่เหมาะสมกับพื้นที่และตลาดให้กับเกษตรกร เพราะจากการศึกษาเกษตรกรมีความหลากหลายในการเลือกชนิดพันธุ์ที่ปลูก โดยพิจารณาจากเฉพาะปริมาณน้ำหนักของหัวมันที่ได้ แต่ไม่ได้พิจารณาถึงปริมาณแป้งและคุณภาพของหัวมันสำปะหลัง ทำให้ราคาของผลผลิตได้ราคาที่ต่ำ
2. เจ้าหน้าที่และหน่วยงานที่เกี่ยวข้องในการสนับสนุนให้เกษตรกรใช้มาตรฐานการปฏิบัติการที่ดีและเหมาะสมในการผลิต ควรจัดให้มีการอบรมเชิงปฏิบัติการให้กับเกษตรกร เพื่อให้เกษตรกรสามารถปรับกระบวนการผลิตเพื่อสร้างมูลค่าเพิ่มให้กับผลผลิตของตนเอง สร้างความปลอดภัยให้กับตนเองและผู้บริโภคอย่างมีความรับผิดชอบต่อสังคมและสิ่งแวดล้อม
3. ควรมีการสนับสนุนอย่างจริงจังในการปลูกมันสำปะหลังที่ใช้เป็นอาหารของมนุษย์ เนื่องจากปัญหาความมั่นคงทางอาหารของโลกจะมีความรุนแรงเพิ่มสูงขึ้น จึงเป็นโอกาสที่ดีของเกษตรกรในการเพิ่มทางเลือกในการผลิตตามหลักการของ BCG Model

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การพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ในอำเภอหาดใหญ่ จังหวัดสงขลา โดยใช้วิธีวิเคราะห์อนุกรมเวลา

Forecasting the Price of Gasohol 95 in Hatyai District, Songkhla Province Using Time Series Analysis.

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อสร้างและเปรียบเทียบแบบจำลองการพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา โดยใช้วิธีวิเคราะห์อนุกรมเวลาด้วยเทคนิคเหมืองข้อมูล 3 วิธี ได้แก่ วิธีการถดถอยเชิงเส้น แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้น และซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอย ข้อมูลที่นำมาใช้เป็นชุดข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา ตั้งแต่เดือนมกราคม พ.ศ.2566 ถึงมกราคม พ.ศ.2567 ผลการวิจัยพบว่า ซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอย (SMOreg) มีความเหมาะสมกับชุดข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 ด้วยชุดข้อมูลย้อนหลัง 25 วัน (Lag 25) ค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์เท่ากับ 0.153%

คำสำคัญ: พยากรณ์, น้ำมัน, อนุกรมเวลา

Abstract

The objective of this research is to create and compare a price prediction model for Gasohol 95 sold in Hat Yai District, Songkhla Province, using time series analysis using three data mining techniques: linear regression method. Multi-layer perceptron neural network model. and support vector machines for regression. The data used as the oil price dataset includes the price of gasohol 95 sold in Hat Yai District, Songkhla Province from January 2023 to January 2024. The research results found that the vector machine supports For the regression (SMOreg), it is suitable for the gasohol price data set 95 with the historical data set of 25 days (Lag 25). The mean relative error is equal to 0.153%.

Keywords: prediction, oil, time series

บทนำ

น้ำมันถือเป็นแหล่งพลังงานที่มีความสำคัญต่อเศรษฐกิจโลก ซึ่งในปัจจุบันนี้พลังงานจากน้ำมันเป็นส่วนสำคัญต่อการดำรงชีวิต ทั้งการคมนาคมและการขนส่งสินค้าทั้งหมด จากปริมาณการใช้น้ำมันกลุ่มเบนซิน เดือนมกราคม - สิงหาคม 2566 เฉลี่ยอยู่ที่ 31.91 ล้านลิตร/วัน เพิ่มขึ้นจากช่วงเดียวกันของปี 2565 ร้อยละ 5.5 การใช้น้ำมันแก๊สโซฮอล์ 95 เพิ่มขึ้นมาอยู่ที่ 18.10 ล้านลิตร/วัน และแก๊สโซฮอล์ อี 20 เพิ่มขึ้นมาอยู่ที่ 5.94 ล้านลิตร/วัน ขณะที่การใช้แก๊สโซฮอล์ 91 แก๊สโซฮอล์ อี85 และเบนซิน ลดลงมาอยู่ที่ 6.83 ล้านลิตร/วัน 0.19 ล้านลิตร/วัน และ 0.47 ล้านลิตร/วัน ตามลำดับ ทั้งนี้ส่วนต่างราคาแก๊สโซฮอล์ 95 ใกล้เคียงกับแก๊สโซฮอล์ 91 ประกอบกับแก๊สโซฮอล์ อี 20 มีราคาที่ต่ำกว่าแก๊สโซฮอล์ อี 85 (กองบริหารธุรกิจและการสำรองน้ำมันเชื้อเพลิง กรมธุรกิจพลังงาน, 2566) จากปริมาณการใช้น้ำมันกลุ่มเบนซินที่เพิ่มขึ้นเมื่อทำการพิจารณาราคาน้ำมันแก๊สโซฮอล์ในปัจจุบันยังคงมีราคาสูง โดยเฉพาะแก๊สโซฮอล์ 95 ซึ่งราคาในปี 2564 ที่บริษัท ปตท. จำกัด (มหาชน) รายงานไว้มีค่าเพียง 31.47 บาท/ลิตร แต่ราคาในปัจจุบัน (ณ วันที่ 31 มกราคม 2567) มีค่าสูงถึง 37.87 บาท/ลิตร ซึ่งมีค่าสูงกว่าในอดีต

จากการทบทวนวรรณกรรม พบว่า งานวิจัยที่เกี่ยวกับการพยากรณ์ (สุพาพร บรรดาศักดิ์, จุฑามาศ แป้นทอง และนุตยา กัลป์ลา, 2559) ได้พัฒนาแบบจำลองการพยากรณ์การใช้ลูกกอล์ฟในสนามฝึกซ้อมโดยใช้ตัวแปรอนุกรมเวลา โดยโปรแกรม Weka ด้วยเทคนิคเหมืองข้อมูล 2 เทคนิค ได้แก่ 1) การถดถอยเชิงเส้น 2) การถดถอยเวกเตอร์ โดยใช้ข้อมูลในปี 2557 - 2559 จากผลการทดลอง งานวิจัยนี้ทำการเปรียบเทียบประสิทธิภาพของแบบจำลองด้วยเทคนิค 2 กับชุดข้อมูลฝึกฝน และชุดข้อมูลทดสอบเป็นชุดข้อมูลย้อนหลัง 1) 3 วัน 2) 5 วัน 3) 7 วัน 4) 11 วัน 5) 15 วัน 6) 21 วัน 7) 31 วัน งานวิจัยนี้แสดงให้เห็นถึงการแบ่งประเภทเป็นรวมชนิดกับแยกชนิด จะสามารถได้ค่าความคลาดเคลื่อนที่เหมาะสมที่สุดกับแต่ละชนิด เพื่อนำไปปรับใช้ให้เกิดผลลัพธ์ที่ดีที่สุด (พิชญากร เลค, 2561) ได้ศึกษาเกี่ยวกับการพยากรณ์อัตราแลกเปลี่ยนสกุลเงินตราต่างประเทศโดยการใช้การวิเคราะห์อนุกรมเวลา โดยใช้เทคนิคเหมืองข้อมูล 3 เทคนิค ได้แก่ 1) การถดถอยเชิงเส้น 2) แบบจำลองโครงข่ายประสาทเทียมแบบเปอร์เซ็ปตรอนหลายชั้น 3) ซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอย โดยใช้ข้อมูลอัตราการแลกเปลี่ยนเงินตราต่างประเทศปี 2552 - 2560 จำนวน 108 เดือน งานวิจัยนี้แสดงให้เห็นถึงการเลือกใช้เทคนิคเหมืองข้อมูลแต่ละชนิดข้อมูลย้อนหลังที่เหมาะสมกับชนิดของข้อมูลเป็นสิ่งที่ทำให้เห็นถึงประสิทธิภาพของแบบจำลองแต่ละแบบ (ปทิตญา บุญรักษา และจารี ทองคำ, 2560) ได้พัฒนาแบบจำลองการเกิดอุบัติเหตุทางถนนโดยใช้เทคนิคอนุกรมเวลา โดยการใช้เทคนิคเหมืองข้อมูล 5 เทคนิค ได้แก่ 1) linear regression 2) Artificial Neural Network 3) Sequential Minimal Optimization for Regression 4) Support Vector Machine Regression 5) Gussian Process โดยใช้ข้อมูลการเกิดอุบัติเหตุช่วงเดือนมกราคม พ.ศ 2554 - ธันวาคม พ.ศ. 2559 เป็นจำนวน 7 ปี ทั้งสิ้น 78 เดือน แบ่งชุดข้อมูลออกเป็น 2 ส่วน 1) ชุดข้อมูลสำหรับฝึกสอน 2) ชุดข้อมูลสำหรับทดสอบ โดยทำการเปรียบเทียบประสิทธิภาพของแบบจำลองด้วยค่า Mean Absolute Error (MAE) และ Root Mean Square Error(RMSE) งานวิจัยนี้แสดงให้เห็นถึงกราฟข้อมูลการเกิดอุบัติเหตุย้อนหลัง มีลักษณะเป็นการผันแปรตามฤดูกาล ทั้งนี้ผู้วิจัยยังได้แนะนำถึงปัจจัยภายนอกอื่น ๆ เช่น แสงส่องสว่างที่อาจเกิดชำรุดในภายหลังอาจเป็นปัจจัยเพิ่มเติมได้ เป็นต้น (ฉริยะ อัครวรรณ และจารี ทองคำ, 2561) ได้ศึกษาเกี่ยวกับการสร้างตัวแบบจำลองการพยากรณ์การใช้หนังสือด้วยเทคนิคอนุกรมเวลา โดยมีวัตถุประสงค์เพื่อเปรียบเทียบประสิทธิภาพของเทคนิคอนุกรมเวลาการใช้หนังสือของสมาชิกห้องสมุดนำข้อมูลการใช้หนังสือระหว่างช่วงปี พ.ศ. 2557 – 2560 โดยใช้โปรแกรม Weka สร้างแบบจำลองด้วย

เทคนิคเหมืองข้อมูล 5 เทคนิค ได้แก่ 1) โครงข่ายประสาทเทียมแบบหลายชั้นแบบถดถอย 2) โครงข่ายประสาทเทียมแบบถดถอย 3) เทคนิคสนับสนุนเส้นสมมุติแบบถดถอย 4) การวิเคราะห์การถดถอยโลจิสติก 5) การเรียนรู้ต้นไม้ตัดสินใจแบบถดถอยอัลกอริทึมการตัดกิ่งต้นไม้ โดยวัดค่าด้วยการหาค่าเฉลี่ยคลาดเคลื่อนสัมบูรณ์ และค่าความคลาดเคลื่อนเฉลี่ยรากที่สอง ผลการวิจัยชุดข้อมูลหนังสือมีการใช้งานสูงในช่วงเดือนกุมภาพันธ์ - มีนาคม และกันยายน - ตุลาคม และการใช้งานต่ำในช่วงพฤษภาคม - มิถุนายน และธันวาคมของทุกปี งานวิจัยนี้แสดงให้เห็นถึงการแบ่งชุดข้อมูลการเรียนรู้และชุดข้อมูลสำหรับการทดสอบในรูปแบบ Slide window แล้วจึงวัดประสิทธิภาพของแบบจำลองด้วยค่า MAE และ RMSE เพื่อหาค่าเฉลี่ยที่ดีที่สุด ซึ่งได้ผลการทดลองเป็นเทคนิคสนับสนุนเส้นสมมุติแบบถดถอยได้ค่าเฉลี่ยน้อยที่สุด จึงเป็นแบบจำลองที่มีประสิทธิภาพมากที่สุด

ดังนั้นเพื่อทราบทิศทางราคาน้ำมันแก๊สโซฮอล์ 95 ในอนาคต จึงนำมาสู่ความสนใจของผู้วิจัยในการสร้างแบบจำลองพยากรณ์ด้วยเทคนิคเหมืองข้อมูล (Data Mining) จำนวน 3 วิธี ได้แก่ 1) การถดถอยเชิงเส้น (Linear Regression) 2) แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้น (Mutilayer Perceptron) และ 3) ซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอย (Support Vector Machine for Regression) และเปรียบเทียบประสิทธิภาพทั้ง 3 วิธีด้วยการวัดค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์ (Mean Magnitude of Relative Error: MMRE) และเพื่อหาแบบจำลองพยากรณ์ที่เหมาะสมใช้เป็นเครื่องมือในการตัดสินใจวางแผนด้านพลังงานและปริมาณการใช้น้ำมันภายในประเทศต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อสร้างแบบจำลองพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ด้วยเทคนิคเหมืองข้อมูล จำนวน 3 วิธีได้แก่ 1) วิธีการถดถอยเชิงเส้น 2) แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้น และ 3) ซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอย
2. เพื่อเปรียบเทียบประสิทธิภาพในการพยากรณ์ และวิธีที่เหมาะสมในการพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95

สมมติฐาน

การพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา ด้วยเทคนิคเหมืองข้อมูล (Time Series Data Mining Techniques) ด้วยข้อมูลชุดเดียวกันทั้ง 3 วิธี สามารถพยากรณ์หาแนวโน้มราคาราคาน้ำมันแก๊สโซฮอล์ 95 ได้อย่างแม่นยำมีประสิทธิภาพเท่าเทียมกัน

ขอบเขตการวิจัยและกรอบแนวคิดในการวิจัย

1. ข้อมูลที่นำมาวิเคราะห์ เป็นข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา จากเว็บไซต์ของบริษัท ปตท. จำกัด (มหาชน) ตั้งแต่เดือนมกราคม 2566 ถึงเดือนมกราคม 2567 โดยแบ่งชุดข้อมูลออกเป็น 2 ส่วนคือ ชุดข้อมูลสำหรับฝึก และข้อมูลที่ใช้ทดสอบ
2. วิธีพยากรณ์หาแนวโน้มราคาราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา จำนวน 3 วิธี ได้แก่ 1) การถดถอยเชิงเส้น (Linear Regression) 2) แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซ็ปตรอนหลายชั้น (Mutilayer Perceptron) และ 3) ซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอย (Support Vector Machine for Regression)

วิธีดำเนินการวิจัย

การดำเนินการวิจัยประกอบขั้นตอนดังนี้

1) ทบทวนวรรณกรรมที่เกี่ยวข้องกับการพยากรณ์ด้วยเทคนิคเหมืองข้อมูล

2) ดำเนินการเก็บรวบรวมข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา จากเว็บไซต์ของบริษัท ปตท. จำกัด (มหาชน) ตั้งแต่เดือนมกราคม 2566 ถึงเดือนมกราคม. 2567

3) ศึกษาตัวแบบจำลองและทฤษฎีที่เกี่ยวข้อง

3.1 การทำเหมืองข้อมูล (Data Mining)

เหมืองข้อมูล (Data Mining) คือกระบวนการวิเคราะห์เพื่อค้นหาความสัมพันธ์หรือรูปแบบจากฐานข้อมูลขนาดใหญ่ โดยอาศัยหลักการทางสถิติและการเรียนรู้ของเครื่อง เพื่อนำข้อมูลสารสนเทศที่ได้มาประกอบการตัดสินใจหรือวางแผนทางธุรกิจในอนาคต (อดุลย์ ยิ้มงาม, 2551) ขั้นตอนการทำเหมืองข้อมูลมีกระบวนการวิเคราะห์ข้อมูลแบบมาตรฐานคือ CRISP - DM (Cross Industry Standard Process For Data Mining) มี 6 ขั้นตอนดังนี้ (เอกสิทธิ์ พัชรวงศ์ศักดา, 2564)

ขั้นตอนที่ 1. ทำความเข้าใจในธุรกิจ (Business understanding)

ขั้นตอนที่ 2. ทำความเข้าใจข้อมูล (Data understanding)

ขั้นตอนที่ 3. การเตรียมข้อมูล (Data Preparation)

ขั้นตอนที่ 4. การจัดทำตัวแบบ (Modelling)

ขั้นตอนที่ 5. การประเมินผล (Evaluation)

ขั้นตอนที่ 6. การนำเอาไปใช้งาน (Deployment)

3.2 ข้อมูลอนุกรมเวลา (Time Series Data)

ข้อมูลอนุกรมเวลา คือชุดข้อมูลหรือค่าสังเกตเชิงปริมาณ (X) ที่มีการเก็บรวบรวม โดยเรียงลำดับของเวลาอย่างต่อเนื่องกัน การจัดเรียงข้อมูลมีลักษณะเป็นรายปี (Yearly) รายไตรมาส (Quarterly) รายเดือน (Monthly) รายอาทิตย์ (Weekly) รายวัน (Daily) หรือรายชั่วโมง (Hourly) ขึ้นอยู่กับความเหมาะสมในการนำไปใช้งาน (เฉลิมพล จตุพร, 2562) ส่วนประกอบของอนุกรมเวลาประกอบด้วย 4 ส่วน คือ

1. แนวโน้ม (Trend) คือส่วนที่ทำให้อนุกรมเวลามีค่าเพิ่มหรือลดลงเรื่อย ๆ เมื่อเวลาผ่านไป (ภูมิฐาน รังคกูลนุวัฒน์, 2562)

2. วัฏจักร (Cycle) คือส่วนที่ทำให้อนุกรมเวลาที่เก็บข้อมูลมีค่าเพิ่มขึ้น และลดลงสลับกันไปรอบ ๆ ค่าแนวโน้ม การนับระยะเวลาของส่วนวัฏจักรจะนับจุดสูงสุดหนึ่ง (peak) ไปยังอีกจุดสูงสุดหนึ่ง หรือจากจุดต่ำสุดหนึ่ง (trough) ไปยังอีกจุดต่ำสุดหนึ่ง เมื่อส่วนของวัฏจักรอยู่ในช่วงที่อนุกรมเวลามีค่าลดลงเรียกว่าช่วงถดถอย (Recession) ส่วนของวัฏจักรที่ทำให้อนุกรมเวลามีค่าเพิ่มขึ้นเรียกว่าช่วงฟื้นตัว (Recovery)

3. ความผันแปรจากฤดูกาล (Seasonal Variations) คือรูปแบบในช่วงเวลาหนึ่งของอนุกรมเวลาที่จะเป็นภายใน 1 ปีและเกิดขึ้นซ้ำกันทุกปี

4. ความผันผวนจากเหตุการณ์ไม่ปกติ (Irregular Fluctuations) คือ ส่วนที่ทำให้อนุกรมเวลามีค่าที่ผิดปกติไปจากรูปแบบที่เป็นมักเกิดจากเหตุการณ์ไม่คาดฝัน (Shock) คำนวณจากการนำค่าของส่วนแนวโน้ม ค่าของส่วนวัฏจักร และค่าของความผันแปรจากฤดูกาล ไปหักล้างค่าอนุกรมเวลานั้น

3.3 การวิเคราะห์การถดถอย (Regression analysis)

การวิเคราะห์การถดถอย เป็นเทคนิคทางสถิติที่ใช้ในการประมาณค่าความสัมพันธ์ระหว่างตัวแปรแบ่งออกเป็น 2 แบบ คือ 1) การวิเคราะห์การถดถอยเชิงเส้น (Linear regression analysis) เป็นการวิเคราะห์การถดถอยที่ตัวแปรอิสระส่วนใหญ่เป็นตัวแปรเชิงปริมาณ ส่วนตัวแปรตามเป็นตัวแปรเชิงปริมาณเท่านั้น รูปแบบของความสัมพันธ์สามารถแทนได้ด้วยสมการทางคณิตศาสตร์ที่เป็นเชิงเส้น (Linear model) 2) การวิเคราะห์การถดถอยแบบไม่เป็นเชิงเส้น (Non linear regression) เป็นการวิเคราะห์การถดถอยที่รูปแบบของความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตาม สามารถแทนได้ด้วยสมการทางคณิตศาสตร์ที่ไม่เป็นเชิงเส้น (non – Linear model) การวิเคราะห์การถดถอยแบ่งออกเป็น

1. แบบจำลองการถดถอยอย่างง่าย ประกอบด้วยตัวแปรตาม (Y) หนึ่งตัวแปร และตัวแปรอิสระ (X) เพียงหนึ่งตัวแปร ดังนี้ (เฉลิมพล จตุพร, 2562)

$$Y_i = \alpha_0 + \beta_1 X_i + \varepsilon_i$$

$$Y_t = \alpha_0 + \beta_1 X_t + \varepsilon_t$$

2. แบบจำลองการถดถอยพหุคูณ ประกอบด้วยตัวแปรตาม (Y) หนึ่งตัวแปร และตัวแปรอิสระ (X) มากกว่าหนึ่งตัวแปร

$$Y_t = \alpha_0 + \beta_1 X_{1t} + \alpha_0 + \beta_2 X_{2t} + \ldots + \alpha_0 + \beta_n X_{nt} \varepsilon_t$$

$$Y_t = \alpha_0 + \sum_{i=1}^{n} \beta_n X_{nt} + \varepsilon_t$$

3.4 โครงข่ายประสาทเทียม (Artificial Neural Network: ANN)

โครงข่ายประสาทเทียม (Artificial Neural Network, ANN) คือ โมเดลทางคณิตศาสตร์สำหรับประมวลผลสารสนเทศด้วยการคำนวณแบบคอนเนคชันนิสต์ (Connectionist) เพื่อจำลองการทำงานของเครือข่ายประสาทในสมองมนุษย์ หลักการทำงานในการประมวลผลเกิดขึ้นในหน่วยประมวลผลย่อย (Node) เมื่อมีข้อมูลนำเข้า (Input Data) ส่งเข้ามายังโครงข่าย ข้อมูลนำเข้าแต่ละค่าจะถูกนำมาคูณกับค่าถ่วงน้ำหนัก (weight) แทนด้วยสัญลักษณ์ W_n ผลลัพธ์ที่ได้ถูกนำมารวมกันแล้วส่งไปยังฟังก์ชันการแปลง (Transfer function) หรือเรียกว่า “ฟังก์ชันกระตุ้น (Activation function)” เพื่อหาข้อมูลผลลัพธ์ (Output Data) ส่งไปยังหน่วยประมวลผลย่อยถัดไป มีองค์ประกอบดังนี้

1. ชั้นอินพุต (Input Layer) ประกอบด้วยนิวรอลรับข้อมูล (Input Neurons) ทำหน้าที่เป็นตัวรับข้อมูลเข้าสู่แบบจำลองโครงข่ายประสาทเทียม ชั้นรับข้อมูล (Input Layer) ทำหน้าที่รับข้อมูลเข้าสู่นิวรอนจำนวนข้อมูลกับจำนวนนิวรอลเท่ากัน

2. ชั้นส่งออกหรือแสดงผลลัพธ์ (Output Layer) ทำหน้าที่แสดงผลลัพธ์ของข้อมูล จำนวนนิวรอนข้อมูลจะเท่ากับนิวรอนแสดงผลลัพธ์

3. ชั้นซ่อน (Hidden Layer) ทำหน้าที่รวมข้อมูลจากชั้นรับข้อมูลและค่าน้ำหนักส่งต่อไปยังชั้นแสดงผลลัพธ์ อาจมีหลายชั้นและมีนิวรอนจำนวนมาก

กระบวนการเรียนรู้ของโครงข่ายประสาทเทียม มี 2 ส่วนคือ การเรียนรู้แบบมีผู้สอน (Supervised Learning) และการเรียนรู้แบบไม่มีผู้สอน (Unsupervised Learning)

3.5 โครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้น (Multi-layer perceptron: MLP)

โครงข่ายประสาทเทียมแบบหลายชั้น (Feedforward neural network) เป็นตัวแบบประเภทการพยากรณ์ (prediction) ใช้พยากรณ์ข้อมูลอนุกรมเวลา มีโครงสร้าง 3 ชั้น ได้แก่ Input Layer, Hidden layer และOutput layer แต่ละชั้นจะประกอบด้วยโหนดที่มีจำนวนต่างกัน (ภัทร วรภู,

2556) โหนดในชั้น Input Layer จะเชื่อมไปข้างหน้ากับทุกโหนดในชั้นถัดไปตามลำดับจนถึง Output Layer โดยค่า Inputs ถูกส่งผ่านจาก Input neurons ไปยัง Hidden neurons แบบทั่วถึงกัน (Fully connected) จากนั้นเข้าสู่ Output neurons ค่าผลรวมของโหนดในชั้นซ่อน คำนวณโดยนำค่าของข้อมูลนำเข้าคูณกับค่าถ่วงน้ำหนักในแต่ละเส้นเชื่อมโยงไปยังโหนดที่ j นำมารวมกัน ดังนั้นค่าผลรวมของโหนดที่ j ในชั้นซ่อน คือ

$$net_j = \sum_{i=1}^{N} x_i w_{ij} + bias$$

เมื่อ Xi แทนข้อมูลนำข้าที่ i , i=1,..,N Wij แทนค่าถ่วงน้ำหนักของเส้นเชื่อมโยงกับข้อมูลนำเข้าที่ i ไปยังโหนดที่ j, j=1,..,J ปรับค่าผลรวมด้วย Sigmoid/logistic Activation Function จะได้ค่าของโหนดในชั้นซ่อนที่อยู่ในช่วง (0,1)

$$y_i = f(net_j) = \frac{1}{1 + e^{-net_j}}$$

พิจารณาโหนดในชั้นผลลัพธ์ คำนวณค่าผลรวมของโหนดในชั้นผลลัพธ์ (Output Layer) ซึ่งมี k โหนด

$$net_k = \sum_{j=1}^{j} y_j w_{jk} + bias$$

เมื่อ w_{jk} แทนค่าถ่วงน้ำหนักของเส้นเชื่อมโยงจากโหนดที่ j ในชั้น hidden layer ไปยังโหนดที่ k ในชั้น Output layer , k=1,..,K ทำการปรับค่าผลรวมด้วยฟังก์ชันกระตุ้นโดยใช้ Linear Activation Function ซึ่งจะได้ค่าของโหนดในชั้น Output

$$y_k = f(net_k) = net_k$$

3.6 แบบซัพพอร์ทเวกเตอร์แมชชีนสำหรับการถดถอย (Support vector machine model for regression)

หลักการของซัพพอร์ทเวกเตอร์แมชชีนสำหรับการถดถอย (Support vector regression :SVR) คือการลดความเสี่ยงเชิงโครงสร้างให้มีค่าต่ำที่สุด ด้วยกระบวนการปรับรูปแบบข้อมูลจากข้อมูลที่มีมิติต่ำ (low dimension dataset) บนพื้นที่ข้อมูลนำเข้า (input space) ให้อยู่ในรูปแบบของข้อมูลที่มีมิติสูง (high dimension dataset) บนพื้นที่ข้อมูลคุณลักษณะ (Feature space) เมื่อกำหนดเซตข้อมูลนำเข้า โดยที่ฟังก์ชัน f(x) จะต้องมีระยะ ε มากที่สุด ในขณะเดียวกันมีค่าคลาดเคลื่อน (Minimize error) น้อยที่สุด

$$f(x) = (w, x) + b, \qquad w \in R^d, b \in R$$

การหาฟังก์ชันการถดถอยที่เหมาะสมที่สุด (optimal regression function) เป็นการหาค่าน้อยที่สุดของฟังก์ชันต่อไปนี้

Minimize $-R_{svm}(C) = \frac{1}{2}||w||^2 + C\sum_{i=1}^{n} L_\epsilon(y_i - f(x_i, w))$-----(1)

$$L_\varepsilon(y_i, f(x_i, w)) = \begin{cases} 0, & |y_i - f(x_i, w)| \le \varepsilon \\ |y_i - f(x_i, w)| - \varepsilon, & otherwise \end{cases}$$

Subject to $\begin{cases} y_i - \langle w, x\rangle - b \le \varepsilon \\ \langle w, x\rangle + b - y_i \le \varepsilon \end{cases}$

พารามิเตอร์ ε เป็นตัวควบคุมความกว้างของ ε -intensive zone ใช้ในการ fit ข้อมูล training ส่งผลกระทบต่อการสร้างสมการ regression กล่าวคือหาก ε มีค่าน้อยทำให้ training error มีค่าต่ำ แต่อาจทำให้เกิดปัญหา overfitting ทำให้การพยากรณ์ในชุด testing data ไม่แม่นยำ หาก ε มีค่ามาก

เกินไปทำให้ training error มีค่าสูง ทำให้ไม่เกิดปัญหา overfitting มากนัก (Chen & Wang, 2007) ส่วน errors ที่มีค่ามากกว่า $\pm\varepsilon$ จะถูกเรียกหรือกำหนดให้เป็น “Slack variable : $\xi^{(*)}$ ” ξ_i^* (เหนือ ε) และ ξ_i^* (ต่ำกว่า ε) แสดงระยะห่างระหว่างค่าจริงที่อยู่นอก ε -intensive zone และสมการ regression ดังสมการที่ (1) เปลี่ยนไปเป็นสมการที่ (2)

Minimize $\frac{1}{2}||w||^2 + C\sum_{i=1}^{n}(\xi_i + \xi_i^*)$-------- (2)

Subject to $\begin{cases} y_i - \langle w, x\rangle - b \le \varepsilon + \xi_i \\ \langle w, x\rangle + b - y_i \le \varepsilon + \xi_i \\ \xi_i, \xi_i^* \ge 0, i = 1, 2, \ldots, n \end{cases}$

3.7 เกณฑ์ที่ใช้ในการตัดสินใจ

เกณฑ์ที่ใช้ในการคัดเลือกตัวแบบในการพยากรณ์ในงานวิจัยนี้ ใช้ค่าความคลาดเคลื่อนสัมบูรณ์เฉลี่ย Mean Absolute Error (MAE) เป็นค่าวัดความถูกต้องของการพยากรณ์ที่วัดจากขนาดของค่าความคลาดเคลื่อนของการพยากรณ์ โดยไม่คำนึงถึงทิศทางของความคลาดเคลื่อน

$$MAE = \frac{\sum_{i=1}^{n} |x_t - \hat{x_t}|}{n}$$

3.8 การประมาณค่าความแม่นยำ (Evaluation Criterion)

การประมาณค่าความแม่นยำ (Evaluation Criterion) จากการใช้วิธีต่าง ๆ ที่สร้างขึ้นต้องมีความแม่นยำเข้ากันได้ (Model best fit) จะถูกนำไปทดสอบกับกลุ่มข้อมูลอีกชุดหนึ่งที่ทราบค่าจริง (Actual Data) ผลจากการพยากรณ์ข้อมูลชุดใหม่ (Predicted Data) จะถูกนำมาคำนวณหาค่าความคลาดเคลื่อนสัมพัทธ์ (Magnitude of Relative Error: MRE) โดยสามารถคำนวณได้จากสมการดังนี้

$$MRE_i = \frac{Actual_{\ i} - predicted_i}{Actual_i}$$

หากมีข้อมูลหลายชุด การคำนวณให้นำค่าความคลาดเคลื่อนสัมพัทธ์ (MRE) ของแต่ละชุดข้อมูลมารวมกันและหาค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์ (Mean-MRE: MMRE) ค่า MMRE มากกว่า 0 แสดงว่ามีความคลาดเคลื่อนสูง ค่า MMRE = 0 (ศูนย์) แสดงว่าค่าของการพยากรณ์เท่ากับค่าจริงทุกค่า นั่นคือ MMRE ยิ่งมีค่าน้อยแสดงว่ามีความแม่นยำมาก ในการประมาณค่าสูญหายของข้อมูลคำนวณได้จากสมการดังนี้

$$MMRE = \frac{1}{2}\sum_{i}^{n} = 1\ \frac{Actual_{\ i} - predicted_i}{Actual_i} \times 100$$

4) สร้างแบบจำลองสำหรับการพยากรณ์โดยใช้วิธีการวิเคราะห์อนุกรมเวลาด้วยเทคนิคเหมืองข้อมูล จำนวน 3 วิธี

5). คำนวณหาค่า MAE และค่าเฉลี่ยของ RMSE โดยใช้ชุดข้อมูลสำหรับเรียนรู้ แบ่งช่วงเวลาย้อนหลัง (Lagged) 10 วัน, 12 วัน, 25 วัน, 28 วัน และ 30 วัน

6) พิจารณาคัดเลือกค่า MAE ที่ค่าใกล้เคียงกันของแบบจำลองพยากรณ์ทั้ง 3 วิธี

7) พยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ด้วยชุดข้อมูลสำหรับการทดสอบ เพื่อคำนวณหาค่า MRE และ MMRE

8) เปรียบเทียบความแม่นยำของแบบจำลองพยากรณ์ทั้ง 3 วิธี

9) วิเคราะห์และสรุปผลการวิจัย

ผลการวิจัย

จากการเก็บข้อมูลและสร้างแบบจำลองพยากรณ์ เพื่อทำการเปรียบเทียบประสิทธิภาพการพยากรณ์ข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 จำนวน 3 วิธี ด้วยการแบ่งชุดข้อมูลออกเป็นชุดข้อมูลการเรียนรู้และชุดข้อมูลสำหรับการทดสอบ (ฉริยะ อัครวรรณ และจารี ทองคำ, 2561) ผลจากการเปรียบเทียบดังตารางที่ 1

ตารางที่ 1 ผลการเปรียบเทียบประสิทธิภาพการพยากรณ์ข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95

Lagged		Time Series Data Mining Techniques					
		Linear Regression		Multilayer Perceptron		SMOreg	
		MAE	RMSE	MAE	RMSE	MAE	RMSE
แก๊สโซฮออล์ 95	Lag 10	0.3502	0.3959	0.3134	0.4028	0.333	0.4092
	Lag 12	0.333	0.3822	**0.2804**	0.3385	0.3289	0.4207
	Lag 25	0.2815	0.3344	0.2427	0.295	**0.2806**	0.3765
	Lag 28	**0.2809**	0.3315	0.2196	0.2675	0.2746	0.358
	Lag 30	0.269	0.3122	0.209	0.2534	0.2602	0.343

จากตารางที่ 1 พบว่า การแบ่งชุดข้อมูลย้อนหลัง (Lag) ที่แตกต่างกัน และหาค่า MAE และ RMSE สำหรับวัดประสิทธิภาพของแบบจำลองทั้ง 3 วิธี ได้ผลดังนี้ วิธีการถดถอยเชิงเส้นด้วยข้อมูลย้อนหลัง 28 วัน มีค่า MAE เท่ากับ 0.2809 และค่า RMSE เท่ากับ 0.3315 แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซ็ปตรอนหลายชั้นด้วยข้อมูลย้อนหลัง 12 วัน มีค่า MAE เท่ากับ 0.2804 และค่า RMSE เท่ากับ 0.3385 และซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอยด้วยข้อมูลย้อนหลัง 25 วัน มีค่า MAE เท่ากับ 0.2806 และค่า RMSE เท่ากับ 0.3765 ซึ่งค่าความคลาดเคลื่อนที่ได้มีค่าที่ใกล้เคียงกัน (สุพาพร บรรดาศักดิ์, จุฑามาศ แป้นทอง และนุตยา กัลป์ลา, 2559)

จากสมมุติฐานที่ว่าแบบจำลองพยากรณ์ด้วยข้อมูลชุดเดียวกันทั้ง 3 วิธี สามารถพยากรณ์หาแนวโน้มราคาราคาน้ำมันแก๊สโซฮอล์ 95 ได้อย่างแม่นยำมีประสิทธิภาพเท่าเทียมกัน เมื่อทำการเปรียบเทียบแบบจำลองการพยากรณ์ทั้ง 3 วิธีด้วยชุดข้อมูลสำหรับการทดสอบเดือนมกราคม 2567 จำนวน 30 วัน ด้วยการวัดค่าความคลาดเคลื่อนสัมพัทธ์ (Magnitude of Relative Error: MRE) ผลการเปรียบเทียบดังตารางที่ 2

ตารางที่ 2 ตารางเปรียบเทียบประสิทธิภาพแบบจำลองการทำนายราคาแก๊สโซฮอล์ 95

Data Set			Time Series Data Mining Techniques					
Data	1 month data		Linear Regression		Multilayer Perceptron		SMOreg	
			Lag 28		Lag 12		Lag 25	
	Data	Actual	Predict	MRE	Predict	MRE	Predict	MRE
น้ำมันแก๊สโซฮอล์ 95	1	35.57	35.005	0.0162	34.894	0.0194	35.425	0.0041
	2	35.57	28.131	0.2644	35.221	0.0099	35.465	0.0030
	3	35.57	28.877	0.2318	35.032	0.0154	35.457	0.0032
	4	35.57	29.612	0.2012	34.866	0.0202	35.451	0.0034
	5	35.07	30.334	0.1561	34.724	0.0100	35.447	-0.0106
	6	35.07	31.148	0.1259	34.767	0.0087	35.065	0.0002
	7	35.07	31.837	0.1016	34.711	0.0104	35.065	0.0002
	8	35.07	32.505	0.0789	34.682	0.0112	35.067	0.0001
	9	35.07	33.149	0.0579	34.682	0.0112	35.071	0.0000
	10	35.07	33.769	0.0385	34.712	0.0103	35.077	-0.0002
	11	35.07	34.359	0.0207	34.773	0.0085	35.086	-0.0005
	12	35.07	34.919	0.0043	34.866	0.0059	35.098	-0.0008
	13	35.07	35.445	-0.0106	34.992	0.0022	35.112	-0.0012
	14	35.07	35.936	-0.0241	35.153	-0.0023	35.129	-0.0017
	15	35.07	36.387	-0.0362	35.349	-0.0079	35.149	-0.0022
	16	35.57	36.797	-0.0334	35.581	-0.0003	35.172	0.0113
	17	35.57	37.057	-0.0401	35.306	0.0075	35.576	-0.0002
	18	35.87	37.377	-0.0403	35.579	0.0082	35.605	0.0075
	19	35.87	37.584	-0.0456	35.520	0.0098	35.863	0.0002
	20	36.17	37.803	-0.0432	35.853	0.0089	35.899	0.0075
	21	36.17	35.005	0.0162	34.894	0.0194	35.425	0.0041
	22	36.17	37.904	-0.0457	35.810	0.0100	36.165	0.0002
	23	36.67	38.013	-0.0485	36.205	-0.0010	36.207	-0.0010
	24	36.67	38.062	-0.0366	36.642	0.0008	36.254	0.0115
	25	37.17	37.943	-0.0335	36.319	0.0097	36.681	-0.0003
	26	37.17	37.866	-0.0184	36.808	0.0098	36.735	0.0118
	27	37.57	37.615	-0.0118	36.463	0.0194	37.170	0.0000
	28	37.57	37.401	0.0045	37.004	0.0153	37.232	0.0091
	29	37.57	37.030	0.0146	36.828	0.0201	37.599	-0.0008
	30	37.57	36.669	0.0246	37.428	0.0038	37.670	-0.0027

ตารางที่ 2 (ต่อ)

Data Set			Time Series Data Mining Techniques					
Data	1 month data		Linear Regression		Multilayer Perceptron		SMOreg	
			Lag 28		Lag 12		Lag 25	
	Data	Actual	Predict	MRE	Predict	MRE	Predict	MRE
	31	37.87	36.231	0.0369	38.069	-0.0131	37.745	-0.0046
MMRE			**3.131%**		**0.707%**		**0.153%**	

จากตารางที่ 2 แสดงผลการเปรียบเทียบประสิทธิภาพแบบจำลองการทำนายทั้ง 3 วิธีกับชุดข้อมูลสำหรับทดสอบ โดยใช้วิธีประมาณการความแม่นยำในการพยากรณ์ด้วยค่าความคลาดเคลื่อนสัมพัทธ์ (Mean Magnitude of Relative Error: MMRE) พบว่า แบบจำลองโครงข่ายประสาทเทียมซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอยให้ประสิทธิภาพสูงสุดด้วยชุดข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 ย้อนหลัง 25 วัน (Lag 25) มีค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์ เท่ากับ 0.153% แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้นด้วยชุดข้อมูลย้อนหลัง 12 วัน (Lag 12) มีค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์เท่ากับ 0.707% และวิธีการถดถอยเชิงเส้นด้วยชุดข้อมูลย้อนหลัง 28 วัน (Lag 28) มีค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์เท่ากับ 3.131% ตามลำดับ

อภิปรายผล

ผลจากการสร้างและเปรียบเทียบประสิทธิภาพแบบจำลองการพยากรณ์ราคาน้ำมันแก๊สโซฮอล์ 95 ที่จำหน่ายในอำเภอหาดใหญ่ จังหวัดสงขลา ด้วยเทคนิคเหมืองข้อมูล พบว่า ซัพพอร์ตเวกเตอร์แมชชีนสำหรับการถดถอยด้วยชุดข้อมูลย้อนหลัง 25 วัน (Lag 25) เมื่อทำการวัดด้วยค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์ มีค่าเท่ากับ 0.153% ส่วนแบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้นด้วยชุดข้อมูลย้อนหลัง 12 วัน (Lag 12) เมื่อทำการวัดด้วยค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์มีค่าเท่ากับ 0.707% และแบบจำลองการถดถอยเชิงเส้นด้วยชุดข้อมูลย้อนหลัง 28 วัน (Lag 28) เมื่อทำการวัดด้วยค่าเฉลี่ยความคลาดเคลื่อนสัมพัทธ์มีค่าเท่ากับ 3.131%

เมื่อพิจารณาเลือกใช้เทคนิคเหมืองข้อมูลแต่ละชนิด ด้วยข้อมูลย้อนหลังที่เหมาะสมกับชนิดของข้อมูล (พิชญากร เลค, 2561) พบว่า แบบจำลองโครงข่ายประสาทเทียมแบบเพอร์เซปตรอนหลายชั้นมีความเหมาะสมที่สุดในการนำไปวิเคราะห์กับชุดข้อมูลราคาน้ำมันแก๊สโซฮอล์ 95 ด้วยชุดข้อมูลย้อนหลัง 25 วัน

ดังนั้นผลจากการวิจัยสามารถนำแบบจำลองดังกล่าวไปพัฒนาต่อเพื่อดูแนวโน้มของราคาน้ำมันในการตัดสินใจวางแผนด้านพลังงานและปริมาณการใช้น้ำมัน

ข้อเสนอแนะ

การที่แบบจำลองจะสามารถทำนายผลได้อย่างแม่นยำต้องอาศัยข้อมูลเป็นจำนวนมาก และมีความสมบูรณ์ของข้อมูล ดังนั้นจึงควรศึกษาข้อมูลจากหลากหลายแหล่งก่อนเริ่มทำงานวิจัยในหัวข้อดังกล่าว เพื่อศึกษาถึงความเป็นไปได้ต่าง ๆ จะทำให้การพยากรณ์มีความแม่นยำมีประสิทธิภาพมากขึ้น

เอกสารอ้างอิง

กองบริหารธุรกิจและการสำรองน้ำมันเชื้อเพลิง กรมธุรกิจพลังงาน กระทรวงพลังงาน. (2565). สถานการณ์การใช้น้ำมันเชื้อเพลิงรอบ 8 เดือนของปี 2566 (มกราคม-สิงหาคม). สืบค้นเมื่อ 18 กุมภาพันธ์ 2567 จาก https://www.doeb.go.th/news_activity/2528.pdf.

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ไร่ข้าว : ความหมาย ความสัมพันธ์ และอัตลักษณ์ความเป็นปกาเกอะญอ
The Rice Fields: Their Signification and Connection to a Karen Identity

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บทคัดย่อ

บทความวิจัยนี้เป็นการศึกษาเพื่อทำความเข้าใจวัฒนธรรมการผลิตข้าวไร่ของเกษตรกรชาติพันธุ์ (กะเหรี่ยง) ตำบลแม่อูคอ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน โดยการเก็บข้อมูลด้วยแบบสอบถามและแบบสัมภาษณ์ การสังเกตการณ์แบบมีส่วนร่วมและไม่มีส่วนร่วม และการค้นคว้าข้อมูลเอกสารและงานวิจัยที่เกี่ยวข้อง ประชากรและกลุ่มตัวอย่างในการศึกษา จำนวน 2 หมู่บ้าน ได้แก่ บ้านหัวแม่สุริน และบ้านแม่อูคอหลวง โดยการสำรวจข้อมูลด้วยแบบสอบถาม จำนวน 126 คน และการสัมภาษณ์เชิงลึก จำนวน 8 คน ผลการศึกษาพบว่า ไร่ข้าว คือ ความมั่นคงด้านอาหาร เพราะไม่เพียงแต่ผลผลิตข้าว ทว่ายังรวมถึงความหลากหลายของพันธุ์พืชชนิดอื่น ไร่ข้าวยังสะท้อนสัมพันธภาพระหว่างธรรมชาติ และภูมิปัญญาความเชื่อพิธีกรรมของกลุ่มชาติพันธุ์กะเหรี่ยงในวิถีการผลิตข้าวบนพื้นที่สูง การปลูกข้าวไร่ยังเป็นการพัฒนาอัตลักษณ์ความเป็น “ปกาเกอะญอ” ที่มีความหมายแสดงถึง การใช้ชีวิตที่เรียบง่าย พอเพียง การจัดการทรัพยากรธรรมชาติอย่างเคารพ เพื่อความยั่งยืนของระบบนิเวศและชุมชน สร้างการยอมรับชอบธรรมในการดำรงชีวิตของชาติพันธุ์กะเหรี่ยงบนดอยแม่อูคอ

คำสำคัญ: ไร่ข้าว, อัตลักษณ์, ปกาเกอะญอ

Abstract

This research article investigates the cultivation of upland rice of a Karen community in Mae U Kho subdistrict, Khun Yuam district, Mae Hong Son province. A total of 126 Karen residents in two villages of Ban Hua Mae Surin and Ban Mae U Kho Luang were surveyed through a questionnaire. An in-depth interview was also conducted with eight residents. Direct observation and participant observation as well as reviews of related

documents and literature were employed. The findings show that the rice fields determined food stability of the community, not only the rice varieties but also other plant species that can be kept as food. The rice fields represented a close connection between nature and Karen folk wisdoms and indigenous rituals. Cultivating the upland rice was a practice to nurture the Karen identity which was based on a simple and sufficient living and a respectful natural resource management for the stability of the ecosystem and the community; it projected a righteous existence of a people on the highland of Mae U Kho.

Keywords: The Rice Fields, Identity, Paka Kyaw (Karen)

บทนำ

วัฒนธรรมและระบบการผลิตข้าวบนพื้นที่สูง (Upland Rice) ของชาติพันธุ์กะเหรี่ยง คือ ระบบนิเวศเกษตรพื้นบ้านที่เป็นสัมพันธภาพระหว่างภูมิปัญญาความรู้ท้องถิ่นกับธรรมชาติสิ่งแวดล้อมที่สั่งสมและสืบทอดยาวนาน จากภูมิประเทศภาคเหนือประเทศไทยที่เป็นพื้นที่สูงมีความลาดชัน และมีที่ราบลุ่มเชิงเขาอยู่บ้าง ระบบการผลิตข้าว จึงมีทั้งปลูกข้าวนาในที่ราบลุ่มหุบเขา แบบการทำนาดำขั้นบันได มีการทำคันนากักเก็บน้ำ ขั้นตอนทำนา ตั้งแต่เตรียมดิน เพาะกล้า ไถคราด ดำนา ถอนกล้า ปลูกข้าว เกี่ยวข้าว ตีข้าว และมีการปลูกข้าวในพื้นที่เชิงเขาที่มีความลาดชันหรือที่เรียกว่า ทำไร่ข้าว ข้อมูลของสถาบันวิจัยข้าวระหว่างประเทศ (IRRI, 1990 อ้างถึงใน ชัยฤทธิ์ ดำรงเกียรติ, 2555) แบ่งนิเวศการปลูกข้าวแถบเอเชีย 4 ประเภท ข้าวไร่ คือ การปลูกในระบบนิเวศแบบหนึ่ง โดยให้ความหมายข้าวไร่ว่า ข้าวที่ปลูกในสภาพไม่มีน้ำขัง หรือสภาพไร่และปลูกผสมกับพืชอื่น ไม่มีการให้น้ำ ส่วนใหญ่ไม่พรวนดิน

งานศึกษาเรื่อง Farmers in the Forest: Economic Development and Marginal Agriculture in Northern Thailand (Kunstadter, Zinke, Sanga, 1978 อ้างถึงใน ประเสริฐ ตระการศุภกร, 2563) ชี้ให้เห็นความหลากหลายของระบบการผลิตของกลุ่มชาติพันธุ์ในภาคเหนือของประเทศไทยภายใต้ระบบนิเวศป่าเขตร้อนชื้นที่มีความหลากหลายทางชีวภาพ เรียก ระบบการผลิตของกลุ่มชาติพันธุ์กะเหรี่ยง และคนลัวะ ว่า Short Cultivation – long Cultivation คือ เกษตรกรรมที่ผลิตซ้ำพื้นที่ในระยะสั้นและทิ้งให้ไร่ฟื้นตัวระยะยาว 5 - 7 ปี หรือจำนวนปีที่มากกว่านั้น ขึ้นกับสภาพนิเวศและความอุดมสมบูรณ์ การปล่อยพักดิน คือ การปล่อยพื้นที่ทิ้งไว้เฉย ๆ เรียกว่า "ไร่เหล่า" ทำให้พืชพันธุ์ต่าง ๆ เติบโตขึ้นมาทดแทนพืชพันธุ์ที่ถูกเก็บเกี่ยวออกไป ธาตุอาหารในดินจะคืนความสมบูรณ์ จากนั้นจึงวนกลับมาทำการผลิตซ้ำที่ไร่เดิม คนกะเหรี่ยงเรียกวิถีการผลิตข้าวไร่บนพื้นที่สูงว่า“คี-ฉี่”, คำว่า “คี” คือ ไร่ คำว่า ฉี่ คือ ไร่เหล่าที่กำลังฟื้นสภาพป่า หมายถึง เกษตรกรรมแบบไร่หมุนเวียน (Rotation Swiddening) เป็นระบบเก่าแก่ที่สุดระบบหนึ่งของโลก พื้นที่ที่ยังคงทำไร่หมุนเวียนทั่วโลกคิดเป็น 30 เปอร์เซ็นต์ ของพื้นที่เพาะปลูกได้ (World Resource Institute 1997 อ้างถึงใน อานันท์ กาญจนพันธุ์, 2547) การทำไร่ข้าวหมุนเวียนจึงเป็นเกษตรกรรมภาคบังคับที่ใช้ความรู้ภูมิปัญญาการจัดการทรัพยากรที่เหมาะสมกับภูมินิเวศพื้นที่สูงลาดชัน แม้ว่าการปลูกข้าวบนที่สูงไม่ได้มีผลทางเศรษฐกิจของประเทศอย่างมีนัยยะสำคัญ ทว่าคือ ระบบการผลิตที่ค้ำจุนการดำรงชีวิตของกลุ่มชาติพันธุ์ได้จนถึงทุกวันนี้

อย่างไรก็ตาม ระบบการผลิตบนพื้นที่สูงโดยเฉพาะการปลูกข้าวไร่หมุนเวียนมักจะถูกเชื่อมโยงกับปัญหาการลดลงของทรัพยากรป่าไม้และการบุกรุกพื้นที่ป่า ทั้งนี้เพราะวิธีการทำเกษตรแบบตัดฟันเผาและเคลื่อนย้ายพื้นที่เพาะปลูก ถูกรับรู้ว่าเป็นการทำไร่เลื่อนลอยและกลายเป็นวาทกรรมหลัก ที่มองว่าคนกะเหรี่ยงและกลุ่มชาติพันธุ์ที่มีวิถีการผลิตเช่นเดียวกันนี้ คือ ผู้ที่มีส่วนทำให้ป่าไม้มีจำนวนลดลง เป็นต้นเหตุสำคัญการเกิดไฟป่าและกลายเป็นมลพิษทางอากาศ อีกทั้งยังเป็นวิถีการผลิตที่ล้าหลังและด้อยพัฒนา เป็นการใช้ที่ดินอย่างสิ้นเปลือง มีงานศึกษาวิจัยทางสังคมศาสตร์รุ่นบุกเบิกที่สร้างองค์ความรู้และความเข้าใจต่อระบบการผลิตไร่หมุนเวียนและศักยภาพในการจัดการทรัพยากรธรรมชาติของกลุ่มชาติพันธุ์ที่ดำรงชีวิตร่วมกับป่า ได้แก่ การศึกษาเรื่องวิวัฒนาการของการบุกเบิกที่ทำกินในเขตป่า (เจิมศักดิ์ ปิ่นทอง, 2534) และป่าชุมชนในประเทศไทย: แนวทางการพัฒนา (เสน่ห์ จามริก และ ยศ สันตสมบัติ, 2536) งานของ ปิ่นแก้ว เหลืองอร่ามศรี (2534) ที่เสนอความรู้นิเวศวิทยาของชุมชนกะเหรี่ยงในเขตป่าทุ่งใหญ่นเรศวร ที่มีความสัมพันธ์กับเกษตรกรรมเพื่อการยังชีพอย่างมีศีลธรรม และระบบการจัดการทรัพยากรธรรมชาติอย่างเคารพ งานของ ยศ สันตสมบัติ (2546) มีการขยายความเข้าใจต่อวิถีการผลิตของกะเหรี่ยงในมิติความสัมพันธ์เชิงอำนาจ โดยชี้ว่า ไร่ข้าวหมุนเวียน คือ ระบบนิเวศที่มีประสิทธิภาพในการผลิตพืชอาหารบนพื้นที่สูงและกลุ่มชาติพันธุ์กะเหรี่ยง มีศักยภาพจัดการป่าได้อย่างยั่งยืนจากภูมิปัญญาความรู้ที่สืบทอดกันมา หนึ่งในกรณีศึกษา คือ ชุมชนกะเหรี่ยงบ้านหนองเต่า อำเภอแม่วาง จังหวัดเชียงใหม่ งานของ กฤษฎา บุญชัย,พรพณา ก๊วยเจริญ และคณะ (2557) มีการรวบรวมองค์ความรู้ระบบการผลิตข้าวของคนกะเหรี่ยงในภาคเหนือและภาคตะวันตกของประเทศไทย ในการขับเคลื่อนเชิงนโยบายให้การทำไร่ข้าวแบบหมุนเวียนของกะเหรี่ยงเป็นมรดกภูมิปัญญาวัฒนธรรม

ปัจจุบัน วิถีการผลิตข้าวไร่ของคนกะเหรี่ยงหรือการทำเกษตรกรรมบนพื้นที่สูงภาคเหนือของประเทศไทย มีการเปลี่ยนแปลงการปรับตัวเคลื่อนไหวอย่างซับซ้อนและแตกต่างหลากหลายในแต่ละบริบทพื้นที่อย่างต่อเนื่อง ภายใต้เงื่อนไขสังคมวัฒนธรรมเศรษฐกิจสมัยใหม่ วิถีชีวิตแบบเมืองและความจำเป็นในชีวิตตามสมัยนิยม เช่น สินค้าอุปโภคและบริโภค เศรษฐกิจที่เน้นเงินตรา รายได้ และการสะสมมูลค่า การเปลี่ยนแปลงพื้นที่ปลูกข้าวเพื่อปลูกพืชเศรษฐกิจอื่นชนิดอื่น การลดลงของเกษตรกรชาติพันธุ์ และการประกอบอาชีพรับจ้างแทน การเมืองและนโยบายการพัฒนาต่าง ๆ กฎหมายที่อ้างสิทธิเหนือทรัพยากรธรรมชาติ ที่มีการกำหนดขอบเขตพื้นที่ และจำกัดการใช้ประโยชน์จากป่าที่เข้มงวดและชัดเจนมากขึ้น หรือแม้แต่การเปลี่ยนแปลงด้านสิ่งแวดล้อมและสภาพภูมิอากาศ ตัวอย่าง งานศึกษาของพุฒิพงศ์ นวกิจบำรุง (2556) อธิบายว่า หลังจากที่ข้าวโพดเลี้ยงสัตว์ถูกส่งเสริมให้ปลูกอย่างมาก ในพื้นที่อำเภอแม่แจ่ม จังหวัดเชียงใหม่ ทำให้การจัดการพื้นที่ไร่หมุนเวียน เพื่อปลูกข้าวไร่และพืชอาหารได้เปลี่ยนแปลงไป ไร่ข้าวหมุนเวียนถูกเปลี่ยนเป็นไร่ถาวรสำหรับปลูกข้าวโพดเลี้ยงสัตว์ และยังคงมีการรักษาพื้นที่ไร่ส่วนหนึ่งสำหรับปลูกข้าว แต่ก็ไม่ใช่ตามระบบไร่หมุนเวียนแบบดั้งเดิม แต่เป็นการปลูกข้าวเพียงอย่างเดียว ไม่สามารถปลูกพืชอาหารชนิดอื่น ๆ ด้วยกันได้เหมือนเดิม เพราะมีการฉีดพ่นยาฆ่าหญ้าในไร่ข้าว และไม่มีการปล่อยทิ้งให้ผืนดินฟื้นฟูตามธรรมชาติ งานศึกษาของ จิรวัฒน์ รักชาติ (2562) ที่ศึกษาการปรับโครงสร้างทางการเกษตรบนพื้นที่สูงในอำเภอฮอดและอำเภออมก๋อย จังหวัดเชียงใหม่ ชี้ให้เห็นว่าหลัง พ.ศ. 2530 เกษตรกรลัวะและกะเหรี่ยงที่ตั้งหมู่บ้านติดถนนสายหลัก ตัดสินใจเลิกปลูกข้าวไร่และเปลี่ยนไปปลูกข้าวนาปีพันธุ์พื้นเมืองหรือพันธุ์ของรัฐ เช่น กข.6 แทน และมีการเปลี่ยนจากการปลูกข้าวไร่ในพื้นที่บริเวณเชิงเขาเป็นการปลูกมะเขือเทศที่สามารถสร้างรายได้เงินสด

งานของ อานันท์ กาญจนพันธุ์ และคณะ (2547) เรื่อง ระบบเกษตรแบบไร่หมุนเวียน: สถานภาพและการเปลี่ยนแปลง มีการศึกษาการทำไร่ข้าวหมุนเวียนของชุมชนชาติพันธุ์บนพื้นที่สูง 11 หมู่บ้าน ใน 4 จังหวัด ได้แก่ เชียงใหม่ เชียงราย ลำปาง และ แม่ฮ่องสอน พบว่า มีการปรับตัว 3 รูปแบบ คือ รูปแบบที่ 1 การทำไร่หมุนเวียนที่มีเสถียรภาพยั่งยืน มีรอบหมุนเวียนที่ยาวนาน เป็นระบบการผลิตหลักของชุมชน มีการทำนาและทำสวนเป็นระบบการผลิตรอง มีความมั่นคงทางการผลิตและความยั่งยืนของทรัพยากรและสิ่งแวดล้อม มีลักษณะการผลิตเพื่อการยังชีพสูงและพึ่งพาตนเองด้านอาหารได้ มีการผลิตเพื่อขายระดับต่ำอาทิ กรณีศึกษาหมู่บ้านแม่อุ้มพาย ตำบลแม่โถ อำเภอแม่ลาน้อย จังหวัดแม่ฮ่องสอน รูปแบบที่ 2 ชุมชนมีการปรับตัวอย่างมีทางเลือก คือ มีการหมุนเวียนการใช้พื้นที่รอบสั้นลง ชุมชนบางแห่งเหลือเพียง 1–3 ปีการทำไร่ข้าวเป็นระบบรองร่วมกับการทำเกษตรกรรมแบบวนเกษตร ชุมชนยังมีอำนาจการจัดการและควบคุมการใช้ทรัพยากรอยู่ ชาวบ้านมีการหาทางเลือก และรูปแบบการผลิตที่หลากหลาย เพื่อสร้างรายได้ การทำอาชีพนอกภาคเกษตร เช่น รับจ้าง รูปแบบที่ 3 การปรับตัวแบบพึ่งพา คือ ชุมชนไม่สามารถรักษาระบบการทำไร่ข้าวแบบหมุนเวียนไว้ได้อีกต่อไป พื้นที่ส่วนใหญ่กลายเป็นไร่ถาวร มีการผลิตเพื่อขายเต็มรูปแบบ พึ่งพาตลาด และแบกรับความเสี่ยงการปลูกพืชเศรษฐกิจตามกลไกตลาด มีการรับจ้างแรงงานในพื้นที่เกษตรกรรม การจัดการระบบเกษตรที่ดินและทรัพยากรธรรมชาติเป็นเรื่องปัจเจกหรือส่วนบุคคล

จังหวัดแม่ฮ่องสอน เป็นจังหวัดที่มีประชากรกลุ่มชาติพันธุ์อาศัยหลายกลุ่ม รายงานสถานการณ์ทางสังคม จังหวัดแม่ฮ่องสอน ประจำปี 2565 รายงานว่า กลุ่มชาติพันธุ์ที่มีจำนวนมากที่สุด คือ ชนเผ่ากะเหรี่ยง ประกอบด้วย กะเหรี่ยงสะกอ (ปกาเกอะญอ) กะเหรี่ยงแดง กะเหรี่ยงคอยาว เป็นต้น มีจำนวนประชากรคิดเป็นร้อยละ 79.3 (ประชากรจังหวัดแม่ฮ่องสอน 284,982 คน) พื้นที่จังหวัดแม่ฮ่องสอน 7,987,808.27 ไร่ สภาพภูมิประเทศมีลักษณะเป็นทิวเขาสูงสลับซับซ้อน ที่มีความสูงจากน้ำทะเลปานกลางตั้งแต่ 100 – 2,000 เมตร มีพื้นที่ป่า ประมาณ 6,860,611.94 ไร่ คิดเป็นร้อยละ 85.99 (สำนักงานพัฒนาสังคมและความมั่นคงของมนุษย์จังหวัดแม่ฮ่องสอน, 2565). จากข้อมูลงานวิจัยเรื่องสิทธิของชุมชนกะเหรี่ยง ฯ ของ ไพสิฐ พาณิชย์กุล และคณะ (2560) มีการสำรวจชุมชนกะเหรี่ยงพื้นที่จังหวัดแม่ฮ่องสอน พบว่า ยังมีวิถีการผลิตข้าวและทำไร่หมุนเวียนอยู่ จำนวน 519 ชุมชน ด้วยข้อจำกัดสภาพภูมิประเทศที่ส่วนใหญ่เป็นพื้นที่เชิงเขาและพื้นที่ราบน้อย จำเป็นต้องพึ่งพาการปลูกข้าวไร่และพืชอาหารอื่น ๆ บนพื้นที่เชิงเขาเพื่อเป็นหลักประกันความมั่นคงด้านอาหารและการอยู่รอด

บทความวิจัยนี้ ให้ความสนใจเรื่องวัฒนธรรมและระบบการผลิตข้าวไร่ของเกษตรกรกะเหรี่ยงพื้นที่ตำบลแม่อูคอ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน มีพื้นที่ศึกษา 2 ชุมชน คือ ชุมชนบ้านหัวแม่สุรินและชุมชนบ้านแม่อูคอหลวง ทั้งสองชุมชนเป็นกลุ่มชาติพันธุ์กะเหรี่ยง (สะกอ) ที่ยังคงมีการสืบทอดภูมิปัญญา และความรู้เรื่องระบบการผลิตข้าวไร่มาตั้งแต่การตั้งถิ่นฐานของบรรพบุรุษ และในปัจจุบันยังปรากฏว่า มีการปลูกข้าวไร่หมุนเวียนอยู่ (ร่วมกับการปลูกข้าวนา) คำถามสำคัญของบทความวิจัยนี้ คือ วิถีการผลิตข้าวไร่ของกลุ่มชาติพันธุ์กะเหรี่ยงดอยแม่อูคอ จังหวัดแม่ฮ่องสอน มีความหมายความสำคัญอย่างไร ทำไมทั้งสองชุมชนถึงยังคงสืบทอดวัฒนธรรมและระบบการผลิตข้าวไร่ได้อยู่ มีการปรับตัวทำไร่ข้าวอย่างไร ภายใต้สถานการณ์ของการกดดันจากการใช้พื้นที่ และเหตุผลแบบเศรษฐกินทุนนิยม ความต้องการรายได้และการเข้ามาของพืชเศรษฐกิจ โดยมีสมมติฐานว่า ทุนทางสังคมวัฒนธรรมและความสามารถในจัดการทุนประเภทต่าง ๆ ของชุมชนกะเหรี่ยงดอยแม่อูคอ เป็นเงื่อนไขสำคัญอย่างหนึ่งที่ช่วยค้ำจุนเสถียรภาพการทำไร่ข้าวให้ดำรงอยู่ได้ (บทความนี้ ใช้คำว่า “กะเหรี่ยงดอยแม่อูคอ” หมายรวมถึง ชุมชนกะเหรี่ยง 2 หมู่บ้าน ในพื้นที่ศึกษาของงานวิจัย)

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาวัฒนธรรมและระบบการผลิตข้าวของเกษตรกรชาติพันธุ์กะเหรี่ยง ตำบลแม่อูคอ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน

แนวคิด ทฤษฎี กรอบแนวคิด

บทความวิจัยนี้เป็นการศึกษาเพื่อทำความเข้าใจวิถีการผลิตข้าวไร่ของคนกะเหรี่ยงของดอยแม่อูคอ จังหวัดแม่ฮ่องสอน ผ่านมุมมองแนวคิดเรื่องทุนทางสังคม (Social Capital) และเลือกแนวคิดทุนทางสังคมของ ปิแอร์ บูร์ดิเยอร์ (Pierre Felix Bourdieu: 1930 -2002) ศาสตราจารย์สังคมวิทยาประจำวิทยาลัยแห่งฝรั่งเศส (Collège de France) มาประยุกต์ใช้เป็นแนวคิดเพื่อการวิเคราะห์และทำความเข้าใจวัฒนธรรมและระบบการผลิตข้าวไร่บนดอยแม่อูคอในฐานะที่เป็นกิจกรรมทางสังคมของเกษตรกรชาติพันธุ์กะเหรี่ยงที่มีการนำทุนทางสังคมประเภทต่าง ๆ ที่มีอยู่ และนำไปใช้ให้เกิดประโยชน์ต่อชีวิตทางสังคมวัฒนธรรมและเศรษฐกิจ หรืออาจจะพูดตามสิ่งที่บูร์ดิเยอร์ เรียกว่า“ปฏิบัติการ” (Practice) คือการปฏิบัติการในชีวิตประจำวันของคนกะเหรี่ยงจากวิถีการผลิตในไร่ข้าวเป็นปฏิบัติการที่มีความหมายความสำคัญและการเป็นคนกะเหรี่ยงอย่างไร

“ทุนทางสังคม” เป็นแนวคิดที่มีการกล่าวถึงอย่างมีนัยยะสำคัญภายหลังจากเกิดวิกฤตเศรษฐกิจในประเทศไทย พ.ศ. 2540 มีการจัดตั้งสำนักงานกองทุนเพื่อสังคม (Social Investment Fund, SIF) และมีการใช้คำว่า ทุนทางสังคมกับการพัฒนาสังคมอย่างยั่งยืน มีการให้ความสำคัญการพัฒนาชุมชนและสังคม โดยกลับไปให้คุณค่าความสำคัญ“ทุนเดิม” ที่มีในท้องถิ่น ทว่าถูกละเลยมองข้าม เพราะการพัฒนากระแสหลักเน้นมองทุนที่เป็นเงินและการวัดคุณค่าเชิงวัตถุ คือ การเติบโตทางเศรษฐกิจ และมีการปรับหมุดหมายการพัฒนาประเทศ โดยการขับเคลื่อนการพัฒนาสังคมจากรากหญ้า ชุมชน หรือองค์กรพัฒนาชุมชน

แผนพัฒนาสังคมและเศรษฐกิจแห่งชาติฉบับที่ 10 (พ.ศ.2550 - 2554) กำหนดให้การพัฒนาทุนทางสังคมเป็นวาระแห่งชาติ มีการระดมความคิดเห็นจากภาคส่วนต่าง ๆ เพื่อร่วมกันพัฒนายุทธศาสตร์และแนวทางการพัฒนาทุนทางสังคม ขณะเดียวกันมีการศึกษาวิจัยเพื่อสนับสนุนการพัฒนาทุนทางสังคม สำนักงานพัฒนาเศรษฐกิจและสังคมแห่งชาติ (สศช.) อธิบาย “ทุนทางสังคม” ว่า เกิดจากการรวมตัวรวมคิดรวมทำบนฐานของความไว้เนื้อเชื่อใจ สายใยความผูกพัน และวัฒนธรรมที่ดีงามของสังคมไทยผานระบบความสัมพันธ์ในองคประกอบหลัก ไดแก คน สถาบัน วัฒนธรรม และองค์ความรู ซึ่งจะเกิดเปนพลังในชุมชนและสังคม

บทความ Social Capital in the Creation of Human Capital (Coleman, 1988 ใน American Journal of Sociology) ทุนทางสังคมเป็นแนวคิดที่ใช้ในการอธิบายการปฏิสัมพันธ์ทางสังคม (Social Interaction) ที่ต้องสร้างขึ้นมาและเป็นทรัพยากรที่สำคัญในการสร้างความสัมพันธ์ระหว่างปัจเจกบุคคล ทั้งความไว้วางใจทางสังคม (Social Trust) เครือข่ายทางสังคม (Social Networks) และบรรทัดฐานทางสังคม, ความคิดร่วมกัน (Social/Civil Norms)

สำหรับแนวคิดเรื่อง “ทุนทางสังคม” ของ ปิแอร์ บูร์ดิเยอร์ (Bourdieu, 1986) บูร์ดิเยอร์มองว่ามนุษย์มีทรัพยากรทุนหลายรูปแบบ ไม่ใช่เพียงแต่ทุนเศรษฐกิจ และมีความสามารถใช้ทุนรูปแบบที่หลากหลายเพื่อการดำรงรักษาสถานะตำแหน่งแห่งที่ของตนเองและความสัมพันธ์ทางสังคมในสนามความสัมพันธ์ต่าง ๆ บูร์ดิเยอร์ จำแนกทุน เป็น 4 แบบ คือ ทุนเศรษฐกิจ ทุนวัฒนธรรม ทุนสังคม และทุนสัญลักษณ์ บูร์ดิเยอร์ให้ความสำคัญกับมนุษย์ในฐานะผู้กระทำการสังคม (Agent) ที่รู้ว่าในสนามของ

ความสัมพันธ์ทางสังคมต่าง ๆ คือ การกระทำที่มีเป้าหมายเพื่อสิ่งใด (ชนิดา เสงี่ยมไพศาลสุข, 2550; รุ้งนภา ยรรยงเกษมสุข, 2557; อานันท์ กาญจนพันธ์, 2560) ทุนทางสังคม 4 รูปแบบ ดังนี้

1.ทุนเศรษฐกิจ (Economic Capital) หมายถึง ทรัพย์สิน ที่ดิน เงินทอง ทุนที่สามารถเปลี่ยนรูปเป็น“เงิน” ได้ รวมไปถึงการครอบครองทางเศรษฐกิจ ซึ่งบ่งบอกถึงความสามารถและบทบาทในสังคมทุนรูปแบบนี้อาจอยู่ในรูปแบบขององค์กรหรือสถาบันที่มีสิทธิในทรัพย์สินนั้น ๆ

2.ทุนวัฒนธรรม (Cultural Capital) หมายถึง ความรู้ที่สะสมอยู่ในตัวคน ศักยภาพในการกระทำ ทุนทางวัฒนธรรมสามารถแยกเป็น 3 ระดับ ที่ต่างกัน คือ

(1) ทุนที่อยู่ภายในตัวคน (Embodied State) สามารถสะท้อนออกมาผ่านปัจเจกแต่ละคน ผ่านกระบวนการพัฒนาตนเอง ทำให้ปัจเจกมีความโดดเด่นหรือมีลักษณะเฉพาะตัว ทุนรูปแบบนี้จะเป็นส่วนหนึ่งของร่างกายที่ใช้เวลาในการสะสมและบ่มเพาะจากสิ่งที่อยู่รอบข้าง หรือสิ่งที่ได้เรียนรู้ สิ่งที่ได้พบเห็นให้อยู่ในรูปแบบของกิริยาและจิตใจรวมถึงความเชื่อ ศรัทธา อุปนิสัยที่คงทนถาวร ทุนวัฒนธรรมจะมีความแตกต่างกันขึ้นอยู่กับการสะสม และการส่งผ่านเห็นได้จากเมื่ออายุเพิ่มมากขึ้นทุนวัฒนธรรมจะถูกสะสมอยู่ในตัวเพิ่มมากขึ้นไปด้วย

(2) ทุนที่ถูกทำให้อยู่ในรูปของวัตถุหรือเป็นรูปธรรม (Objectified State) คือ ทรัพย์สินที่ถูกนิยามในความสัมพันธ์กับทุนทางวัฒนธรรมในลักษณะเป็นวัตถุ และสามารถเปลี่ยนไปสู่ทุนทางเศรษฐกิจได้ดี กล่าวคือ การถือครองทุนวัฒนธรรมแบบนี้ คือ การบริโภค เช่น งานเขียน รูปภาพ เครื่องมือ หนังสืออนุสาวรีย์ ฯลฯ

(3) ทุนที่ถูกทำให้อยู่ในรูปของสถาบัน (Institutionalization State) ทุนวัฒนธรรมที่ถูกสร้างมูลค่าให้มีคุณสมบัติคู่ควรกับผู้ที่ครอบครอง โดยถูกสร้างในรูปของสถาบัน คือ การรับประกันที่แสดงออกในรูปของการให้ประกาศนียบัตร, หนังสือรับรอง เพื่อแสดงให้เห็นถึงการเป็นผู้มีความรู้เชี่ยวชาญ

3.ทุนสังคม (Social Capital) หมายถึง ฐานะตำแหน่งหรือเครือข่ายทางสังคม เป็นทุนที่ปัจเจกบุคคลเป็นเจ้าของ และการแสดงความเป็นเจ้าของอย่างถูกต้อง โดยเชื่อมโยงเป็นเครือข่ายความสัมพันธ์ที่ระดมทรัพยากร การกระทำหรือความดีงาม “ทุนสังคม” จะมีปริมาณมากน้อยเพียงไรนั้นขึ้นอยู่กับความสัมพันธ์ในชุมชนนั้นเอง ทุนสังคมจึงสามารถแยกออกได้ 2 ลักษณะดังนี้

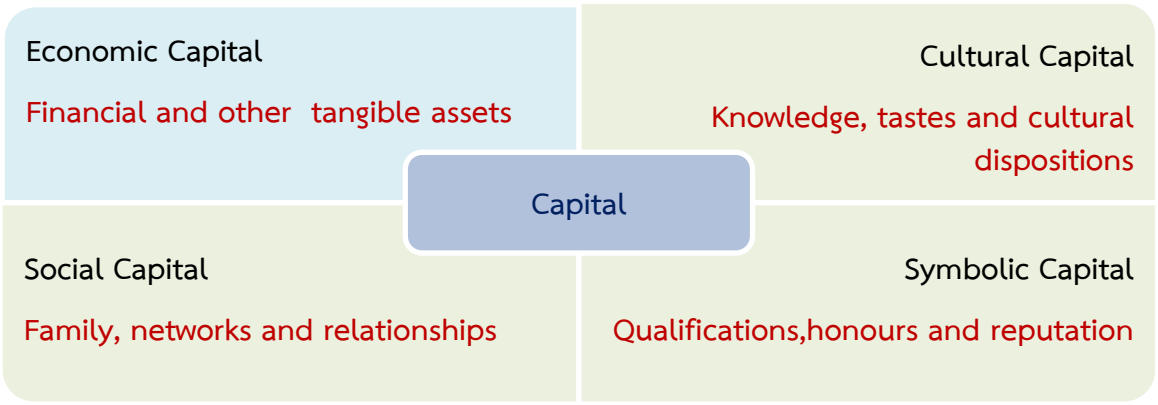
(1) ทรัพยากรที่มีความสัมพันธ์กับสมาชิกของกลุ่มและเครือข่ายของสังคม ทรัพยากรในข้อนี้ไม่ได้ขึ้นอยู่กับปริมาณของสมาชิกของกลุ่มเสียทั้งหมดแต่ขึ้นอยู่กับประสิทธิภาพที่จะสามารถระดมมาได้ ดังนั้นผลรวมของการมีความสัมพันธ์กันระหว่างบุคคลส่งผลต่อคุณภาพของทุนทางสังคม

(2) การรวมตัวกันของความรู้ความเข้าใจและการยอมรับ (Cognition and Recognition) เป็นคุณลักษณะเชิงสัญลักษณ์ ซึ่งสามารถเปลี่ยนรูปแบบเป็นทุนสัญลักษณ์ได้

บูร์ดิเยอร์ให้ความเห็นเรื่องทุนสังคมว่า ทุนสังคมเป็นทุนที่สามารถเปลี่ยนรูปไปตามเงื่อนไขเฉพาะเพราะทุนสังคมถูกสร้างขึ้นโดยอำนาจทางสังคมและต้องมีการปฏิบัติอย่างสม่ำเสมอไม่ว่าจะเป็นความสัมพันธ์ทางสังคมหรือการเป็นตัวแสดงที่มีประสิทธิภาพของปัจเจกบุคคลเอง มิใช่สิ่งที่เกิดเองอย่างเป็นธรรมชาติ สถาบันจึงเป็นตัวสำคัญในความมีอยู่ของทุนทางสังคม

4.ทุนสัญลักษณ์ (Symbolic Capital) เป็นทุนที่สัมผัสรู้และยอมรับถึงการมีอยู่ เช่น ศักดิ์ศรี สถานภาพอำนาจ ทุนสัญลักษณ์สามารถได้มาจากเกือบทุกที่ หรืออาจเป็นผลรวมจาก ทุนทางสังคม ทุนเศรษฐกิจและทุนวัฒนธรรม ทำให้ผู้ครอบครองนั้นมีอำนาจบารมี เห็นได้ชัด คือ การที่ปัจเจกบุคคลมีพื้นฐานเป็นทุนเศรษฐกิจที่ดีและมากพอ สังคมก็รับรู้ถึงการมีสถานะที่มั่นคง มั่งคั่ง และเมื่อบุคคล

ดังกล่าวได้มีการบำเพ็ญประโยชน์ต่อสังคมโดยการบริจาค บุคคลผู้นั้นก็ได้ชื่อว่า เป็นบุคคลที่ใจบุญ ด้วยคำว่าเป็นคนดีของสังคมทุน สัญลักษณ์ คือ อะไรก็ได้ที่เป็นตัวแทนของอำนาจทางสังคมของบุคคลที่ครอบครองได้มาสะสม และที่สำคัญสามารถใช้อำนาจบารมีนั้นแสดงผ่านปฏิบัติการใน “สนามของความสัมพันธ์” (Field) นั้น ๆ ได้



ภาพที่ 1 Bourdieu’s Concept of Capital
ที่มา: Harvey, and Maclean (2008)

จากมโนทัศน์ทุนของบูร์ดิเยอร์ นำไปสู่การประยุกต์ใช้เป็นกรอบแนวคิดของบทความวิจัย เพื่อทำความเข้าใจวัฒนธรรมและระบบการผลิตข้าวไร่ของเกษตรกรชาติพันธุ์กะเหรี่ยงดอยแม่อูคอ ดังภาพที่ 2

ภาพที่ 2 กรอบคิดบทความวิจัย โดยการประยุกต์จากมโนทัศน์เรื่องทุนของบูร์ดิเยอร์
ที่มา: ผู้วิจัย (ดัดแปลงจากมโนทัศน์เรื่อง ทุนของบูร์ดิเยอร์)

วิธีดำเนินการวิจัย

บทความวิจัยนี้ ดำเนินการวิจัยในพื้นที่ 2 หมู่บ้าน คือ บ้านหัวแม่สุริน และ บ้านแม่อูคอหลวง อยู่ในพื้นที่ปกครองขององค์การบริหารส่วนตำบลแม่อูคอ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน ประชากรทั้งสองหมู่บ้าน เป็นกลุ่มชาติพันธุ์กะเหรี่ยง (สะกอ) นับถือศาสนาพุทธและผีบรรพบุรุษ มีวัฒนธรรม ภาษาประเพณี เป็นเอกลักษณ์ของกลุ่มชาติพันธุ์กะเหรี่ยง มีความเชื่อและพิธีกรรมที่เกี่ยวข้องกับวัฏจักรของระบบวิถีการผลิตในรอบปี เช่น การเลี้ยงผีไร่ผีนา มีการสืบทอดความรู้และภูมิปัญญาด้านการเกษตรและการจัดการทรัพยากรธรรมชาติที่สอดคล้องระบบนิเวศ มีข้อตกลงที่ชุมชนยึดถือร่วมกันในการจัดการพื้นที่ใช้สอยและพื้นที่อนุรักษ์ มีการปลูกข้าวนาในพื้นที่ราบลุ่มเชิงเขา มีการปลูกข้าวไร่ในพื้นที่ลาดชันเชิงเขา และทำไร่หมุนเวียนตามจารีตประเพณีอยู่ มีความสัมพันธ์ที่เชื่อมแน่นด้วยระบบเครือญาติ ความเป็นพี่น้อง

1.พื้นที่ศึกษาและบริบทของชุมชน

ตำบลแม่อูคอ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน อยู่ห่างจากตัวเมืองอำเภอขุนยวม ประมาณ 7 กิโลเมตร มีเนื้อที่ทั้งหมดประมาณ 130,803 ไร่ หรือ ประมาณ 209.28 ตารางกิโลเมตร สภาพพื้นที่โดยทั่วไป ร้อยละ 90 มีลักษณะเป็นภูเขา มีที่ราบระหว่างหุบเขาเพียงร้อยละ 10 ของพื้นที่ พื้นที่ส่วนใหญ่อยู่ในเขตป่าอนุรักษ์และป่าสงวน คือ ป่าแม่สุรินและป่าแม่ยวมฝั่งซ้าย มีแหล่งน้ำธรรมชาติ ได้แก่ น้ำแม่สุริน น้ำยวมและน้ำยวมน้อย พื้นที่เขตการปกครองมี 6 หมู่บ้าน ได้แก่ บ้านคำสุข บ้านหัวแม่สุริน บ้านปางตอง บ้านใหม่พัฒนา บ้านแม่อูคอหลวง และบ้านแม่อูคอ (องค์การบริหารส่วนตำบลแม่อูคอ, 2565)

บ้านหัวแม่สุริน หมู่ที่ 2 ชื่อเดิม เรียกว่า“เส่อลีคี” ตั้งอยู่ห่างจากอำเภอขุนยวม ประมาณ 30 กิโลเมตร ห่างจากจังหวัดแม่ฮ่องสอน 96 กิโลเมตร มีหย่อมบ้านทั้งหมด 10 หย่อมบ้าน มีประชากรทั้งหมด 765 คน เพศชาย 397 คน เพศหญิง 368 คน ที่ตั้งของหมู่บ้านและที่ทำกินอยู่ในเขตอุทยานแห่งชาติน้ำตกแม่สุรินและเขตป่าสงวนแห่งชาติ ระบบถือครองที่ดินได้รับตกทอดจากพ่อแม่โดยเฉลี่ยพื้นที่ 7 ไร่ต่อครัวเรือน นอกจากการทำนา ทำไร่ ทำสวน มีการทำปศุสัตว์ เลี้ยงวัว ควาย หมู ไก่

บ้านแม่อูคอหลวง หมู่ที่ 5 ชื่อเดิม “คลออูโกล๊ะ” มาจากชื่อของห้วยบ้านแม่อูคอหลวง มี 4 หย่อมบ้าน มีประชากรทั้งหมด 585 คน เพศชาย 317 คน เพศหญิง 268 คน พื้นที่ชุมชนตั้งในเขตป่าต้นน้ำ ชั้น 1 โซน A เป็นแหล่งต้นน้ำสำคัญ“น้ำแม่สุริน” ที่ไหลลงสู่พื้นที่การเกษตรชุมชนบ้านแม่อูคอหลวง พื้นที่ส่วนใหญ่ของบ้านแม่อูคอหลวงเป็นภูเขาสูงในเขตป่าสงวนแห่งชาติ และเขตวนอุทยานทุ่งดอกบัวตอง มีพื้นที่ราบลุ่มเชิงเขาทำนาขั้นบันได การเพาะปลูกส่วนใหญ่เป็นพื้นที่สูงระหว่างหุบเขา การถือครองที่ดินเป็นมรดกตกทอดจากพ่อแม่และบรรพบุรุษ

2.ประชากรและกลุ่มตัวอย่าง

ประชากรในการศึกษา คือ เกษตรกรชาติพันธุ์กะเหรี่ยง ที่อาศัยอยู่ในบ้านหัวแม่สุริน และบ้านแม่อูคอหลวง ดำรงชีวิตด้วยอาชีพเกษตรกรรม คือ การปลูกข้าว และ/หรือมีการทำการเกษตรโดยการปลูกพืชเศรษฐกิจชนิดอื่น และการรับจ้างทั่วไป

กลุ่มตัวอย่างในการศึกษา คือ เกษตรกรชาติพันธุ์กะเหรี่ยงที่อาศัยในพื้นที่ศึกษา 2 หมู่บ้าน เป็นเกษตรกรที่ปลูกข้าวอายุ 18 – 65 ปี เพศชายหรือเพศหญิงอยู่ในพื้นที่ไม่น้อยกว่า 5 ปี และเต็มใจให้ข้อมูล

การเลือกกลุ่มตัวอย่างเพื่อตอบแบบสอบถามการวิจัย ใช้หน่วยการวิเคราะห์ระดับครัวเรือน จำนวนครัวเรือนละ 1 คน ทั้งหมด 126 ครัวเรือน แบ่งเป็นบ้านหัวแม่สุริน จำนวน 76 คน (จากประชากรรวม 247 ครัวเรือน) และบ้านแม่อูคอหลวง จำนวน 50 คน (จากประชากรรวม 158 ครัวเรือน) (กรมการปกครอง, 2564) จำนวนกลุ่มตัวอย่างของการวิจัย คิดเป็นร้อยละ 31.11 ของประชากรรวมทั้งสองหมู่บ้าน

เป็นไปตามหลักการหาขนาดตัวอย่างที่มีประชากรจำนวนหลักร้อยให้ใช้กลุ่มตัวอย่างไม่น้อยกว่าร้อยละ 25 โดยใช้เกณฑ์เลือกกลุ่มตัวอย่างร้อยละ 15 – 30 (ณรงค์ ศรีสวัสดิ์, 2545) การเลือกกลุ่มตัวอย่างใช้วิธีการเลือกแบบบังเอิญ (Accidental Sampling) จนครบตามจำนวนที่ต้องการ

การเลือกกลุ่มตัวอย่างการสัมภาษณ์เชิงลึก คัดเลือกแบบเจาะจง (Purposive Sampling) จำนวน 8 คน

3.การเก็บรวบรวมข้อมูล

1) การเก็บรวบรวมข้อมูลเชิงปริมาณ (Quantitative Research) ด้วยเครื่องมือวิจัย คือ แบบสอบถาม (Survey Questionnaires) “พลวัตวัฒนธรรมข้าวของเกษตรกรชาติพันธุ์ (กะเหรี่ยง) อำเภอขุนยวม จังหวัดแม่ฮ่องสอน” แบบสอบถามแบ่งเป็น 5 ส่วน ดังนี้ ส่วนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม ส่วนที่ 2 พื้นที่ทำการเกษตรและความหลากหลายของพืชอาหารที่ปลูก ส่วนที่ 3 การปลูกข้าวบนพื้นที่สูงของเกษตรกรชาติพันธุ์ ส่วนที่ 4 การทำไร่หมุนเวียน และ ส่วนที่ 5 พลวัตของวัฒนธรรมข้าวและทัศนคติของเกษตรกรชาติพันธุ์ในสถานการณ์ปัจจุบัน

2) การเก็บรวบรวมข้อมูลเชิงคุณภาพ (Qualitative Research) ด้วยเครื่องมือวิจัย คือ แบบสัมภาษณ์เชิงลึก แนวคำถามในการสัมภาษณ์ (Interview Guidelines) แบ่งเป็น 3 ส่วน ดังนี้ ส่วนที่ 1 ข้อมูลทั่วไปของผู้ให้สัมภาษณ์ ส่วนที่ 2 ข้อมูลด้านการปลูกข้าวและสภาพการเปลี่ยนแปลง ส่วนที่ 3 ด้านการสนับสนุนส่งเสริมการปลูกข้าว

3) การเก็บรวบรวมข้อมูลจากเอกสารและงานวิจัยที่เกี่ยวข้อง ทั้งในมิติประวัติศาสตร์ สังคมวัฒนธรรม เศรษฐกิจ การเมือง ของกลุ่มชาติพันธุ์กะเหรี่ยงในพื้นที่ศึกษา และการค้นคว้าข้อมูลบริบทของพื้นที่ตำบลแม่อูคอ อำเภอขุนยวม จังหวัดแม่ฮ่องสอน เพื่อนำข้อมูลจากการค้นคว้าในระดับทุติยภูมิ (Secondary Data) ประกอบการอธิบายผลการศึกษาร่วมกับข้อมูลปฐมภูมิ (Primary Data) ที่ผู้วิจัยดำเนินการสำรวจและการสัมภาษณ์ เพื่อให้มีความชัดเจนครบถ้วนสมบูรณ์มากขึ้น

4) การเก็บรวบรวมข้อมูลจากการสังเกตการณ์แบบมีส่วนร่วมและไม่มีส่วนร่วม อาทิ การสังเกตและการพูดคุยอย่างไม่เป็นทางการกับเกษตรกรและชาวบ้านในพื้นที่ การมีส่วนร่วมในกิจกรรมต่าง ๆ อาทิ พิธีกรรม/ความเชื่อที่สัมพันธ์กับการปลูกข้าว การฟันไร่ การปลูกข้าว การเก็บพืชผักในไร่ข้าว การมัดมือ การประชุมหมู่บ้าน และการนอนค้างในหมู่บ้านช่วงของการลงพื้นที่เก็บข้อมูลวิจัย

4.การวิเคราะห์ข้อมูล

ผู้วิจัยได้วิเคราะห์ข้อมูลเชิงปริมาณ ผ่านโปรแกรมวิเคราะห์และประมวลผลสำเร็จรูป SPSS ใช้สถิติเชิงพรรณนา (Descriptive Statistics) จำนวน ร้อยละค่าเฉลี่ย ประเด็นต่าง ๆ ตามหัวข้อแบบสอบถาม ส่วนการวิเคราะห์เชิงคุณภาพ เป็นการวิเคราะห์เชิงเนื้อหา (Content Analysis) มีแนวคิด/ทฤษฎีเป็นแนวทางวิเคราะห์ จากนั้นนำข้อมูลมาวิเคราะห์ สังเคราะห์ อภิปรายผลและสรุปผลการศึกษา

5.จริยธรรมการวิจัยในมนุษย์

บทความวิจัย เป็นส่วนหนึ่งของงานวิจัย เรื่อง พลวัตวัฒนธรรมข้าวของเกษตรกรชาติพันธุ์ (กะเหรี่ยง) อำเภอขุนยวม จังหวัดแม่ฮ่องสอน ผ่านการรับรองจริยธรรมการวิจัยในมนุษย์ จากมหาวิทยาลัยราชภัฏเชียงใหม่ เลขที่การรับรอง IRBCMRU 2022 /121 .15.06 รับรองตั้งแต่วันที่ 21 กรกฎาคม พ.ศ.2565 – 20 กรกฎาคม พ.ศ.2566

ผลการวิจัย

การนำเสนอผลการศึกษาเพื่อทำความเข้าใจวัฒนธรรมและระบบการผลิตข้าวไร่ของกะเหรี่ยงดอยแม่อูคอ แบ่งการนำเสนอ 2 ประเด็น ประเด็นที่ 1.วัฒนธรรมและระบบการผลิตข้าวไร่ของกะเหรี่ยงดอยแม่อูคอ: บ้านหัวแม่สุรินและบ้านแม่อูคอหลวง และประเด็นที่ 2. สัมพันธภาพในวิถีการผลิตข้าวดอยแม่อูคอ: ไร่-ป่า-คน-ผี/จิตวิญญาณ

ประเด็นที่ 1.ระบบการผลิตข้าวไร่ของกะเหรี่ยงดอยแม่อูคอ: บ้านหัวแม่สุริน - บ้านแม่อูคอหลวง

ตารางที่ 1 แสดงข้อมูลการปลูกข้าวของเกษตรกรกะเหรี่ยงบนดอยแม่อูคอ

ข้อมูลการปลูกข้าว	จำนวน	ร้อยละ
ปลูกข้าวไร่	62	49.21
ปลูกข้าวนา	45	35.71
ผสมผสาน	19	15.08
รวม	**126**	**100.00**

บ้านหัวแม่สุรินและบ้านแม่อูคอหลวง เป็นชุมชนกะเหรี่ยงที่ยังคงสืบทอดวิถีการผลิตข้าวเพื่อเป็นพืชอาหารหลักในการบริโภคของครัวเรือน จากข้อมูลการสำรวจ พบว่า มีตัวแทนครัวเรือนที่เป็นกลุ่มตัวอย่าง 81 คน ระบุว่ายังมีวิถีชีวิตที่สัมพันธ์กับการปลูกข้าวไร่ และกลุ่มตัวอย่างที่ปลูกข้าวนา 64 คน คนกะเหรี่ยงดอยแม่อูคอไม่ได้มีเป้าหมายการผลิตข้าวเพื่อขาย จากผลการสำรวจแบบสอบถามงานวิจัย พบว่า ไม่มีเกษตรกรกะเหรี่ยงรายใดที่มีความคิดจะปลูกข้าวเพื่อเป็นแหล่งที่มาของรายได้ กลุ่มตัวอย่างทั้งหมด จำนวน 126 คน มีความคิดเห็นตรงกันว่า หากปีใดผลผลิตข้าวที่ปลูกได้มากและเหลือ จะแบ่งปันข้าวให้กับคนที่รู้จัก หรือแบ่งขายให้กับคนที่ไม่ได้ปลูกข้าว หรือบางปีที่ผลผลิตข้าวบางครอบครัวไม่พอบริโภค เช่น คนม้งจากหมู่บ้านอื่นบนดอยแม่อูคอที่ไม่ได้ปลูกข้าวก็จะมาขอแบ่งซื้อ

“คนกะเหรี่ยงที่นี่ถูกสอนให้ปลูกข้าวกิน เราจะได้ยินตำนานเรื่องเล่าจากผู้เฒ่าผู้แก่ว่า การมีข้าวกินสำคัญอย่างไร ตั้งแต่เด็กก็ต้องช่วยทำไร่ ทำนา ไม่มีครอบครัวไหนซื้อข้าวกิน ใครไม่มีนาก็ต้องทำไร่ข้าวหรือมีการบุกเบิกที่นาเพิ่มขึ้น ช่วยทำเหมืองฝายทดน้ำ เพื่อให้มีข้าวพอกิน ข้าวเป็นวิถีชีวิตคนกะเหรี่ยง”

(ชิโพะเดส่า, สัมภาษณ์, 2566, กุมภาพันธ์ 5)

“ผลผลิตข้าวปัจจุบันดีกว่าเมื่อก่อนมาก คนรุ่นพ่อแม่เคยเล่าว่าทำไร่ทำนาสมัยก่อนลำบากกว่านี้ ผืนดินไม่ได้อุดมสมบูรณ์เท่าตอนนี้ มีหญ้าคาเป็นเขาหัวโล้น ข้าวที่ปลูกได้จึงไม่ค่อยพอกิน แต่เดี๋ยวนี้ป่าไม้มีความอุดมสมบูรณ์ ไร่หมุนเวียนได้ผลดี ยิ่งถ้าไร่ปล่อยทิ้งไว้ 7 ปี ข้าวจะโตสวย ไม่ต้องใช้ปุ๋ย ไม่ใช้สารเคมี เรามีข้าวเพียงพอต่อการบริโภค ข้าวยังใช้เลี้ยงหมูเลี้ยงไก่ด้วย บางปีมีแบ่งขายบ้าง อย่างคนที่มีนาข้าวเยอะก็จะขายข้าวได้เกือบทุกปี ขายเป็นข้าวเปลือก ราคากิโลกรัมละ 10-12 บาท”

(หลู่เคปอส่า, สัมภาษณ์, 2566, กุมภาพันธ์ 5)

ข้อมูลรายได้ของกลุ่มตัวอย่างที่ศึกษา พบว่า ส่วนใหญ่มีรายได้ต่อปี (พ.ศ.2565-2566) อยู่ในช่วง 10,000 ถึง 50,000 บาท จำนวน 66 คน คิดเป็นร้อยละ 52.38 แหล่งที่มาของรายได้ของชุมชนกะเหรี่ยงทั้งสองหมู่บ้าน มาจากการปลูกพืชเศรษฐกิจขาย เช่น ถั่วแดง กรณีบ้านหัวแม่สุริน และ ข้าวโพดเลี้ยงสัตว์ กรณีบ้านแม่อูคอหลวง นอกจากนี้มีรายได้จากพืชยืนต้นในป่าในระบบวนเกษตร เช่น กาแฟ อโวคาโด และพลับ โดยเฉพาะกาแฟ เป็นพืชยืนต้นที่สร้างรายได้ให้กับบ้านแม่อูคอหลวง รายได้จากการเลี้ยงสัตว์ เช่น วัว ควาย หมู ไก่ การขายพืช - สัตว์จากป่า การขายผลผลิตในไร่หมุนเวียน เช่น พริก ฟักทอง การทำงานรับจ้าง เช่น รับจ้างหน่วยงานป่าไม้ ของอุทยานแห่งชาติ รับจ้างในพื้นที่เกษตรกรรมของพี่น้องม้งใกล้เคียง และมีรายได้จากการค้าขายหรือกิจกรรมที่เกี่ยวข้องฤดูกาลท่องเที่ยวทุ่งดอกบัวตอง อนึ่ง ชาวบ้านของบ้านหัวแม่สุรินบางครอบครัวจะมีรายได้จากกิจการที่พักโฮมสเตย์

ตารางที่ 2 แสดงข้อมูลการประกอบอาชีพของกลุ่มตัวอย่าง เกษตรกรกะเหรี่ยงดอยแม่อูคอ

ข้อมูลทั่วไป	จำนวน	ร้อยละ
ปลูกข้าวเพียงอย่างเดียว	2	1.59
ปลูกข้าวร่วมกับการปลูกพืชเศรษฐกิจชนิดอื่น	71	56.35
ปลูกข้าวร่วมกับการปลูกพืชเศรษฐกิจและรับจ้างทั่วไป	49	38.89
ปลูกข้าวร่วมกับการปลูกพืชเศรษฐกิจและเป็นผู้ประกอบการ	3	2.38
ปลูกข้าวร่วมกับอาชีพข้าราชการ	1	0.79
รวม	**126**	**100.00**

สถานการณ์ของการรุกเข้ามาของพืชเศรษฐกิจบนดอยแม่อูคอ ประมาณ 10 ปี ที่ผ่านมา โดยเริ่มจากวิถีการผลิตของกลุ่มชาติพันธุ์ม้งก่อนที่มีการปลูกพืชเชิงเดี่ยวเพื่อขายเป็นรายได้ เช่น ข้าวโพดเลี้ยงสัตว์ กะหล่ำปลี มะเขือเทศ ต่อมาเริ่มมีเข้ามาทดลองปลูกที่บ้านแม่อูคอหลวงและบ้านหัวแม่สุริน จากการเข้ามาเผยแพร่แนะนำโดยพ่อค้าคนกลางและนายทุนนอกชุมชน ซึ่งเหตุผลของการปลูกพืชเศรษฐกิจเนื่องมาจากความต้องการเงินสด และการมีพื้นที่ว่างปล่อยทิ้งไว้เพื่อรอการหมุนเวียน

“เริ่มปลูกถั่วแดงเพราะมีพ่อค้าคนกลางเข้ามาถามหาซื้อถั่วแดงในหมู่บ้าน ให้ราคากิโลกรัมละ 25-30 บาท เห็นว่าราคาดี เลยอยากทดลองปลูกบ้าง แรก ๆ ปลูกแซมในไร่ข้าว ตอนนี้ก็แบ่งพื้นที่จากการปลูกข้าวมาปลูกถั่วแดงด้วย ช่วงเวลาปลูกใกล้เคียงกัน ลงถั่วก่อนแล้วค่อยปลูกข้าว”

(บือเคเข่, สัมภาษณ์, 2566, กุมภาพันธ์ 5)

“บ้านหัวแม่สุริน ปลูกข้าวโพดได้แค่บางพื้นที่ของหย่อมบ้าน ดินไม่เหมาะและป่ามีความชื้นสูง ปลูกไม่ค่อยได้ผล เลือกปลูกถั่วแดงมากกว่า แต่ที่แม่อูคอหลวงปลูกได้ดีกว่า ตอนนี้มีการปลูกกันเยอะขึ้น เขาก็รู้กันนะว่าทำลายดินมาก ถ้าจะกลับมาปลูกข้าวก็ต้องฟื้นสภาพนานหลายปี ถ้าดินเสื่อมปลูกพืชอะไรไม่ได้จะมีปัญหาบุกเบิกพื้นที่ป่าเหมือนพื้นที่อื่น ปีที่ผ่านมาราคาปุ๋ยแพง ต้องจ้างแรงงานพ่นยาฆ่าหญ้า, ยาฆ่าแมลง, ใส่ปุ๋ย วันละ 500 บาท เพราะเสี่ยงต่อสุขภาพ หลายครอบครัวที่ปลูกมีทั้งที่ได้และมีหนี้สิน”

(มูส่าทอ, สัมภาษณ์, 2566 กุมภาพันธ์, 4)

แม้การเข้ามาของพืชเศรษฐกิจในชุมชนพื้นที่ศึกษาทั้ง 2 พื้นที่ และมีกลุ่มตัวอย่างบางส่วนได้เลือกปรับตัวด้วยการลดพื้นที่ปลูกข้าวไร่ และหารายได้เสริมด้วยการปลูกพืชเศรษฐกิจ แต่กลุ่มตัวอย่างทั้งสองชุมชนยังคงรักษาการปลูกข้าวไร่ของครัวเรือนตามวิถีการผลิตไร่ข้าวหมุนเวียน และไม่มีความคิดที่จะล้มเลิกการปลูกข้าวไร่แม้แต่รายเดียว หากแต่ว่า เกษตรกรกลุ่มตัวอย่าง จำนวน 69 คน คิดเป็นร้อยละ 54.76 มีความคิดที่จะปลูกข้าวเพื่อการบริโภคเหมือนเดิม แต่อยากปลูกพืชเศรษฐกิจอื่นควบคู่กับการปลูกข้าว และการหารายได้เพิ่มจากทางเลือกอื่น ขณะที่เกษตรกรกลุ่มตัวอย่าง จำนวน 57 คน คิดเป็นร้อยละ 45.24 มีแนวโน้มที่จะลดขนาดพื้นที่ในการปลูกข้าวแค่เพียงพอบริโภคและเพิ่มพื้นที่ปลูกพืชเศรษฐกิจ และการหารายได้เพิ่มจากทางเลือกอื่น

การจัดการไร่และการปลูกข้าว

ฤดูกาลปลูกข้าวไร่จะเริ่มต้นราวเดือนกุมภาพันธ์ หลังจากประเพณีปีใหม่และการมัดมือของคนกะเหรี่ยงในชุมชน การเตรียมการเพาะปลูกเริ่มจากการฟันไร่เพื่อเตรียมพื้นที่ และปล่อยทิ้งซากกิ่งต้นใบที่ตัดฟันให้แห้ง จากนั้นจะมีการเผาไร่โดยมีการทำแนวกันไฟ เพื่อไม่ให้ไฟลุกลามจากไร่เข้าไปในพื้นที่ป่า ขั้นตอนต่อมา คือ การปลูกข้าว คนกะเหรี่ยงเรียกว่า “ปักไร่, หว่านข้าวไร่, หยอดข้าวไร่” วิธีการคือ การใช้เสียมไม้ไผ่แทงลงไปในดินเพื่อให้เกิดหลุม แล้วมีการหยอดเมล็ดข้าวและพืชผักลงไป ไม่มีการใช้จอบขุดพลิกหน้าดิน เพื่อรักษาหน้าดินคงตามธรรมชาติ เมื่อเข้าสู่กลางฤดูฝนจะเป็นขั้นตอนของการดายหญ้าในไร่เพื่อไม่ให้ต้นหญ้าหรือวัชพืชอื่นขึ้นบดบังต้นข้าวและพืชผักที่กำลังงอก

ตารางที่ 3 ตารางแสดงปฏิทินการปลูกข้าวไร่ของเกษตรกรกะเหรี่ยงดอยแม่อูคอ

เดือน	ก.พ.	มี.ค-เม.ย.	พ.ค.-มิ.ย	ก.ค-ก.ย.	ต.ค.	พ.ย.
กิจกรรมการปลูกข้าวไร่	ฟันไร่ ตัดต้นไม้ เตรียมพื้นที่	ทำแนวกันไฟ เผาไร่	หยอดเมล็ดข้าว, เมล็ดพืชผักต่างๆ	ถอน/ดายหญ้า	ข้าวตั้งท้อง	เก็บเกี่ยว ตี/ฟาดข้าว

การจัดการเมล็ดพันธุ์

ชุมชนกะเหรี่ยงดอยแม่อูคอมีการเก็บรักษาเมล็ดพันธุ์ข้าวพื้นเมืองมากกว่า 10 ชนิด อาทิ บือหมื่อโพ บือกิโพ บือซู บือโป๊ะโละ บือเนอมู บือบอ บือกิ บือพะโด่ะ บือปิอีปอซี บือกะซอแม บือพะทอ บือลอแป๊ะ เป็นต้น คนกะเหรี่ยงเรียกข้าว ว่า“บือ” การเลือกปลูกข้าวสายพันธุ์ไหนมาจากเหตุผลว่าพันธุ์ข้าวชนิดนั้นจะให้ปริมาณผลผลิตต่อถังมากกว่า เช่น เชื้อข้าว 1 ถัง จะได้ผลผลิตอยู่ที่ 15-20 ถัง หรือพันธุ์ข้าวสามารถต้านทานโรคและแมลงได้ดี หรือ ความชอบรสชาติข้าวแต่ละครอบครัว ข้าวบางสายพันธุ์ที่ปลูกในไร่ก็ไม่สามารถปลูกในนาได้ ผลสำรวจพบว่า ข้าวที่ปลูกมากบนดอยแม่อูคอ คือ บือหมื่อโพมและบือกิโพ

ตารางที่ 4 แสดงข้อมูลพันธุ์ข้าวที่ปลูกบนดอยแม่อูคอ

ข้อมูลการปลูกข้าว	จำนวน	ร้อยละ
บือหมื่อโพ	29	35.80
บือซู	16	19.75
บือเนอมู	4	4.94
บอบือ	6	7.41
บือกิโพ	29	35.80

ข้อมูลการปลูกข้าว	จำนวน	ร้อยละ
บือกิ	2	2.47
บือพะโด่ะ	2	2.47
บือปีอีปอซี	9	11.11
บือกะซอแม	1	1.23
บือโป๊ะโละ	14	17.28
บือพะทอ	1	1.23
เขี้ยวงู	2	2.47

ความหลากหลายทางชีวภาพในระบบนิเวศดอยแม่อูคอ พบว่า มีเมล็ดพันธุ์พืชผักกว่า 50 ชนิด ที่มีการเก็บรักษา การปลูกและให้ผลผลิตตลอดทั้งปี พืชผักแต่ละชนิดจะเก็บกินได้ในฤดูกาลที่ต่างกัน คนกะเหรี่ยงมีแนวคิดเรื่องการแบ่งปัน ฉะนั้นจึงให้เพื่อนบ้านในชุมชนเข้าไปเก็บผลผลิตพืชชนิดอื่นในไร่ข้าวของครอบครัวตนเองได้ และยังมีแลกเปลี่ยนเมล็ดพันธุ์ข้าวและพืชผักกับเพื่อนบ้านและคนชุมชนใกล้เคียง

การจัดการแรงงาน

วิถีการผลิตข้าวบนพื้นที่สูง มีการใช้แรงงานทุกขั้นตอนของระบบการผลิต ตั้งแต่ การตัด ฟัน โค่นต้นไม้ การทำแนวกันไฟ การเผาไร่ การหยอดข้าว การถอนหญ้า การเกี่ยวข้าว การตีข้าว ไม่สามารถทำการผลิตได้เองทั้งหมดภายในครัวเรือน โดยเฉพาะการปลูกข้าวและการเก็บเกี่ยวข้าวที่ต้องอาศัยแรงงานจำนวนมาก เพราะเร่งทำเวลา หรือ การทำแนวกันไฟที่ทุกครัวเรือนจะต้องส่งตัวแทนมาช่วยอย่างน้อยบ้านละ 1 – 2 คน ชุมชนกะเหรี่ยงแม่อูคอ มีการจัดการแรงงานโดยพึ่งพาแรงงานจากเครือญาติพี่น้องและเพื่อนบ้านในชุมชนเป็นหลัก เป็นการจัดการแรงงานที่เรียกกว่า “การเอามือเอาวัน”ลักษณะการแลกเปลี่ยนต่างตอบแทน หากใครมาช่วยในไร่จำนวนกี่วันก็จะมีการใช้แรงคืนในจำนวนวันที่เท่ากัน จากผลสำรวจแบบสอบถามกลุ่มตัวอย่าง จำนวน 126 คน พบว่า 107 คน หรือ ร้อยละ 84.92 ที่อาศัยแรงงานจากเพื่อนบ้านในการผลิตข้าว การจ้างแรงงานแทบจะไม่ปรากฏในวิถีการผลิตข้าวไร่ของดอยแม่อูคอ แต่มีการจ้างแรงงานในพื้นที่ไร่ที่มีการปลูกพืชเศรษฐกิจ เช่น ข้าวโพด

ประเด็นที่ 2 สัมพันธภาพ ไร่-ป่า-คน-ผี/จิตวิญญาณ ในวิถีการผลิตดอยแม่อูคอ

โลกทัศน์และระบบคิดคนกะเหรี่ยงมีความเชื่อเกี่ยวกับผู้สร้าง“เก่อจ่า” ฐานะของสิ่งศักดิ์สิทธิ์ที่คอยพิทักษ์รักษาสรรพสิ่งต่าง ๆ ความอุดมสมบูรณ์ของทรัพยากรธรรมชาติและพืชอาหารในระบบนิเวศของชุมชน หรือ การมีผลผลิตที่ดีในรอบปีของการเพาะปลูก การมีที่อยู่อาศัยและมีที่ทำกินอุดมสมบูรณ์ที่สืบทอดจากบรรพบุรุษ ล้วนสัมพันธ์กับผู้สร้างที่เป็นจิตวิญญาณคนกะเหรี่ยง ซึ่งคือ ลูกหลานสัมพันธภาพของคนกะเหรี่ยงกับธรรมชาติ ดิน น้ำ ป่า คือ การใช้ประโยชน์อย่างเคารพ มีศีลธรรมพอเพียง ไม่ละโมบ

การจัดการทรัพยากร

ชุมชนกะเหรี่ยงแม่อูคอ มีความอุดมสมบูรณ์ของอาหารทั้งพืชป่าและสัตว์ป่าจากป่าชุมชน การมีอาหารจากป่ากินไปตลอด คือ การมีระบบการจัดการใช้ประโยชน์จากป่าร่วมกัน และการอนุรักษ์เพื่อความยั่งยืนส่งต่อไปถึงลูกหลาน ดังคำสอนของคนกะเหรี่ยงที่ว่า “เอาะก่อ เก่อตอก่อ” กินจากป่าต้องรักษาแผ่นดิน, “เอาะที เก่อตอที” กินน้ำต้องรักษาน้ำ มีการกำหนดกฎกติการ่วมกันและมีการตั้งองค์กร

หรือคณะกรรมการในชุมชน เพื่อช่วยกันดูแล เป็นต้นว่า การกำหนดพื้นที่ป่าแบบต่าง ๆ เช่น ป่าอนุรักษ์ ป่าใช้สอย ห้ามตัดต้นไม้โดยไม่ได้รับอนุญาต ห้ามล่าสัตว์ ห้ามจุดไฟเผาป่า แต่อนุญาตให้คนในชุมชนหาอาหารจากป่าใช้สอยเพื่อดำรงชีวิต หาของป่าเพื่อขายเป็นรายได้ ด้วยแนวคิดของส่วนรวมใช้ประโยชน์ร่วมกัน

พิธีกรรมและความเชื่อ

ความเชื่อและพิธีกรรมที่สัมพันธ์เกี่ยวข้องกับวิถีชีวิตและระบบการผลิตข้าวพื้นที่สูงของคนกะเหรี่ยงดอยแม่อูคอ ได้แก่ พิธีกินข้าวใหม่ พิธีขึ้นปีใหม่ พิธีมัดมือ พิธีกินเชื้อข้าว พิธีเลี้ยงไฟ พิธีเลี้ยงไร่ และ พิธีเรียก – ส่ง (นก) ขวัญข้าว ที่มาจากตำนานเรื่องเล่าของคนกะเหรี่ยงจากบรรพบุรุษ “นกโถ่บีข่า” หรือ นกขวัญข้าว เป็นดั่งสัญลักษณ์ของเทพเจ้าแห่งความอุดมสมบูรณ์ ก่อนที่คนกะเหรี่ยงจะเริ่มทำการผลิต จะทำพิธีเรียก นกโถ่บีข่า ให้มาอยู่ เพื่อปกปักรักษาดูแลต้นข้าวจนกว่าจะเสร็จสิ้นฤดูกาลทำไร่ทำนา และหลังจากที่เก็บเกี่ยวผลผลิตเสร็จ ใส่ข้าวใหม่ในยุ้งฉางเรียบร้อยแล้ว ก็จะทำพิธีเรียกนกให้มากินข้าว จากนั้นก็จะส่งนกขวัญข้าวกลับไปบนฟ้า และจะทำเฉกเช่นนี้ทุกปี

เมื่อปลูกข้าว ประมาณ 2 เดือน ต้นข้าวจะงอกงามสีเขียวเต็มผืนไร่ จะมีพิธีเลี้ยงผีไร่ เพราะเชื่อว่าการที่ไร่ข้าวเจริญงอกงามเป็นผลจากการได้รับการคุ้มครองดูแลจากผีไร่ ดังนั้นเพื่อให้ผีไร่ดูแลการผลิตไปจนกว่าจะเก็บเกี่ยวต้องทำพิธีเลี้ยงผีไร่ ซึ่งจะมีพิธีย่อยอีกหลายพิธีแยกตามวัตถุประสงค์ ได้แก่ พิธีเลี้ยงไร่ขอพร พิธีเลี้ยงไร่ปัดรังควาญ (กรณีที่มีศัตรูธรรมชาติเข้ามารบกวนไร่ข้าว เช่น มีนกแมลง หรือสัตว์ป่ารบกวน) พิธีเลี้ยงขวัญข้าว ทั้งหมดนี้ใช้เครื่องเซ่นไหว้ คือ เหล้า ไก่ และข้าว การทำพิธีจะเหมือนกัน ต่างกันที่คำบอกกล่าวของแต่ละพิธี การเลี้ยงผีไร่ หรือผีต่าง ๆ เป็นความสัมพันธ์ของคนกับธรรมชาติ แสดงถึงวิธีคิดที่พึ่งพิงกับธรรมชาติ มีผู้ปกปักรักษาธรรมชาติ ซึ่งกำกับจารีตปฏิบัติของคนในชุมชนให้ต้องแสดงความเคารพและสามัคคี

สรุปและอภิปรายผล

ชุมชนกะเหรี่ยงดอยแม่อูคอ มีการรักษาและสืบทอดวิถีการผลิตข้าวไร่อยู่ แม้จะพบว่า การทำไร่หมุนเวียนมีการปรับตัวตามเงื่อนไขข้อจำกัดต่างๆ เช่น มีการจำกัดรอบการหมุนเวียนที่สั้นลง 3 - 5 ปี จากแปลงใหญ่ที่มีการหมุนเวียนรวมกันเป็นแปลงกระจาย จากเดิมที่ชุมชนมีส่วนร่วมตกลงใช้พื้นที่ปลูกข้าวไร่หมุนเวียน ทำให้การเปลี่ยนพื้นที่ในไร่ข้าวเป็นพื้นที่สวนเพื่อปลูกพืชอย่างอื่นเป็นการจัดการที่อิสระของแต่ละครัวเรือนมากขึ้น มีการปลูกพืชเศรษฐกิจชนิดอื่น ๆ เช่น ข้าวโพด ถั่วแดง เพื่อเป็นรายได้สำหรับใช้จ่ายในครอบครัวและความจำเป็นในเงื่อนไขชีวิตแบบใหม่ เช่น การส่งลูกเรียนหนังสือ การซื้อสิ่งของจำเป็นเพื่ออำนวยความสะดวก เช่น รถยนต์ เครื่องใช้ไฟฟ้า เห็นได้ว่ามีการจัดการความสัมพันธ์ระหว่างคนกะเหรี่ยงกับการใช้พื้นที่ คือ ยังคงมีการใช้พื้นที่เพื่อปลูกข้าวให้เพียงพอต่อการบริโภค โดยยึดจารีตปฏิบัติดั้งเดิม เพื่อสืบทอดภูมิปัญญาและรักษาระบบการผลิตแบบศีลธรรมในไร่ข้าวไว้ และแบ่งพื้นที่ไร่เพื่อการปลูกพืชชนิดอื่นในระบบเศรษฐกิจที่มีเหตุผลแบบเงินตรา นอกจากนี้ยังมีการหารายได้อื่น เช่น การทำงานรับจ้าง งานวิจัยของ ยศ สันตสมบัติ (2546) อธิบายว่า การเป็นพลวัต การเลือกปรับตัวอย่างยืดหยุ่นของชาวนา คือ ไม่ได้เลือกปลูกข้าวหรือพืชเศรษฐกิจอย่างเดียว แต่ประกอบอาชีพอื่น ๆ เพื่อโอกาสทางรายได้

ระบบการผลิตข้าวของคนกะเหรี่ยงบ้านหัวแม่สุรินและบ้านแม่อูคอหลวง มีพื้นฐานจากการมีทุนทางสังคมและวัฒนธรรม และความสามารถของชุมชนในจัดการทุนประเภทต่าง ๆ ให้สอดคล้องเหมาะสมกับระบบนิเวศบนพื้นที่สูง ทำให้วัฒนธรรมและระบบการผลิตข้าวยังดำรงอยู่ได้ กล่าวคือ การมีทุนวัฒนธรรมด้านภูมิปัญญาท้องถิ่นเกี่ยวกับระบบการผลิตและการจัดการทรัพยากร ชุมชนกะเหรี่ยงบนดอยแม่อูคอ มีการรักษาและสืบทอดวิถีการผลิตข้าวไร่อยู่ แม้พบว่า บางครอบครัวจำกัดรอบการหมุนเวียนที่น้อยลง ข้อจำกัดที่ไม่สามารถบุกเบิกที่ดินจากป่าเพิ่มได้อีกต่อไปแล้ว ข้อกังวลที่ว่า หากรอบหมุนเวียนที่ยาว และทิ้งให้ไร่เหล่าคืนความอุดมสมบูรณ์หลายปี จะกลายเป็นพื้นที่ป่าชั้นสองตามความคิดของหน่วยงานป่าไม้ และเท่ากับว่าคือ การเป็นผู้บุกรุกเปิดพื้นที่ทำกินในป่าใหม่ คนกะเหรี่ยงดอยแม่อูคอต้องเลือกปรับตัวด้วยการลดพื้นที่หมุนเวียนให้น้อยลง แม้รู้ว่าความอุดมสมบูรณ์ของพื้นที่ไร่และความหลากหลายของพืชผัก ขึ้นกับรอบหมุนเวียนด้วยเช่นกัน นอกจากนี้การเข้ามาของโครงการปลูกป่าสร้างรายได้ที่ชาวบ้านได้เข้าร่วมโครงการ ก็ต้องจัดการที่ดินให้เป็นพื้นที่ปลูกไม้ผลหรือไม้ยืนต้นเพิ่มขึ้นด้วย แม้ว่ายังไม่ได้เกิดผลผลิตเชิงรายได้ที่ชัดเจน

การได้รับการส่งเสริมให้ปลูกไม้ยืนต้นในระบบวนเกษตรที่ไม่ทำลายสภาพผืนดิน และเหมาะสมกับระบบนิเวศป่าบนดอยแม่อูคอ เช่น กาแฟ ที่มีหน่วยงานเอกชน/มูลนิธิ เข้ามาสนับสนุน จนปัจจุบันสามารถให้ผลผลิตและเป็นทางเลือกสร้างรายได้ให้คนในชุมชน โดยเฉพาะบ้านแม่อูคอหลวง มีการส่งเสริมวิสาหกิจกาแฟแม่อูคอหลวง ความต้องการเมล็ดกาแฟที่เป็นอินทรีย์ในระบบนิเวศที่ไม่ใช้สารเคมี ทำให้กาแฟมีราคาสูง นอกจากนี้ระบบนิเวศของไร่ข้าวในป่าบ้านหัวแม่สุริน ยังมีพืชสมุนไพรที่มีลักษณะเฉพาะ คือ ตะไคร้ภูเขา ที่เจริญเติบโตในระบบนิเวศป่าชื้น เดิมใช้บริโภคเป็นเครื่องเทศของมื้ออาหารกะเหรี่ยง แต่ปัจจุบันมีมูลค่าเพิ่มจากการแปรรูปเป็นน้ำมันหอมระเหย หรือผลิตภัณฑ์อื่น ๆ เพื่อสร้างรายได้เพิ่มให้ชุมชนบ้านหัวแม่สุรินได้ มีหน่วยงานในจังหวัดเข้าไปสนับสนุน และมีการส่งเสริมให้รวมกลุ่มเป็นวิสาหกิจ การมีทางเลือกหรือเห็นโอกาสของรายได้ที่เพิ่มจากพืชเฉพาะในระบบนิเวศที่สะอาด ไม่มีสารเคมี และมีความอุดมสมบูรณ์แบบป่าในไร่ข้าวหมุนเวียน

ทุนสังคมจากความสัมพันธ์ของความเป็นเครือญาติพี่น้องและเพื่อนบ้านในชุมชน ทำให้มีแรงงานเพียงพอต่อการผลิตข้าวโดยไม่ต้องจ้าง ทั้งนี้การผลิตข้าวเป็นงานที่ยากลำบากและทำต่อเนื่องตลอดทั้งปี หากไม่สามารถจัดการแรงงานหรือต้องจ้างแรงงาน คือ ความไม่คุ้มค่า เพราะข้าวไม่ได้ผลิตเพื่อขาย และที่สำคัญการจ้างงานอาจไม่ได้หาง่ายในพื้นที่สูงและห่างไกล ความผูกพันจากความเป็นเครือญาติพี่น้อง ความมีมิตรไมตรีที่ดีต่อกัน ความไว้วางใจต่อกันได้ว่าจะช่วยเหลือกัน เป็นกลไกสำคัญของทุนสังคมที่ทำให้มีหลักประกันด้านการมีแรงงานที่เพียงพอต่อการปลูกข้าวแต่ละปี มีการแบ่งปันเมล็ดพันธุ์ข้าว พืชและผัก มีการอนุญาตให้เพื่อนบ้านเข้าไปเก็บพืชผลในไร่หมุนเวียนได้ นอกจากทุนสังคมภายในชุมชนแล้ว ทุนสังคมจากเครือข่ายภายนอกที่ได้หนุนเสริมผ่านการเรียนรู้จากการทำงานวิจัยท้องถิ่น โดยการมีส่วนร่วมเป็นนักวิจัยในพื้นที่ชุมชนตนเอง อาทิ โครงการศึกษาและฟื้นฟูเพื่อจัดการอาหารแบบพอเพียงตามวิถีปากาเกอญอ บ้านแม่อูคอหลวง ในปี พ.ศ. 2556 โครงการคนรุ่นใหม่กับการสร้างเศรษฐกิจเชิงสร้างสรรค์ผลผลิตจากป่าชุมชน อ.ขุนยวม จ.แม่ฮ่องสอน ในปี พ.ศ. 2563 เป็นต้น ที่ได้หนุนเสริมให้ชุมชนกะเหรี่ยงแม่อูคอตระหนักถึงการสร้างความมั่นคงทางเศรษฐกิจในชุมชน

ทุนเศรษฐกิจ คือ การมีสิทธิ์ในการใช้ที่ดินเพื่อการเพาะปลูก ก่อนหน้านี้กะเหรี่ยงดอยแม่อูคอมีปัญหากับหน่วยงานรัฐโดยเฉพาะการบุกรุกพื้นที่ป่า จนกระทั่งมีการร่วมกันเรียกร้องสิทธิการทำกิน จนทำให้มีที่ดินทำกินจากความชอบธรรมในการอ้างสิทธิ์ทำไร่ข้าวหมุนเวียนตามจารีตประเพณี การมี

ความมั่นคงด้านอาหารจากผลผลิตข้าวและพืชผักอาหารที่ปลูกในไร่ข้าวหมุนเวียน โดยไม่ต้องซื้อและยังสามารถเปลี่ยนเป็นเงินสดได้ เช่น พริก ฟักทอง หรือการขายข้าวที่เหลือจากบริโภค วิถีการผลิตข้าวไร่ยังเป็นจารีตที่เป็นปฏิบัติการที่มีความหมาย เป็นทุนสัญลักษณ์ที่แสดงภาพลักษณ์คนกะเหรี่ยงดอยแม่อูคอที่ใช้ชีวิตอยู่ร่วมกับป่าอย่างยั่งยืนและชอบธรรม พออยู่พอกิน ไม่ละโมบ ไม่บุกรุกพื้นที่ป่าปลูกพืชเศรษฐกิจ วิถีการผลิตข้าวไร่ของคนกะเหรี่ยงดอยแม่อูคอยังเป็นปฏิบัติการที่มีความหมายและความสำคัญดังนี้

1.ความมั่นคงด้านอาหาร

การปลูกข้าวเป็นหลักประกันความมั่นคงของชีวิตที่พึ่งตนเองได้ คือ การมีกินตลอดทั้งปี ขณะที่วิธีการปลูกข้าวไร่พร้อมกับหว่านเมล็ดพันธุ์พืชผักต่าง ๆ ในไร่ข้าว ทำให้มีพืชอาหารที่มีความหลากหลายและเป็นความยั่งยืนทางชีวภาพ มีการเก็บรักษาเมล็ดพันธุ์พืชพื้นเมือง ระบบนิเวศไร่ข้าวมีความอุดมบูรณ์จากแร่ธาตุในดินจากการหมุนเวียน ไม่มีการใช้สารเคมีเหมือนการปลูกพืชเศรษฐกิจ มีการใช้แรงงานของคนในชุมชน ไร่ข้าวของคนกะเหรี่ยง คือ ทุนทางเศรษฐกิจรูปแบบหนึ่งที่ไม่ใช่ความหมายแบบต้นทุนที่เป็นตัวเงิน และวัดมูลค่าจากการแลกเปลี่ยนซื้อขายเท่านั้น ทว่าคือ ความมั่นคงทางเศรษฐกิจที่ยั่งยืนกว่าการมีกิน ไม่ต้องซื้อ และแบ่งปันได้ อาทิเช่น การศึกษาของ พนา ชอบขุนเขา และคณะ (2556); กฤษฎา บุญชัย , พนา ก๊วยเจริญ, และคณะ (2557) เป็นต้น การเกิดสถานการณ์โควิด 19 ชุมชนกะเหรี่ยงดอยแม่อูคอไม่ได้รับผลกระทบจากการขาดแคลนอาหาร หรือกรณีบ้านแม่อูคอหลวงที่ไม่ได้อยู่บนเส้นทางคมนาคมหรือถนนเส้นหลักผ่าน มีพิธีเกราะหยี่ ปิดหมู่บ้านเพื่อป้องกันสิ่งชั่วร้ายเข้ามา ก็มีข้าวและพืชอาหารบริโภค

2.ความสัมพันธ์ทางสังคมและธรรมชาติ

ไร่ข้าว คือ วิถีชีวิต และวัฒนธรรมที่สืบทอดผ่านปฏิบัติการทางวัฒนธรรม การให้ความหมายว่าสรรพสิ่งนั้นมีจิตวิญญาณ การสร้างพื้นที่ความเชื่อต่อสิ่งศักดิ์สิทธิ์ พิธีกรรมที่เกี่ยวข้องสัมพันธ์กับระบบการผลิต สะท้อนความผูกพันระหว่างคนกะเหรี่ยงกับไร่ข้าว แม้ปัจจุบันลูกหลานคนกะเหรี่ยงรุ่นใหม่ จะมีความเข้าใจเกี่ยวกับพิธีกรรมไม่ลึกซึ้งเท่ากับบรรพบุรุษ ทว่ายังมีการปฏิบัติสืบต่อตามกัน ชุมชนกะเหรี่ยงทั้งสองบ้าน มีผู้นำตามธรรมชาติ เรียกว่า “ฮี่โข่” หรือ ผู้ที่สืบทอดจากบรรพบุรุษที่ตั้งถิ่นฐานเป็นครอบครัวแรกในชุมชน มีประเพณีมัดมือ 2 ครั้งในรอบปี โดย“ฮี่โข่”ต้องไปมัดมือ และกินข้าวดื่มเหล้าให้ครบทุกบ้าน ความผูกพันเชื่อมแน่นของคนในชุมชนปรากฏให้เห็นได้ชัดเจนจากการจัดการแรงงานในไร่ข้าว เพื่อนบ้าน เครือญาติพี่น้องที่ช่วยเหลือกัน ไว้วางใจต่อกัน แม้กระทั่งลูกหลาน หรือคนที่ทำงานนอกชุมชนเมื่อถึงฤดูกาลปลูกข้าวหรือเก็บเกี่ยวข้าวก็จะกลับไปช่วยเป็นแรงงาน ต่างจากงานของ จิรวัฒน์ รักชาติ (2562) ที่อธิบายว่า เมื่อพืชเศรษฐกิจเข้ามาในพื้นที่สูงจะมีการจ้างงานมากขึ้น และแรงงานครัวเรือนลดความสำคัญ

3.อัตลักษณ์กะเหรี่ยงและการอยู่ร่วมกับป่าอย่างยั่งยืน

วิถีการผลิตข้าวไร่แบบไร่หมุนเวียนและการจัดการทรัพยากรธรรมชาติที่สอดคล้องระบบนิเวศ ทำให้การอยู่ในพื้นที่ป่าของกลุ่มชาติพันธุ์กะเหรี่ยงดอยแม่อูคอจากสถานะการไม่มีสิทธิบนที่ดินทำกินทางกฎหมาย ทว่าได้รับการยอมรับในสถานะผู้รักษาผืนป่าที่เป็นทรัพยากรสำคัญของรัฐ ด้วยสภาพป่าไม้บนดอยแม่อูคอยังคงมีความอุดมสมบูรณ์ สามารถสนับสนุนนโยบายด้านการท่องเที่ยวเชิงนิเวศดอยแม่อูคอจังหวัดแม่ฮ่องสอน และในกระแสความตื่นตัวด้านสิ่งแวดล้อม มีความสนใจต่อวิถีการผลิตบนพื้นที่สูงและการปรับตัวเปลี่ยนแปลงของเกษตรกรชาติพันธุ์ในหลายพื้นที่ ไร่ข้าวจึงไม่ใช่แค่เพียงพื้นที่ผลิตพืชอาหาร ทว่าเป็นพื้นที่ผลิตสร้างความหมายให้กลุ่มชาติพันธุ์กะเหรี่ยงในการอยู่ร่วมกับป่าได้อย่างชอบธรรมมากขึ้น การได้รับการอนุโลมให้ใช้ที่ดินจากการอ้างสิทธิ์ทำไร่ข้าวหมุนเวียนตามจารีตประเพณีและมีสิทธิชุมชน

ในการจัดการทรัพยากร เช่น งานของวินัย บุญลือ (2545) กล่าวถึง ภูมิปัญญาคุณค่าศีลธรรมของกะเหรี่ยง อาทิ วัฒนธรรมและระบบการผลิตข้าวไร่หมุนเวียน ความรู้ระบบนิเวศความหลากหลายชีวภาพกฎเกณฑ์การใช้ประโยชน์และการอนุรักษ์ คือ ทุนวัฒนธรรมที่สำคัญของกะเหรี่ยง และเป็นทุนสัญลักษณ์ที่มีความหมาย ทำให้คนกะเหรี่ยงมีอัตลักษณ์ที่แสดงถึงความหมายในการใช้ชีวิตที่สมดุลยั่งยืนกับธรรมชาติ

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พฤติกรรมการใช้ แอปพลิเคชัน TikTok กับบริบททางความคิดของคนในสังคมกลุ่มเจเนอเรชั่น Y และ เจเนอเรชั่น Z

Behavior in using TikTok application and the contextual thinking of Generation Y and Generation Z

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บทคัดย่อ

การวิจัยในครั้งนี้เพื่อศึกษาพฤติกรรมการใช้แอปพลิเคชัน TikTok ของคนในกลุ่มเจเนอเรชั่น Z ช่วงอายุระหว่าง 8 – 20 ปี และกลุ่มเจเนอเรชั่น Y ช่วงอายุระหว่าง 21-37 ปี ในด้านทัศนคติต่อพฤติกรรมการใช้งานแอปพลิเคชัน TikTok โดยผลการวิจัยสะท้อนให้เห็นถึงแง่มุมทางความคิดของคนทั้ง 2 เจเนอเรชันในการนำแอปพลิเคชั่น TikTok มาใช้งานและสร้าง Content ต่าง ๆ ทั้งเพื่อความบันเทิง การชักจูงใจ ตลอดจนเกิดความรู้ภายหลังจากการใช้งาน นอกจากนี้ยังสามารถนำข้อมูลจากผลการวิจัยไปการศึกษาต่อยอดในประเด็นของการวิเคราะห์พฤติกรรมการใช้งานแอปพลิเคชัน TikTok ต่อไปได้พร้อมทั้งเป็นประโยชน์สำหรับผู้ใช้งานแอปพลิเคชัน TikTok ในการนำข้อมูลไปใช้ในการพัฒนาสร้าง Content ของตนเองให้ตอบโจทย์และโดนใจผู้ใช้งานให้มากที่สุด

โดยการศึกษาวิจัยนี้เป็นการวิจัยเชิงปริมาณ (Quantitative) จากกลุ่มตัวอย่าง กลุ่มเจเนอเรชั่น Z และกลุ่มเจเนอเรชั่น Y หรือ Gen Y จำนวน 400 คน โดยเครื่องมือในการวิจัย คือ แบบสอบถามภายหลังจากเก็บรวมรวมข้อมูลนำข้อมูลไปวิเคราะห์ด้วยโปรแกรมทางสถิติ ประกอบด้วย การวิเคราะห์ข้อมูลด้วยสถิติค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน และเขียนพรรณนาวิเคราะห์

ผลการวิจัยพบว่า จากความคิดเห็นของกลุ่มตัวอย่างกลุ่มเจเนอเรชั่น Z และกลุ่มเจเนอเรชั่น Y มีพฤติกรรมการใช้แอปพลิเคชัน TikTok แบ่งเป็น 2 ประเด็น ดังนี้ ในหัวข้อทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok ผลการศึกษาค่าเฉลี่ยที่พบมากที่สุด คือ ท่านคิดว่าท่านรู้สึกสนุกเพลิดเพลินเมื่อใช้แอปพลิเคชัน TikTok มีค่าเฉลี่ย 4.57 ระดับความพึงพอใจมากที่สุด และพบน้อยที่สุดคือ ท่านคิดว่าแอปพลิเคชัน TikTok มีผลต่อการใช้ชีวิตประจำวัน มีค่าเฉลี่ย 4.15 อยู่ในระดับความพึงพอใจมาก ส่วนในหัวข้อพฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน ผลการศึกษาพบว่า ค่าเฉลี่ยที่มากที่สุด คือ ท่านคิดว่าแอปพลิเคชัน TikTok มีข่าวสารที่ทันข้อมูลตามยุคสมัย มีค่าเฉลี่ย 4.51 อยู่ในระดับความพึงพอใจมากที่สุด และพบน้อยที่สุด คือ ท่านเคยอัพโหลดคลิปวีดีโอของตนเองลงในแอปพลิเคชัน TikTok

มีค่าเฉลี่ย 2.95 อยู่ในระดับความพึงพอใจปานกลาง

ผลการเปรียบเทียบความคิดเห็นของกลุ่มเจเนอเรชั่น Y และกลุ่มเจเนอเรชั่น Z พบว่า ในด้านทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok กลุ่มเจเนอเรชั่น Y มีความรู้สึกดีใจ ภูมิใจ เมื่อมีคนมากด Like กด Share เข้ามาดู หรือเข้ามากดติดตามในแอปพลิเคชัน TikTok มากที่สุด ส่วนกลุ่มเจเนอเรชั่น Z นั้น คิดว่าแอปพลิเคชัน TikTok เป็นโลกเสรีที่เปิดกว้างในการแสดงออกในการเปิดเผยตัวตน และแสดงความคิดเห็นมากที่สุด และคะแนนเฉลี่ยน้อยที่สุดสำหรับกลุ่มคนเจเนอเรชั่น Y คือ คิดว่าแอปพลิเคชัน TikTok มีผลต่อการใช้ชีวิตประจำวัน ส่วนคำตอบสำหรับกลุ่มเจเนอเรชั่น Z ที่ได้คะแนนเฉลี่ยน้อย คือ แอปพลิเคชัน TikTok มีประโยชน์ในสังคมปัจจุบัน

ทั้งนี้ในด้านพฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน กลุ่มเจเนอเรชั่น Y มักจะติดตามเฉพาะคลิปในแอปพลิเคชัน TikTok ที่ตรงกับความสนใจเป็นเวลานานมากที่สุด ส่วนกลุ่มเจเนอเรชั่น Z ใช้แอปพลิเคชัน TikTok เป็นประจำทุกวันมากที่สุด และที่ได้คะแนนเฉลี่ยน้อยที่สุดสำหรับกลุ่มคนเจเนอเรชั่น Y และกลุ่มคนเจเนอเรชั่น Z คือ ท่านเคยอัพโหลดคลิปวีดีโอของตนเองลงในแอปพลิเคชัน

คำสำคัญ: แอปพลิเคชัน TikTok, เจเนอเรชั่น Y, เจเนอเรชั่น Z

Abstract

This research is to study the behavior in using TikTok application and the contextual thinking of Generation Y 27-37 years old and Generation Z 2-20 years old . To attitude and behavior in using TikTok application . The research results reflected to the contextual thinking of both Generations towards TikTok application and the cognitive aspects of creating different content. It can be used not only for entertainment and encouragement, but also for the generation of knowledge post-using application. In addition, The research results enable also for further the data of the research results into the research on the application behavior analysis of TikTok applications, and also provide useful help for TikTok application users to apply information in development. The information will be used to develop and create their own content to meet the needs and satisfy users as much as possible.

This is quantitative research. The sample group were 400 people of Generation Z and Generation Y. The research instrument was questionnaire. The data was statistical analyzed by using percentages, mean, standard deviations and descriptive analysis.

The results were divided into two aspects as follows. For the attitude towards TikTok using, the topic with highest score level was the sample group thought that TikTok was fun and enjoyable in the highest level of satisfaction (4.57). The topic with highest level was the sample group thought that the thinking of the application TikTok has an impact on daily life in the high level of satisfaction (4.15) . The topic of behavior in using the TikTok application in daily life was the thinking of the application TikTok has up-to-date news and information according to the times in the highest level of satisfaction (4.51).

The topic of the uploading your own video clips into the TikTok application in the moderate level of satisfaction (2.95).

The results of comparing the opinions of the Generation Y group and the Generation Z group found that in terms of attitude towards using the TikTok application, the Generation Y group felt happy and proud when Most people click Like or Share or come to view or follow you in the TikTok application. As for the Generation Z group, they think that the TikTok application is a free world that is open in the highest expression of self-disclosure and expressing opinions, and the lowest level of satisfaction for Generation Y people, is that they think that the TikTok application has an impact on their daily life. The answer for Generation Z in the lowest level of satisfaction is that the TikTok application was useful for recent society.

In terms of the behavior of using the TikTok application in daily life. Generation Y tends to only follow TikTok clips that are most relevant to their long-term interests, while Generation Z the most were use TikTok on a daily basis. And the lowest level of satisfaction for Generation Y and Generation Z was that you had uploaded your own video clips to the TikTok application.

Keywords: Application, Generation Y, Generation Z

บทนำ

ในปัจจุบันนี้สื่อออนไลน์เข้ามามีบทบาทสำคัญในชีวิตประจำวันของคนจำนวนมากในสังคมเปรียบดังปัจจัยที่ 5 ในการดำเนินชีวิต ซึ่งแอปพลิเคชันหนึ่งที่กำลังเป็นที่นิยมอยู่ในขณะนี้ทั้งเชิงธุรกิจการค้า รับข้อมูลข่าวสาร ความบันเทิง โฆษณาประชาสัมพันธ์ ตลอดจนการเปิดเผยตัวตนนั่นก็คือแอปพลิเคชัน TikTok ซึ่งเป็นสื่อสังคมออนไลน์ที่มีเอกลักษณ์ในการผสมผสานทางความคิดสร้างสรรค์คอมมูนิตี้ และวัฒนธรรมที่ช่วยผลักดันประสบการณ์ที่น่าจดจำให้แก่ผู้ใช้และผู้ที่ติดตามอย่างกว้างขวาง

ทั้งนี้ แอปพลิเคชัน TikTok หรือ Douyin คือ แพลตฟอร์มที่มีจุดกำเนิดมาจากบริษัทแม่เดียวกันคือ ไบต์แดนซ์ (ByteDance) ทั้งนี้แอปพลิเคชัน TikTok มีการเติบโตขยายตัวอย่างรวดเร็ว โดยปี ค.ศ 2019 มีจำนวนการดาวน์โหลดแอปพลิเคชัน TikTok ในทุกแอปสโตร์มากกว่า 508 ล้านครั้ง และในปี ค.ศ 2022 มีจำนวนผู้ใช้งานมากกว่า 1,000 ล้านคนทั่วโลก (MGR Online, 2566). สำหรับแอปพลิเคชัน TikTok จะมีเอฟเฟคต่าง ๆ ประกอบด้วยภาพ เสียง รวมทั้งมีการให้ผู้ใช้ได้ตกแต่งวิดีโอของตนเองตามที่ต้องการ แต่ด้วยพัฒนาการการใช้ที่เปลี่ยนไปในปัจจุบันแอปพลิเคชัน TikTok จึงเข้ามามีอิทธิพลต่อการเปิดเผยตัวตนและแง่มุมอื่น ๆ ทั้งเพื่อความบันเทิง เพื่อการศึกษา เพื่อการติดตามข่าวสารและอื่น ๆ อีกมากมาย ดังที่ MGR Online (2566) กล่าวถึงการขยายตัวต่อการใช้แอปพลิเคชัน TikTok ว่าสำหรับแพลตฟอร์ม TikTok ซึ่งได้รับความนิยมสูงขึ้นอย่างมากในช่วงสถานการณ์ Covid-19 โดยมีเหล่าเซเลบคนดังจนถึงเหล่า Influencer ที่เพิ่มช่องทางคอนเทนต์ของตัวเอง อีกทั้งยังมี Influencer หน้าใหม่เกิดขึ้นในช่องทางนี้เป็นจำนวนมาก และสอดคล้องกับที่ผลวิจัยของ Reuters ระบุว่าคนไทย ติดตามข่าวจากแอปพลิเคชัน Tiktok มากที่สุดในโลก ปัจจุบันแพลตฟอร์ม TikTok จึงเป็นที่นิยม และมีผู้ใช้มากถึง 35.8 ล้านคน หรือเมื่อเทียบกับจำนวนประชากรไทยสูงถึง 50% อย่างไรก็ดี จากข้อมูลยังพบอีกว่า ประเทศไทย

เป็นประเทศที่รับข่าวสารจากแอปพลิเคชัน TikTok มากที่สุด โดย 30% ของผู้ใช้งาน ใช้แอปพลิเคชัน TikTok เพื่อติดตามข่าวโดยเฉพาะ

เหตุผลสำคัญที่ทำให้แอปพลิเคชัน TikTok มีอัตราการใช้ที่สูงขึ้น ส่วนหนึ่งเป็นเพราะคนสังคมหลายเจเนอเรชั่นต้องการแสดงความเป็นตัวตน แสดงออกซึ่งความสามารถ ตลอดจนสร้างการยอมรับและต้องการพื้นที่ในเชิงธุรกิจการค้าด้วยการส่งข้อความสร้างคอนเทนต์ที่ตนเองต้องการ เพื่อสื่อสารไปยังผู้คนหลากหลายกลุ่มวัยส่งผลให้เกิดการรวมกลุ่มทางสังคม สำหรับคนที่มีทัศนคติการดำเนินชีวิตที่คล้ายกัน จนได้รับการแชร์ให้ผู้ใช้งานคนอื่น ๆ เห็นได้จากในระยะเวลาอันรวดเร็วแอปพลิเคชัน TikTok จึงกลายเป็นสื่อสังคมออนไลน์ที่มีผู้ใช้จากหลากหลายหลายเจเนอเรชั่น และกำลังได้รับความนิยมอย่างมากในปัจจุบัน ซึ่งในประเทศไทยนั้น ในปี ค.ศ. 2023 แอปพลิเคชัน TikTok มีผู้ใช้เป็นอันดับ 8 ของโลก จำนวน 38 ล้านคน (Marketeer, 2566)

จึงเห็นได้ว่าส่วนหนึ่งของการดำเนินชีวิตของคนในสังคมกับพลวัตที่เปลี่ยนแปลงไปส่งผลให้คนไทยในทุกเจเนอเรชั่นมีการใช้แอปพลิเคชัน TikTok อย่างแพร่หลายแต่ก็มีความนิยมในการใช้งานที่แตกต่างกันไปตามแต่ละช่วงอายุของแต่ละเจเนอเรชั่น ซึ่งเป็นไปตามผลการวิจัยของ ภรภัทร ธัญญเจริญ (2564) ที่ได้กล่าวว่า ช่วงอายุมีผลต่อการตัดสินใจใช้งานแอปพลิเคชัน TikTok โดยผลการทดสอบ พบว่า กลุ่มอายุ 15 - 24 ปี จะมีการตัดสินใจใช้งานแอปพลิเคชัน TikTok สูงกว่า กลุ่มอายุ 25 - 34 ปี อายุ 35 - 44 ปี และอายุ 45 ปีขึ้นไป

จากที่กล่าวมาและจากการศึกษาค้นคว้าในประเด็นดังกล่าวพบว่า มีผู้ศึกษาข้อมูลที่เกี่ยวข้องกับแอปพลิเคชัน TikTok ไว้จำนวนหนึ่ง แต่ในประเด็นของการศึกษาในด้านพฤติกรรมการใช้แอปพลิเคชัน TikTok ของคนในช่วงวัยต่าง ๆ ยังมีไม่มากนัก คณะผู้วิจัยจึงสนใจที่จะศึกษาในประเด็นพฤติกรรมการใช้แอปพลิเคชัน TikTok ของกลุ่มคนช่วงวัย เจเนอเรชั่น Y และเจเนอเรชั่น Z ว่ามีอิทธิพลในชีวิตประจำวันมากน้อยประการใด รวมทั้งต้องการจะสะท้อนให้เห็นว่า ปัจจุบันสื่อดิจิทัลแอปพลิเคชัน TikTok นั้นเป็นสื่อโซเชียลมีเดียที่เป็นส่วนหนึ่งของวิถีชีวิตของคนในสังคม ตามการเปลี่ยนแปลงไปในพลวัตสังคมไทย

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาพฤติกรรมการใช้แอปพลิเคชัน TikTok ของคนในกลุ่มเจเนอเรชั่น Z ช่วงอายุระหว่าง 8 – 20 ปี และกลุ่มเจเนอเรชั่น Y ช่วงอายุระหว่าง 21 - 37 ปี

แนวคิด ทฤษฎี กรอบแนวคิด

ผู้วิจัยได้ศึกษาค้นคว้าแนวคิด ทฤษฎีและงานวิจัยที่เกี่ยวข้องเพื่อเป็นกรอบในการวิจัย ดังนี้

พิชญาณี ภู่ตระกูล (2559) กล่าวว่า การเปิดเผยตนเองในเครือข่ายสังคมออนไลน์ หมายถึง การเปิดเผยข้อมูลส่วนบุคคลทั้งข้อมูลส่วนตัว ความรู้สึก ความคิด และประสบการณ์ ในช่องทางการสื่อสารผ่านระบบเครือข่ายอินเทอร์เน็ต ซึ่งเป็นการติดต่อสื่อสารแบบสองทาง มีการแลกเปลี่ยนข้อมูลข่าวสารและการพูดคุยโต้ตอบกันระหว่างผู้ใช้เครือข่าย Klapper (1960) กล่าวว่า บุคคลจะเลือกเปิดรับสื่อและข่าวสารจากแหล่งต่างๆ ตามความสนใจและความต้องการ และหลีกเลี่ยงข่าวสารที่ขัดแย้งกับความรู้สึกนึกคิดของตน เพื่อนำมาใช้แก้ไขปัญหาหรือสนองความต้องการของตน การเลือกรับหรือการเลือกใช้ยังเป็นขั้นตอนแรกในการเลือกช่องทางของมนุษย์ ทักษะ และความชำนาญในการรับรู้ และเข้าใจ

ข่าวสารของคนนั้นมีความแตกต่างกัน บางคนถนัดที่จะเขียนมากกว่าพูด หรือบางคนถนัดที่จะฟังมากกว่าอ่าน สิ่งเหล่านี้จะเป็นตัวกำหนดในการเปิดรับหรือการใช้สื่อของมนุษย์

พรกมล รัชนาภรณ์ (2542) ให้ความหมายของการเปิดรับข่าวสาร โดยได้จำแนกตามพฤติกรรมการเปิดรับข่าวสาร ดังนี้

1. การแสวงหาข้อมูล คือ บุคคลจะหาข้อมูลเมื่อต้องการให้มีความคล้ายคลึงกับบุคคลอื่นในเรื่องใดเรื่องหนึ่ง หรือเรื่องทั่วไป

2. การเปิดรับข้อมูล คือ บุคคลจะเปิดรับข่าวสารเพื่อต้องการทราบข้อมูลที่ตนเองสนใจ เช่น การเปิดดูโทรทัศน์เฉพาะรายการที่ตนเองสนใจเท่านั้น มีคนอื่นแนะนำ ขณะอ่านหนังสือ หรือชมรายการโทรทัศน์ หากมีข้อมูลข่าวสารที่มีความสำคัญเกี่ยวกับตนเองก็จะให้ความเอาใจใส่อ่านหรือเปิดดูเป็นพิเศษ

3. การเปิดรับประสบการณ์ คือ บุคคลจะเปิดรับข่าวสารเพราะต้องการทำสิ่งใดสิ่งหนึ่งหรือเพื่อความผ่อนคลายอารมณ์

Morse (1958, อ้างถึงใน ธัญพร สินพัฒนพงศ์, 2560) กล่าวว่า ความพึงพอใจหรือความพอใจตรงกับคำใน ภาษาอังกฤษว่า “Satisfaction” หมายถึง สิ่งที่ตอบสนองความต้องการขั้นพื้นฐานของมนุษย์ เป็นการลดความตึงเครียดทางด้านร่างกายและจิตใจ หรือสภาพความรู้สึกของบุคคลที่มีความสุข ความชื่นใจ ตลอดจนสามารถสร้างทัศนคติในทางบวกต่อบุคคลต่อสิ่งหนึ่ง ซึ่งจะเปลี่ยนแปลงไปตามความพอใจต่อสิ่งนั้น

เบญจมาศ มุ่งอุ่นกลาง (2565) ศึกษาปัจจัยที่มีอิทธิพลต่อความตั้งใจในการยอมรับการใช้งานแอปพลิเคชัน TikTok ผลการวิจัยพบว่า การรับรู้ประโยชน์ในการใช้งาน การรับรู้ความเพลิดเพลิน และการรับรู้ด้านการมีปฏิสัมพันธ์ มีอิทธิพลต่อการรับรู้คุณค่าในการใช้งานแอปพลิเคชัน TikTok และการรับรู้คุณค่ามีอิทธิพลเชิงบวกต่อความตั้งใจในการยอมรับการใช้งานแอปพลิเคชัน TikTok ส่วนการรับรู้ความง่ายในการใช้งาน และประสบการณ์ในภาวะลื่นไหลนั้นไม่มีอิทธิพลต่อการรับรู้คุณค่า นอกจากนี้ การรับรู้ความง่ายในการใช้งานนั้นยังมีอิทธิพลต่อการรับรู้ประโยชน์ในการใช้งาน และประสบการณ์ในภาวะลื่นไหลมีอิทธิพลต่อการรับรู้ความเพลิดเพลิน รวมไปถึงทัศนคติในการใช้งาน และการคล้อยตามกลุ่มอ้างอิงมีอิทธิพลเชิงบวกต่อความตั้งใจในการยอมรับการใช้งานแอปพลิเคชัน TikTok

จากแนวคิด ทฤษฎี และงานวิจัย ผู้วิจัยจึงนำมาจัดทำเป็นกรอบแนวคิดในการวิจัยประยุกต์เป็นแนวทางในการศึกษาวิจัยในครั้งนี้โดยแบ่งออกเป็น 2 ด้าน เพื่อให้สอดคล้องกับวัตถุประสงค์ของการวิจัย คือ ด้านทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok และพฤติกรรมการใช้แอปพลิเคชัน TikTok

ขั้นตอนการดำเนินงาน

การศึกษาวิจัยครั้งนี้เป็นการวิจัยเชิงปริมาณ (Quantitative) ที่มุ่งศึกษาเฉพาะคนในช่วงวัยเจนเนอเรชั่น Y หรือ Gen Y และช่วงวัยเจเนอเรชั่น Z หรือ Gen Z ทั้งเพศหญิง เพศชาย และ LGBT เท่านั้น โดยใช้แบบสอบถามซึ่งเป็นการเก็บรวบรวมข้อมูลครั้งเดียว (One-shot Descriptive Study) ด้วยการใช้แบบสอบถาม (Questionnaire) ประกอบไปด้วยหัวข้อต่อไปนี้

1. ประชากร

ประชากร คือ ผู้ที่เคยใช้แอปพลิเคชัน TikTok ที่อาศัยอยู่ในจังหวัดสุโขทัย จังหวัดสุพรรณบุรี และจังหวัดชลบุรี

2. กลุ่มตัวอย่าง

กลุ่มตัวอย่างที่ใช้ในการวิจัยในครั้งนี้ เป็นผู้ที่เคยใช้แอพพลิเคชั่น TikTok โดยผู้วิจัยใช้วิธีการเลือกแบบเฉพาะเจาะจง (Purposive Sampling) แบ่งเป็น 2 กลุ่ม ประกอบด้วย กลุ่มเจเนอเรชั่น Z หรือ Gen Z ช่วงอายุระหว่าง 8 – 20 ปี และกลุ่มเจเนอเรชั่น Y หรือ Gen Y ช่วงอายุระหว่าง 21 - 37 ปี เนื่องจากกลุ่มประชากรมีขนาดใหญ่และไม่ทราบจำนวนประชากรที่แน่นอน ดังนั้นขนาดกลุ่มตัวอย่างสามารถคำนวณได้จากสูตรไม่ทราบขนาดจำนวนของ Cochran (1977 อ้างถึงใน ธีรวุฒิ เอกะกุล, 2543). ใช้ขนาดกลุ่มตัวอย่างอย่างน้อย 384 คน จึงจะสามารถประมาณค่าร้อยละ โดยมีความผิดพลาดไม่เกินร้อยละ 5 ที่ระดับความเชื่อมั่น ร้อยละ 95 เพื่อความสะดวกในการเก็บข้อมูลและการวิเคราะห์ข้อมูล ผู้วิจัยจึงใช้ขนาดกลุ่มตัวอย่างเป็นกลุ่มเจเนอเรชั่น Z จำนวน 200 คน และกลุ่มเจเนอเรชั่น Y จำนวน 200 คน รวมทั้งหมด 400 คน

3. เครื่องมือที่ใช้ในการวิจัย เครื่องมือที่ใช้ในการวิจัยครั้งนี้ได้แก่ แบบสอบถาม จำนวน 2 ตอน ประกอบด้วย ตอนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม ตอนที่ 2 พฤติกรรมการใช้แอปพลิเคชั่น TikTok กับบริบทของคนในสังคม โดยการสร้างเครื่องมือการวิจัย มีวิธีดำเนินการดังนี้

3.1 ศึกษาค้นคว้าเอกสาร จากเอกสาร ตำรา หนังสือ บทความวิชาการ ตำรา สื่อทางอินเตอร์เน็ต และเอกสารงานวิจัยที่เกี่ยวข้อง เกี่ยวกับพฤติกรรมการใช้แอปพลิเคชัน TikTok ของกลุ่มเจเนอเรชั่น Y และเจเนอเรชั่น Z นำข้อมูลที่ได้จากการศึกษามากำหนดกรอบและขอบเขตของแบบสอบถาม โดยให้มีความสอดคล้องกับวัตถุประสงค์ โดยเรียงลำดับตามลักษณะของคำถามแยกเป็นหมวดหมู่

3.2 สุ่มตัวอย่างข้อคำถามกับกลุ่มเจเนอเรชั่น Y และเจเนอเรชั่น Z ตามช่วงอายุที่กำหนด เพื่อให้ได้คำตอบในการนำมาเป็นแนวทางในการตั้งคำถามและปรับปรุงคำถามในแบบสอบถามให้ถูกต้อง

3.3. นำข้อมูลที่ได้จากการศึกษามากำหนดกรอบและแนวคิดรวบรวมเป็นแนวทางการสัมภาษณ์ (interview guide) เพื่อเสนอต่อเสนอผู้เชี่ยวชาญ จำนวน 3 ท่าน โดยได้แบบสอบถามที่ผ่านการตรวจสอบโดยผู้เชี่ยวชาญมีค่า IOC ผ่านเกณฑ์ทุกข้อ เท่ากับ 0.50 ขึ้นไป แสดงว่าข้อคำถามนั้นวัดได้ตรงวัตถุประสงค์หรือตรงตามเนื้อหาจึงนำไปเก็บรวบรวมข้อมูลต่อไป

4. การเก็บรวบรวมข้อมูลกับกลุ่มตัวอย่าง จำนวน 400 คน ในครั้งนี้เป็นการเก็บข้อมูลด้วยแบบสอบถามแบบออนไลน์ โดยผู้วิจัยจะเก็บข้อมูลตั้งแต่เดือนตุลาคม พ.ศ. 2565 ถึง เดือนธันวาคม พ.ศ. 2566

5. การวิเคราะห์ข้อมูล

5.1 ข้อมูลทั่วไปของผู้ที่ตอบแบบสอบถามวิเคราะห์ด้วยโปรแกรมทางสถิติ สำหรับสถิติที่ใช้ประกอบด้วย วิเคราะห์ข้อมูลด้วยสถิติค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน

5.2 พฤติกรรมการใช้แอปพลิเคชัน TikTok ของคนในสังคมกลุ่มเจเนอเรชั่น Y และ เจเนอเรชั่น Z วิเคราะห์ด้วยโปรแกรมทางสถิติ สำหรับสถิติที่ใช้ประกอบด้วย วิเคราะห์ข้อมูลด้วยสถิติค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน

5.3 เปรียบเทียบพฤติกรรมการเปิดเผยตัวตนของช่วงวัยเจเนอเรชั่น Y และ เจเนอเรชั่น Z ผ่านการใช้แอปพลิเคชั่น TikTok ตามช่วงอายุที่ต่างกัน และนำเสนอเชิงพรรณนาวิเคราะห์

ผลการวิจัย

ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

ตารางที่ 1 จำนวนและค่าร้อยละของผู้ตอบแบบสอบถาม จำแนกตามเพศ

เพศ	จำนวน (คน)	ร้อยละ
ชาย	171	42.75
หญิง	190	47.50
LGBT	39	9.75
รวม	**400**	**100.00**

จากตารางที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม ผลการวิเคราะห์ข้อมูลพบว่า ผู้ตอบแบบสอบถามที่พบมากที่สุดเป็นเพศหญิง จำนวน 190 คน คิดเป็นร้อยละ 47.50 รองลงมาเป็นเพศชาย จำนวน 171 คน คิดเป็นร้อยละ 42.75 และน้อยที่สุด LGBT จำนวน 39 คน คิดเป็นร้อยละ 9.75

ตารางที่ 2 จำนวนและค่าร้อยละของผู้ตอบแบบสอบถาม จำแนกตามอายุ

อายุ	จำนวน (คน)	ร้อยละ
8 - 20 ปี	200	50.00
21 - 37 ปี	200	50.00
รวม	**400**	**100.00**

จากตารางที่ 2 ผลการวิเคราะห์ข้อมูล พบว่า จากการที่ผู้วิจัยกำหนดการแจกแบบสอบถามในสัดส่วนที่เท่ากัน คือ ร้อยละ 50.00 ใน 2 ช่วงอายุ คือ อายุ 21 - 37 ปี จำนวน 200 คน คิดเป็นร้อยละ 50.00 รองลงมา คือ อายุ 8-20 ปี จำนวน 200 คน

ตารางที่ 3 ความคิดเห็นของคนในสังคมต่อพฤติกรรมการใช้แอปพลิเคชัน TikTok

ข้อคำถาม	รายการ		
	ค่าเฉลี่ย	S.D.	ระดับความพึงพอใจ
ทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok			
1. ท่านรู้สึกสนุก เพลิดเพลินเมื่อใช้แอปพลิเคชัน TikTok	4.57	0.66	มากที่สุด
2. ท่านรู้สึกดีใจ ภูมิใจ เมื่อมีคนมากด Like หรือกด Share หรือเข้ามาดู หรือเข้ามากดติดตามท่านในแอปพลิเคชัน TikTok	4.55	0.71	มากที่สุด
3. ท่านมีความสุขกับการแบ่งปันเรื่องราว รูปภาพ VDO ต่าง ๆ ผ่านแอปพลิเคชัน TikTok	4.29	0.82	มาก
4. ท่านรู้สึกว่าแอปพลิเคชัน TikTokเป็นโลกเสมือนจริง ที่ท่านรู้สึกเป็นตัวเองเมื่อได้ใช้งาน	4.27	0.79	มาก
5. ท่านคิดว่าแอปพลิเคชัน TikTokเป็นสังคมเสรีที่เปิดกว้างในการแสดงออกในการเปิดเผยตัวตนและแสดงความคิดเห็น	4.53	0.60	มากที่สุด
6. ท่านคิดว่าแอปพลิเคชัน TikTok มีผลต่อการใช้ชีวิตประจำวัน	4.15	4.08	มาก

ข้อคำถาม	รายการ		
	ค่าเฉลี่ย	S.D.	ระดับความพึงพอใจ
7. แอปพลิเคชัน TikTok ทำให้ท่านสามารถสร้างไอเดียใหม่ ๆ	4.51	0.77	มากที่สุด
8. แอปพลิเคชัน TikTokทำให้ท่านสามารถแลกเปลี่ยนเรื่องราวต่าง ๆ กับผู้อื่นได้	4.52	0.74	มากที่สุด
9. เกร็ดความรู้จากแอปพลิเคชัน TikTok สามารถนำมาใช้ในชีวิตประจำวันได้จริง	4.52	0.66	มากที่สุด
10. แอปพลิเคชัน TikTok มีประโยชน์ในสังคมปัจจุบัน	4.36	0.76	มาก
พฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน			
1. ท่านใช้ แอปพลิเคชัน TikTok เป็นประจำทุกวัน	4.01	0.93	มาก
2. ถ้าท่านต้องการความบันเทิงท่านจะเข้าใช้งานในแอปพลิเคชัน TikTok	3.93	0.86	มาก
3. ท่านคิดว่า แอปพลิเคชัน TikTok ช่วยลดความตึงเครียดในชีวิตประจำวัน	4.14	0.82	มาก
4. ท่านเปิดเผยตัวตน หรือขายสินค้าในแอปพลิเคชัน TikTok	4.13	0.82	มาก
5. ท่านคิดว่าแอปพลิเคชัน TikTok มีข่าวสารที่ทันข้อมูลตามยุคสมัย	4.51	0.73	มากที่สุด
6. ท่านจะให้ความสนใจกับคลิป VDO ในแอปพลิเคชัน TikTok ที่มียอดติดตามและยอดดูคลิปจำนวนมาก	4.15	0.80	มาก
7. ท่านเคยอัพโหลดคลิปวีดีโอของตนเองลงในแอปพลิเคชัน TikTok	2.95	2.04	ปานกลาง
8. ท่านมักจะติดตามเฉพาะคลิปในแอปพลิเคชัน TikTok ที่ตรงกับความสนใจเป็นเวลานาน	4.29	0.77	มาก
9. ท่านมักจะข้ามคลิปในแอปพลิเคชัน TikTok ที่ไม่ตรงกับความสนใจ	3.55	1.51	มาก
10. ท่านรู้สึกว่าเมื่อใช้แอปพลิเคชัน TikTok เวลาผ่านไปอย่างรวดเร็ว	4.16	0.71	มาก

จากตาราง ความคิดเห็นของคนในสังคมต่อพฤติกรรมการใช้แอปพลิเคชัน TikTok แบ่งเป็น 2 ประเด็น ดังนี้

หัวข้อทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok ผลการศึกษาค่าเฉลี่ยมากที่สุด 3 ลำดับ คือ ท่านรู้สึกสนุกเพลิดเพลินเมื่อใช้แอปพลิเคชัน TikTok ค่าเฉลี่ย 4.57 อยู่ในระดับความพึงพอใจมากที่สุด รองลงมา คือ ท่านรู้สึกดีใจ ภูมิใจ เมื่อมีคนมากด Like หรือกด Share หรือเข้ามาดู หรือเข้ามากดติดตามท่านในแอปพลิเคชัน TikTok ค่าเฉลี่ย 4.55 อยู่ในระดับความพึงพอใจมากที่สุด และแอปพลิเคชัน TikTok เป็นสังคมเสรีที่เปิดกว้างในการแสดงออกในการเปิดเผยตัวตนและแสดงความคิดเห็น ค่าเฉลี่ย 4.53 อยู่ในระดับความพึงพอใจมากที่สุด และพบน้อยที่สุด คือ ท่านคิดว่าแอปพลิเคชัน TikTok มีผลต่อการใช้ชีวิตประจำวัน ค่าเฉลี่ย 4.15 อยู่ในระดับความพึงพอใจมาก

หัวข้อพฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน ผลการศึกษาค่าเฉลี่ยมากที่สุด 3 ลำดับ คือ ท่านคิดว่าแอปพลิเคชัน TikTok มีข่าวสารที่ทันข้อมูลตามยุคสมัย ค่าเฉลี่ย 4.51 อยู่ในระดับความพึงพอใจมากที่สุด รองลงมา คือ ท่านมักจะติดตามเฉพาะคลิปในแอปพลิเคชัน TikTok ที่ตรงกับความสนใจเป็นเวลานาน ค่าเฉลี่ย 4.29 อยู่ในระดับความพึงพอใจมากที่สุด และท่านรู้สึกว่าเมื่อใช้แอปพลิเคชัน TikTok เวลาผ่านไปอย่างรวดเร็ว ค่าเฉลี่ย 4.16 อยู่ในระดับความพึงพอใจมาก และพบ

น้อยที่สุด คือ ท่านเคยอัพโหลดคลิปวีดีโอของตนเองลงใน แอปพลิเคชัน TikTok ค่าเฉลี่ย 2.95 อยู่ในระดับความพึงพอใจปานกลาง

จากการตอบแบบสอบถามผลการเปรียบเทียบความคิดเห็นของกลุ่มเจเนอเรชั่น Y และกลุ่มเจเนอเรชั่น Z พบว่า ในด้านทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok กลุ่มเจเนอเรชั่น Y รู้สึกดีใจ ภูมิใจเมื่อมีคนมากด Like หรือกด Share หรือเข้ามาดูหรือเข้ามากดติดตามท่านในแอปพลิเคชัน TikTok มากที่สุด ส่วนกลุ่มเจเนอเรชั่น Z นั้น คิดว่าแอปพลิเคชัน TikTok เป็นสังคมเสรีที่เปิดกว้างในการแสดงออกในการเปิดเผยตัวตน และแสดงความคิดเห็นมากที่สุด และคะแนนเฉลี่ยน้อยที่สุดสำหรับกลุ่ม คนเจเนอเรชั่น Y คือ คิดว่า แอปพลิเคชัน TikTok มีผลต่อการใช้ชีวิตประจำวัน ส่วนคำตอบสำหรับกลุ่มเจเนอเรชั่น Z ที่ได้คะแนนเฉลี่ยน้อย คือ แอปพลิเคชัน TikTok มีประโยชน์ในสังคมปัจจุบัน ทั้งนี้ในด้านพฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน กลุ่มเจเนอเรชั่น Y มักจะติดตามเฉพาะคลิปในแอปพลิเคชัน TikTok ที่ตรงกับความสนใจเป็นเวลานานมากที่สุด ส่วนกลุ่มเจเนอเรชั่น Z ใช้แอปพลิเคชัน TikTok เป็นประจำทุกวันมากที่สุด และที่ได้คะแนนเฉลี่ยน้อยที่สุด สำหรับกลุ่มคนเจเนอเรชั่น Y และกลุ่มคนเจเนอเรชั่น Z คือ ท่านเคยอัพโหลดคลิปวีดีโอของตนเองลงในแอปพลิเคชัน TikTok

สรุปและอภิปรายผล

จากการศึกษาพฤติกรรมการใช้แอปพลิเคชัน TikTok กับบริบทของคนในสังคมพบว่า ในด้านทัศนคติต่อการใช้งาน แอปพลิเคชัน TikTok ของกลุ่มตัวอย่างรู้สึกสนุก เพลิดเพลินเมื่อใช้แอปพลิเคชัน TikTok ซึ่งในปัจจุบันคนในสังคมมีวิถีการดำเนินชีวิตที่มีการแข่งขันกันสูง ต่อสู้ดิ้นรนในการดำเนินชีวิตประจำวันทั้งในด้านเศรษฐกิจ สังคม การศึกษา และการทำงาน รวมไปถึงการเมือง จึงเกิดภาวะความตึงเครียดมากกว่าในอดีตและเมื่อมีแอปพลิเคชัน TikTok ซึ่งเปรียบเสมือนโลกแห่งเสรีที่ผู้ใช้งานได้แสดงออกซึ่งตัวตน เสพความบันเทิงตลอดจนติดตามเรื่องราวต่าง ๆ ที่ตนเองสนใจผ่านแอปพลิเคชันได้ ดังนั้นเมื่อมีภาวะความเครียดหรือมีเวลาว่างจึงนิยมใช้แอปพลิเคชัน TikTok ด้วยเหตุผลที่แตกต่างกันของแต่ละบุคคล ซึ่งสอดคล้องกับงานวิจัยของ ณัฏฐพงษ์ สายพิณ (2563) ที่กล่าวถึงการใช้ชีวิตประจำวันของคนในปัจจุบันมีพฤติกรรมใช้เวลาแบบติดหน้าจอสมาร์ทโฟนอยู่แล้ว เป็นปัจจัยที่ทำให้แอปพลิเคชัน TikTok ได้รับความนิยมในสังคมไทยเป็นวงกว้าง นอกจากนี้ความเครียดของผู้คนในช่วงสถานการณ์การแพร่ระบาดของโรคโควิด-19 และการล็อคดาวน์ในระหว่างช่วงปีที่ผ่านมา ซึ่งเป็นภาวะที่ผู้คนต่างต้องการหาทางออกในการผ่อนคลายความตึงเครียด จึงมีผู้นิยมใช้งานแอปพลิเคชั่น TikTok เพิ่มสูงขึ้นเป็นจำนวนมากในสังคมไทย และงานวิจัยของ ภรภัทร ธัญญเจริญ (2664) ที่พบว่า กลุ่มตัวอย่างจากงานวิจัยเรื่องพฤติกรรมการเปิดรับ ทัศนคติ และการตัดสินใจใช้งานแอปพลิเคชัน TikTok มีการตัดสินใจใช้งานแอปพลิเคชัน TikTok เนื่องจากเวลาที่เปิดรับแอปพลิเคชันดังกล่าวมักจะเกิดความรู้สึกผ่อนคลายหายเครียดจากสถานการณ์ความตึงเครียดที่พบเจอเรื่องราวต่าง ๆ ในชีวิตประจำวัน ดังนั้นจึงเห็นได้ว่าแอปพลิเคชัน TikTok มีอิทธิพลบางประการในการช่วยเสริมสร้างความรู้สึกเชิงบวกต่อผู้ใช้งาน อีกทั้งเป็นภาพสะท้อนหนึ่งที่ทำให้เห็นถึงการเปลี่ยนแปลงของคนในสังคม

ส่วนในด้านพฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน พบว่า กลุ่มตัวอย่างคิดว่าแอปพลิเคชัน TikTok มีข่าวสารที่ทันข้อมูลตามยุคสมัย เนื่องจากแอปพลิเคชัน TikTok คือ สื่อออนไลน์ที่มีการเผยแพร่ข้อมูลต่าง ๆ อย่างแพร่หลายในระยะเวลาอันรวดเร็ว และอย่างง่ายดาย จึงทำให้ผู้ที่ใช้งาน

สามารถรับรู้ข่าวสาร และเป็นช่องทางในการติดตามเรื่องราวต่าง ๆ ที่เกิดขึ้นในสังคมได้อย่างทันท่วงที สอดคล้องกับงานวิจัยของ YE and XU (2019) และงานวิจัยของ Kim และคนอื่น ๆ (2007) อ้างถึงใน เบญจมาศ มุ่งอุ่นกลาง (2565) ที่พบว่า การรับรู้ประโยชน์ในการใช้งานแอปพลิเคชัน TikTok ของผู้ใช้ทำให้ผู้ใช้รับรู้คุณค่าจากการใช้งาน สามารถนำไปเพิ่มประสิทธิภาพการทำงานให้กับตนเอง ทั้งการได้รับรู้ข้อมูลข่าวสาร ได้รับข้อมูลเนื้อหาที่หลากหลาย และยังได้รับข้อมูลที่เป็นประโยชน์จากการใช้งานแอปพลิเคชัน และผลการวิจัย Digital News Report ประจำปี 2563 จากสำนักข่าว Reuters ที่เปิดเผยว่าคนไทยบริโภคข่าวจาก แอปพลิเคชัน TikTok มากกว่าประเทศอื่นในโลก โดยคนที่มีอายุ 18-24 ปี มากกว่า 30 % เลือกติดตามข้อมูลข่าวสารจากแอปพลิเคชัน TikTok (MarketThink, 2566) นั่นเป็นเพราะด้วยสื่อดิจิทัลที่มีความทันสมัยขึ้นประกอบกับเป็นยุคแห่งสังคมอัลกอริทึมของ AI ดังนั้นเมื่อแอปพลิเคชั่น TikTok สามารถใช้การประมวลผลอัลกอริทึมต่อการติดตาม TikTok สำหรับความสนใจ การมองเห็น การถูกใจ การแสดงความคิดเห็น และการแชร์ เพื่อเฟ้นหาสิ่งที่เร้าความสนใจต่อผู้ใช้งานได้ จึงทำให้แอปพลิเคชัน TikTok ตอบโจทย์ความต้องการและเพิ่มความรวดเร็ว ความสะดวกอย่างง่ายดายให้กับกลุ่มตัวอย่างต่อการติดตามข้อมูลข่าวสารที่ทันตรงกับใจและทันตามสถานการณ์ที่เกิดขึ้นในสังคม

การเปรียบเทียบความคิดเห็นของกลุ่มเจเนอเรชั่น Y ในด้านทัศนคติต่อการใช้งานแอปพลิเคชัน TikTok กลุ่มเจเนอเรชั่น Y รู้สึกดีใจ ภูมิใจ เมื่อมีคนมากด Like หรือ กด Share หรือเข้ามาดูหรือเข้ามากดติดตามท่านในแอปพลิเคชัน TikTok มากที่สุด ซึ่งแตกต่างจากแนวความคิดของกลุ่มเจเนอเรชั่น Z ที่คิดว่า แอปพลิเคชัน TikTok เป็นสังคมเสรีที่เปิดกว้างในการแสดงออกในการเปิดเผยตัวตน และแสดงความคิดเห็นด้วยระดับคะแนนเฉลี่ยมากที่สุด ดังนั้นจึงเห็นได้ว่า แอปพลิเคชัน TikTok มีบทบาทอย่างมากต่อการสร้างพื้นที่เพื่อเปิดเผยตัวตนของกลุ่มเจเนอเรชั่น Z และยังก่อให้เกิดความภูมิใจเมื่อกลุ่มตัวอย่างเจเนอเรชั่น Y ได้อัพโหลดคลิปวีดีโอ หรือถ่ายทอด และสร้างคอนเทนต์เรื่องราวของตนเองในหลากหลายแง่มุมต่อการเผยแพร่ไปยังแอปพลิเคชัน เพื่อให้สาธารณชนติดตาม สอดคล้องกับผลการศึกษา จิณณรัตน์ ธัญศิรอนันต์ (2562) ที่ได้ศึกษาเรื่องการเปิดรับสื่อ การรับรู้ ทัศนคติ การใช้ประโยชน์ และความพึงพอใจต่อแอปพลิเคชัน TikTok พบว่า ทัศนคติที่มีต่อแอปพลิเคชัน TikTok ผู้ตอบแบบสอบถามส่วนใหญ่มีความคิดเห็นว่า TikTok เป็นพื้นที่เปิดโอกาสให้ได้สร้างสรรค์คอนเทนต์ วิดีโอสั้นในหลากหลายรูปแบบเช่นเดียวกับ ศิรินทร์ วิทยานุภาพยืนยง (2559) ที่พบว่า ผู้ให้ข้อมูลส่วนใหญ่มีพฤติกรรมการเปิดรับสื่อ โดยผ่านเครื่องมือที่หลากหลายแตกต่างกันตามวัตถุประสงค์ของการใช้งานตามความเหมาะสมและสถานที่ในการใช้งาน โดยอาจกล่าวได้ว่า ช่วงอายุที่แตกต่างกันทำให้ลักษณะการเปิดรับสื่อ รวมถึงความคิด ทัศนคติมีแตกต่างกันด้วยเช่นกัน ผลการศึกษาในด้านพฤติกรรมการใช้แอปพลิเคชัน TikTok ในชีวิตประจำวัน กลุ่มเจเนอเรชั่น Y มักจะติดตามเฉพาะคลิปในแอปพลิเคชัน TikTok ที่ตรงกับความสนใจเป็นเวลานานมากที่สุด ส่วนกลุ่มเจเนอเรชั่น Z ใช้แอปพลิเคชัน TikTok เป็นประจำทุกวันมากที่สุด ซึ่งสอดคล้องกับผลการวิจัยของ ชมพูนุท นรินทรางกูล ณ อยุธยา และ ประณีต ใจหนัก (2563) ได้ศึกษาเรื่องความสัมพันธ์ระหว่างโซเชียลมีเดียและการตอบสนองของผู้บริโภคในการเข้าถึงข้อมูลทางการตลาดผลการวิจัย พบว่า ผู้ตอบแบบสอบถามส่วนใหญ่มีการใช้โซเชียลมีเดียในการเข้าถึงข้อมูลเฉลี่ยมากกว่า 4 วันต่อสัปดาห์ โดยมีระยะเวลาเฉลี่ยประมาณ 3 - 4 ชั่วโมงต่อวัน ซึ่งสะท้อนได้ว่าโดยปกติแล้วกลุ่มผู้ใช้แอปพลิเคชัน TikTok กลุ่มเจเนอเรชั่น Y จะเลือกติดตามคลิปวีดีโอที่ตรงกับความสนใจเป็นเวลานาน ๆ อันเนื่องมาจากโดยปกติแล้วหากเราชอบสิ่งใดก็มักจะติดตามหรือสนใจให้ความสำคัญกับสิ่งนั้น และเมื่อเทคโนโลยีในปัจจุบันก้าวล้ำสมัยไปถึงการที่อัลกอริทึมสามารถประมวล

พฤติกรรมความสนใจของผู้ใช้งานแอปพลิเคชัน TikTok จากพฤติกรรมการใช้จึงปรากฏคลิปวีดีโอที่ตรงกับความสนใจของผู้ใช้งานมาสร้างความสนใจต่อการติดตามให้แก่ผู้ใช้งานมากยิ่งขึ้น อย่างไรก็ตาม แม้แอปพลิเคชัน TikTok จะมีบทบาทและอิทธิพลต่อการดำเนินชีวิตของกลุ่มตัวอย่างทุกเจเนอเรชั่นในหลากหลายมิติแต่การเลือกใช้ให้ถูกทิศทางรู้เท่าทัน ตระหนักถึงผลกระทบที่อาจเกิดขึ้นตลอดจนควรเลือกใช้อย่างสร้างสรรค์ก็เป็นสิ่งที่สำคัญที่ต้องตระหนักถึง ทั้งนี้ การติดตามเป็นเวลานานมากเกินไปจนอาจสร้างผลกระทบต่อวิถีการดำเนินชีวิต ทั้งการทำงาน การศึกษา ตลอดจนใช้เปิดเผยตัวตนแสดงพื้นที่ในทางที่ไม่ถูกต้องก็อาจจะส่งผลลัพธ์ทำลายชีวิต ท่ามกลางการสื่อสารอย่างไร้พรมแดนในสังคมปัจจุบันได้อีกด้วย

ข้อเสนอแนะ

1. ควรมีการศึกษารูปแบบการวิจัยเชิงคุณภาพ (Qualitative Research) โดยการสัมภาษณ์เชิงลึก (In-depth Interview) หรือการสนทนาแบบกลุ่ม (Focus Group) เพื่อศึกษาพฤติกรรมการใช้แอปพลิเคชัน TikTok กับบริบททางความคิดของคนในสังคมหลากหลายช่วงวัยในเชิงลึกมากยิ่งขึ้น

2. ควรมีการศึกษาเปรียบเทียบวิถีการดำเนินชีวิตในสังคมยุคปัจจุบันของคนหลากหลายช่วงวัยมีอิทธิพลต่อการใช้งานแอปพลิเคชัน TikTok มากน้อยเพียงใด

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การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดยะลา

Crops Production Management to increase Income Stability and Food Security of DOA smart community in Yala Province

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บทคัดย่อ

โครงการ “การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดยะลา”ดำเนินการทดลองที่ตำบลตาชี อำเภอยะหา จังหวัดยะลา ระยะเวลาการดำเนินการโครงการ ตุลาคม พ.ศ. 2564 - กันยายน พ.ศ. 2566 ประกอบด้วย 5 การทดลอง

การทดลองที่ 1 พัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร มีเกษตรกรเข้าร่วมการทดสอบ 10 ราย ทดสอบโดยใส่ปุ๋ยตามค่าวิเคราะห์ดิน เตรียมความพร้อมต้นทุเรียนให้ได้รับอาหารสะสมเพียงพอก่อนออกดอกและติดผล ป้องกันกำจัดโรคและแมลง และห่อผลป้องกันหนอนเจาะเมล็ดทุเรียน พบว่า ปริมาณผลผลิตทุเรียน ในปีการผลิต พ.ศ. 2565 และ 2566 เฉลี่ย 1,270 และ 1,558 กิโลกรัมต่อไร่ ตามลำดับ รายได้ของเกษตรกรในปีการผลิต พ.ศ. 2565 และ 2566 เฉลี่ย 107,933 และ 163,580 บาทต่อไร่ ตามลำดับ อัตราส่วนรายได้ต่อต้นทุน (BCR) ในปีการผลิต พ.ศ. 2565 เท่ากับ 4.70 ส่วนในปี 2566 เท่ากับ 5.24 ปริมาณผลผลิตที่หนอนเจาะเมล็ดทุเรียนเข้าทำลายในปีการผลิต พ.ศ. 2565 และ 2566 เฉลี่ย 82 และ 73 กิโลกรัมต่อไร่ หรือ 6.51 และ 4.87 เปอร์เซ็นต์ ตามลำดับ

การทดลองที่ 2 พัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียงเพื่อสร้างเสถียรภาพด้านรายได้และความเพียงพอและความหลากหลายทางอาหาร ประกอบด้วย 9 กลุ่มพืช มีเกษตรกรเข้าร่วม 19 ราย พบว่า เกษตรกรนิยมปลูกพืชกลุ่มพืชรายได้ และกลุ่มพืชอาหาร เนื่องจาก

เกษตรกรมีความต้องการทางอาหารและรายได้เพื่อเลี้ยงดูครอบครัว โดยการผลิตผักกรีนโอ๊ค/เรดโอ๊ค ผักเหลียง สะตอ ข่า และหมาก เป็น 5 ชนิด พืชที่มีอัตราส่วนผลตอบแทนต่อต้นทุน (BCR) มากที่สุด เท่ากับ 7.55, 7.00, 6.29, 6.10 และ 5.74 ตามลำดับ

การทดลองที่ 3 พัฒนาต้นแบบการผลิตพืชพืชอินทรีย์ เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพและปลอดภัย เกษตรกรเข้าร่วม จำนวน 14 ราย โดยทดสอบปลูกผักกวางตุ้งอินทรีย์ มะเขือเปราะอินทรีย์ และพริกขี้หนูอินทรีย์ พบว่า ในปีการผลิต พ.ศ. 2565 ให้ผลผลิตเฉลี่ย เท่ากับ 747, 954 และ 741 กิโลกรัม/ไร่ ตามลำดับ สามารถสร้างรายได้เฉลี่ย 22,400, 28,629 และ 74,080 บาท/ไร่ ตามลำดับ ส่วนปี 2566 ให้ผลผลิตเฉลี่ย เท่ากับ 814, 1,005 และ 804 กิโลกรัม/ไร่ ตามลำดับ สามารถสร้างรายได้เฉลี่ย 32,549, 35,163 และ 80,436 บาท/ไร่ ตามลำดับ

การทดลองที่ 4 การพัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหาร โดยมีรูปแบบการปลูกพืช คือ การปลูกแบบยกแคร่ มีเกษตรกรเข้าร่วม 13 ราย พืชที่ปลูก ได้แก่ ผักกวางตุ้ง ผักคะน้า ผักกาดหอม ผักกรีนโอ๊ค/เรดโอ๊ค ซึ่งมีอัตราส่วนรายได้ต่อต้นทุน (BCR) อยู่ที่ 3.01, 2.99, 2.61 และ 6.07 ตามลำดับ และรูปแบบระบบน้ำหยด เพื่อลดการใช้น้ำในภาคการเกษตรที่ประสบปัญหาขาดแคลนน้ำในฤดูร้อน มีเกษตรกรเข้าร่วม 4 ราย โดยพืชที่ดำเนินการทดลอง คือ ผักกูด ซึ่งมีอัตราส่วนรายได้ต่อต้นทุน (BCR) อยู่ที่ 7.11

การทดลองที่ 5 พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วม จังหวัดยะลา เกษตรกร จำนวน 29 ราย ที่เข้าร่วมการจัดเวทีวิจัยสัญจรเพื่อแลกเปลี่ยนเรียนรู้ภูมิปัญญาประสบการณ์ระหว่างเกษตรกร นักวิจัย และผู้เกี่ยวข้อง จำนวน 21 ครั้ง ในส่วนของการเชื่อมโยงเครือข่ายได้จัดงานวันถ่ายทอดเทคโนโลยี การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ครั้งที่ 5 ประจำปี 2566 เพื่อให้เกิดการแลกเปลี่ยนเรียนรู้ของเกษตรกรจาก 5 ชุมชน จำนวน 200 ราย รวมถึงกิจกรรมเยี่ยมเยียน ศึกษาดูงานภายในพื้นที่ชุมชนตำบลตาชี อำเภอยะหา จังหวัดยะลา ทั้งหมด 5 ฐานการเรียนรู้

คำสำคัญ: การจัดการผลิตพืช ความมั่นคงด้านอาหาร ชุมชนนวัตกรรมวิชาการเกษตร

Abstract

The Project “Crops Production Management to increase Income Stability and Food Security of DOA smart community in Yala Province” was carried out at Ta Chi Sub-district, Yaha District, Yala Province. The project duration was October 2021 - September 2023. This project consists of 5 experiments.

Experiment 1: Appropriate Technology Development for Community Economic Crop Production, Durian for Stable Income and Food Accessibility. 10 farmers participated in the test. Testing methods of Fertilize according to the soil analysis value. Preparing the plants for adequate accumulation of nutrients before flowering and fruiting. Prevent and eradicate diseases and insects and protect against durian seed borer. The yield of durian in production year 2022 and 2023 averaged 1,270 and 1,558 kg. per rai, respectively. Income of farmers by production year 2022 and 2023 averaged 107,933 and 163,580 baht

per rai, respectively. Return on Cost Ratio (BCR) by production year 2022 and 2023 averaged 4.70 and 5.24 respectively. The amount of yield that the durian seed borer infested in production year 2022 and 2023 averaged 82 and 73 kilograms per rai or 6.51 and 4.87 percent, respectively.

Experiment 2 : Model Development of Integrated Crop Production Based on Sufficiency Economy Philosophy for Stable Income and Food Sufficiency and Diversity, consisting of 9 plant groups based on the philosophy of sufficiency economy. There were 19 farmers participating, It was found that farmers preferred growing income crops. and food plant groups This is because farmers need food and income to support their families. The production of green oak/red oak, Liang, sato, galangal, and betel nut are the 5 crops with the highest cost-benefit ratio (BCR), equal to 7.55, 7.00, 6.29, 6.10, and 5.74, respectively.

Experiment 3: The development of prototypes of organic crop production to create income stability and quality and safe food. 14 farmers participated in the test, Farmers grow organic bok choy organic eggplant and organic chilli. The yield in production year 2022 averaged 747, 954 and 741 kg/rai, respectively, with average income of 22,400, 28,629 and 74,080 baht/rai, respectively. Production year 2023 were found to have average yields of 814, 1,005 and 804 kg/rai, respectively, with average income of 32,549, 35,163 and 80,436 baht/rai, respectively.

Experiment 4: Development of a prototype of crop production that is resilient to climate change for income stability and food stability. The pattern is growing vegetables in a raised platform. There were 13 farmers participating. Crops grown include bok choy, kale, lettuce, and green oak/red oak, which have Return on Cost Ratio (BCR) of 3.01, 2.99, 2.61, and 6.07, respectively. Pattern is The drip irrigation system is used to reduce water use in the agricultural sector, which faces water shortages in the summer. There were a total of 4 farmers participating. The plant used in the experiment was Pak Kut, which had Return on Cost Ratio (BCR) of 7.11

Experiment 5: Developing an innovative platform for community food security with participation in Yala Province. 29 farmers participated in a traveling research forum to exchange knowledge and wisdom. Experiences between farmers, researchers, and related parties, 21 times, in the network connection section. Organized a technology transfer day for crop production management to increase income stability and food security in the 5th Field Day in 2023 to create an exchange of knowledge among 200 farmers in all 5 communities, including visiting activities Study tour within the Ta Chi Subdistrict community area, Yaha District, Yala Province, a total of 5 learning bases.

Keywords: Crops Production Management, Food Security, DOA smart community

บทนำ

โครงการวิจัยการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดยะลา จัดทำขึ้นเพื่อตอบสนองยุทธศาสตร์ชาติระยะ 20 ปี ด้านเกษตรในแผนแม่บทย่อยระบบนิเวศเกษตร ที่กำหนดให้มีการสร้างความมั่นคงอาหารให้กับครัวเรือนและชุมชน ลดการพึ่งพาอาหารจากภายนอก สร้างเสถียรภาพด้านรายได้ ส่งเสริมเกษตรตามหลักปรัชญาของเศรษฐกิจพอเพียง สร้างความเข้มแข็งชุมชน สนับสนุนให้ท้องถิ่นมีบทบาทดำเนินการให้เกิดความมั่นคงด้านอาหารในชุมชน รวมทั้งวิจัยพัฒนาการสร้างมูลค่าเพิ่ม และให้รองรับกับบริบทการเปลี่ยนแปลงที่จะเกิดขึ้นต่อภาคเกษตร

ในด้านสถานการณ์ความมั่นคงทางอาหารของไทยพบว่า อยู่ในลำดับที่ 51 ของโลก มี 59.5 จาก 100 คะแนน โดยประเด็นที่ไทยยังต้องพัฒนา คือ การลดค่าใช้จ่ายด้านอาหาร การกระจายรายได้ เพิ่มประสิทธิภาพการผลิต ลดสารพิษตกค้างในผลผลิต และลดผลกระทบจากเกิดภัยพิบัติธรรมชาติ (สำนักงานเศรษฐกิจการเกษตร, 2560) และในปี พ.ศ. 2562 คณะรัฐมนตรีมีมติต่อร่างปฏิญญารัฐมนตรีความมั่นคงอาหารเอเปค ครั้งที่ 5 โดยไทยจะต้องมีการดำเนินการส่งเสริมระบบอาหารและพัฒนาการเกษตรอย่างยั่งยืน และจากวิกฤตโรคระบาด Covid-19 พบว่า ได้เกิดการขาดแคลนพืชอาหารบางชนิดในชุมชน เนื่องจากส่วนใหญ่ยังพึ่งพาการนำเข้าพืชอาหารจากนอกชุมชน ส่วนสินค้าที่เกษตรกรผลิตก็จำหน่ายได้น้อยลง ซึ่งสะท้อนให้เห็นถึงการขาดภูมิคุ้มกันที่ดีของชุมชน จึงจะต้องพัฒนาให้ปรับตัวเพื่อรับผลกระทบจากวิกฤตที่กำลังเกิดขึ้น

โดยพื้นที่เป้าหมายในการวิจัยและพัฒนาในจังหวัดยะลา เกษตรกรส่วนใหญ่ปลูกยางพารา และไม้ผลเป็นหลัก ซึ่งมีพื้นที่ปลูก 1,024,137 ไร่ และ 89,510 ไร่ ตามลำดับ โดยมีไม้ผลเศรษฐกิจที่สำคัญได้แก่ ทุเรียน ลองกอง และมังคุด เป็นต้น นอกจากนั้นเกษตรกรจะปลูกไม้ผลชนิดอื่น ๆ ไม้ยืนต้น 23,617 ไร่ ข้าว 40,878 ไร่ พืชผัก 5,015 ไร่ และพืชไร่ 1,025 ไร่ ตามลำดับ จังหวัดยะลาเป็นแหล่งปลูกทุเรียนมากที่สุดในภาคใต้ตอนล่าง มีเกษตรกรผู้ปลูกทุเรียน 31,221 ครัวเรือน พื้นที่ปลูก 89,878 ไร่ เนื้อที่ให้ผลผลิต 50,359 ไร่ มีผลผลิตรวม 43,360 ตัน (สำนักงานเกษตรจังหวัดยะลา, 2564) และมีแนวโน้มปลูกทุเรียนเพิ่มขึ้น ส่วนการปลูกยางพารา พบว่า เกษตรกรมีรายได้ลดลง เนื่องจากปัญหาราคาตกต่ำและการเกิดโรคใบร่วงในยางพารา ซึ่งจะเห็นได้ว่า เกษตรกรในจังหวัดยะลา พึ่งพารายได้จากพืชเชิงเดี่ยว ขาดความหลากหลายของชนิดพืชในการทำอาชีพการเกษตร

การสร้างเสถียรภาพรายได้และการสร้างความมั่นคงทางอาหารในจังหวัดยะลา พบว่า มีความเสี่ยงเนื่องจากสาเหตุหลายประการ ดังนี้ ด้านการเข้าถึงอาหารได้อย่างพอเพียง และในช่วงการเกิดโรคระบาด Covid-19 ส่งผลกระทบต่อรายได้เกษตรกรเป็นอย่างมาก ชนิดพืชขาดความหลากหลายจากการปลูกพืชเชิงเดี่ยว พืชอาหารมีน้อยชนิด จึงอาศัยการนำเข้ามาจากพื้นที่อื่นๆ ซึ่งมีความเสี่ยงในด้านความปลอดภัย และมักได้รับผลกระทบจากเนื่องจากการเปลี่ยนแปลงสภาพภูมิอากาศ เช่น น้ำท่วมขังในที่ลุ่ม และภัยแล้งที่จะทำให้ไม้ผลออกดอกผลไม่เป็นไปตามฤดูกาล ด้านประโยชน์และความหลากหลายทางอาหาร เป็นผลกระทบจากการผลิตพืชเชิงเดี่ยวของยางพารา จึงทำให้ความหลากหลายที่เคยมีลดลงมาก จึงจำเป็นที่จะต้องมีการพัฒนาระบบการปลูกพืชผสมผสานและเกษตรผสมผสาน เพื่อให้มีพืชที่หลากหลายทั้งทางด้านสารอาหาร โภชนาการ ตลอดจนนำไปใช้ในการดำรงชีพตามหลักปรัชญาของเศรษฐกิจพอเพียง ด้านอาหารที่มีคุณภาพและอาหารปลอดภัย พื้นที่จังหวัดยะลามีการผลิตพืชอาหารที่ไม่เพียงพอต่อความต้องการบริโภค จึงต้องนำเข้าผลผลิตมาจากพื้นที่อื่น ๆ จังหวัดยะลามีสภาพอากาศแบบร้อนชื้น

มีพื้นที่เสี่ยงต่อการเกิดภัยแล้ง จึงควรวางระบบและรูปแบบการปลูกพืชที่เหมาะสม นอกจากนั้นการเปลี่ยนแปลงสภาพภูมิอากาศ ยังส่งผลต่อการออกดอกของไม้ผลต่าง ๆ ผิดฤดูกาล เช่น ไม่ออกดอก ออกดอกหลายรุ่น หรือออกมากหรือน้อยกว่าปกติ เช่น ในทุเรียน ลองกอง มังคุด เป็นต้น ส่วนด้านการจัดการความมั่นคงทางอาหารชุมชน ระบบการเชื่อมโยง และการกระจายอาหารจากแหล่งผลิตสู่ผู้บริโภคในสังคมชนบทจะอาศัยตลาดนัดชุมชน และสังคมเมืองอาศัยตลาดเทศบาลและห้างสรรพสินค้า ซึ่งชุมชนไม่สามารถจัดการความมั่นคงทางอาหารได้ทั้งในประเด็นการเข้าถึงความหลากหลาย ความพอเพียง และการพึ่งตนเองได้ จึงจำเป็นที่จะต้องพัฒนาการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชน อันจะนำไปสู่การเป็นชุมชนนวัตกรรมที่พึ่งตนเองและการจัดการตนเองบนฐานปรัชญาเศรษฐกิจพอเพียง

วัตถุประสงค์ของการวิจัย

1. วิจัยและพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชน เพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหารได้อย่างพอเพียง
2. วิจัยและพัฒนารูปแบบและเทคโนโลยีที่เหมาะสมในการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง เพื่อสร้างเสถียรภาพด้านรายได้และมีความหลากหลายทางอาหาร
3. วิจัยและพัฒนารูปแบบและเทคโนโลยีที่เหมาะสมในการผลิตพืชปลอดภัยและพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้และมีอาหารที่มีคุณภาพและปลอดภัย
4. วิจัยและพัฒนารูปแบบและเทคโนโลยีที่เหมาะสมในการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และมีเสถียรภาพทางอาหาร
5. วิจัยและพัฒนาการสร้างแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารชุมชน หรือพื้นที่สำหรับการเชื่อมโยงการกิจกรรมและแลกเปลี่ยนเรียนรู้ของผู้มีส่วนได้เสียในการจัดการความมั่นคงอาหารของชุมชนต้นแบบ เพื่อพัฒนาชุมชนต้นแบบ และเครือข่ายชุมชน ที่จะเป็นศูนย์ถ่ายทอดเทคโนโลยีด้านการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงทางอาหาร และขยายผลไปสู่ชุมชนอื่น ๆ

แนวคิด ทฤษฎี กรอบแนวคิด

การวิจัยการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร เป็นการพัฒนาการจัดการพืชทั้งองค์รวมในชุมชน โดยนำตัวชี้วัดความมั่นคงทางอาหารของ FAO (2017) 4 ด้าน คือ 1) Food Availability ปริมาณและความหลากหลายอาหาร 2) Food Access การเข้าถึงอาหาร 3) Food Stability เสถียรภาพอาหาร และ 4) Food Utilization คุณภาพอาหารมาผสมผสานกับแนวนโยบายการพัฒนาของประเทศไทย เป็นประเด็นการวิจัยและพัฒนา 5 ด้าน คือ 1) การเพิ่มประสิทธิภาพผลิตพืชเศรษฐกิจชุมชนที่เป็นทางเลือกที่ช่วยให้เกิดเสถียรภาพทางรายได้เพื่อเพิ่มความสามารถในการเข้าถึงอาหาร 2) การผลิตพืชผสมผสานที่หลากหลายที่แก้ปัญหาการการขาดความหลากหลายจากการผลิตพืชเชิงเดี่ยวเพื่อเพิ่มความเพียงพอทางอาหาร 3) การผลิตพืชอินทรีย์เพื่อความปลอดภัยและคุณภาพทางอาหาร 4) การผลิตพืชที่ยืดหยุ่นต่อการเปลี่ยนแปลงสภาพภูมิอากาศทั้งภัยแล้งน้ำท่วมเพื่อเสถียรภาพอาหาร และ 5) การพัฒนาแพลตฟอร์มการจัดการความมั่นคงทางอาหารชุมชนให้เกิดชุมชนนวัตกรรมที่สามารถจัดการตนเองได้ด้วยเทคโนโลยี/นวัตกรรม และการพัฒนาชุมชนต้นแบบที่เข้มแข็ง รวมทั้งตอบสนองยุทธศาสตร์ชาติระยะ 20 ปี และแนวทางการพัฒนาที่ยั่งยืน (SDGs)

ประเด็นปัญหา คือ ชุมชนเกษตรกรขาดความสามารถในการจัดการตนเองด้านการเกษตร ทำให้ประสบปัญหาการขาดเสถียรภาพรายได้ และขาดความมั่นคงทางอาหารของชุมชน การผลิตพืชชนิดต่าง ๆ ยังมีประสิทธิภาพต่ำ ขาดความหลากหลาย ขาดการพัฒนาคุณภาพให้ได้มาตรฐานสินค้า มีการสร้างมูลค่าเพิ่มน้อย การเชื่อมโยงการตลาดสินค้ายังมีน้อย การรวมกลุ่มเกษตรกรยังไม่เข้มแข็ง ได้รับความเสียหายจากภัยธรรมชาติที่เกิดจากการเปลี่ยนแปลงสภาพภูมิอากาศ เช่น น้ำท่วมขังและภัยแล้ง การขาดภูมิคุ้มกันในการจัดการเมื่อได้รับผลกระทบจากภายนอก เช่น ผลกระทบจากโรคระบาด Covid-19 ตลอดจนขาดการบริหารจัดการเชื่อมโยงที่ดีในชุมชน

⇩

วัตถุประสงค์เป้าหมาย พัฒนาการจัดการผลิตพืชทั้งองค์รวมของชุมชนให้มีเทคโนโลยีการปฏิบัติที่เหมาะสมกับภูมิสังคม สามารถเพิ่มรายได้ เพิ่มความหลากหลายของพืชใช้ประโยชน์ ผลิตได้มาตรฐานลดสารพิษตกค้าง ลดความเสียหายจากภัยธรรมชาติพร้อม ๆ กับ มีการบริหารจัดการอาหารอย่างเป็นระบบจากผู้ผลิตสู่ผู้บริโภคในชุมชน ทำให้ชุมชนมีความเข้มแข็ง พึ่งตนเองได้ เป็นชุมชนนวัตกรรมที่จะถ่ายทอดเทคโนโลยี และขยายผลไปสู่ชุมชนอื่น ๆ ต่อไป

⇩

โครงการวิจัย การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดยะลา

พัฒนาเทคโนโลยีที่เหมาะสม ในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร (Food Access)	พัฒนาต้นแบบการผลิตพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพปลอดภัย (Food Utilization)	พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศเพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหาร (Food Stability)	พัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง เพื่อสร้างเสถียรภาพด้านรายได้ความเพียงพอและความหลากหลายทางอาหาร (Food Availability)

พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วม (food Security Innovation Platform)

ภาพที่ 1 กรอบแนวคิดการวิจัย โครงการวิจัยการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดยะลา

วิธีดำเนินการวิจัย

เป็นการวิจัยเชิงปฏิบัติการแบบมีส่วนร่วม (Participatory Action Research: PAR: Kemmis & Mc Taggart, 1982) ที่นักวิจัยทำการวิจัยร่วมกับเกษตรกร ชุมชน หน่วยงานในท้องถิ่น และผู้ประกอบการ โดยมีขั้นตอนการวิจัย 4 ขั้นตอน คือ 1) ขั้นวางแผน (Planning) 2) ขั้นปฏิบัติการ (Acting) 3) ขั้นสังเกตการณ์ (Observing) 4) ขั้นสะท้อนผลปฏิบัติ (Reflecting) ซึ่งการวิจัยจะมีรอบวงจรการปฏิบัติครบ 4 ขั้นตอน ปีละ 1 รอบ และจากผลของรอบที่ 1 จะนำไปเริ่มรอบใหม่อีกในการปรับปรุงผล (Re-planning) ในปีต่อไป จนกว่าจะได้วิธีการหรือเทคโนโลยีที่เหมาะสมกับพื้นที่นั้นๆ

สถานที่ดำเนินการวิจัย คือ ชุมชนตำบลตาชี อำเภอยะหา จังหวัดยะลา

ระยะเวลาดำเนินงานวิจัยระหว่างเดือนตุลาคม 2564-กันยายน 2566

การวิจัยและพัฒนาประกอบ 5 การทดลอง ดังนี้

1. พัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร

พัฒนาเทคโนโลยีการเพิ่มประสิทธิภาพการผลิตทุเรียน โดยการใส่ปุ๋ยทุเรียนตามค่าวิเคราะห์ดิน การบำรุงดูแลรักษาตามคำแนะนำของกรมวิชาการเกษตร และการป้องกันกำจัดหนอนเจาะเมล็ดทุเรียนโดยวิธีผสมผสาน (IPM) ร่วมกับภูมิปัญญาท้องถิ่น โดยบันทึกและวิเคราะห์ข้อมูลผลผลิต ต้นทุน รายได้ อัตราส่วนรายได้ต่อต้นทุน (BCR)

2. พัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียงเพื่อสร้างเสถียรภาพด้านรายได้และความเพียงพอ ความหลากหลายทางอาหาร

สำรวจและพัฒนาการปลูกพืชผสมผสาน 9 กลุ่ม ได้แก่ 1) พืชอาหาร 2) พืชรายได้ 3) พืชสมุนไพรสุขภาพ 4) พืชสมุนไพรป้องกันกำจัดศัตรูพืช 5) พืชอนุรักษ์ดินและน้ำ 6) พืชอาหารสัตว์ 7) พืชอนุรักษ์พันธุกรรมท้องถิ่น 8) พืชใช้สอย และ 9) พืชพลังงานหรือเชื้อเพลิง โดยบันทึกการสำรวจและวิเคราะห์ข้อมูลผลผลิต ต้นทุน รายได้ อัตราส่วนรายได้ต่อต้นทุน (BCR)

3. พัฒนาต้นแบบการผลิตพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพและปลอดภัย

พัฒนาและทดสอบเทคโนโลยีการผลิตพืชอินทรีย์ โดยผลิตผักกวางตุ้งอินทรีย์ มะเขือเปราะอินทรีย์ และพริกขี้หนูอินทรีย์ ทำการบันทึกและวิเคราะห์ข้อมูลผลผลิตและรายได้

4. พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหาร

สำรวจ วิเคราะห์ สภาพพื้นที่ที่ได้รับผลกระทบจากการเปลี่ยนแปลงสภาพอากาศ เช่น ได้รับผลกระทบจากน้ำท่วมหรือขาดน้ำหรือได้รับผลกระทบจากฤดูกาลที่เปลี่ยนแปลง เพื่อเป็นพื้นที่ดำเนินการทดลอง จากนั้นพัฒนาและทดสอบเทคโนโลยีและรูปแบบการผลิตพืชที่เหมาะสม เช่น การปรับสภาพพื้นที่ หรือการปลูกแบบยกแคร่ และคัดเลือกชนิดพืช เพื่อพัฒนาให้เหมาะสมกับสภาพพื้นที่เกษตรกร โดยบันทึกและวิเคราะห์ข้อมูลผลผลิต ต้นทุน รายได้ อัตราส่วนรายได้ต่อต้นทุน (BCR)

5. พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วม

พัฒนาการมีส่วนร่วมของชุมชน พัฒนาสร้างความเข้มแข็งของกลุ่มเกษตรกร โดยจัดเวทีแลกเปลี่ยนเรียนรู้ผ่านกระบวนการจัดเวทีวิจัยสัญจร จัดเชื่อมโยงชุมชนเครือข่าย โดยการจัดกิจกรรมงานวันถ่ายทอดเทคโนโลยี และทดลองขยายผลไปสู่ชุมชนเครือข่าย

ผลการวิจัย

1. พัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร

เกษตรกรเข้าร่วมพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชน โดย พืชเศรษฐกิจของชุมชน คือ ทุเรียน จำนวน 10 ราย ซึ่งต้นทุเรียนของเกษตรกรมีอายุมากกว่า 25 ปี ดำเนินการโดยการใส่ปุ๋ยตามค่าวิเคราะห์ดิน เตรียมความพร้อมต้นทุเรียนให้ได้รับอาหารสะสมเพียงพอก่อนออกดอกและติดผล ป้องกันกำจัดโรคและแมลงโดยวิธีผสมผสาน (IPM) ร่วมกับภูมิปัญญาท้องถิ่น เช่น การห่อผลเพื่อป้องกันหนอนเจาะเมล็ดทุเรียน เริ่มห่อผลตั้งแต่ผลทุเรียนมีอายุ 6-10 สัปดาห์ จนถึงเก็บเกี่ยว และรมควัน

ไล่แมลง เริ่มรมควันตั้งแต่ช่วงที่ทุเรียนเริ่มติดผล อายุประมาณ 1-4 สัปดาห์ หลังดอกบาน หากพบว่าตัวเต็มวัยเริ่มระบาดให้ใช้สารเคมีในการป้องกันกำจัด เช่น แลมบ์ดาไซฮาโลทริน อัตรา 50 มิลลิลิตรต่อน้ำ 20 ลิตร หรือคาร์บาริล อัตรา 50 กรัมต่อน้ำ 20 ลิตร

พบว่า ปริมาณผลผลิตทุเรียนในปีการผลิต พ.ศ. 2565 และปี 2566 เฉลี่ย 1,270 และ 1,558 กิโลกรัมต่อไร่ ตามลำดับ ต้นทุนการผลิตในปีการผลิต พ.ศ. 2565 และปี 2566 เฉลี่ย 22,802 และ 31,197 บาทต่อไร่ ตามลำดับ รายได้ของเกษตรกร ในปีการผลิต พ.ศ. 2565 และปี 2566 เฉลี่ย 107,933 และ 163,580 บาทต่อไร่ ตามลำดับ รายได้สุทธิของเกษตรกร ในปีการผลิต พ.ศ. 2565 และปี 2566 เฉลี่ย 85,131 และ 132,383 บาทต่อไร่ ตามลำดับ อัตราส่วนรายได้ต่อต้นทุน (BCR) ในปีการผลิต พ.ศ. 2565 เท่ากับ 4.70 ส่วนในปี 2566 เท่ากับ 5.24 ปริมาณผลผลิตที่หนอนเจาะเมล็ดทุเรียนเข้าทำลายในปีการผลิต พ.ศ. 2565 และปี 2566 เฉลี่ย 82 และ 73 กิโลกรัมต่อไร่ หรือ 6.51 และ 4.87 เปอร์เซ็นต์ตามลำดับ

ตารางที่ 1 ข้อมูลผลผลิต ต้นทุน รายได้ อัตราส่วนรายได้ต่อต้นทุน (BCR) ปริมาณผลผลิตและเปอร์เซ็นต์การเข้าทำลายของหนอนเจาะเมล็ดทุเรียน

ข้อมูล	ปีการผลิต พ.ศ. 2565	ปีการผลิต พ.ศ. 2566
ผลผลิตเฉลี่ย (กิโลกรัมต่อไร่)	1,270	1,558
ต้นทุนเฉลี่ย (บาทต่อไร่)	22,802	31,197
รายได้เฉลี่ย (บาทต่อไร่)	107,933	163,580
รายได้สุทธิเฉลี่ย (บาทต่อไร่)	85,131	132,383
อัตราส่วนรายได้ต่อต้นทุน (BCR)	4.70	5.24
ผลผลิตเฉลี่ยที่หนอนเจาะเมล็ดทุเรียนเข้าทำลาย (กิโลกรัมต่อไร่)	82	73
เปอร์เซ็นต์การเข้าทำลายเฉลี่ยของหนอนเจาะเมล็ดทุเรียน (เปอร์เซ็นต์)	6.51	4.87

2. พัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียงเพื่อสร้างเสถียรภาพด้านรายได้และความเพียงพอ ความหลากหลายทางอาหาร

เกษตรกรเข้าร่วมพัฒนาต้นแบบการผลิตพืชผสมผสาน จำนวน 19 ราย ประกอบด้วย 9 กลุ่มพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง ดังนี้

1) กลุ่มพืชอาหาร เกษตรกรมีการปลูกพืชผักเป็นหลัก เช่น กวางตุ้ง ถั่วพู สะตอ ผักเหลียง เรดโอ๊ค/กรีนโอ๊ค และมีการปลูกพืชเครื่องแกง เช่น พริก ตะไคร้ ข่า ซึ่งเป็นพืชหลักในการบริโภคภายในครัวเรือนและชุมชน

2) กลุ่มพืชรายได้ เป็นการปลูกพืชรายได้ประจำปีชนิดต่าง ๆ เช่น ทุเรียน มังคุด ลองกอง เป็นต้น และมีการปลูกพืชรายได้รายวันและรายเดือน เช่น ยางพารา หมาก (ส่วนมากปลูกเป็นเขตแดนระหว่างแปลง) มะพร้าวแกง มะพร้าวน้ำหอม มะละกอแขกดำ ข้าวโพดหวาน และกล้วย

3) กลุ่มพืชสมุนไพรสุขภาพ เป็นการปลูกเพื่อการใช้ประโยชน์ในครัวเรือน และแปรรูปทางการค้า เช่น ขิง ข่า ตะไคร้ และขมิ้น

4) กลุ่มพืชสมุนไพรป้องกันกำจัดศัตรูพืช เป็นการปลูกเพื่อการเพิ่มปริมาณพืชและการใช้ประโยชน์สารสกัดจากพืช เช่น สะเดา ข่า และตะไคร้หอม

5) กลุ่มพืชอนุรักษ์ดินและน้ำ เช่น ปลูกปอเทือง และหญ้าแฝก

6) กลุ่มพืชอาหารสัตว์ เป็นการปลูกเพื่อตอบสนองความต้องการการเลี้ยงสัตว์ เช่น หญ้าเนเปียร์ปากช่องเพื่อเลี้ยงแพะและวัวเนื้อ แหนแดงเพื่อเป็นแหล่งโปรตีนเสริม ลดปริมาณการใช้อาหารข้นในการเลี้ยงไก่และเป็ด

7) กลุ่มพืชใช้สอย เป็นการปลูกพืชเพื่อใช้ประโยชน์ภายในครัวเรือน เช่น ไผ่นำมาใช้ประโยชน์ในการเป็นอุปกรณ์การค้ำชูต้นพืช และทำแคร่เพื่อใช้ในการปลูกผักยกแคร่

8) กลุ่มพืชอนุรักษ์พันธุกรรม เป็นการปลูกพืชเพื่ออนุรักษ์พืชดั้งเดิมและใช้ประโยชน์พืชประจำถิ่น รวมถึงการขายให้มีรายได้เพิ่ม เช่น กล้วยนางพญา ที่มีการปลูกและบริโภคในพื้นที่ ว่านค้างคาวดำ หรือว่านนางครวญ เป็นพืชสมุนไพรที่สามารถนำรากมาทำเป็นยาดอง เป็นต้น

9) กลุ่มพืชพลังงานหรือเชื้อเพลิง เป็นการปลูกพืชเพื่อการใช้ประโยชน์เป็นเชื้อเพลิงเป็นหลัก เช่น ไผ่ ซึ่งเกษตรกรนิยมใช้เป็นเชื้อเพลิงเพื่อทำกับข้าวภายในครัวเรือน

ตารางที่ 2 ข้อมูลการสำรวจและพัฒนาการผลิต 9 กลุ่มพืชผสมผสานฯ

กลุ่มพืช	ข้อมูล	เกษตรกร (ราย)	ชนิดพืช (ชนิด)	รายละเอียดชนิดพืช
กลุ่มพืชอาหาร	ก่อนเข้าร่วมโครงการ	8	3	ผักบุ้ง พริก ข่า
	หลังเข้าร่วมโครงการ	18	15	ผักบุ้ง พริก ข่า ตะไคร้ ขมิ้น มะเขือ คะน้า กวางตุ้ง แตงกวา ผักกาดหอม กวางตุ้ง ถั่วพู สะตอ ผักเหลียง ผักเรดโอ๊ค/กรีนโอ๊ค
กลุ่มพืชรายได้	ก่อนเข้าร่วมโครงการ	12	4	ทุเรียน มังคุด เงาะ ลองกอง ยางพารา
	หลังเข้าร่วมโครงการ	19	12	ทุเรียน มังคุด เงาะ ลองกอง กล้วย ยางพารา หมาก มะพร้าวแกง มะพร้าวน้ำหอม มะละกอแขกดำ ข้าวโพดหวาน จำปาดะ ส้มแขก
กลุ่มพืชสมุนไพรสุขภาพ	ก่อนเข้าร่วมโครงการ	1	1	ว่านค้างคาวดำหรือว่านนางครวญ
	หลังเข้าร่วมโครงการ	9	5	ว่านค้างคาวดำหรือว่านนางครวญ ขิง ข่า ตะไคร้ ขมิ้น
กลุ่มพืชสมุนไพรป้องกันกำจัดศัตรูพืช	ก่อนเข้าร่วมโครงการ	2	1	ตะไคร้หอม
	หลังเข้าร่วมโครงการ	3	3	ตะไคร้หอม สะเดา ข่า
กลุ่มพืชอนุรักษ์ดินและน้ำ	ก่อนเข้าร่วมโครงการ	1	1	หญ้าแฝก
	หลังเข้าร่วมโครงการ	3	3	หญ้าแฝก ปอเทือง แหนแดง

กลุ่มพืช	ข้อมูล	เกษตรกร (ราย)	ชนิดพืช (ชนิด)	รายละเอียดชนิดพืช
กลุ่มพืชอาหารสัตว์	ก่อนเข้าร่วมโครงการ	1	1	หญ้าในที่สาธารณะ
	หลังเข้าร่วมโครงการ	2	2	หญ้าเนเปียร์ปากช่อง แหนแดง
กลุ่มพืชใช้สอย	ก่อนเข้าร่วมโครงการ	2	2	ตะเคียน ไผ่
	หลังเข้าร่วมโครงการ	5	2	ตะเคียน ไผ่
กลุ่มพืชอนุรักษ์พันธุกรรมท้องถิ่น	ก่อนเข้าร่วมโครงการ	5	2	ส้มแขก ทุเรียนพื้นบ้าน
	หลังเข้าร่วมโครงการ	6	4	ส้มแขก ทุเรียนพื้นบ้าน กล้วยนางพญา ว่านค้างคาวดำหรือว่านนางครวญ
กลุ่มพืชพลังงานหรือเชื้อเพลิง	ก่อนเข้าร่วมโครงการ	5	1	ไผ่
	หลังเข้าร่วมโครงการ	5	1	ไผ่

จากการผลิตพืชของเกษตรกร พบว่า เกษตรกรนิยมปลูกพืชกลุ่มพืชรายได้ และกลุ่มพืชอาหาร เนื่องจากเกษตรกรมีความต้องการทางอาหารและรายได้เพื่อเลี้ยงดูครอบครัว โดยการผลิตผักกรีนโอ๊ค/เรดโอ๊ค ผักเหลียง สะตอ ข่า และหมาก เป็น 5 ชนิดพืช ที่มีอัตราส่วนผลตอบแทนต่อต้นทุน (BCR) มากที่สุด เท่ากับ 7.55, 7.00, 6.29, 6.10 และ 5.74 ตามลำดับ

ตารางที่ 3 ชนิดพืชที่มีอัตราส่วนผลตอบแทนต่อต้นทุน (BCR) มากที่สุด 5 ลำดับ จากการผลิตพืชตาม 9 กลุ่มพืชผสมผสานฯ

ลำดับที่	ชนิดพืช	ผลผลิต (กิโลกรัม)	ต้นทุน (บาท/ไร่)	รายได้ (บาท/ไร่)	อัตราส่วนรายได้ต่อต้นทุน (BCR)
1	ผักกรีนโอ๊ค/เรดโอ๊ค	780	6,200	46,800	7.55
2	ผักเหลียง	350	2,500	17,500	7.00
3	สะตอ	620	3,500	22,000	6.29
4	ข่า	1,500	17,200	105,000	6.10
5	หมาก	798	7,640	43,890	5.74

3. พัฒนาต้นแบบการผลิตพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพและปลอดภัย

เกษตรกรเข้าร่วมพัฒนาการผลิตพืชอินทรีย์ จำนวน 14 ราย โดยช่วงแรกของการพัฒนาจะเน้นให้เกษตรกรได้เรียนรู้ ฝึกทักษะ สร้างประสบการณ์ในการทำเกษตรอินทรีย์ เมื่อเกษตรกรมีความคุ้นเคยกับทำเกษตรอินทรีย์ จึงต่อยอดไปสู่การเพิ่มประสิทธิภาพการผลิต โดยผลิตผักกวางตุ้งอินทรีย์ มะเขือเปราะอินทรีย์ และพริกขี้หนูอินทรีย์ ซึ่งเน้นการปลูกในถุงปลูก และกระบะเพาะ พบว่า ในปีการผลิต พ.ศ. 2565 ให้ผลผลิตเฉลี่ย เท่ากับ 747, 954 และ 741 กิโลกรัม/ไร่ ตามลำดับ สามารถสร้างรายได้เฉลี่ย 22,400,

28,629 และ 74,080 บาท/ไร่ ตามลำดับ ส่วนปี 2566 ให้ผลผลิตเฉลี่ย เท่ากับ 814, 1,005 และ 804 กิโลกรัม/ไร่ ตามลำดับ สร้างรายได้เฉลี่ย 32,549, 35,163 และ 80,436 บาท/ไร่ ตามลำดับ

ตารางที่ 4 ข้อมูลผลผลิตและรายได้เฉลี่ยจากการพัฒนาการผลิตพืชอินทรีย์

ชนิดพืชอินทรีย์	ข้อมูล	ปีการผลิต พ.ศ. 2565	ปีการผลิต พ.ศ. 2566
ผักกวางตุ้งอินทรีย์	ผลผลิตเฉลี่ย (กิโลกรัม/ไร่)	747	814
	รายได้เฉลี่ย (บาท/ไร่)	22,400	32,549
มะเขือเปราะอินทรีย์	ผลผลิตเฉลี่ย (กิโลกรัม/ไร่)	954	1,005
	รายได้เฉลี่ย (บาท/ไร่)	28,629	35,163
พริกขี้หนูอินทรีย์	ผลผลิตเฉลี่ย (กิโลกรัม/ไร่)	741	804
	รายได้เฉลี่ย (บาท/ไร่)	74,080	80,436

ผลผลิตเฉลี่ยของพืชอินทรีย์ทุกชนิดในปีการผลิต พ.ศ. 2566 เพิ่มสูงขึ้น เมื่อเทียบกับปี 2565 แต่ผลผลิตเฉลี่ยยังต่ำกว่าผลผลิตจากการผลิตพืชในรูปแบบปกติ (ใช้ปุ๋ยเคมีและสารเคมีทางการเกษตร) โดยจังหวัดยะลา มีผลผลิตเฉลี่ยของผักกวางตุ้ง มะเขือเปราะ และพริกขี้หนู เท่ากับ 960, 1,700 และ 941 กิโลกรัมต่อไร่ ตามลำดับ (สำนักงานเกษตรจังหวัดยะลา, 2564) ซึ่งโจทย์ที่ต้องร่วมกันพัฒนาและยกระดับกระบวนการผลิตผักอินทรีย์ให้ได้ผลผลิตที่สูงขึ้นต่อไป

ส่วนการป้องกันกำจัดศัตรูพืช จะเน้นการป้องกันก่อนมีการระบาด หรือควบคุมเมื่อพบการระบาดเพียงเล็กน้อย ความเสียหายจากศัตรูพืชที่พบ จึงไม่เกิดความรุนแรงถึงระดับเศรษฐกิจ โดยสำรวจการเข้าทำลายของศัตรูพืชอย่างสม่ำเสมอ และใช้สารชีวภัณฑ์ เช่น ใช้ไส้เดือนฝอยกำจัดแมลงสายพันธุ์ไทย และเชื้อแบคทีเรีย *Bacillus thuringiensis* (BT) ในการควบคุมหนอนใยผัก/หนอนผีเสื้อกลางคืน

4. พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหาร

การพัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ โดยการปลูกแบบยกแคร่ มีเกษตรกรเข้าร่วม 13 ราย พืชที่ปลูก ได้แก่ ผักกวางตุ้ง ผักคะน้า ผักกาดหอม ผักกรีนโอ๊ค/เรดโอ๊ค ซึ่งมีอัตราส่วนรายได้ต่อต้นทุน (BCR) อยู่ที่ 3.01, 2.99, 2.61 และ 6.07 ตามลำดับ และรูปแบบการจัดการเขตกรรม โดยนำระบบน้ำหยดมาใช้เพื่อลดการใช้น้ำในภาคการเกษตร มีเกษตรกรเข้าร่วม 4 ราย โดยพืชที่ดำเนินการทดลอง คือ ผักกูด ซึ่งมีอัตราส่วนรายได้ต่อต้นทุน (BCR) อยู่ที่ 7.11 ซึ่งระบบน้ำหยดมีเกษตรกรที่สนใจและเริ่มนำวิธีการไปปรับใช้ในแปลงตนเอง เช่น การทำแปลงผักกูดโดยใช้ระบบน้ำหยดในร่องแปลงยางพารา

ตารางที่ 6 อัตราส่วนรายได้ต่อต้นทุน (BCR) ของพืชผักที่ปลูกแบบยกแคร่

ชนิดพืช	ผลผลิต (กิโลกรัม/ไร่)	ต้นทุน (บาท/ไร่)	รายได้ (บาท/ไร่)	อัตราส่วนรายได้ต่อต้นทุน (BCR)
ผักกวางตุ้ง	1,130	7,500	22,600	3.01
ผักคะน้า	1,120	7,500	22,400	2.99
ผักกาดหอม	980	7,500	19,600	2.61
ผักกรีนโอ๊ค/เรดโอ๊ค	860	8,500	51,600	6.07

ตารางที่ 7 อัตราส่วนรายได้ต่อต้นทุน (BCR) ของการปลูกผักกูดในระบบน้ำหยด

ชนิดพืช	ผลผลิต (กิโลกรัม/ไร่)	ต้นทุน (บาท/ไร่)	รายได้ (บาท/ไร่)	อัตราส่วนรายได้ต่อต้นทุน (BCR)
ผักกูด	800	4,500	32,000	7.11

5. พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วม

พัฒนาการมีส่วนร่วมของชุมชน โดยเริ่มจากรวบรวมและสรุปผลการสำรวจข้อมูล พบปะผู้มีส่วนได้ส่วนเสีย และจัดทำเวทีผู้มีส่วนได้ส่วนเสียในชุมชน เพื่อกำหนดเป้าหมายการพัฒนา โดยมีเกษตรกรสมัครใจเพื่อเข้าร่วมการพัฒนา จำนวน 29 ราย ดำเนินการจัดตั้งกลุ่มเกษตรกร และคัดเลือกคณะกรรมการโครงการวิจัย

พัฒนาสร้างความเข้มแข็งของกลุ่มเกษตรกร ผ่านกระบวนการจัดเวทีวิจัยสัญจร เพื่อแลกเปลี่ยนเรียนรู้ภูมิปัญญา ประสบการณ์ระหว่างเกษตรกร นักวิจัย และผู้เกี่ยวข้อง โดยกำหนดแผนดำเนินการจัดเวทีวิจัยสัญจร อย่างน้อยเดือนละ 1 ครั้ง ปีการผลิต พ.ศ. 2565 ดำเนินการแล้ว จำนวน 11 ครั้ง และปี 2566 จำนวน 10 ครั้ง รวมทั้งสิ้น 21 ครั้ง โดยมีกิจกรรมดังนี้

1) ของฝากจากเพื่อนบ้าน: เพื่อรื้อฟื้นวัฒนธรรมการเอื้อเฟื้อเผื่อแผ่ โดยการนำพันธุ์พืชหรือผลผลิต ไปเอื้อเฟื้อเผื่อแผ่แก่เจ้าของบ้านที่ไปเยี่ยมเยียน

ภาพที่ 2 กิจกรรมของฝากจากเพื่อนบ้าน

2) เรื่องเล่าจากเจ้าของบ้าน: เพื่อสร้างความสัมพันธ์ระหว่างบุคคลโดยการแลกเปลี่ยนประสบการณ์ในอดีตถึงปัจจุบัน

ภาพที่ 3 กิจกรรมเรื่องเล่าจากเจ้าบ้าน

3) การแลกเปลี่ยนเรียนรู้ภูมิปัญญาการทำการเกษตร: เพื่อการศึกษา เรียนรู้ แบ่งปันภูมิปัญญาความรู้ ประสบการณ์ การร่วมอภิปราย และแสดงความคิดเห็นต่อการแก้ไขปัญหาในแปลงปลูกพืช

ภาพที่ 4 กิจกรรมแลกเปลี่ยนเรียนรู้ภูมิปัญญาการทำเกษตร

4) การสาธิตความรู้วิชาการ: เพื่อถ่ายทอดเทคโนโลยีการเกษตร แลกเปลี่ยนเรียนรู้ ตามความต้องการของเกษตรกร หรือจากปัญหาการเกษตรที่พบ

ภาพที่ 5 กิจกรรมการสาธิตความรู้วิชาการ

5) การบรรยายสรุปการดำเนินงาน: เพื่อแลกเปลี่ยนผลการทดลองและฝึกการเป็นวิทยากร โดยการประเมินผลการจัดเวทีวิจัยสัญจรในทุกกิจกรรมและประโยชน์ที่ได้รับ พบว่า เกษตรกรมีความพึงพอใจในระดับมากถึงมากที่สุด

ภาพที่ 6 กิจกรรมบรรยายสรุปการดำเนินงาน

การเชื่อมโยงชุมชนเครือข่าย ได้จัดงานวันถ่ายทอดเทคโนโลยี การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ครั้งที่ 5 ประจำปี พ.ศ. 2566 ณ องค์การบริหารส่วนตำบลตาชี อำเภอยะหา จังหวัดยะลา ในวันที่ 15 สิงหาคม พ.ศ. 2566 เพื่อให้เกิดการแลกเปลี่ยนเรียนรู้กระบวนการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของเกษตรกรจากชุมชนนวัตกรรมวิชาการเกษตร จำนวน 5 ชุมชน จากจังหวัดสงขลา พัทลุง ปัตตานี ยะลา และสตูล เป้าหมายจำนวน 200 ราย ภายในงานมีการจัดนิทรรศการจากหน่วยงานราชการเครือข่าย เช่น องค์การบริหารส่วนตำบลตาชี สำนักงานเกษตรอำเภอยะหา ศูนย์วิจัยและพัฒนาการเกษตรสตูล ศูนย์วิจัยและพัฒนาการเกษตรปัตตานี ศูนย์วิจัยและพัฒนาการเกษตรสงขลา และศูนย์วิจัยและพัฒนาการเกษตรพัทลุง โดยมีกิจกรรมเวทีแลกเปลี่ยนเรียนรู้และกิจกรรมเยี่ยมเยียนศึกษาดูงานภายในพื้นที่ชุมชนตำบลตาชี ทั้งหมด 5 ฐานการเรียนรู้ ได้แก่ การผลิตพืชผสมผสานในช่วงทุเรียนยังไม่ให้ผลผลิต การผลิตทุเรียนคุณภาพ การจัดการศัตรูพืชและการจัดการดินปุ๋ย การผลิตพืชผสมผสานและการจำหน่ายสินค้าออนไลน์ และการแปรรูปผลผลิตทางการเกษตร

ภาพที่ 7 การเชื่อมโยงเครือข่าย ในงานวันถ่ายทอดเทคโนโลยี

สรุปและอภิปรายผล

เมื่อเปรียบเทียบผลผลิตเฉลี่ยจากเทคโนโลยีการผลิตพืชในการทดลองต่าง ๆ กับผลผลิตเฉลี่ยจากการผลิตพืชของเกษตรกรทั่วไปในจังหวัดยะลา ปี พ.ศ. 2564 พบว่ามีผลผลิตเฉลี่ยที่มากกว่าหรือใกล้เคียงกับผลผลิตเฉลี่ยของจังหวัด ยกเว้นในการทดลองการผลิตพืชอินทรีย์ เมื่อดำเนินการร่วมกับการสร้างความเข้มแข็งให้กลุ่มเกษตรกร โดยการจัดกระบวนการเวทีวิจัยสัญจร แลกเปลี่ยนเรียนรู้ร่วมกัน สร้างอัตลักษณ์ชุมชน และจัดการเชื่อมโยงเครือข่ายชุมชน จึงส่งผลให้ชุมชนมีความมั่นคงด้านอาหาร นำไปสู่การเพิ่มเสถียรภาพด้านรายได้ของชุมชนต่อไป

ส่วนการขาดแคลนแรงงานในพื้นที่ และการที่เกษตรกรส่วนใหญ่เป็นผู้สูงอายุ ส่งผลต่อแผนการจัดการผลิตพืชที่กำหนดไว้ โดยเฉพาะการจัดการที่ต้องดำเนินการตามช่วงเวลานั้น ๆ เช่น การตัดแต่ง การโยงกิ่ง การฉีดพ่นสารเคมี และการห่อผล ส่งผลต่อปริมาณ/คุณภาพของผลผลิต และรายได้ของเกษตรกร ดังนั้น ควรจัดทำแผนบริหารความเสี่ยง และติดตาม ปรับเปลี่ยนการดำเนินงานอย่างต่อเนื่อง เช่น การทำสัญญาจ้างแรงงานล่วงหน้า และการหาแรงงานสำรองไว้ ในกรณีที่มีการแย่งชิงแรงงานกันในพื้นที่

ข้อเสนอแนะ

เกษตรกรในพื้นที่ส่วนใหญ่เป็นผู้สูงอายุ ไม่มีทายาทเกษตรกรมารับช่วงต่อ ทำให้มีข้อจำกัดในด้านการใช้แรงงาน และการขาดแคลนแรงงานรับจ้างในพื้นที่ส่งผลต่อการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชน จึงจำเป็นต้องให้ความสำคัญกับการพัฒนายุวเกษตรกรหรือเกษตรกรรุ่นใหม่ ให้เห็นถึงความสำคัญของการผลิตพืชเพื่อความมั่นคงด้านอาหารของชุมชน ดังนั้นจึงควรขยายผลไปสู่นักเรียนที่ศึกษาในโรงเรียน หรือเยาวชนนอกระบบการศึกษาในพื้นที่ต่อไป

คำขอบคุณ

ขอขอบพระคุณ ความร่วมมือจากคณะนักวิจัย เกษตรกร หน่วยงานภาครัฐและเอกชนในพื้นที่ โดยงานวิจัยได้รับการสนับสนุนจากกรมวิชาการเกษตร กระทรวงเกษตรและสหกรณ์ และสนับสนุนงบประมาณจากกองทุนส่งเสริมวิทยาศาสตร์ วิจัยและนวัตกรรม (สกสว.)

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การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดปัตตานี

Crops Production Management to Increase Income Stability and Food Security of DOA Smart Community in Pattani Province

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บทคัดย่อ

โครงการวิจัยการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดปัตตานี ดำเนินการทดลองที่ตำบลพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี ระหว่างเดือนตุลาคม พ.ศ. 2565 – กันยายน พ.ศ. 2566 ประกอบด้วย 5 การทดลอง พบว่า การทดลองที่ 1 กรรมวิธีแนะนำของกรมวิชาการเกษตร ให้จำนวนผลผลิตมะพร้าวเฉลี่ยและมีรายได้สุทธิสูงกว่ากรรมวิธีของเกษตรกร คือ จำนวนผลผลิตเฉลี่ย 1,132 ผล/ไร่ และมีรายได้สุทธิเฉลี่ย 9,970 บาท/ไร่ การทดลองที่ 2 โดยพัฒนาต้นแบบการผลิตพืชผสมผสานทั้ง 9 ชนิด พบว่า มีการปลูกพืชเพิ่มขึ้นจาก 108 ชนิด เป็น 135 ชนิด ซึ่งเพิ่มขึ้น 27 ชนิด เกษตรกรมีรายได้สุทธิเฉลี่ย 34,712 บาท/ปี การทดลองที่ 3 การผลิตถั่วฝักยาวอินทรีย์ให้ผลผลิตเฉลี่ย 1,217 กิโลกรัม/ไร่ และมีรายได้สุทธิเฉลี่ย 16,977 บาท/ไร่ การทดลองที่ 4 พัฒนาต้นแบบการผลิตพืช โดยการปลูกผักยกแคร่ พบว่า ผักกาดขาว ให้ผลผลิตเฉลี่ย 931 กิโลกรัม/ไร่ และมีรายได้สุทธิเฉลี่ย 14,566 บาท/ไร่ การทดลองที่ 5 พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วมจังหวัดปัตตานี มีการจัดเวทีวิจัยสัญจรเพื่อแลกเปลี่ยนเรียนรู้ภูมิปัญญา ประสบการณ์ระหว่างเกษตรกร นักวิจัย และผู้เกี่ยวข้อง มีการเชื่อมโยงเครือข่าย โดยจัดงานวันถ่ายทอดเทคโนโลยี “การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร” ครั้งที่ 3 ประจำปี พ.ศ. 2566 จำนวน 200 ราย มีกิจกรรมเยี่ยมเยียนศึกษาดูงานภายในพื้นที่ชุมชนตำบลพ่อมิ่ง ทั้งหมด 5 ฐานการเรียนรู้ ส่งผลให้เกิดการพัฒนาการแบบมีส่วนร่วมของชุมชน เกิดการแลกเปลี่ยนเรียนรู้ สร้างความเข้มแข็งให้เกษตรกรเครือข่ายจาก 5 ชุมชน ส่วนการทดสอบการผลิตพืชในชุมชนพ่อมิ่ง เกษตรกรในชุมชนมีการยอมรับเทคโนโลยี ทำให้ผลผลิตพืชเพิ่มขึ้น และมีรายได้เพิ่มขึ้น นำไปสู่การเพิ่มเสถียรภาพด้านรายได้ของชุมชนต่อไป

คำสำคัญ: การผลิตพืช, ความมั่นคงทางอาหาร, จังหวัดปัตตานี

Abstract

Crops Production Management to increase Income Stability and Food Security of DOA smart community in Pattani Province. The experiment was conducted at Pho Ming Subdistrict, Panare District, Pattani Province. Between October 2022 - September 2023. This project consists of 5 experiments. Experiment 1 recommended methods of the Department of Agriculture The average coconut yield and net income were higher than the farmers' method, with an average yield of 1,132 fruits/rai and an average net income of 9,970 baht/rai. Experiment 2 by developing a prototype for producing all 9 types of mixed crops found that There was an increase from 108 types of crops to 135, which increased by 27 types. Farmers had an average net income of 34,712 baht/year. Experiment 3 Production of organic yardlong beans yielded an average yield of 1,217 kilograms/rai and an average net income of 16,977. Baht/rai Experiment 4 Develop a prototype for crop production. By growing vegetables on a litter, it was found that Chinese cabbage had an average yield of 931 kilograms/rai and an average net income of 14,566 baht/rai. Experiment 5 Develop a food security innovation platform in participatory communities in Pattani Province. There is a traveling research forum to exchange knowledge and wisdom. Experiences between farmers, researchers, and related parties There is a network connection. Organized a technology transfer day “Management of crop production to increase income stability and food security of the Agricultural Innovation Community” in 3rd Field Day in 2023, 200 people, there are visiting activities. Study tour within the Pho Ming Subdistrict community area, a total of 5 learning bases. Resulting in the participatory development of the community. There was an exchange of knowledge. Strengthening the network of farmers from 5 communities, while testing crop production in the Por Ming community Farmers in the community accept technology. Makes crop production increase and have increased income Leading to further increasing the income stability of the community.

Keywords: crop production, food security, Pattani Province

บทนำ

โครงการวิจัยนี้จัดทำเพื่อตอบสนองยุทธศาสตร์ชาติระยะ 20 ปี (พ.ศ. 2561 – 2580) ด้านเกษตรในแผนแม่บทย่อยระบบนิเวศเกษตรที่กำหนดให้มีการสร้างความมั่นคงอาหารให้กับครัวเรือนและชุมชน ลดการพึ่งพาอาหารจากภายนอก สร้างเสถียรภาพด้านรายได้ ส่งเสริมเกษตรตามหลักปรัชญาของเศรษฐกิจพอเพียง สร้างความเข้มแข็งของชุมชน สนับสนุนให้ท้องถิ่นมีบทบาทดำเนินการให้เกิดความมั่นคงด้านอาหารในชุมชน รวมทั้งวิจัยพัฒนาการสร้างมูลค่าเพิ่ม ซึ่งด้านสถานการณ์ความมั่นคงทางอาหารของไทย พบว่า อยู่ในลำดับที่ 51 ของโลก มี 59.5 จาก 100 คะแนน โดยประเด็นที่ไทยยังต้องพัฒนา คือ การลดค่าใช้จ่ายด้านอาหาร การกระจายรายได้ เพิ่มประสิทธิภาพการผลิตลดสารพิษตกค้างในผลผลิต และลดผลกระทบจากเกิดภัยพิบัติธรรมชาติ (สำนักงานเศรษฐกิจการเกษตร, 2560) และจาก

วิกฤตโรคระบาด Covid-19 พบว่า ได้เกิดการขาดแคลนพืชอาหารบางชนิดในชุมชน ส่วนสินค้าที่เกษตรกรผลิตก็จำหน่ายได้น้อยลง ซึ่งสะท้อนให้เห็นถึงการขาดภูมิคุ้มกันที่ดีของชุมชน จึงจะต้องพัฒนาให้ปรับตัวเพื่อรับผลกระทบจากวิกฤตที่กำลังเกิดขึ้น โดยยุทธศาสตร์จังหวัดปัตตานีได้มุ่งเน้นการส่งเสริมการผลิตที่ได้มาตรฐาน เช่น GAP หรือเกษตรอินทรีย์ ด้านเสถียรภาพทางอาหาร พื้นที่เป้าหมายในการวิจัยและพัฒนาในจังหวัดปัตตานี มีพื้นที่ปลูกไม้ยืนต้น 461,761 ไร่ ข้าว 123,135 ไร่ ไม้ผล 50,857 ไร่ พืชไร่ 15,115 ไร่ และพืชผัก 9,206 ไร่ (สำนักงานเกษตรจังหวัดปัตตานี, 2565) ชุมชนตำบลพ่อมิ่ง อำเภอปะนาเระ มีมะพร้าวเป็นพืชหลัก ผลผลิตทางการเกษตรที่สำคัญรองลงมา ได้แก่ ข้าว ยางพารา ปาล์มน้ำมัน ไม้ผล (ทุเรียน มังคุด ลองกอง) พืชไร่ และพืชผัก ทำเกษตรโดยอาศัยน้ำฝน การสร้างเสถียรภาพรายได้และการสร้างความมั่นคงทางอาหารในจังหวัดปัตตานี พบว่า มีความเสี่ยงสูง เนื่องจากสาเหตุหลายประการ เกษตรกรส่วนใหญ่นิยมปลูกพืชเชิงเดี่ยว ได้แก่ มะพร้าว ข้าว ยางพารา และปาล์มน้ำมัน มีผลิตภาพการผลิตต่ำ ปัจจัยการผลิตมีราคาสูง และผลกระทบจากภาวะราคาสินค้าเกษตรตกต่ำ ทำให้รายได้เกษตรกรลดลง ความเสียหายในการปลูกพืชเนื่องจากการเปลี่ยนแปลงสภาพภูมิอากาศ เช่น ไม้ผลออกดอกออกผลไม่เป็นไปตามฤดูกาล เช่น มังคุด ลองกอง เป็นต้น ปัญหาน้ำท่วมขังในพื้นที่ราบลุ่ม ในช่วงเดือนพฤศจิกายน - มกราคม เช่น เกิดความเสียหายของพืชผักในชุมชนจากน้ำท่วมขัง ซึ่งจำเป็นต้องวางระบบและรูปแบบการปลูกพืชที่เหมาะสม รวมถึงการระบาดของโรคและแมลงศัตรูพืชในชุมชน เช่น หนอนใยผัก แมลงวันผลไม้ ด้วงแรด และแมลงดำหนามมะพร้าว ทำให้พืชผักและพืชอาหารของเกษตรกรเกิดความเสียหาย ส่งผลให้พืชอาหารและพืชใช้ประโยชน์ขาดความหลากหลาย และยังพบว่าเกษตรกรในชุมชนยึดวิธีการเพาะปลูกแบบดั้งเดิม และไม่มีการบริหารจัดการที่ถูกต้องเหมาะสม ทำให้ผลผลิตเฉลี่ยต่อไร่และคุณภาพผลผลิตต่ำ รวมทั้งการแปรรูปสร้างมูลค่าเพิ่มสินค้าเกษตรยังมีน้อย ส่วนด้านการจัดการความมั่นคงทางอาหารชุมชน ระบบการเชื่อมโยง และการกระจายอาหารจากแหล่งผลิตสู่ผู้บริโภค ในสังคมชนบทจะอาศัยตลาดนัดชุมชน ซึ่งชุมชนไม่สามารถจัดการความมั่นคงทางอาหารได้ ทั้งในประเด็นการเข้าถึงความหลากหลาย ความพอเพียง และการพึ่งตนเองได้ จึงจำเป็นที่จะต้องพัฒนาการจัดการผลิตพืช เพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชน เพื่อให้เกิดการพัฒนาการเกษตรอย่างยั่งยืน มีผลิตภาพทางการเกษตรเพิ่มขึ้น อันจะนำไปสู่ชุมชนนวัตกรรมที่เกิดการพึ่งพาตนเองตามหลักปรัชญาของเศรษฐกิจพอเพียง และสามารถขยายผลไปยังชุมชนใกล้เคียงหรือพื้นที่อื่น ๆ ต่อไป

วัตถุประสงค์ของการวิจัย

1. วิจัยและพัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชน และการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง เพื่อสร้างเสถียรภาพด้านรายได้ และการเข้าถึงอาหารได้อย่างพอเพียงและมีความหลากหลายทางอาหาร

2. วิจัยและพัฒนารูปแบบและเทคโนโลยีที่เหมาะสมในการผลิตพืชปลอดภัยและพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้ และมีอาหารที่มีคุณภาพและปลอดภัย

3. วิจัยและพัฒนารูปแบบและเทคโนโลยีที่เหมาะสมในการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และมีเสถียรภาพทางอาหาร

4. วิจัยและพัฒนาการสร้างแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารชุมชน หรือพื้นที่สำหรับการเชื่อมโยงกิจกรรมและแลกเปลี่ยนเรียนรู้ในการจัดการความมั่นคงอาหารของชุมชนต้นแบบ เพื่อพัฒนา

ชุมชนต้นแบบ และเครือข่ายชุมชน ที่จะเป็นศูนย์ถ่ายทอดเทคโนโลยีด้านการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงทางอาหาร และขยายผลไปสู่ชุมชนอื่น ๆ

แนวคิด ทฤษฎี กรอบแนวคิด

การวิจัยการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดปัตตานี เป็นการศึกษาการพัฒนาการจัดการพืชทั้งองค์รวมในชุมชน โดยนำตัวชี้วัดความมั่นคงทางอาหารของ FAO (2017) 4 ด้าน คือ 1) Food Availability ปริมาณและความหลากหลายอาหาร 2) Food Access การเข้าถึงอาหาร 3) Food Stability เสถียรภาพอาหาร และ 4) Food Utilization คุณภาพอาหาร มาผสมผสานกับแนวนโยบายการพัฒนาของประเทศไทย เป็นประเด็นการวิจัยและพัฒนา 5 ด้าน คือ 1) การเพิ่มประสิทธิภาพผลิตพืชเศรษฐกิจชุมชนที่เป็นทางเลือกที่ช่วยให้เกิดเสถียรภาพทางรายได้ เพื่อเพิ่มความสามารถในการเข้าถึงอาหาร 2) การผลิตพืชผสมผสานที่หลากหลายที่แก้ปัญหาการขาดความหลากหลายจากการผลิตพืชเชิงเดี่ยว เพื่อเพิ่มความเพียงพอทางอาหาร 3) การผลิตพืชอินทรีย์เพื่อความปลอดภัยและคุณภาพทางอาหาร 4) การผลิตพืชที่ยืดหยุ่นต่อการเปลี่ยนแปลงสภาพภูมิอากาศทั้งภัยแล้งน้ำท่วมเพื่อเสถียรภาพอาหาร และ 5) การพัฒนาแพลตฟอร์มการจัดการความมั่นคงทางอาหารชุมชน ให้เกิดชุมชนนวัตกรรมที่สามารถจัดการตนเองได้ด้วยเทคโนโลยี/นวัตกรรม และการพัฒนาชุมชนต้นแบบที่เข้มแข็ง รวมทั้งตอบสนองยุทธศาสตร์ชาติระยะ 20 ปี (พ.ศ. 2561 – 2580) และแนวทางการพัฒนาที่ยั่งยืน (SDGs)

กรอบการวิจัย

ประเด็นปัญหา คือ เกษตรกรในชุมชนส่วนใหญ่นิยมปลูกพืชเชิงเดี่ยว ได้แก่ มะพร้าว ข้าว ยางพารา และปาล์มน้ำมัน โดยยึดวิธีการเพาะปลูกแบบดั้งเดิม ไม่มีการบริหารจัดการที่ถูกต้องเหมาะสม มีผลิตภาพการผลิตต่ำ รวมถึงปัจจัยการผลิตมีราคาสูง และผลกระทบจากภาวะราคาสินค้าเกษตรตกต่ำ ทำให้รายได้เกษตรกรลดลง ประสบปัญหาการขาดเสถียรภาพรายได้ และขาดความมั่นคงทางอาหารของชุมชน การผลิตพืชชนิดต่าง ๆ ยังมีประสิทธิภาพต่ำ ขาดความหลากหลาย มีการสร้างมูลค่าเพิ่มน้อย การเชื่อมโยงการตลาดสินค้ายังมีน้อย การรวมกลุ่มเกษตรกรยังไม่เข้มแข็ง ได้รับความเสียหายจากภัยธรรมชาติที่เกิดจากการเปลี่ยนแปลงสภาพภูมิอากาศ เช่น น้ำท่วมขังในพื้นที่ลุ่ม ทำให้พืชผักและพืชอาหารของเกษตรกรเกิดความเสียหาย รวมถึงมีการระบาดของโรคและแมลงศัตรูพืชในชุมชน เช่น หนอนใยผัก แมลงวันผลไม้ ด้วงแรด และแมลงดำหนามมะพร้าว การขาดภูมิคุ้มกันในการจัดการเมื่อได้รับผลกระทบจากภายนอก เช่น ผลกระทบจากโรคระบาด Covid-19 ตลอดจนขาดการบริหารจัดการเชื่อมโยงที่ดีในชุมชน

วัตถุประสงค์เป้าหมาย พัฒนาการจัดการผลิตพืชทั้งองค์รวมของชุมชนให้มีเทคโนโลยีการปฏิบัติที่เหมาะสมกับภูมิสังคม สามารถเพิ่มรายได้ เพิ่มความหลากหลายของพืชใช้ประโยชน์ ผลิตได้มาตรฐานลดสารพิษตกค้าง ลดความเสียหายจากภัยธรรมชาติพร้อม ๆ กับ มีการบริหารจัดการอาหารอย่างเป็นระบบจากผู้ผลิตสู่ผู้บริโภคในชุมชน ทำให้ชุมชนมีความเข้มแข็ง พึ่งตนเองได้ และเป็นชุมชนนวัตกรรมที่จะถ่ายทอดเทคโนโลยีและขยายผลไปสู่ชุมชนอื่น ๆ ได้ต่อไป

โครงการวิจัยการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหาร ของชุมชนนวัตกรรมวิชาการเกษตรจังหวัดปัตตานี

การพัฒนาเทคโนโลยีที่เหมาะสม ในการผลิตพืชเศรษฐกิจชุมชน เพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร (Food access)	การพัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง เพื่อสร้างเสถียรภาพด้านรายได้ ความเพียงพอและความหลากหลายทางอาหาร (Food availability)	พัฒนาต้นแบบการผลิตพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพปลอดภัย (Food Utilization)	พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศเพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหาร (Food Stability)

การพัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วม (Food Security Innovation Platform)

ผลิตภาพการผลิตของภาคเกษตรเพิ่มขึ้น จากการนำเอาองค์ความรู้ เทคโนโลยี และนวัตกรรมด้านการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนไปจัดการกับกลุ่มปัญหาการเกษตร ได้ถ่ายทอดและขยายผลการใช้ประโยชน์ให้กลุ่มเป้าหมายและพื้นที่เพื่อสร้างความยั่งยืนในการแก้ปัญหาและการพัฒนาต่อไป

ภาพที่ 1 กรอบการวิจัย โครงการวิจัย การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร จังหวัดปัตตานี

วิธีดำเนินการวิจัย

เป็นการวิจัยเชิงปฏิบัติการแบบมีส่วนร่วม (Participatory Action Research: PAR) (Kemmis and Mc Taggart, 1982) ที่นักวิจัยทำการวิจัยร่วมกับเกษตรกร ชุมชน หน่วยงานในท้องถิ่น และผู้ประกอบการ โดยมีขั้นตอนการวิจัย 4 ขั้นตอน คือ 1) ขั้นวางแผน (Planning) 2) ขั้นปฏิบัติการ (Acting) 3) ขั้นสังเกตการณ์ (Observing) 4) ขั้นสะท้อนผลปฏิบัติ (Reflecting) ซึ่งการวิจัยจะมีรอบวงจรการปฏิบัติครบ 4 ขั้นตอน โดยก่อนทดสอบ ได้ทำการสำรวจและสัมภาษณ์เกษตรกรในชุมชน

- สถานที่ดำเนินการวิจัย คือ ชุมชนตำบลพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี
- ระยะเวลาดำเนินงานวิจัยระหว่างเดือนตุลาคม พ.ศ. 2565 - กันยายน พ.ศ. 2566
- การวิจัยและพัฒนาประกอบด้วย 5 การทดลอง

1) พัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหาร โดยเปรียบเทียบกรรมวิธีการใช้เทคโนโลยีการผลิตตามคำแนะนำของกรมวิชาการเกษตร และกรรมวิธีเกษตรกร บันทึกข้อมูลผลผลิต ต้นทุน รายได้ รายได้สุทธิ และอัตราส่วนรายได้ต่อต้นทุน (BCR)

2) พัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียงเพื่อสร้างเสถียรภาพด้านรายได้และความเพียงพอ ความหลากหลายทางอาหาร สำรวจและพัฒนาการปลูกพืชผสมผสาน 9 กลุ่ม ได้แก่ 1) พืชอาหาร 2) พืชรายได้ 3) พืชสมุนไพรสุขภาพ 4) พืชสมุนไพรป้องกันกำจัดศัตรูพืช 5) พืชอนุรักษ์ดินและน้ำ 6) พืชอาหารสัตว์ 7) พืชอนุรักษ์พันธุกรรมท้องถิ่น 8) พืชใช้สอย และ 9) พืชพลังงานหรือเชื้อเพลิง บันทึกข้อมูลต้นทุน รายได้ รายได้สุทธิ และอัตราส่วนรายได้ต่อต้นทุน (BCR) พร้อมกับพัฒนาต้นแบบสร้างมูลค่าเพิ่มจากการแปรรูปผลผลิต

3) พัฒนาต้นแบบการผลิตพืชอินทรีย์เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพและปลอดภัย พัฒนาและทดสอบเทคโนโลยีการผลิตพืชอินทรีย์ พัฒนาเกษตรอินทรีย์รายใหม่ที่เริ่มจากแปลงเล็ก เพื่อให้เกษตรกรได้เรียนรู้ ฝึกทักษะ สร้างประสบการณ์ในการทำเกษตรอินทรีย์ บันทึกข้อมูลผลผลิต ต้นทุน รายได้ รายได้สุทธิ และอัตราส่วนรายได้ต่อต้นทุน (BCR)

4) พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหาร พัฒนาและทดสอบเทคโนโลยีและรูปแบบการผลิตพืชที่เหมาะสมต่อการเปลี่ยนแปลงสภาพภูมิอากาศ เช่น การปลูกผักยกแคร่ บันทึกข้อมูลผลผลิต ต้นทุน รายได้ รายได้สุทธิ และอัตราส่วนรายได้ต่อต้นทุน (BCR)

5) พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วม พัฒนาการมีส่วนร่วมของชุมชน พัฒนาเป็นศูนย์เรียนรู้ พัฒนาสร้างความเข้มแข็งของกลุ่มเกษตรกร โดยจัดเวทีแลกเปลี่ยนเรียนรู้ สร้างอัตลักษณ์ชุมชน จัดเชื่อมโยงเครือข่ายชุมชน โดยการจัดกิจกรรมงานวันถ่ายทอดเทคโนโลยี และทดลองขยายผลไปสู่ชุมชนเครือข่าย

ผลการวิจัย

สภาพพื้นที่ ตำบลพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี เป็นพื้นที่ราบเชิงเขา ทิศเหนือ และทิศใต้ เป็นแนวเทือกเขา บริเวณใจกลางของตำบลเป็นที่ราบลุ่ม มีพื้นที่บางส่วนที่เป็นพื้นที่ลุ่มน้ำท่วมถึง โดยเกษตรกรปลูกมะพร้าวบนที่ราบลุ่ม ลักษณะดินเป็นดินทราย และดินร่วนปนทราย สภาพอากาศมีอากาศชื้นและฝนตกชุกตลอดปี จากข้อมูลอุตุนิยมวิทยา ปี พ.ศ. 2566 มีอุณหภูมิเฉลี่ยสูงสุด 32.90 องศาเซลเซียส มีอุณหภูมิเฉลี่ยต่ำสุด 24.20 องศาเซลเซียส มีความชื้นสัมพัทธ์สูงสุดเฉลี่ย 94.00 เปอร์เซ็นต์ ความชื้นสัมพัทธ์ต่ำสุดเฉลี่ย 60.00 เปอร์เซ็นต์ มีปริมาณน้ำฝนเฉลี่ย 175.20 มิลลิเมตร จำนวนวันฝนตกเฉลี่ย 12 วัน และมีความกดอากาศเฉลี่ย 1,009.50 เฮกโตปาสคาล (สถานีอุตุนิยมวิทยาปัตตานี, 2566)

การทดลองที่ 1 พัฒนาเทคโนโลยีที่เหมาะสมในการผลิตพืชเศรษฐกิจชุมชนเพื่อสร้างเสถียรภาพด้านรายได้และการเข้าถึงอาหารจังหวัดปัตตานี ชนิดพืช คือ มะพร้าว เกษตรกรเข้าร่วมจำนวน 25 ราย โดยใช้กรรมวิธีการใช้เทคโนโลยีการผลิตตามคำแนะนำ เช่น การใช้ปุ๋ยตามคำแนะนำกรมวิชาการเกษตร โดยใส่ปุ๋ยเคมีสูตร 13-13-21 อัตรา 2 กิโลกรัม/ต้น และใส่ปุ๋ยแมกนีเซียมซัลเฟต อัตรา 500 กรัม/ต้น ในเดือนพฤษภาคม พ.ศ. 2566 และดำเนินการใส่ปุ๋ยครั้งที่ 2 ในเดือนพฤศจิกายน พ.ศ. 2566 มีการป้องกันกำจัดโรคและแมลงโดยใช้ชีวภัณฑ์ ได้แก่ วางกับดักฟีโรโมนป้องกันกำจัดด้วงแรด และปล่อยแตนเบียน ป้องกันกำจัดแมลงดำหนามมะพร้าว เมื่อพบการระบาด ส่วนกรรมวิธีการผลิตของเกษตรกร มีการใส่ปุ๋ยเคมีสูตร 15-15-15 อัตรา 1 กิโลกรัม/ต้น ในเดือนพฤษภาคม 2566 และใส่ปุ๋ยคอก อัตรา 1-2 กิโลกรัม/ต้น/ปี ในเดือนสิงหาคม พ.ศ. 2566 บางรายไม่มีการใส่ปุ๋ย หรือไม่มีการป้องกันกำจัดโรคและแมลงศัตรูมะพร้าว (ตารางที่ 1)

จากการทดสอบ พบว่า กรรมวิธีแนะนำของกรมวิชาการเกษตร ให้น้ำหนักผลทั้งเปลือกเฉลี่ย 1,298 กรัม/ผล จำนวนผลผลิตเฉลี่ย 1,182 ผล/ไร่ มีรายได้เฉลี่ย 14,720 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 4,750 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 9,970 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 3.10 ส่วนกรรมวิธีของเกษตรกร พบว่า ให้น้ำหนักผลทั้งเปลือกเฉลี่ย 1,217 กรัม/ผล จำนวนผลผลิตเฉลี่ย 797 ผล/ไร่ มีรายได้เฉลี่ย 10,360 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 3,057 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 7,304 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 3.39 (ตารางที่ 2) วิธีแนะนำของกรมวิชาการเกษตรมีข้อดี คือ มีการใส่ปุ๋ย และการป้องกันกำจัดศัตรูมะพร้าวเมื่อพบการระบาดตามคำแนะนำ ทำให้มีผลผลิตและรายได้สุทธิมากกว่าวิธีเกษตรกร ข้อเสีย คือ การใช้ชีวภัณฑ์ในการป้องกันกำจัดศัตรูมะพร้าว มีวิธีการผลิตที่ยุ่งยาก เกษตรกรยังไม่สามารถผลิตแตนเบียน หรือแมลงหางหนีบเองได้ แต่เกษตรกรมีการยอมรับเทคโนโลยี ซึ่งเป็นวิธีการป้องกันกำจัดศัตรูมะพร้าวที่ปลอดภัยทั้งเกษตรกรและผู้บริโภค นอกจากเกษตรกรจำหน่ายผลมะพร้าวแล้ว เกษตรกรในชุมชนมีการแปรรูปผลผลิตมะพร้าวเป็นขุยมะพร้าว มะพร้าวคั่ว และกะทิคั้น เป็นต้น เพื่อจำหน่ายในชุมชน และพื้นที่ใกล้เคียง เพื่อสร้างรายได้อีกทางหนึ่ง

ตารางที่ 1 วิธีปฏิบัติ วิธีแนะนำของกรมวิชาการเกษตร และวิธีเกษตรกรในการผลิตพืชเศรษฐกิจชุมชนมะพร้าว

วิธีปฏิบัติ	วิธีแนะนำ	วิธีเกษตรกร
การใส่ปุ๋ย	-ปุ๋ยเคมีสูตร 13-13-21 อัตรา 4 กิโลกรัม/ต้น/ปี -ปุ๋ยแมกนีเซียมซัลเฟต อัตรา 500 กรัม/ต้น/ปี -ปุ๋ยคอก อัตรา 30-50 กิโลกรัม/ต้น/ปี -โดยแบ่งใส่ปีละ 2 ครั้ง หว่านปุ๋ยห่างจากลำต้นภายในรัศมี 2 เมตร	-ปุ๋ยเคมีสูตร 15-15-15 อัตรา 1 กิโลกรัม/ต้น/ปี -ปุ๋ยคอก อัตรา 1-2 กิโลกรัม/ต้น/ปี -ใส่ปีละ 1 ครั้ง
การกำจัดศัตรูมะพร้าว	**แมลงดำหนาม** -ใช้แตนเบียนอะซีโคเดส ฮิสไพนารัม *Asecodes hispinarum* ทำลายหนอนแมลงดำหนามมะพร้าว โดยนำมัมมี่ที่จะปล่อยใส่ภาชนะสำหรับปล่อย จำนวน 5 มัมมี่/1 ภาชนะปล่อย/1 ไร่ -ปล่อยแมลงหางหนีบบริเวณ เพื่อกินไข่ หนอน และดักแด้ ของ แมลงดำหนามมะพร้าว อัตรา 50 ตัวต่อยอด **หนอนหัวดำมะพร้าว** -ตัดใบที่มีหนอนหัวดำมะพร้าวนำไปเผาทำลายนอกแปลง -พ่นเชื้อบีทีอัตรา 80-100 มิลลิลิตร/น้ำ 20 ลิตร ผสม ด้วยสารจับใบ 5 มิลลิลิตร ฉีดพ่นต้นละ 3 - 5 ลิตร ให้ทั่วทรงพุ่ม จำนวน 3 ครั้ง ห่างกัน 7 - 10 วัน (ไม่ควรฉีดพ่นในขณะ ที่มีแสงแดดจัด) **ด้วงแรด** -ทำความสะอาดบริเวณสวนมะพร้าวเพื่อกำจัดแหล่งขยายพันธุ์ หากพบหนอนให้จับทำลายหรือเผากองขยะ -ใช้กับดักฟีโรโมน เพื่อล่อด้วงแรด ไปทำลาย -ใช้เชื้อราเขียว *Metarhizium anisopliae* ใส่ไว้ตามกองขยะ กองปุ๋ย คอก หรือท่อนมะพร้าวที่มีหนอนด้วงแรดมะพร้าวอาศัยอยู่ เกลี่ยเชื้อให้กระจายทั่ว รดน้ำให้ความชื้น นำใบมะพร้าวคลุมกองไว้เพื่อรักษาความชื้นและป้องกันแสงแดด เชื้อราจะแพร่กระจายไปเอง และทำลาย ด้วงแรดมะพร้าวทุกระยะการเจริญเติบโต **ด้วงงวงมะพร้าว** ป้องกันและกำจัดด้วงแรดมะพร้าวอย่าให้ระบาดในสวนมะพร้าวเพราะรอยแผลที่ด้วงแรดมะพร้าว เจาะไว้จะเป็นช่องทางให้ด้วงงวงมะพร้าววางไข่	-ไม่มีการป้องกันกำจัดแมลงศัตรูมะพร้าว หรือใช้กำมะถัน อัตรา 1 กิโลกรัม/ยอด (ทุกทางใบ)

ตารางที่ 2 น้ำหนักผลทั้งเปลือก จำนวนผลผลิต รายได้ ต้นทุน รายได้สุทธิเฉลี่ยของมะพร้าว และอัตราส่วนรายได้ต่อต้นทุน (BCR) ของกรรมวิธีแนะนำ และกรรมวิธีวิธีเกษตรกร

ข้อมูล	วิธีแนะนำ	วิธีเกษตรกร
น้ำหนักผลทั้งเปลือกเฉลี่ย (กรัม)	1,298	1,217
จำนวนผลผลิตเฉลี่ย (ผล/ไร่)	1,132	797
รายได้เฉลี่ย (บาท/ไร่)	14,720	10,360
ต้นทุนเฉลี่ย (บาท/ไร่)	4,750	3,057
รายได้สุทธิเฉลี่ย (บาท/ไร่)	9,970	7,304
อัตราส่วนรายได้ต่อต้นทุน (BCR)	3.10	3.39

หมายเหตุ: ราคามะพร้าวเฉลี่ย 13 บาท/กก.

การทดลองที่ 2 พัฒนาต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียงเพื่อสร้างเสถียรภาพด้านรายได้และความเพียงพอและความหลากหลายทางอาหารจังหวัดปัตตานี เกษตรกรเข้าร่วม จำนวน 25 ราย ผลการสำรวจชนิดพืชก่อนดำเนินการ พบว่ามี 108 ชนิด หลังดำเนินการมี 135 ชนิด เพิ่มขึ้น 27 ชนิด จากการทดสอบผลิตพืช 9 กลุ่มพืชผสมผสานในชุมชนตำบลพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี ดังตารางที่ 3 ได้แก่ 1) กลุ่มพืชรายได้ เน้นพืชเสริมรายได้ชนิดต่าง ๆ 2) กลุ่มพืชอาหาร เน้นพืชอาหารที่ใช้เป็นเครื่องแกง พืชผัก และไม้ผลเพื่อบริโภคในครัวเรือน 3) กลุ่มพืชสมุนไพรสุขภาพ เน้นรวบรวมชนิดพืชสมุนไพร ขยายพันธุ์ การใช้ประโยชน์ในครัวเรือน 4) กลุ่มพืชสมุนไพรป้องกันกำจัดศัตรูพืช เน้นการเพิ่มปริมาณพืชและการใช้ประโยชน์สารสกัดจากพืช 5) กลุ่มพืชอนุรักษ์ดินและน้ำ 6) กลุ่มพืชอาหารสัตว์ 7) กลุ่มพืชใช้สอย 8) กลุ่มพืชอนุรักษ์พันธุกรรมท้องถิ่น 9) กลุ่มพืชพลังงานหรือเชื้อเพลิง พบว่า รายได้เฉลี่ย 49,614 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 14,902 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 34,712 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 3.33 (ตารางที่ 4) นอกจากนี้ เกษตรกรมีการทำปุ๋ยหมักไว้ใช้เอง ทำบ่อขยายพันธุ์แหนแดงไว้เป็นแหล่งโปรตีนพืชอาหารสัตว์ ได้แก่ เป็ด และไก่ ที่เลี้ยงในชุมชน เพื่อลดต้นทุนค่าอาหาร และเพื่อลดการใช้ปุ๋ยเคมี/ทดแทนปุ๋ยไนโตรเจนในพืช และมีการแปรรูปผลิตภัณฑ์จากมันสำปะหลัง เพื่อเพิ่มมูลค่าสินค้า ได้แก่ มันสำปะหลังแผ่นทอดกรอบ เกษตรกรนิยมปลูกพืชอาหาร และพืชรายได้เป็นหลัก เพื่อเป็นอาหารไว้บริโภคในครัวเรือน และสร้างรายได้ให้แก่เกษตรกร ส่วนต้นแบบการผลิตพืชผสมผสาน เกษตรกรควรมีการปลูกพืช ทั้ง 9 กลุ่มพืชผสมผสาน เพื่อให้มีพืชที่หลากหลาย เพียงพอสำหรับบริโภคในครัวเรือนหรือจำหน่าย ทั้งยังช่วยลดค่าใช้จ่ายในการซื้อผลผลิตจากภายนอก และเกษตรกรสามารถพึ่งพาตนเองได้มากขึ้น จากการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง

ตารางที่ 3 พืช 9 กลุ่มพืชผสมผสานในชุมชน ตำบลพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี

กลุ่มพืช	รายละเอียดชนิดพืช
พืชรายได้	มะพร้าว ยางพารา ข้าว มังคุด ทุเรียน ส้มโอ แตงโม มันสำปะหลัง ยาสูบ กล้วยน้ำว้า กล้วยหอมทอง ข้าวโพดหวาน สับปะรด มะพร้าวน้ำหอม ส้มแขก ตาลโตนด มันเทศ ถั่วหรั่ง ถั่วลิสง สะตอ มะม่วง หมาก มะนาว พริก และถั่วฝักยาว
พืชอาหาร	มะนาว มะกรูด พริกไทย พริก ขิง ข่า ตะไคร้ กะเพรา โหระพา ถั่วฝักยาว ผักกาดขาว กวางตุ้ง คะน้า ผักบุ้ง บวบ มะระ แตงกวา มะเขือ ฟักทอง ดาหลา บุก ชะอม แค มะม่วงหิมพานต์ ถั่วฝักยาว กระเจี๊ยบเขียว เพกา ชะมวง ส้มแขก ฟักเขียว มะเขือพวง คื่นช่าย มันปู เนียง สะตอ ต้นหอม ผักชี ผักชีฝรั่ง อัญชัน ผักเหรียง แตงโม มันขี้หนู มันเทศ ถั่วหรั่ง ถั่วลิสง ขนุน มะม่วง เงาะ ลองกอง กล้วยหิน กล้วยน้ำว้า กล้วยไข่ กล้วยหอม ส้มแขก ข้าวโพด ละมุด มะละกอ มะพร้าว และมะพร้าวน้ำหอม
พืชสมุนไพรสุขภาพ	ไพล ขมิ้น ตะไคร้ ฟ้าทะลายโจร ขิง ข่า กระท่อม มะรุม บอระเพชร ว่านหางจระเข้ เตยหอม ยอ กระชายขาว กระชายดำ พริกไทย มะกรูด กระทือ และเหงือกปลาหมอ
พืชสมุนไพรป้องกันกำจัดศัตรูพืช	สะเดา ตะไคร้หอม ขี้เหล็ก ข่า และสาบเสือ
พืชอนุรักษ์ดินและน้ำ	หญ้าแฝก ปอเทือง และถั่วบราซิล
พืชอาหารสัตว์	หญ้าแพงโกลา หญ้าเนเปียร์ หญ้ามาเลเซีย หญ้าขน หญ้ามัน และแหนแดง
พืชไม้ใช้สอย	ต้นสัก ยูคาลิปตัส ตะแบก ตะเคียน ยางนา มะฮอกกานี พะยูง พะยอม ไผ่ หมาก ตำเสา กระถินณรงค์ มะขาม หมาก และเพกา
พืชอนุรักษ์พันธุกรรม	ยาสูบ และกะพ้อ
พืชพลังงาน	ปาล์มน้ำมัน และอ้อย

ตารางที่ 4 รายได้ ต้นทุน รายได้สุทธิเฉลี่ย และอัตราส่วนรายได้ต่อต้นทุน (BCR) พืชผสมผสาน 9 กลุ่มพืชของเกษตรกรต้นแบบการผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง

ข้อมูล	ปี 2566
รายได้เฉลี่ย (บาท/ไร่)	49,614
ต้นทุนเฉลี่ย (บาท/ไร่)	14,902
รายได้สุทธิเฉลี่ย (บาท/ไร่)	34,712
อัตราส่วนรายได้ต่อต้นทุน (BCR)	3.33

การทดลองที่ 3 พัฒนาต้นแบบการผลิตพืชอินทรีย์ เพื่อสร้างเสถียรภาพด้านรายได้และอาหารที่มีคุณภาพปลอดภัยจังหวัดปัตตานี เกษตรกรเข้าร่วม จำนวน 15 ราย โดยมีวิธีปฏิบัติตามเทคโนโลยีการจัดการผลิตพืชอินทรีย์ของกรมวิชาการเกษตร ผสมผสานกับภูมิปัญญาท้องถิ่น โดยวิธีปฏิบัติต้นแบบการผลิตพืชอินทรีย์ คือ 1) การคัดเลือกพื้นที่ ทราบประวัติการใช้พื้นที่ อยู่ห่างไกลมลพิษ มีแหล่งน้ำสะอาด ดินมีความอุดมสมบูรณ์ 2) การวางแผนการจัดการ วางแผนการป้องกันสารปนเปื้อนจากแปลงข้างเคียง จากเครื่องมือ อุปกรณ์ และการขนส่ง การวางแผนจัดการการผลิต เลือกฤดูปลูก ระบบปลูกที่เหมาะสม เลือกใช้วัสดุและปัจจัย การผลิตที่สอดคล้องกับมาตรฐาน มีการทำแนวกันชน 3) การเลือกพันธุ์ ใช้พันธุ์ที่ต้านทานต่อโรคและแมลงศัตรูพืช ไม่เป็นพันธุ์ที่มาจากการตัดต่อทางพันธุกรรม (GMOs) และไม่ผ่านการฉายรังสี ควรมาจากระบบการผลิตแบบเกษตรอินทรีย์ 4) การจัดการและการปรับปรุงดิน ใช้สารอินทรีย์และวัสดุธรรมชาติที่ปราศจากการปนเปื้อนสารต้องห้าม เช่น ปุ๋ยหมัก ปุ๋ยคอก ปุ๋ยพืชสด 5) การจัดการศัตรูพืช การควบคุมแมลงศัตรู ใช้สารสกัดจากพืช เช่น สะเดา หางไหล ใช้ตัวห้ำ ตัวเบียน ใช้จุลินทรีย์ เช่น Bt ใช้กับดักกาวเหนียวหรือแสงไฟ 6) การจัดการเก็บรักษาและขนส่งผลิตผล จัดวางแยกจากผลิตภัณฑ์ที่ไม่ใช่อินทรีย์ เพื่อป้องกันการปนเปื้อนจากวัสดุและสารต้องห้าม 7) การจัดการหลังการเก็บเกี่ยว สารที่ใช้ในทุกขั้นตอนต้องเป็นสารจากธรรมชาติ การจัดการโรงเก็บ ต้องสะอาดมีอุปกรณ์ที่เหมาะสม มีการป้องกัน การปนเปื้อนจากสารต้องห้าม ป้องกัน นก หนู แมลง โดยวิธีกลและกายภาพ 8) การแปรรูป ผลิตภัณฑ์ควรเป็นไปตามข้อกำหนด GMP วัตถุดิบต้องมาจากผลิตผลอินทรีย์ 9) การจดบันทึกข้อมูลการผลิต มีการจัดทำบัญชีและจดบันทึกข้อมูลต่าง ๆ ในกระบวนการผลิตทุกขั้นตอน

ก่อนปลูกมีการทำแนวกันชน เช่น ปลูกกล้วย ตะไคร้หอม หรือใช้ตาข่ายพรางแสงกั้นเป็นแนวกันชนและขุดร่องรอบแปลง ตามความเหมาะสมของพื้นที่ ซึ่งในระยะแรกจะเน้นการใช้ปุ๋ยอินทรีย์เป็นหลัก มีการใช้ชีวภัณฑ์ในการป้องกันกำจัดโรคและแมลงศัตรูพืช เช่น สาร Bt สารสกัดสะเดา และใช้กับดักกาวเหนียวป้องกันกำจัดแมลงศัตรูพืชผัก ซึ่งพบการระบาดเพียงเล็กน้อย ไม่เกิดความรุนแรงถึงระดับเศรษฐกิจ เช่น เพลี้ยอ่อน เพลี้ยแป้ง และหนอนเจาะฝักถั่วฝักยาว จากการทดสอบ พบว่า ถั่วฝักยาวให้ผลผลิตเฉลี่ย 1,217 กิโลกรัม/ไร่ มีรายได้เฉลี่ย 24,347 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 7,370 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 16,977 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 3.30 และแตงกวาให้ผลผลิตเฉลี่ย 2,948 กิโลกรัม/ไร่ มีรายได้เฉลี่ย 44,213 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 7,450 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 36,763 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 5.93 (ตารางที่ 5) การผลิตพืชอินทรีย์ทำให้เกษตรกรมีอาหารที่มีคุณภาพและปลอดภัยมากขึ้น และสามารถสร้างรายได้ให้แก่เกษตรกรได้

ตารางที่ 5 ผลผลิต รายได้ ต้นทุน รายได้สุทธิเฉลี่ย และอัตราส่วนรายได้ต่อต้นทุน (BCR) ของแปลงพัฒนาต้นแบบการผลิตถั่วฝักยาวและแตงกวาอินทรีย์

ชนิดพืช	ผลผลิต (กิโลกรัม/ไร่)	รายได้ (บาท/ไร่)	ต้นทุน (บาท/ไร่)	รายได้สุทธิ (บาท/ไร่)	อัตราส่วนรายได้ต่อต้นทุน (BCR)
ถั่วฝักยาว	1,217	24,347	7,370	16,977	3.30
แตงกวา	2,948	44,213	7,450	36,763	5.93

หมายเหตุ: ราคาถั่วฝักยาวเฉลี่ย 20 บาท/กก. และราคาแตงกวาเฉลี่ย 15 บาท/กก.

การทดลองที่ 4 พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหารจังหวัดปัตตานี เกษตรกรเข้าร่วม จำนวน 16 ราย โดยเลือกรูปแบบการปลูกผักยกแคร่ เนื่องจากมีบางพื้นที่ในชุมชนเป็นพื้นที่ลุ่มน้ำท่วมขัง และบางพื้นที่มีน้ำไหลผ่านในช่วงฤดูฝน/น้ำท่วม โดยทดสอบปลูกผักกาดขาวและผักกวางตุ้ง พบว่า ผักกาดขาวให้ผลผลิตเฉลี่ย 931 กิโลกรัม/ไร่ มีรายได้เฉลี่ย 18,736 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 4,170 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 14,566 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 4.49 และผักกวางตุ้งให้ผลผลิตเฉลี่ย 872 กิโลกรัม/ไร่ มีรายได้เฉลี่ย 13,075 บาท/ไร่ มีต้นทุนการผลิตเฉลี่ย 3,920 บาท/ไร่ มีรายได้สุทธิเฉลี่ย 9,155 บาท/ไร่ และมีอัตราส่วนรายได้ต่อต้นทุน (BCR) เท่ากับ 3.34 (ตารางที่ 6) การปลูกผักยกแคร่ในชุมชนพ่อมิ่ง ลดความเสี่ยงการปลูกพืชผักบนดินในช่วงฤดูฝน/มีน้ำท่วมขังในบางพื้นที่ ซึ่งจะเป็นแหล่งอาหารและสร้างรายได้เพิ่มขึ้นให้กับเกษตรกรในชุมชนอีกทางหนึ่ง และพบว่า ผักกาดขาว สามารถจำหน่ายในชุมชนได้ดีกว่าผักกวางตุ้ง และควรต้องหาช่องทางสำรวจความต้องการพืชของตลาด เพื่อปรับเปลี่ยนหรือเพิ่มชนิดพืชผักยกแคร่ เพื่อให้มีความหลากหลายและเกษตรกรสามารถจำหน่ายได้หลากหลาย และสร้างรายได้เพิ่มขึ้น

ตารางที่ 6 ผลผลิต รายได้ ต้นทุน และรายได้สุทธิ ของผักกาดขาวแปลงพัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ

ชนิดพืช	ผลผลิต (กิโลกรัม/ไร่)	รายได้ (บาท/ไร่)	ต้นทุน (บาท/ไร่)	รายได้สุทธิ (บาท/ไร่)	อัตราส่วนรายได้ต่อต้นทุน (BCR)
ผักกาดขาว	931	18,736	4,170	14,566	4.49
กวางตุ้ง	872	13,075	3,920	9,155	3.34

หมายเหตุ: ราคาผักกาดขาวเฉลี่ย 20 บาท/กก. และราคาผักกวางตุ้งเฉลี่ย 15 บาท/กก.

การทดลองที่ 5 พัฒนาแพลตฟอร์มนวัตกรรมความมั่นคงทางอาหารในชุมชนแบบมีส่วนร่วมจังหวัดปัตตานี พัฒนาการมีส่วนร่วมของชุมชน จัดทำเวทีผู้มีส่วนได้ส่วนเสียในชุมชน เพื่อกำหนดเป้าหมายพัฒนา คัดเลือกเกษตรกรเข้าร่วม จำนวน 30 ราย จัดตั้งกลุ่มเกษตรกรที่เข้าร่วมโครงการวิจัย จัดเวทีวิจัยสัญจรเพื่อแลกเปลี่ยนเรียนรู้ภูมิปัญญา ประสบการณ์ระหว่างเกษตรกร นักวิจัย นักพัฒนาและผู้เกี่ยวข้องทุกเดือน ดำเนินการ 8 ครั้ง มีกิจกรรมดังนี้ 1) ของฝากจากเพื่อนบ้าน 2) เรื่องเล่าจากเจ้าของบ้าน 3) การแลกเปลี่ยนเรียนรู้ภูมิปัญญาการทำการเกษตร 4) การสาธิตความรู้วิชาการ 5) การบรรยายสรุปการดำเนินงาน โดยการแลกเปลี่ยนเรียนรู้ สาธิตวิชาการป้องกันกำจัดแมลงศัตรูมะพร้าวโดยใช้ชีวภัณฑ์ การผลิตพืชผสมผสานตามหลักปรัชญาของเศรษฐกิจพอเพียง เป็นต้น สรุปผลการประเมินผลการจัดเวทีวิจัยสัญจรในทุกกิจกรรมและประโยชน์ที่ได้รับ เกษตรกรและผู้เข้าร่วมกิจกรรมมีความพึงพอใจในระดับมากถึงมากที่สุด ระดับคะแนนอยู่ที่ 4.30 - 4.64 (คะแนนเต็มเท่ากับ 5)

การเชื่อมโยงชุมชนเครือข่าย ได้จัดงานวันถ่ายทอดเทคโนโลยี กิจกรรมเวทีสัญจรชุมชน “การจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนนวัตกรรมวิชาการเกษตร ครั้งที่ 3 ประจำปี พ.ศ. 2566” ณ กลุ่มวิสาหกิจชุมชนแปรรูปหญ้าเนเปียร์ตำบลพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี ในวันพุธ ที่ 19 กรกฎาคม พ.ศ. 2566 เพื่อให้เกิดการแลกเปลี่ยนเรียนรู้กระบวนการจัดการผลิตพืชเพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของทั้ง 5 ชุมชน

ของเกษตรกรเครือข่าย จากชุมชนนวัตกรรมวิชาการเกษตรจังหวัดสงขลา พัทลุง สตูล ยะลา และปัตตานี จำนวน จำนวน 200 ราย ภายในงานมีการจัดนิทรรศการจากหน่วยงานราชการเครือข่าย ได้แก่ สำนักงานเกษตรอำเภอปะนาเระ ศูนย์วิจัยและพัฒนาการเกษตรยะลา ศูนย์วิจัยและพัฒนาการเกษตรสตูล ศูนย์วิจัยและพัฒนาการเกษตรสงขลา และศูนย์วิจัยและพัฒนาการเกษตรพัทลุง และมีกิจกรรมเวทีแลกเปลี่ยนเรียนรู้กิจกรรมเยี่ยมเยียน ศึกษาดูงานภายในพื้นที่ชุมชนตำบลพ่อมิ่ง มีกิจกรรมฐานเรียนรู้ทั้งหมด 5 ฐาน ได้แก่ 1) การผลิตและแปรรูปมะพร้าว 2) การผลิตและแปรรูปมันสำปะหลัง 3) การผลิตและแปรรูปยาสูบ 4) การผลิตพืชผสมผสาน 5) การผลิตพืชอาหารสัตว์ ส่งผลให้เกิดการพัฒนาการแบบมีส่วนร่วมของชุมชน การพัฒนาแปลงต้นแบบเป็นศูนย์เรียนรู้ สร้างความเข้มแข็งของเกษตรกรเครือข่ายทั้ง 5 ชุมชน

ภาพที่ 2 การจัดเวทีวิจัยสัญจร และการเชื่อมโยงชุมชนเครือข่าย ในวันงานถ่ายทอดเทคโนโลยี

สรุปและอภิปรายผล

จากการทดสอบการผลิตพืชในชุมชนพ่อมิ่ง อำเภอปะนาเระ จังหวัดปัตตานี พบว่า การผลิตพืชโดยปฏิบัติตามวิธีแนะนำของกรมวิชาการเกษตร ส่งผลให้เกษตรกรมีผลผลิตและมีรายได้เฉลี่ยเพิ่มขึ้นมากกว่าการผลิตตามวิธีเกษตรกร และเมื่อเปรียบเทียบผลผลิตพืชในการทดลองต่าง ๆ กับผลผลิตพืชเฉลี่ยของจังหวัดปัตตานี ปี 2565 พบว่า ให้ผลผลิตเฉลี่ยที่มากกว่าหรือใกล้เคียงกันกับผลผลิตของจังหวัด เช่น การทดสอบผลิตมะพร้าว ถั่วฝักยาว และกวางตุ้ง ตามวิธีแนะนำของกรมวิชาการเกษตร ให้ผลผลิตเฉลี่ย 1,132 ผล/ไร่ 1,217 กิโลกรัม/ไร่ และ 872 กิโลกรัม/ไร่ ตามลำดับ ขณะที่ผลผลิตของจังหวัด มีผลผลิตเฉลี่ย 1,020 ผล/ไร่ 1,072 กิโลกรัม/ไร่ และ 598 กิโลกรัม/ไร่ ตามลำดับ (สำนักงานเกษตรจังหวัดปัตตานี, 2565) และพบว่า เกษตรกรยอมรับเทคโนโลยีการใส่ปุ๋ย การใช้ชีวภัณฑ์ แตนเบียน แมลงหางหนีบ ป้องกันกำจัดศัตรูมะพร้าว โดยไม่ใช้สารเคมี ซึ่งมีข้อดี คือ ปลอดภัยทั้งเกษตรกรและผู้บริโภค ส่วนข้อเสียเกษตรกรยังไม่สามารถผลิตแตนเบียน และแมลงหางหนีบเองได้ การผลิตพืช 9 กลุ่มพืชผสมผสาน มีความหลากหลายของชนิดพืชเพิ่มขึ้น สามารถลดรายจ่ายในครัวเรือนของเกษตรกรและสร้างความมั่นคงทางอาหารของเกษตรกรในชุมชนเพิ่มขึ้น (ธัชธาวินท์ สะรุโณ, 2558)

ในส่วนของการดำเนินการร่วมกับการสร้างความเข้มแข็งให้กลุ่มเกษตรกรในชุมชน โดยการจัดกระบวนการเวทีวิจัยสัญจร แลกเปลี่ยนเรียนรู้ร่วมกัน ระหว่างเกษตรกร นักวิจัย นักพัฒนาและผู้เกี่ยวข้อง รวมถึงจัดการเชื่อมโยงเครือข่ายชุมชน ส่งผลให้ชุมชนมีความมั่นคงด้านอาหาร เพื่อนำไปสู่การเพิ่มเสถียรภาพด้านรายได้ของชุมชนต่อไป

ข้อเสนอแนะ

- ควรมีการถ่ายทอดองค์ความรู้ และฝึกปฏิบัติการผลิตแตนเบียน และแมลงหางหนีบ เพื่อป้องกันกำจัดศัตรูมะพร้าว ให้แก่เกษตรกรในชุมชนได้ศึกษาเรียนรู้ และสามารถผลิตไว้ใช้เองได้
- ควรมีการขยายผลการจัดการผลิตพืช เพื่อเพิ่มเสถียรภาพด้านรายได้และความมั่นคงด้านอาหารของชุมชนไปยังพื้นที่/ชุมชนใกล้เคียง หรือนักเรียนในโรงเรียน เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหารต่อไป
- ในการวิจัยครั้งต่อไป ควรมีการทดสอบชนิดพืชการปลูกผักยกแคร่ให้หลากหลายยิ่งขึ้น เพื่อสร้างรายได้ให้เกษตรกรในชุมชนเพิ่มมากขึ้น หรือเลือกรูปแบบ/พัฒนาต้นแบบการผลิตพืชที่ยืดหยุ่นจากการได้รับผลกระทบจากการเปลี่ยนแปลงสภาพภูมิอากาศ เพื่อสร้างเสถียรภาพด้านรายได้และเสถียรภาพทางอาหารให้แก่เกษตรกรต่อไป

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ผลกระทบของฐานความผิดบัญชีม้าต่อสิทธิเสรีภาพของเหยื่ออาชญากรรมหลอกรักออนไลน์

Impact of Criminalization of Money Mule Account on Right and Liberty of Romance Scam's Victim.

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ (1) ศึกษารูปแบบพฤติกรรมและผลกระทบของอาชญากรรมประเภทการหลอกรักออนไลน์ (2) ศึกษารูปแบบและแนวทางการกำหนดความผิดสำหรับบัญชีม้าตามกฎหมายไทยและต่างประเทศ (3) ศึกษาวิเคราะห์ประเด็นปัญหาขององค์ประกอบความผิดฐานบัญชีม้าตามกฎหมายไทยต่อเหยื่ออาชญากรรมประเภทการหลอกลวงเชิงความรัก โดยเปรียบเทียบกับความผิดตามกฎหมายต่างประเทศ ผลการศึกษาพบว่า (1) เหยื่อของอาชญากรรมประเภทหลอกรักออนไลน์ ได้รับผลกระทบทางทรัพย์สิน และอาจส่งผลให้เหยื่อเปิดหรือใช้บัญชีเงินฝากอันมีลักษณะเป็น “บัญชีม้า” (2) กฎหมายไทยและต่างประเทศ มีรูปแบบและแนวทางกำหนดความผิดสำหรับบัญชีม้าแตกต่างกัน โดยไทยมีฐานความผิดเฉพาะเกี่ยวกับบัญชีม้า ในขณะที่สหรัฐอเมริกาและสหราชอาณาจักรไม่ได้กำหนดฐานความผิดเฉพาะ แต่ปรับใช้ฐานความผิดตามกฎหมายฟอกเงิน (3) ความผิดฐานบัญชีม้าตามกฎหมายไทยมีองค์ประกอบความผิดที่กว้างไม่จำกัดเฉพาะเจ้าของบัญชีที่รับจ้างเปิดหรือยอมให้ใช้บัญชีเพื่อแลกประโยชน์ตอบแทนเท่านั้น แต่อาจส่งผลให้เหยื่ออาชญากรรมหลอกรักออนไลน์ที่ถูกหลอกหรือชักจูงให้ใช้บัญชีเงินฝากเพื่อรับหรือโอนเงินเกี่ยวกับความผิดต่างๆ ตกเป็นผู้ต้องหาของความผิดฐานนี้ ผู้วิจัยจึงเสนอให้ยกเลิกฐานความผิดเฉพาะสำหรับบัญชีม้า ซึ่งยังคงสามารถบังคับใช้ฐานความผิดตามกฎหมายฟอกเงินได้โดยเป็นการลดความซ้ำซ้อนและบังคับใช้ความผิดหลายฐานสำหรับบัญชีม้าอีกด้วย

คำสำคัญ: อาชญากรรรมหลอกรักออนไลน์, ความผิดฐานบัญชีม้า, เหยื่ออาขญากรรม

Abstract

The objectives of this research are to (1) study behavioral patterns and impacts of Romance scam (2) study patterns and guidelines for determining offenses for money mule offence according to Thai and foreign laws. (3) study and analyze issues, problems of the element of money mule offense under Thai law and impact on victims of romance scam by comparing with foreign laws. The results of the study found that (1) victims of romance

scam are not only affected by losing of property but in some cases could be deceived to be money mule. (2) Thai and foreign laws are different in formats and guidelines for determining money mule account. Thailand has specific offenses regarding money mule while the United States and the United Kingdom do not have specific offenses but apply money laundering laws to money mule cases. (3) Money mule account under Thai law composes of broad elements that are not limited to the account owner who is hired to be money mule but may include victims of romance scam who are deceived to use their bank accounts to receive or transfer money related to crimes and could be accused of money mule offence. The researcher therefore proposes to abolish the specific offense of money mule and enforce only money laundering offence for reducing duplication and enforcing multiple offenses for money mule.

Keywords: Romance Scam, Money Mule Offence, Victim of Crime.

บทนำ

การหลอกรักออนไลน์ (แปลมาจากภาษาอังกฤษว่า “Romance Scam” เนื่องจากยังไม่มีกฎหมายกำหนดศัพท์และนิยามโดยเฉพาะ โดยอาจมีการใช้คำที่แตกต่างกัน ในที่นี้ใช้คำว่า “การหลอกรักออนไลน์” เป็นอาชญากรรมชนิดหนึ่ง ซึ่งจัดอยู่ในกลุ่มการฉ้อโกงหลอกลวง (Scam) โดยอาชญากรติดต่อสร้างความสัมพันธ์ในเชิงความรักกับเหยื่อ ทำให้เชื่อใจว่าอาชญากรมีความรักและประสงค์จะแต่งงานหรือใช้ชีวิตร่วมกัน จากนั้นอาชญากรจะใช้วิธีการต่าง ๆ เพื่อแสวงประโยชน์ เช่น อ้างเหตุต่าง ๆ ขอให้เหยื่อโอนเงินให้ เช่น อ้างเหตุจำเป็นด้านการเดินทางหรือค่าใช้จ่ายในการเดินทาง โดยเฉพาะกรณีเหยื่ออยู่ต่างประเทศ เหตุความเจ็บป่วยหรือเหตุจำเป็นอื่นเพื่อให้เหยื่อเห็นใจ (Tilley & Sidebottom, 2017) การหลอกลวงอาจเกิดขึ้นครั้งเดียว (Hit and Run) หรืออาจเกิดขึ้นอย่างต่อเนื่องผ่านความสัมพันธ์ที่ยาวนาน (Jakobsson, 2016). การหลอกรักออนไลน์ อาศัยจุดอ่อนในแง่ความเปราะบางทางจิตใจหรืออารมณ์ของเหยื่อ (Emotional Vulnerability) (FBI, 2017). แม้ว่าอาชญากรรมนี้ไม่จำกัดว่าจะต้องเป็นการกระทำทางคอมพิวเตอร์ แต่ในปัจจุบันการติดต่อสื่อสารสร้างความสัมพันธ์ระหว่างบุคคลทั่วไปเกิดขึ้นผ่านการสื่อสารทางคอมพิวเตอร์ และสามารถทำได้โดยไม่มีข้อจำกัดด้านเขตแดนของประเทศ

การศึกษาวิจัยทางนิติศาสตร์เกี่ยวกับอาชญากรรมประเภทนี้จำแนกได้หลายประเด็น เช่น ประเด็นการกำหนดความผิดสำหรับการหลอกรักออนไลน์ ซึ่งผลการศึกษาวิจัยชี้ให้เห็นว่า พระราชบัญญัติว่าด้วยการกระทำความผิดเกี่ยวกับคอมพิวเตอร์ พ.ศ. 2550 ที่แก้ไขเพิ่มเติม พ.ศ. 2560 (ซึ่งต่อไปในบทความนี้จะใช้คำย่อว่า “พ.ร.บ. คอมพิวเตอร์”) เป็นกฎหมายเฉพาะสำหรับอาชญากรรมคอมพิวเตอร์ แต่ไม่มีฐานความผิดเฉพาะสำหรับการหลอกรักออนไลน์ แม้ว่าฐานความผิดเกี่ยวกับการฉ้อโกงหลอกลวงทางคอมพิวเตอร์ในมาตรา 14 สามารถนำมาปรับใช้ แต่มีปัญหาและข้อจำกัดบางประการทำให้ไม่สามารถครอบคลุมพฤติกรรมต่าง ๆ อย่างเป็นกระบวนการของอาชญากรรมนี้ (คณาธิป ทองรวีวงศ์ และ ชลธิชา สมสะอาด, 2564)

สำหรับการวิจัยนี้จะศึกษาประเด็นผลกระทบของเหยื่ออาชญากรรมหลอกรักออนไลน์ ซึ่งนอกจากได้รับความเสียหายในแง่ทรัพย์สินแล้ว ยังอาจตกเป็นผู้ต้องหาการกระทำความผิดฐานบัญชีม้าตามกฎหมายอื่นด้วย ทั้งนี้ เนื่องจากในบางกรณีเหยื่อของการหลอกรักออนไลน์ถูกอาชญากรชักจูงให้เปิด

บัญชีหรือใช้บัญชีเงินฝากเพื่อรับหรือโอนเงินอันอาจเกี่ยวข้องกับอาชญากรรมต่าง ๆ อีกทั้งในปี พ.ศ. 2566 มีการประกาศใช้ “พระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566” ซึ่งกำหนดมาตรการหลายประการที่เกี่ยวข้องกับอาชญากรรมทางเทคโนโลยี เช่น การกำหนดกระบวนการระงับการทำธุรกรรม การกำหนดให้มีระบบแลกเปลี่ยนข้อมูลระหว่างสถาบันการเงิน ในที่นี้จะศึกษาในส่วนของการกำหนดฐานความผิดสำหรับ “บัญชีม้า” ในมาตรา 9 ที่มีองค์ประกอบความผิดกว้างครอบคลุมบุคคลใดที่เปิดบัญชีเงินฝากหรือยอมให้บุคคลอื่นใช้บัญชีเงินฝากในการกระทำที่เกี่ยวข้องกับอาชญากรรม จากผลของการกำหนดฐานความผิดนี้ ซึ่งมีองค์ประกอบความผิดที่กว้างนำไปสู่ประเด็นว่า เหยื่ออาชญากรรมหลอกรักออนไลน์ที่ในแง่หนึ่งเป็นผู้เสียหายจากอาชญากรรม แต่อาจถูกดำเนินคดีตั้งข้อหาความผิดฐานบัญชีม้า ซึ่งการวิจัยนี้จะทำการศึกษาว่าการกำหนดความผิดมาตรา 9 ดังกล่าว มีความเหมาะสมและสมดุลหรือไม่เมื่อพิจารณาสิทธิเสรีภาพของเหยื่ออาชญากรรมหลอกรักออนไลน์ โดยจะศึกษาเปรียบเทียบกับแนวทางการกำหนดความผิดสำหรับบัญชีม้าตามกฎหมายสหรัฐอเมริกาและสหราชอาณาจักร

วัตถุประสงค์ของการวิจัย

(1) ศึกษารูปแบบพฤติกรรมและผลกระทบของอาชญากรรมประเภทการหลอกรักออนไลน์

(2) ศึกษารูปแบบและแนวทางการกำหนดความผิดสำหรับบัญชีม้าตามกฎหมายไทยและต่างประเทศ โดยมีขอบเขตศึกษากฎหมายสหรัฐอเมริกาและสหราชอาณาจักร

(3) ศึกษาวิเคราะห์ประเด็นปัญหาขององค์ประกอบความผิดฐานบัญชีม้าตามกฎหมายไทยต่อเหยื่ออาชญากรรมประเภทการหลอกลวงเชิงความรัก โดยเปรียบเทียบกับความผิดตามกฎหมายต่างประเทศ

แนวคิด ทฤษฎี กรอบแนวคิด

ในทางวิชาการมีกรอบแนวคิดในการจำแนกประเภทอาชญากรรมคอมพิวเตอร์ (Computer Crime) หรือ อาชญากรรมไซเบอร์ (Cyber Crime) โดยจำแนกเป็นหลายประเภท ในส่วนที่เกี่ยวข้องกับ “การฉ้อโกงหลอกลวงทางคอมพิวเตอร์” (Computer Fraud) สามารถจำแนกเป็น 4 กลุ่ม ได้แก่ (1) การฉ้อโกงหลอกลวงทางคอมพิวเตอร์ที่มีเป้าหมายต่อการประมวลผลโดยอัตโนมัติของระบบหรือโปรแกรมคอมพิวเตอร์ เช่น การหลอกลวงซอฟท์แวร์หรือโปรแกรมที่ใช้วิเคราะห์ข้อมูล (Analytics Software) หรือการใช้ปัญญาประดิษฐ์ (Artificial Intelligence หรือ AI) อาชญากรจึงไม่ได้มุ่งหมายต่อการรับรู้ของมนุษย์ ดังเช่น การหลอกลวงฉ้อโกงแบบดั้งเดิม (2) การฉ้อโกงหลอกลวงในระบบการชำระเงินทางอิเล็กทรอนิกส์ เช่น การรับเงินหรือชำระเงินผ่านระบบอิเล็กทรอนิกส์ ผ่านโปรแกรมประยุกต์ (Application) (3) การฉ้อโกงหลอกลวงประเภท “Phishing” โดยทั่วไปคือ การใช้วิธีการนำข้อมูลปลอมเข้าสู่ระบบ โดยมุ่งหมายได้มาซึ่งรหัสผ่านหรือข้อมูลส่วนตัวของเหยื่อ แต่มีความซับซ้อนในแง่เทคนิคและจำแนกวิธีการกระทำได้หลากหลาย (Thongraweewong, 2018) (4) การฉ้อโกงหลอกลวงประเภท “Scam” ซึ่งใช้ข้อมูลเท็จหลอกลวงมนุษย์ โดยแยกเป็นสองกลุ่มหลัก ได้แก่ (1) การหลอกลวงเกี่ยวกับธุรกิจหรือการลงทุน (Rustad, 2014) และ (2) การหลอกลวงด้านความรักหรือการหลอกรักออนไลน์ (Romance Scam) ซึ่งคล้ายคลึงกับ “Scam” ชนิดอื่น เนื่องจากอาศัยความไว้วางใจของเหยื่อและอาจนำไปสู่การได้มาซึ่งประโยชน์ทางการเงินเช่นกัน แต่การหลอกรักออนไลน์ อาศัยความไว้วางใจใน

ระดับที่ลึกซึ้งกว่า เนื่องจากเชื่อมโยงกับความสัมพันธ์ในเชิงความรัก และอาจมีชื่อเรียกที่หลากหลาย เช่น Online Dating Scam, Sex Scam เป็นต้น ดังนั้นเมื่อพิจารณาการหลอกรักออนไลน์หรือ “Romance Scam” พบว่า จัดเป็นส่วนย่อยของอาชญากรรมประเภทการหลอกลวงทางคอมพิวเตอร์

กรอบแนวคิดเกี่ยวกับอาชญากรรมคอมพิวเตอร์ที่เกี่ยวข้องกรอบแนวคิดเกี่ยวกับเกณฑ์ความมั่นคงปลอดภัยของระบบและข้อมูลคอมพิวเตอร์ (Information Security) ซึ่งพิจารณาโดยจำแนกคุณลักษณะ (Characteristics) 3 ประการอันนำไปสู่เป้าหมายของความมั่นคงปลอดภัยของระบบหรือข้อมูล (Set of Security Goals) (Cherdantseva & Hilton, 2013) ได้แก่ 1) “Confidentiality” หรือ “C” หมายถึง การรักษาความลับของข้อมูล ซึ่งจะไม่ถูกเข้าถึงหรือเปิดเผยโดยผู้ที่ไม่มีสิทธิ (Gattiker, 2004) 2) “Integrity” หรือ “I” หมายถึง การคงสภาพหรือบูรณภาพ หมายถึง ข้อมูลจะถูกเปลี่ยนแปลงได้เฉพาะกรณีที่กระทำโดยมีอำนาจ (National Research Council, 1991) 3) Availability หรือ “A” หมายถึง การที่ระบบพร้อมที่จะทำงานโดยไม่ปฏิเสธผู้ใช้ที่มีอำนาจ อาจเรียกว่า “ความพร้อมใช้งาน” โดยในความหมายอย่างกว้างรวมถึงระบบและข้อมูลคอมพิวเตอร์ด้วย (Longley & Shain, 1989).เมื่อนำกรอบแนวคิดนี้มาวิเคราะห์การฉ้อโกงหลอกลวงทางคอมพิวเตอร์ จะจำแนกได้ 2 กรณี คือ กรณีที่หนึ่ง การฉ้อโกงหลอกลวงทางคอมพิวเตอร์ที่ส่งผลกระทบต่อคุณลักษณะด้านความปลอดภัยของระบบหรือข้อมูลคอมพิวเตอร์ เช่น การส่งชุดคำสั่งไปยังโปรแกรมเป้าหมายเพื่อให้ทำงานไปตามที่อาชญากรต้องการ กรณีที่สอง การฉ้อโกงหลอกลวงทางคอมพิวเตอร์ที่ไม่ส่งผลกระทบต่อคุณลักษณะด้านความปลอดภัยของระบบหรือข้อมูลคอมพิวเตอร์ กล่าวคือ การหลอกลวงที่มุ่งเน้นการหลอกลวงบุคคลโดยอาศัยข้อมูลเนื้อหาที่มนุษย์เข้าใจได้ เช่น ข้อมูลเท็จ (คณาธิป ทองรวีวงศ์, 2563)

สำหรับการหลอกรักออนไลน์ แม้กระทำทางคอมพิวเตอร์ แต่เป็นการฉ้อโกงหลอกลวงที่ไม่ส่งผลกระทบต่อคุณลักษณะด้านความปลอดภัยของระบบหรือข้อมูล เนื่องจากอาศัยข้อมูลเท็จเพื่อหลอกลวงเหยื่อเพื่อสร้างความสัมพันธ์ระหว่างบุคคล กล่าวคือ ผลกระทบจากข้อมูลเท็จที่นำเข้าสู่ระบบนั้นเกิดขึ้นกับความรู้และความเข้าใจตลอดจนปฏิกิริยาตอบสนองจากบุคคลผู้เป็นเหยื่อ โดยไม่ส่งผลให้ระบบหรือข้อมูลถูกแก้ไขหรือไม่สามารถใช้การได้แต่อย่างใด

วิธีดำเนินการวิจัย

งานวิจัยนี้ใช้วิธีการวิจัยเชิงคุณภาพ (Qualitative Research) ศึกษาข้อมูลเอกสาร (Documentary Research) โดยมีขั้นตอนดังนี้

1. ข้อมูลที่นำมาวิเคราะห์ ประกอบด้วย วรรณกรรมทางกฎหมายที่เกี่ยวข้องจากงานวิจัย หนังสือ บทความวิชาการ บทความวิจัย รายงานสืบเนื่องการประชุมวิชาการ

2. การเก็บรวบรวมข้อมูลมาจากแหล่งเอกสาร ห้องสมุด ในส่วนของแหล่งข้อมูลอิเล็กทรอนิกส์เก็บรวบรวมจากเว็บไซต์ของหน่วยงานที่เกี่ยวข้องกับการบัญญัติและตีความกฎหมาย เว็บไซต์ของสถาบันการศึกษา ฐานข้อมูลวิจัยออนไลน์ต่างประเทศ เช่น SpringerLink, EBSCO, ProQuest เป็นต้น

3. การวิเคราะห์ข้อมูล ใช้วิธีการวิเคราะห์เชิงเนื้อหา (Content Analysis) นำหลักกฎหมายที่กำหนดความผิดเกี่ยวกับบัญชีม้าของไทยและต่างประเทศมาวิเคราะห์เนื้อหาเปรียบเทียบ

การศึกษาวิจัยนี้มุ่งเน้นการวิเคราะห์ตีความเนื้อหาตัวบทกฎหมาย เพื่อทราบปัญหาในแง่ความกว้างขององค์ประกอบความผิดฐานบัญชีม้าซึ่งส่งผลกระทบต่อเหยื่ออาชญากรรมหลอกรักออนไลน์ ซึ่งจะนำไปสู่การสร้างข้อเสนอแนะเชิงนโยบาย โดยไม่ได้ใช้วิธีเชิงปริมาณและสถิติ

ผลการวิจัย

(1) จากกรอบแนวคิดทฤษฎี จะเห็นได้ว่าการหลอกรักออนไลน์ เป็นการหลอกลวงทางคอมพิวเตอร์ ที่มิได้มุ่งเน้นหรือส่งผลกระทบต่อระบบหรือข้อมูล แต่มุ่งเป้าหมายในการหลอกลวงความรู้สึกของเหยื่อ จากรูปแบบขั้นตอนของการหลอกรักออนไลน์ จะเห็นได้ว่าผลกระทบหรือความเสียหายของเหยื่อมีความหลากหลาย มิได้จำกัดเฉพาะการสูญเสียทรัพย์สิน ดังเช่น อาชญากรรมออนไลน์อื่นๆ แต่อาจรวมถึงการให้เหยื่อดำเนินการต่าง ๆ เช่น การให้เหยื่อเปิดบัญชีเงินฝากหรือยอมให้ผู้หลอกลวงนำบัญชีไปใช้รับหรือโอนเงินจากการกระทำผิดต่าง ๆ ซึ่งอาจเป็นการดำเนินการต่อเนื่องในช่วงระยะเวลาหนึ่ง ทำให้เหยื่อที่ถูกมีลักษณะพฤติกรรมเข้าข่ายเป็นบัญชีม้า (Money Mule)

(2) กฎหมายของประเทศไทยและต่างประเทศ มีรูปแบบและแนวทางกำหนดความผิดสำหรับบัญชีม้าแตกต่างกัน ผลการศึกษาพบว่า ประเทศไทยมีฐานความผิดเกี่ยวกับการฟอกเงิน ซึ่งสามารถปรับใช้กับบัญชีม้าโดยครอบคลุมพฤติกรรมการรับหรือโอนเงินที่เกี่ยวข้องกับความผิดมูลฐาน การกำหนดความผิดนี้เป็นรูปแบบและแนวทางที่เทียบได้กับกฎหมายฟอกเงินของสหรัฐอเมริกาและสหราชอาณาจักร อย่างไรก็ตามประเทศไทยยังได้กำหนดฐานความผิดเฉพาะเกี่ยวกับบัญชีม้าไว้ในกฎหมายเฉพาะ คือ มาตรา 9 ของพระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 แยกออกมาจากกฎหมายเกี่ยวกับการฟอกเงิน โดยกำหนดความผิดสำหรับพฤติกรรมการเปิดบัญชีหรือยอมให้บุคคลอื่นใช้บัญชีเงินฝาก ซึ่งเป็นรูปแบบและแนวทางที่ไม่ปรากฏในกฎหมายสหรัฐอเมริกาและสหราชอาณาจักร

(3) การกำหนดความผิดฐานบัญชีม้าตามมาตรา 9 ของพระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 มีองค์ประกอบความผิดหลายส่วนที่มีขอบเขตกว้าง เช่น การกำหนดความผิดสำหรับการเปิดหรือยอมให้บุคคลอื่นใช้บัญชีเงินฝาก ที่ครอบคลุมตั้งแต่ยังไม่มีพฤติกรรมการรับหรือโอนทรัพย์สิน การกำหนดความผิดโดยองค์ประกอบพฤติการณ์ประกอบการกระทำ “ควรรู้” ว่าการใช้บัญชีนั้นเกี่ยวข้องกับการกระทำผิด ซึ่งไม่มีเกณฑ์ชี้วัดที่ชัดเจน จึงทำให้ฐานความผิดนี้ไม่เจาะจงเฉพาะบัญชีม้ากรณีที่ผู้กระทำมีเจตนาโดยได้รับประโยชน์ เช่น การรับจ้างเปิดบัญชี เพราะองค์ประกอบความผิดอาจครอบคลุมไปถึงเหยื่ออาชญากรรมหลอกรักออนไลน์ที่ถูกหลอกให้ใช้บัญชีเงินฝากเพื่อการทำธุรกรรมที่เกี่ยวข้องกับความผิดอาญาต่าง ๆ เมื่อเปรียบเทียบกับกฎหมายสหรัฐอเมริกาและสหราชอาณาจักรพบว่า ความผิดเกี่ยวกับบัญชีม้าเป็นส่วนหนึ่งของความผิดฐานฟอกเงิน กำหนดองค์ประกอบความผิดที่แคบและเจาะจงสำหรับบัญชีม้าที่รับจ้างหรือร่วมมือในการประกอบอาชญากรรม

สรุปและอภิปรายผล

(1) จากกรอบแนวคิดทฤษฎี การหลอกรักออนไลน์ เป็น การหลอกลวงทางคอมพิวเตอร์ (Computer Fraud) ที่มิได้มุ่งเน้นหรือส่งผลกระทบต่อความมั่นคงปลอดภัยของระบบหรือข้อมูล แต่มุ่งหลอกลวงบุคคลผู้เป็นเหยื่อโดยอาศัยความเชื่อใจ และความคาดหวังบนพื้นฐานของความรัก (FBI, 2017). นอกจากนี้จากการวิเคราะห์วรรณกรรมที่เกี่ยวข้องกับการหลอกรักออนไลน์ พบว่า อาชญากรรมนี้มีรายละเอียดแตกต่างกันไปในแต่ละกรณี แต่มีรูปแบบหรือวงจรพฤติกรรมที่จำแนกเป็นขั้นตอนได้ 4 ขั้นตอน คือ 1) ขั้นตอนการแสวงหาเหยื่อ กล่าวคือ การสืบค้นข้อมูลหรือแสวงหาเหยื่อจากสื่อออนไลน์ เช่น เว็บไซต์จัดหาคู่หรือสื่อสังคมออนไลน์ (Social Media) โดยผู้หลอกลวงอาจปลอมตัวหรือใช้ข้อมูลเท็จต่างๆ เพื่อหลอกเหยื่อ (Rege, 2009) 2) ขั้นตอนการสร้างความสัมพันธ์ กล่าวคือ อาชญากรติดต่อ

สร้างความรู้จัก นำไปสู่ความสนิทสนมและความสัมพันธ์เชิงความรัก โดยขั้นตอนนี้อาจใช้เวลานานกว่าการหลอกลวงแบบอื่น (Jakobsson, 2016) 3) ขั้นตอนการแสวงประโยชน์ โดยอาชญากรอาจมุ่งประสงค์ทรัพย์สินโดยเริ่มจากสิ่งเล็กน้อย เช่น ขอสิ่งของ ของขวัญ เพื่อเป็นการทดสอบเหยื่อ จากนั้นจะขอเงินจำนวนที่มากขึ้นโดยอ้างเหตุจำเป็นต่างๆ เช่น ค่าเดินทางจากต่างประเทศ ความเดือดร้อนที่ต้องใช้เงินด่วนเกี่ยวกับความเจ็บป่วย รวมทั้งอาจแสวงประโยชน์อื่น เช่น การให้เหยื่อดำเนินการต่างๆ ให้ (Whitty & Buchanan, 2012) 4) ขั้นตอนการแสวงประโยชน์ต่อเนื่องหรือเป็นวงจร (IC3,2007) ทั้งนี้ เพราะการหลอกรักออนไลน์อยู่บนพื้นฐานความสัมพันธ์ที่เกิดจากการหลอกลวงอย่างต่อเนื่อง จึงแตกต่างจากการหลอกลวงออนไลน์แบบอื่นที่เกิดขึ้นและจบลงเป็นรายครั้ง เช่น คอลเซ็นเตอร์ที่หลอกลวงให้เหยื่อโอนเงิน จากการศึกษารูปแบบพฤติกรรมและขั้นตอนการกระทำ พบว่า อาชญากรรมนี้ใช้รูปแบบและวิธีการแตกต่างกันในแต่ละกรณี โดยส่งผลกระทบต่อเหยื่อในมิติต่างๆ ได้แก่ 1) ผลกระทบเชิงทรัพย์สิน เหยื่อถูกหลอกให้โอนหรือส่งมอบทรัพย์สินให้ผู้หลอกลวง หรือหลอกลวงให้ลงทุนต่าง ๆ 2) ผลกระทบทางจิตใจ ทั้งนี้ เพราะอาชญากรใช้วิธีการสร้างความสัมพันธ์ผ่านการพูดคุยทางออนไลน์ 3) ผลกระทบเชิงสิทธิเสรีภาพกล่าวคือ เหยื่อตกเป็นผู้ต้องหาในการกระทำผิดต่าง ๆ ซึ่งเกิดขึ้นในกรณีที่อาชญากรหลอกลวงให้เหยื่อเปิดบัญชีเงินฝาก หรือยอมให้อาชญากรนำบัญชีของเหยื่อไปใช้รับหรือโอนเงินที่ได้จากการประกอบอาชญากรรมต่าง ๆ หรือเหยื่อตกอยู่ในสถานะ “บัญชีม้า” (Money Mule) (Jakobsson, 2016)

(2) ผลการศึกษาพบว่า กฎหมายของประเทศไทยและต่างประเทศ มีรูปแบบและแนวทางในการกำหนดความผิดสำหรับบัญชีม้าแตกต่างกันไป ดังนี้

1) กฎหมายไทยที่เกี่ยวข้องกับบัญชีม้า ประกอบด้วยกฎหมายหลายฉบับ ได้แก่

-พระราชบัญญัติป้องกันและปราบปรามการฟอกเงิน พ.ศ. 2542 กำหนดความผิดสำหรับการโอนรับโอนเงินหรือทรัพย์สิน ซึ่งเชื่อมโยงกับ “ความผิดมูลฐาน” เช่น การฉ้อโกงหลอกลวงทางคอมพิวเตอร์ โดยมาตรา 5 มีองค์ประกอบความผิดว่า “ผู้ใด 1) โอน รับโอน หรือเปลี่ยนสภาพทรัพย์สินที่เกี่ยวกับการกระทำความผิดเพื่อซุกซ่อนหรือปกปิดแหล่งที่มาของทรัพย์สินนั้น หรือเพื่อช่วยเหลือผู้อื่นไม่ว่าก่อนขณะ หรือหลังการกระทำความผิด มิให้ต้องรับโทษหรือรับโทษน้อยลงในความผิดมูลฐาน หรือ 2) กระทำด้วยประการใดๆ เพื่อปกปิดหรืออำพรางลักษณะที่แท้จริงการได้มาแหล่งที่ตั้ง การจำหน่ายการโอน การได้สิทธิใดๆ ซึ่งทรัพย์สินที่เกี่ยวกับการกระทำความผิด 3) ได้มาครอบครอง หรือใช้ทรัพย์สินโดยรู้ในขณะที่ได้มา ครอบครอง หรือใช้ทรัพย์สินนั้นว่า เป็นทรัพย์สินที่เกี่ยวกับการกระทำความผิด ผู้นั้นกระทำความผิดฐานฟอกเงิน”

-ประมวลกฎหมายอาญาฐานความผิดตัวการ ตามมาตรา 83 กำหนดความผิดสำหรับบุคคลที่ร่วมกันกระทำผิด ซึ่งครอบคลุมการกระทำความผิดทางอาญาต่างๆ รวมถึงการฉ้อโกง และการกระทำผิดทางคอมพิวเตอร์ด้วย สำหรับผู้ที่ตกลงร่วมกันหรือวางแผนในการรับเงินจากการกระทำผิดและส่งเงินต่อไป นอกจากเป็นความผิดฐานฟอกเงิน ยังเข้าข่ายความผิดฐานตัวการร่วมกันในความผิดอันเป็นเหตุให้เกิดการได้มาซึ่งเงินหรือการโอนเงินนั้น

-พระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 มีหลักการหลายส่วน ในที่นี้ศึกษาเฉพาะความผิดเกี่ยวกับบัญชีเงินฝาก ในมาตรา 9 ซึ่งมีองค์ประกอบความผิดว่า “...ผู้ใดเปิดหรือยินยอมให้บุคคลอื่นใช้บัญชีเงินฝาก บัญชีเงินอิเล็กทรอนิกส์ บัตรอิเล็กทรอนิกส์โดยมิได้เจตนาใช้เพื่อตน หรือเพื่อกิจการที่ตนเกี่ยวข้อง โดยประการที่รู้หรือควรรู้ว่าจะนำไปใช้ในการกระทำความผิดเกี่ยวกับอาชญากรรมทางเทคโนโลยีหรือความผิดทางอาญาอื่นใด...”

2) ผลการศึกษากฎหมายสหรัฐอเมริกา พบว่า กฎหมายฟอกเงินระดับรัฐบาลกลาง (Money Laundering Control Act of 1986, Public Law 99-570) กำหนดความผิดฐานฟอกเงินสำหรับการทำธุรกรรมเกี่ยวกับการเคลื่อนไหวหรือเคลื่อนย้ายเงินทุน การโอนเอกสารสิทธิในทรัพย์สิน ซึ่งครอบคลุมการใช้บัญชีธนาคารเพื่อรับเงิน โอนเงินอันเกี่ยวกับความผิดต่าง ๆ (Pickles, 2021)

กฎหมายอาญาและความผิดฐานสมคบ (Conspiracy) กล่าวคือ ในกรณีบุคคลที่ใช้บัญชีธนาคารรับโอนเงินที่เกี่ยวข้องกับการกระทำความผิดฐานต่างๆ จะเข้าข่ายถูกดำเนินคดีตามข้อหาสมคบ ขึ้นอยู่กับความผิดอันเป็นเหตุให้เกิดการได้มาซึ่งเงินหรือการโอนเงินนั้น จึงเป็นกฎหมายที่กว้างและครอบคลุมอาชญากรรมชนิดต่าง ๆ โดยเป็นความผิดเมื่อมีการกระทำต่าง ๆ กับเงินหรือทรัพย์สินที่ได้มาจากการกระทำผิด

3) ผลการศึกษากฎหมายสหราชอาณาจักร พบว่า ไม่มีกฎหมายเฉพาะที่กำหนดความผิดสำหรับการเปิดบัญชีเงินฝากหรือใช้บัญชีเงินฝากรับเงินจากอาชญากรรมประเภทการหลอกลวงเชิงความรักและอาชญากรรมไซเบอร์อื่น ๆ แต่มีกฎหมายเกี่ยวกับการป้องกันและปราบปรามการฟอกเงิน ซึ่งกำหนดความผิดอาญาฐานฟอกเงิน กล่าวคือ พระราชบัญญัติรายได้จากอาชญากรรม ค.ศ. 2002 (Proceeds of Crime Act 2002 หรือ POCA) ซึ่งกำหนดมาตรการหลายอย่างเกี่ยวกับการป้องกันและปราบปรามการฟอกเงิน เช่น การยึดทรัพย์อันได้จากการประกอบอาชญากรรม การรายงานธุรกรรมทางการเงิน โดยในส่วนของการกำหนดความผิดอาญาสำหรับผู้ที่กระทำการเกี่ยวข้องกับการใช้บัญชีธนาคารเพื่อรับหรือโอนเงินจากการกระทำผิดจะเกี่ยวข้องกับฐานความผิดดังนี้

-ความผิดสำหรับการปกปิด (Concealing) ตามมาตรา 327 มีองค์ประกอบความผิดสำหรับการ “ปกปิด ซ่อนเร้น แปรสภาพ โอน ทรัพย์สินที่เกี่ยวข้องกับอาชญากรรม” (Criminal Property) ทั้งนี้กฎหมายนิยามว่า การปกปิด ซ่อนเร้น (Concealing or Disguising) หมายรวมถึง การปกปิดหรือซ่อนเร้นลักษณะ แหล่งที่มา ที่ตั้ง การเคลื่อนไหว หรือสิทธิใด ๆ ที่เกี่ยวข้องกับทรัพย์สินที่เกี่ยวข้องกับอาชญากรรม

-ความผิดสำหรับการเข้ามีส่วนร่วมในการดำเนินการเกี่ยวกับทรัพย์สิน (Arrangement) ตามมาตรา 328 ซึ่งมีองค์ประกอบความผิดสำหรับการ “..กระทำการใดอันเป็นการมีส่วนร่วมในการดำเนินการซึ่งผู้กระทำรู้หรือมีเหตุอันควรสงสัยว่าการดำเนินการนั้นเป็นการช่วยเหลือ หรือสนับสนุนบุคคลอื่นหรือในนามของบุคคลอื่น ในการได้มา การเก็บรักษา การใช้ หรือการควบคุมทรัพย์สินที่เกี่ยวข้องกับอาชญากรรม..”

ผลการศึกษาข้อ 2 จึงสรุปได้ว่า ประเทศไทยมีฐานความผิดเกี่ยวกับการฟอกเงิน ซึ่งสามารถปรับใช้กับบัญชีม้าโดยครอบคลุมพฤติกรรมการรับหรือโอนเงินที่เกี่ยวข้องกับความผิดมูลฐาน การกำหนดความผิดนี้เป็นรูปแบบและแนวทางที่เทียบได้กับกฎหมายฟอกเงินของสหรัฐอเมริกาและสหราชอาณาจักร อย่างไรก็ตาม ประเทศไทยยังได้กำหนดฐานความผิดเฉพาะเกี่ยวกับบัญชีม้าไว้ในกฎหมายเฉพาะคือ มาตรา 9 ของพระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 แยกออกมาจากกฎหมายเกี่ยวกับการฟอกเงิน โดยกำหนดความผิดสำหรับพฤติกรรมการเปิดบัญชีหรือยอมให้บุคคลอื่นใช้บัญชีเงินฝาก ซึ่งเป็นรูปแบบและแนวทางที่ไม่ปรากฏในกฎหมายสหรัฐอเมริกาและสหราชอาณาจักร

(3) การกำหนดความผิดฐานบัญชีม้าตามกฎหมายไทย และผลกระทบต่อสิทธิเสรีภาพของเจ้าของบัญชีที่เป็นเหยื่ออาชญากรรมหลอกรักออนไลน์ สามารถจำแนกเป็นประเด็นเพื่อวิเคราะห์เปรียบเทียบกับกฎหมายต่างประเทศดังนี้

1) กฎหมายไทยกำหนดฐานความผิดเฉพาะสำหรับบัญชีม้า โดยเป็นส่วนหนึ่งของพระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 อันเป็นกฎหมายที่ตราขึ้นเฉพาะแยกเป็นคนละฉบับกับกฎหมายเกี่ยวกับการฟอกเงิน อย่างไรก็ตาม บุคคลที่ใช้บัญชีเงินฝากของตนเพื่อรับหรือโอนเงินที่ได้จากการกระทำความผิดต่างๆ ก็ยังคงเข้าข่ายความผิดตามกฎหมายฟอกเงิน ส่งผลให้มีความผิดตามกฎหมายหลายฉบับและเกิดความซ้ำซ้อน เปรียบเทียบกับสหรัฐอเมริกาและสหราชอาณาจักรพบว่า มิได้กำหนดกฎหมายเฉพาะเกี่ยวกับบัญชีม้าและไม่ได้กำหนดความผิดฐานบัญชีม้า (Money Mule) เป็นการเฉพาะ แต่ปรับใช้ฐานความผิดตามกฎหมายเกี่ยวกับการฟอกเงินซึ่งมีองค์ประกอบครอบคลุมการรับหรือโอนเงินที่เกี่ยวข้องกับการกระทำผิดได้ ทำให้บัญชีม้ามีความผิดเฉพาะตามกฎหมายฟอกเงิน

2) กฎหมายไทยกำหนดความผิดอย่างเจาะจงถึงการกระทำเกี่ยวกับบัญชีเงินฝาก เช่น การเปิดบัญชีหรือยอมให้บุคคลอื่นใช้บัญชี ซึ่งส่งผลให้บุคคลทั่วไปที่ใช้บัญชีธนาคารมีความเสี่ยงที่จะเข้าองค์ประกอบนี้ ในขณะที่ความผิดฐานฟอกเงินตามกฎหมายสหราชอาณาจักรและกฎหมายสหรัฐอเมริกาไม่ได้ระบุเจาะจงถึงบัญชีเงินฝาก แต่กำหนดความผิดสำหรับการโอนเงินหรือทรัพย์สินไม่ว่าจะดำเนินการด้วยวิธีการหรือผ่านช่องทางใด

3) กฎหมายไทยกำหนดความผิดสำหรับบัญชีม้า โดยแยกเป็นพฤติกรรมสองขั้นตอนที่เกี่ยวข้องกับการรับหรือโอนเงิน คือ การเปิดบัญชีธนาคาร และการยินยอมให้บุคคลอื่นใช้บัญชีเงินฝากธนาคาร เปรียบเทียบกับกฎหมายสหราชอาณาจักรและสหรัฐอเมริกา กำหนดความผิดเมื่อมีพฤติกรรมการซ่อนเร้นหรือแปรสภาพทรัพย์สิน เช่น การรับหรือโอนเงิน แต่มาตรา 9 กำหนดความผิดตั้งแต่การเปิดบัญชีเงินฝาก แม้ยังไม่ปรากฏว่ามีการรับหรือโอนเงิน องค์ประกอบความผิดในส่วนนี้จึงมีขอบเขตกว้าง

4) กฎหมายไทยกำหนดความผิดโดยมีองค์ประกอบว่า “..โดยมิได้เจตนาใช้เพื่อตน หรือเพื่อกิจการที่ตนเกี่ยวข้อง..” ซึ่งมีขอบเขตกว้าง นอกจากจะครอบคลุมกรณีเจ้าของบัญชีม้าที่รับจ้างโดยยอมให้อาชญากรใช้บัญชีทำธุรกรรมแล้ว ยังครอบคลุมการเปิดหรือใช้งานบัญชีเพื่อประโยชน์หรือกิจการของบุคคลอื่นที่มิได้เกี่ยวข้องกับกิจการของตนในมิติทางสังคมอื่น เช่น การที่บุคคลให้ญาติที่ไม่มีบัญชีเงินฝากรับหรือโอนเงินเพื่อกิจกรรมทางครอบครัวหรือสังคม แม้ว่าการเปิดหรือใช้บัญชีนั้นยังต้องพิจารณาองค์ประกอบความผิดอื่นต่อไปด้วย แต่องค์ประกอบความผิดที่กว้างในส่วนนี้อาจทำให้กิจกรรมทางสังคมอาจมีความเสี่ยงต่อความผิดไปด้วย เมื่อเปรียบเทียบกับกฎหมายสหราชอาณาจักร และสหรัฐอเมริกากำหนดความผิดสำหรับการกระทำในการรับหรือโอนเงินที่เกี่ยวข้องกับการกระทำผิด โดยมิได้กำหนดองค์ประกอบความผิดในส่วนของการใช้บัญชีเงินฝากเพื่อกิจการของผู้อื่น ดังนั้นลำพังเพียงปรากฏว่ามีการใช้บัญชีเงินฝากของตนเพื่อกิจการของผู้อื่น ยังไม่เข้าองค์ประกอบความผิดใด

5) มาตรา 9 กำหนดองค์ประกอบความผิดว่า เจ้าของบัญชีต้องรู้หรือควรรู้ว่าการใช้บัญชีนั้นเกี่ยวข้องกับอาชญากรรม แต่เนื่องจากการกำหนดว่า “ควรรู้” มีขอบเขตกว้างและไม่มีเกณฑ์พิจารณาชัดเจน จึงทำให้ความผิดมาตรานี้ไม่จำกัดเฉพาะการรับจ้างเปิดบัญชี แต่อาจครอบคลุมถึงเหยื่อผู้ถูกหลอกให้ใช้บัญชีของตนเพื่อรับเงินซึ่งอาจถูกตั้งข้อหาตามองค์ประกอบว่า “ควรรู้” ทั้งนี้เมื่อพิจารณาเหยื่ออาชญากรรมการหลอกรักออนไลน์จะพบว่า อาชญากรที่หลอกลวงใช้วิธีการวิศวกรรมทางสังคม (Social

Engineering) เช่น การปลอมตัวในการสนทนาหรืออ้างอิงข้อมูลเท็จให้เหยื่อหลงเชื่อ (Jakobsson, 2016) โดยเหยื่ออาจดำเนินการต่างๆ บนพื้นฐานความเชื่อนั้น เช่น การเปิดบัญชีหรือโอนเงิน ซึ่งกรณีเช่นนี้อาจเข้าข่ายองค์ประกอบ “ควรรู้” ซึ่งมีลักษณะกว้าง

6) เกณฑ์พิจารณาความหมายของบัญชีม้า (Money mule) จากงานวิชาการหลายฉบับแสดงถึงองค์ประกอบสำคัญในการรับค่าตอบแทน (Commission, Remuneration, Benefit) กล่าวคือ บัญชีม้าเป็นบุคคลที่ใช้บัญชีของตนรับหรือโอนเงินเพื่อบุคคลอื่นโดยได้รับค่านายหน้าหรือผลตอบแทน ดังนั้นเหยื่อผู้ถูกหลอกให้ใช้บัญชีโดยไม่ได้รับค่าตอบแทน จึงไม่จัดอยู่ในข่ายบัญชีม้า (Abdul Rani, Syed Mustapha Nazri, and Zolkaflil, 2024) แต่มาตรา 9 ไม่ได้กำหนดองค์ประกอบเกี่ยวกับการได้รับประโยชน์ตอบแทน จึงส่งผลให้เหยื่อผู้ถูกหลอกที่ไม่ได้รับค่าตอบแทน อาจเข้าข่ายความผิดได้หากมีพฤติการณ์ที่แสดงว่า “ควรรู้” ซึ่งก็เป็นองค์ประกอบที่กว้างและไม่จำกัดว่า บุคคลนั้นควรจะรู้ เมื่อมีปรากฏว่ามีการรับเงินหรือค่าตอบแทนเท่านั้น

7) เมื่อพิจารณาจากสภาพข้อเท็จจริงของบุคคลที่ยอมให้บุคคลอื่นใช้บัญชีธนาคาร อาจเกิดจากมูลเหตุจูงใจ เจตนา และพฤติการณ์ที่หลากหลาย ซึ่งจำแนกได้สองกลุ่มคือ กลุ่มที่หนึ่ง บุคคลที่รับจ้างเปิดบัญชี และยอมให้บุคคลอื่นใช้บัญชีนั้นในการรับเงินจากการกระทำผิดต่าง ๆ โดยได้รับค่าตอบแทน และกลุ่มที่สอง บุคคลที่เปิดบัญชีธนาคารหรือยอมให้บุคคลอื่นใช้บัญชีธนาคารของตนในการรับหรือโอนเงินที่เกี่ยวกับการกระทำผิด เนื่องจากถูกหลอกลวงในลักษณะต่าง ๆ โดยการศึกษาหลายฉบับได้แสดงให้เห็นวิธีการแสวงหาบัญชีม้าของอาชญากรรมโดยการหลอกลวงเหยื่อโดยเฉพาะกลุ่มเปราะบาง เช่น เยาวชน (Pickles, 2021) รวมถึงกรณีเจ้าของบัญชีที่เป็นเหยื่อของการหลอกรักออนไลน์ โดยเหยื่อไม่รู้ว่าเป็นการรับเงินที่เกี่ยวกับอาชญากรรม กรณีเช่นนี้ในแง่หนึ่งผู้ถูกหลอกลวงเป็นเหยื่อของอาชญากรรมประเภทการหลอกลวงเชิงความรัก แต่ในอีกแง่หนึ่ง มาตรา 9 ของพระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 ซึ่งมีองค์ประกอบที่กว้างในหลายประเด็น ดังวิเคราะห์ข้างต้น ประกอบกับพยานหลักฐานเบื้องต้นบ่งชี้ว่า เส้นทางการเงินของอาชญากรรมมีความเชื่อมโยงไปยังบัญชีดังกล่าว อาจทำให้เจ้าของบัญชีกลุ่มนี้ถูกดำเนินคดีเป็นผู้ต้องหา ซึ่งส่งผลกระทบต่อสิทธิเสรีภาพแม้ว่าต่อมาในชั้นพิจารณาศาลอาจตัดสินว่า ไม่มีความผิดก็ตาม

ข้อเสนอแนะ

1) ข้อเสนอแนะเชิงนโยบาย จากผลการวิจัยชี้ให้เห็นว่า เหยื่อของอาชญากรรมประเภทหลอกรักออนไลน์ (Romance Scam) ได้รับผลกระทบในหลายด้าน นอกจากความเสียหายทางทรัพย์สินแล้ว การหลอกลวงอาจทำให้เหยื่อเปิดหรือใช้บัญชีเงินฝาก เพื่อรับโอนเงินจากการกระทำผิดต่าง ๆ ทำให้เหยื่อมีลักษณะเป็น “บัญชีม้า” อย่างไรก็ตาม ในปี พ.ศ. 2566 ประเทศไทยกำหนดกฎหมายและฐานความผิดเฉพาะสำหรับบัญชีม้าตามมาตรา 9 ของพระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 โดยมีองค์ประกอบความผิดที่กว้าง ไม่จำกัดเฉพาะเจ้าของบัญชีที่รับจ้างเปิดหรือยอมให้ใช้บัญชีเพื่อแลกประโยชน์ตอบแทนเท่านั้น แต่อาจส่งผลให้เหยื่ออาชญากรรมหลอกรักออนไลน์ที่ถูกหลอกหรือชักจูงให้ใช้บัญชีเงินฝากเพื่อรับหรือโอนเงินเกี่ยวกับความผิดต่าง ๆ ตกเป็นผู้ต้องหาของความผิดฐานนี้ได้ เมื่อเปรียบเทียบกับกฎหมายสหรัฐอเมริกาและสหราชอาณาจักร พบว่าไม่ได้กำหนดความผิดดังกล่าวเป็นการเฉพาะที่มีองค์ประกอบความผิดกว้าง ดังเช่น มาตรา 9 แต่ปรับใช้ฐานความผิดตามกฎหมายฟอกเงินสำหรับบัญชีม้า ดังนั้น ผู้วิจัยมีข้อเสนอแนะเชิงนโยบายให้ยกเลิกมาตรา

9 ของ พระราชกำหนดมาตรการป้องกันและปราบปรามอาชญากรรมทางเทคโนโลยี พ.ศ. 2566 ซึ่งยังคงสามารถบังคับใช้ฐานความผิดตามกฎหมายฟอกเงิน สำหรับบัญชีม้าได้ โดยเป็นการลดความซ้ำซ้อนและบังคับใช้ความผิดหลายฐานสำหรับบัญชีม้าอีกด้วย

2) ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

-การวิจัยครั้งนี้มีข้อจำกัดในแง่ขอบเขตและวัตถุประสงค์โดยศึกษาเฉพาะองค์ประกอบของตัวบทกฎหมาย จึงมีข้อเสนอแนะในการศึกษาเพิ่มเติมในส่วนมาตรการอื่นที่เกี่ยวข้อง เช่น มาตรการทางสังคมในการป้องกันอาชญากรรม

-การวิจัยครั้งนี้มีขอบเขตจำกัดการเปรียบเทียบกฎหมายต่างประเทศเฉพาะสหรัฐอเมริกาและสหราชอาณาจักร จึงควรศึกษาเพิ่มเติมเพื่อเปรียบเทียบมาตรการทางกฎหมายของประเทศอื่น เช่น ประเทศในอาเซียน เป็นต้น

-การวิจัยครั้งนี้มีข้อจำกัดในแง่ขอบเขตการวิเคราะห์เนื้อหาองค์ประกอบของตัวบทกฎหมายไทยเปรียบเทียบกับต่างประเทศ โดยใช้วิธีวิจัยเอกสาร จึงมีข้อเสนอในการศึกษาเพิ่มเติมประเด็นอื่น เช่น การตระหนักรู้และความเห็นของเหยื่ออาชญากรรม การบังคับใช้กฎหมาย ซึ่งควรใช้วิธีการวิจัยอื่นประกอบด้วย เช่น สัมภาษณ์เชิงลึก หรือสนทนากลุ่ม หรือแบบสอบถาม เป็นต้น

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สาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี

Causes in Deciding to Become a Committee of the Subdistrict Children and Youth Council in Thung Yang Daeng District, Pattani Province

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บทคัดย่อ

งานวิจัยนี้ต้องการศึกษาสาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี โดยเก็บข้อมูลจากการสำรวจจากกลุ่มเป้าหมาย คือ คณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง รวม 84 คน และวิเคราะห์ข้อมูลด้วยการหาค่าร้อยละ ผลการวิจัย พบว่า สาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี คือการได้ความรู้และประสบการณ์ในการทำกิจกรรม มากที่สุด ร้อยละ 39.30 รองลงมา คือ การสะสมแฟ้มผลงานเพื่อเตรียมตัวเข้าศึกษาต่อในระดับมหาวิทยาลัย การได้เจอเพื่อนใหม่และได้สร้างเครือข่ายเพิ่มขึ้น การได้เป็นแกนนำและตัวอย่างของเยาวชนในชุมชน การอยากมีส่วนร่วมในการผลักดันให้สภาเด็กและเยาวชนอำเภอเข้มแข็ง คิดเป็นร้อยละ 23.80 21.40 10.70 และร้อยละ 4.80 ตามลำดับ

คำสำคัญ: ตัดสินใจ สภาเด็กและเยาวชน

Abstract

This research aims to study the causes in deciding to become a member of the Subdistrict Children and Youth Council in Thung Yang Daeng District. Pattani Province. Data were collected from a survey from a target group, namely, all Subdistrict Children and Youth Council committees in Thung Yang Daeng District, a total of 84 people, and analyzed the data by finding percentage values. The research results found that, causes in deciding to become a member of the Subdistrict Children and Youth Council in Thung Yang Daeng District Pattani Province is to gain the most knowledge and experience in activities, 39.30 percent. Secondly is collecting a portfolio to prepare for further study at

the university level. Meeting new friends and building more networks. Being a leader and example for youth in the community. Wanting to participate in pushing for the district's Children and Youth Council to be strong Representing 23.80%, 21.40%, 10.70% and 4.80% respectively.

Keywords : Decide, The Children and Youth Council

บทนำ

เด็กและเยาวชนคือพลังสำคัญในการพัฒนาสังคม บ้านเมืองและประเทศชาติในอนาคต หากต้องการให้ประเทศชาติเป็นไปในทางที่ดี ได้รับการพัฒนาในด้านต่างๆ เทียบเท่านานาประเทศ เราจะต้องเตรียมความพร้อมในการพัฒนาเด็กและเยาวชนตั้งแต่วันนี้ ฉะนั้น ภาคส่วนที่เกี่ยวข้องจึงจำเป็นต้องให้ความสำคัญต่อเด็กและเยาวชน ให้เขาได้มีโอกาสและมีส่วนร่วมในการคิดและพัฒนาสังคมในด้านต่างๆ ทำอย่างไรก็ได้ให้รู้สึกว่าพวกเขาเป็นส่วนหนึ่งของสังคม มีความสำคัญ ได้รับโอกาส มีบทบาทในการตัดสินใจ มีจุดยืน และสามารถแสดงออกถึงความคิดความอ่านได้อย่างอิสระ

สืบเนื่องจากการประชุมสมัชชาเยาวชน และการสัมมนาวันเยาวชนแห่งชาติ เสียงสะท้อนจากเยาวชนเนื่องในวันเยาวชนแห่งชาติประจำปี 2547 เยาวชนได้เสนอความต้องการให้มีการจัดตั้งสภาเด็กและเยาวชนแห่งชาติขึ้น คณะกรรมการจัดงานวันเยาวชนแห่งชาติในการประชุม ครั้งที่ 5/2547 ได้มีมติเห็นชอบให้สำนักงานส่งเสริมสวัสดิภาพและพิทักษ์เด็ก เยาวชน ผู้ด้อยโอกาส และผู้สูงอายุ สท. ดำเนินโครงการจัดตั้งสภาเด็กและเยาวชนจังหวัดนำร่อง ในปีพ.ศ. 2547 รวม 4 จังหวัด คือ เชียงราย สุรินทร์ ปราจีนบุรี และสตูล ปี พ.ศ. 2548 คณะกรรมการส่งเสริมและประสานงานเยาวชนแห่งชาติ ได้เห็นชอบให้ สท. ดำเนินการจัดตั้งสภาเด็กและเยาวชนจังหวัดทุกจังหวัด ทั่วประเทศ ภายใต้หลักการ เด็กนำ ผู้ใหญ่หนุน และเพื่อให้มีการเชื่อมโยง เครือข่ายเยาวชนสู่ระดับชาติ จึงได้มีการแต่งตั้งคณะกรรมการสภาเด็กและเยาวชนแห่งประเทศไทย เมื่อวันที่ 27 ตุลาคม พ.ศ. 2549 แนวคิดในการจัดตั้งสภาเด็กและเยาวชนเพื่อเป็นเครือข่ายการเชื่อมโยงกลุ่มเด็กและเยาวชนที่มีการดำเนินงานในด้านต่างๆ เข้าด้วยกัน อย่างเป็นระบบและอย่างเป็นรูปธรรม เพื่อปฏิบัติภารกิจร่วมกันในการแสวงหาแนวทางในการส่งเสริมและพัฒนาเด็กและเยาวชน โดยที่แต่ละกลุ่มยังคงปฏิบัติภารกิจหลักของตนต่อไปอย่างไม่สูญเสียเอกลักษณ์และปรัชญาของตนเอง การเชื่อมโยงนี้จะอยู่ในรูปของการจัดองค์กรที่มีโครงสร้างของความสัมพันธ์กันอย่างชัดเจน ตลอดจนเฝ้าระวังปัญหาที่เด็กและเยาวชนต้องเผชิญ (กลุ่มกิจการสภาและเครือข่ายเด็กและเยาวชน, 2567)

ในปี พ.ศ. 2550 ได้มีการประกาศใช้พระราชบัญญัติส่งเสริมการพัฒนาเด็กและเยาวชนแห่งชาติ พ.ศ. 2550 และมีผลบังคับใช้ในวันที่ 13 เมษายน 2551 โดยกำหนดให้สำนักงานส่งเสริมสวัสดิภาพและพิทักษ์เด็ก เยาวชน ผู้ด้อยโอกาส และผู้สูงอายุ (สท.) ร่วมกับสำนักงานพัฒนาสังคมและความมั่นคงของมนุษย์จังหวัดดำเนินการจัดตั้งสภาเด็กและเยาวชนระดับอำเภอ ระดับจังหวัด และระดับชาติ ปัจจุบันมีสภาเด็กและเยาวชนอำเภอ 877 อำเภอ สภาเด็กและเยาวชน จังหวัด 75 จังหวัด สภาเด็กและเยาวชนกรุงเทพมหานคร 1 แห่ง และ สภาเด็กและเยาวชนแห่งประเทศไทย 1 แห่ง

กระทรวงการพัฒนาสังคมและความมั่นคงของมนุษย์ มีนโยบายให้สำนักงานส่งเสริมสวัสดิภาพและพิทักษ์เด็ก เยาวชน ผู้ด้วยโอกาส และผู้สูงอายุ (สท.) ดำเนินการจัดตั้งสภาเด็กและเยาวชนตำบล โดยให้มีคณะบริหารสภาเด็กและเยาวชนตำบล จำนวนไม่ต่ำกว่า 20 คน และมีสัดส่วนหญิง/ชายเท่ากัน หรือ

ใกล้เคียงกัน ทั้งนี้คณะกรรมการส่งเสริมการพัฒนาเด็กและเยาวชนแห่งชาติ ซึ่งมีนายกรัฐมนตรี เป็นประธาน ได้มีมติในการประชุมครั้งที่ 2/2553 เมื่อวันศุกร์ที่ 11 มิถุนายน พ.ศ. 2553 เรื่องการจัดตั้งสภาเด็กและเยาวชนตำบล โดยขอให้องค์กรปกครองส่วนท้องถิ่นสนับสนุนให้มีการจัดตั้งสภาเด็กและเยาวชนตำบล เพื่อส่งเสริมสนับสนุนให้เด็กและเยาวชนของท้องถิ่นได้มีส่วนร่วมในการจัดกิจกรรมที่เป็นประโยชน์ต่อสังคม เป็นแกนนำในการทำกิจกรรมที่เกี่ยวกับการพัฒนาเด็กและเยาวชนรวมทั้งให้ข้อเสนอแนะความคิดเห็นในการพัฒนาเด็กและเยาวชนในท้องถิ่น (กรมกิจการเด็กและเยาวชน, 2567)

บทบาทหน้าที่สภาเด็กและเยาวชนตำบล

1. เป็นศูนย์กลางการเรียนรู้ด้านวิชาการและกิจกรรมที่เกี่ยวกับการศึกษา กีฬา และวัฒนธรรมในตำบล

2. จัดกิจกรรมต่างๆ เพื่อส่งเสริมการพัฒนาเด็กและเยาวชนในตำบล ให้มีความรู้ ความสามารถ คุณธรรมและจริยธรรม

3. ประสานการดำเนินกิจกรรมของกลุ่ม/ชมรมเด็กและเยาวชนในตำบล ให้สอดคล้องและสนับสนุนซึ่งกันและกัน โดยคำนึงประโยชน์สูงสุดในการพัฒนาเด็กและเยาวชน

4. เสนอแนะและให้ความเห็นเกี่ยวกับการพัฒนาเด็กและเยาวชนในตำบลต่อสภาองค์การบริหารส่วนตำบล/เทศบาล เพื่อจัดทำแผนพัฒนาเด็กและเยาวชน

5. ประสานการทำกิจกรรมร่วมกับสภาเด็กและเยาวชนอำเภอ

องค์ประกอบสภาเด็กและเยาวชนตำบล

สมาชิกสภาเด็กและเยาวชนตำบล คือ เด็กและเยาวชนที่อยู่ในเขตตำบลนั้น

เด็ก หมายความว่า บุคคลที่มีอายุต่ำกว่าสิบแปดปีบริบูรณ์

เยาวชน หมายความว่า บุคคลที่มีอายุตั้งแต่สิบแปดปีถึงยี่สิบห้าปีบริบูรณ์

คณะบริหารสภาเด็กและเยาวชนตำบล ประกอบด้วย

1. ประธานสภา 1 คน

2. คณะบริหารคัดเลือกจากผู้แทนนักเรียนหรือนักศึกษาจากสถานศึกษา ตามกฎหมายว่าด้วยการศึกษาแห่งชาติที่อยู่ในเขตตำบล ตั้งแต่ระดับมัธยมศึกษาตอนต้นขึ้นไป โดยให้มีผู้แทนเด็กและเยาวชนจากแต่ละสถานศึกษาอย่างน้อยเป็นชาย 1 คน หญิง 1 คน ผู้แทนเด็กและเยาวชน หมู่บ้านๆ ละ 2 คน ชาย 1 คน หญิง 1 คน และผู้แทนเด็กและเยาวชนที่ไม่ได้อยู่ในสังกัดสถานศึกษา รวมแล้วจำนวนไม่เกิน 20 คน

ที่ปรึกษาคณะบริหารสภาเด็กและเยาวชนตำบล ประกอบด้วย

1. นายอำเภอหรือผู้แทนที่ดูแลตำบลนั้น จำนวน 1 คน

2. ผู้แทนสำนักงานพัฒนาสังคมและความมั่นคงของมนุษย์จังหวัด จำนวน 1 คน

3. ผู้แทนสำนักงานเขตพื้นที่การศึกษาที่ดูแลตำบล จำนวน 1 คน

4. นายกองค์การบริหารส่วนตำบล หรือนายกเทศมนตรีเทศบาลตำบล

5. ผู้แทนองค์กรเอกชนหรือองค์กรชุมชนที่มีกิจกรรมหรือผลงานเกี่ยวกับการพัฒนาเด็กและเยาวชน จำนวน 1 คน

คุณสมบัติคณะบริหารสภาเด็กและเยาวชนตำบล

1. มีอายุไม่เกิน 25 ปีบริบูรณ์

2. ไม่เป็นผู้ดำรงตำแหน่งในทางการเมือง กรรมการหรือผู้ดำรงตำแหน่งที่รับผิดชอบ ในการบริหารพรรคการเมือง ที่ปรึกษาพรรคการเมือง เจ้าหน้าที่พรรคการเมือง สมาชิกพรรคการเมือง สมาชิก

สภาท้องถิ่น หรือผู้บริหารท้องถิ่น

วาระการดำรงตำแหน่งของคณะบริหารสภาเด็กและเยาวชนตำบล

1. คณะบริหารมีวาระการดำรงตำแหน่งคราวละ 2 ปีนับแต่วันที่ได้รับคัดเลือก ประธานสภาหรือคณะบริหารซึ่งพ้นจากตำแหน่งตามวาระ อาจได้รับแต่งตั้งอีกได้ แต่ต้องไม่เกินสองวาระติดต่อกัน

2. กรณีที่คณะบริหารพ้นจากตำแหน่งตามวาระ ให้ดำเนินการคัดเลือกใหม่ภายใน 60 วัน ในระหว่างที่ยังมิได้มีการคัดเลือกคณะบริหารขึ้นใหม่ ให้คณะบริหารนั้นปฏิบัติหน้าที่ไปพลางก่อนจนกว่าจะได้มีการคัดเลือกคณะบริหารใหม่

3. กรณีที่คณะบริหารพ้นจากตำแหน่งก่อนวาระ ให้มีการคัดเลือกบุคคลอื่นแทนตำแหน่งที่ว่าง เว้นแต่วาระของคณะบริหารจะเหลือไม่ถึง 90 วัน และให้ผู้ได้รับคัดเลือกแทนตำแหน่งที่ว่างอยู่ในตำแหน่งเท่ากับวาระที่เหลืออยู่ของประธานสภาหรือ คณะบริหารที่เข้าไปรับตำแหน่งแทน

การพ้นจากตำแหน่งคณะบริหารสภาเด็กและเยาวชนตำบล

1. ขาดคุณสมบัติ
2. การพ้นตำแหน่งตามวาระ
3. ตาย
4. ลาออก

ขั้นตอนการคัดเลือกคณะบริหารสภาเด็กและเยาวชนตำบล

1. แต่งตั้งคณะกรรมการดำเนินการจัดตั้งสภาเด็กและเยาวชนตำบล โดยเจ้าหน้าที่องค์กรปกครองส่วนท้องถิ่นขอผู้แทนจากหน่วยงานที่เกี่ยวข้องเข้าร่วมเป็นคณะกรรมการ ซึ่งได้แก่ ผู้อำนวยการโรงเรียน กำนัน ผู้ใหญ่บ้าน ฯลฯ กำหนดให้มีอำนาจหน้าที่ในการจัดตั้ง และคัดเลือกคณะบริหารสภาเด็กและเยาวชนตำบล

2. รับสมัครเด็กและเยาวชนเข้ารับการคัดเลือกเป็นคณะบริหารสภาเด็กและเยาวชนตำบล ดังนี้

2.1 จัดทำประกาศรับสมัครเด็กและเยาวชน

2.2 ประชาสัมพันธ์ไปยังหน่วยงานต่างๆ เช่น สถานศึกษา หมู่บ้าน

2.3 รับสมัครเด็กและเยาวชน

2.4 ตรวจสอบเอกสารและคุณสมบัติ

2.5 ประกาศรายชื่อผู้มีสิทธิเข้ารับการคัดเลือก

3. การคัดเลือกคณะบริหารสภาเด็กและเยาวชนตำบล โดยคณะกรรมการดำเนินการดังนี้

3.1 ชี้แจงหลักเกณฑ์การคัดเลือก

3.2 ชี้แจงแนวทางการดำเนินงานด้านการพัฒนาเด็กและเยาวชนขององค์การบริหารส่วนตำบล/เทศบาลตำบล แก่ผู้เข้ารับการคัดเลือก

3.3 ให้ผู้มีสิทธิเข้ารับการคัดเลือกเสนอแนวทางการดำเนินงานของสภาเด็กและเยาวชนตำบลเพื่อเป็นข้อมูลประกอบการตัดสินใจในการลงคะแนนคัดเลือกของเด็กและเยาวชน

3.4 ให้เด็กและเยาวชนที่มีสิทธิรับการคัดเลือก ลงคะแนนคัดเลือกกันเอง โดยผู้มีคะแนนสูงสุดเป็นประธานสภาเด็กและเยาวชนตำบล

4. การรับรองการคัดเลือกคณะบริหารสภาเด็กและเยาวชนตำบล

4.1 จัดทำประกาศการจัดตั้งสภาเด็กและเยาวชนตำบล

4.2 เสนอประกาศการจัดตั้งให้นายกองค์การบริหารส่วนตำบล หรือนายกเทศมนตรีเทศบาล

ตำบลลงนามในประกาศ

กิจกรรม

กิจกรรมของสภาเด็กและเยาวชนตำบล ได้แก่ กิจกรรมตามบทบาทหน้าที่ที่กำหนดเป็นกิจกรรมเพื่อส่งเสริมการพัฒนาเด็กและเยาวชนในตำบลให้มีความรู้ ความสามารถตลอดจนคุณธรรม จริยธรรม ให้สภาเด็กและเยาวชนตำบล เป็นศูนย์กลางเรียนรู้ด้านวิชาการ และการจัดกิจกรรมเกี่ยวกับการศึกษา กีฬา วัฒนธรรม ในตำบลตลอดจนกิจกรรมที่เป็นประโยชน์ต่อสังคม โดยการประสานกลุ่ม/ชมรมเด็กและเยาวชนในตำบลดำกิจกรรมให้สอดคล้องกัน การจัดประชุม/เวทีเสวนาเพื่อหาแนวทางการพัฒนาเด็กและเยาวชนต่อหน่วยงาน (งานพัฒนาชุมชนและสวัสดิการสังคม สำนักปลัด เทศบาลตำบลม่วงคัน, 2567)

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาถึงสาเหตุในการตัดสินใจเป็นสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของการตัดสินใจ

สำนักงานคณะกรรมการการศึกษาแห่งชาติ (2556) การตัดสินใจ หมายถึง การกระทำของบุคคลในการที่เลือกทางเลือกที่มีอยู่หลายๆทางเลือก โดยการรวบรวมและประเมินข้อมูลและสิ่งประกอบอื่นๆที่สำคัญ โดยการเลือกทางเลือกที่ดีที่สุดเพียงทางเลือกเดียวที่สามารถตอบสนองเป้าหมายหรือความต้องการของผู้เลือก เพื่อเป็นแนวทางในการปฏิบัติ

ทิพย์วัลย์ สีจันทร์ และคณะ (2548) กล่าวว่า การตัดสินใจ หมายถึง การเลือกทางเลือกมาเป็นแนวทางในการแก้ปัญหาหรืออาจกล่าวได้ว่าการตัดสินใจจะเกิดขึ้นมาได้ต้องมีทางเลือกหลายๆ ทางเกิดขึ้นก่อน จากนั้นจึงนำทางเลือกเหล่านั้นมาพิจารณาเปรียบเทียบกันจนได้ทางเลือกที่เหมาะสมที่สุดแล้วจึงนำแนวทางที่เลือกนั้นมาเป็นแนวทางในการแก้ปัญหาต่อไป

สมคิด บางโม (2548) ได้ให้ความหมายว่า การตัดสินใจ หมายถึง การตัดสินใจเลือกทางปฏิบัติซึ่งมีหลายทางเป็นแนวปฏิบัติไปสู่เป้าหมายที่วางไว้ การตัดสินใจนี้อาจเป็นการตัดสินใจที่จะกระทำการสิ่งใดสิ่งหนึ่งหรือหลายสิ่งเพื่อความสำเร็จตรงตามที่ตั้งเป้าหมายไว้ ในทางปฏิบัติการตัดสินใจเกี่ยวกับปัญหาที่ยุ่งยากสลับซับซ้อนและมีวิธีการแก้ปัญหามากกว่าหนึ่งทางเสมอ

ฉัตราพร เสมอใจ (2550) ได้ให้ความหมายว่า การตัดสินใจ (Decision Making) หมายถึง กระบวนการในการเลือกที่จะกระทำสิ่งใดสิ่งหนึ่งจากทางเลือกต่างๆ ที่มีอยู่

สร้อยตระกูล (ติวยานนท์) อรรถมานะ (2550) ได้กล่าวว่า การตัดสินใจ หมายถึง การเลือกทางเลือกที่เป็นไปได้เพื่อให้บรรลุผลสำเร็จตามเป้าหมายที่กำหนดไว้

วรวิทย์ จักรบุตร (2543) กล่าวว่า การตัดสินใจ คือ กระบวนการเลือกสรรวิธีการปฏิบัติเพื่อแก้ไขปัญหาหรือดำเนินการในสิ่งใดสิ่งหนึ่ง โดยผ่านกระบวนการศึกษารวบรวมข้อมูลจากแหล่งต่าง ๆ และพิจารณาอย่างมีเหตุผล แล้วจึงนำวิธีการที่ตนเองคิดว่าดีที่สุดมาใช้ให้เกิดประโยชน์สูงสุดตามวัตถุประสงค์ที่ต้องการ

สุพจน์ เตระจิตร (2541) กล่าวว่า การตัดสินใจเป็นพฤติกรรมของบุคคลที่แสดงถึงความตั้งใจไตร่ตรองอย่างสุขุมรอบครอบในการพิจารณาทางเลือกเพื่อนำไปปฏิบัติให้บรรลุเป้าหมายหรือความมุ่งหวังตามที่กำหนดไว้

จากความหมายของการตัดสินใจที่หลาย ๆ ท่านได้ให้ไว้ข้างต้น สรุปได้ว่า การตัดสินใจ คือ กระบวน การคัดเลือกทางเลือกโดยการคิดอย่างรอบคอบ เพื่อให้ได้ทางเลือกที่ดีที่สุดและนำไปสู่การบรรลุผลสำเร็จตามเป้าหมายที่กำหนดไว้

ประเภทของการตัดสินใจ

การตัดสินใจสามารถจำแนกออกเป็น 2 ประเภท (วีรพล สุวรรณนันต์, 2534)

1) การตัดสินใจแบบมีเหตุผล (Rational decision making) การตัดสินใจแบบมีเหตุผลเป็นการตัดสินใจของบุคคลหรือองค์การที่มีการใช้ข้อมูลในด้านต่างๆ มาประกอบการวิเคราะห์ทางเลือกก่อนที่จะตัดสินใจเลือกทางเลือกใดทางเลือกหนึ่ง การตัดสินใจแบบมีเหตุผลเป็นการตัดสินใจที่มีความสำคัญในทางการบริหารองค์การต่างๆ และเป็นประเภทการตัดสินใจที่นักวิชาการให้ความสนใจมากที่สุด เพราะเชื่อว่าหากเรามีข้อมูลเกี่ยวกับการตัดสินใจแล้ว เราสามารถที่จะปรับปรุงการตัดสินใจให้มีคุณภาพสูงขึ้นได้

2) การตัดสินใจโดยสัญชาตญาณ (Instinct) การตัดสินใจประเภทนี้ เป็นการตัดสินใจกระทำการใดโดยสัญชาตญาณ ซึ่งมีลักษณะเป็นอัตโนมัติ เช่น การกระพริบตาเมื่อมีคนชี้นิ้วหรือวัตถุใดเข้าใกล้ดวงตา ซึ่งเป็นสัญชาตญาณการป้องกันตัวของมนุษย์

กระบวนการตัดสินใจ

วุฒิชัย จำนง (2535) กล่าวถึง การตัดสินใจของมนุษย์ว่ามีลักษณะเป็นกระบวนการที่ประกอบด้วยขั้นตอนต่าง ๆ ต่อเนื่องกันไปดังนี้

1) การแยกแยะตัวปัญหา ในขั้นตอนแรกของการตัดสินใจนั้น จึงเป็นเรื่องราวของการสร้างความแน่ใจ มั่นใจกับตัวปัญหาที่แท้จริง ก็เพราะเหตุว่ากระบวนการตัดสินใจเริ่มต้นตามขั้นแรก เมื่อผู้ทำการตัดสินใจมีความรู้สึกว่าได้เกิดปัญหาขึ้นมา นั่นก็คือ เป็นความรู้สึกที่เกิดขึ้นภายในว่าได้มีปรากฏการณ์บางสิ่งบางอย่างมิได้เป็นไปตามแนวคิด

2) การหาข่าวสารที่เกี่ยวข้องกับตัวปัญหานั้นก็คือ การเสาะหาสิ่งที่เป็นสาเหตุหรือสิ่งที่ก่อให้เกิดตัวปัญหานั้น ซึ่งอาจไม่ใช่สาเหตุโดยตรงก็ได้

3) การประเมินข่าวสาร เป็นความจำเป็นที่ต้องประเมินค่าดูว่าข่าวสารที่ได้มานั้นถูกต้องเหมาะสมเพียงพอตรงกับความเวลาและความสามารถที่นำไปวิเคราะห์ปัญหาได้หรือไม่

4) การกำหนดทางเลือก เป็นขั้นตอนสำคัญของการตัดสินใจ คือ การกำหนดทางเลือกมากที่สุดเท่าที่ทำได้ เป็นการพยายามครอบคลุมทิศทางที่แก้ปัญหาได้หลายวิธี ถ้ามีข่าวสารสมบูรณ์สำหรับปัญหาแต่ละเรื่องกำหนดทางเลือกได้เหมาะสมและครอบคลุมได้อย่างแท้จริง

5) การเลือกทางเลือกเมื่อได้กำหนดทางเลือกต่าง ๆ ออกมาแล้ว พร้อมทั้งกำหนดลำดับความสำคัญและความเหมาะสมในการแก้ปัญหาขั้นตอนต่อไป คือ การเลือกทางเลือกปฏิบัติการต่อไปและขั้นนี้เองเป็นที่ยอมรับกันโดยทั่วไปว่าเป็นการตัดสินใจอย่างแท้จริง

6) การปฏิบัติตามการตัดสินใจเมื่อทางเลือกได้ถูกเลือกเข้ามาแล้วก็เป็นการปฏิบัติตามผลของการตัดสินใจหรือทางเลือก

อย่างไรก็ตาม ทั้งหมดนี้เป็นขั้นตอนของการตัดสินใจที่จำเป็นต้องมี กล่าวโดยรู้ตัวหรือไม่ก็ตาม เมื่อได้ดำเนินการตั้งแต่เกิดความรู้สึกในตัวปัญหา ตลอดจนการปฏิบัติการแก้ปัญหานั้นตามผลของการตัดสินใจ คือ การเลือกทางเลือกนั้นเอง และในหลายกรณีอาจมีการแบ่งขั้นตอนละเอียดย่อยไปกว่านี้

สรุปได้ว่า การตัดสินใจเป็นกระบวนการเลือกทางเลือกปฏิบัติเป็นลำดับขั้นตอนในการตัดสินใจอย่างต่อเนื่อง โดยการแยกแยะปัญหาการหาข่าวสารที่เกี่ยวข้องกับปัญหาประมวลข่าวสารที่ได้มาว่าถูกต้องเหมาะสมหรือไม่ กำหนดทางเลือกและปฏิบัติตามการตัดสินใจ

วิธีดำเนินการวิจัย

1. กลุ่มเป้าหมาย คือ คณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง ซึ่งประกอบด้วย 4 ตำบล ได้แก่ ตำบลตะโละแมะนา ตำบลน้ำดำ ตำบลพิเทน และตำบลปากู โดยแบ่งเป็นตำบลละ 21 คน รวม 84 คน

โดยผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง จำนวน 59 คน คิดเป็นร้อยละ 70.20 และเพศชาย จำนวน 25 คน คิดเป็นร้อยละ 29.80 ซึ่งผู้ตอบแบบสอบถามอยู่ในช่วงอายุ 15-18 ปี มากที่สุด จำนวน 48 คน คิดเป็นร้อยละ 57.20 รองลงมา คือ อยู่ในช่วงอายุ 19-22 ปี จำนวน 29 คน คิดเป็นร้อยละ 34.50 และอยู่ในช่วงอายุ 22-25 ปี น้อยที่สุด จำนวน 7 คน คิดเป็นร้อยละ 8.30 และผู้ตอบแบบสอบถามส่วนใหญ่เป็นนักเรียนระดับมัธยมศึกษาตอนปลายหรือเทียบเท่า มากที่สุด จำนวน 48 คน คิดเป็นร้อยละ 57.14 รองลงมาคือ ระดับอนุปริญญาหรือเทียบเท่าปริญญาตรี จำนวน 29 คน คิดเป็นร้อยละ 34.53 และอื่นๆ มีจำนวนผู้ตอบแบบสอบถาม จำนวน 7 คน คิดเป็นร้อยละ 8.33

2. เครื่องมือที่ใช้ ได้แก่ แบบสอบถาม โดยมีรายละเอียดแบ่งออกเป็น 2 ตอน ดังนี้

ตอนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม ประกอบด้วย เพศ อายุ และสถานภาพการทำงานในปัจจุบัน

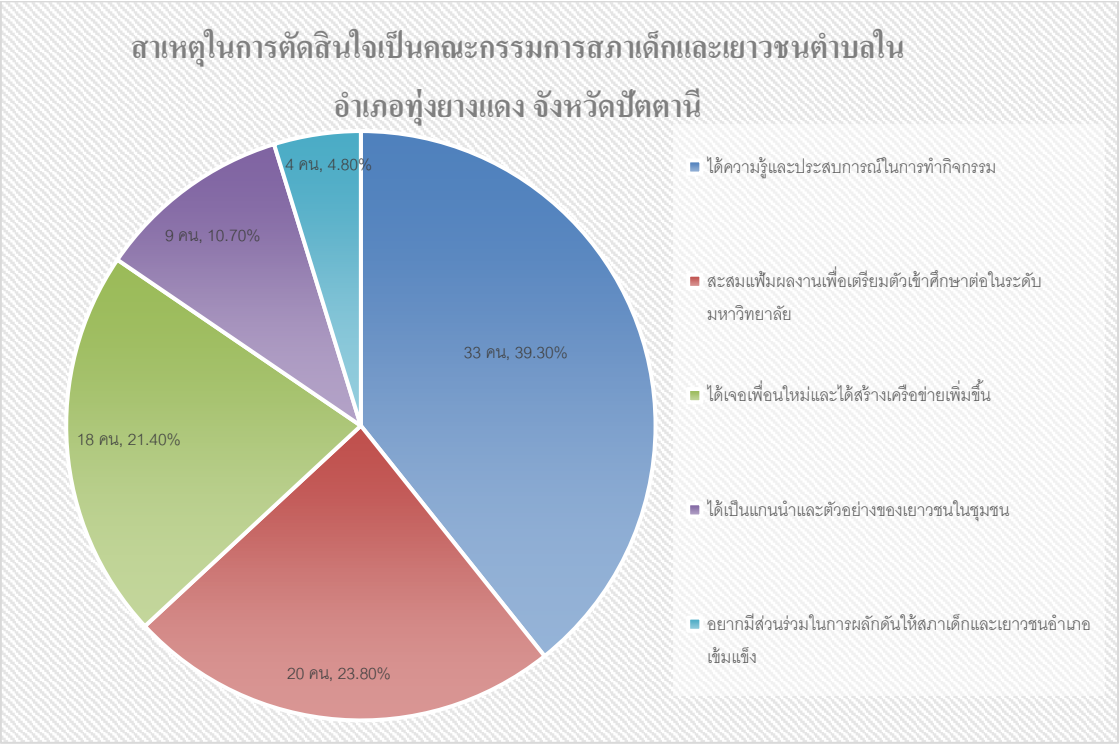
ตอนที่ 2 สอบถามข้อมูลสาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี

การตรวจสอบคุณภาพเครื่องมือ ผู้วิจัยได้นำแบบสอบถามไปให้ผู้เชี่ยวชาญ จำนวน 3 ท่าน เพื่อพิจารณาความสอดคล้องของเนื้อหา

3. การเก็บรวบรวมข้อมูล เป็นการใช้คำถามแบบสอบถามในการเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่าง คือ คณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จำนวน 84 คน

4. การวิเคราะห์ข้อมูล ผู้วิจัยใช้ค่าสถิติหาค่าร้อยละ

ผลการวิจัย



ภาพที่ 1 แสดงสาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี

จากภาพที่ 1 พบว่า สาเหตุในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี ส่วนใหญ่ได้ความรู้และประสบการณ์ในการทำกิจกรรม มากที่สุด จำนวน 33 คน คิดเป็นร้อยละ 39.30 รองลงมา คือ สะสมแฟ้มผลงานเพื่อเตรียมตัวเข้าศึกษาต่อในระดับมหาวิทยาลัย จำนวน 20 คน คิดเป็นร้อยละ 23.80 ได้เจอเพื่อนใหม่และได้สร้างเครือข่ายเพิ่มขึ้น จำนวน 18 คน คิดเป็นร้อยละ 21.40 ได้เป็นแกนนำและตัวอย่างของเยาวชนในชุมชน จำนวน 9 คน คิดเป็นร้อยละ 10.70 และต้องการมีส่วนร่วมในการผลักดันให้สภาเด็กและเยาวชนอำเภอเข้มแข็ง จำนวน 4 คน คิดเป็นร้อยละ 4.80 ตามลำดับ

สรุปและอภิปรายผล

ผลการวิจัย พบว่า ในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี คือ ได้ความรู้และประสบการณ์ในการทำกิจกรรม มากที่สุด อยู่ที่ร้อยละ 39.30 โดยมีเหตุผลประกอบคือ การได้เข้ามาเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี สามารถเรียนรู้กระบวนการต่างๆในการทำงาน ทั้งในเรื่องของวิชาการและประสบการณ์ในการทำกิจกรรม ไม่ว่าจะเป็นการประชุมเพื่อวางแผนงานประจำปี การจัดโครงการประจำปี การลงพื้นที่ หรือแม้แต่การได้รับฟังการถ่ายทอดประสบการณ์จากรุ่นพี่ที่เคยเป็นคณะกรรมการมาก่อน ซึ่งสอดคล้องกับงานวิจัยของ กนกวรรณ วงศ์กระพันธุ์ (2562) ได้กล่าวว่า การเป็นคณะกรรมการสภาเด็กและเยาวชนทำให้ได้ความรู้ ได้รับประสบการณ์ใหม่ๆ ได้ฝึกภาวะการเป็นผู้นำจากการทำกิจกรรมต่างๆ

ในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี รองลงมา คือ สะสมแฟ้มผลงานเพื่อเตรียมตัวเข้าศึกษาต่อในระดับมหาวิทยาลัย ร้อยละ 23.80 เนื่องจากคณะกรรมการสภาเด็กและเยาวชนส่วนใหญ่กำลังเรียนอยู่ในระดับมัธยมศึกษาตอนปลายและในอนาคตต้องเข้าศึกษาต่อในระดับอุดมศึกษาหรือมหาวิทยาลัย เพราะฉะนั้น เกณฑ์ในการคัดเลือกของมหาวิทยาลัยต่างๆ ส่วนหนึ่งจะดูที่ประวัติการทำกิจกรรมประกอบด้วย ถ้าหากคนที่มีประวัติการทำกิจกรรม การเข้าร่วมกิจกรรมหรือเป็นคณะกรรมการในกิจกรรมหรือโครงการต่างๆก็จะทำให้ได้รับการพิจารณาเป็นพิเศษและมีโอกาสถูกตอบรับมากยิ่งขึ้นจากสถาบันต่างๆ ซึ่งสอดคล้องกับงานวิจัยของ ศิรพงศ์ โภคินวงศ์หิรัญ (2557) ซึ่งได้กล่าวว่า การทำงาน ในสภาเด็กและเยาวชนในระยะเวลา 2 ปี เป็นการสะสมประสบการณ์และผลงานได้

เรื่องต่อมาคือ ได้เจอเพื่อนใหม่และได้สร้างเครือข่ายเพิ่มขึ้น ร้อยละ 21.40 โดยได้ให้เหตุผลประกอบว่า การได้มาทำงานเป็นคณะกรรมการสภาเด็กและเยาวชนนั้น เป็นการเปิดโอกาสให้ได้รู้จักกับเพื่อนใหม่ๆ ไม่ว่าจะเป็นในระดับตำบล ระดับอำเภอหรือระดับจังหวัด เวลามีการประชุมร่วมกันหรือทำกิจกรรมร่วมกันได้แลกเปลี่ยนมุมมอง ทัศนคติใหม่ๆ และนอกจากนี้ยังได้สร้างเครือข่ายเพิ่มขึ้นทั้งที่เป็นหน่วยงาน องค์กรต่างๆทั้งจากภาครัฐและภาคเอกชน ซึ่งสอดคล้องกับงานวิจัยของ ศิรพงศ์ โภคินวงศ์หิรัญ (2557) ซึ่งได้กล่าวว่า ทำให้คณะบริหารสภาเด็กและเยาวชนได้มีเวลามากพอที่จะสร้างความสนิทสนมและสร้างความไว้วางใจต่อกัน เกิดเป็นความรู้สึกที่เป็นน้ำหนึ่งใจเดียวกัน รับผิดชอบร่วมกัน และช่วยกันทำงานเพื่อขับเคลื่อนสภาเด็กและเยาวชนให้ประสบผลสำเร็จ ส่งผลให้เกิดการทำงานที่เป็นทีมและเรียนรู้งานไปพร้อมกัน ซึ่งจะทำให้คณะบริหารสภาเด็กและเยาวชนสามารถแสดงศักยภาพในการทำงานได้อย่างชัดเจนและสามารถร่วมกันสร้างผลงานให้เป็นที่ประจักษ์ได้ในระยะเวลา 2 ปี

ลำดับต่อมาคือ ได้เป็นแกนนำและตัวอย่างของเยาวชนในชุมชน ร้อยละ 10.70 โดยมีการให้เหตุผลว่า การได้เข้ามาทำหน้าที่เป็นคณะกรรมการสภาเด็กและเยาชน ก็คือการได้เป็นตัวแทนของเยาวชนในตำบลในการประชุมหารือและทำกิจกรรมต่างๆ นอกจากนี้ยังสามารถเป็นตัวอย่างให้แก่น้อง ๆ เยาวชนที่สนใจต้องการเข้ามาทำงานตรงนี้ ซึ่งสอดคล้องกับงานวิจัยของกนกวรรณ วงศ์กระพันธุ์ (2562) ได้กล่าวว่า การเป็นคณะกรรมการสภาเด็กและเยาวชน เป็นการส่งเสริมการเรียนรู้ และเป็นศูนย์กลางในการทำกิจกรรมให้แก่เยาวชนในชุมชน เป็นการกระตุ้นการเรียนรู้ให้แก่เยาวชนในชุนชนอีกด้วย

และลำดับสุดท้ายคือ ต้องการมีส่วนร่วมในการผลักดันให้สภาเด็กและเยาวชนอำเภอเข้มแข็ง ร้อยละ 4.80 โดยให้เหตุผลว่า การที่ได้มาทำหน้าที่เป็นคณะกรรมการสภาเด็กและเยาวชนนั้น คือ การได้เป็นตัวแทนและคอยขับเคลื่อนให้สภาเยาวชนตำบลมีกิจกรรมและมีการเคลื่อนไหวในด้านต่างๆ เมื่อสภาเด็กและเยาวชนตำบลเข้มแข็งก็ส่งผลให้สภาเด็กและเยาวชนอำเภอมีความเข้มแข็งตามไปด้วย ซึ่งสอดคล้องกับงานวิจัยของกนกวรรณ วงศ์กระพันธุ์ (2562) ได้กล่าวว่า สภาเด็กและเยาวชนเป็นศูนย์กลางการรวมกลุ่มในการทำกิจกรรมต่างๆ ยิ่งไปกว่านั้น การจัดตั้งสภาเด็กและเยาวชนจะยิ่งทำให้เด็กและเยาวชนเข้าถึงการมีส่วนร่วมในสภาเด็กและเยาวชนได้ง่ายขึ้น นอกจากนี้ยังเป็นการสร้างความเข้มแข็งให้กับสภาเด็กและเยาวชนอีกด้วย

ข้อเสนอแนะ

ข้อเสนอแนะจากการวิจัย

จากผลการวิจัย พบว่า ความรู้และประสบการณ์ในการทำกิจกรรม เป็นสาเหตุในการตัดสินใจมากที่สุด ดังนั้น หน่วยงานที่เกี่ยวข้องที่รับผิดชอบ ควรจัดกิจกรรมต่างๆ ไม่ว่าจะเป็น การเข้าค่ายกิจกรรมอบรมด้านวิชาการ กิจกรรมจิตอาสา ที่มีเนื้อหาสอดคล้องกับวัยของกลุ่มคณะกรรมการสภาเด็ก

และเยาวชนที่เข้าร่วม เพราะจะทำให้กลุ่มเหล่านี้ได้รับความรู้และประสบการณ์อย่างเต็มที่ และนอกจากนี้ การสะสมแฟ้มผลงานเพื่อเตรียมตัวเข้าศึกษาต่อในระดับมหาวิทยาลัย เป็นเรื่องที่สำคัญรองลงมา ดังนั้น หน่วยงานที่เกี่ยวข้อง ควรมีเกียรติบัตร ประกาศนียบัตร หรือหนังสือรับรองการทำกิจกรรมเพื่อเป็นประโยชน์ในการใช้ประกอบในการศึกษาต่อในระดับที่สูงขึ้นต่อไป อีกทั้งการจัดกิจกรรมต่างๆ ทั้งในระดับตำบล ระดับอำเภอ ระดับจังหวัด หรือระดับประเทศ ก็เป็นสิ่งที่จำเป็นเพื่อให้คณะกรรมการสภาเด็กและเยาวชนในแต่ละพื้นที่ได้เจอเพื่อนใหม่และได้สร้างเครือข่ายเพิ่มขึ้น

ข้อเสนอแนะสำหรับงานวิจัยครั้งต่อไป

สำหรับผลของการวิจัยในครั้งนี้สามารถต่อยอดในการศึกษาถึงปัจจัยที่ส่งผลในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนตำบลในอำเภอทุ่งยางแดง จังหวัดปัตตานี และยังสามารถศึกษาเปรียบเทียบปัจจัยในการตัดสินใจเป็นคณะกรรมการสภาเด็กและเยาวชนในอำเภออื่นๆ ของจังหวัดปัตตานี หรือ ในระดับจังหวัด

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(ระดับชาติ)

กลุ่มการศึกษา

ผลการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพตามแนวทฤษฎีคอนตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1

Effects of Basic Mathematics Learning Activities for Careers on Constructivist Theory on Introduction Basic to Statistics Promissory Note of the First Year Vocational Certificate Student.

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บทคัดย่อ

การวิจัยในครั้งนี้มีวัตถุประสงค์เพื่อ 1) พัฒนากิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ให้มีประสิทธิภาพตามเกณฑ์ 75/75 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนและหลังการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่1 ประชากรที่ใช้ในการวิจัยครั้งนี้ คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ปีการศึกษา 2565 วิทยาลัยเทคโนโลยีหาดใหญ่อำนวยวิทย์ อำเภอหาดใหญ่ จังหวัดสงขลา จำนวน 269 คน กลุ่มตัวอย่าง คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 สาขาวิชาคอมพิวเตอร์กราฟิก จำนวน 32 คน โดยเลือกแบบเจาะจง (Purposive Sampling) ในห้องเรียนที่ผู้วิจัยรับผิดชอบสอนปีการศึกษา 2565 เครื่องมือที่ใช้ในการศึกษา ได้แก่ แผนการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง สถิติเบื้องต้น สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าร้อยละ ค่าเฉลี่ย ($\overline{X}$) ส่วนเบี่ยงเบนมาตรฐาน (S.D.) และหาค่าความแตกต่างโดยค่าที (t-test) แบบ Dependent ผลการวิจัยพบว่า ผลการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 มีประสิทธิ์ภาพ 82.70/84.20 และผลสัมฤทธิ์ทางการเรียนโดยใช้กิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 งานวิจัยนี้ทำให้นักเรียนมีความรับผิดชอบ มีความสามัคคี มีความเป็นผู้ตามและผู้นำ มีทักษะการแก้ปัญหา ค้นคว้าสิ่งใหม่ ๆ และมีความพึงพอใจต่อกิจกรรมการเรียนคณิตศาสตร์

คำสำคัญ: แนวคิดทฤษฎีคอนสตรัคติวิสต์, ประสิทธิภาพตามเกณฑ์ 75/75, ผลสัมฤทธิ์ทางการเรียน

Abstract

The purposes of this research were: 1) to develop a learning activity on Basic Mathematical for Careers based on Constructivist theory on Introduction Basic to Statistic for Vocational Certificate Level 1 students to reach efficiency 75/75. 2) to compare the mathematics learning achievement, before and after organizing learning activities on Basic vocational mathematics according to the concept of Constructivist theory on Basic to Statistics Promissory Note of the first year vocational certificate students. The population used in this research is 269 first-year vocational certificate students, academic year 2022 at HatYai Amnuaywit Technological College, HatYai District, Songkhla Province. The sample group is 32 first-year vocational certificate students in Computer Graphics. Purposive sampling: selected classrooms that the researcher is responsible for teaching in the academic year 2022. The tools used in the study include a learning plan for Basic vocational mathematics. According to the concept of constructivist theory on basic statistics achievement test of Basic Career Mathematics for subject, basic statistics. Statistics used in data analysis are the arithmetic means, the standard deviation (S.D.) and dependent t-test.

The result were followed; The results of learning Basic Mathematics for Careers on Constructivist Theory on Basic to Statistics Promissory Note of the first year vocational certificate students were developed to reach efficiency 82.70/84.20. Academic achievement by using learning management activities in Basic vocational mathematics. According to the concept of constructivist theory regarding the preliminary statistics of first-year vocational certificate students after studying, it is significantly higher than before studying at the.01level. This research makes students responsible. Have unity Being a follower and a leader Have problem solving skills Research new things and are satisfied with mathematics learning activities

Keywords: Constructivist Theory Concept, Performance according to 75/75 Criteria, Academic Achievement

บทนำ

การสอนคณิตศาสตร์ตั้งแต่อดีตถึงปัจจุบัน ครูส่วนใหญ่ยังคุ้นเคยอยู่กับวิธีสอนที่เน้นความรู้ความจำมากกว่ากระบวนการคิดวิเคราะห์และการแสวงหาความรู้ด้วยตนเอง เน้นที่การสอนของครูมากกว่าการเรียนของนักเรียน สอนตามแบบเรียน โดยอธิบายตัวอย่างแล้วให้ทำแบบฝึกหัด และมักจะไม่คำนึงถึงความรู้เดิม และความต้องการของนักเรียน หรือความแตกต่างระหว่างบุคคล (ละออง ล่ำเทียน, 2549) วิธีสอนตามปกติที่ใช้กันมาตั้งแต่อดีตจนปัจจุบัน เป็นวิธีสอนที่ครูพูดบอกเล่า อธิบายเนื้อหา หรือเรื่องราวต่าง ๆ ให้นักเรียนฟังโดยเน้นลักษณะและความสำคัญของเนื้อหาที่ครูค้นคว้า หรือตระเตรียมการสอนทำให้นักเรียนทราบเนื้อหาได้รวดเร็ว เหมาะสมกับนักเรียนจำนวนมาก และสะดวกสำหรับครูผู้สอน ซึ่งเป็นการสื่อสารทางเดียว โดยครูเป็นศูนย์กลางในการสอน ทำให้นักเรียนไม่มีส่วนร่วมในกิจกรรมการเรียนการสอน นักเรียนเป็นผู้รับเพียงอย่างเดียว ได้แต่คิดตาม ขาดความคิดริเริ่มสร้างสรรค์ ขาดทักษะ

ในการแสวงหาความรู้ ลืมเรื่องที่เรียนไปได้ง่าย (สิริพร ทิพย์คง, 2545) ทำให้การเรียนวิชาคณิตศาสตร์ของนักเรียนประสบปัญหา เนื่องจากนักเรียนต้องเรียนรู้สิ่งที่เป็นเรื่องไกลตัว ต้องจินตนาการด้วยความยากลำบาก และมีความเบื่อหน่าย เพราะต้องท่องจำอยู่ตลอดเวลา (รุ่ง แก้วแดง, 2544) ดังนั้นวิธีการสอนจึงเป็นสาเหตุสำคัญที่ส่งผลทำให้นักเรียนไม่ประสบผลสำเร็จในการเรียนวิชาคณิตศาสตร์

เมื่อพิจารณาสภาพการจัดการเรียนการสอนคณิตศาสตร์ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 วิทยาลัยเทคโนโลยีหาดใหญ่อำนวยวิทย์ พบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียนปีการศึกษา 2564 มีระดับผลการเรียนไม่ถึงเกณฑ์ตามที่วิทยาลัยกำหนดไว้ โดยวิทยาลัยได้กำหนดไว้คือ นักเรียนจะต้องได้ระดับผลการเรียนไม่ต่ำกว่า 2 ซึ่งในรายวิชาคณิตศาสตร์พื้นฐานอาชีพมีนักเรียนไม่ผ่านเกณฑ์จำนวน 45 คน จากจำนวนนักเรียนทั้งหมด 225 คน คิดเป็นร้อยละ 20 และที่สำคัญเรื่องสถิติเบื้องต้น ยังเป็นเนื้อหาพื้นฐานในการเรียนระดับสูงขึ้น ดังนั้นเมื่อนักเรียนขาดความเข้าใจเรื่องสถิติเบื้องต้นจึงส่งผลทำให้เกิดปัญหาในการเรียนรู้เนื้อหาอื่น ๆ ในระดับสูงขึ้น

จากการศึกษาแนวคิด ทฤษฎี และงานวิจัยที่เกี่ยวข้องสอดคล้องกับธรรมชาติของวิชาคณิตศาสตร์เพื่อเป็นแนวทางในจัดกิจกรรมการเรียนรู้ดังที่ ละออง ล่ำเทียน. (2549) กล่าวว่า คณิตศาสตร์ เป็นศาสตร์ที่เน้นให้ผู้เรียนคิดและหาวิธีคิด ซึ่งจะทำให้เกิดความรู้ความเข้าใจในความคิดรวบยอดและหลักการต่าง ๆ ทางคณิตศาสตร์ แล้วนำความรู้ความเข้าใจในหลักการต่าง ๆ ไปพัฒนา และแก้ปัญหาในชีวิตจริงจนทำให้ผู้เรียนเกิดความสนใจ เกิดความคิดริเริ่มสร้างสรรค์ เห็นคุณค่าของคณิตศาสตร์ที่ก่อให้เกิดศาสตร์อื่น ๆ ตามมา นอกจากนี้จากการศึกษางานวิจัยของนักการศึกษาหลายท่านแสดงให้เห็นว่า ทฤษฎีคอนสตรัคติวิสต์ (Constructivist Theory) เป็นทฤษฎีการเรียนรู้ที่เน้นให้ผู้เรียนสร้างความรู้ใหม่ขึ้นจากความรู้พื้นฐานเดิมของตนเอง แทนที่จะรับความรู้ที่สมบูรณ์และถูกต้องจากครู การสร้างความรู้เป็นกระบวนการที่ส่งเสริมให้ผู้เรียนได้กระทำกิจกรรมไตร่ตรอง เพื่อตรวจสอบความเป็นไปได้ของทางเลือกที่แตกต่าง อันเป็นการเปิดโอกาสให้ผู้เรียนได้เรียนรู้คณิตศาสตร์ในวิถีทางที่ผู้เรียนสามารถถ่ายโยงประสบการณ์ส่วนตัวทั้งที่เกี่ยวข้องหรือไม่เกี่ยวข้องกับคณิตศาสตร์โดยตรง ทำให้เกิดความเข้าใจในเนื้อหาทางคณิตศาสตร์ได้อย่างลึกซึ้ง กระบวนการสร้างความรู้ทางคณิตศาสตร์ ในลักษณะนี้จะสนองความแตกต่างระหว่างบุคคลและอาจส่งผลให้นักเรียนสามารถหาความรู้และถ่ายโอนความรู้ต่าง ๆ ได้อย่างไม่จำกัดสาขาวิชา (คฤหัสถ์ บุญเย็น, 2546)

จากที่ได้นำกล่าวข้างต้น ผู้วิจัยจึงมีความสนใจที่จะนำแนวคิดทฤษฎีคอนสตรัคติวิสต์มาใช้ในการพัฒนากิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่องสถิติเบื้องต้น สำหรับนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนของนักเรียนให้อยู่ในระดับดีขึ้น ซึ่งจะทำให้การเรียนวิชาคณิตศาสตร์พื้นฐานอาชีพของนักเรียนประสบความสำเร็จมากยิ่งขึ้น โดยผลที่ได้จากการวิจัยจะใช้เป็นแนวทางในการปรับปรุงและพัฒนาสำหรับการจัดการเรียนรู้วิชาคณิตศาสตร์ต่อไป และอาจจะเป็นทางเลือกหนึ่งในการสอนวิชาคณิตศาสตร์ที่แตกต่างไปจากรูปแบบการสอนเดิมที่ใช้กันอยู่ในห้องเรียนของไทยในปัจจุบัน

วัตถุประสงค์ของการวิจัย

1. เพื่อพัฒนากิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ให้มีประสิทธิภาพตามเกณฑ์ 75/75

2. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนและหลังการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1

แนวคิด ทฤษฎี กรอบแนวคิด

ทฤษฎีคอนสตรัคติวิสต์

ความหมายของแนวคิดคอนสตรัคติวิสต์

สุมาลี ชัยเจริญ (2548) กล่าวว่า ทฤษฎีคอนสตรัคติวิสต์เป็นทฤษฎีที่เน้นในเรื่องการสร้างความรู้ใหม่ด้วยตนเอง การเรียนรู้เกิดขึ้นจากภายในตัวของผู้เรียน เพราะผู้เรียนจะดูความสัมพันธ์ของสิ่งที่พบเห็นกับความรู้เดิมที่มีอยู่แล้วทำความเข้าใจกับเหตุการณ์นั้น ๆ จึงจะเกิดเป็นองค์ความรู้ของตนเอง

สำนักงานคณะกรรมการการศึกษาแห่งชาติ (2540) กล่าวว่า แนวคิดคอนสตรัคติวิสต์ คือ การสร้างสรรค์ความรู้เป็นทั้งปรัชญาและทฤษฎีที่เกี่ยวข้องกับความรู้ใช้การอธิบายการเรียนรู้ของมนุษย์ว่าได้มาอย่างไร และเรียนรู้อะไร เชื่อว่าความรู้เป็นสิ่งที่มนุษย์สร้างขึ้นด้วยตนเอง เป็นสิ่งที่นึก เห็น และผิดพลาด ได้ความรู้เจริญงอกงามขึ้นด้วยการเปิดโอกาสให้ทำ และจะทำให้เข้าใจอย่างลุ่มลึก

แนวคิดพื้นฐานของทฤษฎีคอนสตรัคติวิสต์

วรรณทิพา รอดแรงค้า (2541) กล่าวว่า ทฤษฎีคอนสตรัคติวิสต์ เป็นทฤษฎีความรู้ที่มีรากฐานมาจากปรัชญาจิตวิทยา และปรัชญาการศึกษา ซึ่งมีความเกี่ยวข้องกับการสื่อความหมายในตัวตน มีการอ้างอิงถึงหลักการ 2 ข้อ คือ

1. ความรู้ไม่ได้เกิดจากการเรียนรู้แค่เพียงอย่างเดียวเท่านั้น แต่ความรู้เกิดจากการสร้างขึ้นของผู้ที่มีความรู้ความเข้าใจ

2. หน้าที่ของการรับรู้ คือ การปรับตัว และการประมวลประสบการณ์ทั้งหมด ไม่ใช่เพื่อค้นพบสิ่งที่จำเป็น ซึ่งถ้านำเอาหลักการทั้งสองนี้ไปใช้จะมีผลเกิดขึ้นตามมาแผ่กว้างไปไกลในการศึกษา การเรียนรู้ และการพัฒนาทางสติปัญญา เช่นเดียวกันกับในการฝึกปฏิบัติการสอนในจิตวิทยาบำบัดในการจัดการระหว่างบุคคล

อรุณ มาวัน (2549) กล่าวว่า แนวคิดทฤษฎีคอนสตรัคติวิสต์ เป็นทฤษฎีการสร้างความรู้ที่เน้นให้ผู้เรียนเป็นผู้สร้างด้วยตัวเองด้วยการเรียนรู้ ซึ่งเป็นกระบวนการที่เกิดขึ้นภายในตัวผู้เรียน มีการสร้างความรู้จากความสัมพันธ์ของสิ่งพบเห็น หรือประสบการณ์ใหม่กับความเข้าใจเดิมที่มีมาก่อน โดยพยายามนำความเข้าใจเกี่ยวกับเหตุการณ์และประสบการณ์ของตนที่พบ มาสร้างเป็นโครงสร้างทางปัญญาในสมอง โครงสร้างทางปัญญาประกอบด้วยความหมายของสิ่งต่าง ๆ ที่ใช้ภาษาเกี่ยวกับเหตุการณ์หรือสิ่งที่บุคคลมีประสบการณ์ อาจจะเป็นความเข้าใจหรือความรู้ของแต่ละบุคคล

จากที่กล่าวมาสรุปได้ว่า แนวคิดทฤษฎีคอนสตรัคดิวิสต์เกิดจากมนุษย์จะเข้าใจสิ่งใดสิ่งหนึ่งได้อย่างถ่องแท้ก็ต่อเมื่อได้สร้างสิ่งนั้นด้วยตนเอง บุคคลจะพยายามปรับสภาวะให้อยู่ในภาวะสมดุลโดยใช้กระบวนการปรับโครงสร้างทางปัญญาเป็นกระบวนการที่เกิดขึ้นภายในตัวผู้เรียน โครงสร้างทางปัญญาประกอบด้วยความหมายของสิ่งต่าง ๆ ที่ใช้ภาษาเกี่ยวกับเหตุการณ์หรือสิ่งที่บุคคลมีประสบการณ์ อาจจะเป็นความเข้าใจหรือความรู้ของแต่ละบุคคล

บทบาทของครูตามแนวคิดทฤษฎีคอนสตรัคติวิสต์

สุวิทย์ มูลคำ และ อรทัย มูลคำ (2545) กล่าวถึง บทบาทของครูในการจัดการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ ไว้ดังนี้

1. ผู้สอนมีหน้าที่จัดการให้นักเรียนเกิดการจัดการโครงสร้างทางปัญญา โดยมีสมมติฐาน ดังนี้

1.1 นำเสนอสถานการณ์ที่เป็นปัญหาซึ่งมีปฏิสัมพันธ์ต่อสังคมและนักเรียนก่อให้เกิดความขัดแย้งทางปัญญา

1.2 ความขัดแย้งทางปัญญาเป็นแรงจูงใจที่ก่อให้เกิดกิจกรรมการคิดไตร่ตรอง เพื่อสร้างความรู้ที่จะขจัดความขัดแย้งนั้น

1.3 การคิดไตร่ตรองบนพื้นฐานของประสบการณ์และโครงสร้างทางปัญญาที่มีอยู่เดิมภายใต้การมีปฏิสัมพันธ์ทางสังคม จะกระตุ้นให้มีการพัฒนา และสร้างโครงสร้างทางปัญญาขึ้นมาใหม่

2. จัดเนื้อหาสาระและกิจกรรมให้สอดคล้องกับความสนใจ และความถนัดของนักเรียน คำนึงถึงความแตกต่างระหว่างบุคคล

3. จัดกิจกรรมให้นักเรียนได้เรียนรู้จากประสบการณ์จริง ฝึกปฏิบัติ เท่าที่ทำได้ คิดเป็น ทำเป็น และใฝ่เรียนรู้ตลอดชีวิตอย่างต่อเนื่อง

4. ผู้สอนเรียนรู้ไปพร้อมกับนักเรียนจากกิจกรรมการเรียนการสอนสื่อและแหล่งวิทยาการต่าง ๆ

5. ผู้สอนเปลี่ยนบทบาทจากเดิมที่เป็นผู้บอกความรู้ เป็นผู้อำนวยความสะดวกในจัดบรรยากาศสภาพแวดล้อม วางแผนกิจกรรม สื่อการเรียนรู้ ให้ความช่วยเหลือนักเรียนเกิดการเรียนรู้ และสร้างความรู้ กระตุ้นความคิดของนักเรียนโดยการตั้งคำถาม ให้กำลังใจ ประเมินผลการเรียนรู้ และให้ข้อมูลย้อนกลับ

จากที่กล่าวมาสรุปได้ว่า บทบาทของครูตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ คือ ครูจะต้องทำทุกวิถีทางที่จะทำให้นักเรียนสร้างความรู้ด้วยตนเองจากฐานความรู้เดิมที่มีอยู่ โดยครูต้องเริ่มจากการค้นหาความรู้เดิมของนักเรียน ซึ่งตัวครูเองจะต้องศึกษาแนวทางการจัดการเรียนรู้ให้เชื่อมโยงจากความรู้เดิมที่นักเรียนมีอยู่กับความรู้ใหม่ พร้อมทั้งกระตุ้นด้วยคำถามหรือสร้างสถานการณ์ที่ทำให้นักเรียนอยากรู้ คำตอบหรือสนองต่อความอยากรู้ อยากเห็น ท้าทายให้นักเรียนสร้างข้อคาดเดาคำตอบ และยั่วยุให้นักเรียนได้ต่อสู้กับปัญหา หรือสถานการณ์ที่ครูสร้างขึ้น โดยครูจะอำนวยความสะดวกในการเรียนรู้ของนักเรียน เช่น การจัดทรัพยากรทางการเรียนรู้และสภาพแวดล้อมทางการเรียนรู้ ให้นักเรียนเป็นศูนย์กลางในการเรียนรู้ และสะท้อนความคิดเห็นอย่างเต็มที่โดยอิสระ และครูจะให้ความช่วยเหลือนักเรียนก็ต่อเมื่อเห็นว่า มีความจำเป็นหรือเห็นว่าควรเพิ่มเติมความรู้ในส่วนที่ควรจะเติมเต็มให้สมบูรณ์

บทบาทของนักเรียนตามแนวคดิทฤษฎีคอนสตรัคติวิสต์

ทิศนา แขมมณี (2548) กล่าวว่า การนำแนวคิดทฤษฎีคอนสตรัคติวิสต์ไปใช้ในการจัดการเรียนรู้ นักเรียนควรมีบทบาท ดังนี้

1. นักเรียนจะต้องฝึกฝน สร้างความรู้ด้วยตนเอง
2. นักเรียนจะเป็นผู้มีบทบาทในการเรียนรู้อย่างตื่นตัว และจัดการกับข้อมูลหรือประสบการณ์
3. นักเรียนจะต้องสร้างความหมายของสิ่งนั้นให้กับตัวเอง
4. นักเรียนต้องมีปฏิสัมพันธ์กับสื่อ อุปกรณ์ สิ่งของหรือข้อมูลต่าง ๆ ที่เป็นจริงและสอดคล้องกับความสนใจของนักเรียน โดยนักเรียนสามารถศึกษาวิเคราะห์ ทดลองได้ด้วยตนเองจนเกิดเป็นความรู้ความเข้าใจ
5. ในการเรียนการสอนนักเรียนต้องมีบทบาทในการเรียนรู้อย่างเต็มที่ โดยจะเป็นผู้นำและ

ควบคุมตนเองในการเรียนรู้ เช่น นักเรียนจะเป็นผู้เลือกในสิ่งที่ต้องการเรียนรู้ด้วยตนเอง ตั้งกฎเอง แก้ปัญหาที่เกิดขึ้นด้วยตนเอง หาข้อตกลงกันได้เมื่อเกิดความแตกต่าง รักษาห้องเรียนร่วมกันเป็นต้น

จากที่กล่าวมาสรุปได้ว่า ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ มักจะยอมรับกันในหลักการว่า ผู้เรียนสามารถสร้างความรู้ และเข้าใจในสิ่งต่าง ๆ ได้ด้วยตนเอง ดังนั้นจึงเป็นหน้าที่ของนักเรียนที่จะต้องคิดริเริ่ม ลงมือทำกิจกรรมตามที่ตนเองสนใจ รวมทั้งคิดและบรรยายเกี่ยวกับสิ่งต่าง ๆ ที่ได้ปฏิบัติไปแล้วให้กับคนอื่นได้รับรู้ ซึ่งนำไปสู่การแลกเปลี่ยนทางความคิดซึ่งกันและกัน และเมื่อได้ปฏิบัติเกี่ยวกับสิ่งเหล่านี้อย่างต่อเนื่องเป็นประจำแล้ว ก็จะทำให้นักเรียนเกิดความรู้ความเข้าใจในกระบวนการเรียนรู้ของตนเองได้มากขึ้นตามลำดับ และสามารถนำไปประยุกต์ใช้กับสถานการณ์จริงได้

ขั้นตอนการจัดการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์

สมหมาย มะลิกอง (2552) กล่าวว่า แบบการจัดการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวัสต์ ประกอบด้วยขั้นตอนการจัดการเรียนรู้ 4 ขั้นตอน ดังนี้

1. ขั้นค้นหาความเดิม เป็นขั้นการกระตุ้นให้นักเรียนเกิดภาวะไม่สมดุลทางปัญญา โดยครูนำเข้าสู่บทเรียนด้วยการเสนอเหตุการณ์ที่ชวนสงสัย เป็นการกระตุ้นนักเรียนหรือท้าทายให้นักเรียนคิดแก้ปัญหา กิจกรรมที่ใช้ คือ การสร้างสถานการณ์ที่น่าสงสัย การซักถาม การอภิปรายการเล่าเหตุการณ์ และให้นักเรียนตอบคำถามเป็นรายบุคคล

2. ขั้นทำความเข้าใจ เป็นขั้นที่ทำให้นักเรียนเกิดความสมดุลทางปัญญาโดยกระบวนการปรับขยายโครงสร้างทางปัญญา ความสมดุลจะเกิดขึ้นเมื่อนักเรียนสามารถผสมผสานความคิดใหม่ให้กลมกลืนเข้ากันได้กับประสบการณ์เดิม ในขั้นนี้ให้นักเรียนทำงานร่วมกันเป็นกลุ่ม กิจกรรมที่ใช้ คือ ครูตั้งปัญหาจากเหตุการณ์ที่ครูเสนอ นักเรียนตั้งสมมติฐานทำการทดลองเพื่อรวบรวมหลักฐานและพิสูจน์สมมติฐาน

3. ขั้นจัดโครงสร้างแนวความคิดใหม่ เป็นขั้นที่นักเรียนพัฒนาความคิดเพิ่มขึ้นโดยผ่านกระบวนการรับรู้ทางกายภาพ และกิจกรรมทางปัญญาจากความร่วมมือภายในกลุ่มจะช่วยให้นักเรียนปรับปรุงความคิดรวบยอดได้ชัดเจนยิ่งขึ้น กิจกรรมที่ใช้ คือ การรายงานผลการทดลอง การอภิปรายร่วมกันระหว่างครูกับนักเรียน เพื่อให้ได้ข้อสรุปที่เป็นที่ยอมรับ และถูกต้องตามหลักการทางวิทยาศาสตร์

4. ขั้นการนำแนวความคิดไปใช้ เป็นขั้นที่นักเรียนนำความคิดรวบยอดไปประยุกต์ใช้ในสถานการณ์ต่าง ๆ หรือ นำความรู้ไปใช้แก้ไขปัญหา และใช้ประโยชน์ในชีวิตประจำวัน กิจกรรมที่ใช้ คือ การอภิปรายร่วมกันของครูกับนักเรียน การประเมินตนเองของนักเรียนลงในแบบฟอร์มเพื่อเป็นการตรวจสอบพัฒนาการในด้านความคิดของนักเรียน

จากที่กล่าวมาสรุปได้ว่า ขั้นตอนการเขียนแผนการจัดกิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ ประกอบด้วย 4 ขั้น ดังนี้

ขั้นที่1 ขั้นกระตุ้น คือ ครูกำหนดปัญหาหรือสถานการณ์ที่สอดคล้องกับความคิดรวบยอดที่จัดกิจกรรมการเรียนรู้ เพื่อกระตุ้นความสนใจให้แก่นักเรียนได้ทดลองหาคำตอบของปัญหาหรือสถานการณ์นั้น

ขั้นที่ 2 ขั้นสำรวจ คือ การให้นักเรียนรายบุคคลหรือเป็นกลุ่มช่วยกันแก้ปัญหาหรือสถานการณ์ที่ได้จากขั้นกระตุ้น ครูอาจจะช่วยชี้แนวทางโดยการตั้งคำถามปลายเปิดให้นักเรียนได้คิดและวางแผนแก้ปัญหาจนหาข้อสรุปเหล่านั้นได้สำเร็จ

ขั้นที่ 3 ขั้นอภิปราย คือ การให้นักเรียนนำเสนอความคิดของตนเองหรือของกลุ่มจากข้อสรุปในขั้นสำรวจหน้าชั้นเรียน เพื่อให้เกิดการแลกเปลี่ยนความรู้ ผสมผสานแนวคิดร่วมกันเพื่อให้ได้ข้อตกลงหรือ

คำตอบร่วมกันในชั้นเรียน

ขั้นที่ 4 ขั้นสรุปผล คือ การที่นักเรียนได้อภิปรายผลร่วมกันหน้าชั้นเรียน ทำให้ทุกคนจะได้ฟังแนวคิดการหาคำตอบของคนอื่น นำมาเปรียบเทียบกับแนวคิดของตนเอง จนกลายเป็นข้อสรุปของทั้งห้อง ครูมีบทบาทในการชี้แนวทางให้นักเรียนได้แนวคิดที่เข้าสู่คำตอบของสถานการณ์มากยิ่งขึ้น หรือเติมเต็มองค์ความรู้ให้สมบูรณ์ยิ่งขึ้น

ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์

ความหมายของผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์

เวชฤทธิ์ อังกนะภัทรขจร (2555) กล่าวว่า เป็นความสามารถทางสติปัญญาในการเรียนรู้วิชาคณิตศาสตร์ ซึ่งจำแนกตามพฤติกรรม ผลสัมฤทธิ์ทางการเรียนที่พึงประสงค์ด้านสติปัญญาในการเรียนวิชาคณิตศาสตร์ แบ่งออกเป็น 4 ระดับ ดังนี้

1. ความรู้ ความจำ และการคิดคำนวณ (Computation) เป็นระดับที่วัดความสามารถในการระลึกถึงสิ่งที่ผู้เรียนได้เรียนผ่านไปแล้ว เกี่ยวกับข้อเท็จจริง ศัพท์ นิยาม ตลอดจนการบวก การคิดคำนวณอย่างง่าย ๆ

2. ความเข้าใจเป็นระดับที่วัดความสามารถในการนำความรู้หรือเรียนมาแล้ว มาสัมพันธ์กับโจทย์หรือปัญหาใหม่ ตลอดจนสามารถอธิบาย ยกตัวอย่างจำแนก แปลความ ตีความ สรุปความ หรือ ขยายความได้

3. การนำไปใช้ (Application) เป็นระดับที่วัดความสามารถในการนำความรู้ กฎ หลักการ ข้อเท็จจริง หรือ ทฤษฎีต่าง ๆ ที่ได้เรียนรู้มาแล้วไปแก้ปัญหาใหม่ให้เป็นผลสำเร็จ ทั้งนี้โจทย์ปัญหาที่ใช้วัดในระดับนี้ต้องไม่ใช่โจทย์เดิมที่ผู้เรียนเคยฝึกทำมาแล้ว

4. การวิเคราะห์ (Analysis) เป็นระดับที่วัดความสามารถในการแก้ปัญหาที่แปลกกว่าธรรมดา มีลักษณะซับซ้อน หรือ โจทย์ปัญหาที่ไม่คุ้นเคยกับที่รู้มาก่อน แต่ต้องอยู่ในขอบข่ายเนื้อหาวิชาที่เคยเรียนมา

องค์ประกอบที่ส่งผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์

องค์ประกอบที่มีอิทธิพลต่อผลสัมฤทธิ์ทางการเรียนของนักเรียนทั้งในและนอกห้องเรียน ดังนี้

1. องค์ประกอบทางด้านร่างกาย ได้แก่ อัตราการเจริญเติบโตของร่างกาย สุขภาพทางร่างกาย ข้อบกพร่องทางกาย และบุคลิกท่าทาง

2. องค์ประกอบทางความรัก ได้แก่ ความสัมพันธ์ของบิดามารดากับลูก ความสัมพันธ์ระหว่างลูก ๆ ด้วยกัน และความสัมพันธ์ระหว่างสมาชิกทั้งหมดในครอบครัว

3. องค์ประกอบทางวัฒนธรรมและสังคม ได้แก่ ขนบธรรมเนียมประเพณี ความเป็นอยู่ของครอบครัว สภาพแวดล้อมทางบ้าน การอบรมทางบ้าน และฐานะทางบ้าน

4. องค์ประกอบทางความสัมพันธ์ในเพื่อนวัยเดียวกัน ได้แก่ ความสัมพันธ์ของนักเรียนกับเพื่อนวัยเดียวกันทั้งที่บ้านและที่โรงเรียน

5. องค์ประกอบทางพัฒนาแห่งตน ได้แก่ สติปัญญา ความสนใจ เจตคติของนักเรียนต่อการเรียน

6. องค์ประกอบทางการปรับตน ได้แก่ ปัญหาการปรับตน การแสดงออกทางอารมณ์

ศิรีกานต์ งามพิพัฒนพงษ์ (2558) กล่าวว่า องค์ประกอบที่มีอิทธิพลต่อผลสัมฤทธิ์ทางการเรียนนั้น ประกอบด้วย ลักษณะของตัวนักเรียนเอง ได้แก่ ความพร้อมทางด้านสมอง ความรู้ ความคิด ความพร้อมทางด้านสติปัญญา ความพร้อมทางด้านร่างกาย สุขภาพ ความสนใจ ทัศนคติการยอมรับความสามารถของตนเอง ลักษณะบุคลิกภาพ แรงจูงใจ ค่านิยม อายุ เพศ ประสิทธิภาพ การจัดการเรียนการสอนของครู การได้รับคำแนะนำ การเสริมแรงจากครู วิธีการที่ครูนำมาสอน การมีส่วนร่วมในการเรียนการสอนระหว่างครูกับนักเรียน ตลอดไปถึงองค์ประกอบทางด้านสังคม สิ่งแวดล้อมที่มีปฏิสัมพันธ์กับตัวเด็ก เช่น บ้าน ครอบครัว เพื่อน อิทธิพลทางศิลปวัฒนธรรม เป็นต้น

สรุปองค์ประกอบที่ส่งผลต่อสัมฤทธิ์ทางการเรียนคณิตศาสตร์มีหลายด้าน ได้แก่ นักเรียน ครู ผู้ปกครอง ระบบบริหารจัดการ พื้นฐานความรู้ทางคณิตศาสตร์ และการสอนของครู เป็นต้น

จากความหมายดังกล่าวพอสรุปได้ว่า ผลสัมฤทธิ์ทางการเรียน หมายถึง ความสามารถทางสติปัญญาที่ส่งให้เกิดผลสัมฤทธิ์ในการเรียนรู้วิชาคณิตศาสตร์ และจากการวิเคราะห์การเรียนรู้ในระดับประกาศนียบัตรวิชาชีพแล้ว ผู้วิจัยเห็นว่า การวัดความสามารถในการเรียนรู้ที่เหมาะสมของนักเรียนในระดับประกาศนียบัตรวิชาชีพ คือ การวัดความรู้ ความจำ ด้านการคำนวณ ความเข้าใจและการนำไปใช้ วัดผลสัมฤทธิ์ทางการเรียนโดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน

งานวิจัยที่เกี่ยวข้อง

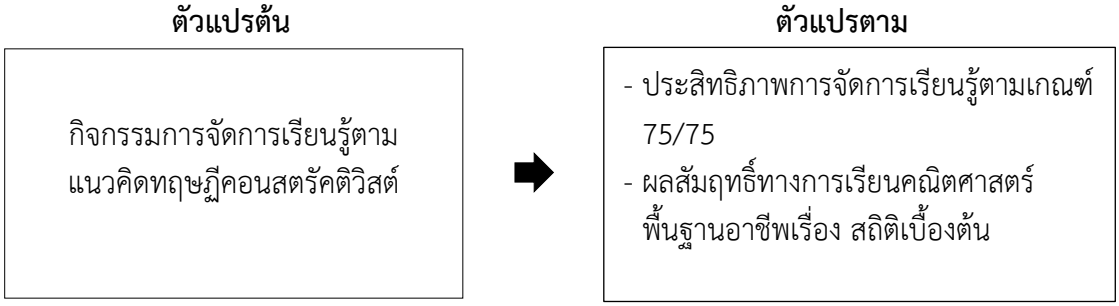
รัตน์พีภรณ์ คงหนู (2560) ทำการวิจัยเรื่อง การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์พื้นฐานของนักเรียนระดับประกาศนียบัตรวิชาชีพ (ปวช.) ชั้นปีที่ 1 โดยใช้การจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ร่วมกับการใช้แฟ้มสะสมงานกับการเรียนรู้แบบปกติ พบว่า ผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนของกลุ่มควบคุมที่เรียน โดยใช้การจัดการเรียนรู้แบบปกติและกลุ่มทดลองที่เรียน โดยใช้การจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ร่วมกับการใช้แฟ้มสะสมงานมีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนระหว่างการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ร่วมกับการใช้แฟ้มสะสมงานกับการจัดการเรียนรู้แบบปกติ พบว่า หลังเรียนมีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ผลการประเมินความพึงพอใจและผลการประเมินเจตคติของกลุ่มที่มีการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ร่วมกับการใช้แฟ้มสะสมงานและการจัดการเรียนรู้แบบปกติอยู่ในระดับมาก

ศราวุฒ เพชรอินทร์ (2561) ทำการวิจัยเรื่อง การศึกษาผลการเรียนรู้ เรื่อง คณิตศาสตร์เชิงการจัดการ (Combinatorics) ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่ใช้การจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ พบว่า นักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่ได้รับการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ เรื่อง คณิตศาสตร์เชิงการจัดการ มีผลการเรียนรู้ผ่านเกณฑ์เป็นจำนวนมากกว่าร้อยละ 60 ของจำนวนนักเรียนทั้งหมด ที่ระดับนัยสำคัญ .05 และนักเรียนกลุ่มตัวอย่างที่ได้รับการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ มีความพึงพอใจโดยภาพรวมต่อการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์อยู่ในระดับมาก

ปิยะพร นิตยารส (2562) ทำการวิจัยเรื่อง การพัฒนาการจัดการเรียนรู้คณิตศาสตร์ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการ ชั้นมัธยมศึกษาปีที่ 3 พบว่า 1) กิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการของนักเรียนชั้นมัธยมศึกษาปีที่ 3 มีประสิทธิภาพ เท่ากับ 83.83/82.31 ซึ่งเป็นตามเกณฑ์ที่ตั้งไว้ 2) ดัชนีประสิทธิผลของกิจกรรมการเรียนรู้วิชาคณิตศาสตร์ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการ

แก้ปัญหาเรื่อง อสมการ ชั้นมัธยมศึกษาปีที่ 3 เท่ากับ .7209 คิดเป็นร้อยละ 72.09 3) นักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการ ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 มีผลสัมฤทธิ์ทางการเรียนสูงกว่านักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้แบบปกติอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 4) นักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการ ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 มีความสามารถในการแก้ปัญหาสูงกว่านักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้แบบปกติ

กรอบแนวคิด



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากร ได้แก่ ประชากรกลุ่มเป้าหมายที่ใช้ในการวิจัยครั้งนี้ คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ปีการศึกษา 2565 วิทยาลัยเทคโนโลยีหาดใหญ่อำนวยวิทย์ จำนวน 269 คน

กลุ่มตัวอย่าง คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 สาขาคอมพิวเตอร์กราฟิก จำนวน 32 คน โดยเลือกแบบเจาะจง คือ ห้องเรียนที่ผู้วิจัยรับผิดชอบสอนปีการศึกษา 2565 อยู่ในเกณฑ์ปานกลาง – ต่ำ

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น จำนวน 3 แผน (คาบละ 2 ชั่วโมง จำนวน 6 คาบ)

2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์พื้นฐานอาชีพก่อนและหลังเรียน เรื่อง สถิติเบื้องต้น ที่ผู้วิจัยสร้างขึ้น ซึ่งแบบทดสอบจะเป็นข้อสอบปรนัยชนิด 4 ตัวเลือก จำนวน 20 ข้อ จำนวน 1 ฉบับ

การสร้างเครื่องมือในการวิจัย

1. แผนการจัดการเรียนรู้

1.1 ศึกษาหลักสูตรหมวดทักษะชีวิต ระดับประกาศนียบัตรวิชาชีพ พุทธศักราช 2562 และศึกษาโครงสร้างรายวิชาคณิตศาสตร์พื้นฐานอาชีพ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 เพื่อเป็นแนวทางในการเขียนแผนการจัดการเรียนรู้

1.2 ศึกษารูปแบบการจัดการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ จากเอกสารและงานวิจัยที่เกี่ยวข้อง และเขียนแผนการจัดการเรียนรู้ให้สอดคล้องกับวัตถุประสงค์การเรียนรู้ เรื่อง สถิติเบื้องต้น

1.3 นำแผนการจัดการเรียนรู้เสนอผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบความเหมาะสมของเนื้อหา เมื่อผู้เชี่ยวชาญทั้ง 3 ท่าน ตรวจสอบผลปรากฏว่า ค่าเฉลี่ยของแผนการจัดการเรียนรู้มีค่าเท่ากับ 4.57 ซึ่งเหมาะสมที่จะนำไปใช้ในการทำวิจัย

1.4 นำแผนการจัดการเรียนรู้ไปใช้ในการเรียนการสอน

2. แบบทดสอบ

2.1 ศึกษาหลักสูตรระดับประกาศนียบัตรวิชาชีพ พุทธศักราช 2562 และศึกษาโครงสร้างรายวิชาคณิตศาสตร์พื้นฐานอาชีพของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1

2.2 ศึกษาจุดประสงค์เชิงพฤติกรรมเพื่อนำมาสร้างแบบทดสอบ

2.3 สร้างแบบทดสอบแบบปรนัยชนิดเลือกตอบ 4 ตัวเลือก จำนวน 1 ฉบับ จำนวน 20 ข้อ

2.4 นำแบบทดสอบเสนอผู้เชี่ยวชาญ 3 ท่าน ตรวจสอบความถูกต้องความเที่ยงตรงตามเนื้อหาและจุดประสงค์โดยการหาค่า IOC แล้วนำมาปรับปรุงแก้ไข

2.5 นำแบบทดสอบที่ผู้เชี่ยวชาญประเมินความเหมาะสม โดยเลือกข้อสอบที่มีค่า IOC ตั้งแต่ 0.50 ถึง 1.00 ซึ่งได้ข้อสอบที่มีค่า IOC ตั้งแต่ 0.66- 1.00 จำนวน 20 ข้อ สามารถนำแบบทดสอบไปใช้ในการทดสอบ

การเก็บรวบรวมข้อมูล

1. ทดสอบก่อนเรียน เรื่องสถิติเบื้องต้น โดยใช้แบบทดสอบที่ผ่านการตรวจสอบจากผู้เชี่ยวชาญกับกลุ่มตัวอย่างครูบันทึกคะแนนไว้

2. ดำเนินการจัดกิจกรรมการเรียนรู้ เรื่อง สถิติเบื้องต้น ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ ซึ่งเมื่อเรียนแต่ละหน่วยการเรียนรู้ครบ จะมีแบบทดสอบย่อยจำนวน 3 ครั้ง ๆ ละ 10 คะแนนรวมทั้งหมด 30 คะแนน แล้วนำมาหาค่า E1 และหาค่าคะแนนเฉลี่ยของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนหลังเรียน 1 วัน จากคะแนนเต็ม 20 คะแนน แล้วหาค่า E2

3. ทดสอบหลังเรียน เพื่อนำคะแนนมาหาค่าผลสัมฤทธิ์ก่อนเรียนและหลังเรียนของนักเรียน

4. นำผลมาวิเคราะห์ด้วยวิธีทางสถิติเพื่อทดสอบสมมติฐาน

5. สรุปผลการดำเนินงาน

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

ประสิทธิภาพของกิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น และเปรียบเทียบผลสัมฤทธิ์ทางการเรียน เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชั้นปีที่ 1 ก่อนเรียนและหลังเรียน โดยดำเนินการจัดกิจกรรมการเรียนรู้ เรื่อง สถิติเบื้องต้น ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ โดยการหาค่าร้อยละ ค่าเฉลี่ย ($\overline{X}$) ส่วนเบี่ยงเบนมาตรฐาน (S.D.) และค่าความแตกต่างโดยค่าที-เทส (t-test) แบบ Dependent

ผลการวิจัย

การศึกษาผลการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ซึ่งผู้วิจัยได้ทำการเก็บรวบรวมข้อมูลดังนี้ ทดสอบก่อนเรียนโดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์พื้นฐานอาชีพ เรื่อง สถิติเบื้องต้น ดำเนินการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น จำนวน 8 ชั่วโมง เมื่อเรียนแต่ละหน่วยการเรียนรู้ครบจะมี

แบบทดสอบย่อยจำนวน 3 ครั้ง ครั้งละ 10 คะแนน รวมทั้งหมด 30 คะแนน แล้วหาค่า E1 และทดสอบวัดผลสัมฤทธิ์ทางการเรียนหลังการจัดกิจกรรมจากคะแนนเต็ม 20 คะแนน แล้วหาค่า E2 และวิเคราะห์เปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนและหลังการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ตามตารางที่ 1

ตารางที่ 1 แสดงประสิทธิภาพของกิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1

ประสิทธิภาพ	คะแนนเต็ม	คะแนนเฉลี่ย	ร้อยละของคะแนนเต็ม
ประสิทธิภาพของกระบวนการ (E1)	30	24.81	82.70
ประสิทธิภาพผลลัพธ์ (E2)	20	16.84	84.20

จากตารางที่ 1 ประสิทธิภาพของกิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 มีประสิทธิภาพต่อกระบวนการ/ประสิทธิภาพของผลลัพธ์ (E1/E2) เท่ากับ 82.70/84.20 ซึ่งเป็นไปตามเกณฑ์ที่กำหนดไว้คือ 75/75

ตารางที่ 2 แสดงผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนและหลังการจัดกิจกรรมการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1

	N	$\bar{\chi}$	S.D.	t-test	sig
ก่อนเรียน	32	8.50	2.527 1.505	28.808**	.000
หลังเรียน	32	16.84			

จากตารางที่ 2 พบว่า นักเรียนที่เรียนวิชาคณิตศาสตร์พื้นฐานอาชีพตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 สาขาคอมพิวเตอร์กราฟิก มีสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียน โดยก่อนเรียน คิดเป็นค่าเฉลี่ย ($\overline{X}$) เท่ากับ 8.50 ส่วนเบี่ยงเบนมาตรฐาน (S.D.) เท่ากับ 2.527 และหลังเรียน คิดเป็นค่าเฉลี่ย ($\overline{X}$) 16.84 ส่วนเบี่ยงเบนมาตรฐาน (S.D.) เท่ากับ 1.505 เมื่อทดสอบความแตกต่างของคะแนนเฉลี่ยก่อนและหลังเรียน เรื่อง สถิติเบื้องต้น ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เมื่อเปรียบเทียบและวิเคราะห์ข้อมูล พบว่า ผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

สรุปและอภิปรายผล

สรุปผลการวิจัย

1. กิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 มีประสิทธิภาพ 82.70/84.20

2. ผลสัมฤทธิ์ทางการเรียนโดยใช้กิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

การอภิปรายผล

1. จากการวิจัย พบว่า กิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์พื้นฐานอาชีพ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 มีประสิทธิภาพ 82.70/84.20 ซึ่งมีประสิทธิภาพตามเกณฑ์ที่ตั้งไว้ 75/75 ทั้งนี้อาจเป็นเพราะว่า กิจกรรมการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น เน้นให้นักเรียนสร้างองค์ความรู้ขึ้นมาด้วยตนเองจากพื้นฐานองค์ความรู้เดิม กิจกรรมการจัดการเรียนรู้นี้มีสถานการณ์หรือเหตุการณ์ท้าทายให้นักเรียนทดลองคิดด้วยตัวเอง หรือคิดเป็นกลุ่ม จากนั้นจะมีการอภิปรายแลกเปลี่ยนความคิดเห็นร่วมกันกับเพื่อน ๆ ในชั้นเรียนเพื่อหาข้อสรุปร่วมกัน ทำให้นักเรียนมีความสนใจในเนื้อหาของการเรียนมากขึ้น จึงส่งผลให้กิจกรรมการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์มีประสิทธิภาพเป็นที่ยอมรับได้ตามเกณฑ์ที่กำหนด

2. จากการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียนกลุ่มตัวอย่างมีการจัด กิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ มีค่าเฉลี่ยเท่ากับ 16.84 ของคะแนนเต็ม คิดเป็นร้อยละ 84.27 ทั้งนี้อาจเป็นเพราะว่า กิจกรรมการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น เปิดโอกาสให้นักเรียนทุกคนได้ดึงเอาองค์ความรู้เดิมที่นักเรียนเคยเรียนรู้มาเป็นฐานในการคิดต่อยอดเพื่อสร้างองค์ความรู้ขึ้นมาใหม่ ทำให้เกิดการเรียนรู้และเข้าใจเนื้อหาความรู้ใหม่ได้อย่างรวดเร็ว การอภิปรายแลกเปลี่ยนความคิดเห็นกับเพื่อนในชั้นเรียน ทำให้เห็นความคิดที่หลากหลาย เป็นสิ่งที่ทำให้เกิดการเรียนรู้ใหม่ประกอบด้วย

ขั้นที่ 1 ขั้นกระตุ้น คือ ครูเป็นผู้กำหนดปัญหาหรือสถานการณ์ที่สอดคล้องกับความคิดรวบยอดที่จัดกิจกรรมการเรียนรู้ เพื่อกระตุ้นความสนใจให้แก่นักเรียนได้ทดลองหาคำตอบของปัญหาหรือสถานการณ์นั้น ๆ

ขั้นที่ 2 ขั้นสำรวจ คือ การให้นักเรียนรายบุคคลหรือเป็นกลุ่มช่วยกันแก้ปัญหาหรือสถานการณ์ที่ได้จากขั้นกระตุ้น ครูอาจจะช่วยชี้แนวทางโดยการตั้งคำถามปลายเปิดให้กับนักเรียนได้คิด และวางแผนแก้ปัญหา จนหาข้อสรุปเหล่านั้นได้สำเร็จ

ขั้นที่ 3 ขั้นอภิปราย คือ การให้นักเรียนนำเสนอความคิดของตนเองหรือของกลุ่มจากข้อสรุปในขั้นสำรวจหน้าชั้นเรียน เพื่อให้เกิดการแลกเปลี่ยนความรู้ ผสมผสานแนวคิดร่วมกันเพื่อให้ได้ข้อตกลงหรือคำตอบร่วมกันในชั้นเรียนและขั้นสรุปผล คือ การที่นักเรียนได้อภิปรายผลร่วมกันหน้าชั้นเรียน ทำให้ทุกคนจะได้ฟังแนวคิดการหาคำตอบของคนอื่น นำมาเปรียบเทียบกับแนวคิดของตนเอง จนกลายเป็นข้อสรุปของทั้งห้อง ครูมีบทบาทให้การชี้แนวทางให้นักเรียนได้แนวคิดที่เข้าสู่คำตอบของสถานการณ์มากยิ่งขึ้นหรือเติมเต็มองค์ความรู้ให้สมบูรณ์ยิ่งขึ้น

ซึ่งสอดคล้องกับงานของ ปิยะพร นิตยารส (2562) ทำการวิจัยเรื่อง การพัฒนาการจัดการเรียนรู้คณิตศาสตร์ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการ ชั้นมัธยมศึกษาปีที่ 3 พบว่า 1) กิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหาเรื่อง อสมการ ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 มีประสิทธิภาพเท่ากับ 83.83/82.31 ซึ่งเป็นตามเกณฑ์ที่ตั้งไว้ 2) นักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการ ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 มีผลสัมฤทธิ์ทางการเรียนสูงกว่านักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้แบบปกติอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 3) นักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ที่ส่งเสริมทักษะการแก้ปัญหา เรื่อง อสมการ

ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 มีความสามารถในการแก้ปัญหาสูงกว่านักเรียนที่เรียนด้วยกิจกรรมการเรียนรู้แบบปกติอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และยังสอดคล้องกับ ศุภนัส นงค์นวล (2562) ทำการวิจัยเรื่อง การพัฒนากิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 พบว่า 1) กิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 มีประสิทธิภาพ 75.93/75 2) ผลสัมฤทธิ์ทางการเรียนโดยใช้กิจกรรมการจัดการเรียนรู้วิชาคณิตศาสตร์ ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์ เรื่อง สถิติเบื้องต้น ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 มีค่าเฉลี่ย เท่ากับ 15.04 จากที่กล่าวมา กิจกรรมการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์ เป็นแนวคิดหนึ่งที่ช่วยยกระดับผลสัมฤทธิ์ทางการเรียนของนักเรียนได้เป็นอย่างดีคิดเป็นร้อยละ 75.21 จากที่กล่าวมา กิจกรรมการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์เป็นแนวคิดหนึ่งที่ช่วยยกระดับผลสัมฤทธิ์ทางการเรียนของนักเรียน

ข้อเสนอแนะ

1. ข้อเสนอแนะในการนำงานวิจัยไปใช้ประโยชน์

1.1 กิจกรรมการจัดการเรียนรู้ตามแนวคิดทฤษฎีคอนสตรัคติวิสต์เป็นกิจกรรมที่ช่วยให้นักเรียนมีผลสัมฤทธิ์ทางการเรียนที่ดีขึ้น ดังนั้นครูหรือผู้สนใจจะนำไปจัดกิจกรรมการจัดการเรียนรู้ควรศึกษากระบวนการจัดกิจกรรมให้รอบคอบ และตรวจสอบเครื่องมือซ้ำ ๆ เพื่อให้เกิดประสิทธิภาพสูงสุด

1.2 ครูผู้สอนควรมีการกระตุ้นให้นักเรียนที่ขาดการมีส่วนร่วมในกิจกรรมกลุ่มได้มีโอกาสมีส่วนร่วมในกิจกรรมกลุ่มเพื่อให้นักเรียนได้ฝึกคิดรู้จักการทำงานกลุ่ม

2. ข้อเสนอแนะในการต่อยอดงานวิจัย

2.1 ควรพัฒนากิจกรรมการเรียนรู้ที่มีสื่อเทคโนโลยีเป็นเครื่องมือการเรียนรู้ เช่น แอพพลิเคชั่นต่าง ๆ เพื่อให้เกิดความหลากหลาย และดึงดูดความสนใจในการเรียนของนักเรียน

2.2 ควรศึกษาผลของการจัดกิจกรรมการจัดการเรียนรู้ตามแนวคิดคอนสตรัคติวิสต์กลุ่มที่เรียนแบบปกติ

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การพัฒนาผลสัมฤทธิ์ทางการเรียน วิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับประกาศนียบัตรวิชาชีพปีที่ 1 โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E)

Developing Academic Achievement Vocational Basic Mathematics Subject: Arithmetic Mean of First-year Vocational Certificate Students Using a 7-Step Inquiry Cycle (7E) Teaching Method.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนในรายวิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) กลุ่มตัวอย่าง คือ นักเรียนระดับชั้นประกาศนียบัตรวิชาชีพชั้นปีที่ 1/7 สาขาภาษาต่างประเทศ จำนวน 21 คน โดยการสุ่มกลุ่มตัวอย่างแบบชั้นภูมิ (Stratified Random Sampling) เครื่องมือที่ใช้ในการศึกษา คือ แผนการจัดการเรียนรู้โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) เรื่อง ค่าเฉลี่ยเลขคณิต สถิติที่ใช้ในการวิจัย คือ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน สถิติที่ใช้ในการทดสอบสมมติฐาน คือ t-test (Dependent Samples)

ผลการวิจัย สรุปได้ว่า ผลสัมฤทธิ์ทางการเรียน เรื่อง ค่าเฉลี่ยเลขคณิต ในรายวิชาคณิตศาสตร์พื้นฐานอาชีพ โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ผลสัมฤทธิ์ทางการเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และทำให้ครูผู้สอนนำมาพัฒนาการเรียนการสอนในห้องเรียน เพื่อให้นักเรียนมีผลสัมฤทธิ์ทางการเรียน เรื่อง ค่าเฉลี่ยเลขคณิตเพิ่มขึ้น และสามารถนำไปปรับใช้กับเรื่องหรือรายวิชาอื่น ๆ ได้

คำสำคัญ: การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E), ผลสัมฤทธิ์ทางการเรียน

Abstract

This research aims to develop academic achievement in the subject of Vocational Basic Mathematics. The arithmetic mean of students at the Vocational Diploma Year level 1 Using the 7-step inquiry cycle teaching method (7E), the sample group is Vocational Certificate Year 1/7 students in Foreign Languages, 21 people, by random sampling (Stratified Random Sampling). The tool used in the study was a learning management plan using the teaching method. The 7-step cycle of knowledge inquiry (7E) on the subject of

arithmetic mean Statistics used in the research are mean, and standard deviation. The statistic used to test the hypothesis is a t-test (Dependent Samples).

The research results concluded that the academic achievement in the subject of arithmetic mean in the course Basic Vocational Mathematics By using teaching and learning in the 7-step inquiry cycle (7E), academic achievement was significantly higher than before learning at the .01 level and allowed teachers to develop teaching and learning in the classroom. For students to have increased academic achievement in the subject of arithmetic mean. and can be applied to other subjects or courses.

Keywords: 7-step Inquiry Cycle Teaching Method (7E), Achievement

บทนำ

หลักสูตรประกาศนียบัตรวิชาชีพพุทธศักราช 2562 เป็นหลักสูตรหลังมัธยมศึกษาตอนต้นหรือเทียบเท่าที่พัฒนาขึ้นเพื่อใช้ในการจัดการศึกษาด้านวิชาชีพระดับประกาศนียบัตรวิชาชีพ และเพื่อยกระดับการศึกษาวิชาชีพของบุคคลให้สูงขึ้น สอดคล้องกับแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ แผนการศึกษาแห่งชาติ เป็นไปตามกรอบคุณวุฒิแห่งชาติมาตรฐานการศึกษาของชาติ และกรอบคุณวุฒิอาชีวศึกษาแห่งชาติ ตลอดจนยึดโยงกับมาตรฐานอาชีพ โดยเน้นการเรียนรู้สู่การปฏิบัติเพื่อพัฒนาสมรรถนะกำลังคนระดับฝีมือ รวมทั้งคุณธรรม จริยธรรม จรรยาบรรณวิชาชีพ และกิจนิสัยที่เหมาะสม ในการทำงาน ให้สอดคล้องกับความต้องการกำลังคนของตลาดแรงงาน ชุมชน สังคม และสามารถประกอบอาชีพอิสระได้ โดยเปิดโอกาสให้ผู้เรียนเลือกระบบและวิธีการเรียนได้อย่างเหมาะสมตามศักยภาพตามความสนใจและโอกาสของตน ส่งเสริมให้มีการประสานความร่วมมือเพื่อจัดการศึกษาและพัฒนาหลักสูตรร่วมกันระหว่างสถาบัน สถานศึกษา หน่วยงาน สถานประกอบการและองค์กรต่าง ๆ ทั้งในระดับชุมชนระดับท้องถิ่นและระดับชาติ (สำนักงานคณะกรรมการการอาชีวศึกษา, 2562)

วิชาคณิตศาสตร์มีความสำคัญ และมีบทบาทต่อบุคคลมาก คณิตศาสตร์ช่วยฝึกให้คนมีความคิดรอบคอบ มีเหตุผล รู้จักหาความจริงมีคุณธรรมเช่นนี้อยู่ในใจ เป็นสิ่งสำคัญมากกว่าความเจริญในด้านวิทยาการใด ๆ นอกจากนี้เมื่อเด็กคิดเป็นและเคยชินต่อการแก้ปัญหาตามวัยไปทุกระยะแล้ว เมื่อเป็นผู้ใหญ่ย่อมสามารถแก้ปัญหาชีวิตได้ คณิตศาสตร์ยังเป็นรากฐานของวิทยาศาสตร์และเป็นวิชาหลัก ฝึกในเรื่องการสังเกตและเป็นกุญแจนำไปสู่วิชาการใหม่ ๆ มากมาย ไม่ว่าจะเป็นทางศิลปศาสตร์ ดนตรี นาฏศิลป์ ประวัติศาสตร์ หรือด้านวิทยาศาสตร์สาขาต่าง ๆ ฯลฯ (สมทรง ดอนแก้วบัว, 2538)

การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) จะเน้นการถ่ายโอนการเรียนรู้และให้ความสำคัญกับการตรวจสอบความรู้เดิมของเด็ก ซึ่งเป็นสิ่งที่ครูไม่ควรละเลย หรือละทิ้ง เนื่องจากการตรวจสอบพื้นความรู้เดิมของเด็กจะทำให้ครูได้ค้นพบว่า นักเรียนจะต้องเรียนรู้อะไรก่อนที่จะเรียนในเนื้อหานั้น ๆ นักเรียนจะสร้างความรู้จากพื้นความรู้เดิมที่เด็กมี ทำให้เด็กเกิดการเรียนรู้อย่างมีความหมาย และมีแนวความคิดที่ไม่ผิดพลาด การละเลยหรือเพิกเฉยในขั้นนี้จะทำให้ยากแก่การพัฒนาแนวความคิดของเด็ก ซึ่งจะไม่เป็นไปตามจุดมุ่งหมายที่ครูวางไว้ นอกจากนี้ยังเน้นให้นักเรียนสามารถนำความรู้ที่ได้รับไปประยุกต์ใช้ให้เกิดประโยชน์ในชีวิตประจำวันได้

จากความสำคัญข้างต้น ผู้วิจัยจึงสนใจศึกษาผลการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) รายวิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับ

ประกาศนียบัตรวิชาชีพชั้นปีที่ 1 โดยมุ่งเน้นให้นักเรียนค้นหาคำตอบ หาความรู้ด้วยตนเอง และลงมือแก้ปัญหาได้ด้วยตนเอง ซึ่งผู้วิจัยหวังว่าการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) จะสามารถพัฒนาผลสัมฤทธิ์ทางการเรียนของผู้เรียน และสามารถสร้างบรรยากาศในการเรียนรู้ มีความสนใจในการเรียน เกิดการเรียนรู้อย่างเป็นระบบ เป็นขั้นตอน และเป็นแนวทางในการประยุกต์ใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) สำหรับรายวิชาอื่นได้

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนในรายวิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ก่อนและหลังเรียนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E)

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E)

ทิศนา แขมมณี (2550) ได้ให้ความหมายการสอนแบบวัฏจักรการเรียนรู้ 7 ขั้น ว่าเป็นการดำเนินการเรียนการสอนโดยครูผู้สอนกระตุ้นให้นักเรียนเกิดคำถาม เกิดความคิด และลงมือแสวงหาความรู้เพื่อนำมาประมวลหาคำตอบหรือข้อสรุปด้วยตนเอง โดยที่ครูผู้สอนช่วยอำนวยความสะดวกในการเรียนรู้ในด้านต่าง ๆ ให้แก่นักเรียน เช่น ในด้านการสืบค้นหาแหล่งความรู้ การศึกษาข้อมูล การวิเคราะห์ การสรุปข้อมูล การอภิปรายโต้แย้งทางวิชาการ และการทำงานร่วมกับผู้อื่น

ประสาท เนืองเฉลิม (2550) ได้ให้ความหมายไว้ว่า การจัดการเรียนรู้ตามวัฏจักรการเรียนรู้ 7 ขั้น เป็นการสอนที่เน้นการถ่ายโอนการเรียนรู้ และให้ความสำคัญเกี่ยวกับการตรวจสอบความรู้เดิมของเด็ก ซึ่งเป็นสิ่งที่ครูละเลยไม่ได้ และการตรวจสอบความรู้พื้นฐานเดิมของเด็กจะทำให้ครูค้นพบว่า นักเรียนต้องเรียนรู้อะไรก่อน ก่อนที่จะเรียนรู้ในเนื้อหาบทเรียนนั้น ๆ ซึ่งจะช่วยให้เด็กเกิดการเรียนรู้อย่างมีประสิทธิภาพ

จากความหมายของการจัดการเรียนรู้ตามวัฏจักรการเรียนรู้ ดังกล่าวข้างต้นสรุปได้ว่า การจัดการเรียนรู้ตามวัฏจักรการเรียนรู้ 7 ขั้น (7E) หมายถึง การจัดการเรียนรู้ที่มุ่งเน้นให้ผู้เรียนค้นหาคำตอบ โดยการแสวงหาความรู้ด้วยตนเอง มุ่งส่งเสริมให้ผู้เรียนได้ฝึกคิด ลงมือแก้ปัญหาด้วยตนเอง และนำความรู้ที่ได้ไปประยุกต์ใช้ในสถานการณ์อื่น ๆ โดยครูมีหน้าที่อำนวยความสะดวกในการจัดบรรยากาศให้เอื้อต่อการเรียนรู้

ขั้นตอนของการจัดการเรียนรู้แบบวัฏจักรการเรียนรู้ 7 ขั้น (7E)

พิมพันธ์ เดชะคุปต์ และ พเยาว์ ยินดีสุข (2552) ได้กล่าวถึง การจัดการเรียนรู้ตามวัฏจักร การเรียนรู้ 7 ขั้น (7E) ไว้ ดังนี้

1. ขั้นทบทวนความรู้เดิม (Elicit) ผู้สอนจัดกิจกรรมเพื่อให้ผู้เรียนดึงความรู้ ความเข้าใจจากประสบการณ์เดิมของผู้เรียนออกมา หรือทบทวนความรู้เดิมที่ผู้เรียนมีอยู่

2. ขั้นสร้างความสนใจ (Engage) ผู้สอนจัดกิจกรรมเพื่อกระตุ้นความสนใจให้ผู้เรียนเกิดความอยากรู้อยากเห็น กิจกรรมอาจเป็นการทดลอง การนำเสนอข้อมูล ข่าวหรือสถานการณ์ที่ก่อให้เกิดความคิดขัดแย้งกับสิ่งที่ผู้เรียนเคยรู้ กระตุ้นให้ผู้เรียนตั้งคำถาม กำหนดประเด็นปัญหาที่จะศึกษาซึ่งนำไปสู่การตรวจสอบ

3. ขั้นสำรวจและค้นหา (Explore) ผู้สอนกระตุ้นให้ผู้เรียนตรวจสอบปัญหาและให้ผู้เรียนดำเนินการตรวจสอบ สืบค้น รวบรวมข้อมูล โดยการวางแผนการสำรวจตรวจสอบ ลงมือปฏิบัติ เช่น การสังเกต การทดลอง การรวบรวมข้อมูล

4. ขั้นอธิบายและลงข้อสรุป (Explain) ผู้สอนส่งเสริมให้ผู้เรียนนำข้อมูลที่ได้มาวิเคราะห์และจัดกระทำข้อมูลในรูปตาราง กราฟ แผนภาพ เพื่อให้เห็นแนวโน้มหรือความสัมพันธ์ของข้อมูล สรุปผล และอภิปรายผลการทดลองโดยอ้างอิงทฤษฎีหรือกฎต่าง ๆ อย่างเป็นเหตุเป็นผล นอกจากนี้ผู้สอนยังมีหน้าที่จัดกิจกรรมส่งเสริมให้ผู้เรียนอธิบายความคิดของผู้เรียนด้วยตนเอง ให้ผู้เรียนแสดงหลักฐานเหตุผลประกอบคำอธิบาย

5. ขั้นขยายความรู้ (Elaborate) ผู้สอนให้ผู้เรียนใช้สัญลักษณ์ นิยาม คำอธิบาย และทักษะไปสู่สถานการณ์ใหม่ ให้ผู้เรียนได้ประยุกต์ใช้ความรู้ที่สร้างขึ้นในการตอบคำถาม แนะทางแก้ปัญหา และนำไปสู่การตั้งสมมติฐาน และค้นคว้าต่อไป

6. ขั้นประเมินผล (Evaluate) เป็นการประเมินผลการเรียนรู้ของผู้เรียน ซึ่งมีทั้งการประเมินการปฏิบัติกิจกรรมในแต่ละขั้นตอน และการประเมินการเรียนรู้ของผู้เรียนก่อนที่ผู้เรียนจะขยายความคิดรวบยอด และค้นพบปัญหาใหม่ โดยผู้สอนและผู้เรียนมีส่วนร่วมในการประเมิน

7. ขั้นขยายความคิดรวบยอด (Extend) ผู้สอนส่งเสริมให้ผู้เรียนเชื่อมโยงความคิดรวบยอดที่ได้จากการเรียนรู้ไปสู่การเรียนรู้เรื่องอื่น ๆ ต่อไป อาจเริ่มจากการเปรียบเทียบข้อแตกต่างระหว่างเรื่องที่ศึกษากับเรื่องใหม่ที่เกี่ยวข้องแต่ยังไม่ได้ทำการศึกษาและนำไปสู่วัฏจักรใหม่อีกครั้ง

ผลสัมฤทธิ์ทางการเรียน

พวงรัตน์ ทวีรัตน์ (2530) กล่าวว่า จุดมุ่งหมายของการวัดผลสัมฤทธิ์ทางการเรียน เพื่อเป็นการตรวจสอบความสามารถของสมรรถภาพทางสมองของบุคคลว่า เรียนแล้วได้อะไรบ้าง มีความสามารถด้านใดมากน้อยเท่าใด เช่น พฤติกรรมการจำ ความเข้าใจ การนำไปใช้ การวิเคราะห์ การสังเคราะห์ และการประเมินค่า การวัดผลสัมฤทธิ์เป็นการตรวจสอบพฤติกรรมของผู้เรียนในด้านของพุทธพิสัย ซึ่งเป็นการวัด 2 องค์ประกอบ ตามจุดมุ่งหมายและลักษณะที่เรียน ดังนี้

1. การวัดด้านการปฏิบัติ เป็นการตรวจสอบความรู้ความสามารถทางการปฏิบัติ โดยให้ผู้เรียนได้ลงมือปฏิบัติจริงให้เห็นเป็นผลงานปรากฏออกมา ให้ทำการสังเกตและวัดได้ การวัดแบบนี้จึงต้องใช้ข้อสอบภาคปฏิบัติ ซึ่งการประเมินผลจะพิจารณาที่การปฏิบัติและผลงานที่ปฏิบัติ

2. การวัดด้านเนื้อหา เป็นการตรวจสอบความรู้ความสามารถเกี่ยวกับเนื้อหาวิชา รวมถึงความสามารถอันเป็นผลมาจากการเรียนการสอน

งานวิจัยที่เกี่ยวข้อง

ศิวพร ศรีจรัญ (2559) ได้ทำการวิจัยผลการจัดกิจกรรมการเรียนรู้แบบวัฏจักรสืบเสาะหาความรู้ 7 ขั้น (7E) ร่วมกับการใช้คำถามระดับสูงที่มีผลต่อการคิดอย่างมีเหตุผล และผลสัมฤทธิ์ทางการเรียนวิชาชีววิทยา เรื่อง ระบบย่อยอาหาร ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 ผลการวิจัยพบว่า 1) การคิดอย่างมีเหตุผลของนักเรียนชั้นมัธยมศึกษาปีที่ 4 หลังเรียนโดยใช้การจัดการเรียนรู้แบบวัฏจักรสืบเสาะหาความรู้ 7 ขั้น (7E) ร่วมกับการใช้คำถามระดับสูง สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 2) การคิดอย่างมีเหตุผลของนักเรียนชั้นมัธยมศึกษาปีที่ 4 ระหว่างก่อนเรียนและหลังเรียนโดยใช้การจัดการเรียนรู้แบบวัฏจักรสืบเสาะหาความรู้ 7 ขั้น (7E) ร่วมกับการใช้คำถามระดับสูง มีคะแนนพัฒนาการเฉลี่ยร้อยละ 36.47 นักเรียนมีพัฒนาการระดับกลาง 3) ผลสัมฤทธิ์ทางการเรียนวิชาชีววิทยา เรื่อง ระบบย่อย

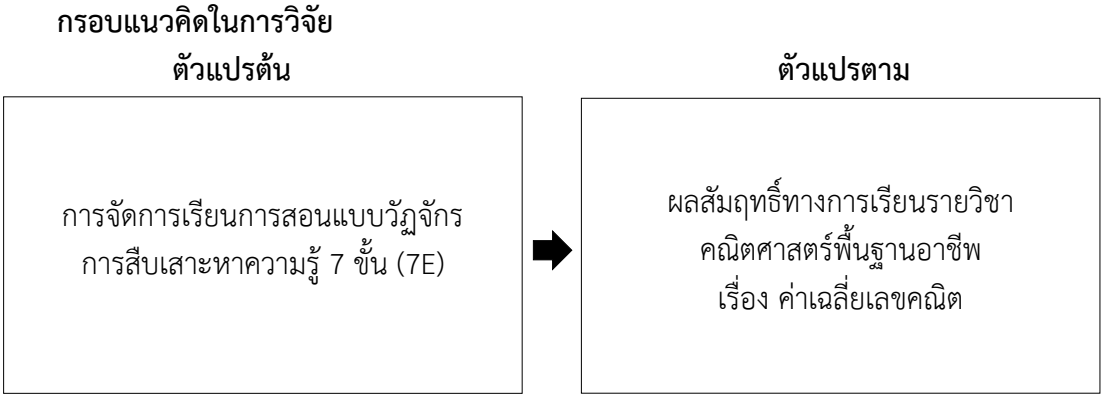
อาหาร ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 หลังเรียนโดยใช้การจัดการเรียนรู้แบบวัฏจักรสืบเสาะหาความรู้ 7 ขั้น (7E) ร่วมกับการใช้คำถามระดับสูง สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 4) ผลสัมฤทธิ์ทางการเรียนรายวิชาชีววิทยา เรื่อง ระบบย่อยอาหาร ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 ระหว่างก่อนเรียนและหลังเรียนโดยใช้การจัดการเรียนรู้แบบวัฏจักรสืบเสาะหาความรู้ 7 ขั้น (7E) ร่วมกับการใช้คำถามระดับสูง มีคะแนนพัฒนาการเฉลี่ยร้อยละ 32.28 นักเรียนมีพัฒนาการระดับกลาง

อุไรวรรณ บุรินทร์โกษฐ์ (2561) ได้ทำการวิจัยผลการจัดการเรียนรู้แบบการสืบเสาะหาความรู้ 7 ขั้น ร่วมกับการใช้แผนผังมโนทัศน์ เรื่อง น้ำและอากาศ ที่มีต่อผลสัมฤทธิ์ทางการเรียนวิทยาศาสตร์และเจตคติต่อวิชาวิทยาศาสตร์ของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนเทศบาลบ้านบางเหนียว จังหวัดภูเก็ต ผลการวิจัยพบว่า 1) นักเรียนที่เรียนแบบสืบเสาะหาความรู้ 7 ขั้น ร่วมกับการใช้แผนผังมโนทัศน์เรื่อง น้ำและอากาศ มีผลสัมฤทธิ์ทางการเรียนวิทยาศาสตร์หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 2) นักเรียนที่เรียนแบบสืบเสาะหาความรู้ 7 ขั้น ร่วมกับการใช้แผนผังมโนทัศน์เรื่อง น้ำและอากาศ มีผลสัมฤทธิ์ทางการเรียนวิทยาศาสตร์หลังเรียนสูงกว่าเกณฑ์ร้อยละ 80 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และ 3) นักเรียนที่เรียนแบบสืบเสาะหาความรู้ 7 ขั้น ร่วมกับการใช้แผนผังมโนทัศน์เรื่อง น้ำและอากาศ มีเจตคติต่อวิชาวิทยาศาสตร์หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

ดารณี ชมโสม, ธนานันต์ กุลไพบุตร, และ สำราญ กำจัดภัย (2562) ได้ทำการวิจัยการพัฒนากิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) เรื่อง ทศนิยมและเศษส่วน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ผลการวิจัยพบว่า 1) ประสิทธิภาพของกิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) เรื่อง ทศนิยมและเศษส่วน มีค่าเท่ากับ 75.59/79.52 ซึ่งสูงกว่าเกณฑ์ที่ตั้งไว้ที่ 75/75 2) ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ของนักเรียนหลังเรียนด้วยกิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) เรื่อง ทศนิยมและเศษส่วนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 3) เจตคติต่อการเรียนวิชาคณิตศาสตร์ของนักเรียนหลังเรียนด้วยกิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

สุดเฉลียว ไทยกรรณ์ (2562) ได้ทำการวิจัยการพัฒนาการเรียนรู้และทักษะการคิดเชิงบูรณาการคณิตศาสตร์ โดยใช้กิจกรรมวัฏจักรการเรียนรู้ 7E ร่วมกับแหล่งเรียนรู้ในชุมชนสำหรับนักเรียน ชั้นมัธยมศึกษาปีที่ 2 ผลการวิจัยพบว่า 1) การพัฒนาแผนการจัดการเรียนรู้คณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ 7E ร่วมกับแหล่งเรียนรู้ในชุมชน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 2 เรื่อง การวัด ได้แก่ แผนการจัดการเรียนรู้ เรื่อง ประวัติความเป็นมาของการวัด การวัดความยาว การวัด พื้นที่ การวัดปริมาตร การวัดน้ำหนัก และการวัดเวลา ในการจัดกิจกรรมได้นำแหล่งเรียนรู้ที่นำมาบูรณาการ เช่น ส่วนต่าง ๆ ของร่างกาย ห้องเรียน อาคารเรียน ห้องสมุด โรงอาหารวัด กล่องปริซึมทรงสี่เหลี่ยมมุมฉาก กระป๋องทรงกระบอก นักเรียน สมาชิกในครอบครัว นาฬิกา ปฏิทิน ซึ่งมีประสิทธิภาพของแผนการจัดการเรียนรู้เท่ากับ 79.22/84.19 สูงกว่าเกณฑ์ที่ กำหนดไว้ 75/75 2) ผลการเรียนรู้ ด้านความรู้หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 ด้านทักษะกระบวนการทางคณิตศาสตร์ของนักเรียนมากกว่าร้อยละ 70 มีผลการประเมินในระดับดีขึ้นไป และด้านคุณธรรมจริยธรรม และคุณลักษณะที่พึงประสงค์ของนักเรียนมากกว่าร้อยละ 58 มีผลการประเมินอยู่ในระดับดีมาก และ 3) ผลการประเมินทักษะการคิดเชิงบูรณาการคณิตศาสตร์ นักเรียนผ่านเกณฑ์ระดับดีขึ้นไป มากกว่าร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

กรอบแนวคิดในการวิจัย



ภาพที่ 1 กรอบแนวคิดในการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากร ได้แก่ ประชากรกลุ่มเป้าหมายที่ใช้ในการวิจัยครั้งนี้ คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ปีการศึกษา 2565 วิทยาลัยเทคโนโลยีหาดใหญ่อำนวยวิทย์ จำนวน 269 คน

กลุ่มตัวอย่าง คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1/7 สาขาภาษาต่างประเทศ จำนวน 21 คน โดยการสุ่มกลุ่มตัวอย่างแบบชั้นภูมิ (Stratified Random Sampling)

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้โดยการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) เรื่อง ค่าเฉลี่ยเลขคณิต จำนวน 1 แผน

2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ก่อนและหลังเรียน เรื่องค่าเฉลี่ยเลขคณิต รายวิชาคณิตศาสตร์พื้นฐานอาชีพ โดยการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) แบบปรนัยชนิดเลือกตอบ 4 ตัวเลือก จำนวน 20 ข้อ จำนวน 1 ฉบับ

การสร้างเครื่องมือในการวิจัย

1. แผนการจัดการเรียนรู้

1.1 ศึกษาหลักสูตรหมวดทักษะชีวิต ระดับประกาศนียบัตรวิชาชีพ พุทธศักราช 2562 และศึกษาโครงสร้างรายวิชาคณิตศาสตร์พื้นฐานอาชีพ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 เพื่อเป็นแนวทางในการเขียนแผนการจัดการเรียนรู้

1.2 ศึกษารูปแบบการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) จากเอกสารและงานวิจัยที่เกี่ยวข้องและดำเนินการเขียนแผนการจัดการเรียนรู้ให้สอดคล้องกับวัตถุประสงค์การเรียนรู้ เรื่อง ค่าเฉลี่ยเลขคณิต

1.3 นำแผนการจัดการเรียนรู้เสนอผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบความเหมาะสมของเนื้อหา เมื่อผู้เชี่ยวชาญทั้ง 3 ท่าน ตรวจสอบผลปรากฏว่า ค่าเฉลี่ยของแผนการจัดการเรียนรู้ มีค่าเท่ากับ 4.56 ซึ่งเหมาะสมที่จะนำไปใช้ในการทำวิจัย

1.4 นำแผนการจัดการเรียนรู้ไปใช้ในการเรียนการสอน

2. แบบทดสอบ

2.1 ศึกษาหลักสูตรระดับประกาศนียบัตรวิชาชีพ พุทธศักราช 2562 และศึกษาโครงสร้างรายวิชาคณิตศาสตร์พื้นฐานอาชีพ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1

2.2 ศึกษาจุดประสงค์เชิงพฤติกรรมเพื่อนำมาสร้างแบบทดสอบ

2.3 สร้างแบบทดสอบแบบปรนัยชนิดเลือกตอบ 4 ตัวเลือก จำนวน 1 ฉบับ จำนวน 20 ข้อ

2.4 นำแบบทดสอบเสนอผู้เชี่ยวชาญ 3 ท่าน ตรวจสอบความถูกต้องความเที่ยงตรงตามเนื้อหาและจุดประสงค์โดยการหาค่า IOC แล้วนำมาปรับปรุงแก้ไข

2.5 นำแบบทดสอบที่ผู้เชี่ยวชาญประเมินความเหมาะสม โดยเลือกข้อสอบที่มีค่า IOC ตั้งแต่ 0.50 ถึง 1.00 ซึ่งได้ข้อสอบที่มีค่า IOC ตั้งแต่ 0.67 - 1.00 จำนวน 20 ข้อ สามารถนำแบบทดสอบไปใช้ในการทดสอบ

การเก็บรวบรวมข้อมูล

1. ทดสอบก่อนเรียน เรื่อง ค่าเฉลี่ยเลขคณิต โดยใช้แบบทดสอบที่ผ่านการตรวจสอบจากผู้เชี่ยวชาญแล้ว กับกลุ่มตัวอย่างครูบันทึกคะแนนไว้

2. ดำเนินการจัดกิจกรรมการเรียนรู้เรื่องค่าเฉลี่ยเลขคณิต โดยการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) โดยผ่านกระบวนการกลุ่ม

3. ทดสอบหลังเรียน เพื่อนำคะแนนมาหาค่าผลสัมฤทธิ์ก่อนเรียนและหลังเรียนของนักเรียน

4. นำผลมาวิเคราะห์ด้วยวิธีทางสถิติเพื่อทดสอบสมมติฐาน

5. สรุปผลการดำเนินงาน

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

เปรียบเทียบผลสัมฤทธิ์ทางการเรียน เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับชั้นประกาศนียบัตรวิชาชั้นปีที่ 1/7 ก่อนเรียนและหลังเรียนโดยจัดการเรียนรู้แบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) โดยการหาค่าเฉลี่ย ($\overline{X}$) ส่วนเบี่ยงเบนมาตรฐาน (S.D.) และค่าความแตกต่างโดยค่า t-test แบบ Dependent

ผลการวิจัย

ตารางที่ 1 แสดงผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนและหลังเรียน เรื่องค่าเฉลี่ยเลขคณิต โดยการจัดการเรียนรู้แบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) รายวิชาคณิตศาสตร์พื้นฐานอาชีพของนักเรียนระดับประกาศนียบัตรวิชาชีพ ชั้นปีที่ 1/7 สาขาภาษาต่างประเทศ

คะแนนสอบ	n	$\bar{x}$	S.D.	t-test	Sig
ก่อนเรียน	21	8.90	2.119	12.728**	0.000
หลังเรียน	21	12.76	2.663		

t = (.01, df = 20) = 2.845 ** มีนัยสำคัญทางสถิติที่ระดับ .01

จากตารางที่ 1 ผลปรากฏว่า จำนวนผู้เรียนทั้งหมด 21 คน ก่อนเรียนคิดเป็นค่าเฉลี่ย ($\overline{X}$) เท่ากับ 8.90 ส่วนเบี่ยงเบนมาตรฐาน (S.D.) เท่ากับ 2.119 และหลังเรียนคิดเป็นค่าเฉลี่ย ($\overline{X}$) 12.76 ส่วนเบี่ยงเบนมาตรฐาน (S.D.) เท่ากับ 2.663 เมื่อทดสอบความแตกต่างของคะแนนเฉลี่ยก่อนและหลังเรียน เรื่อง ค่าเฉลี่ยเลขคณิต โดยการจัดการเรียนรู้แบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) เท่ากับ 12.768

เมื่อเปรียบเทียบและวิเคราะห์ข้อมูล พบว่า ผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

สรุปผลและอภิปรายผล

สรุปผลการวิจัย

ผลสัมฤทธิ์ทางการเรียนของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1/7 ที่เรียนโดยการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

การอภิปรายผล

จากการศึกษาผลการจัดการเรียนรู้โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) รายวิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 มีประเด็นที่จะนำมาอภิปรายผลดังนี้

1. จากผลการใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ปรากฏว่านักเรียนมีการพัฒนาในเรื่องค่าเฉลี่ยเลขคณิตได้ดียิ่งขึ้น มีความสนใจ ความเข้าใจ และทักษะที่ดีขึ้น เกิดการรักในการเรียนวิชานี้มากยิ่งขึ้น และทำให้นักเรียนมีความรู้ความเข้าใจในการคำนวณและวิเคราะห์โจทย์ได้อย่างมีประสิทธิภาพ พร้อมที่จะนำไปใช้ในชีวิตประจำวันมากยิ่งขึ้น

2. การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์พื้นฐานอาชีพก่อนและหลังการจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ในรายวิชาคณิตศาสตร์พื้นฐานอาชีพ เรื่อง ค่าเฉลี่ยเลขคณิต ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 พบว่า ผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 การที่ผลการวิจัยเป็นเช่นนี้ แสดงให้เห็นว่าการจัดการเรียนรู้โดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ทำให้นักเรียนมีพัฒนาการด้านการเรียนรู้ และทักษะทางด้านการเรียนเพิ่มขึ้นสอดคล้องกับงานวิจัยของ ดารณี ชมโสม, ธนานันต์ กุลไพบูตร, และ สำราญ กำจัดภัย (2562) ได้ทำการวิจัยการพัฒนากิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) เรื่อง ทศนิยมและเศษส่วน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ผลการวิจัยพบว่า 1) ประสิทธิภาพของกิจกรรมการเรียนรู้วิชาคณิตศาสตร์ โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) เรื่องทศนิยมและเศษส่วน มีค่าเท่ากับ 75.59/79.52 ซึ่งสูงกว่าเกณฑ์ที่ตั้งไว้ที่ 75/75 2) ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ของนักเรียนหลังเรียนด้วยกิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) เรื่อง ทศนิยมและเศษส่วน สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 3) เจตคติต่อการเรียนวิชาคณิตศาสตร์ของนักเรียนหลังเรียนด้วยกิจกรรมการเรียนรู้วิชาคณิตศาสตร์โดยใช้รูปแบบวัฏจักรการเรียนรู้ (7E) สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 จากผลการวิจัยพบว่า การใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ทำให้นักเรียนมีความเข้าใจ และทักษะที่ดีขึ้น เกิดการรักในการเรียนวิชานี้มากยิ่งขึ้น และทำให้นักเรียนมีความเข้าใจตลอดจนมีความรู้ความคิดสร้างสรรค์ และการตัดสินใจแก้ปัญหาต่าง ๆ ได้อย่างมี

ประสิทธิภาพ

1.2 ควรส่งเสริมให้นำการสอนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ในรายวิชาคณิตศาสตร์ในบางเรื่อง เพราะการสอนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) จะทำให้นักเรียนมีความสนใจและมีความกระตือรือร้นในการเรียนมากยิ่งขึ้น

1.3 ก่อนการสอนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) ควรมีการแนะนำให้นักเรียนเข้าใจวิธีการสอนก่อน เพราะถ้านักเรียนไม่เข้าใจจะเกิดการสับสนส่งผลให้นักเรียนไม่ประสบความสำเร็จในการเรียนได้

1.4 นำแนวทางการพัฒนาไปใช้กับสภาพปัญหาอื่น ๆ ในการจัดการเรียนการสอน

1.5 ควรเผยแพร่ผลงานให้ครูคนอื่นได้นำไปทดลองใช้

2. ข้อเสนอแนะสำหรับการทำวิจัยครั้งต่อไป

2.1. ควรทำการวิจัยเพื่อศึกษาผลการสอนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) โดยออกแบบการวิจัยที่มีกลุ่มทดลองและกลุ่มควบคุม เพื่อเปรียบเทียบผลการทดลองระหว่างการสอนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) กับการสอนโดยวิธีอื่น

2.2 ควรศึกษาค้นคว้าการสอนโดยใช้การจัดการเรียนการสอนแบบวัฏจักรการสืบเสาะหาความรู้ 7 ขั้น (7E) กับเนื้อหาวิชาอื่นที่มีคำตอบที่แน่นอนตายตัวหรือระดับชั้นอื่น เป็นต้น

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ทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์
Essential General Skills for Undergraduate Student of Faculty of Science Prince of Songkla University

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บทคัดย่อ

งานวิจัยฉบับนี้มีวัตถุประสงค์เพื่อพัฒนาองค์ประกอบของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ประกอบด้วย 2 ระยะ ดังต่อไปนี้

ระยะที่ 1 กำหนดทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โดยใช้แบบประเมินความเหมาะสมของทักษะทั่วไปที่จำเป็น โดยการรวบรวมข้อมูลจากแนวคิด ทฤษฎี และผลงานวิจัยที่เกี่ยวข้องกับทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ หลังจากนั้นให้ผู้เชี่ยวชาญ จำนวน 9 คน พิจารณาถึงความเหมาะสมของทักษะทั่วไปที่จำเป็น พบว่า ทักษะทั่วไปที่จำเป็น มีจำนวน 14 ทักษะ ได้แก่ 1) ทักษะการสื่อสาร 2) ทักษะการเรียนรู้ 3) ทักษะการทำงานเป็นทีม 4) ทักษะการแก้ปัญหา 5) ทักษะความคิดสร้างสรรค์และนวัตกรรม 6) ทักษะการจัดการความเครียด 7) ทักษะการปรับตัว 8) ทักษะความเป็นผู้นำ 9) ทักษะจริยธรรมในการทำงาน 10) ทักษะการบริหารจัดการ 11) ทักษะความสัมพันธ์ระหว่างบุคคล 12) ทักษะความคิดริเริ่มและการชี้นำตัวเอง 13) ทักษะความเห็นอกเห็นใจ และ 14) ทักษะการตระหนักสถานการณ์

ระยะที่ 2 พัฒนาองค์ประกอบทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โดยใช้แบบสอบถามทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ ในการรวบรวมข้อมูล ประกอบด้วย 2 ส่วน ได้แก่ 1) ข้อมูลทั่วไป และ 2) ทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ จากกลุ่มตัวอย่าง คือ นักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ชั้นปีที่ 4 ปีการศึกษา 2565 ใช้วิธีการสุ่มกลุ่มตัวอย่างแบบแบ่งชั้น ประกอบด้วย 4 สาขาวิชา ได้แก่ 1) สาขาวิชาวิทยาศาสตร์กายภาพ 2) สาขาวิชาวิทยาศาสตร์ชีวภาพ 3) สาขาวิชาวิทยาศาสตร์การคำนวณ และ4) สาขาวิชาวิทยาศาสตร์สุขภาพและวิทยาศาสตร์ประยุกต์ จำนวน 205 คน จากนั้นนำข้อมูลไปวิเคราะห์องค์ประกอบเชิงสำรวจและสกัดองค์ประกอบด้วยวิธีวิเคราะห์องค์ประกอบหลัก ได้ค่าวัดความเหมาะสมของข้อมูลในการวิเคราะห์องค์ประกอบ มีค่าเท่ากับ 0.919 ช่วงค่าสัดส่วนความแปรปรวนของตัวแปรคิดเป็นร้อยละ 52.5 - 82.9 และหมุนแกนองค์ประกอบตั้งฉากด้วยวิธีแวริแมกซ์ พบว่า ทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มี 2 องค์ประกอบ ได้แก่ องค์ประกอบที่ 1 (วิทยาศาสตร์อัจฉริยะ) ประกอบด้วย 10 ทักษะ ได้แก่

1) ทักษะการสื่อสาร 2) ทักษะการเรียนรู้ 3) ทักษะความเป็นผู้นำ 4) ทักษะความคิดสร้างสรรค์และนวัตกรรม 5) ทักษะการแก้ปัญหา 6) ทักษะความคิดริเริ่มและการชี้นำตัวเอง 7) ทักษะการจัดการความเครียด 8) ทักษะการปรับตัว 9) ทักษะการบริหารจัดการ และ 10) ทักษะการทำงานเป็นทีม ตามลำดับ และองค์ประกอบที่ 2 (จิตวิญญาณวิทยาศาสตร์) ประกอบด้วย 4 ทักษะ ได้แก่ 1) ทักษะความเห็นอกเห็นใจ 2) ทักษะจริยธรรมในการทำงาน 3) ทักษะความสัมพันธ์ระหว่างบุคคล และ 4) ทักษะการตระหนักสถานการณ์ ตามลำดับ โดยค่าร้อยละของความแปรปรวนสะสมของทั้ง 2 องค์ประกอบ คิดเป็นร้อยละ 71.832 แต่ละองค์ประกอบอธิบายความแปรปรวนได้ร้อยละ 45.034 และ 26.798 ตามลำดับ

คำสำคัญ: ทักษะทั่วไปที่จำเป็น, วิธีการสุ่มกลุ่มตัวอย่างแบบแบ่งชั้น, วิธีแวริแมกซ์

Abstract

This descriptive research aimed to develop elements of essential general skills for undergraduate student in the Faculty of Science, Prince of Songkla University, consisting of 2 phases as follows:

Phase 1: Determine the essential general skills required for undergraduate student of Faculty of Science Prince of Songkhla University, using the appropriateness assessment of the essential general skills required by collecting information from concepts, theories, and research results related to essential general skills for undergraduate students in the Faculty of Science. After that, 9 experts were asked to consider the appropriateness of the essential general skills required. It was found that there were 14 essential general skills required, including 1) communication skills, 2) learning skills, 3) teamwork skills, 4) problem-solving skills, 5) creativity and innovation skills, 6) stress management skills, 7) adaptation skills, 8) leadership skills, 9) work ethics skills, 10) management skills, 11) interpersonal skills, 12) initiative skills and self-direction, 13) empathy skills and 14) situational awareness skills.

Phase 2: Develop the components of the essential general skills required for undergraduate students in the Faculty of Science, Prince of Songkhla University, using the general skills questionnaire required for undergraduate students in the Faculty of Science to collect data, consisting of 2 parts: 1) general information and 2) essential general skills required for undergraduate students in the Faculty of Science. The sample was collected from a sample of undergraduate students, Faculty of Science, 4th year, academic year 2022, used a stratified random sampling method consisting of 4 subjects: 1) Physical Sciences, 2) Biological Sciences, 3) Computational Sciences, and 4) Health and Applied Sciences, totaling 205 students. The data were then subjected to exploratory factor analysis and extracted elements using principal component analysis. The measurement of the appropriateness of the data in the factor analysis was obtained at a value of 0.919. The range of proportional variance of the variables was 52.5-82.9 percent and the

component axis was rotated perpendicular using the Varimax method. It was found that essential general skills required for undergraduate students, Faculty of Science has 2 components.Component 1 (Smart Science) consists of 10 skills, including 1) communication skills, 2) learning skills, 3) leadership skills, 4) creativity and innovation skills, 5) problem-solving skills, 6) initiative skills and self-direction, 7) stress management skills, 8) adaptation skills, 9) management skills, and10) teamwork skills, respectively. And component 2 (Scientific Spirit) consists of 4 skills, including 1) empathy skills, 2) work ethics skills, 3) interpersonal skills and 4) situational awareness skills, respectively. The percentage of cumulative variance explained by both components was 71.832 %, with each component explaining 45.034 % and 26.798 % of the variance, respectively.

Keywords: Essential General Skills, Randomly Selected according to their Field of Study, Varimax Method

บทนำ

มหาวิทยาลัยสงขลานครินทร์มีนโยบายจัดการศึกษาที่มุ่งเน้นเป้าหมายหรือผลลัพธ์โดยมีผู้เรียนเป็นศูนย์กลางและการจัดการศึกษาที่เน้นผลลัพธ์การเรียนรู้ โดยใช้เกณฑ์ AUN-QA และการเขียนผลลัพธ์การเรียนรู้ระดับหลักสูตรและรายวิชา เพื่อให้สามารถจัดการศึกษาที่มุ่งเน้นผลลัพธ์ได้อย่างเป็นรูปธรรมและสามารถปรับปรุงหลักสูตรให้เป็นไปตามการจัดการศึกษาที่เน้นผลลัพธ์การเรียนรู้ โดยจะเริ่มใช้หลักสูตรนี้ในปีการศึกษา 2564 มีการปรับเปลี่ยนจากการมุ่งเน้นทักษะทางด้านอาชีพ (Hard Skill) ซึ่งเป็นผลลัพธ์ที่คาดหวังเดิมของนักศึกษาและเป็นทักษะที่จำเป็นอย่างมากต่อการประกอบวิชาชีพ ต่อมาจากข้างต้น เมื่อได้เล็งเห็นว่าทักษะทางด้านสังคม (Soft Skill) ก็มีความจำเป็นไม่น้อยไปกว่าทักษะทางด้านอาชีพ จึงให้ความสำคัญต่อทักษะทางด้านสังคมเช่นเดียวกัน เพื่อให้มีประสิทธิผลและประสบความสำเร็จในทีมงานสมัยใหม่ รวมถึงการทำงานที่ดีในทีมหลายสาขาวิชา ความสามารถในการออกแบบการแก้ปัญหา ความสามารถในการสื่อสารอย่างมีประสิทธิผล สามารถรักษามาตรฐานจริยธรรมและความเป็นมืออาชีพตามผลลัพธ์การเรียนรู้ระดับหลักสูตร (PLOs: Program Learning Outcomes) (สำนักการศึกษาและนวัตกรรมการเรียนรู้, 2562)

คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ จึงมีการปรับปรุงหลักสูตรเพื่อสนองนโยบายของทางมหาวิทยาลัย โดยมีอัตลักษณ์ของคณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ “ช่วยแก้ปัญหาเป็นส่วนสำคัญของหลายอาชีพ ทันสมัยไม่ตกยุค” ที่กล่าวมาทั้งหมดนี้ล้วนมีพื้นฐานมาจากการที่นักศึกษาต้องมีทักษะด้านอาชีพที่มีความเฉพาะทางของตน ผนวกรวมกับทักษะทั่วไปที่จำเป็นที่มีความชำนาญเกี่ยวข้องกับบุคคล เช่น การแก้ปัญหา การทำงานเป็นทีม ความสัมพันธ์ระหว่างบุคคล ความคิดริเริ่ม การสื่อสาร ความเป็นผู้นำ ความร่วมมือ และการบริหารจัดการเวลา เป็นต้น ทักษะเหล่านี้จึงต้องได้รับการส่งเสริมจากทางหลักสูตรของคณะวิทยาศาสตร์ เพื่อเป็นทักษะที่จำเป็นสำหรับการทำงานของบัณฑิตคณะวิทยาศาสตร์ในศตวรรษที่ 21 (คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์, 2564)

ทักษะทั่วไปที่จำเป็นจึงควรได้รับการปลูกฝังซึ่งต่างกันกับทักษะด้านอาชีพที่นักศึกษาสามารถใฝ่เรียนใฝ่รู้ได้ด้วยตนเอง ไม่จำเป็นต้องมีการบ่มเพาะหรือปลูกฝังเป็นระยะเวลานาน และในขณะนี้ทักษะ

ทั่วไปที่จำเป็นมีความจำเป็นอย่างมากต่อการทำงานในศตวรรษที่ 21 และตลาดแรงงานมีความต้องการค่อนข้างสูง ดังนั้นทักษะทั่วไปที่จำเป็นจึงเป็นสิ่งที่พึงมีในตัวของบัณฑิตที่สำเร็จการศึกษาจากคณะวิทยาศาสตร์ เพราะนอกจากความรู้ที่ตนได้ศึกษามาแล้วนั้น การมีทักษะทั่วไปที่จำเป็นจึงเสมือนการประคับประคองอาชีพการทำงานให้มีความราบรื่นและสามารถปรับตัวรวมกับสังคมการทำงานของตนได้

จากแนวทางในการปรับปรุงหลักสูตรของคณะวิทยาศาสตร์ ผู้วิจัยจึงมีความสนใจที่จะวิเคราะห์องค์ประกอบของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ เพื่อให้ได้มาจากซึ่งองค์ประกอบของทักษะทั่วไปที่จำเป็น ภายใต้การจัดการศึกษาที่เน้นผลลัพธ์การเรียนรู้ และนำผลการวิจัยตลอดจนข้อเสนอแนะไปปรับปรุงหาแนวทางการพัฒนาทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อพัฒนาองค์ประกอบของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์

แนวคิด ทฤษฎี กรอบแนวคิด

ผู้วิจัยได้กำหนดกรอบแนวคิดจากการทบทวนวรรณกรรมที่เกี่ยวข้อง ดังนี้

1. การสื่อสาร (Communication) สามารถแสดงความคิดเห็นอย่างชัดเจน มีประสิทธิภาพ มั่นใจในการพูดและการเขียน สื่อสารกับบุคคลที่มีวัฒนธรรมต่างกันได้ ใช้เทคโนโลยีในการนำเสนอ (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564) ความรู้และความเข้าใจในการสื่อสารได้ถูกต้องชัดเจน และมีประสิทธิภาพตรงวัตถุประสงค์ ทั้งการพูด การฟัง และการเขียน ใช้สื่อที่หลากหลาย เข้าถึงสารสนเทศได้อย่างมีประสิทธิภาพและเกิดประสิทธิผล (เบญจวรรณ ถนอมชยธวัช, ผ่องศรี วาณิชย์ศุภวงศ์, วุฒิชัย เนียมเทศ, และ ณัฐวิทย์ พจนตันติ, 2559) สื่อสารให้ผู้อื่นเข้าใจประเด็นที่ต้องการสื่อสารได้อย่างมีประสิทธิภาพด้วยวิธีที่เหมาะสม (วิชญะ น้อยมาลา, 2564) การประสานงานการฟังอย่างตั้งใจการถ่ายทอดข้อมูล (Fadzilah, Yasmiza, Fakhrul, & Maslina, 2012)

2. การเรียนรู้ (Learning) เรียนรู้จากการฝึกอบรม เรียนรู้จากสิ่งแวดล้อม และเรียนรู้ตามอัธยาศัย จะต้องปรับพัฒนาความคิดที่จะเรียนรู้และปรับตัวในทุกสถานการณ์ และพัฒนาลงมือทำสิ่งใหม่ ๆ เพื่อสร้างตัวตน เรียนรู้เพื่อมีชีวิตอยู่ร่วมกับผู้อื่น (สำนักงานสภานโยบายการอุดมศึกษา วิทยาศาสตร์ วิจัย และนวัตกรรมแห่งชาติ, 2563) การเรียนรู้เป็นเป้าหมายสำคัญในการพัฒนา มีการศึกษา ค้นคว้า แสวงหาความรู้ด้วยตนเอง พัฒนาได้โดยการศึกษา การฝึกปฏิบัติ (สุนันทา มาวัน และคณะ, 2565) การประมวลผลและการสื่อสารข้อมูล รวมถึงการคิดสร้างสรรค์ (วิชญะ น้อยมาลา, 2564) การได้รับความรู้ใหม่ทุกวัน (Fadzilah et al., 2012) การเรียนรู้ไม่ใช่เป็นการเรียนในเฉพาะสาขาที่ทำงาน แต่จะต้องเรียนข้ามศาสตร์ รวมถึงเรื่องความรู้รอบตัวอื่น ๆ หรือการเรียนรู้ผ่านงานอดิเรกต่าง ๆ (ธนกรณ์ ชัยธวัช และสิรินธร สินจินดาวงศ์, 2565)

3. การทำงานเป็นทีม (Teamwork) เป็นการรับรู้ เคารพทัศนคติ และความเชื่อของผู้อื่น เข้าใจสมาชิกในทีม มีส่วนร่วมในการวางแผนและประสิทธิภาพของทีม (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564) การอยู่ร่วมกับผู้อื่น เป็นที่ยอมรับ ให้ความช่วยเหลือ ให้ความร่วมมือในการทำกิจกรรม

รับผิดชอบในงาน ส่งผลให้การทำงานบรรลุผลตามที่มุ่งหวังเป็นอย่างดี รวมถึงมองเห็นคุณค่าของการทำงานเป็นทีม (เบญจวรรณ ถนอมชยธวัช และคณะ, 2559) การจัดลำดับความสำคัญจากทุกคนในทีมส่งผลต่อการบรรลุความคาดหวังในฐานะบุคคลที่เชื่อถือในทีม มีการเปิดกว้างทางความคิดของผู้ร่วมทีม วางเป้าหมายร่วมกัน และยอมรับความผิดพลาดของผู้ร่วมทีม (สุนันทา มาวัน และคณะ, 2565) การเต็มใจรับฟังเรียนรู้ และทำงานร่วมกับผู้อื่นเพื่อบรรลุเป้าหมายร่วมกัน (วิชญะ น้อยมาลา, 2564) ทั้งนี้ หากทุกคนในทีมมีการทำงานบนความคิดที่ว่าจะทำให้ดีที่สุด และไม่ไปสร้างภาระหรืองานเพิ่มเติมให้ผู้อื่นก็ถือดีมากแล้ว (ธนกรณ์ ชัยธวัช และ สิรินธร สินจินดาวงศ์, 2565)

4. การแก้ปัญหา (Problem-Solving) สามารถพัฒนาทักษะการคิด เช่น การอธิบาย วิเคราะห์และประเมินผล ตัดสินใจแก้ปัญหาได้ มองหาแนวคิด และค้นหาวิธีแก้ปัญหาได้อย่างหลากหลาย (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564) แก้ปัญหาต่าง ๆ ด้วยเทคนิควิธีการที่หลากหลาย ตามสถานการณ์ที่เหมาะสมได้อย่างมีระบบ เกิดประสิทธิภาพในการตัดสินใจเกี่ยวกับเรื่องราวปัญหาต่าง ๆ ในชีวิตได้ (เบญจวรรณ ถนอมชยธวัช และคณะ, 2559) การจัดลำดับข้อมูลความสำคัญ การระบุปัญหาและการแก้ปัญหาวิเคราะห์อย่างถี่ถ้วนในการตัดสินใจการแก้ไขปัญหาความขัดแย้ง (Fadzilah et al., 2012) ต้องเป็นผู้มีความรู้รอบทุกด้าน และสามารถแก้ปัญหาความซับซ้อนได้ (ธนกรณ์ ชัยธวัช และ สิรินธร สินจินดาวงศ์, 2565)

5. ความคิดสร้างสรรค์และนวัตกรรม (Creativity and Innovation) กล้าลองทำในสิ่งที่คิด มองหาแนวทางใหม่ ๆ ในการทำงาน มีทัศนคติในการเปิดรับแนวคิดใหม่ ๆ (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564) ความคิดโดยใช้วิธีการประเมินแนวคิดแบบละเอียดรอบคอบ เข้าใจวิธีการสร้างสรรค์นวัตกรรมสิ่งแปลกใหม่เพื่อพัฒนางานในเชิงสร้างสรรค์ (เบญจวรรณ ถนอมชยธวัช และคณะ, 2559) กระบวนการทางความคิดที่อาศัยจินตนาการและถ่ายทอดในการสร้างสิ่งที่เป็นเอกลักษณ์ของตนเอง การคิดสร้างสรรค์สิ่งใหม่หรือนวัตกรรมที่ขึ้นใหม่ อาจในรูปแบบของความคิด การกระทำ หรือสิ่งประดิษฐ์ (สุนันทา มาวัน และคณะ, 2565) ความคิดสร้างสรรค์ปลูกฝังได้เป็นกุญแจสำคัญในสร้างนวัตกรรม (วิชญะ น้อยมาลา, 2564)

6. การจัดการความเครียด (Stress Management) การจัดการทางความคิดได้เหมาะสมกับสถานการณ์ สามารถรับรู้ถึงสาเหตุของความเครียด รู้วิธีผ่อนคลายความเครียด และรู้จักให้กำลังใจตนเอง (กษณา รักษมณี, 2562)

7. การปรับตัว (Adaptation) เป็นการพยายามปรับตัวเพื่อการเปลี่ยนแปลงตามบทบาทหน้าที่และความรับผิดชอบให้สามารถบรรลุจุดหมายที่ต้องการ โดยสร้างความสมดุลไม่ให้เกิดผลเสียทั้งต่อตนเองและผู้อื่น (เบญจวรรณ ถนอมชยธวัช และคณะ, 2559) การยอมรับการเปลี่ยนแปลงที่เกิดขึ้น พร้อมรับมือกับการเปลี่ยนแปลงตลอดเวลา (สุนันทา มาวัน และคณะ, 2565) มีความยืดหยุ่นในหลาย ๆ ด้าน ในการทำงาน มีใจจดจ่อ สนใจในแนวคิดใหม่ พร้อมยินดีทำงานใหม่ ๆ ออกจากจุดเดิม และทดลองทำสิ่งใหม่ ๆ อยู่เสมอ (วิชญะ น้อยมาลา, 2564) รวมถึงต้องเตรียมพร้อมรับกับสถานการณ์ในการทำงานทุก ๆ รูปแบบ (ธนกรณ์ ชัยธวัช และ สิรินธร สินจินดาวงศ์, 2565)

8. ความเป็นผู้นำ (Leadership) เป็นคุณลักษณะที่ได้รับการยกย่องเชื่อถือ มีความเห็นอกเห็นใจผู้อื่น (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564) เป็นผู้ได้รับความไว้วางใจในทีมทำงาน ให้คำแนะนำผู้อื่นได้ มีความน่าเชื่อถือ ให้ความร่วมมืออย่างเต็มใจ จูงใจให้บุคคลอื่นปฏิบัติตาม มีการจัดการ

องค์กรที่ดี สร้างความร่วมมือร่วมใจกับบุคคลที่ทำงานได้เพื่อให้ขับเคลื่อนและบรรลุจุดมุ่งหมายเดียวกัน (สุนันทา มาวัน และคณะ, 2565) มีความอ่อนน้อมถ่อมตน ในขณะที่มีความเด็ดขาดในการบริหารงานนำผู้อื่นในการตัดสินใจได้ (วิชญะ น้อยมาลา, 2564)

9. จริยธรรมในการทำงาน (Work Ethics) เป็นการทำงานที่ขยันขันแข็งต่องานที่ได้รับมอบหมาย มีความซื่อสัตย์ในการทำงาน มีทัศนคติทางบวกต่องาน (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564)

10. การบริหารจัดการ (Management) เป็นการจัดการกับเวลาได้คุ้มค่าและเกิดประโยชน์สูงสุดในการทำงาน การบริหารจัดการเวลาให้บรรลุตามแผนงานที่วางไว้ จัดลำดับความสำคัญกับสิ่งที่ต้องทำ (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564) การรู้จักวางแผนและจัดสรรเวลาในการทำงานเป็นสิ่งสำคัญ การควบคุมการปฏิบัติงานให้บรรลุผลตามเวลาที่กำหนด เพื่อก่อให้เกิดประสิทธิภาพในงาน (สุนันทา มาวัน และคณะ, 2565)

11. ความสัมพันธ์ระหว่างบุคคล (Interpersonal) เป็นการสร้างสัมพันธ์ที่ดีในการทำงานกับทุกคนที่พบเจอ มีการแสดงออกอย่างเป็นมิตร (รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ, 2564)

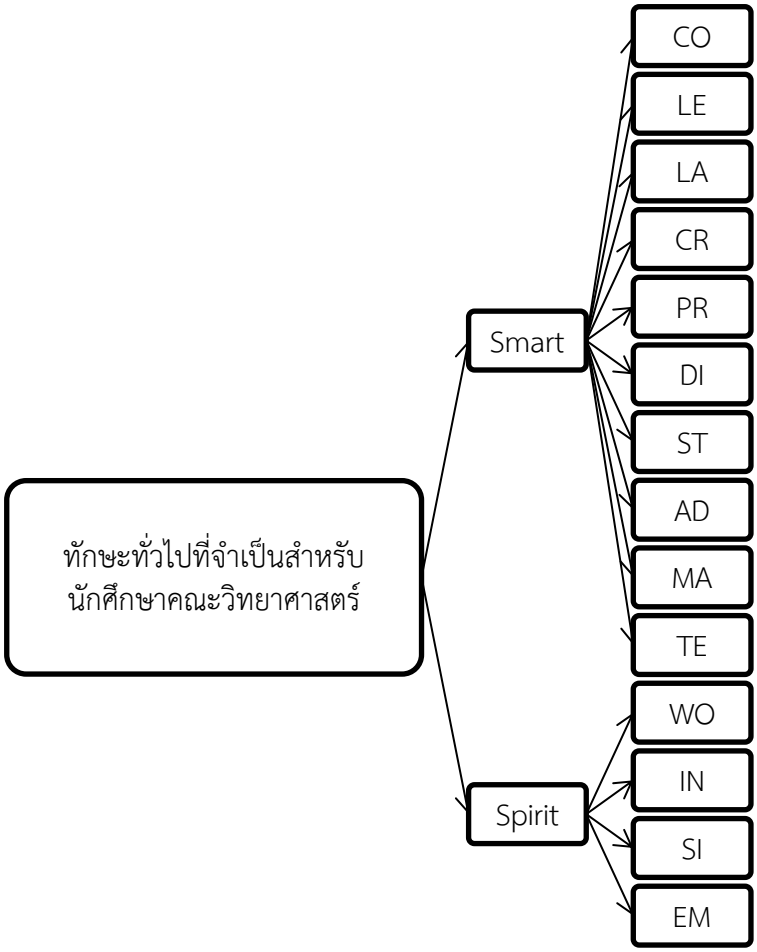
12. ความคิดริเริ่มและการชี้นำตัวเอง (Initiative and Self-Direction) เป็นการรู้จักและเข้าใจตนเอง สามารถจัดการเป้าหมายที่มีประสิทธิภาพในตนเอง (เบญจวรรณ ถนอมชยธวัช และคณะ, 2559)

13. ความเห็นอกเห็นใจ (Empathy) เป็นการเข้าถึงสภาวะจิตใจหรืออารมณ์ของบุคคลอื่นเหมือนการได้เข้าไปอยู่ในสถานการณ์เดียวกันกับบุคคลนั้น จนเข้าใจมุมมองความรู้สึกได้เป็นอย่างดี (สุนันทา มาวัน และคณะ, 2565)

14. การตระหนักสถานการณ์ (Situational Awareness) เป็นการรับรู้ถึงสิ่งที่อยู่รอบตัว โดยใช้ประสาทสัมผัสทุกด้าน และคาดคะเนสิ่งที่จะเกิดขึ้นลวงหนาโดยอาศัยการสังเกต เกิดจากการสะสมความรู้ประสบการณ์ และการฝึกวิธีประมวลผล (กษณา รักษมณี, 2562)

กรอบแนวคิดการวิจัย

จากการศึกษางานวิจัยที่เกี่ยวข้องทำให้ได้กรอบแนวคิดที่ใช้ในการศึกษาทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ตามคำแนะนำของผู้เชี่ยวชาญ และการวิเคราะห์องค์ประกอบเชิงสำรวจได้ 2 องค์ประกอบหลัก ได้แก่ องค์ประกอบวิทยาศาสตร์อัจฉริยะ (Smart) คือ ทักษะการสื่อสาร (CO) ทักษะการเรียนรู้ (LE) ทักษะความเป็นผู้นำ (LA) ทักษะความคิดสร้างสรรค์และนวัตกรรม (CR) ทักษะการแก้ปัญหา (PR) ทักษะความคิดริเริ่มและการชี้นำตัวเอง (DI) ทักษะการจัดการความเครียด (ST) ทักษะการปรับตัว (AD) ทักษะการบริหารจัดการ (MA) และทักษะการทำงานเป็นทีม (TE) และองค์ประกอบจิตวิญญาณวิทยาศาสตร์ (Spirit) คือ ทักษะจริยธรรมในการทำงาน (WO) ทักษะความสัมพันธ์ระหว่างบุคคล (IN) ทักษะการตระหนักสถานการณ์ (SI) และทักษะความเห็นอกเห็นใจ (EM) ดังนี้



ภาพที่ 1 กรอบแนวคิด

วิธีดำเนินการวิจัย

1. ระเบียบวิธีวิจัย

การวิจัยครั้งนี้เป็นการวิจัยรูปแบบการวิเคราะห์องค์ประกอบเชิงสำรวจ (Exploratory Factor Analysis: EFA) มีวัตถุประสงค์การวิจัย เพื่อพัฒนาองค์ประกอบทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โดยอาศัยวิธีวิจัยทั้งเชิงคุณภาพ (Qualitative Method) และวิธีวิจัยเชิงปริมาณ (Quantitative Method) เพื่อให้บรรลุเป้าหมายของงานวิจัย

2. ขั้นตอนการวิจัย

วิธีการดำเนินการวิจัย 2 ระยะ ดังต่อไปนี้

2.1 กำหนดทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์

2.1.1 ทำการศึกษาแนวคิด ทฤษฎี และผลงานวิจัยที่เกี่ยวข้องกับทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์

2.1.2 รวบรวมตัวแปรตามที่คาดว่าจะเป็นทักษะทั่วไปที่จำเป็นที่ใช้ได้จากการศึกษาแนวคิด ทฤษฎี และผลงานวิจัยที่เกี่ยวข้องกับทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ ได้ทั้งหมด 20 ทักษะ จากนั้นส่งให้ผู้เชี่ยวชาญจำนวน 9 ท่าน พิจารณาถึงความเหมาะสมขององค์ประกอบพิจารณาแล้วได้มาทั้งหมด 14 ทักษะ

2.1.3 นำทักษะทั่วไปที่จำเป็นที่ผู้เชี่ยวชาญพิจารณาถึงความเหมาะสมที่จะเป็นทักษะทั่วไปที่จำเป็นมาสร้างพฤติกรรมบงชี้ทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์

2.2 พัฒนาองค์ประกอบทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์

2.2.1 นำตัวแปรที่ผ่านเกณฑ์การประเมินที่ได้จากผู้เชี่ยวชาญ นำไปกำหนดนิยามศัพท์เฉพาะ (นิยามเชิงปฏิบัติการ) แล้วจึงนำไปสร้างเครื่องมือแบบสอบถาม

2.2.2 สร้างแบบสอบถาม โดยแบบสอบถามแบ่งออกเป็น 2 ส่วน คือ ส่วนที่ 1 ข้อมูลพื้นฐานของนักศึกษา และส่วนที่ 2 แบบสอบถามเกี่ยวกับทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ และส่งให้ผู้เชี่ยวชาญทำการพิจารณาตรวจสอบคุณภาพของแบบสอบถาม

2.2.3 นำแบบสอบถามที่ได้ไปทดสอบกับกลุ่มตัวอย่าง (Try Out) จำนวน 30 ชุด และวิเคราะห์ความเชื่อมั่น ด้วยการหาค่าสัมประสิทธิ์แอลฟาของครอนบัค (Cronbach's Alpha) พบว่า ค่าความเชื่อมั่นโดยรวมเท่ากับ 0.972

3. การเก็บรวบรวมข้อมูล

3.1 นำแบบสอบถามทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ ไปเก็บข้อมูลด้วยตนเอง โดยมีกลุ่มตัวอย่าง คือ นักศึกษาชั้นปีที่ 4 คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ โดยใช้แบบฟอร์มออนไลน์ กับนักศึกษากลุ่มตัวอย่างจำนวน 205 คน

3.2 ทำการรวบรวมแบบสอบถาม ตรวจสอบความเรียบร้อยของแบบสอบถาม และนำไปวิเคราะห์เพื่อหาค่าสถิติในโปรแกรมสำเร็จรูปทางสถิติ

4. การวิเคราะห์ข้อมูล

4.1 ตรวจสอบข้อมูลเบื้องต้นของผู้ตอบแบบสอบถาม

4.2 เนื่องจากตัวแปรแต่ละตัวมีหลายข้อคำถาม จึงทำการการเปลี่ยนแปลงรูปแบบข้อมูลใหม่ (Transform Data)

4.3 วิเคราะห์องค์ประกอบเชิงสำรวจ โดยดำเนินการตามขั้นตอน ดังนี้

1) ตรวจสอบความเหมาะสมของข้อมูลนำมาจะมีความเหมาะสมในการวิเคราะห์องค์ประกอบโดยใช้สถิติ Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) ดังนี้

ค่า KMO 0.80 ขึ้นไป เหมาะสมที่จะวิเคราะห์องค์ประกอบมากที่สุด
ค่า KMO 0.70 – 0.79 เหมาะสมที่จะวิเคราะห์องค์ประกอบมาก
ค่า KMO 0.60 – 0.69 เหมาะสมที่จะวิเคราะห์องค์ประกอบปานกลาง
ค่า KMO 0.50 – 0.59 เหมาะสมที่จะวิเคราะห์องค์ประกอบน้อย
ค่า KMO น้อยกว่า 0.50 ไม่เหมาะสมที่จะวิเคราะห์องค์ประกอบ

และทดสอบความสัมพันธ์ของตัวแปรต่าง ๆ โดยใช้สถิติ Bartlett's test of Sphericity มีสมมติฐาน ดังนี้ H0: ตัวแปรต่าง ๆ ไม่มีความสัมพันธ์กัน, H1: ตัวแปรต่าง ๆ มีความสัมพันธ์กันการ

วิเคราะห์ Bartlett's test of Sphericity ถ้าพบว่า มีนัยสำคัญทางสถิติจะยอมรับสมมติฐาน H1 นั้นคือ ตัวแปรต่าง ๆ มีความสัมพันธ์กันสามารถนำไปวิเคราะห์องค์ประกอบได้

2) ตรวจสอบโดยพิจารณาค่าความแปรปรวนตัวแปรแต่ละตัวโดยพิจารณาค่าความร่วมกันของตัวแปร (Communality: H2) ซึ่งไม่ควรต่ำกว่า 0.50 และหากมีค่าต่ำกว่า 0.50 ควรตัดตัวแปรนั้นออกไปจากการวิเคราะห์องค์ประกอบ

3) สกัดองค์องค์ประกอบ (Factor Extraction) ด้วยการวิเคราะห์องค์ประกอบเชิงสำรวจ (Exploratory Factor Analysis: EFA) เทคนิคย่อยวิธีแกนหลัก (Principal Axis Factoring: PAF) และหมุนแกนองค์ประกอบแบบมุมฉาก (Orthogonal Rotation) ด้วยวิธีแวริแมกซ์ (Varimax Method) โดยสกัดองค์ประกอบย่อย 14 องค์ประกอบ พบว่า สามารถจัดองค์ประกอบได้ 2 องค์ประกอบหลัก และได้กำหนดชื่อองค์ประกอบ

4) พิจารณาองค์ประกอบ โดยใช้เกณฑ์การกำหนดจำนวนองค์ประกอบ ดังนี้

1.1 องค์ประกอบแต่ละตัวต้องมีตัวแปรสังเกตได้ตั้งแต่ 3 ตัวขึ้นไป

1.2 Eigen Value ต้องมีค่ามากกว่า 1

1.3 ค่าร้อยละของความแปรปรวนสะสมมากกว่า 60%

และ 1.4 ค่าน้ำหนักองค์ประกอบ (Factor Loading) ต้องมากกว่า 0.3 (ธีระดา ภิญโญ, 2561)

ผลการวิจัย

การพัฒนาองค์ประกอบของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ สามารถสรุปผลการศึกษาได้ 2 ระยะ ดังนี้

1. กำหนดทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ผลจากการรวบรวมทักษะการศึกษาแนวคิด ทฤษฎี และผลงานวิจัยที่เกี่ยวข้องกับทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ แล้วจึงให้ผู้เชี่ยวชาญพิจารณาถึงความเหมาะสมของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษา จากนั้นนำมาวิเคราะห์ค่า IOC ผลการวิเคราะห์ค่า IOC พบว่า ได้จำนวน 14 ทักษะ ได้แก่

1) ทักษะการสื่อสาร มีค่าเท่ากับ 0.9
2) ทักษะการเรียนรู้ มีค่าเท่ากับ 1
3) ทักษะการทำงานเป็นทีม มีค่าเท่ากับ 0.9
4) ทักษะการแก้ปัญหา มีค่าเท่ากับ 0.9
5) ทักษะความคิดสร้างสรรค์และนวัตกรรม มีค่าเท่ากับ 1
6) ทักษะการจัดการความเครียด มีค่าเท่ากับ 1
7) ทักษะการปรับตัว มีค่าเท่ากับ 0.9
8) ทักษะความเป็นผู้นำ มีค่าเท่ากับ 0.9
9) ทักษะจริยธรรมในการทำงาน มีค่าเท่ากับ 1
10) ทักษะการบริหารจัดการ มีค่าเท่ากับ 1
11) ทักษะความสัมพันธ์ระหว่างบุคคล มีค่าเท่ากับ 0.9

12) ทักษะความคิดริเริ่มและการชี้นำตัวเอง มีค่าเท่ากับ 1

13) ทักษะความเห็นอกเห็นใจ มีค่าเท่ากับ 1

และ 14) ทักษะการตระหนักสถานการณ์ มีค่าเท่ากับ 0.8

2. พัฒนาองค์ประกอบทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ผลการศึกษา ทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ พบว่า Kaiser-Meyer-Olkin (KMO) ของข้อมูลในการวิเคราะห์องค์ประกอบ มีค่าเท่ากับ 0.919 และค่าสถิติทดสอบ Bartlett's Test of Sphericity (Chi-Square) เท่ากับ 2534.344 ได้ 2 องค์ประกอบ ได้แก่ องค์ประกอบที่ 1 ประกอบด้วย 10 ตัวแปร ได้แก่ ทักษะการสื่อสาร มีค่าเท่ากับ (.858) ทักษะการเรียนรู้ มีค่าเท่ากับ (.848) ทักษะความเป็นผู้นำ มีค่าเท่ากับ (.843) ทักษะความคิดสร้างสรรค์และนวัตกรรม มีค่าเท่ากับ (.823) ทักษะการแก้ปัญหา มีค่าเท่ากับ (.812) ทักษะความคิดริเริ่มและการชี้นำตัวเอง มีค่าเท่ากับ (.730) ทักษะการจัดการความเครียด มีค่าเท่ากับ (.728) ทักษะการปรับตัว มีค่าเท่ากับ (.718) ทักษะการบริหารจัดการ มีค่าเท่ากับ (.614) และทักษะการทำงานเป็นทีม มีค่าเท่ากับ (.538) ตามลำดับ ซึ่งตั้งชื่อองค์ประกอบนี้ว่า วิทยาศาสตร์อัจฉริยะ สามารถอธิบายความแปรปรวนได้ร้อยละ 45.034 และองค์ประกอบที่ 2 ประกอบด้วย 4 ตัวแปร ได้แก่ ทักษะความเห็นอกเห็นใจ มีค่าเท่ากับ (.909) ทักษะจริยธรรมในการทำงาน มีค่าเท่ากับ (.845) ทักษะความสัมพันธ์ระหว่างบุคคล มีค่าเท่ากับ (.671) และทักษะการตระหนักสถานการณ์ มีค่าเท่ากับ (.656) ตามลำดับ ซึ่งตั้งชื่อองค์ประกอบนี้ว่า จิตวิญญาณวิทยาศาสตร์ สามารถอธิบายความแปรปรวนได้ร้อยละ 26.798 โดยมีค่าร้อยละของความแปรปรวนสะสมของทั้ง 2 องค์ประกอบ คิดเป็นร้อยละ 71.832

สรุปและอภิปรายผล

ผลการวิเคราะห์องค์ประกอบเชิงสำรวจของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาระดับปริญญาตรี คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ผลการวิจัยพบว่า ทักษะทั่วไปที่จำเป็น มีจำนวน 2 องค์ประกอบ ได้แก่ 1) วิทยาศาสตร์อัจฉริยะ (Smart Science) ประกอบด้วย 10 ตัวแปร ได้แก่ ทักษะการสื่อสาร ทักษะการเรียนรู้ ทักษะความเป็นผู้นำ ทักษะความคิดสร้างสรรค์และนวัตกรรม ทักษะการแก้ปัญหา ซึ่งสอดคล้องกับมาตรฐานคุณวุฒิระดับปริญญาตรี สาขาวิทยาศาสตร์และคณิตศาสตร์ ของกระทรวงศึกษาธิการ (2554) ทักษะความคิดริเริ่มและการชี้นำตัวเอง ซึ่งสอดคล้องกับทักษะแห่งศตวรรษที่ 21: ความท้าทายในการพัฒนานักศึกษา ในงานวิจัยของ เบญจวรรณ ถนอมชยธวัช และคณะ (2559) และทักษะการจัดการความเครียด ซึ่งสอดคล้องกับ Non-technical skills ในงานวิจัยของ กษณา รักษมณี (2562) ทักษะการปรับตัว ทักษะการบริหารจัดการ และทักษะการทำงานเป็นทีม ตามลำดับ ซึ่งสอดคล้องกับมาตรฐานคุณวุฒิระดับปริญญาตรี สาขาวิทยาศาสตร์และคณิตศาสตร์ ของกระทรวงศึกษาธิการ (2554) และ 2) จิตวิญญาณวิทยาศาสตร์ (Scientific Spirit) ประกอบด้วย 4 ตัวแปร ได้แก่ ทักษะความเห็นอกเห็นใจ ซึ่งสอดคล้องกับทักษะที่สำคัญของบัณฑิตในอนาคต ในงานวิจัยของสุนันทา มาวัน และคณะ (2565) ทักษะจริยธรรมในการทำงาน ทักษะความสัมพันธ์ระหว่างบุคคล ซึ่งสอดคล้องกับการสำรวจ Soft Skills ที่จำเป็นของสถานประกอบการในศตวรรษที่ 21 ในงานวิจัยของ รัตนวัชร์ เพ็ญรัตนหิรัญ และ ก่องทรัพย์ ทองคำ (2564) และทักษะการตระหนักสถานการณ์ Non-technical skills ในงานวิจัยของ กษณา รักษมณี (2562) ตามลำดับ

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 ผู้บริหารคณะวิทยาศาสตร์ ควรนำองค์ประกอบและตัวบ่งชี้ทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ที่ได้จากงานวิจัยนี้นำไปเป็นแนวทางเพื่อการกำหนดนโยบายหลักสูตรของคณะวิทยาศาสตร์

1.2 อาจารย์ผู้สอนคณะวิทยาศาสตร์ ควรนำองค์ประกอบและตัวบ่งชี้ของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ ไปใช้ประกอบการออกแบบกิจกรรมการเรียนรู้ สื่อการเรียนรู้ และวิธีการวัดประเมินผลนักศึกษาให้สอดคล้องกับศักยภาพที่พึงประสงค์ของนักศึกษา

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ควรมีการศึกษาเชิงเปรียบเทียบองค์ประกอบของทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์ ในแต่ละสาขาวิชาเพิ่มเติม

2.2 ควรมีการวิเคราะห์องค์ประกอบและตัวบ่งชี้ศักยภาพทักษะทั่วไปที่จำเป็นในนักศึกษาระดับชั้นอื่น ๆ เพื่อให้มีความเหมาะสมกับระดับความสามารถและบริบทของนักศึกษาที่แตกต่างกัน

2.3 ควรมีการศึกษาความสัมพันธ์ระหว่างทักษะทั่วไปที่จำเป็นสำหรับนักศึกษาคณะวิทยาศาสตร์กับ เพศ ผลสัมฤทธิ์ทางการเรียน และกิจกรรมที่นักศึกษาทำ

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การพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1

Development of Online Lessons by Google Site Website on Substances in Daily Life for Secondary 1 (Grade 7) Students

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บทคัดย่อ

การวิจัยในครั้งนี้มีวัตถุประสงค์เพื่อ 1) พัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ให้มีคุณภาพ 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนและหลังเรียน ด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 และ 3) ศึกษาความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 กลุ่มตัวอย่างใช้ในการวิจัยครั้งนี้ เป็นนักเรียนระดับชั้นมัธยมศึกษาปีที่ 1 โรงเรียนวัดหนองทองทราย อำเภอเมืองนครนายก จังหวัดนครนายก จำนวน 22 คน ซึ่งได้มาโดยการสุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) จากนักเรียนที่ผู้วิจัยทำการสอน เครื่องมือที่ใช้ในการวิจัยประกอบด้วย บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site แบบประเมินคุณภาพ แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน แบบประเมินความพึงพอใจ สถิติที่ใช้ในการวิจัย ได้แก่ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบค่าทีของกลุ่มตัวอย่าง ผลการวิจัยพบว่า 1) บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน มีคุณภาพด้านสื่ออยู่ในระดับมาก มีค่าเฉลี่ยเท่ากับ 4.33 และด้านเนื้อหาอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.87 2) ผู้เรียนมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียน โดยมีคะแนนเฉลี่ยเท่ากับ 17.00/8.14 การทดสอบทีหลังเรียนสูงกว่าก่อนเรียน อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 และ 3) ผู้เรียนมีความพึงพอใจต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site อยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.66

คำสำคัญ: บทเรียนออนไลน์, Google Site, สารในชีวิตประจำวัน

Abstract

The research objectives were to: 1) develop a quality online lessons by the Google Site website on substances in daily life for Secondary 1 (Grade 7) Students, 2) compare the academic achievement between pretest and posttest scores of students after studying via the online lessons by Google Site website on substances in daily life, and 3) study the satisfaction of students who studying via online lessons by the Google Site website on substances in daily life. The sample of this study were 22 students Secondary 1 (Grade 7) Students at Wat Nong ThongSai School, Mueang Nakhon Nayok District Nakhon Nayok Province. They were selected by using purpose sampling, from the students the researcher. The research instruments consisted of Online lessons by the Google Site website on substances in daily life, an evaluation form regarding the quality of media and contents, academic achievement test, and an evaluation form regarding students' satisfaction Statistics used for data analysis were mean, standard deviation, and t-test for dependent samples. The research results showed that: 1) the online lessons by the Google Site website on substances in daily life achieved quality in media at a good level with an average of 4.33 and quality in content of excellent level with an average of 4.87 2) the students have higher academic achievement after studying than before, with the average scores of 17.00/8.14 with a significant difference at the 0.05 level, and 3) the students were satisfied with the online lessons by the Google Site website at the highest level with an average of 4.66.

Keywords: Online Lesson, Google Site, Substance in Daily Life

บทนำ

การจัดการศึกษาต้องเน้นความสำคัญทั้งด้านความรู้และทักษะด้านวิทยาศาสตร์และเทคโนโลยี รวมทั้งส่งเสริมสนับสนุนให้ผู้สอนสามารถจัดบรรยากาศ และสภาพแวดล้อม อำนวยความสะดวกให้ผู้เรียนเกิดการเรียนรู้ มีความรู้รอบตัวและจัดการเรียนรู้ให้สามารถเกิดขึ้นได้ทุกเวลาสถานที่ โดยมุ่งหวังเพื่อยกระดับการพัฒนาคุณภาพของการศึกษาไทยให้ได้มาตรฐานสากลและเพิ่มโอกาสทางการศึกษาการเรียนรู้ในรูปแบบที่หลากหลาย (กระทรวงศึกษาธิการ, 2562) รายวิชาวิทยาศาสตร์เป็นวิชาที่สำคัญอยู่ในสาระหลักที่นักเรียนควรรู้ เพราะส่งผลให้นักเรียนมีความรู้ความเข้าใจ และทักษะในด้านต่าง ๆ ที่สามารถนำไปใช้ในชีวิตประจำวัน การศึกษาทางวิทยาศาสตร์จึงเป็นสิ่งสำคัญที่ควรได้รับการพัฒนาให้มีคุณภาพเพื่อส่งเสริมการพัฒนาทักษะของผู้เรียน เช่น ทักษะการคิดระดับสูง การแก้ปัญหา และการสื่อสาร รวมทั้งมีการฝึก ปฏิบัติด้วยกระบวนการทางวิทยาศาสตร์ให้เป็นผู้ที่กล้าคิด กล้าทำ กล้าตัดสินใจ และมีการทำงานอย่างเป็นระบบ (สุพรรณี ชาญประเสริฐ, 2557) เมื่อเนื้อหาการเรียนสูงขึ้น ครูผู้สอนจำเป็นต้องพัฒนาสื่อที่สามารถทำให้นักเรียนเข้าใจในเนื้อหาและสนใจในการเรียนมากขึ้น (มาริษา พานจันทร์, 2561) การจัดการเรียนรู้โดยใช้บทเรียนออนไลน์ผ่านเว็บไซต์เป็นวิธีการหนึ่งที่มีส่วนช่วยในการพัฒนาการเรียนรู้ของนักเรียน นักเรียนสามารถใช้เวลาใดก็ได้ สถานที่ใดก็ได้ ขึ้นอยู่กับความพร้อมของนักเรียนโดยไม่จำกัด

การปฏิสัมพันธ์ไว้แต่เพียงในห้องเรียน ครูผู้สอนสามารถให้ผลย้อนกลับแก่นักเรียนได้ทันทีโดยไม่ต้องรอให้ถึงเวลาเรียน ซึ่งจัดการเรียนการสอนในปัจจุบันก็ได้มีการนำโปรแกรมสำเร็จรูปโปรแกรมคอมพิวเตอร์ช่วยสอน การเรียนการสอนทางไกล และการเรียนการสอนผ่านเครือข่ายออนไลน์ต่าง ๆ (พัทธพล ฟุ้งจันทึก, 2553) และการเรียนการสอนออนไลน์เป็นสิ่งที่กำลังเพิ่มขึ้นเป็นที่นิยมในช่วงปัจจุบัน โดยเฉพาะในสถานการณ์ที่มีการระบาดของโรคระบาด เช่น COVID-19 (Means, Bakia, & Murphy, 2014; Alqurashi, 2020; Hodges, Moore, Lockee, Trust, & Bond, 2020) Google Site เป็นเครื่องมือที่สะดวกและเหมาะสมสำหรับการสร้างและแชร์บทเรียนออนไลน์ เนื่องจากมีความสามารถในการปรับแต่งหน้าเว็บไซต์และการแบ่งปันเนื้อหาได้อย่างง่ายดาย (Palloff & Pratt, 2013; Meyer, 2014) สามารถสร้างบทเรียนออนไลน์ที่สอดคล้องกับความต้องการและลักษณะการเรียนรู้ของนักเรียนทุกคน นอกจากนี้ยังเป็นเครื่องมือในการสร้างและออกแบบบทเรียน โดยใช้ปัญหาที่ผู้เรียนมีศักยภาพในการรับรู้ที่แตกต่างกันเป็นจุดประสงค์ในการออกแบบ เนื่องจากความแตกต่างในการรับรู้และการเรียนรู้ของนักเรียน ซึ่งส่งผลให้การสอนแบบเดียวกันไม่สามารถตอบสนองความต้องการและลักษณะการเรียนรู้ของนักเรียนได้อย่างเต็มที่ ทำให้บางบุคคลมีความยากลำบากในการเรียนรู้ เพราะการสื่อสารและวิธีการสอนที่ไม่สอดคล้องกับสไตล์การเรียนของแต่ละบุคคล (Siemens, 2005; Hodges et al., 2020) ผู้วิจัยปฏิบัติหน้าที่ครูผู้สอนกลุ่มสาระการเรียนรู้วิทยาศาสตร์ได้สังเกตการเรียนรู้ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ในปีการศึกษาที่ผ่านมา พบว่า ผู้เรียนมีศักยภาพในการรับรู้ที่แตกต่างกัน จดจำและทำความเข้าใจเนื้อหาต่างกัน เนื่องจากปัจจัยหลายอย่าง ได้แก่ ชั่วโมงการเรียนการสอนที่จำกัด สื่อการสอนที่ไม่เร้าความสนใจ ทำให้ขาดความใฝ่รู้ เทคนิคการสอน กิจกรรมต่าง ๆ ของสถานศึกษาที่มีมากมาย ฯลฯ ซึ่งส่งผลต่อความเข้าใจรับรู้จดจำของผู้เรียน เพื่อสนับสนุนการเรียนรู้ของผู้เรียนให้เต็มตามศักยภาพจากหลักการ แนวคิด และสภาพปัญหาดังกล่าว ผู้วิจัยจึงมีความสนใจที่จะศึกษาการจัดการเรียนรู้รายวิชาวิทยาศาสตร์แบบออนไลน์ด้วยเว็บไซต์ Google Site จึงพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 เนื่องจากเว็บ Google Site เป็นสื่อการสอนที่จะช่วยให้การจัดการเรียนการสอน ในรายวิชาวิทยาศาสตร์มีประสิทธิภาพมากขึ้น เป็นสื่อที่มีความหลากหลายและเหมาะสมกับผู้เรียนที่มีความแตกต่างระหว่างบุคคลได้ดี ผู้เรียนสร้างองค์ความรู้ได้ด้วยตนเอง เกิดสนใจในการเรียนรายวิชาวิทยาศาสตร์ ซึ่งจะส่งผลให้ผลสัมฤทธิ์ทางการเรียนของผู้เรียนสูงขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ให้มีคุณภาพ
2. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนและหลังเรียนของนักเรียนที่เรียนรู้ด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1
3. เพื่อศึกษาความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิด ทฤษฎี

แนวคิดเกี่ยวกับการเรียนรู้วิทยาศาสตร์และเทคโนโลยี

กระทรวงศึกษาธิการ (2560) ได้ประกาศใช้มาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์ วิทยาศาสตร์ และสาระภูมิศาสตร์ในกลุ่มสาระการเรียนรู้สังคมศึกษา ศาสนา และวัฒนธรรม (ฉบับปรับปรุง พุทธศักราช 2560) ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 ตามคำสั่งกระทรวงศึกษาธิการที่ สพฐ. 1239/2560 ลงวันที่ 7 สิงหาคม พ.ศ. 2560 และคำสั่งสำนักงานคณะกรรมการการศึกษาขั้นพื้นฐานที่ 30/2561 ลงวันที่ 5 มกราคม พ.ศ. 2561 ให้เปลี่ยนแปลงมาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์และวิทยาศาสตร์ (ฉบับปรับปรุง พุทธศักราช 2560) โดยมีคำสั่งให้โรงเรียนดำเนินการใช้หลักสูตรในปีการศึกษา 2561 โดยให้ใช้ในชั้นประถมศึกษาปีที่ 1 และ 4 ตั้งแต่ปีการศึกษา 2561 เป็นต้นมา ให้เป็นหลักสูตรแกนกลางของประเทศ โดยกำหนดจุดหมายและมาตรฐานการเรียนรู้เป็นเป้าหมายและกรอบทิศทางในการพัฒนาคุณภาพผู้เรียนมีพัฒนาการเต็มตามศักยภาพ มีคุณภาพและมีทักษะการเรียนรู้ ในศตวรรษที่ 21

มหาวิทยาลัยนเรศวร (2556) ได้เสนอแนวคิดในการสอนวิทยาศาสตร์ในศตวรรษที่ 21 ไว้ว่า การจัดการเรียนรู้วิทยาศาสตร์มิได้เป็นเพียงการช่วยให้ผู้เรียนมีความรู้ความเข้าใจในวิทยาศาสตร์เท่านั้น แต่ยังต้องช่วยให้ผู้เรียนสามารถนำความรู้วิทยาศาสตร์ไปประยุกต์ใช้ในชีวิตประจำวันได้อย่างรู้เท่าทัน เพราะการศึกษาและทำความเข้าใจเกี่ยวกับความฉลาดรู้ด้านวิทยาศาสตร์จะช่วยให้ทราบถึงขอบเขตความรู้ทางวิทยาศาสตร์ที่สังคมต้องการ ทักษะ การแสวงหาความรู้ที่จำเป็น รวมทั้งเจตคติทางวิทยาศาสตร์ที่สัมพันธ์กับบริบทของโลกที่เปลี่ยนแปลงไป

แนวคิดเกี่ยวกับบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site

บริษัทไทยคอนฟิกจำกัด (2564) ให้คำจัดกัดความของ Google Site ไว้ว่า Google Site เป็นการใช้แพลตฟอร์มสร้างเว็บไซต์จาก Google ซึ่งเป็นแอปที่เป็นส่วนหนึ่งของ Google Workspace (เดิมคือ G Suite) ซึ่งเป็นกลุ่มแอปเพิ่มประสิทธิภาพทางธุรกิจของ Google ซึ่งรวมถึง Gmail ปฏิทิน Drive เอกสาร ชีต สไลด์ Meet และอื่น ๆ Google Sites นำเสนอความเป็นไปได้ไม่รู้จบในการทำเว็บไซต์

สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ (2565) กล่าวว่า เทคโนโลยีการสอนด้วยสื่ออิเล็กทรอนิกส์ เป็นการพัฒนาสื่อเพื่อใช้ในการเรียนการสอนมีพัฒนาการมายาวนาน เนื่องจากสื่อเป็นตัวกลางในการถ่ายทอดความรู้ ความเข้าใจ ทักษะต่าง ๆ จากผู้สอนไปยังผู้เรียนได้เป็นอย่างดี เปรียบเสมือนสะพานเชื่อมความคิดระหว่างกันและกัน หากสื่อได้รับการออกแบบพัฒนาอย่างดีก็จะสามารถสร้างความเข้าใจในประเด็นที่ต้องการนำเสนอได้อย่างถูกต้องด้วย

อาแวนิติส (Arvanitis, 1997) ได้ให้ข้อเสนอแนะว่าในการสร้างเว็บไซต์นั้น ควรจะสร้างเว็บไซต์ตามขั้นตอนต่อไปนี้

1) กำหนดวัตถุประสงค์ โดยพิจารณาว่าเป้าหมายของการสร้างเว็บไซต์นี้เพื่ออะไร

2) ศึกษาคุณลักษณะของผู้ที่จะเข้ามาใช้ว่ากลุ่มเป้าหมายใดที่ผู้สร้างต้องการสื่อสาร ข้อมูล อะไรที่พวกเขาต้องการ โดยขั้นตอนนี้ควรจะปฏิบัติควบคู่ไปกับขั้นตอนที่หนึ่ง

3) วางลักษณะโครงสร้างของเว็บ

4) กำหนดรายละเอียดให้กับโครงสร้าง ซึ่งเราอาจจะพิจารณาจากวัตถุประสงค์ที่ตั้งไว้โดยตั้งเกณฑ์ในการใช้ เช่น ผู้ใช้ควรจะทำอะไรบ้าง จำนวนหน้าควรมีจำนวนเท่าใด มีการเชื่อมโยงมากน้อยเพียงไร

5) หลังจากนั้นจึงทำการสร้างเว็บแล้วนำไปทดลอง เพื่อหาข้อผิดพลาด และทำการปรับปรุงแก้ไขแล้วจึงค่อยนำเข้าสู่เครือข่ายอินเทอร์เน็ตเป็นขั้นตอนสุดท้าย

แนวคิดเกี่ยวกับผลสัมฤทธิ์ทางการเรียน

สมชาย รัตนทองคำ (2554) ได้กล่าวสรุปว่า ผลสัมฤทธิ์ทางการเรียน (Academic Achievement) หมายถึง คุณลักษณะรวมถึงความรู้ความสามารถของบุคคลอันเป็นผลมาจากการเรียนการสอน หรือคือมวลประสบการณ์ทั้งปวงที่บุคคลได้รับจากการเรียนการสอน ทำให้บุคคลเกิดการเปลี่ยนแปลงพฤติกรรมในด้านต่าง ๆ ของสมรรถภาพสมอง จุดมุ่งหมายของการวัดผลสัมฤทธิ์ จึงเป็นการตรวจสอบระดับความสามารถของสมรรถภาพสมองของบุคคลว่าเรียนแล้วรู้อะไรบ้าง และมีความสามารถด้านใดมากน้อยเท่าไร เช่น มีพฤติกรรมด้านความจำ ความเข้าใจการนำไปใช้ การวิเคราะห์ และการประเมินค่ามากน้อยอยู่ในระดับใด ซึ่งเป็นการวัด 2 องค์ประกอบ ตามจุดมุ่งหมายและลักษณะของวิชาที่เรียน คือ

1) การวัดด้านการปฏิบัติ เป็นการตรวจสอบความรู้ความสามารถทางการปฏิบัติ โดยให้ผู้เรียนได้ลงมือปฏิบัติจริงให้เห็นผลงานปรากฏออกมาให้ทำการสังเกตและวัดได้ เช่น วิชาศิลปศึกษา พลศึกษา การช่าง เป็นต้น การวัดแบบนี้จึงต้องวัดโดยใช้ “ข้อสอบภาคปฏิบัติ” (Performance Test) ซึ่งการประเมินผลจะพิจารณาที่วิธีการปฏิบัติ (Procedure) และผลงานที่ปฏิบัติ (Product)

2) การวัดด้านเนื้อหาเป็นการตรวจสอบความรู้ความสามารถเกี่ยวกับเนื้อหาวิชา (Content) รวมถึงพฤติกรรมความสามารถในด้านต่าง ๆ อันเป็นผลมาจากการเรียนการสอน

แนวคิดเกี่ยวกับความพึงพอใจ

ทิฆัมพร ยุทธเสรี (2550) กล่าวว่า ความพึงพอใจ หมายถึง ความรู้สึกหรือเจตคติที่ดีของบุคคลที่มีต่อการปฏิบัติงาน ความรู้สึกพอใจชอบใจในการร่วมปฏิบัติกิจกรรมการเรียนรู้การจัดกิจกรรมการเรียนรู้ต้องทำให้ผู้เรียนเกิดความพอใจในการเรียน จึงจะทำให้ผู้เรียนเกิดการเรียนรู้ได้อย่างมีประสิทธิภาพ การที่บุคคลจะเรียนรู้หรือพัฒนาการและความเจริญงอกงามนั้นบุคคลต้องอยู่ในภาวะพึงพอใจ สุขใจ เป็นเบื้องต้น นั่นคือ บุคคลต้องได้รับการจูงใจทั้งในลักษณะนามธรรมและรูปธรรม

เพจ และ มาร์แชล (Page & Marshall, 1997) กล่าวถึงความพึงพอใจโดยสรุปว่า หมายถึงความประสงค์ที่จะเข้าร่วมในกิจกรรมในการพัฒนาหลักสูตร สำหรับในทางจิตวิทยา เพจ กล่าวเสริมไว้โดยสรุปว่า ความพึงพอใจ เป็นอาการที่จิตใจเพ่งเล็งกับการเลือกกิจกรรมหนึ่ง หรืออาการสนุกเพลิดเพลินใจในการทำสิ่งใดสิ่งหนึ่งวัดได้จากแบบวัดความพึงพอใจ

งานวิจัยที่เกี่ยวข้อง

นิภาพร บุญสร้อย, สุรัติ วิภักดิ์, เพ็ญแก้ว ดงโย, และ สุภัทรศักดิ์ คำสามารถ (2565) ได้ศึกษาวิจัยเรื่อง การศึกษาผลการใช้ห้องเรียนออนไลน์ด้วย Google Site รายวิชาเศรษฐกิจพอเพียงระดับมัธยมศึกษาตอนต้น กศน.อำเภอเมยวดี จังหวัดร้อยเอ็ด มีวัตถุประสงค์เพื่อ 1) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักศึกษาระดับมัธยมศึกษาตอนต้นที่ใช้ห้องเรียนออนไลน์ด้วย Google Site รายวิชาเศรษฐกิจพอเพียง 2) ศึกษาความพึงพอใจของนักศึกษาระดับมัธยมศึกษาตอนต้น ในการใช้ห้องเรียนออนไลน์ด้วย Google Site เครื่องมือที่ใช้ในวิจัย ได้แก่ 1) แผนการจัดการเรียนแบบผสมผสานผ่าน

เครือข่ายสังคมออนไลน์รายวิชาเศรษฐกิจพอเพียง 2) แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน 3) แบบประเมินความพึงพอใจของนักศึกษาที่มีต่อการใช้ห้องเรียนออนไลน์ ผลการศึกษาพบว่า 1) ผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนโดยใช้ห้องเรียนออนไลน์ มีคะแนนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ซึ่งสอดคล้องกับสมมุติฐานที่ตั้งไว้ 2) ความพึงพอใจของนักศึกษาที่มีต่อการจัดการเรียนการสอนโดยใช้ห้องเรียนออนไลน์ในภาพรวมอยู่ในระดับมากที่สุด เป็นไปตามสมมุติฐานที่กำหนด

กุลนิษฐ์ วงศ์แก้ว (2563) การพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 มีวัตถุประสงค์เพื่อ 1) สร้างและหาประสิทธิภาพบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 มีประสิทธิภาพตามเกณฑ์ 80/80 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนและหลังเรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 และ 3) ศึกษาความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ผลการศึกษาพบว่า 1) ผลการสร้างและหาประสิทธิภาพของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 (E_1/E_2) เท่ากับ 86.68/82.74 ซึ่งสูงกว่าเกณฑ์มาตรฐาน 80/80 2) ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียน ระหว่างคะแนนเฉลี่ยของการทดสอบหลังเรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site สูงกว่าคะแนนเฉลี่ยของการทดสอบก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 3) นักเรียนที่เรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีความพึงพอใจอยู่ในระดับมากที่สุด

มะลิ จรรยากรณ์ (2563) การพัฒนาห้องเรียนดิจิทัลด้วย Google Sites รายวิชาเทคโนโลยีสารสนเทศเพื่อการจัดการอาชีพ รหัสวิชา 30001-2001 มีวัตถุประสงค์เพื่อ 1) หาประสิทธิภาพของห้องเรียนดิจิทัลด้วย Google Sites 1 มีประสิทธิภาพตามเกณฑ์ 80/80 2) ศึกษาผลสัมฤทธิ์ทางการเรียนหลังเรียนของนักศึกษาที่เรียนโดยใช้ห้องเรียนดิจิทัลด้วย Google Sites 3) ศึกษาความพึงพอใจของนักศึกษาที่เรียนรู้โดยใช้ห้องเรียนดิจิทัลด้วย Google Site ผลการวิจัยพบว่า 1) ประสิทธิภาพของห้องเรียนดิจิทัลด้วย Google Sites มีประสิทธิภาพโดยรวม เท่ากับ 82.75/81.11 ผ่านเกณฑ์ประสิทธิภาพที่ตั้งไว้ 2) ผลสัมฤทธิ์ทางการเรียนหลังเรียนของนักศึกษาที่เรียนโดยใช้ห้องเรียนดิจิทัลด้วย Google Sites มีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 3) ความพึงพอใจของนักศึกษาที่เรียนรู้โดยใช้ห้องเรียนดิจิทัลด้วย Google Site มีค่าเฉลี่ยผลการประเมินรวมทั้งต่อการใช้ห้องเรียนดิจิทัลด้วย Google Site ในภาพรวมอยู่ระดับมาก ค่าเฉลี่ย 4.40

บุญฤทธิ์ กาวี และ ภัทริณี คงชู (2565) การพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site วิชาคณิตศาสตร์ เรื่อง เลขยกกำลัง มีวัตถุประสงค์เพื่อ 1) สร้างบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site วิชาคณิตศาสตร์ เรื่อง เลขยกกำลัง 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนหลังเรียนกับก่อนเรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site วิชาคณิตศาสตร์ เรื่อง เลขยกกำลัง และศึกษาความพึงพอใจของนักเรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ผลการวิจัยพบว่า 1) องค์ประกอบและความเหมาะสมในระดับมากที่สุด 2) ผลสัมฤทธิ์ทางการเรียนหลังเรียนของนักเรียนสูงกว่าก่อนเรียน

อย่างมีนัยทางสถิติที่ระดับ .05 และ 3) ผลการศึกษาความพึงพอใจที่ได้เรียนบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site รายวิชาคณิตศาสตร์ เรื่อง เลขยกกำลัง ของนักเรียนมีความพึงพอใจอยู่ในระดับมากที่สุด

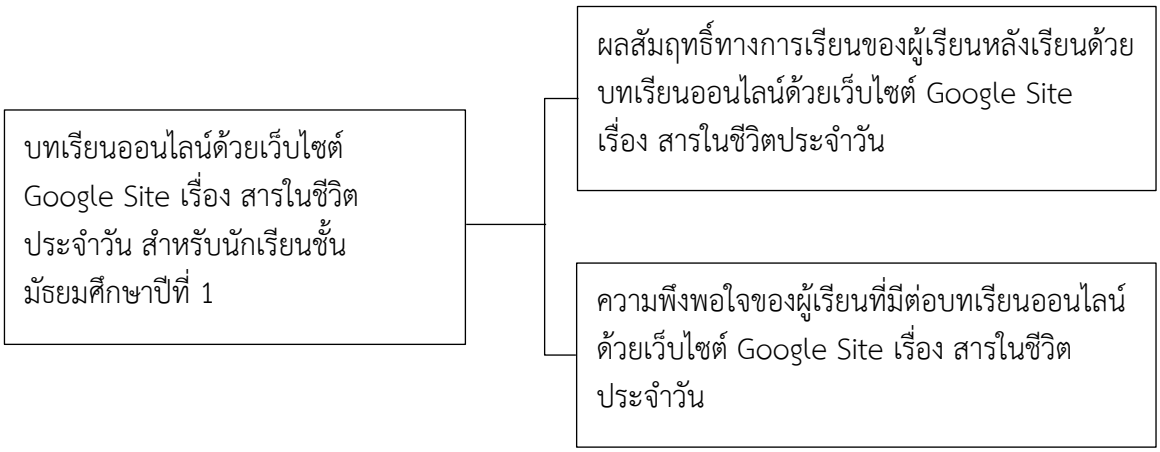
Fitriana and Hartono. (2023) ได้ทำการวิจัย เรื่อง การปฏิบัติตามรูปแบบ ASSURE โดยใช้สื่อ Google Site ในการเรียนรู้ข้อความกระบวนการ โดยกล่าวว่าการศึกษาในประเทศอินโดนีเซียมีคุณภาพต่ำ สื่อการเรียนรู้เป็นหนึ่งในส่วนประกอบที่สามารถนำมาใช้เพื่อพัฒนาคุณภาพการศึกษาในครูในฐานะผู้กำหนดสื่อการเรียนรู้ที่เหมาะสมสำหรับลักษณะของนักเรียนเพื่อให้ผลการเรียน และความสนใจในการเรียนเพิ่มขึ้น ความขาดแคลนของการเรียนรู้ที่หลากหลายทำให้นักเรียนเกิดความเฉยเมยในการเรียน โดยเฉพาะในการศึกษาภาษาอินโดนีเซีย โดยอิงจากผลการสังเกตที่ได้จากโรงเรียนมัธยมเอ็มพีเนอร์ 21 เซมารัง พบว่า ปัญหาที่เกิดขึ้นเป็นเพราะความเบื่อในการเรียน เนื่องจากสื่อการเรียนรู้ที่นำเสนอโดยครูต้องการให้มีความหลากหลายและนวัตกรรมมากขึ้น จากปัญหาที่พบ การวิจัยมีวัตถุประสงค์เพื่อหาวิธีการในการนำ ASSURE Model มาใช้ในการสอนข้อความกระบวนการ โดยใช้สื่อ Google Site การวิจัยถูกดำเนินการในห้องเรียน VII A ของโรงเรียนมัธยมเอ็มพีเนอร์ 21 เซมารัง จำนวนนักศึกษา 33 คน การรวบรวมข้อมูลถูกดำเนินการโดยการสังเกตหรือสังเกตและสัมภาษณ์ ผลการวิจัยแสดงให้เห็นว่า การนำ ASSURE Model มาใช้ในการสอนข้อความกระบวนการ โดยใช้สื่อ Google Site ได้เป็นไปได้อย่างดี ผ่านการใช้สื่อการเรียนรู้ที่แตกต่างจากปกติ นักเรียนมีความสนใจในการเรียนจึงทำให้กิจกรรมการเรียนไม่รู้สึกน่าเบื่อและผลการเรียนก็ตรงตามเป้าหมายการเรียนรู้

2. กรอบแนวคิด

จากการศึกษาแนวคิดและทฤษฎีที่เกี่ยวข้อง เพื่อพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ได้กำหนดเป็นแนวคิด ดังนี้

2.1 ตัวแปรต้น ได้แก่ บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1

2.2 ตัวแปรตาม ได้แก่ 1) ผลสัมฤทธิ์ทางการเรียนของผู้เรียนหลังเรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน และ 2) ความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน



ภาพที่ 1 กรอบแนวคิด

วิธีดำเนินการวิจัย

ประชากร

ประชากรที่ใช้ในการศึกษาครั้งนี้เป็นนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนขยายโอกาสในอำเภอเมืองนครนายก สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษานครนายก จำนวน 8 โรงเรียน นักเรียนทั้งหมด 213 คน

กลุ่มตัวอย่าง

กลุ่มตัวอย่างใช้ในการศึกษาครั้งนี้ เป็นนักเรียนระดับชั้นมัธยมศึกษาปีที่ 1 โรงเรียนวัดหนองทองทราย อำเภอเมืองนครนายก จังหวัดนครนายก สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษานครนายก ในภาคเรียนที่ 1 ปีการศึกษา 2566 จำนวน 22 คน ซึ่งได้มาโดยการสุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) จากนักเรียนที่ผู้วิจัยทำการสอน

เครื่องมือที่ใช้ในการวิจัย

1. บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1) สร้างและพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ตามผังการทำงาน (Flowchart) ที่กำหนด โดยใช้เครื่องมือต่าง ๆ ได้แก่ โปรแกรม Microsoft Word โปรแกรม Adobe Acrobat หรือโปรแกรมประเภท PDF Creator และ YouTube สำหรับนำเสนอเนื้อหา และ ใช้ Google Form สำหรับออกแบบทดสอบ

2. แบบประเมินคุณภาพบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน กำหนดหัวข้อ ออกแบบ และสร้างแบบประเมินคุณภาพบทเรียนออนไลน์ ด้วยเว็บไซต์ Google Site ทั้งด้านเนื้อหา ด้านสื่อ เป็นแบบมาตราส่วน 5 ระดับ (บุญชม ศรีสะอาด, 2560) และนำไปให้ผู้เชี่ยวชาญด้านวัดและประเมินผล จำนวน 3 ท่าน ตรวจสอบความเหมาะสม และความสอดคล้องของเนื้อหากับวัตถุประสงค์ ได้ค่าดัชนีความสอดคล้องด้านเนื้อหาเท่ากับ 1.00 และด้านสื่อเท่ากับ 1.00

3. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง สารในชีวิตประจำวัน เป็นแบบทดสอบ แบบเลือกตอบ 4 ตัวเลือก จำนวน 20 ข้อ และไปให้คณะผู้เชี่ยวชาญด้านการวัดผลประเมินผล 3 ท่าน ตรวจสอบความเหมาะสมและความสอดคล้องของเนื้อหาและวัตถุประสงค์ โดยค่าดัชนีความสอดคล้องเท่ากับ 1.00 และนำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนมาตรวจคะแนนหาค่าความยากง่าย (p) ค่าอำนาจจำแนก (r) เป็นรายข้อ ข้อสอบมีค่าความยากง่ายอยู่ระหว่าง 0.50 - 0.63 และมีค่าอำนาจจำแนกอยู่ระหว่าง 0.25 - 0.50 และนำไปหาความเชื่อมั่น โดยใช้สูตรการหาค่าความเชื่อมั่นของแบบทดสอบ โดยวิธี KR-20 (Kuder Richardson Formular 20) ได้ค่าความเชื่อมั่น 0.93

4. แบบสอบถามความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 มีลักษณะเป็นแบบสอบถามมาตราส่วนประมาณค่า (Rating Scale) 5 ระดับ และนำแบบสอบถามความพึงพอใจที่สร้างขึ้นให้ผู้เชี่ยวชาญด้านการวัดผลประเมินผล จำนวน 3 ท่าน พิจารณาตรวจสอบความเหมาะสม และความสอดคล้องของข้อคำถามกับวัตถุประสงค์แต่ละรายข้อ โดยมีค่าดัชนีความสอดคล้องเท่ากับ 1.00

การวิเคราะห์ข้อมูล

1. หาความสอดคล้องของแบบประเมินคุณภาพของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน และแบบประเมินความพึงพอใจ ตรวจสอบความสอดคล้องของข้อสอบกับจุดประสงค์การเรียนรู้ของผู้เชี่ยวชาญ วิเคราะห์ข้อมูลโดยคำนวณหาค่าดัชนีความสอดคล้อง (IOC)

2. หาคุณภาพของแบบประเมินคุณภาพ โดยใช้การคำนวณหาค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐาน

3. วิเคราะห์เปรียบเทียบวัดผลสัมฤทธิ์ทางการเรียน วิเคราะห์ข้อสอบรายข้อเพื่อหาค่าความยากง่าย (p) และค่าอำนาจจำแนก (r)

4. นำผลการทดสอบมาหาค่าความเชื่อมั่นของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนทั้งฉบับ

5. เปรียบเทียบความแตกต่างของคะแนนสอบวัดผลสัมฤทธิ์ก่อนเรียนและหลังเรียน โดยใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน ซึ่งวิเคราะห์ข้อมูลโดยใช้สถิติ t–test for Dependent Samples

6. วิเคราะห์ความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้โดยใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน นำผลการตรวจสอบมาหาค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัย

1. ผลการพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1

1.1 ผลการประเมินคุณภาพ บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ด้านสื่อ

ตารางที่ 1 ผลการประเมินคุณภาพบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน ด้านสื่อ

รายการประเมิน	$\bar{x}$	SD.	แปลผล
1. การนำเข้าสู่บทเรียนมีความเหมาะสม	4.67	0.58	ดีมาก
2. การจัดวางรูปแบบและองค์ประกอบของหน้าเว็บไซต์มีความเหมาะสม	4.33	1.15	มาก
3. รูปแบบและขนาดตัวอักษรมีความเหมาะสม	4.67	0.58	ดีมาก
4. สีตัวอักษรและสีพื้นหลังมีความเหมาะสม และชัดเจน	3.33	0.58	ปานกลาง
6. เมนูหรือปุ่มต่าง ๆ ใช้งานง่าย และสะดวก	4.33	1.15	มาก
7. การสื่อความหมายของภาพชัดเจน	4.67	0.58	ดีมาก
8. การเปลี่ยนเมนูในการเรียนรู้มีความเหมาะสม	4.67	0.58	ดีมาก
9. การเชื่อมโยงมีความเหมาะสมและสมบูรณ์	4.33	1.15	มาก
10. บทเรียนมีลักษณะจูงใจ และน่าสนใจ	4.33	1.15	มาก
ค่าเฉลี่ยโดยรวม	**4.33**	**0.85**	**มาก**

จากตารางที่ 1 พบว่า บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โดยรวมมีคุณภาพด้านสื่ออยู่ในระดับมาก มีค่าเฉลี่ยเท่ากับ 4.33 และ

เมื่อพิจารณารายข้อ พบว่า การนำเข้าสู่บทเรียนมีความเหมาะสม รูปแบบและขนาดตัวอักษรมีความเหมาะสม การสื่อความหมายของภาพชัดเจน การเปลี่ยนเมนูในการเรียนรู้มีความเหมาะสม มีค่าเฉลี่ยเท่ากับ 4.67 อยู่ในระดับดีมาก รองลงมา ได้แก่ การจัดวางรูปแบบและองค์ประกอบของหน้าเว็บไซต์มีความเหมาะสม เมนูหรือปุ่มต่าง ๆ ใช้งานง่ายและสะดวก การเชื่อมโยงมีความเหมาะสมและสมบูรณ์ บทเรียนมีลักษณะจูงใจ และน่าสนใจ มีค่าเฉลี่ยเท่ากับ 4.33 อยู่ในระดับมาก วิดีโอ เสียง และการเคลื่อนไหวมีความเหมาะสมและชัดเจน มีค่าเฉลี่ยเท่ากับ 4.00 อยู่ในระดับมาก สีตัวอักษรและสีพื้นหลังมีความเหมาะสมและชัดเจน มีค่าเฉลี่ยเท่ากับ 3.33 อยู่ในระดับปานกลาง ตามลำดับ

1.2 ผลการประเมินคุณภาพ บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ด้านเนื้อหา

ตารางที่ 2 ผลการประเมินคุณภาพบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน ด้านเนื้อหา

รายการประเมิน	$\bar{x}$	SD.	แปลผล
1. เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Siteครอบคลุมวัตถุประสงค์ที่ต้องการศึกษาที่กำหนดไว้	5.00	0.00	ดีมาก
2. เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีความถูกต้องและทันสมัย	5.00	0.00	ดีมาก
3. เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีการเรียบเรียง โดยเรียงลำดับจากง่ายไปหายาก	5.00	0.00	ดีมาก
4. เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีความเหมาะสมสาหรับการเรียนด้วยการฝึกอบรมออนไลน์	4.67	0.58	ดีมาก
5. ภาษาที่ใช้ในเนื้อหาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เข้าใจง่าย	4.67	0.58	ดีมาก
6. ภาพประกอบมีความเหมาะสมกับเนื้อหา	5.00	0.00	ดีมาก
7. คำอธิบายภาพประกอบมีความถูกต้อง สอดคล้องกับเนื้อหา	5.00	0.00	ดีมาก
8. เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site สามารถนำไปปรับใช้ในการเรียนได้	5.00	0.00	ดีมาก
9. แบบทดสอบก่อนและหลังการเรียนมีความสอดคล้องกับเนื้อหา	4.67	0.58	ดีมาก
10. แบบทดสอบก่อนและหลังเรียนความสอดคล้องกับวัตถุประสงค์การเรียนรู้	4.67	0.58	ดีมาก
ค่าเฉลี่ยโดยรวม	4.87	0.23	ดีมาก

จากตารางที่ 2 พบว่า บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โดยรวมมีคุณภาพด้านเนื้อหาในระดับดีมาก มีค่าเฉลี่ยเท่ากับ 4.87 และเมื่อพิจารณารายข้อ พบว่า เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ครอบคลุมวัตถุประสงค์ที่ต้องการศึกษาที่กำหนดไว้ เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีความ

ถูกต้องและทันสมัย เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีการเรียบเรียง โดยเรียงลำดับจากง่ายไปหายาก ภาพประกอบมีความเหมาะสมกับเนื้อหา คำอธิบายภาพประกอบมีความถูกต้องสอดคล้องกับเนื้อหา เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site สามารถนำไปปรับใช้ในการเรียนได้ มีค่าเฉลี่ยเท่ากับ 5.00 อยู่ในระดับดีมาก รองลงมา ได้แก่ เนื้อหาของบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site มีความเหมาะสมสาหรับการเรียนด้วยการฝึกอบรมออนไลน์ ภาษาที่ใช้ในเนื้อหาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เข้าใจง่าย แบบทดสอบก่อนและหลังการเรียนมีความสอดคล้องกับเนื้อหา แบบทดสอบก่อนและหลังเรียนความสอดคล้องกับวัตถุประสงค์การเรียนรู้ มีค่าเฉลี่ยเท่ากับ 4.67 อยู่ในระดับดีมาก ตามลำดับ

2. เปรียบเทียบผลสัมฤทธิ์ทางการเรียนหลังเรียนและก่อนเรียน หลังเรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site

ตารางที่ 3 ผลการเปรียบเทียบทางการเรียนคะแนนก่อนเรียนและหลังเรียนโดยใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน จำนวน 22 คน

รายการ	คะแนนเต็ม	คะแนนเฉลี่ย	SD.	t	df	P-value
ทดสอบก่อนเรียน	20	8.14	0.89	31.9965	21	0.00*
ทดสอบหลังเรียน	20	17.00	1.09			

*นัยสำคัญทางสถิติที่ระดับ .05

จากตารางที่ 3 พบว่า คะแนนผลสัมฤทธิ์ทางการเรียนก่อนเรียนโดยใช้บทเรียนออนไลน์ เรื่อง สารในชีวิตประจำวัน ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 มีคะแนนค่าเฉลี่ยเท่ากับ 8.14 ส่วนคะแนนหลังเรียน มีคะแนนเฉลี่ยเท่ากับ 17.00 เมื่อนำคะแนนมาเปรียบเทียบผลสัมฤทธิ์ทางการเรียน พบว่าผลสัมฤทธิ์ทางการเรียนโดยใช้บทเรียนออนไลน์ เรื่อง สารในชีวิตประจำวัน หลังเรียนสูงกว่าก่อนเรียนที่ระดับนัยสำคัญทางสถิติ .05

3 ผลการศึกษาความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน

ตารางที่ 4 ผลการศึกษาความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน

รายการประเมิน	$\bar{x}$	SD.	แปลผล
1. คำอธิบายในการใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ชัดเจนเข้าใจง่าย	4.55	0.51	มากที่สุด
2. การอธิบายเนื้อหาชัดเจนเข้าใจได้ง่าย	4.55	0.51	มากที่สุด
3. เนื้อหามีระบบความยากง่ายเหมาะสมกับผู้เรียน	4.64	0.49	มากที่สุด
4. บทเรียนมีรูปแบบที่น่าใช้น่าสนใจ	4.68	0.48	มากที่สุด

รายการประเมิน	$\bar{x}$	SD.	แปลผล
5. สีอักษรและตัวอักษรมีขนาดเหมาะสม	4.45	0.51	มาก
6. ภาพและวิดีโอประกอบสอดคล้องกับเนื้อหาการเรียนรู้	4.82	0.39	มากที่สุด
7. มีการจัดลำดับเนื้อหาเป็นขั้นเป็นตอน มีความต่อเนื่องอ่านแล้วเข้าใจง่าย	4.68	0.48	มากที่สุด
8. บทเรียนใช้งานง่าย สะดวกต่อการเรียนรู้ และมีความทันสมัย	4.68	0.48	มากที่สุด
9. สื่อมีความเหมาะสมในการนำไปใช้ในการเรียนการสอน	4.82	0.39	มากที่สุด
10. ผู้เรียนได้รับความรู้และความเข้าใจในเนื้อหาที่เรียนมากขึ้น	4.68	0.48	มากที่สุด
เฉลี่ย	**4.66**	**0.47**	**มากที่สุด**

จากตารางที่ 4 พบว่า ผู้เรียนมีความพึงพอใจต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน โดยรวมอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.66 และเมื่อพิจารณารายด้าน พบว่า ภาพและวิดีโอประกอบสอดคล้องกับเนื้อหาการเรียนรู้ สื่อมีความเหมาะสมในการนำไปใช้ในการเรียนการสอน มีความพึงพอใจอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.82 รองลงมา บทเรียนมีรูปแบบที่น่าใช้น่าสนใจ มีการจัดลำดับเนื้อหาเป็นขั้นเป็นตอนมีความต่อเนื่องอ่านแล้วเข้าใจง่าย บทเรียนใช้งานง่ายสะดวกต่อการเรียนรู้ และมีความทันสมัย ผู้เรียนได้รับความรู้และความเข้าใจในเนื้อหาที่เรียนมากขึ้น มีความพึงพอใจอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.68 ตามลำดับ

การอภิปรายผล

การวิจัย เรื่อง บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ผู้วิจัยขอนำเสนอการอภิปรายผล ดังนี้

1. ผลการประเมินคุณภาพด้านสื่อ โดยรวมอยู่ในระดับดีมาก มีค่าเฉลี่ยเท่ากับ 4.33 คุณภาพด้านเนื้อหาโดยรวมอยู่ในระดับดีมาก มีค่าเฉลี่ยเท่ากับ 4.87 สามารถนำบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ไปใช้ได้ เนื่องมาจากผู้วิจัยได้นำหลักของ ADDIE Model มาเป็นหลักในการสร้างบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน โดยให้ผู้เชี่ยวชาญด้านสื่อ และด้านเนื้อหา ที่มีประสบการณ์ในด้านการพัฒนาสื่อการเรียนการสอนได้ประเมิน และนำข้อเสนอแนะต่าง ๆ ของผู้เชี่ยวชาญมาปรับปรุงแก้ไข จึงทำให้ได้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน ที่มีความสอดคล้องกับวัตถุประสงค์การเรียนรู้และระยะเวลาที่กำหนด ที่มีคุณภาพโดยภายในบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน มีเนื้อหา ประกอบรูปภาพให้ผู้เรียนเข้าใจง่ายขึ้น มีคลิปวิดีโอ และเสียงบรรยายประกอบ ใบงานประกอบด้วยทักษะการสังเกต สำรวจ และทดลอง และเนื้อหาการเรียนรู้อื่น ๆ ที่เหมาะสมสำหรับผู้เรียน ให้ใช้งานได้ง่าย และมีประสิทธิภาพ สอดคล้องกับผลงานวิจัยของ บุญฤทธิ์ กาวี และ ภัทริณี คงชู (2565) การพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site วิชาคณิตศาสตร์ เรื่อง เลขยกกำลัง ผลการวิจัยพบว่า องค์ประกอบและความเหมาะสมในระดับมากที่สุด นอกจากนี้บทเรียนมีการนำเสนอข้อมูลที่เข้าใจง่าย และเพิ่มกิจกรรมที่ส่งเสริมการเรียนรู้เชิงปฏิบัติ

ให้ผู้เรียนมีโอกาสในการทดลอง การฝึกฝน และการทำงานร่วมกัน Google Site ที่สร้างขึ้น บทเรียนออนไลน์ที่สามารถสร้างประสบการณ์การเรียนรู้ที่น่าสนใจและมีประสิทธิภาพสำหรับผู้เรียนได้อย่างมีประสิทธิภาพด้วยการเพิ่มสมบัติที่น่าสนใจ เช่น การใช้งานแบบโต้ตอบ การใช้ภาพเคลื่อนไหว หรือการใช้งานอื่น ๆ ที่ทำให้ผู้ใช้มีประสบการณ์การเรียนรู้ที่น่าสนใจ และสนุกสนานมากขึ้น และเพิ่มคุณค่าในกระบวนการสอนในอนาคต ทำให้เข้าใจการใช้เทคโนโลยีในการสอนทำให้ผู้เรียนมีความสนใจ และมีแรงจูงใจในการเรียนรู้อย่างต่อเนื่องในระยะยาว และการเรียนอย่างมีประสิทธิภาพมากยิ่งขึ้น

2. ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนระหว่างคะแนนก่อนเรียนและหลังเรียนของผู้เรียนโดยใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน พบว่า ผู้เรียนมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียน โดยใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน มีค่าเฉลี่ยเท่ากับ 17.00/14.27 มีนัยสำคัญทางสถิติที่ระดับ .05 เนื่องมาจากผู้วิจัยได้พัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ตามแนวทางของสำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ (2565) ที่ส่งเสริมสนับสนุนให้ครูผู้สอนพัฒนาสื่อเพื่อใช้ในการเรียนการสอน และใช้สื่อเป็นตัวกลางในการถ่ายทอดความรู้ ความเข้าใจ ทักษะต่าง ๆ จากผู้สอนไปยังผู้เรียน เปรียบเสมือนสะพานเชื่อมความคิด ระหว่างกันและกัน หากสื่อได้รับการออกแบบพัฒนาอย่างดีก็จะสามารถสร้างความเข้าใจในประเด็นที่ต้องการนำเสนอได้อย่างถูกต้องด้วย ดังนั้นบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน ได้ออกแบบให้มีลักษณะของการเรียนรู้ที่ผู้เรียนสามารถเข้าไปศึกษาเรียนรู้จากใบความรู้ และแหล่งเรียนรู้เพิ่มเติมจากวิดีโอซ้ำ ๆ หลายรอบได้ และสามารถเรียนรู้ได้จากสมาร์ทโฟนที่นักเรียนมีอยู่ จึงให้ผู้เรียนนั้นเกิดความเข้าใจ สร้างองค์ความรู้สู่การจดจำได้ด้วยตนเอง เกิดการเรียนรู้ได้ดีกว่าผู้ที่เรียนด้วยวิธีปกติ สอดคล้องกับผลงานวิจัยของ กุลนิษฐ์ วงศ์แก้ว (2563) ได้ทำการพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ผลการศึกษาพบว่า ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนระหว่างคะแนนเฉลี่ยของการทดสอบหลังเรียนด้วยบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 สูงกว่าคะแนนเฉลี่ยของการทดสอบก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และสอดคล้องกับผลงานวิจัยของบุญฤทธิ์ กาวี และ ภัทริณี คงชู (2565) ได้ทำการพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site วิชาคณิตศาสตร์ เรื่อง เลขยกกำลัง ผลการวิจัยพบว่าผลสัมฤทธิ์ทางการเรียนหลังเรียนของนักเรียนสูงกว่าก่อนเรียนอย่างมีนัยทางสถิติที่ระดับ .05

3. ผลการศึกษาความพึงพอใจของผู้เรียนที่มีต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน พบว่า ผู้เรียนมีความพึงพอใจต่อบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง สารในชีวิตประจำวัน โดยรวมอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.65 และเมื่อพิจารณารายด้านพบว่า ภาพและวิดีโอประกอบสอดคล้องกับเนื้อหาการเรียนรู้ สื่อ มีความเหมาะสมในการนำไปใช้ในการเรียนการสอน มีความพึงพอใจอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.82 รองลงมา บทเรียนมีรูปแบบที่น่าใช้ น่าสนใจ มีการจัดลำดับเนื้อหาเป็นขั้นเป็นตอนมีความต่อเนื่องอ่านแล้วเข้าใจง่าย บทเรียนใช้งานง่ายสะดวกต่อการเรียนรู้ และมีความทันสมัย ผู้เรียนได้รับความรู้และความเข้าใจในเนื้อหาที่เรียนมากขึ้น มีความพึงพอใจอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.68 .ตามลำดับ สอดคล้องกับผลงานวิจัยของกุลนิษฐ์ วงศ์แก้ว (2563) ได้ทำการพัฒนาบทเรียนออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 ผลการศึกษาพบว่า นักเรียนที่เรียนด้วยบทเรียน

ออนไลน์ด้วยเว็บไซต์ Google Site เรื่อง โครงงานอาชีพเห็ดสวรรค์ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 มีความพึงพอใจอยู่ในระดับมากที่สุด และสอดคล้องกับผลงานวิจัยของ มะลิ จรรยากรณ์ (2563) ได้ทำการพัฒนาห้องเรียนดิจิทัล ด้วย Google Sites รายวิชา เทคโนโลยีสารสนเทศเพื่อการจัดการอาชีพ รหัสวิชา 30001 - 2001 ผลการวิจัยพบว่า ความพึงพอใจของนักศึกษาที่เรียนรู้โดยใช้ห้องเรียนดิจิทัลด้วย Google Site โดยมีค่าเฉลี่ยผลการประเมินรวมทั้งต่อการใช้ห้องเรียนดิจิทัลด้วย Google Site โดยภาพรวมอยู่ระดับมาก มีค่าเฉลี่ย 4.40

ข้อเสนอแนะ

1. การออกแบบการเรียนการสอนที่น่าสนใจและมีประสิทธิภาพด้วยการนำเสนอข้อมูลและกิจกรรมที่เกี่ยวข้องกับสารในชีวิตประจำวันที่ถูกต้องและน่าสนใจสำหรับนักเรียนในระดับชั้นมัธยมศึกษาปีที่ 1 และสร้างประสบการณ์การเรียนรู้ที่น่าสนใจสำหรับนักเรียน

2. การใช้เทคโนโลยีเพื่อเพิ่มประสิทธิภาพในการเรียนรู้ โดยการใช้เทคโนโลยีและเว็บไซต์ Google Site เพื่อเสริมความเข้าใจและการเรียนรู้ของนักเรียนในเรื่อง สารในชีวิตประจำวัน ด้วยการใช้ภาพประกอบ เสียง วิดีโอ และการเชื่อมโยงกับแหล่งข้อมูลเพิ่มเติมเพื่อสร้างประสบการณ์การเรียนรู้ที่เพลิดเพลิน และมีประสิทธิภาพมากขึ้น

3. การศึกษาผลกระทบของการใช้บทเรียนออนไลน์ โดยการใช้บทเรียนออนไลน์ด้วยเว็บไซต์ Google Site ต่อการเรียนรู้ของนักเรียนในระยะยาว และความเปลี่ยนแปลงในการเรียนรู้ของนักเรียน

4. การสร้างความร่วมมือระหว่างครูและนักเรียน ในกระบวนการเรียนรู้ผ่านการใช้บทเรียนออนไลน์ ซึ่งอาจประสานงานกันในการสร้างและปรับปรุงบทเรียนอย่างร่วมมือ

5. การสร้างบทเรียนที่สมบูรณ์และมีประสิทธิภาพด้วยเว็บไซต์ Google Site การนำเสนอข้อมูลเกี่ยวกับสารในชีวิตประจำวันสำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 อาจเสริมความเข้าใจและพัฒนาทักษะการเรียนรู้ของนักเรียนได้อย่างมีประสิทธิภาพและเป็นรูปธรรมในการพัฒนาการสอนในอนาคต

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การพัฒนาแผนการจัดการเรียนรู้วิชาภาษาไทย ตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผน ของนักเรียนชั้นมัธยมศึกษาปีที่ 6 โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก

The Development of Thai Subject Learning Management According to Literature Based Approach, Sepha Khun Chang Khun Phan's Learning Unit for Mathayomsuksa 6 of Nuannoradit Wittayakhom Rachamangkhalapisak School

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1.ศึกษาผลสัมฤทธิ์ทางการเรียนของนักเรียนที่จัดการเรียนรู้โดยใช้วรรณคดีเป็นฐาน 2.ศึกษาความพึงพอใจต่อการเรียนของนักเรียนที่จัดการเรียนรู้โดยใช้วรรณคดีเป็นฐาน กลุ่มตัวอย่างคือ นักเรียนชั้นมัธยมศึกษาปีที่ 6/2 โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก ที่เรียนวิชาภาษาไทยพื้นฐาน ท33101 ปีการศึกษา 2566 จำนวน 31 คน ที่ได้มาจากการสุ่มแบบกลุ่ม (Cluster Sampling) เครื่องมือที่ใช้ในการวิจัย คือ 1) แผนการจัดการเรียนรู้วิชาภาษาไทย ตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน 2) แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน และ 3) แบบสอบถามความพึงพอใจของนักเรียน ผู้วิจัยวิเคราะห์ข้อมูลด้วยค่าสถิติ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และสถิติทดสอบสมมติฐานโดยใช้ t-test

ผลการวิจัยพบว่า 1) นักเรียนมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ .05 และ 2) นักเรียนมีความพึงพอใจต่อการจัดการเรียนรู้วิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐานอยู่ในระดับมาก ($\overline{X}$=4.31, S.D. = 0.66) ทั้งนี้ประโยชน์ของการจัดการเรียนรู้วิชาภาษาไทยโดยใช้วรรณคดีเป็นฐานนั้น ทำให้นักเรียนมีความสนใจในการเรียนวิชาภาษาไทยมากขึ้น ร่วมกิจกรรมการเรียนรู้ในชั้นเรียนอย่างตั้งใจ ทำให้ผลสัมฤทธิ์ทางการเรียนสูงขึ้น

คำสำคัญ: ผลสัมฤทธิ์ทางการเรียน, แผนการเรียนรู้, การสอนโดยใช้วรรณคดีเป็นฐาน

Abstract

The purposes of this research were: 1) to study the students' learning achievement after learning through Literature Based Approach and 2) to study the students' attitudes after learning through Literature Based Approach. The samples are 31 Mathayomsuksa 6/2 students with mixed abilities grouping which was obtained from the cluster sampling. The instruments used for gathering data were comprised of 1) Literature Based Approach lesson plans 2) Academic achievement test and 3) a questionnaire on the students' opinions after learning through Literature Based Approach. The collected data were analyzed by mean, standard deviation and t-test dependent.

The results revealed that: 1) The students' achievement after learning through Literature Based Approach was higher than before learning through Literature Based Approach at the level of .05. 2) The students' attitudes toward the instruction of Literature Based Approach were at good level with the mean of 4.31.

Keywords: Academic Achievement, Learning Plans, Literature-based Teaching

บทนำ

ภาษาไทยเป็นภาษาประจำชาติและใช้ในการติดต่อสื่อสารของคนในสังคม เป็นเครื่องมือในการศึกษาหาความรู้พัฒนาตนเอง พัฒนาอาชีพและช่วยให้มนุษย์ใช้ชีวิตอยู่ในสังคมอย่างมีความสุข นอกจากนี้ภาษายังสร้างความจรรโลงใจ สร้างความสามัคคีในสังคม ภาษาไทยจึงเป็นสมบัติทางวัฒนธรรมอันล้ำค่าที่คนไทยทุกคนควรหวงแหน และสืบทอดให้คงอยู่คู่ชาติสืบไป ดังพระบรมราโชวาทในพระบาทสมเด็จพระบรมชนกาธิเบศร มหาภูมิพลอดุลยเดชมหาราช บรมนาถบพิตร ทรงมีพระราชดำรัสถึงความสำคัญของภาษาไทย เมื่อครั้งเสด็จพระราชดำเนินไปเป็นประธานในการประชุมทางวิชาการที่ชุมนุมภาษาไทย คณะอักษรศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ความว่า "ภาษาไทยนั้นเป็นเครื่องมืออย่างหนึ่ง ภาษาทั้งหลายเป็นเครื่องมือของมนุษย์ชนิดหนึ่ง คือ เป็นทางสำหรับแสดงความคิดเห็นอย่างหนึ่ง เป็นสิ่งที่สวยงามอย่างหนึ่ง เช่น ในทางวรรณคดี เป็นต้น ฉะนั้นจึงจำเป็นต้องรักษาเอาไว้ให้ดี ประเทศไทยนั้นมีภาษาไทยของเราเองซึ่งต้องหวงแหน ประเทศใกล้เคียงของเราหลายประเทศมีภาษาของตนเอง แต่ว่าเขาก็ไม่ค่อยแข็งแรง เขาต้องพยายามหาทางที่จะต้องสร้างภาษาของตนเองไว้ให้มั่นคง เราโชคดีที่มีภาษาของตนเองแต่โบราณกาล จึงสมควรอย่างยิ่งที่จะรักษาไว้" (กรมศิลปากร, 2558) พระราชดำรัสข้างต้นแสดงถึงความสำคัญของการใช้ภาษาไทยอย่างถูกต้อง แข็งแรงเพื่อให้ภาษาไทยคงอยู่สืบไป เมื่อเป็นเช่นนี้ การถ่ายทอดความรู้ทางภาษาไทยที่ถูกต้องสู่เยาวชนของชาติจึงมีความจำเป็นอย่างยิ่ง

การสอนภาษาไทยไทยให้บรรลุตามจุดประสงค์การเรียนรู้นั้น การวางแผนการจัดการเรียนรู้นั้นมีความสำคัญอย่างมาก เนื่องจากเป็นแนวทางให้ผู้เรียนบรรลุผลการเรียนรู้ได้อย่างมีประสิทธิภาพ ทำให้ผู้เรียนมีความเข้าใจสาระสำคัญในบทเรียนได้ตรงกับจุดประสงค์การเรียนรู้ ดังนั้นการวางแผนการจัดการเรียนรู้นั้นผู้สอนจำเป็นต้องศึกษาบริบทในการจัดการเรียนรู้ สภาพผู้เรียน และจัดวางประสบการณ์การเรียนรู้อย่างแยบคาย เพื่อนำผู้เรียนไปสู่จุดมุ่งหมายของการจัดการเรียนการสอน และพัฒนาความคิดคุณธรรมจริยธรรม ตลอดจนคุณลักษณะที่พึงประสงค์ ตามเจตนารมณ์ของพระราชบัญญัติการศึกษาแห่งชาติ พ.ศ.2542 แก้ไขเพิ่มเติม (ฉบับที่ 2) พ.ศ. 2545 และ (ฉบับที่ 3) พ.ศ. 2553 อย่างมีคุณภาพ

ในปัจจุบันสภาพการเรียนการสอนภาษาไทยปรับเปลี่ยนไปจากเดิม ทำให้ครูผู้สอนและนักเรียนต้องปรับแนวทางการเรียนรู้เพื่อให้สอดรับกับสภาพการเปลี่ยนแปลงไป มีปัญหาในการจัดการเรียนรู้ในลักษณะใหม่ ๆ ที่ครูไม่คุ้นชินเข้ามา เช่น การจัดการเรียนรู้แบบออนไลน์ (Online) อย่างไรให้มีคุณภาพ ปัญหาสภาวะถดถอยทางการเรียนรู้ของผู้เรียน ซึ่งมีความจำเป็นต้องแก้ไข นอกจากนี้ยังมีปัญหาที่คุ้นชินที่ครูผู้สอนมักพบเจอบ่อยครั้งในระหว่างการจัดการเรียนรู้อีกมากมาย อาทิ ปัญหาการขาดแคลนสื่อการสอนที่มีคุณภาพ, ปัญหาความสนใจในการเรียนและปัญหาผลสัมฤทธิ์ทางการเรียนของผู้เรียน ซึ่งทั้งหมดที่กล่าวมาเป็นภารกิจที่ครูผู้สอนภาษาไทยจะต้องรับมือและวางแนวทางการแก้ปัญหา เมื่อพิจารณาปัญหาทั้งหลายที่กล่าวมาจึงเป็นความท้าทายที่ครูผู้สอนจะต้องวางแนวทางแก้ปัญหาโดยใช้แนวคิด ทฤษฎีที่เหมาะสมกับบริบทในการจัดการเรียนรู้ของตนเองมากที่สุดเพื่อประโยชน์สูงสุดอันจะเกิดกับผู้เรียนต่อไป

แนวทางการจัดการเรียนรู้วิชาภาษาไทยที่สามารถพัฒนาคุณภาพการศึกษาได้นั้นมีหลายแนวทางด้วยกัน เช่น แนวทางการจัดการเรียนรู้เชิงรุก (Active Learning), แนวทางการจัดการเรียนรู้ฐานสมรรถนะ (Competency-based Language Teaching), แนวทางการจัดการเรียนรู้ในศตวรรษที่ 21 (The 21st Century Learning) หรือแนวคิดการสอนโดยใช้วรรณคดีเป็นฐาน (Literature Based Approach) ล้วนแต่เป็นแนวทางการจัดการเรียนรู้ที่น่าสนใจ และแนวคิดการสอนโดยใช้วรรณคดีเป็นฐาน ก็เป็นแนวทางที่ผู้วิจัยสนใจที่จะใช้ในการจัดการเรียนรู้เพื่อให้สอดรับกับบริบทการจัดการเรียนรู้ สภาพสังคม และลักษณะของผู้เรียน เนื่องจากการสอนแบบวรรณคดีเป็นฐานนั้นเป็นแนวทางการสอนที่ให้อิสระในการเรียนรู้แก่ผู้เรียน ส่งเสริมพัฒนาการทางภาษาอย่างเป็นองค์รวม และเชื่อมโยงวรรณคดีกับชีวิตประจำวันของนักเรียน ทำให้ผู้เรียนเกิดการเรียนรู้ และมีอิทธิพลต่ออารมณ์ของผู้เรียน เป็นการเรียนรู้ที่สอดรับกับความแตกต่างระหว่างบุคคล ดังที่ พรทิพย์ ศิรีสมบูรณ์เวช (2547) กล่าวว่า “การสอนแบบวรรณคดีเป็นฐานจะช่วยให้ผู้เรียนเห็นความเชื่อมโยงระหว่างวรรณกรรมและตัวผู้เรียนได้ การจัดการเรียนการสอนตามแนวทฤษฎีการตอบสนองของผู้อ่านนั้นเป็นการเรียนรู้ที่เน้นผู้เรียนเป็นสำคัญ โดยให้ผู้เรียนเรียนรู้จากการฝึกปฏิบัติจริง และสร้างกระบวนการคิดเพื่อหาแนวทางแก้ไขปัญหาร่วมกับผู้อื่นได้อย่างเป็นระบบ” จึงถือว่าการสอนโดยใช้วรรณคดีเป็นฐาน เป็นแนวทางการสอนที่สอดคล้องกับทฤษฎีการสร้างองค์ความรู้ด้วยตนเอง ผู้เรียนจะมีความสำคัญในฐานะผู้ตีความหมายของสิ่งที่อ่าน โดยใช้ความเข้าใจและประสบการณ์ของตนเองในการสนับสนุนความคิดของตน ผู้เรียนจะแสวงหาความรู้ในเรื่องที่อ่านด้วยตนเองจากแหล่งเรียนรู้ต่าง ๆ รอบตัว โดยผู้วิจัยมุ่งหวังจากผลการจัดการเรียนรู้จะสามารถพัฒนาคุณภาพผู้เรียนและแก้ปัญหาที่เกิดจากการเรียนการสอน และสร้างสภาพที่เอื้อต่อการจัดการเรียนรู้ให้แก่ผู้เรียนต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนของนักเรียนที่จัดการเรียนรู้โดยใช้วรรณคดีเป็นฐาน
2. เพื่อศึกษาความพึงพอใจต่อการเรียนของนักเรียนที่จัดการเรียนรู้โดยใช้วรรณคดีเป็นฐาน

แนวคิด ทฤษฎี กรอบแนวคิด

การสอนโดยใช้วรรณคดีเป็นฐาน

แนวคิดนี้พัฒนามาจากแนวทางการสอนภาษาแบบองค์รวม (Whole Language) บนฐานของทฤษฎี Constructivism โดยมีความเชื่อว่า การเรียนรู้ภาษาที่มีประสิทธิภาพต้องเป็นไปตามธรรมชาติของภาษาที่พัฒนาทักษะแต่ละด้านอย่างสัมพันธ์กัน โดยมีผู้นำเสนอแนวคิดการใช้วรรณคดีเป็นฐานในการ

จัดการเรียนรู้อย่างมากมาย แต่โดยสรุปแล้ว แนวคิดการสอนโดยใช้วรรณคดีเป็นฐาน เป็นการเรียนรู้ที่ใช้วรรณคดีบูรณาการการเรียนรู้เพื่อพัฒนาทักษะทางภาษาไทยแบบสัมพันธ์ทักษะของผู้เรียนให้สอดคล้องกับสาระการเรียนรู้ ซึ่งประกอบด้วย 5 สาระ ได้แก่ การอ่าน การเขียน การฟัง การดู และ การพูด หลักการใช้ภาษา และ วรรณคดีและวรรณกรรม

มีนักการศึกษาได้ให้แนวคิดและหลักการในการสอนภาษาโดยใช้วรรณกรรมเป็นฐานอันเป็นพื้นฐานความเชื่อบทการสอนภาษาตามแนวแบบธรรมชาติ ดังนี้

Nicoll and Roberts (1993) กล่าวว่า การสอนแบบวรรณกรรมเป็นฐานไม่เพียงแต่พัฒนาศักยภาพในการอ่านของผู้เรียนเท่านั้น แต่ยังส่งเสริมให้เกิดความรักการอ่าน สามารถเลือกอ่านได้และสามารถเลือกจะไม่อ่านได้ด้วย

Stewing and Nordberg (1995) ได้เปรียบเทียบให้เห็นความแตกต่างระหว่างการสอนโดยใช้แบบเรียนเป็นฐาน (Text-based) และการสอนโดยใช้วรรณกรรมเป็นฐาน ไวดังนี้

ตารางที่ 1 เปรียบเทียบการสอนโดยใช้แบบเรียนเป็นฐานกับการสอนโดยใช้วรรณกรรมเป็นฐาน

การสอนโดยใช้แบบเรียนเป็นฐาน (Text - based)	การสอนโดยใช้วรรณกรรมเป็นฐาน (Literature Based Approach)
1. เรียงลำดับเนื้อหาแบบค่อยเป็นค่อยไปและเพิ่มความยาก	1. จัดลำดับเนื้อหาตามความสนใจของเด็ก
2. ใช้แบบเรียนเป็นโครงสร้างหลัก	2. ใช้แบบเรียนเป็นแหล่งอ้างอิงสำหรับครูและนักเรียนในการค้นคว้า
3. มีการกำหนดเนื้อหาที่จะสอนไว้ล่วงหน้า	3. ปล่อยเนื้อหาบทเรียนไปตามความสนใจและความสามารถของเด็ก
4. สอนทักษะให้เด็กทั้งกลุ่มเหมือน ๆ กัน	4. ค้นหาและระบุว่าเด็กคนใดต้องได้รับการสอนทักษะใด
5. ใช้แบบทดสอบในการประเมินความก้าวหน้าของเด็ก	5. ใช้แบบประเมินอย่างไม่เป็นทางการที่ครูสร้างขึ้นหลากหลายเพื่อบันทึกและรายงานความก้าวหน้าของเด็ก

แนวคิดและหลักการเกี่ยวกับเนื้อหาที่ใช้ในการเรียนการสอน

มีนักศึกษาได้ให้แนวคิดเกี่ยวกับเนื้อหาที่ใช้ในการเรียนการสอน ดังนี้

1) เด็กอ่านและตอบสนองต่อวรรณกรรมที่ตนสนใจ แม้วาบางครั้งเป็นงานเขียนที่ยาก แต่ก็ไม่เป็นอุปสรรคต่อการเรียนรูระดับความสามารถของเด็ก (Ruddell & Ruddell, 1995)

2) เด็กไม่จำเป็นต้องเข้าใจทุกคำในเรื่อง แต่ต้องเข้าใจเค้าโครง และความหมายโดยรวมของเรื่อง

3) เด็กควรได้มีเวลาในการอ่านที่หลากหลาย ทั้งที่เป็นร้อยแก้ว ร้อยกรอง และ สารคดี

4) วรรณกรรมที่ใช้อ่านความ ช่วยให้สามารถคาดคะเนได้ เช่น เป็นเรื่องที่คุ้นเคย เพื่อให้สามารถควบคุมและมั่นใจในความสามารถของตนเอง

5) งานเขียนของเด็ก ควรมาจากวรรณกรรมและประสบการณจริง

ปฏิสัมพันธ์ระหว่างครูและนักเรียนและบรรยากาศในการเรียนการสอน

Fisher and Terry (1990) ได้ให้คำแนะนำเกี่ยวกับการสร้างปฏิสัมพันธ์ระหว่างครูและนักเรียนและสร้างบรรยากาศในการเรียนการสอน ดังนี้

1) ครูควรให้เกียรติแกภาษาที่นักเรียนติดตัวมาจากบ้าน และใช้เป็นพื้นฐานในการจัดกิจกรรมการเรียนรูภาษา

2) ในระยะแรก ๆ ของการเรียนรู ครูควรส่งเสริมความตั้งใจในการเขียนของนักเรียนโดยยังไม่ตองใสใจเกี่ยวกับความรูเรื่องตัวหนังสือหรือความถูกต้องของการสะกดคำ

3) ครูควรส่งเสริมการลองผิดลองถูกในการอ่านและการเขียน โดยถือว่าความผิดพลาดเป็นธรรมชาติ และการพัฒนาของนักเรียน

4) ครูควรเป็นแม่แบบให้นักเรียนได้เลียนแบบ ครูควรใช้ภาษาด้วยความชื่นชมเพื่อให้นักเรียนเห็นแบบอย่าง และส่งเสริมการอ่านการเขียนของนักเรียน

แนวคิดและหลักการเกี่ยวกับการจัดสภาพห้องเรียน

การเอาใจใสในการจัดสภาพแวดล้อมในห้องเรียนและการเลือกวัสดุอุปกรณ์ เป็นปัจจัยหนึ่งที่ทำให้กระบวนการสอนอ่านเขียนประสบผลสำเร็จได้ การจัดวัสดุอุปกรณ์อย่างเหมาะสม สามารถเพิ่มคุณภาพและประเภทพฤติกรรมการอ่านออกเขียนได้ของนักเรียนได้อย่างมากมาย

ผลการศึกษาเกี่ยวกับกิจกรรมการอ่านชี้ให้เห็นว่า สภาพแวดล้อมของห้องเรียนมีคุณค่าต่อการส่งเสริมและสนับสนุนการรู้หนังสือของเด็ก เด็กในห้องเรียนที่จัดเนื้อที่ใช้งานอย่างมีเป้าหมาย แสดงถึงความคิดเห็นทางศิลปะและผลงานด้านการขีดเขียน ตลอดจนใช้ภาษาพูดที่ซับซ้อนมากกว่าเด็กกลุ่มอื่น ๆ ผู้ใหญ่ที่จัดเตรียมรูปแบบของสภาพแวดล้อมที่บูรณาการเพื่อการอ่านเขียนให้แก่เด็ก สามารถช่วยพัฒนาพื้นฐานความสามารถและระดับความต้องการทางการอ่านเขียนแกเด็กได้

Ruddell and Ruddell (1995) ได้ให้แนวคิดในการจัดสภาพชั้นเรียน ดังนี้

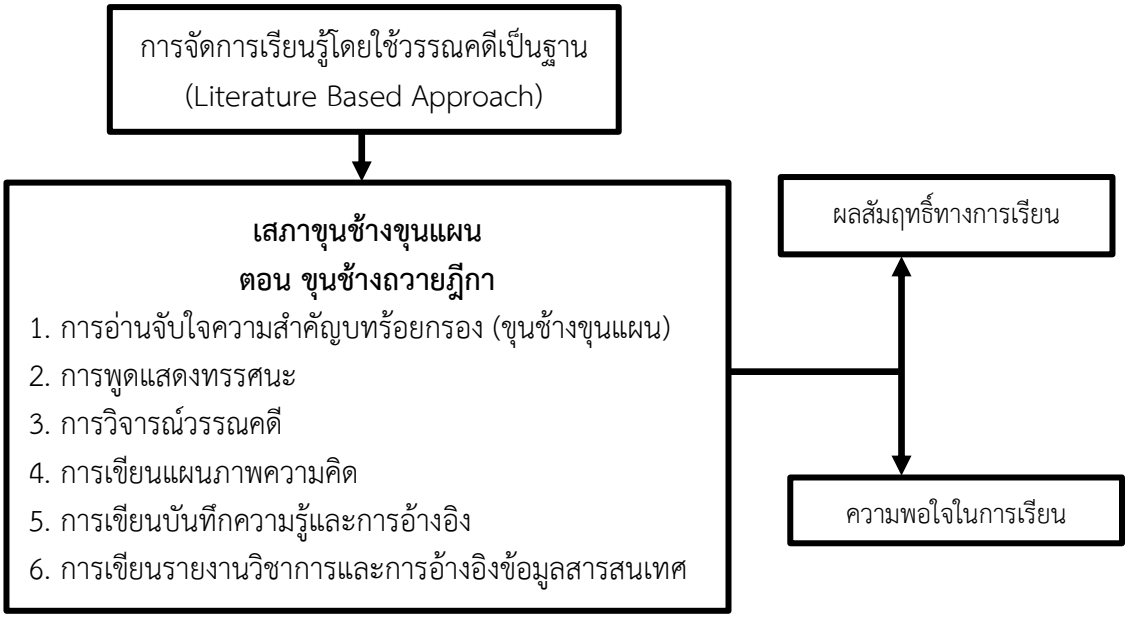
1) มีมุมหรือศูนยการอ่านที่รวบรวมวรรณกรรมต่าง ๆ เช่น หนังสือ นิตยสาร หนังสือพิมพ์ และวัสดุการอ่านอื่น ๆ ซึ่งมีความหลากหลายทั้งในเรื่องระดับความยากง่าย ประเภทของวรรณกรรมตลอดจนเนื้อหา

2) มีพื้นที่ว่างเพียงพอที่จะให้นักเรียนได้ทำกิจกรรมกลุ่มย่อยได้อย่างสะดวกสบาย และไม่รบกวนห้องข้างเคียง

3) มีพื้นที่และระบบการจัดเก็บอุปกรณ์ต่าง ๆ ที่จำเป็น เช่น เครื่องเขียน ที่ช่วยให้นักเรียนสามารถหยิบใช้เพื่อทำกิจกรรมในข้อ 2) หรือกิจกรรมรายบุคคลได้อย่างอิสระ

จากแนวคิดและหลักการดังกล่าวสรุปได้ว่า การสอนภาษาไทยโดยใช้วรรณกรรมเป็นฐาน (Literature Based Approach) ที่นักวิชาการให้ข้อมูลมานั้นไม่สามารถใช้ในการจัดการเรียนรู้ที่สอดคล้องกับบริบทของสถานศึกษาในบางประเด็น แต่ครูผู้สอนสามารถนำมาปรับใช้ให้สอดคล้องกับบริบทของตนเองได้

กรอบแนวคิด



ภาพที่1 กรอบแนวคิดการพัฒนาแผนการจัดการเรียนรู้วิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน

งานวิจัยที่เกี่ยวข้อง

กาญจนา วงศ์กรด (2564) ศึกษาผลสัมฤทธิ์ทางการเรียนวิชาภาษาไทย โดยใช้แนวคิดวรรณคดีเป็นฐานร่วมกับการจัดการเรียนรู้ตามแนวคิดจิตวิทยาเชิงบวก PERMA สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 3 กลุ่มตัวอย่าง คือ นักเรียนชั้นมัธยมศึกษาปีที่ 3/1 โรงเรียนทุ่งเสลี่ยมชนูปถัมภ์ จังหวัดสุโขทัย ในภาคเรียนที่ 2 ปีการศึกษา 2563 จำนวน 37 คน เครื่องมือที่ใช้ในการวิจัย ได้แก่ แผนการจัดการเรียนรู้ และเก็บรวบรวมข้อมูลโดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน และแบบสอบถามความพึงพอใจต่อการเรียน ผลการวิจัยพบว่า หลังการจัดการเรียนรู้วิชาภาษาไทยเชิงบูรณาการโดยใช้แนวคิดวรรณคดีเป็นฐาน ร่วมกับรูปแบบการจัดการเรียนรู้ตามแนวคิดจิตวิทยาเชิงบวก PERMA นักเรียนมีผลสัมฤทธิ์ทางการเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และนักเรียนมีความพึงพอใจต่อการเรียนในระดับมาก

บุษย์ชานันท์ มณเฑียร (2563) พัฒนากิจกรรมการเรียนรู้ผ่านวรรณกรรมภาษาอังกฤษ เพื่อส่งเสริมการอ่านภาษาอังกฤษอย่างมีวิจารณญาณ และความเข้าใจในวัฒนธรรมทางภาษา สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 กลุ่มตัวอย่างเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนเมืองลี้ประชาสามัคคี สังกัดสำนักงานเขตพื้นที่การศึกษามัธยมศึกษา เขต 37 ภาคเรียนที่ 2 ปีการศึกษา 2563 จำนวน 19 คน เครื่องมือที่ใช้ในการวิจัย ประกอบด้วย 1) กิจกรรมการเรียนรู้ผ่านวรรณกรรมภาษาอังกฤษ 2) แบบบันทึกภาคสนาม 3) แบบวัดความสามารถด้านการอ่านภาษาอังกฤษอย่างมีวิจารณญาณ และ 4) แบบวัดความเข้าใจในวัฒนธรรมทางภาษา ผลการวิจัยพบว่า กิจกรรมการเรียนรู้ภาษาอังกฤษผ่านวรรณกรรมมีประสิทธิภาพเป็นไปตามเกณฑ์ที่กำหนด นักเรียนมีความสามารถในการอ่านภาษาอังกฤษอย่างมีวิจารณญาณหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ความเข้าใจในวัฒนธรรม

ทางภาษาของนักเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และนักเรียนมีทัศนคติที่ดีต่อการเรียนภาษาอังกฤษ

วิธีดำเนินการวิจัย

การพัฒนาการจัดการเรียนรู้วิชาภาษาไทย ตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผน ของนักเรียนชั้นมัธยมศึกษาปีที่ 6 โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก ผู้วิจัยดำเนินวิจัยดังนี้

ประชากรและกลุ่มตัวอย่าง

1. ประชากร

ประชากรเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 6 โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก ที่เรียนวิชาภาษาไทยพื้นฐาน ท33101 ปีการศึกษา 2566 จำนวน 88 คน

2. กลุ่มตัวอย่าง

กลุ่มตัวอย่างเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 6/2 โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก ที่เรียนวิชาภาษาไทยพื้นฐาน ท33101 ปีการศึกษา 2566 จำนวน 31 คน ที่จัดห้องเรียนแบบคละความสามารถ โดยได้มาจากการสุ่มแบบกลุ่ม

เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยได้แก่ 1) แผนการจัดการเรียนรู้ 2) แบบสอบถาม

ตัวแปรในการวิจัย

1. ตัวแปรต้น การจัดการเรียนรู้โดยใช้วรรณคดีเป็นฐาน
2. ตัวแปรตาม 2.1 ผลสัมฤทธิ์ทางการเรียนของนักเรียน
   2.2 ความพึงพอใจต่อการเรียนของนักเรียน

รูปแบบการศึกษา

การศึกษาครั้งนี้เป็นการศึกษาวิจัยเชิงทดลอง (Experimental Research) ใช้รูปแบบ One Group Pretest-posttest Design (พวงรัตน์ ทวีรัตน์, 2543) เป็นกระบวนการแก้ปัญหาหรือบรรลุเป้าหมายการพัฒนาโดยการทำวิจัยและการทดลองควบคู่กันไป มีรูปแบบดังนี้

T_1	X	T_2

T_1 แทนการทดสอบก่อนการทดลอง (Pretest)

X แทนการจัดการเรียนรู้วิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน (Experiment)

T_2 แทนการทดสอบหลังการเรียน (Posttest)

เครื่องมือที่ใช้ในการศึกษา

1. แผนการเรียนรู้วรรณคดี 4 ขั้นตอน วิชาภาษาไทย
2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน
3. แบบประเมินความพึงพอใจต่อการเรียนของนักเรียน

ขั้นตอนการหาประสิทธิภาพเครื่องมือในการศึกษา

1. แผนการเรียนรู้วรรณคดี 4 ขั้นตอน วิชาภาษาไทย มีขั้นตอนการสร้างและพัฒนา โดยผู้วิจัยสนใจนำแนวทางการจัดการเรียนรู้วิชาภาษาไทย โดยใช้วรรณคดีเป็นฐานมาตั้งแต่ปีการศึกษา 2558 โดยบูรณาการเนื้อหาวรรณคดีที่กำหนดในบทเรียนกับสาระการเรียนรู้ตามตัวชี้วัด จัดทำหน่วยการเรียนรู้เริ่มจากวรรณคดี เรื่อง กาพย์เห่เรือก่อน จากนั้นจึงเริ่มขยายกิจกรรมการเรียนรู้แบบวรรณคดีเป็นฐาน กับหน่วยการเรียนรู้อื่น ๆ ในส่วนของการสอนวรรณคดี เรื่อง เสภาขุนช้างขุนแผนนั้น ผู้วิจัยใช้การจัดกิจกรรมการเรียนรู้แบบใช้ปัญหาเป็นฐาน (PBL) เนื่องจากว่า วรรณคดี เรื่อง เสภาขุนช้างขุนแผนนั้น มีประเด็นน่าสนใจในการเรียนรู้มากมาย จึงจัดกิจกรรมการเรียนรู้ในรูปแบบโครงงานเปิดโอกาสให้นักเรียนได้ศึกษาหาความรู้ในแง่มุมต่าง ๆ ของวรรณคดีอย่างหลากหลายตามความสนใจ จนได้รับคัดเลือกให้ร่วมการประชุมนำเสนอผลงานวิจัยระดับชาติ กับมหาวิทยาลัยสุโขทัยธรรมาธิราช ครั้งที่ 9 ในรูปแบบบรรยาย เมื่อวันที่ 29 พฤศจิกายน พ.ศ. 2562

โดยผู้วิจัยได้พัฒนาสื่อการสอนให้สอดรับกับการจัดการเรียนที่กำหนดไว้อย่างหลากหลาย ทั้งการสร้างชุดกิจกรรมการเรียนรู้แบบโครงงานเป็นฐาน การพัฒนาสื่ออินโฟกราฟิกเพื่อความเข้าใจในบทเรียนให้แก่ผู้เรียนในระหว่างการจัดการเรียนรู้ และในปีการศึกษา 2566 ผู้วิจัยพบว่า การสอนแบบวรรณคดีเป็นฐานสามารถเชื่อมโยงประสบการณ์การเรียนรู้ให้ผู้เรียนสามารถหาความรู้ควบคู่ไปกับการสอนแบบใช้ปัญหาเป็นฐานได้ จึงทำการปรับปรุงหน่วยการเรียนรู้ เสภาขุนช้าง ขุนแผน พัฒนากิจกรรมการเรียนรู้ให้เหมาะสมกับการสอนโดยใช้วรรณคดีเป็นสื่อ และมีความทันสมัย สอดรับกับการเปลี่ยนแปลง และการใช้ชีวิตประจำวันของนักเรียน โดยมีขั้นตอนในการจัดการเรียนรู้ 4 ขั้นตอน ดังนี้

1. เข้าใจตัวละคร เป็นการนำผู้เรียนเข้าสู่บทเรียน เนื่องจากวรรณคดีบทเรียนที่นักเรียนได้ศึกษามักเป็นเรื่องราวที่ตัดตอนมา ทำให้นักเรียนไม่เข้าใจความเป็นมาของเรื่องราวความสัมพันธ์ ตลอดจนปมความขัดแย้งของตัวละคร ทำให้นักเรียนไม่สามารถเข้าถึงเนื้อเรื่อง และพฤติกรรมที่แสดงออกมาของตัวละครได้ การสอนในขั้น “เข้าใจตัวละคร” ทำให้นักเรียนได้รู้จักตัวละคร และความสัมพันธ์ของตัวละครตลอดจนปมปัญหาในวรรณคดี รวมถึงที่มาและผู้แต่งวรรณคดีโดยสังเขป ซึ่งครูผู้สอนต้องวิเคราะห์ว่าจะนำประเด็นใดของวรรณคดีมาเชื่อมโยงในการจัดการเรียนรู้ในขั้นนี้

2. สอนวรรณคดี เป็นการสอนเนื้อหาของวรรณคดีบทเรียน มุ่งเน้นให้นักเรียนทำความเข้าใจกับเรื่องราว โดยการอ่านทั้งการอ่านออกเสียงบทร้อยกรอง อ่านจับใจความสำคัญ อ่านตีความ แปลความของวรรณคดี จากนั้นร่วมแสดงความคิดเห็นในประเด็นต่าง ๆ

3. ท่วงทีวรรณศิลป์ เป็นขั้นการสอนที่ครูนำสาระการเรียนรู้ตามตัวชี้วัดที่กำหนดไว้มาเชื่อมโยงกับวรรณคดีบทเรียน โดยอาจหยิบยกประเด็นที่ปรากฏในเรื่อง จุดเด่นของวรรณคดี หรือเหตุการณ์รอบตัวในปัจจุบัน เพื่อให้นักเรียนได้พัฒนาทักษะทางภาษาไทยผ่านการอ่าน การเขียน การฟัง การดู และ การพูด โดยใช้กิจกรรมการเรียนรู้ที่หลากหลาย และเน้นผู้เรียนเป็นสำคัญ โดยเนื้อหาที่ครูเลือกควรคำนึงถึงความสัมพันธ์ของเนื้อหาในแผนการเรียนรู้ถัดไปอีกด้วย

4. สุจินตกวี เป็นขั้นตอนการสอนที่เปิดโอกาสให้นักเรียนได้แลกเปลี่ยนเรียนรู้ ร่วมกันวิพากษ์วิจารณ์ ผลงาน ข้อค้นพบ หรือความรู้ที่นักเรียนได้เรียนรู้จากการทำกิจกรรม เพื่อปรับปรุงและพัฒนาตลอดจนประเมินผลร่วมกันอย่างสร้างสรรค์

การพัฒนาแผนการจัดการเรียนรู้วรรณคดี 4 ขั้นตอน มีขั้นตอนดังนี้

1.1 ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 และหลักสูตรการศึกษาขั้นพื้นฐาน วิถีปรัชญาของเศรษฐกิจพอเพียง กลุ่มโรงเรียนเฉลิมพระเกียรติรัชมังคลาภิเษก พุทธศักราช 2552 ฉบับที่ 1 สาระสำคัญหลักสูตร และฉบับที่ 2 โครงสร้างและคำอธิบายรายวิชากลุ่มสาระการเรียนรู้ภาษาไทย

1.2 จัดทำโครงสร้างและคำอธิบายรายวิชาและกำหนดเกณฑ์การวัดและประเมินผลตลอดจนกำหนดเนื้อหาและเวลาในการเรียนเพื่อจัดทำแผนการจัดการเรียนรู้

1.3 กำหนดเนื้อหาให้สอดคล้องกับแผนการเรียนรู้

1.3.1 การอ่านจับใจความสำคัญ

1.3.2 การพูดแสดงทรรศนะ

1.3.3 การวิจารณ์วรรณคดี

1.3.4 การเขียนแผนภาพความคิด

1.3.5 การเขียนบันทึกความรู้และการอ้างอิง

1.3.6 การเขียนรายงานวิชาการและการอ้างอิงข้อมูลสารสนเทศ

1.4 นำแผนการจัดการเรียนรู้ที่พัฒนาขึ้น เข้าร่วมการประชุม PLC ชุมชนการเรียนรู้ทางวิชาชีพ กลุ่มสาระการเรียนรู้ภาษาไทยเพื่อให้ครูที่ร่วมประชุมจำนวน 5 ท่าน พิจารณาความเหมาะสมและสอดคล้องของแผนการจัดการเรียนรู้

1.5 ปรับปรุงแผนการจัดการเรียนรู้ให้เหมาะสม ตามข้อเสนอแนะ

1.6 นำแผนการจัดการเรียนรู้เสนอต่อผู้เชี่ยวชาญจำนวน 3 ท่าน ซึ่งประกอบด้วยครูชำนาญการพิเศษกลุ่มสาระการเรียนรู้ภาษาไทย อาจารย์มหาวิทยาลัยราชภัฏกาญจนบุรี และ ผู้อำนวยการสถานศึกษา สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษาอ่างทอง พิจารณาความเหมาะสมและความสอดคล้องของแผนการจัดการเรียนรู้

1.7 นำแผนการจัดการเรียนรู้ที่พัฒนาขึ้นไปใช้ในการจัดกิจกรรมการเรียนรู้

2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน

การสร้างและพัฒนาแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน แบบทดสอบที่ใช้ในครั้งนี้เป็นแบบทดสอบแบบปรนัยชนิดเลือกตอบ 4 ตัวเลือก จำนวน 20 ข้อ ใช้วัดความรู้ก่อนเรียนและหลังเรียนตามจุดประสงค์เชิงพฤติกรรมของเนื้อหา โดยมีลำดับขั้นตอนการสร้างแบบทดสอบ ดังนี้

2.1 ศึกษาวิธีการสร้างแบบทดสอบวัดผลและประเมินผล หลักการสร้างและวิเคราะห์เครื่องมือในการวิจัย รวมทั้งเทคนิคการเขียนข้อสอบจากตำราเอกสารต่าง ๆ

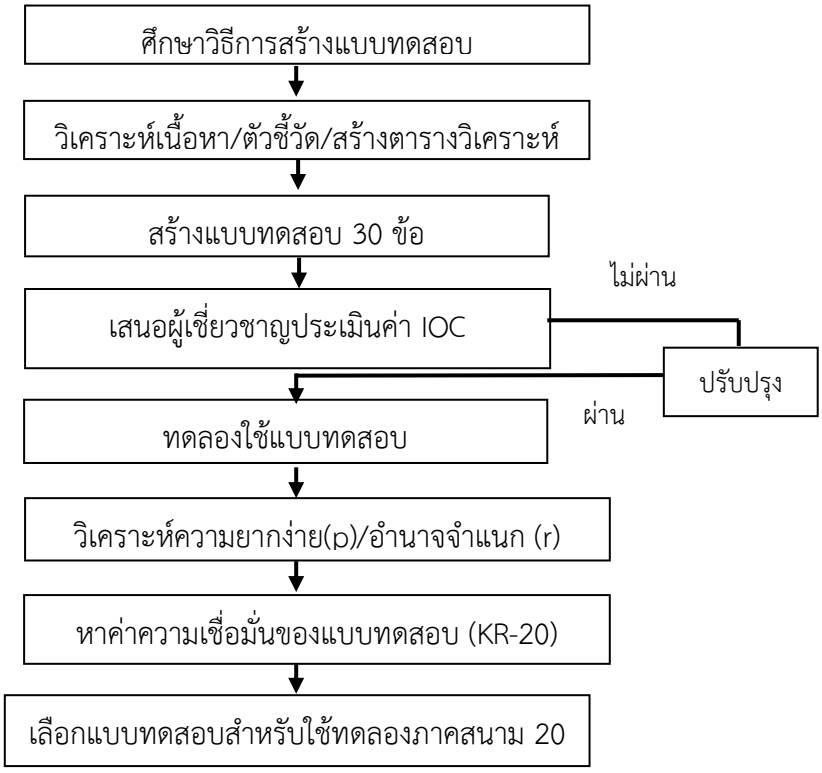
2.2 วิเคราะห์ตัวชี้วัด รายวิชาภาษาไทย หน่วยการเรียนรู้เสภาขุนช้างขุนแผน ตอนขุนช้างถวายฎีกา แล้วสร้างตารางวิเคราะห์ เพื่อสร้างแบบทดสอบตามเนื้อหาและจุดประสงค์เชิงพฤติกรรมที่กำหนดไว้ เป็นแบบทดสอบแบบปรนัยชนิดเลือกตอบแบบ 4 ตัวเลือก จำนวน 40 ข้อ

2.3 นำข้อสอบที่สร้างเสร็จแล้วไปให้ผู้เชี่ยวชาญด้านการวัดผล ประเมินผล พิจารณาความเหมาะสม แล้วนำมาปรับปรุงแก้ไขตามข้อเสนอแนะ

2.4 ตรวจสอบเครื่องมือ ผู้เชี่ยวชาญทำการตรวจสอบความสอดคล้องของข้อสอบกับจุดประสงค์การเรียนรู้ แล้วนำมาวิเคราะห์หาค่า IOC และนำไปทดลองใช้กับนักเรียน ซึ่งไม่ใช่กลุ่มตัวอย่าง จากนั้นนำผลคะแนนมาวิเคราะห์หาค่าความยากง่าย (P)

2.5 นำค่าที่ได้จากการทดสอบมาวิเคราะห์หาข้อสอบที่มีค่าความยากง่าย (P) ระหว่าง .02 -.08 และค่าอำนาจจำแนก (R) ระหว่าง .80 - 1 มาใช้จำนวน 20 ข้อ โดยแบบทดสอบทั้งฉบับมีค่าประสิทธิภาพ อยู่ที่ .94

จากขั้นตอนการสร้างและพัฒนาหาคุณภาพของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน วิชาภาษาไทย หน่วยการเรียนรู้ เสภาขุนช้างขุนแผน ตอนขุนช้างถวายฎีกา สามารถสรุปได้ดังภาพที่ 2



ภาพที่ 2 แสดงการคัดเลือกแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน

3.การสร้างแบบสอบถามความพอใจต่อการเรียนของนักเรียน (Difficulty) มีขั้นตอนดังนี้

3.1 ศึกษาวิธีการสร้างแบบสอบถามความพึงพอใจ จากวิธีการของ (พวงรัตน์ ทวีรัตน์ 2543)

3.2 สร้างข้อความแสดงความพอใจต่อการเรียนวิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน โดยกำหนดค่าระดับแบบสอบถาม เป็น 5 ระดับ คือ

ระดับ 5	หมายถึง	มีความพอใจระดับมากที่สุด
ระดับ 4	หมายถึง	มีความพอใจระดับมาก
ระดับ 3	หมายถึง	มีความพอใจระดับปานกลาง
ระดับ 2	หมายถึง	มีความพอใจระดับน้อย
ระดับ 1	หมายถึง	มีความพอใจระดับน้อยที่สุด

3.3 นำแบบสอบถามที่ได้เสนอผู้เชี่ยวชาญ ซึ่งเป็นครูโรงเรียนนวลนรดิศวิทยาคมรัชมังคลาภิเษก จำนวน 5 ท่าน เพื่อพิจารณาความถูกต้องเชิงเนื้อหา และปรับแก้ตามคำแนะนำของผู้เชี่ยวชาญ

3.4 นำแบบสอบถามความพอใจที่ปรับแก้ไขแล้วไปใช้ในการทดลองภาคสนามต่อไป

การวิเคราะห์ข้อมูล

เพื่อให้การดำเนินการวิจัยเป็นไปอย่างมีประสิทธิภาพ ผู้วิจัยวิเคราะห์ข้อมูลโดยใช้สถิติดังต่อไปนี้

1. ค่าเฉลี่ย (Mean) เป็นการหาค่ากลางของคะแนนที่จะให้ครูมองเห็นภาพรวมของนักเรียนทั้งห้องว่า มีความรู้มากน้อยเพียงใด

2. ค่าส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation: S.D.) มีการแสดงการกระจายของคะแนนว่าคะแนนแต่ละชุดในหนึ่ง ๆ แตกต่างกันมากน้อยเพียงใด ถ้ามีค่าที่ได้มากจะแสดงว่า คะแนนในแต่ละตัวมีความแตกต่างกันมาก ถ้าค่าที่ได้น้อยแสดงว่าคะแนนแต่ละตัวมีค่าใกล้เคียงกัน

3. เปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนและหลัง โดยทดสอบความแตกต่างค่าเฉลี่ยด้วยการทดสอบค่าที (t-test)

ผลการวิจัย

1. นักเรียนมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ .05

ตารางที่ 2 เปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักเรียน

รายการประเมิน	จำนวน (N)	คะแนนเต็ม	ค่าเฉลี่ย ($\bar{x}$)	S.D.	t
ทดสอบก่อนเรียน	31	20	7.90	1.83	00**
ทดสอบหลังเรียน	31	20	16.53	1.21	

**มีนัยสำคัญทางสถิติที่ระดับ .05

2.นักเรียนมีความพึงพอใจต่อการจัดการเรียนรู้ด้วยบทเรียนคอมพิวเตอร์ช่วยสอนวิชา ในระดับมาก ($\bar{X}$= 4.31, S.D. = 0.66)

ตารางที่ 3 แสดงความความพึงพอใจต่อการเรียนของนักเรียนที่เรียนวิชาภาษาไทย ตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน

ลำดับ	รายการประเมิน	ระดับความพอใจ			
		$\bar{x}$	S.D.	แปลผล	ลำดับ
ด้านเนื้อหาบทเรียน					
1	เนื้อหาบทเรียนสอดคล้องกับวัตถุประสงค์	4.41	0.67	มาก	2
2	เนื้อหาบทเรียนมีความเหมาะสม	4.33	0.69	มากที่สุด	5
รวม ด้านเนื้อหาบทเรียน		**4.37**	**0.68**	**มาก**	
ด้านการออกแบบกิจกรรมการเรียนรู้					
3	กิจกรรมการเรียนรู้มีความน่าสนใจ	4.34	0.59	มาก	4
4	กิจกรรมการเรียนรู้มีความหลากหลาย	4.27	0.47	มาก	6

5	กิจกรรมการเรียนรู้ตอบสนองความต้องการของนักเรียน	4.20	0.50	มาก	7
6	กิจกรรมการเรียนรู้ทำให้นักเรียนเกิดความรู้ความเข้าใจ	4.38	0.68	มาก	3
รวม ด้านการออกแบบกิจกรรมการเรียนรู้		**4.29**	**0.56**	**มาก**	
ความพึงพอใจในการเรียน					
7	ครูมีการให้ข้อมูลย้อนกลับ และให้คำแนะนำระหว่างเรียน	4.44	0.72	มาก	1
8	ความพอใจโดยรวมในการเรียนของนักเรียน	4.10	0.76	มาก	8
รวม ความพึงพอใจในการเรียน		**4.27**	**0.74**	**มาก**	
เฉลี่ย (3 ด้าน)		**4.31**	**0.66**	**มาก**	

สรุปและอภิปรายผล

สรุปผล

จากการพัฒนาการจัดการเรียนรู้วิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผนของนักเรียนชั้นมัธยมศึกษาปีที่ 6 โรงเรียนนวลนรดิศวิทยาคม รัชมังคลาภิเษก ปรากฏผลการศึกษาดังนี้

1. นักเรียนที่เรียนวิชาภาษาไทย ตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผน มีผลสัมฤทธิ์ทางการเรียนหลังเรียน ($\bar{x}$ =16.53) สูงกว่าก่อนเรียน ($\bar{x}$ = 7.90) อย่างมีนัยสำคัญทางสถิติที่ระดับ .05

2. นักเรียนมีความพึงพอใจต่อการเรียนวิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผน ในระดับมาก ($\bar{x}$ = 4.31)

การอภิปรายผล

จากการสอนวิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผน ตอนขุนช้างถวายฎีกา พบว่า ผู้เรียนมีผลการเรียนที่ดีขึ้น ทั้งนี้อาจเป็นเพราะว่า ครูผู้สอนมีการพัฒนาการการจัดการเรียนรู้จากเดิมให้มีความทันสมัยเชื่อมโยงกับสถานการณ์รอบตัว ใช้วรรณคดีเป็นสื่อและพัฒนาการจัดการเรียนรู้ ซึ่งครูจะต้องวิเคราะห์หลักสูตร จัดหน่วยการเรียนรู้ จัดวางประสบการณ์การเรียนรู้อย่างแยบคาย เพื่อให้ผู้เรียนไปสู่จุดประสงค์การเรียนรู้ที่กำหนดไว้ โดยครูมีบทบาทในการให้คำแนะนำ และติดตามผลการเรียนรู้ และให้ข้อมูลย้อนกลับแก่ผู้เรียน เพื่อให้ผู้เรียนได้เรียนรู้และพัฒนาทักษะทางภาษาไทย และนำไปสู่สมรรถนะที่ต้องการประจำหน่วยการเรียนรู้ อีกทั้งกระบวนการในการพัฒนากิจกรรมการเรียนรู้ยังได้ผ่านกระบวนการชุมชนการเรียนรู้ทางวิชาชีพ และผ่านการตรวจสอบเนื้อหาโดยผู้เชี่ยวชาญภายนอกมาให้ข้อเสนอแนะ เพื่อปรับปรุงให้เหมาะสมกับบริบทการเรียนรู้ของผู้เรียน สอดคล้องกับ สุนันทา อาจศัตรู (2557) ที่กล่าวว่า การสอนแบบวรรณคดีเป็นฐานทำให้นักเรียนได้รู้จักปฏิบัติกิจกรรมหลากหลายรูปแบบ มีทั้งความยากและง่าย สร้างความสนใจ ท้าทายความรู้สึกให้ต้องทำกิจกรรมให้สำเร็จ โดยมีครูคอยเป็นผู้ชี้แนะให้เกิดการเรียนรู้นำไปสู่การเรียนรู้ของผู้เรียน

นอกจากนี้ ผลการประเมินความพอใจของนักเรียนที่เรียนวิชาภาษาไทยตามแนวทางการสอนโดยใช้วรรณคดีเป็นฐาน หน่วยการเรียนรู้เสภาขุนช้างขุนแผน ตอนขุนช้างถวายฎีกา ยังมีความพอใจใน

การเรียนรู้อยู่ในระดับมาก นั้นอาจเป็นเพราะการสอนวรรณคดี 4 ขั้นตอน (เข้าใจตัวละคร สอนวรรณคดีท่วงทีวรรณศิลป์ และ สุจินตกวี) ที่พัฒนาขึ้นมาเป็นการนำวรรณคดีบทเรียนเข้ามาเชื่อมโยงกับสาระการเรียนรู้ตามตัวชี้วัด ทั้งการอ่าน การเขียน การฟัง การดู การพูด หลักภาษา และวรรณคดี โดยครูเป็นผู้จัดประสบการณ์การเรียนรู้และเนื้อหาให้สอดคล้องกัน เน้นให้ผู้เรียนได้ปฏิบัติทำให้ผู้เรียนเกิดการเรียนรู้และพัฒนาทักษะทางภาษาอย่างเป็นองค์รวม ทั้งการฟัง การพูด การอ่าน และการเขียน ซึ่งต่างกับการเรียนวรรณคดีไทยที่ส่วนมากเน้นการบรรยาย สอดคล้องกับ ชลธิชา ศิริอมรพันธุ์ (2562) ที่ทำการพัฒนารูปแบบการเรียนการสอนวรรณคดีไทยเชิงผลิตภาพเพื่อส่งเสริมความรับผิดชอบ และสำนึกทางสังคม และพบว่า การเรียนการสอนวรรณคดีไทยส่วนมากนิยมใช้การบรรยาย แต่การสอนวรรณคดีไทยเชิงผลิตภาพมีการเปิดโอกาสให้นักเรียนได้ศึกษาค้นคว้าด้วยตนเอง มีการลงมือปฏิบัติ และมีการแลกเปลี่ยนเรียนรู้ร่วมกับเพื่อนสมาชิกในกลุ่มและนอกกลุ่ม ทำให้นักเรียนมีผลสัมฤทธิ์ทางการเรียน และความพอใจต่อรูปแบบการเรียนการสอนที่สร้างขึ้นมากที่สุด

ข้อเสนอแนะ

1. ในการจัดการเรียนรู้วรรณคดี 4 ขั้นตอนครูจำเป็นต้องกำหนดเป้าหมายการเรียนรู้ให้แก่ผู้เรียนและตัดทอนเนื้อหาบางส่วนที่ไม่สัมพันธ์กับเป้าหมายการเรียนรู้ที่กำหนดไว้ออกด้วย
2. ควรจัดการเรียนรู้โดยใช้วรรณคดีเป็นฐานร่วมกับเทคนิคการสอนแบบอื่น ๆ เพื่อพัฒนาทักษะที่จำเป็นหรือทักษะในศตวรรษที่ 21 ของผู้เรียนต่อไป

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การพัฒนาผลสัมฤทธิ์การอ่านจับใจความวิชาภาษาอังกฤษโดยใช้เทคนิค 5W1H ของนักเรียนชั้นประถมศึกษาปีที่ 3

The Development of Reading Comprehension English Achievement Using 5W1H Technique of Third Grade Students

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บทคัดย่อ

การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อเปรียบเทียบผลสัมฤทธิ์การอ่านจับใจความภาษาอังกฤษ ของนักเรียนชั้นประถมศึกษาปีที่ 3 ก่อนเรียนกับหลังเรียนโดยใช้เทคนิค 5W1H และเพื่อศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ศึกษาปีที่ 3 ที่มีต่อการจัดการเรียนรู้โดยใช้เทคนิค 5W1H ในการพัฒนาผลสัมฤทธิ์การอ่านจับใจความภาษาอังกฤษ กลุ่มตัวอย่างในการศึกษาครั้งนี้ ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านนาปง ตำบลห้วยยูง อำเภอเหนือคลอง จังหวัดกระบี่ ภาคเรียนที่ 2 ปีการศึกษา 2565 จำนวน 16 คน ใช้วิธีการเลือกแบบเจาะจง เครื่องมือที่ใช้ในการวิจัยประกอบด้วย (1) แผนการจัดการเรียนรู้การอ่านจับใจความวิชาภาษาอังกฤษโดยใช้เทคนิค 5W1H สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 สาระที่ 1 The First Day of School (2) แบบทดสอบผลสัมฤทธิ์ทางการเรียนรู้ภาษาอังกฤษ และ (3) แบบสอบถามความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 3 ต่อการจัดการเรียนรู้โดยใช้เทคนิค 5W1H วิเคราะห์ข้อมูลโดย วิเคราะห์ค่าร้อยละ (Percentage), การทดสอบสมมติฐาน (Paired t-test) ค่าเฉลี่ย (Mean) และส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation)

ผลการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนการอ่านจับใจความวิชาภาษาอังกฤษหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติ ที่ระดับ .001 และความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่มีต่อการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H มีค่าเฉลี่ยในระดับมากที่สุด (μ= 4.51, σ = 0.31) ผลการวิจัยนี้ คณะผู้วิจัยสามารถนำไปเป็นแนวทางในการจัดการเรียนรู้เพื่อพัฒนาผลสัมฤทธิ์การอ่านจับใจความภาษาอังกฤษ โดยใช้เทคนิค 5W1H ได้อย่างถูกต้องต่อไป

คำสำคัญ: อ่านจับใจความ, ภาษาอังกฤษ, 5W1H

Abstract

The objectives of this research were to study the reading comprehension achievement in English subjects by using the 5W1H technique of third grade students and to study the satisfaction of third grade students towards English reading comprehension learning using the 5W1H technique. For the samples in this research is third grade students Bannapong School Huai Yung, Nuea Khlong, Krabi in the second semester of the academic year 2565, with 16 students were obtained by purposive random sampling. The research tools are consisted of: (1) A learning management plan for reading comprehension using the 5W1H technique for third grade students, Content 1: The First Day of School. (2) English Achievement Test, and (3) The satisfaction questionnaire of third grade students towards English reading comprehension learning was used by using the 5W1H. Test The statistics used in the analysis were Percentage, Paired t-test, Mean (μ) and Standard Deviation (σ)

The results of this study showed that an achievement reading comprehension in English after learning were significantly higher than before studying at the .001 level and the satisfaction of third grade students towards English reading comprehension learning was used by using the 5W1H is in the highest level. (μ =4.51, σ =0.31). The researchers can utilize the findings of this study as guidelines for instructional management aimed for the development of reading comprehension English achievement, using 5W1H technique accurately in the future.

Keywords: Reading comprehension, English, 5W1H

บทนำ

การขับเคลื่อนการพัฒนาเศรษฐกิจของประเทศจำเป็นต้องอาศัย “ภาษา” เป็นเครื่องมือสำคัญในการเข้าถึงข้อมูลองค์ความรู้เพื่อการพัฒนาทักษะ ต่อยอดองค์ความรู้ และใช้ในการสื่อสารที่สร้างสรรค์เพื่อสร้างความมั่นคงทางเศรษฐกิจ นำไปสู่การพัฒนาเพื่อยกระดับคุณภาพชีวิตของประชาชน และการพัฒนาประเทศที่ยั่งยืน ด้วยตระหนักถึงความสำคัญดังกล่าว ทักษะแห่งอนาคตหรือทักษะในศตวรรษที่ 21 จึงให้ความสำคัญกับภาษาอังกฤษ ซึ่งเป็นภาษาสำคัญของโลก ดังเห็นได้ว่าการดำรงชีวิตในโลกอนาคตนั้น ประชาชนต้องมีศักยภาพอย่างสูงทางด้านภาษาและการสื่อสารที่สร้างสรรค์ ดังนั้นทักษะด้านภาษาจึงเป็นสมรรถนะพื้นฐานที่ประชาชนควรได้รับการเตรียมความพร้อม เพื่อให้สามารถปรับตัวให้ทันกับการเปลี่ยนแปลงของโลก (คณะกรรมการจัดทำแผนยุทธศาสตร์ตามนโยบายภาษาแห่งชาติ สำนักงานราชบัณฑิตยสภา, 2561)

ในสังคมโลกปัจจุบันเป็นสังคมโลกไร้พรมแดน ภาษาอังกฤษเป็นภาษาสากลที่มีการใช้กันอย่างแพร่หลายมากที่สุดภาษาหนึ่ง ด้วยอิทธิพลของความก้าวไกลด้านเทคโนโลยีและการสื่อสาร ความเคลื่อนไหวทางเศรษฐกิจ สังคม และวัฒนธรรม ดำเนินไปอย่างรวดเร็ว ส่งผลให้ภาษาอังกฤษทวีความสำคัญมากขึ้นเรื่อย ๆ ในฐานะที่ภาษาอังกฤษเป็น “ภาษาโลก” (English as a global language) (ภีมพสิษฐ์ เตชะราชันย์, 2560) สำหรับประเทศไทยซึ่งภาษาอังกฤษไม่ใช่ภาษาแม่ การเรียนรู้ภาษาอังกฤษส่วนใหญ่ล้วนเกิดผ่านการเรียนการสอนในระบบการศึกษา กระบวนการเรียนการสอนภาษาอังกฤษที่มีประสิทธิภาพ

จึงมีส่วนสำคัญและจำเป็นอย่างมาก ที่จะเสริมสร้างให้ผู้เรียนมีความรู้ความสามารถในการใช้ภาษาอังกฤษเพื่อการสื่อสารและเป็นเครื่องมือในการแสวงหาองค์ความรู้ เพื่อพัฒนาตนเองให้ก้าวทันโลก

จากความสำคัญของภาษาอังกฤษตามที่กล่าวมานี้ กระทรวงศึกษาธิการจึงได้กำหนดให้มีการเรียนการสอนภาษาอังกฤษเป็นภาษาต่างประเทศทุกช่วงชั้น โดยมีความคาดหวังว่าเมื่อนักเรียน เรียนภาษาอังกฤษอย่างต่อเนื่องตั้งแต่ชั้นประถมศึกษาถึงมัธยมศึกษา นักเรียนจะมีความรู้ความสามารถในการรับและส่งสาร มีวัฒนธรรมในการใช้ภาษาถ่ายทอด ความคิด ความรู้ ความเข้าใจ ความรู้สึกและทัศนะของตนเอง เพื่อแลกเปลี่ยนข้อมูลข่าวสารและประสบการณ์ที่เป็นประโยชน์ต่อการพัฒนาตนเองและสังคม โดยเฉพาะอย่างยิ่งทักษะการอ่าน ซึ่งเป็นทักษะที่ให้ประโยชน์สำหรับการแสวงหาความรู้เพื่อนำไปใช้ปรับปรุงและพัฒนาคุณภาพชีวิตและสังคม (สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน, 2552)

สิ่งที่มีความสำคัญและช่วยให้การอ่านประสบความสำเร็จ คือ ความสามารถในการอ่านและความเข้าใจในการอ่าน โดยเฉพาะความเข้าใจในการอ่านนั้นเป็นสิ่งสำคัญมาก การอ่านจะไม่เกิดประโยชน์หากผู้อ่านไม่เข้าใจเรื่องที่ตนอ่าน ฤดี กมลสวัสดิ์ (2554) กล่าวว่า การอ่านจับใจความสำคัญ คือ การอ่านโดยมีจุดมุ่งหมายเพื่อเก็บสาระสำคัญ ความรู้ ข้อมูลที่น่าสนใจ และแนวความคิดหรือทัศนะของผู้เขียนของเรื่องที่อ่าน อีกทั้งยังเป็นการอ่านที่ต้องการแยกแยะเรื่องที่อ่านให้ได้ว่าส่วนใดเป็นใจความหรือข้อความที่สำคัญที่สุด และส่วนใดเป็นข้อความประกอบ การจับใจความจะช่วยให้ผู้อ่านเข้าใจว่าผู้เขียนต้องการสื่ออะไร โดยผู้อ่านต้องใช้ความสามารถทางภาษา ประสบการณ์ หรือภูมิหลังในด้านการแปลความหมายของคำข้อความ เพื่อจับใจความได้รวดเร็วขึ้น

จากผลการทดสอบผลการทดสอบทางการศึกษาระดับชาติ (Ordinary National Educational Test: O-NET) พบว่า คะแนนรายวิชาภาษาอังกฤษ ของนักเรียนชั้นประถมศึกษา โรงเรียนบ้านนาปง อำเภอเหนือคลอง จังหวัดกระบี่ มีคะแนนผลการสอบประจำปีการศึกษา 2565 ต่ำกว่าเกณฑ์ที่สถาบันทดสอบทางการศึกษาแห่งชาติกำหนดไว้ สุวิทย์ มูลคำ (2556) กล่าวไว้ว่า ผลการทดสอบที่โดยภาพรวมของโรงเรียนที่มีผลคะแนนการสอบในรายวิชาภาษาอังกฤษต่ำนั้น เนื่องมาจากทักษะการอ่านของนักเรียนอยู่ในระดับต่ำ สาเหตุเนื่องมาจากผู้สอนใช้วิธีการสอนที่ไม่เหมาะสม ทำให้การอ่านของนักเรียนล้มเหลว และการสอนไม่ได้ให้นักเรียนได้พัฒนาทักษะการอ่านอย่างแท้จริง เนื่องจากผู้สอนจะเน้นไปในด้านการแปล เน้นความจำคำศัพท์ กฎไวยากรณ์ ซึ่งไม่ส่งเสริมทักษะการคิด ทำให้ไม่สามารถสรุปองค์ความรู้จากการอ่านให้ออกมาเป็นคำพูดหรือตัวอักษร นักเรียนไม่เข้าใจในการอ่าน ประกอบกับผู้สอนไม่ได้สอนให้นักเรียนฝึกฝนกระบวนการอ่านอย่างแท้จริง แต่จะสอนโดยวิธีแปลเป็นภาษาไทยแทนที่จะให้นักเรียนทำความเข้าใจโดยใช้ภาษาอังกฤษและที่สำคัญอีกประการหนึ่ง คือ ทักษะการอ่านต้องอาศัยประสบการณ์ความรู้เดิม ประสบการณ์ในการเรียนรู้ สิ่งแวดล้อมและกิจกรรมการเรียนการสอนซึ่งมีอิทธิพลที่จะช่วยให้ผู้เรียนเกิดความพอใจในการเรียน โดยผู้สอนต้องจัดกิจกรรมที่เหมาะสมกับวัย ความสามารถ ความถนัดในการเรียน และต้องให้นักเรียนใช้ภาษาอังกฤษให้มากที่สุดไม่ควรใช้ภาษาไทย และควรสอนให้นักเรียนมีความสามารถใช้ภาษาเป็นเครื่องมือในการทำความเข้าใจกับสิ่งพิมพ์ในรูปแบบต่าง ๆ ที่ปรากฏจริงในชีวิตประจำวัน

จากสภาพปัญหาดังกล่าวข้างต้น คณะผู้วิจัยซึ่งปฏิบัติหน้าที่สอนภาษาอังกฤษระดับชั้นประถมศึกษาปีที่ 3 พบว่า นักเรียนส่วนใหญ่ไม่สามารถสรุปองค์ความรู้จากการอ่านให้ออกมาเป็นคำพูดหรือตัวอักษร นักเรียนไม่เข้าใจในการอ่าน คณะผู้วิจัยทำการศึกษาเทคนิคและวิธีการสอนการอ่านจับใจความภาษาอังกฤษ พบว่า วิธีการสอนการอ่านจับใจความภาษาอังกฤษที่น่าสนใจ คือ เทคนิค 5W1H ซึ่งเป็น

ส่วนหนึ่งของคำถาม 6 ประเภทตามแนวคิดของบลูม (Bloom) เพื่อให้สอดคล้องกับระดับความสามารถในการอ่านจับใจความ คือ Who What Where When Why และ How แต่ในงานวิจัยครั้งนี้คณะผู้วิจัยเลือกใช้เพียง 4W1H คือ Who What Where When และ How โดยตัด Why ออก ทั้งนี้เนื่องจากในสาระที่ 1 ภาษาเพื่อการสื่อสารมีจุดประสงค์การเรียนรู้เพื่อให้ผู้เรียนเข้าใจและตีความเรื่องที่ฟังและอ่านจากสื่อประเภทต่าง ๆ และแสดงความคิดเห็นอย่างมีเหตุผลซึ่งเทคนิค 4W1H เหมาะสมกับความรู้พื้นฐานของนักเรียนและระดับชั้นของนักเรียนชั้นประถมศึกษาปีที่ 3

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบผลสัมฤทธิ์การอ่านจับใจความภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 ก่อนเรียนกับหลังเรียนโดยใช้เทคนิค 5W1H

2. เพื่อศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ศึกษาปีที่ 3 ที่มีต่อการจัดการเรียนรู้โดยใช้เทคนิค 5W1H ในการพัฒนาผลสัมฤทธิ์การอ่านจับใจความภาษาอังกฤษ

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดเกี่ยวกับการจัดการเรียนรู้โดยใช้เทคนิคการสอน 5W1H

รูปแบบ 5W1H เป็นรูปแบบการตั้งประเด็นถามตอบ เพื่อให้นักเรียนบรรลุเป้าหมายที่กำหนดไว้ ซึ่งเป็นส่วนหนึ่งของคำถาม 6 ประเภทตามความคิดของบลูม (Bloom) โดย วิทวัฒน์ ขัตติยะมาน และอมลวรรณ วีระธรรม (2549) สรุปไว้ดังนี้

1. Who ใคร คือ บุคคลสำคัญที่เป็นตัวประกอบหรือผู้เกี่ยวข้องที่จะได้รับผลกระทบ ทั้งด้านบวกและด้านลบ เช่น ใครอยู่ในเหตุการณ์บ้าง ใครน่าจะเกี่ยวข้องกับเหตุการณ์เช่นนี้บ้าง ใครน่าจะเป็นคนที่ทำให้เกิดเหตุการณ์เช่นนี้มากที่สุด

2. What ทำอะไร คือ ปัญหาหรือสาเหตุที่เกิดขึ้น เช่น เกิดอะไรขึ้นบ้าง มีอะไรเกี่ยวข้องกับเหตุการณ์นี้ หลักฐานที่สำคัญที่สุดคืออะไร สาเหตุที่ทำให้เกิดเหตุการณ์นี้คืออะไร

3. Where ที่ไหน คือ สถานที่หรือตำแหน่งที่เกิดเหตุการณ์ เช่น เรื่องนี้เกิดขึ้นที่ไหน เหตุการณ์นี้น่าจะเกิดขึ้นที่ใดมากที่สุด

4. When เมื่อไหร่ คือ เวลาหรือเหตุการณ์นั้นได้เกิดขึ้นหรือจะเกิดขึ้น เช่น เหตุการณ์นั้นน่าจะเกิดขึ้นเมื่อไหร่ เวลาใดที่สถานการณ์เช่นนี้จะเกิดขึ้นได้

5. Why ทำไม คือ สาเหตุหรือมูลเหตุที่ทำให้เกิดขึ้น เช่น เหตุใดต้องเป็นคนนี้ เป็นเวลานี้เป็นสถานที่นี้ เพราะเหตุใดเหตุการณ์นี้จึงเกิดขึ้น ทำไมจึงเกิดเรื่องนี้

6. How อย่างไร คือ รายละเอียดของสิ่งที่เกิดขึ้นแล้วกำลังจะเกิดขึ้นว่ามีความเป็นไปได้ในลักษณะใด เช่น เขาทำสิ่งนี้ได้อย่างไร ลำดับเหตุการณ์นี้ดูว่าเกิดขึ้นได้อย่างไร มีหลักฐานในการพิจารณาอย่างไรบ้าง

ภาพที่ 1 เทคนิค 5W1H

การใช้เทคนิค 5W1H ในการวิเคราะห์แก้ไขปัญหานั้น ส่วนใหญ่เราจะใช้ในขั้นตอนของการวิเคราะห์ข้อมูล ด้วยการตั้งคำถาม Who is it about? What happened? When did it take place? Where did it take place? และ Why did it happen? ได้คำตอบในแต่ละประเด็น แต่ละข้อของคำถาม ซึ่งในงานวิจัยนี้ผู้วิจัยเลือกใช้เพียง 4W1H โดยตัด Why ออก เหลือเพียง Who What Where When และ How เนื่องจากเทคนิคนี้เหมาะสมใช้กับเนื้อหาที่มีองค์ประกอบเพียง ใคร ทำอะไร ที่ไหน เมื่อไหร่ อย่างไร แต่ไม่ครอบคลุมไปถึงสาเหตุหรือเหตุผลว่าทำไมถึงเกิดเหตุการณ์นั้น ๆ ซึ่งเหมาะสมกับความรู้และระดับชั้นของนักเรียนชั้นประถมศึกษาปีที่ 3

ภาพที่ 2 เทคนิค 4W1H

ณัฐกานต์ เฟื่องมณี (2564) กล่าวว่า เทคนิค 5W1H จะใช้ในการวิเคราะห์ข้อมูลหรือปัญหาได้เกือบทุกรูปแบบ เทคนิค 5W1H เป็นการคิดวิเคราะห์ (Analysis Thinking) ที่ใช้ความสามารถในการจำแนกแยกแยะองค์ประกอบต่าง ๆ ของสิ่งหนึ่งสิ่งใดซึ่งอาจจะเป็นวัตถุ สิ่งของ เรื่องราว หรือเหตุการณ์ นำมาหาความสัมพันธ์เชิงเหตุผลระหว่างองค์ประกอบต่าง ๆ เพื่อค้นหาคำตอบที่เป็นความเป็นจริงหรือที่เป็นสิ่งสำคัญ จากนั้นจึงรวบรวมข้อมูลทั้งหมดมาจัดระบบ เรียบเรียงใหม่ให้ง่ายแก่การทำความเข้าใจ

ทักษพร โพธิ์เหมือน (2561) ได้ทำวิจัยเกี่ยวกับการพัฒนาการอ่านจับใจความ โดยใช้เทคนิค 4W1H ส่งเสริมทักษะการอ่านภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 ผลการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนการอ่านจับใจความภาษาอังกฤษ คะแนนหลังเรียนสูงกว่าคะแนนก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

คณะผู้วิจัยสรุปได้ว่า แนวคิดเกี่ยวกับการจัดการเรียนรู้โดยใช้เทคนิคการสอน 5W1H เป็นการใช้เทคนิคการตั้งคำถามในการจัดการเรียนการสอนในขั้นสอน ประกอบด้วยคำถาม What (อะไร) Where (ที่

ไหน) When (เมื่อไหร่) Who (ใคร) Why (ทำไม) และ How (อย่างไร) ซึ่งในงานวิจัยนี้ คณะผู้วิจัยเลือกใช้ 4W1H โดยตัด Why ออกเพื่อให้เหมาะสมกับความรู้และระดับชั้นของนักเรียนชั้นประถมศึกษาปีที่ 3 โดยในการตั้งคำถามประเด็นต่าง ๆ ต้องสอดคล้องกับเนื้อหา สำหรับการตั้งคำถามนั้นผู้สอนและผู้เรียนต้องมีส่วนร่วมในการตั้งคำถาม อภิปรายคำตอบและแลกเปลี่ยนเรียนรู้ภายในห้องเรียน ซึ่งจะส่งผลให้นักเรียนเกิดแนวทางในการตั้งคำถามและตอบคำถาม และสามารถแยกแยะเนื้อหาออกมาให้เข้าใจได้ง่ายโดยเทคนิคในการตั้งคำถามนั้นจะต้องใช้คำถามจากเหตุการณ์สภาพแวดล้อมที่ใกล้ตัว หรือสิ่งที่ผู้เรียนมีความคุ้นเคยมาก่อน

แนวคิดเกี่ยวกับการอ่านจับใจความ

ธนาธิป เสือขำ (2564) กล่าวว่า การอ่านจับใจความเป็นทักษะที่ต้องการใช้การฝึกฝนจากการอ่านอย่างสม่ำเสมอ ซึ่งจะทำให้ผู้อ่านสามารถอ่านได้อย่างรวดเร็วและจับใจความได้อย่างถูกต้อง หากไม่มีการอ่านอย่างสม่ำเสมอจะทำให้ผู้อ่านต้องใช้เวลาในการอ่านเพิ่มมากขึ้น และไม่สามารถจับใจความของเรื่องที่อ่านได้อย่างครบถ้วน

วรรษมล ศุภคุณ (2564) กล่าวว่า การอ่านจับใจความ คือ กระบวนแปลความหมายจากสิ่งที่อ่านผ่านทางสายตา เพื่อเก็บรวบรวมความคิดที่เสนอผ่านตัวอักษรหรือสัญลักษณ์อย่างมีเหตุผลจนเกิดเป็นความรู้ความเข้าใจอย่างถูกต้องในสิ่งที่อ่าน แล้วนำความรู้นั้นไปถ่ายทอดให้เกิดประโยชน์กับตนเองและผู้อื่นได้

ดวงพร เฟื่องฟู (2560) กล่าวว่า การอ่านจับใจความสำคัญ หมายถึง การอ่านแล้วเข้าใจเรื่องที่อ่าน สามารถจับประเด็นสำคัญของเรื่อง ตอบคำถามจากเรื่อง แปลความหมายของเรื่องที่อ่าน และเข้าใจจุดหมายพร้อมทั้งสรุปสาระสำคัญที่อ่านได้อย่างครอบคลุม

คณะผู้วิจัยสรุปได้ว่า การอ่านจับใจความ เป็นการตอบคำถามจากเรื่องที่อ่านได้ว่า What (อะไร) Where (ที่ไหน) When (เมื่อไหร่) Who (ใคร) และ How (อย่างไร) ซึ่งการตั้งคำถามและตอบคำถามจะต้องครอบคลุมประเด็นหลักของย่อหน้าที่อ่าน

การพัฒนาผลสัมฤทธิ์การอ่านจับใจความวิชาภาษาอังกฤษ โดยใช้เทคนิคการสอน 5W1H เป็นการจัดการเรียนรู้โดยผู้สอนจัดการเรียนการสอนให้กับนักเรียน มุ่งเน้นให้นักเรียนพัฒนาผลสัมฤทธิ์การอ่านจับใจความวิชาภาษาอังกฤษ โดยใช้เทคนิคการสอน 5W1H ตั้งคำถาม โดยกระบวนการขั้นตอนในการสอนผู้วิจัยได้นำวิธีการสอนที่เกี่ยวข้องในด้านการอ่านมาสังเคราะห์ เป็นขั้นตอนการสอนที่เหมาะกับการสอนอ่านร่วมกับเทคนิค 5W1H ดังต่อไปนี้

ผู้วิจัยได้นำวิธีการสอนมาสังเคราะห์เป็นขั้นตอนการสอนที่เหมาะสมกับการนำเทคนิค 5W1H เข้าไปใช้เป็นส่วนช่วยให้ผู้เรียนพัฒนาผลสัมฤทธิ์ในการอ่านจับใจความได้ โดยประกอบด้วยขั้นตอนการสอนทั้งหมด 3 ขั้นตอนดังนี้ 1) ขั้นนำเข้าสู่บทเรียน โดยครูกล่าวทักทายและตั้งคำถามง่าย ๆ โดยการใช้คำถาม 5W1H ถามนักเรียนโดยเชื่อมโยงกับเรื่องที่นักเรียนจะได้อ่าน 2) ขั้นกิจกรรม 2.1) แบ่งกลุ่มนักเรียนออกเป็นกลุ่ม กลุ่มละ 3 คน โดยแต่ละกลุ่มจะมีนักเรียนเก่ง ปานกลาง และอ่อนอย่างละ 1 คน 2.2) ให้นักเรียนเลือกหัวหน้ากลุ่มพร้อมตั้งชื่อกลุ่มของตนเอง โดยทุกคนจะต้องช่วยเหลือ และให้ความร่วมมือกัน 2.3) ครูสอนวิธีการอ่านจับใจความโดยการใช้ เทคนิค 5W1H แก่นักเรียน อธิบายถึงการใช้คำถามและการตอบคำถามให้ถูกต้อง ครูแจ้งจุดประสงค์การเรียนรู้ให้นักเรียนทราบพร้อมให้นักเรียนช่วยเหลือกันโดยการทำงานเป็นกลุ่ม 2.4) ครูแจกใบความรู้ ใบเนื้อเรื่อง และใบงานให้นักเรียนอ่านและช่วยกันจับใจความสำคัญของเรื่อง 2.5) ครูสังเกตพฤติกรรมการเรียนรู้ของนักเรียน ซักถามปัญหาและให้คำแนะนำแก่

นักเรียน 2.6) เมื่อทำใบงานที่ 1 เสร็จแล้ว ให้นักเรียนแต่ละกลุ่มเลือกตัวแทนมา 1 คน ออกมานำเสนอหน้าชั้นเรียน 3) ขั้นสรุปและประเมินผล 3.1) ครูเฉลยแบบฝึกหัดบนกระดานเพื่อให้นักเรียนพัฒนาความรู้จากข้อมูลที่ถูกต้อง 3.2) ครูและนักเรียนช่วยกันสรุป 3.3) ครูแจ้งผลการเรียนให้นักเรียนทราบและให้นักเรียนประเมินความพึงพอใจต่อการเรียนด้วยเทคนิค 5W1H

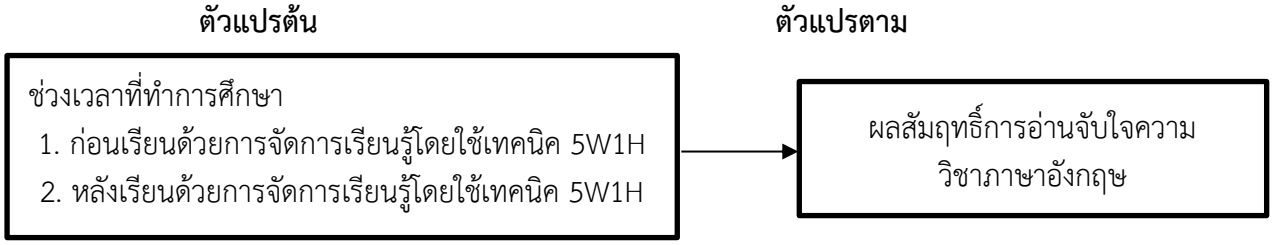
งานวิจัยที่เกี่ยวข้อง

ณัฐกานต์ เฟื่องมณี (2564) ได้ทำการวิจัยการพัฒนาการอ่านคิดวิเคราะห์โดยใช้การจัดการเรียนรู้แบบ 5W1H ร่วมกับแผนผังความคิดสำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 ซึ่งผลการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.5 และนักเรียนมีความพึงพอใจอยู่ในระดับมาก

สิรินรัตน์ น้อยเจริญ (2564) ได้ทำการวิจัยการพัฒนาผลสัมฤทธิ์ด้านการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โดยการจัดการเรียนรู้แบบร่วมมือร่วมกับเทคนิคการตั้งคำถาม 5W1H ผลการวิจัยพบว่า ผลสัมฤทธิ์ด้านการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 2 หลังการจัดการเรียนรู้สูงกว่าก่อนการจัดการเรียนรู้อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และนักเรียนชั้นมัธยมศึกษาปีที่ 2 มีความคิดเห็นต่อการจัดการเรียนรู้แบบร่วมมือร่วมกับเทคนิคการตั้งคำถาม 5W1H อยู่ในระดับเห็นด้วยมาก

ชนกสุดา รักโข (2566) ได้ทำการวิจัยการพัฒนาทักษะการอ่านจับใจความสำคัญภาษาอังกฤษโดยใช้เทคนิคการตั้งคำถาม 5W1H สำหรับนักเรียนระดับชั้นประกาศนียบัตรวิชาชีพชั้นปีที่ 2 กลุ่มสาระภาษาต่างประเทศ ผลการวิจัยพบว่า ทักษะการอ่านจับใจความสำคัญภาษาอังกฤษโดยใช้เทคนิคการตั้งคำถาม 5W1H หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และการพัฒนาการอ่านจับใจความสำคัญโดยการจัดการเรียนรู้โดยใช้เทคนิคการตั้งคำถามของนักเรียนระดับชั้นประกาศนียบัตรวิชาชีพชั้นปีที่ 2 ค่าเฉลี่ยโดยรวมเท่ากับ 16.11 ($\bar{X}$ = 16.11, S.D. = 0.90) เมื่อพิจารณาเป็นรายแผนการจัดการเรียนรู้ พบว่า แผนการจัดการเรียนรู้ที่ 6 คะแนน การอ่านจับใจความสำคัญมีค่าเฉลี่ยมากที่สุดเท่ากับ 18.26 ($\bar{X}$ = 18.26, S.D. = 0.64) รองลงมาคือ แผนการจัดการเรียนรู้ที่ 2 คะแนนเฉลี่ย 16.08 ($\bar{X}$ = 16.08, S.D. = 1.19) และแผนการจัดการเรียนรู้ที่ 1 คะแนนเฉลี่ย 14.00 ($\bar{X}$ = 14.00, S.D. = 1.32)

กรอบแนวคิดการวิจัย



ภาพที่ 3 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากรและกลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ คือ นักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านนาปง ตำบลห้วยยูง อำเภอเหนือคลอง จังหวัดกระบี่ สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษากระบี่ ที่กำลังศึกษาในภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 1 ห้องเรียน จำนวนนักเรียน 24 คน แต่คณะผู้วิจัยเลือกกลุ่มตัวอย่างคือ นักเรียนปกติจำนวน 16 คน ใช้วิธีการเลือกแบบเจาะจงโดยไม่นับรวมนักเรียนที่มีความบกพร่องทางการเรียนรู้ 8 คน

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้การอ่านจับใจความวิชาภาษาอังกฤษ โดยใช้เทคนิค 5W1H สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 สาระที่ 1 The First Day of School
2. แบบทดสอบผลสัมฤทธิ์ทางการเรียนรู้ภาษาอังกฤษ
3. แบบสอบถามความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 3 ต่อการจัดการเรียนรู้โดยใช้เทคนิค 5W1H

การสร้างและการหาคุณภาพเครื่องมือ

1. แผนการจัดการเรียนรู้การอ่านจับใจความวิชาภาษาอังกฤษโดยใช้เทคนิค 5W1H สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 สาระที่ 1 The First Day of School ผู้วิจัยได้ศึกษาข้อมูลที่เกี่ยวข้องเพื่อจัดทำแผนการจัดการเรียนรู้และหาคุณภาพของเครื่องมือ โดยการตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนรายวิชาภาษาอังกฤษ ชั้นประถมศึกษาปีที่ 3 สาระที่ 1 The First Day of School ผู้วิจัยได้ศึกษาข้อมูลที่เกี่ยวข้องเพื่อจัดทำแบบทดสอบวัดผลสัมฤทธิ์ และหาคุณภาพของเครื่องมือ โดยการตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

3. แบบวัดความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 ผู้วิจัยได้ศึกษาข้อมูลที่เกี่ยวข้องเพื่อจัดทำแบบวัดความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษ โดยใช้เทคนิค 5W1H สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 และหาคุณภาพของเครื่องมือโดยการตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

การเก็บรวบรวมข้อมูล

วิธีดำเนินการวิจัยเชิงทดลองการพัฒนาผลสัมฤทธิ์การอ่านจับใจความวิชาภาษาอังกฤษ โดยใช้เทคนิค 5W1H ของนักเรียนชั้นประถมศึกษาปีที่ 3 ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 16 คน มีวิธีดำเนินการวิจัยดังนี้

1. ขั้นเตรียม

1.1 ผู้สอนจัดเตรียมแผนการสอนและรายละเอียดเกี่ยวกับการเรียนการอ่านจับใจความวิชาภาษาอังกฤษโดยใช้เทคนิค 5W1H เพื่อพัฒนาผลสัมฤทธิ์การอ่านภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3

1.2 ทำการทดสอบผลสัมฤทธิ์การเรียนก่อนเรียน (Pre-test) โดยใช้แบบทดสอบก่อนเรียนเรื่อง การอ่านจับใจความวิชาภาษาอังกฤษ ของชั้นประถมศึกษาปีที่ 3 พร้อมบันทึกผลการทดสอบเพื่อวิเคราะห์

1.3 ผู้สอนเริ่มสอนตามแผนการจัดการเรียนรู้ที่กำหนด

2. ขั้นทดลอง

2.1 การวิจัยในครั้งนี้ดำเนินการทดลองในภาคเรียนที่ 2 ปีการศึกษา 2566 โดยคณะผู้วิจัยดำเนินการสอนตามแผนจัดการเรียนรู้การอ่านจับใจความวิชาภาษาอังกฤษ โดยใช้เทคนิค 5W1H จำนวน 1 แผนจัดการเรียนรู้ รวม 3 คาบ โดยให้นักเรียนฝึกทำแบบฝึกหัดการอ่านจับใจความในแต่ละชั่วโมง คือ No Friend for Me, My School และ My New Friend

2.2 เมื่อเรียนจบแต่ละเรื่องแล้วจึงใช้แบบทดสอบหลังเรียนเรื่องการอ่านจับใจความ โดยใช้เทคนิค 5W1H จำนวน 1 ชุด

2.3 ครูให้นักเรียนทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนหลังเรียน (Post-test) ซึ่งเป็นชุดเดียวกันกับแบบทดสอบก่อนเรียน

3. ขั้นสรุป

หลังการจัดกิจกรรมการเรียนรู้ครบทั้ง 3 คาบ ผู้วิจัยได้ดำเนินการให้นักเรียนชั้นประถมศึกษา ปีที่ 3 ทำแบบสอบถามความพึงพอใจต่อการการเรียนการอ่านจับใจความวิชาภาษาอังกฤษ โดยใช้เทคนิค 5W1H

การวิเคราะห์ข้อมูล

สถิติที่ใช้ในการวิเคราะห์ข้อมูล ดังนี้

1. วิเคราะห์และเปรียบเทียบผลสัมฤทธิ์ทางการเรียนรู้การอ่านจับใจความ โดยใช้เทคนิค 5W1H โดยวิเคราะห์ค่าร้อยละ (Percentage) การทดสอบสมมติฐาน (Paired t-test)

2. ค่าเฉลี่ย (Mean) และวิเคราะห์ประเมินแบบสอบถามความพึงพอใจต่อการเรียนรู้ การอ่านจับใจความโดยใช้เทคนิค 5W1H ใช้ ค่าเฉลี่ย (Mean) ส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation) ผู้วิจัยมีเกณฑ์การแปลความหมาย (พล เหลืองรังษี, 2566) ดังนี้

ค่าเฉลี่ย 4.21 - 5.00 มีความพึงพอใจอยู่ในระดับมากที่สุด
ค่าเฉลี่ย 3.41 - 4.20 มีความพึงพอใจระดับมาก
ค่าเฉลี่ย 2.61 - 3.40 มีความพึงพอใจระดับปานกลาง
ค่าเฉลี่ย 1.81 - 2.60 มีความพึงพอใจระดับน้อย
ค่าเฉลี่ย 1.00 - 1.80 มีความพึงพอใจระดับน้อยที่สุด

ผลการวิจัย

ตารางที่ 1 แสดงผลการวิเคราะห์เปรียบเทียบผลสัมฤทธิ์ทางการเรียน นักเรียนชั้นประถมศึกษาปีที่ 3 ก่อนและหลังการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H สาระที่ 1 The First Day of School

รายการ	μ	σ	t	df	Sig.
ก่อนเรียน	11.69	2.06	8.88	15	.000***
หลังเรียน	13.06	2.05			

จากตารางที่ 1 พบว่า นักเรียนได้คะแนนก่อนเรียนเฉลี่ย 11.69 คะแนน และได้คะแนนหลังเรียนเฉลี่ย 13.06 คะแนน พบว่า ผลสัมฤทธิ์ทางการเรียนจากคะแนนแบบทดสอบหลังเรียนสูงกว่าคะแนนแบบทดสอบก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001

ตารางที่ 2 แสดงผลวิเคราะห์ความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 โดยหาค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

	รายการประเมิน	μ	σ	แปลความ
1.	ด้านเนื้อหา	4.64	0.31	มากที่สุด
2.	ด้านการจัดการเรียนรู้	4.32	0.26	มากที่สุด
3.	ด้านชุดกิจกรรม	4.44	0.28	มากที่สุด
4.	ด้านครูผู้สอน	4.67	0.35	มากที่สุด
5.	ด้านประโยชน์ที่ได้รับจากการเรียนรู้	4.50	0.33	มากที่สุด
	ค่าเฉลี่ย	**4.51**	**0.31**	**มากที่สุด**

จากตารางที่ 2 พบว่า ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่มีต่อการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H มีค่าเฉลี่ยในระดับมากที่สุด

สรุปผลการวิจัย

จากผลการวิจัย พบว่า

1. ผลสัมฤทธิ์การอ่านจับใจความภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 หลังเรียนโดยใช้เทคนิค 5W1H สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001
2. ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่มีต่อการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H มีค่าเฉลี่ยในระดับมากที่สุด

การอภิปรายผล

ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนการอ่านจับใจความภาษาอังกฤษ ของนักเรียนชั้นประถมศึกษาปีที่ 3 มีคะแนนเฉลี่ยหลังการจัดการเรียนรู้โดยใช้เทคนิค 5W1H สูงกว่าคะแนนเฉลี่ยก่อนการจัดการเรียนรู้โดยใช้เทคนิค 5W1H อย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ที่ผลเป็นเช่นนี้เพราะ การ

จัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษ โดยใช้เทคนิค 5W1H ส่งเสริมให้นักเรียนได้เรียนรู้จากการใช้คำถาม เพื่อเป็นตัวชี้นำการคิดและหาคำตอบจากเนื้อเรื่องที่อ่าน นอกจากนั้นนักเรียนได้ทราบความหมายของคำศัพท์จากเนื้อเรื่อง ซึ่งทำให้นักเรียนสามารถเข้าใจความหมายของเนื้อเรื่องได้มากขึ้น สอดคล้องกับ ชนกสุดา รักโข (2566) ได้ทำการวิจัยการพัฒนาทักษะการอ่านจับใจความสำคัญภาษาอังกฤษโดยใช้เทคนิคการตั้งคำถาม 5W1H สำหรับนักเรียนระดับชั้นประกาศนียบัตรวิชาชีพชั้นปีที่ 2 สาขาภาษาต่างประเทศ วิทยาลัยเทคโนโลยีพณิชยการหาดใหญ่ อำเภอหาดใหญ่ จังหวัดสงขลา พบว่า ผลสัมฤทธิ์ทางการอ่านจับใจความสำคัญภาษาอังกฤษ โดยใช้เทคนิคการตั้งคำถาม 5W1H หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

ผลการศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่มีต่อการจัดการเรียนรู้การอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H มีค่าเฉลี่ยในระดับมากที่สุด (μ = 4.51, σ = 0.31) ซึ่งสอดคล้องกับ กมลรัตน์ อัจฉริยะมณีกุล, ณัฐมน ศรีราพัฒท์, ชลธชา หงส์คง, และชลชลิตา กมุทธภิไชย (2566) ได้ทำการวิจัยการพัฒนาความสามารถการอ่านจับใจความภาษาอังกฤษ โดยใช้เทคนิค 5W1H ร่วมกับผังมโนทัศน์ของนักเรียนขั้นมัธยมศึกษาปีที่ 4 โรงเรียนกำแพงเพชรพิทยาคม พบว่า ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 4 ที่มีต่อการอ่านจับใจความภาษาอังกฤษโดยใช้เทคนิค 5W1H ร่วมกับผังนโมทัศน์ภาพรวมอยู่ในระดับมากที่สุด ($\bar{x}$= 9.08, S.D. = 4.71)

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. ครูต้องหมั่นฝึกให้นักเรียนอ่านภาษาอังกฤษอย่างสม่ำเสมอโดยใช้เทคนิค 5W1H เพื่อเป็นการช่วยจัดระบบความคิด เพื่อให้นักเรียนสามารถตอบคำถามได้อย่างถูกต้อง และมีใจความสมบูรณ์

2. ครูต้องค้นหาเรื่องที่หลากหลายมีความน่าสนใจทำให้นักเรียนรู้สึกตื่นเต้น และอยากที่จะเรียนรู้ ทั้งนี้เรื่องที่เลือกมาใช้ในการจัดการเรียนรู้ต้องไม่ยากหรือง่ายจนเกินไป สำหรับเด็กในระดับชั้นนั้น ๆ

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรศึกษาเปรียบเทียบความสามารถในการอ่านจับใจความโดยใช้เทคนิค 5W1H กับวิธีการสอนตามรูปแบบอื่น เพื่อศึกษาว่าผลที่ได้รับมีความแตกต่างกันอย่างไร

2. ควรมีการศึกษาพัฒนาการอ่านจับใจความสำคัญภาษาอังกฤษ โดยใช้เทคนิคการตั้งคำถาม 5W1H กับผู้เรียนในระดับชั้นอื่น ๆ และในรายวิชาภาษาต่างประเทศอื่น ๆ โดยการใช้สื่อการเรียนการสอนที่มีความหลากหลาย การใช้แหล่งการเรียนรู้นอกห้องเรียนเพื่อให้เกิดการเรียนรู้ที่หลากหลายมากยิ่งขึ้น

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สิรินรัตน์ น้อยเจริญ. (2564). การพัฒนาผลสัมฤทธิ์ด้านการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โดยการจัดการเรียนรู้แบบร่วมมือร่วมกับเทคนิคการตั้งคำถาม 5W1H. (วิทยานิพนธ์ปริญญามหาบัณฑิต). มหาวิทยาลัยศิลปากร, นครปฐม.

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The Study of the Fourth Grade Student's Learning Achievement and Satisfaction form Studying the Printmaking by Using Natural Materials in the Visual Arts

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บทคัดย่อ

การวิจัยครั้งนี้มีจุดประสงค์เพื่อ 1) เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ กับเกณฑ์ร้อยละ 70 ของนักเรียนชั้นประถมศึกษาปีที่ 4 และ 2) เพื่อศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 4 ต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ กลุ่มตัวอย่าง ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 4 โรงเรียนบ้านควนประกอบ จำนวน 28 คน ภาคเรียนที่ 2 ปีการศึกษา 2566 ได้มาด้วยวิธีการสุ่มตัวอย่างแบบกลุ่มโรงเรียนด้วยวิธีจับสลาก เครื่องมือที่ใช้ในการวิจัย ได้แก่ 1) แผนการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ จำนวน 2 แผน มีค่าความเที่ยงตรงอยู่ที่ 0.93 2) เกณฑ์การประเมินผลงานทักษะการพิมพ์ภาพ มีค่าความเที่ยงตรงอยู่ที่ 1.00 3) แบบวัดความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 มีค่าความเที่ยงตรงอยู่ที่ 0.86 ประโยชน์ของการวิจัย 1) ช่วยในการเสริมสร้างจินตนาการการสร้างสรรค์ผลงานศิลปะของนักเรียนและ 2) เป็นแนวทางในการพัฒนาความสามารถด้านการพิมพ์ภาพวิชาทัศนศิลป์ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ

ผลการวิจัยพบว่า

1) นักเรียนชั้นประถมศึกษาปีที่ 4 มีผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์หลังการจัดการเรียนรู้

โดยใช้วัสดุธรรมชาติ สูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001

2) แบบวัดความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 มีค่าเฉลี่ยรวมเท่ากับ 4.53 อยู่ในระดับมากที่สุด

คำสำคัญ: การพิมพ์ภาพ, วัสดุธรรมชาติ

Abstract

The purpose of this research was 1) To Study of learning achievement in visual arts with the criteria of 70 percent in printmaking using natural materials of grade 4 and 2) To study student's satisfaction with learning management of printmaking using natural materials. The sample group includes 28 students in grade 4 at Ban Kuan Prakob School, Semester 2 the academic year 2023. Obtained by random sampling of schools using lottery methods. the tools used in the research include 1) two learning plans on printmaking using natural materials. validity level between 0.93 2) Form for evaluating work on printmaking skills. validity level between 1.00 3) Form for measuring student satisfaction with learning management on printmaking using natural materials Prathomsuksa 4 validity level between 0.86 Benefits of research 1) Helps in enhancing the imagination of students in creating art works. and 2) It is a guideline for developing abilities printing in the visual arts subject: printing making using natural materials.

The research found that

1. Prathomsuksa 4 students had learning achievement score in visual arts criteria after with learning management. natural materials with the average score higher than 70 percent at the statistical significance level of 0.001.

2. Measurement of students' satisfaction with learning management on the topic of printmaking using natural materials. Grade 4 has an overall average of 4.53, at the highest level.

Keywords: Printing picture, Natural materials

บทนำ

การเรียนรู้ในศตวรรษที่ 21 ควรจัดให้ผู้เรียนได้เรียนรู้และพัฒนาตนเองอย่างต่อเนื่อง มิใช่การจดจำเนื้อหาวิชาเน้นการเรียนรู้ที่เกิดจากความต้องการของผู้เรียนอย่างแท้จริง และลงมือปฏิบัติเพื่อให้เกิดประสบการณ์ตรงและต่อยอดความรู้นั้นได้ด้วยตนเอง ผู้สอนต้องสามารถสร้างและออกแบบสภาพแวดล้อมในการเรียนรู้ที่มีบรรยากาศเกื้อหนุนและเอื้อต่อการเรียนรู้อย่างมีเป้าหมาย (สุวิธิดา จรุงเกียรติกุล, 2561) บุคคลที่สามารถกำกับตนเองได้ในชีวิตประจำวันจะทำให้มีพฤติกรรมคงที่สม่ำเสมอและเป็นมาตรฐานสะท้อนให้เห็นเป้าหมายที่ชัดเจน (Hoyle, 2010) การเปลี่ยนแปลงสภาพทางเศรษฐกิจ สังคม ความเจริญก้าวหน้าทางเทคโนโลยีปรับเปลี่ยนปฏิรูปสังคมสู่ความเป็นสังคมสมัยใหม่ประกอบกับแนวคิดใหม่ ในการจัดการศึกษาขั้นพื้นฐานที่มุ่งพัฒนาผู้เรียนให้เป็นคนที่สมบูรณ์มีความสมดุลทั้งด้านร่างกายจิตใจ สติปัญญา อารมณ์ และสังคม สามารถพัฒนาตนเอง และร่วมมือทำงานกับผู้อื่นได้อย่างสร้างสรรค์ สาระ

การเรียนรู้ศิลปะเป็นกิจกรรมศิลปะมีความสำคัญต่อการพัฒนาเด็กในด้านต่าง ๆ ไม่ว่าจะเป็นด้านอารมณ์ สติปัญญา ร่างกาย สังคม สุนทรียภาพ และการสร้างสรรค์สำหรับกิจกรรมศิลปะทุกประเภท (บุญทิพา เตชะทรงคุณ, 2556) และยังมุ่งเน้นให้ผู้เรียนมีทักษะความคิดริเริ่มสร้างสรรค์ มีจินตนาการทางด้านศิลปะ เห็นคุณค่าและชื่นชมความงามสุนทรียภาพ ซึ่งมีผลต่อคุณภาพชีวิตมนุษย์ ดังนั้นการจัดกิจกรรมศิลปะสามารถนำไปใช้ในการพัฒนาผู้เรียนโดยตรงทั้งด้านร่างกายจิตใจ สติปัญญา อารมณ์ และสังคม ตลอดจนนำไปสู่การพัฒนาสิ่งแวดล้อม ส่งเสริมให้ผู้เรียนมีความเชื่อมั่นในตนเอง และกล้าแสดงออกในเชิงสร้างสรรค์ การเรียนการสอนศิลปศึกษาในปัจจุบันนี้มีบทบาทสำคัญในการพัฒนาคุณภาพของมนุษย์เป็นอย่างมากซึ่งสอดคล้องกับ รัฐนนท์ สว่างผล (2558) ที่กล่าวว่า ความสำคัญของกิจกรรมศิลปะช่วยให้เด็กมีความเชื่อมั่นในตนเอง รู้จักแก้ไขปัญหาได้อย่างเหมาะสม และเป็นการฝึกคิดหาเหตุผลโดยใช้ศิลปะ ในรูปแบบต่าง ๆ เป็นเครื่องมือในการพัฒนาความคิดสร้างสรรค์ นอกจากนั้นยังส่งเสริมสุนทรียภาพของเด็ก ทำให้เด็กรู้จักการแสดงออกทางอารมณ์ตลอดจนความรู้สึกที่เหมาะสมมีกำลังใจในการคิดสร้างสรรค์ต่อไป

ในปัจจุบันปัญหาจากการจัดการเรียนการสอนกลุ่มสาระการเรียนรู้ศิลปะระดับชั้นประถมศึกษา มีกระบวนการเรียนการสอนที่คิดว่างานภาพพิมพ์นั้น เป็นสิ่งที่ยุ่งยาก ซับซ้อน ไม่มีอุปกรณ์ จึงไม่ค่อยนำมาจัดการเรียนการสอนทำให้นักเรียนขาดการแสดงออกทางด้านความคิดสร้างสรรค์ ไม่มีทักษะในการแก้ปัญหา ไม่มีสิ่งเร้ากระตุ้นความสนใจ ทำให้นักเรียนรู้สึกเบื่อหน่ายไม่มีใจรักในการเรียนศิลปะสอดคล้องกับ ชนิดา ปัณณะสฤษฎ์ (2554) ที่กล่าวว่า ในปัจจุบันการเรียนการสอนวิชาศิลปะระดับชั้นประถมศึกษาในประเทศไทย ครูศิลปะส่วนมากจะคิดว่ากิจกรรมภาพพิมพ์นั้น ปฏิบัติยาก และมีปัญหาด้านครูผู้สอนที่ไม่มีความถนัดในการจัดกิจกรรมภาพพิมพ์ กิจกรรมที่จัดการเรียนการสอนส่วนใหญ่จึงเป็นกิจกรรมวาดภาพ ระบายสี เพราะเป็นกิจกรรมพื้นฐานที่สามารถจัดหาอุปกรณ์ได้ง่าย และไม่ยุ่งยาก มีส่วนน้อยที่จะให้นักเรียนทำกิจกรรมภาพพิมพ์ เนื่องจากกิจกรรมภาพพิมพ์เป็นกิจกรรมที่ต้องใช้วัสดุหลากหลายครูต้องเป็นผู้จัดเตรียมอุปกรณ์ อาจทำให้ครูผู้สอนไม่สะดวกในการจัดเตรียมกิจกรรมภาพพิมพ์ จึงไม่เป็นที่นิยมในระดับประถมศึกษาส่งผลไม่ดีต่อคุณภาพโดยรวม เป็นปัญหาด้านผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์เป็นอย่างมาก

ด้วยเหตุผลดังกล่าว จะเห็นได้ว่างานภาพพิมพ์มีความสำคัญยิ่งในการเรียนวิชาทัศนศิลป์และช่วยพัฒนาผู้เรียนทั้งทางด้านร่างกาย จิตใจ สติปัญญา อารมณ์ สังคม ตลอดจนการนำไปสู่การพัฒนาสิ่งแวดล้อม ส่งเสริมให้ผู้เรียนมีความเชื่อมั่นในตนเอง สอดคล้องกับ Balsley (2015) ได้นำเสนอการจัดกิจกรรมศิลปะภาพพิมพ์สำหรับเด็กนักเรียนในชั้นเรียนที่เน้นกระบวนการในการเรียนรู้ ซึ่งมีความสำคัญอย่างยิ่งสำหรับเด็กนอกจากจะได้พัฒนาความแข็งแรงของกล้ามเนื้อมัดเล็กและการประสานสัมพันธ์ระหว่างมือกับสายตาแล้วกิจกรรมศิลปะยังสอดคล้องกับแบบแผนการเรียนรู้ของสมองหรือที่เรียกว่า Brain Base Learning (BBL) โดยเด็กจะได้ฝึกปฏิบัติจริงมีประสบการณ์ตรงเรียนรู้ผ่านการสังเกตและฝึกกิจกรรมอย่างหลากหลาย เพื่อพัฒนาจุดเชื่อมต่อของใยประสาทภายใต้สภาพแวดล้อมที่ผ่อนคลายมีอิสระทางความคิด อันเป็นพื้นฐานในกระบวนการเรียนรู้ให้เกิดประสิทธิภาพสูงสุด ปลูกฝังทักษะในการศึกษาหาความรู้ด้วยตนเองการแลกเปลี่ยนความคิดเห็น โดยจัดกิจกรรมการสอนที่มุ่งเน้นให้นักเรียนเกิดทักษะในการเรียนศิลปะ การแก้ปัญหา และมีความคิดสร้างสรรค์ สอดคล้องกับ สุภาวดี พึ่งฉิ่ง (2562) ที่กล่าวว่า กิจกรรมศิลปะส่งเสริมพัฒนาการทางด้านกระบวนการคิดและด้านต่าง ๆ ของเด็ก เป็นการเปิดโอกาสให้เด็กได้แสดงออกตามความสามารถของตนเอง โดยคำนึงถึงความปลอดภัยของเด็กเป็นสำคัญเพื่อสร้างสรรค์ผลงานและนำมาใช้ประโยชน์ได้อย่างคุ้มค่า ซึ่งจะช่วยให้เด็กคิดเป็น ทำเป็น และแก้ปัญหาเป็น จากสภาพ

ปัญหาและเหตุผลดังกล่าว ผู้วิจัยจึงได้หาวิธีการและแนวทางแก้ปัญหาที่เกิดขึ้น เพื่อให้นักเรียนสามารถค้นคว้าได้ด้วยตนเองและสนใจเรียนมากขึ้น บทเรียนวัสดุนับว่าเป็นนวัตกรรมและเทคโนโลยีทางการศึกษาอีกรูปแบบหนึ่งเหมาะที่จะนำมาใช้จัดกิจกรรมการเรียนการสอน เพราะเป็นการนำเอาวัสดุการสอนเทคนิควิธีการใหม่ ๆ เข้ามาประกอบการเรียนการสอน ซึ่งเป็นวิธีการหนึ่งที่จะนำมาแก้ปัญหาดังกล่าวได้จะทำให้การเรียนการสอนมีประสิทธิภาพมากขึ้น ทำให้ผู้เรียนบรรลุผลการเรียนรู้ตามจุดหมายที่หลักสูตรกำหนดไว้ โดยคิดหาเครื่องมือเข้ามาช่วยในการเรียนการสอน เรื่อง ภาพพิมพ์ สอดคล้องกับ ชญตว์ อินทร์ชา (2561) ได้นำเสนอรูปแบบศิลปะภาพพิมพ์เทคนิคเพลทแม่พิมพ์ เจลาติน ด้วยการใช้สีธรรมชาติในท้องถิ่นของมหาวิทยาลัยราชภัฏร้อยเอ็ด เพื่อแก้ปัญหาการไม่มีอุปกรณ์หรือแท่นพิมพ์ที่จำเป็นในการสร้างสรรค์ผลงานภาพพิมพ์ และการใช้สีจากธรรมชาติที่มีภูมิปัญญาความรู้ในส่วนผสมต่าง ๆ เช่น ประเภทที่มาของสีให้เป็นสีที่ใช้เฉพาะกับเทคนิคภาพพิมพ์ โดยไม่มีสารจากเคมีสังเคราะห์ผสมหรือน้อยที่สุด และใช้วัตถุดิบจากธรรมชาติที่มีอยู่ในท้องถิ่น

จากปัญหาดังกล่าว ผู้วิจัยจึงได้วางแผนดำเนินการแก้ไขด้วยการศึกษาวิธีการสอนจากเอกสารหลักสูตร ตำรา ที่เกี่ยวกับเทคนิคการสอนแบบต่าง ๆ เพื่อพัฒนารูปแบบการจัดกิจกรรมการเรียนการสอนให้บรรลุตามจุดมุ่งหมายของหลักสูตรศึกษาเกี่ยวกับเทคนิค และวิธีการพิมพ์ภาพรวมทั้งการนำวัสดุต่าง ๆ มาใช้ในการจัดการเรียนการสอน เช่น วัสดุธรรมชาติ ผู้วิจัยในฐานะครูผู้สอนวิชาทัศนศิลป์ จึงได้ตระหนักถึงความสำคัญต่อการพิมพ์ภาพ และมีความสนใจที่จะศึกษาการพิมพ์ภาพโดยใช้วัสดุธรรมชาติ ของนักเรียนชั้นประถมศึกษาปีที่ 4

วัตถุประสงค์

1. เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์กับเกณฑ์ร้อยละ 70 เรื่อง ภาพพิมพ์โดยใช้วัสดุธรรมชาติ ของนักเรียนชั้นประถมศึกษาปีที่ 4
2. เพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ของนักเรียนชั้นประถมศึกษาปีที่ 4

แนวคิด ทฤษฎี กรอบแนวคิด

แนวทางการนำวัสดุธรรมชาติมาสร้างผลงานศิลปะ

ศิลปินชาวอังกฤษ Andy Goldsworthy อ้างถึงใน ณัฐรวี วงศ์อริยะกวี (2552) มีแนวคิดในการสร้างสรรค์ผลงานศิลปะจากวัสดุธรรมชาติและวัสดุในท้องถิ่น ซึ่งเป็นการค้นคว้าเกี่ยวกับความสัมพันธ์ระหว่างมนุษย์และธรรมชาติ โดย Andy Goldsworthy เริ่มทำการสำรวจ เรื่อง รูปแบบของธรรมชาติด้วยการจัดเตรียมวัสดุธรรมชาติต่าง ๆ ที่แปลกออกไป และสร้างงานโดยใช้สีและรูปทรงที่มีความโดดเด่นจากธรรมชาติ วัสดุที่เขาใช้มีความโดดเด่นจากธรรมชาติ เช่น กิ่งไม้ โคลน หิมะ หิน ไม้หนาม หยาดน้ำแข็ง ใบไม้ และดอกไม้ ซึ่งจะมีความคงทนอยู่ได้ไม่นาน เขาจึงมีการเก็บผลงานส่วนมากในรูปแบบของการถ่ายภาพ

สำหรับในประเทศไทย การใช้วัสดุธรรมชาติเพื่อสร้างสรรค์งานศิลปะ ปรากฏอยู่ในงานศิลปกรรมแนววัสดุประสม ซึ่ง ณัฐรวี วงศ์อริยะกวี (2552) ได้ทำการวิจัยและรวบรวมตัวอย่างผลงานศิลปิน ที่มีทั้งการใช้วัสดุธรรมชาติผสมผสานกับวัสดุอื่น ๆ เช่น วัสดุสำเร็จจากกระบวนการอุตสาหกรรมและยังมีการใช้วัสดุธรรมชาติหลากหลายชนิดมาประกอบกันการเรียนการสอนในชั้นเด็กประถม กิจกรรมศิลปะช่วยให้เด็กเข้าใจตัวเอง เข้าใจสิ่งแวดล้อมตลอดจนส่งเสริมพัฒนาการในทุกด้าน เด็กจะสนุกสนานกับกิจกรรม

ศิลปะ อันได้แก่ การติด การปะ การปั้น การวาด การละเลง การฉีก เป็นต้น

การสำรวจการรู้จักใช้วัสดุต่าง ๆ เป็นขั้นแรก และขั้นที่สอง คือ การรู้จักผลงานทางศิลปะ ได้แก่ ภาพวาด ภาพปั้น ภาพพิมพ์ งานฝีมือ และภาพระบายสีงานเหล่านี้ ควรเป็นผลงานของศิลปินเด็กควรมีโอกาสสัมผัสอภิปรายและได้ชม จากที่กล่าวมาข้างต้นจะเห็นว่าแนวทางการนำวัสดุธรรมชาติมาสร้างผลงานศิลปะ ผลงานที่ศิลปินสร้างสรรค์ขึ้นมีความหลากหลาย และมีคุณค่าสวยงามด้วยวัสดุธรรมชาติต่าง ๆ ที่แตกต่างกันออกไป โดยคำนึงถึงความปลอดภัยของเด็กเป็นสำคัญ มาสร้างสรรค์ผลงานและนำมาใช้ประโยชน์ โดยอาจจะเพิ่มคุณค่าในด้านความงามคงทนและการนำไปใช้งาน

ทฤษฎีที่ใช้ในการวิจัยครั้งนี้คือ ทฤษฎีโครงสร้างทางสติปัญญา (Structure of Intellect Model) ของกิลฟอร์ด (Guilford, 1967) ได้อธิบายความสามารถทางสมองของมนุษย์ออกมาเป็น 3 มิติ ได้แก่

มิติที่ 1 เนื้อหา (Content) หมายถึง ข้อมูลหรือสิ่งเร้าที่เป็นวัสดุในการคิดซึ่งแบ่งออกเป็น 4 ด้าน ดังนี้

ด้านที่ 1 ภาพ (Figural) หมายถึง ข้อมูลที่เป็นรูปธรรมที่จะรับรู้และระลึกได้ เช่น ภาพเขียน ภาพปั้น

ด้านที่ 2 สัญลักษณ์ (Symbol) หมายถึง รูปแบบที่อยู่ในรูปของเครื่องหมายต่าง ๆ เช่น ตัวอักษร

ด้านที่ 3 ภาษา (Semantic) หมายถึง ข้อมูลที่อยู่ในรูปแบบถ้อยคำที่มีความหมายต่าง ๆ

ด้านที่ 4 พฤติกรรม (Behavior) หมายถึง ความสามารถทางสมองของบุคคลที่รู้จักและมีความเข้าใจในสิ่งต่าง ๆ ได้ทันทีทันใด เช่น เมื่อเห็นของเล่นรูปร่างกลมทำด้วยยางผิวเรียบก็บอกได้ว่าเป็นลูกบอล

มิติที่ 2 วิธีคิด (Operation) เป็นมิติที่แสดงลักษณะการทำงานของสมองในลักษณะต่าง ๆ ซึ่งแบ่งออกเป็น 5 ลักษณะ ดังนี้

1. การรู้จักและเข้าใจ (Cognition) หมายถึง ความสามารถทางสมองของบุคคลที่รู้จักเข้าใจในสิ่งต่าง ๆ ได้ทันทีทันใด เช่น เมื่อเห็นของเล่นรูปร่างกลมทำด้วยยางผิวเรียบก็บอกได้ว่าเป็นลูกบอล

2. การจำ (Memory) ความสามารถทางสมองของบุคคลที่เก็บสะสมรวบรวมข้อมูลต่าง ๆ ไว้แล้วสามารถ ระลึกออกมาในรูปเดิมได้ตามต้องการ เช่น การจำหมายเลขประจำตัวการท่องสูตรคูณ

3. การคิดแบบอเนกนัย (Divergent Thinking) เป็นความสามารถทางสมองของบุคคลที่สามารถคิดได้หลากหลายแง่คิด หลายทิศทาง คิดหาคำตอบได้โดยไม่จำกัดจำนวนจากสิ่งเร้าที่กำหนดให้ในเวลาจำกัด เช่น ให้บอกสิ่งที่ขึ้นต้นด้วยคำว่า น้ำ มาให้มากที่สุด

4. คิดแบบการคิดแบบเอกนัย หรือ ความคิดรวม (Convergent Thinking) เป็นความสามารถทางสมองของบุคคลที่สามารถสรุปข้อมูลที่ดีที่สุดจากข้อมูลที่กำหนดให้ และการสรุปเป็นคำตอบนั้นจะเน้นเพียงคำตอบเดียว เช่น การเลือกคำตอบในการทำข้อสอบแบบเลือกตอบ

5. การประเมินค่า (Evaluation) เป็นการตัดสินใจเกี่ยวกับความดี ความงาม ความเหมาะสม ความพึงพอใจ โดยอาศัยเกณฑ์ที่ดีที่สุด

มิติที่ 3 มิติด้านผลของการคิด (Products) หมายถึง ความสามารถที่เกิดจากการผสมผสานมิติด้านเนื้อหาและด้านปฏิบัติการเข้าด้วยกันเป็นผลผลิตเมื่อสมองรับรู้จากสิ่งเร้าทำให้เกิดการคิดในรูปแบบต่าง ๆ กันซึ่งให้ผลออกมาต่าง ๆ กัน แบ่งออกเป็น 6 ชนิด ดังนี้

1. หน่วย (Units) เป็นส่วนที่ถูกแยกออกมา มีคุณลักษณะเฉพาะของตนเองที่แตกต่างจากสิ่งอื่น

2. จำนวน (Classes) หมายถึง กลุ่มของสิ่งมีชีวิตที่มีคุณสมบัติบางประการร่วมกัน เช่น สุนัข ปลาวาฬ คนเป็นพวกเดียวกัน เพราะต่างก็เลี้ยงลูกด้วยนม

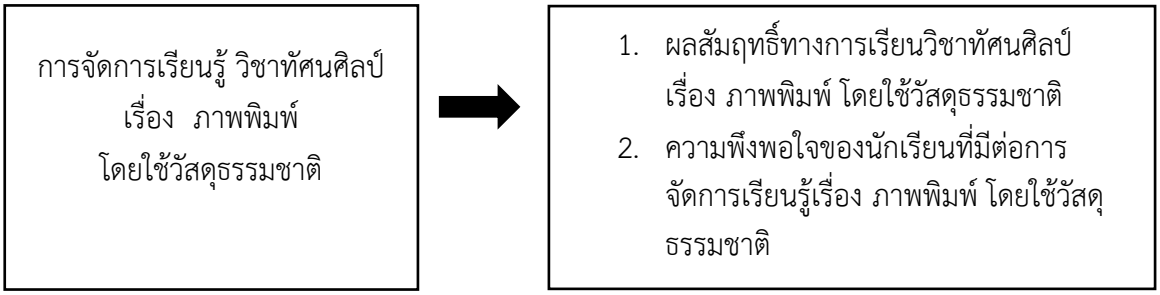
3. ความสัมพันธ์ (Relations) เป็นผลของการเชื่อมโยงความคิดแบบต่าง ๆ ตั้งแต่สองพวกเข้าด้วยกัน โดยอาศัยลักษณะบางอย่างเป็นเกณฑ์ ความสัมพันธ์อาจอยู่ในรูปหน่วยกับหน่วย กลุ่มกับกลุ่ม หรือระบบกับระบบ เช่น การหาคำตรงข้าม การอุปมา อุปมัย

4. ระบบ (System) หมายถึง การเชื่อมโยงความสัมพันธ์ของผลการคิดหลาย ๆ คู่เข้าด้วยกันอย่างมีระบบ เช่น 1, 3, 5, 7, 9 เป็นระบบเลขคี่ เป็นต้น

5. การเปลี่ยนรูป (Transformation) หมายถึง การเปลี่ยนแปลง ปรับปรุง หรือการให้นิยามใหม่ การตีความ การขยายความ การเปลี่ยนแปลงข้อมูลไปใช้ในวัตถุประสงค์อื่น ๆ

6. การประยุกต์ (Implication) หมายถึง การคาดหวังหรือการทำนายเรื่องบางอย่างจากข้อมูลที่กำหนดไว้ให้ และเกิดความแตกต่างไปจากเดิม ทฤษฎีโครงสร้างทางสติปัญญาตามทฤษฎีของกิลฟอร์ดถือว่าเป็นพื้นฐานที่สำคัญในการศึกษาความคิดสร้างสรรค์ เพราะกิลฟอร์ด ได้อธิบายว่า ความคิดสร้างสรรค์เป็นลักษณะการคิดแบบอเนกนัย คือ ความคิดที่หลายทิศทางหลายแง่มุมคิดได้กว้างไกล ซึ่งเป็นลักษณะการคิดที่นำไปสู่สิ่งประดิษฐ์แปลกใหม่ จากข้อสรุปจึงทำให้การศึกษาเรื่องความคิดสร้างสรรค์กว้างขวางขึ้นในเวลาต่อมา

กรอบแนวคิดในการวิจัย



ภาพที่ 1 กรอบแนวคิดในการวิจัย

วิธีดำเนินการวิจัย

กลุ่มประชากร

ประกอบด้วยกลุ่มโรงเรียนในเครือข่ายไพรวัลย์ จำนวน 8 โรง ได้แก่ 1. โรงเรียนบ้านนาทุ่งโพธิ์ 2. โรงเรียนบ้านป่าแก่ 3. โรงเรียนบ้านพูด กรป.กลาง 4. โรงเรียนบ้านคู 5. โรงเรียนบ้านควนประกอบ 6. โรงเรียนบ้านวังปริง 7. โรงเรียนบ้านต้นประดู่ และ 8. โรงเรียนวัดควนขี้แรด

กลุ่มตัวอย่าง

นักเรียนชั้นประถมศึกษาปีที่ 4 โรงเรียนบ้านควนประกอบ อำเภอกงหรา จังหวัดพัทลุง สำนักงานเขตพื้นที่การศึกษาประถมศึกษาพัทลุง เขต 2 ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 1 ห้อง 28 คน ได้มาด้วยวิธีการสุ่มตัวอย่างอย่างง่ายแบบกลุ่มโรงเรียนด้วยวิธีจับสลาก

แบบแผนการวิจัย

ตารางที่ 1 แบบแผนการวิจัย เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 ที่มีการทดสอบหลังเรียน (One Group Posttest Only Design)

กลุ่ม	ทดสอบก่อนเรียน	สิ่งที่ทำการทดลอง	ทดสอบหลังเรียน
E	-	$X_{\text{การจัดกิจกรรมการเรียนรู้ เรื่อง ภาพพิมพ์โดยใช้วัสดุธรรมชาติ}}$	O

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 4 จำนวน 2 แผน แผนละ 1 ชั่วโมง ครอบคลุมเนื้อหา เรื่อง วัสดุอุปกรณ์ และสร้างสรรค์ ภาพพิมพ์จากใบไม้ และภาพพิมพ์จากวัสดุธรรมชาติ มีค่าความเที่ยงตรงอยู่ที่ 0.93

2. แบบประเมินผลสัมฤทธิ์ทางการเรียน โดยวิเคราะห์จากการทำใบกิจกรรมที่สร้างสรรค์ผลงานด้วยวัสดุธรรมชาติมาเปรียบเทียบกับเกณฑ์เป็นร้อยละ 70 ใช้สถิติเทียบกับเกณฑ์ที่กำหนดตามเกณฑ์มาตรฐานหลักสูตรของโรงเรียนบ้านควนประกอบ พุทธศักราช 2563 (โรงเรียนบ้านควนประกอบ, 2563). แนวการปฏิบัติการวัดผล มีดังนี้

ร้อยละ 70 ขึ้นไป หมายถึง ดีเยี่ยม
ร้อยละ 60-69 หมายถึง ดี
ร้อยละ 50-59 หมายถึง พอใช้
ต่ำกว่าร้อยละ 50 หมายถึง ไม่ผ่าน มีค่าความเที่ยงตรงตั้งแต่ 1.00

3. แบบวัดความพึงพอใจของผู้เรียนที่มีต่อวัสดุธรรมชาติ เรื่อง ภาพพิมพ์ เป็นมาตราส่วนประมาณค่า 5 ระดับ ได้แก่ ระดับที่ 1 พึงพอใจน้อยที่สุด ระดับที่ 2 พึงพอใจน้อย ระดับที่ 3 พึงพอใจปานกลาง ระดับที่ 4 พึงพอใจมาก และระดับที่ 5 พึงพอใจมากที่สุด มีค่าความเที่ยงตรงอยู่ที่ 0.86

การเก็บรวบรวมข้อมูล

1. ชี้แจงวัตถุประสงค์ของการจัดการเรียนการสอนนักเรียนปฏิบัติตามกิจกรรม เรื่อง ภาพพิมพ์โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 การจัดกิจกรรมการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 โรงเรียนบ้านควนประกอบ อำเภอกงหรา จังหวัดพัทลุง ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 1 ห้อง 28 คน โดยมีการจัดกิจกรรมการเรียนรู้ด้วยแผนการจัดการเรียนรู้ที่ใช้ในการทำวิจัย จำนวน 2 แผน รวม 2 ชั่วโมง ดังนี้

แผนการจัดการเรียนรู้ที่ 1 เรื่อง วัสดุอุปกรณ์และสร้างสรรค์ภาพพิมพ์จากใบไม้
แผนการจัดการเรียนรู้ที่ 2 เรื่อง ภาพพิมพ์จากวัสดุธรรมชาติ

2. ผู้วิจัยเก็บข้อมูลจากการประกอบกิจกรรมบันทึกผลลงในแบบประเมินผลงานทักษะการพิมพ์และรวบรวมผลงานเทียบกับเกณฑ์ร้อยละ 70 ให้นักเรียนชั้นประถมศึกษาปีที่ 4 ตอบแบบสอบถามความพึงพอใจของผู้เรียนที่มีต่อวัสดุธรรมชาติในการจัดกิจกรรมการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ โดยใช้แบบสอบถามความพึงพอใจที่ผู้วิจัยสร้างขึ้นแล้ววิเคราะห์หาค่า Percentage , $\bar{x}$ และ SD.

การวิเคราะห์ข้อมูล

การวิเคราะห์ข้อมูล ผู้วิจัยได้ทำการวิเคราะห์ข้อมูลไว้ ดังนี้

1. วิเคราะห์ผลสัมฤทธิ์ทางการเรียนของนักเรียนชั้นประถมศึกษาปีที่ 4 เทียบกับเกณฑ์ร้อยละ 70 โดยใช้ One sample t-test

2. วิเคราะห์คะแนนทักษะการปฏิบัติงานโดยใช้ Percentage , $\bar{x}$ และ SD.

3. วิเคราะห์เพื่อหาค่าคุณภาพของแบบประเมินความพึงพอใจของนักเรียนที่มีต่อวัสดุธรรมชาติ การกำหนดเกณฑ์การพิจารณาเกณฑ์การพิจารณาความพึงพอใจ ได้กำหนดเกณฑ์ประเมินไว้ ดังนี้

ค่าเฉลี่ย 4.51 – 5.00 หมายถึง พึงพอใจมากที่สุด
ค่าเฉลี่ย 3.51 – 4.50 หมายถึง พึงพอใจมาก
ค่าเฉลี่ย 2.51 – 3.50 หมายถึง พึงพอใจปานกลาง
ค่าเฉลี่ย 1.51 – 2.50 หมายถึง พึงพอใจน้อย
ค่าเฉลี่ย 1.00 – 1.50 หมายถึง พึงพอใจน้อยที่สุด

ผลการวิจัย

ตารางที่ 2 แสดงผลการเปรียบเทียบคะแนนเฉลี่ยผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์เปรียบเทียบกับเกณฑ์ร้อยละ 70 ของนักเรียน ชั้นประถมศึกษาปีที่ 4 หลังการจัดการเรียนรู้ โดยใช้วัสดุธรรมชาติ

รายการ	เกณฑ์	$\bar{x}$	$S.D.$	t	P
คะแนนเฉลี่ยการพัฒนาความสามารถด้านการพิมพ์	7	8.43	1.200	37.177***	.000

***p < .001

จากตารางที่ 2 พบว่า คะแนนเฉลี่ยผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์เปรียบเทียบกับเกณฑ์ร้อยละ 70 มีค่าคะแนนเฉลี่ยเท่ากับ 8.43 มีค่าคะแนนสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001

ตารางที่ 3 แสดงผลวิเคราะห์ความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 โดยหาค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน พร้อมแปลความตามเกณฑ์

รายการประเมิน	$\bar{x}$	$S.D.$	แปลความ
1. ครูผู้สอนวิชาทัศนศิลป์ช่วยให้นักเรียนมีทักษะในการพิมพ์ภาพ	4.82	0.48	มากที่สุด
2. การสอนของครูผู้สอนวิชาทัศนศิลป์ช่วยให้มีมุมมองในการพิมพ์ภาพ	4.93	0.26	มากที่สุด
3. ครูผู้สอนวิชาทัศนศิลป์ช่วยให้นักเรียนเรียนเข้าใจและปฏิบัติได้ดี	4.96	0.19	มากที่สุด
4. ครูผู้สอนวิชาทัศนศิลป์ช่วยให้นักเรียนอยากเรียนรู้	4.79	0.50	มากที่สุด

ตารางที่ 3 (ต่อ)

รายการประเมิน	$\bar{x}$	$S.D.$	แปลความ
5. ครูผู้สอนวิชาทัศนศิลป์เปิดโอกาสให้นักเรียนมีส่วนร่วมในการปฏิบัติกิจกรรมการเรียนรู้	4.86	0.36	มากที่สุด
6. ครูผู้สอนวิชาทัศนศิลป์มีวิธีการสอนที่หลากหลาย	4.89	0.42	มากที่สุด
7. ครูผู้สอนวิชาทัศนศิลป์ใช้สื่อวัสดุธรรมชาติในการพิมพ์ภาพช่วยให้การเรียนทัศนศิลป์ไม่น่าเบื่อ	4.36	0.49	มาก
8. นักเรียนรู้จักวัสดุอุปกรณ์ในการพิมพ์ภาพ	4.32	0.48	มาก
9. การเรียนวิชาทัศนศิลป์ช่วยให้นักเรียนผ่อนคลาย	4.25	0.44	มาก
10. การเรียนวิชาทัศนศิลป์ช่วยให้นักเรียนมีความรู้ ความเข้าใจ คิดวิเคราะห์อย่างเป็นระบบ แก้ปัญหาเป็น	4.04	0.51	มาก
11. การเรียนวิชาทัศนศิลป์ช่วยฝึกให้นักเรียนวางแผนในการทำงานได้	4.11	0.31	มาก
12. การเรียนวิชาทัศนศิลป์ช่วยฝึกให้นักเรียนมีความคิดริเริ่มสร้างสรรค์	4.96	0.19	มากที่สุด
13. การเรียนวิชาทัศนศิลป์ช่วยฝึกให้นักเรียนมีสมาธิและความเชื่อมั่นในตนเอง	4.11	0.31	มาก
14. การเรียนวิชาทัศนศิลป์ช่วยฝึกให้นักเรียนเสริมสร้างจินตนาการ	4.11	0.31	มาก
15. การเรียนวิชาทัศนศิลป์ช่วยฝึกให้นักเรียนเป็นคนจิตใจอ่อนโยน อารมณ์ดี	4.07	0.26	มาก
16. การเรียนวิชาทัศนศิลป์ส่งเสริมวัฒนธรรมไทย	3.89	0.31	มาก
17. การเรียนวิชาทัศนศิลป์ช่วยให้นักเรียนมีความเชื่อมั่นในการทำกิจกรรมร่วมกันผู้อื่น	4.07	0.26	มาก
18. การเรียนวิชาทัศนศิลป์ช่วยให้นักเรียนมีทักษะการพิมพ์มากขึ้น	5.00	0.00	มากที่สุด
19. นักเรียนสามารถพิมพ์ภาพเป็นเรื่องราวได้	5.00	0.00	มากที่สุด
20. การเรียนวิชาทัศนศิลป์และการให้ความสำคัญช่วยให้นักเรียนมีคุณค่าในตัวเองมากขึ้น	4.21	0.42	มาก
ภาพรวม	**4.53**	**0.11**	**มากที่สุด**

จากตารางที่ 3 พบว่า ความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ ชั้นประถมศึกษาปีที่ 4 มีค่าเฉลี่ยเท่ากับ 4.53 อยู่ในระดับมากที่สุด

สรุปและอภิปรายผล

สรุปผลการวิจัย

จากผลการวิจัย พบว่า

1. ผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ สูงกว่าเกณฑ์ร้อยละ 70 ของนักเรียนชั้นประถมศึกษาปีที่ 4 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001

2. ความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติของนักเรียนชั้นประถมศึกษาปีที่ 4 มีค่าเฉลี่ยรวมเท่ากับ 4.53 อยู่ในระดับมากที่สุด

การอภิปรายผล

1. นักเรียนชั้นประถมศึกษาปีที่ 4 มีผลสัมฤทธิ์ทางการเรียนวิชาทัศนศิลป์หลังการจัดการเรียนรู้โดยใช้วัสดุธรรมชาติสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ผลเป็นเช่นนี้เพราะการจัดการเรียนรู้โดยใช้วัสดุธรรมชาติมีความน่าสนใจ เป็นสิ่งเร้ากระตุ้นสร้างแรงจูงใจให้ผู้เรียนเกิดความสนใจ มีความตื่นเต้นสนุกสนานกับการเรียนทำให้ผู้เรียนไม่รู้สึกเบื่อหน่าย ในการเรียนศิลปะช่วยพัฒนาผู้เรียนทั้งทางด้านร่างกาย สติปัญญา อารมณ์ ความคิดสร้างสรรค์ มุ่งให้ผู้เรียนเกิดทักษะในการพิมพ์ภาพมากยิ่งขึ้น โดยการลงมือทำปฏิบัติด้วยตนเองสามารถแลกเปลี่ยนความคิดเห็น ช่วยเหลือสนับสนุนซึ่งกันและกัน ฝึกการแก้ปัญหา ด้วยเหตุนี้จึงทำให้ผู้เรียนมีผลสัมฤทธิ์ทางการเรียนสูงขึ้น สอดคล้องกับงานวิจัย กิตติ์นิธิ เกตุแก้ว (2564) ได้ศึกษาลักษณะและพัฒนาชุดกิจกรรมของกิจกรรมศิลปะภาพพิมพ์ปลอดสารพิษเพื่อสร้างเสริมสุขภาวะที่เหมาะสมสำหรับผู้สูงอายุจำนวน 5 กิจกรรม โดยนำชุดกิจกรรมไปทดลองใช้กับกลุ่มตัวอย่างในการทดลองใช้กิจกรรม คือ ผู้สูงอายุที่มีอายุตั้งแต่ 60 - 79 ปี ที่ยังมีร่างกายแข็งแรงสามารถช่วยเหลือตนเองได้โดยไม่จำแนกเพศในเขตพื้นที่กรุงเทพฯ และปริมณฑลโดยการรับสมัครผู้เข้าร่วมกิจกรรมตามความสนใจและสมัครใจ จำนวน 20 คน ผลการวิจัยพบว่า ชุดกิจกรรมศิลปะภาพพิมพ์ปลอดสารพิษเพื่อส่งเสริมสุขภาวะสำหรับผู้สูงอายุที่พัฒนาขึ้นมีทั้งหมด 5 กิจกรรม ได้แก่ 1) ทำสีพิมพ์ 2) พิมพ์ภาพด้วยการพับ 3) พิมพ์ภาพด้วยกระดาษลัง 4) พิมพ์ภาพผ่านช่องฉลุ 5) พิมพ์ภาพผ่านร่องลึก ซึ่งผู้สูงอายุที่เข้าร่วมทำกิจกรรมมีผลการประเมินสุขภาวะของผู้สูงอายุหลังทำกิจกรรมศิลปะภาพพิมพ์ปลอดสารพิษเฉลี่ยอยู่ในระดับดีมากที่ 3.32 และค่าส่วนเบี่ยงเบนมาตรฐานมีค่าการกระจายตัวน้อยอยู่ที่ 0.19 ซึ่งสามารถแปลผลได้ว่า ผู้สูงอายุส่วนใหญ่มีความเข้าใจในกระบวนการทางศิลปะภาพพิมพ์ อยากศึกษาเพิ่มเติม มีความสนใจในการสร้างสรรค์ มีความเห็นว่าวัสดุอุปกรณ์ในการทำกิจกรรมมีความเหมาะสมสามารถทำกิจกรรมศิลปะภาพพิมพ์สำเร็จลุล่วง และมีความพึงพอใจกับผลงานที่ตนเองได้สร้างสรรค์ขึ้น นอกจากนี้ยังมีความยินดีที่จะแนะนำกิจกรรมศิลปะภาพพิมพ์ให้เพื่อนและคนในครอบครัวได้รู้จักต่อไป

2. ความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติชั้นประถมศึกษาปีที่ 4 อยู่ในระดับมากที่สุด หัวข้อที่นักเรียนพึงพอใจมากที่สุดลำดับแรก คือ การเรียนวิชาทัศนศิลป์ช่วยให้นักเรียนมีทักษะการพิมพ์มากขึ้น รองลงมาคือ นักเรียนสามารถพิมพ์ภาพเป็นเรื่องราวได้ ทั้งนี้เนื่องจากการจัดการเรียนรู้ เรื่อง ภาพพิมพ์ โดยใช้วัสดุธรรมชาติ สร้างแรงจูงใจให้กับนักเรียนทำให้นักเรียนเกิดความเพลิดเพลินไม่เบื่อหน่าย จึงทำให้นักเรียนมีผลสัมฤทธิ์ทางการเรียนสูงขึ้นและยังเป็นแรงผลักดันที่จะทำผลงานภาพพิมพ์ต่อไปสอดคล้องกับ เหนือดวง พูลเพิ่ม (2560) ที่กล่าวว่า ความพึงพอใจในการเรียนเป็นความรู้สึกที่ดีของนักเรียนที่มีต่อการปฏิบัติกิจกรรมการเรียนรู้ในชั้นเรียนอย่างมีความสุข ดังนั้นในการจัดกิจกรรมการเรียนรู้ที่จะทำให้นักเรียนเกิดความพึงพอใจในการเรียนรู้จึงถือได้ว่า

เป็นองค์ประกอบที่สำคัญ ประการหนึ่งซึ่งส่งผลให้นักเรียนเกิดการเรียนรู้ได้อย่างประสิทธิภาพและมีผลสัมฤทธิ์ทางการเรียนสูงขึ้น

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

ผู้สอนควรใช้วัสดุธรรมชาติที่สามารถจัดการเรียนรู้ เรื่อง ภาพพิมพ์ ซึ่งเป็นวัสดุที่หาง่ายตามบริบทของสถานศึกษาและชุมชน

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ผู้สอนอาจพิจารณาให้ผู้เรียนได้นำวัสดุธรรมชาติมาเอง เพื่อให้เกิดความแตกต่างของภาพพิมพ์ที่ได้รับ

2. ผู้ที่สนใจที่จะศึกษาในประเด็นการวิจัยที่ใกล้เคียงกันอาจใช้วิธีการจัดการเรียนรู้ร่วมกับการใช้วัสดุธรรมชาติ

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การศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์และผลสัมฤทธิ์ทางการเรียนจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดของนักเรียนชั้นมัธยมศึกษาปีที่ 3 โรงเรียนภูเก็ตวิทยาลัย จังหวัดภูเก็ต

The Study of Mathematical Problem Solving and Academic Achievement Using the Process of Problem-Based Learning with Think Pair Share Technique in Mathayomsuksa 3 Phuket Wittayalai School, Phuket Province

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บทคัดย่อ

การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์และผลสัมฤทธิ์ทางการเรียนจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดกลุ่มเป้าหมาย คือ นักเรียนชั้นมัธยมศึกษาปีที่ 3 โรงเรียนภูเก็ตวิทยาลัย จำนวน 40 คน เครื่องมือที่ใช้ในการวิจัย คือ 1) แผนการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด จำนวน 10 แผน 2) แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ และ 3) แบบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ การวิเคราะห์ข้อมูลโดยใช้สถิติ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัยพบว่า คะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจำนวน 40 คน พบว่า มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 3 คะแนน คิดเป็นร้อยละ 87.5 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นวางแผนแก้ปัญหา 3 คะแนน คิดเป็นร้อยละ 88.33 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นดำเนินการตามแผน 3 คะแนน คิดเป็นร้อยละ 92.5 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยขั้นตรวจสอบผล 3 คะแนน คิดเป็นร้อยละ 89.17 ซึ่งอยู่ในระดับดีเยี่ยม และมีคะแนนเฉลี่ยรวม 3 คะแนน คิดเป็นร้อยละ 89.38 อยู่ในระดับดีเยี่ยม

ผลสัมฤทธิ์ทางการเรียนของนักเรียนก่อนเรียนโดยเฉลี่ยเท่ากับ 6.64 คะแนน ส่วนเบี่ยงเบนมาตรฐานเท่ากับ 1.83 และมีผลการเรียนรู้ และหลังเรียนโดยเฉลี่ยเท่ากับ 15 คะแนน ส่วนเบี่ยงเบนมาตรฐาน เท่ากับ 2.06 แสดงว่า คะแนนเฉลี่ยหลังจากการจัดการเรียนรู้จากการตามแนวคิดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดสูงกว่าก่อนการจัดการเรียนรู้

คำสำคัญ: ความสามารถในการแก้ปัญหาทางคณิตศาสตร์, การจัดการเรียนรู้โดยใช้ปัญหาเป็นฐาน, เทคนิคเพื่อนคู่คิด

Abstract

The objectives of this research were to study the ability to solve mathematical problems and academic achievement from problem-based learning combined with the thinking partner technique. The target group is 40 Mathayom 3 students at Phuket Wittayalai School. The research tools are 1) 10 learning management plans from problem-based learning combined with thinking partner techniques, 2) measurement forms. Ability to solve mathematical problems and 3) Mathematics achievement test. Data analysis using statistics, mean and standard deviation.

The research results found that Students' ability to solve mathematical problems has the following average scores: 1) Understanding stage: 3 points, equivalent to 87.5 percent, at an excellent level. 2) Problem solving planning stage: 3 points, equivalent to 88.33 percent, at an excellent level. 3) Plan implementation stage 3 points, equivalent to 92.5 percent, at an excellent level and 4) Results verification stage, 3 points, equivalent to 89.17 percent, at an excellent level. and had a total average score of 3 points, equivalent to 89.38 percent, at an excellent level.

The average student achievement before study was 6.64 points, standard deviation was 1.83, and there was a learning effect. And after learning, the average score was 15 points, the standard deviation was 2.06, showing that the average score after organizing learning from following the concept of problem-based learning with the thinking partner technique was higher than before organizing learning.

Keywords: Ability to Solve Mathematical Problems, Problem-Based Learning, Think Pair Share Technique

บทนำ

หลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พ.ศ. 2551 กำหนดกรอบทิศทางการพัฒนาผู้เรียนให้มีคุณภาพตามมาตรฐานการเรียนรู้ทำให้เกิดสมรรถนะสำคัญ 5 ประการได้แก่ 1) ความสามารถในการสื่อสาร 2) ความสามารถในการคิด 3) ความสามารถในการแก้ปัญหา 4) ความสามารถในการใช้ทักษะชีวิต และ 5) ความสามารถในการใช้เทคโนโลยี การจัดการศึกษาในระดับมัธยมศึกษาตอนต้นมุ่งเน้นให้ผู้เรียนมีทักษะในการคิดอย่างมีวิจารณญาณ คิดสร้างสรรค์ คิดแก้ปัญหา มีทักษะในการดำเนินชีวิต และทักษะการใช้เทคโนโลยี กระทรวงศึกษาธิการ (2552) ระบุไว้ว่า ในปัจจุบันการศึกษานอกจากจะให้ผู้เรียนได้เรียนรู้เนื้อหาวิชาแล้ว การพัฒนาทักษะการคิดและทักษะกระบวนการให้แก่ผู้เรียนจึงเป็นสิ่งจำเป็น

คณิตศาสตร์เป็นสาระหลักสาระหนึ่งที่สำคัญ ในการพัฒนาผู้เรียนตามกรอบการเรียนรู้ในศตวรรษที่ 21 และส่งเสริมกระบวนการคิด การแก้ปัญหาของผู้เรียน ทำให้ผู้เรียนมีความคิดสร้างสรรค์ คิดอย่างมีเหตุผล เป็นระบบมีแบบแผน สามารถวิเคราะห์ปัญหาหรือสถานการณ์ได้อย่างถี่ถ้วนรอบคอบ (กระทรวงศึกษาธิการ, 2552) แต่การจัดการเรียนรู้คณิตศาสตร์ของประเทศไทยที่ผ่านมายังไม่ประสบความสำเร็จเท่าที่ควร จะเห็นได้จากการประเมินคุณภาพผู้เรียนของสำนักทดสอบทางการศึกษา จัดสอบระดับชาติขั้นพื้นฐาน (O-Net) ปีการศึกษา 2565 ในระดับชั้นมัธยมศึกษาปีที่ 3 พบว่า ผลการทดสอบโดยภาพรวมระดับประเทศ ระดับเขตพื้นที่การศึกษามัธยมศึกษา พังงา ภูเก็ต ระนอง กลุ่มสาระการเรียนรู้คณิตศาสตร์ ได้คะแนนเฉลี่ยร้อยละ 25.54 และ 25.41 ตามลำดับ ปรากฏว่า กลุ่มสาระการเรียนรู้คณิตศาสตร์อยู่ในลำดับที่ 8 จาก 8 กลุ่มสาระการเรียนรู้ ทั้งในระดับประเทศ และระดับเขตพื้นที่ผลคะแนนการทดสอบทางการศึกษาระดับชาติขั้นพื้นฐานโรงเรียนวัดดอนโพธิ์ทอง กลุ่มสาระการเรียนรู้คณิตศาสตร์ ระดับมัธยมศึกษาปีที่ 3 นักเรียนได้คะแนนเฉลี่ยร้อยละ 25.78 อยู่ในลำดับสุดท้าย เมื่อเทียบกับกลุ่มสาระอื่น ๆ ซึ่งสอดคล้องกับผลการทดสอบโดยภาพรวมในระดับประเทศและระดับเขตพื้นที่ เมื่อแยกตามสาระการเรียนรู้จากคะแนนการทดสอบทางการศึกษาระดับชาติขั้นพื้นฐานสาระที่ 6 ทักษะ และกระบวนการทางคณิตศาสตร์เป็นสาระที่นักเรียนทำคะแนนได้ต่ำที่สุดเมื่อเทียบกับกลุ่มสาระอื่น ๆ ทั้งในระดับประเทศ ระดับเขตพื้นที่ และระดับโรงเรียน (สถาบันทดสอบทางการศึกษาแห่งชาติ, 2556) ดังนั้นทักษะและกระบวนการทางคณิตศาสตร์จึงเป็นสาเหตุหนึ่งที่ทำให้ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนอยู่ในระดับต่ำ

ทักษะและกระบวนการทางคณิตศาสตร์ ประกอบด้วยการแก้ปัญหา การให้เหตุผล การสื่อสาร การเชื่อมโยง และการคิดสร้างสรรค์ ทักษะที่เป็นหัวใจในการเรียนการสอนคณิตศาสตร์ คือ การแก้ปัญหา เพราะการเรียนรู้คณิตศาสตร์เป็นการเรียนรู้จากการแก้ปัญหา (National Council for the Teacher of Mathematics, 1980) การแก้ปัญหาทางคณิตศาสตร์ เป็นทักษะกระบวนการที่ต้องใช้การคิดระดับสูงเป็นทั้งจุดหมายปลายทางและกระบวนการเรียนรู้ ช่วยให้ผู้เรียนรู้ข้อเท็จจริง ทักษะมโนมติ หลักการต่าง ๆ ทางคณิตศาสตร์ จึงเป็นหน้าที่ของครูผู้สอนที่จะต้องหาแนวทางการสอน เทคนิคการสอนที่สามารถพัฒนาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ให้กับผู้เรียน แนวทางหนึ่งที่เหมาะสมสามารถนำมาใช้ได้ คือ การเรียนโดยใช้ปัญหาเป็นฐาน เป็นการเรียนรู้ที่มุ่งให้ผู้เรียนสร้างความรู้ใหม่จากการใช้ปัญหาที่เกิดขึ้นในโลกแห่งความเป็นจริงเป็นบริบทของการเรียนรู้ เพื่อให้ผู้เรียนเกิดทักษะในการคิดวิเคราะห์และแก้ปัญหา รวมทั้งได้ความรู้ตามศาสตร์ในสาขาที่ศึกษา (มัณฑรา ธรรมบุศย์, 2545) ผู้เรียนได้เรียนรู้จากการสัมผัสและมีส่วนร่วมในการแก้ปัญหา ส่งเสริมทักษะการคิดระดับสูง การบูรณาการการเรียนรู้ การเรียนรู้อย่างอิสระ ทักษะการแก้ปัญหา ทักษะการจัดการข้อมูล การเรียนรู้ด้วยตนเอง การทำงานเป็นทีม และทักษะการสื่อสาร โดยผู้เรียนสร้างความรู้จากกระบวนการทำงานกลุ่มเพื่อค้นหาวิธีการแก้ปัญหาในสถานการณ์ที่สนใจเกี่ยวกับชีวิตประจำวันโดยตัวปัญหาจะเป็นจุดตั้งต้นของกระบวนการเรียนรู้ และเป็นตัวกระตุ้นในการพัฒนาทักษะการแก้ปัญหาพื้นฐานของเหตุและผล การสืบค้นข้อมูลผู้เรียนจะได้รับมอบหมายเป็นรายบุคคลหรือกลุ่มให้ดำเนินการสืบค้น (ชานนท์ จันทรา, 2549) การจัดการเรียนการสอนโดยให้ผู้เรียนร่วมกันเป็นกลุ่ม ร่วมกันคิด ร่วมกันแก้ปัญหา ปรึกษาหารือ อภิปราย และแสดงความคิดเห็นด้วยเหตุผลซึ่งกันและกันจะช่วยให้ผู้เรียนได้พัฒนาทั้งความรู้ทักษะ/กระบวนการคิด และมีประสบการณ์มากขึ้น เทคนิคเพื่อนคู่คิด เป็นเทคนิคการเรียนรู้แบบร่วมมือรูปแบบหนึ่ง ซึ่งมีขั้นตอนที่สำคัญคือ 1.การคิด (Think) เป็นขั้นที่ครูกระตุ้นด้วยปัญหาเพื่อให้ผู้เรียนหาคำตอบ 2. การจับคู่ (Pair) เป็นขั้นที่ให้ผู้เรียนจับคู่

เพื่ออภิปรายปัญหา 3. การแลกเปลี่ยน (Share) เป็นขั้นที่จะให้ผู้เรียนแลกเปลี่ยนและนำเสนอ (Byerley, 2002) ผู้สอนนิยมใช้คู่กับวิธีสอนแบบอื่น ๆ เนื่องจากเป็นเทคนิคที่ส่งเสริมการมีปฏิสัมพันธ์จากการทำกิจกรรมร่วมกัน ทำให้ผู้เรียนได้มีการแลกเปลี่ยนอธิบายความคิดหรือความรู้ที่เชื่อมโยงมาใช้ในการแก้ปัญหาให้เพื่อนฟัง ทำให้มีความแม่นยำในเรื่องที่เรียนมากขึ้น กล้าที่จะสื่อสารความคิดทางคณิตศาสตร์ออกมาอย่างมั่นใจในการทำกิจกรรม มีความสุขในการเรียน และบรรลุเป้าหมายร่วมกัน (ศิริพรรณ ศรีอุทธา, 2548) จากความสำคัญและเหตุผลข้างต้น ผู้วิจัยจึงสนใจนำแนวคิดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด มาศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์และผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 3

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์จากการจัดการเรียนรู้ โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด
2. เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์จากการจัดการเรียนรู้ โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด

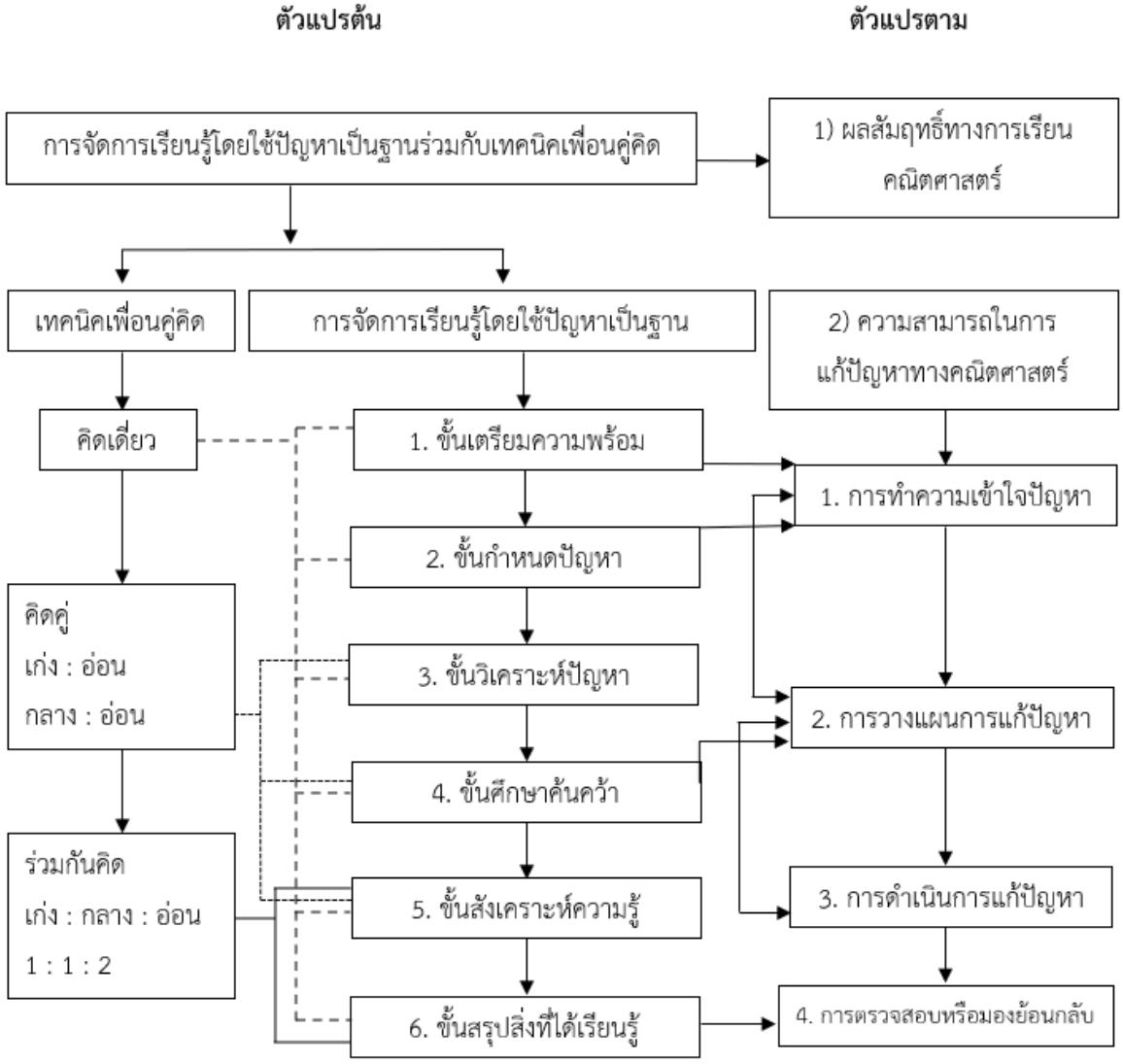
สมมติฐานของการวิจัย

1. ความสามารถในการแก้ปัญหาทางคณิตศาสตร์จากการจัดการเรียนรู้ โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดเป็นไปตามเกณฑ์ร้อยละ 70
2. นักเรียนมีผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์จากการจัดการเรียนรู้ โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด หลังเรียนสูงกว่าก่อนเรียน

แนวคิด ทฤษฎี กรอบแนวคิด

กรอบแนวคิดในการวิจัย

การวิจัยครั้งนี้ ผู้วิจัยได้แนวคิดจากการศึกษา เอกสาร ตำรา และงานวิจัยที่เกี่ยวข้องกับการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐาน เทคนิคเพื่อนคู่คิด ความสามารถในการแก้ปัญหาทางคณิตศาสตร์และผลสัมฤทธิ์ทางการเรียนบูรณาการเป็นกระบวนการเรียนการสอนจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เพื่อพัฒนาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ นำมาสรุปเป็นกรอบแนวคิดในการวิจัย ดังภาพที่ 1



ภาพที่ 1 กรอบแนวคิดในการวิจัย

วิธีดำเนินการวิจัย

1. กลุ่มเป้าหมาย

กลุ่มเป้าหมาย คือ นักเรียนชั้นมัธยมศึกษาปีที่ 3/13 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนภูเก็ตวิทยาลัย อำเภอเมือง จังหวัดภูเก็ต สังกัดสำนักงานเขตพื้นที่การศึกษามัธยมศึกษาพังงา ภูเก็ต ระนอง จำนวน 40 คน

2. ตัวแปรที่ศึกษา

2.1 ตัวแปรต้น ได้แก่ การจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด

2.2 ตัวแปรตาม ได้แก่ ความสามารถในการแก้ปัญหาทางคณิตศาสตร์ และผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์

3. เนื้อหาที่ใช้ในการทดลอง

สาระการเรียนรู้คณิตศาสตร์พื้นฐาน ชั้นมัธยมศึกษาปีที่ 3 เรื่อง ระบบสมการเชิงเส้นสองตัวแปร

4. ระยะเวลาที่ทำวิจัย

ระยะเวลาที่ใช้ในการทดลอง ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 10 คาบ คาบละ 50 นาที ทำการทดลองตั้งแต่วันที่ 2 พฤศจิกายน พ.ศ. 2566 ถึงวันที่ 15 พฤศจิกายน พ.ศ. 2566

เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยนี้ประกอบด้วย

1. แผนการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เรื่อง ระบบสมการเชิงเส้นสองตัวแปร ชั้นมัธยมศึกษาปีที่ 3 ใช้เวลาในการจัดการเรียนการสอน 10 คาบ

2. แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์เป็นแบบทดสอบอัตนัย ให้เขียนตอบจำนวน 5 ข้อ โดยกำหนดเกณฑ์การให้คะแนนเป็นแบบรูบริค (Rubrics) ซึ่งมีเกณฑ์การให้คะแนน 3 ระดับ คือ 1, 2, 3 ดังนี้

ตารางที่ 1 เกณฑ์การประเมินผลแบบย่อยของการแก้ปัญหาทางคณิตศาสตร์

รายการประเมิน	คำอธิบายคุณภาพ		
	ดี (3)	พอใช้ (2)	ปรับปรุง (1)
ขั้นที่ 1 ทำความเข้าใจปัญหา	เข้าใจปัญหาได้ถูกต้อง	เข้าใจปัญหาบางส่วนไม่ถูกต้อง	เข้าใจปัญหาน้อยมากหรือไม่ถูกต้อง
ขั้นที่ 2 วางแผนแก้ปัญหา	เลือกวิธีการแก้ปัญหาได้เหมาะสม	เลือกวิธีการแก้ปัญหาซึ่งอาจนำไปสู่คำตอบที่ถูกแต่ยังมีบางส่วนที่ผิด	เลือกวิธีการส่วนใหญ่ไม่ถูกต้อง
ขั้นที่ 3 ดำเนินการแก้ปัญหา	นำวิธีการแก้ปัญหาไปใช้ได้ถูกต้อง	นำวิธีการแก้ปัญหาไปใช้ได้ถูกต้องเป็นบางครั้ง	นำวิธีการแก้ปัญหาไปใช้ไม่ถูกต้อง
ขั้นที่ 4 ตรวจสอบ	ตรวจคำตอบได้ถูกต้องและสรุปได้ตรงประเด็น	ตรวจคำตอบได้ถูกต้องและสรุปได้บางประเด็น	ตรวจคำตอบได้เป็นบางส่วนหรือไม่ได้เลย

3. แบบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์เป็นแบบทดสอบปรนัยให้เลือกตอบจำนวน 20 ข้อ โดยพิจารณาหาค่าดัชนีความสอดคล้องระหว่างข้อสอบกับจุดประสงค์การเรียนรู้ (IOC) ซึ่งผู้เชี่ยวชาญแต่ละท่าน จะให้คะแนนตามเกณฑ์ดังนี้

ให้ +1 แทน แน่ใจว่าข้อคำถามสอดคล้องกับตัวชี้วัด
ให้ 0 แทน ไม่แน่ใจว่าข้อคำถามสอดคล้องกับตัวชี้วัด
ให้ -1 แทน แน่ใจว่าข้อคำถามไม่สอดคล้องกับตัวชี้วัด

โดยจะนำผลการพิจารณาของผู้เชี่ยวชาญทั้ง 3 ท่าน มาทำการวิเคราะห์เพื่อหาค่าดัชนีความสอดคล้องเป็นรายข้อ (IOC) โดยคัดเลือกข้อสอบที่มีค่าดัชนีความสอดคล้องระหว่าง 0.65 - 1.00

การตรวจสอบคุณภาพของเครื่องมือ

ผู้วิจัยดำเนินการตรวจสอบคุณภาพเครื่องมือดังนี้

1. นำแผนการจัดการเรียนรู้ที่ผู้วิจัยจัดทำขึ้นจำนวน 10 แผน เสนอต่ออาจารย์ที่ปรึกษา และผู้เชี่ยวชาญจำนวน 3 ท่าน เพื่อตรวจสอบความเที่ยงตรง (Validity) ด้านเนื้อหา โดยพิจารณาค่าดัชนีความสอดคล้องระหว่างข้อสอบกับจุดประสงค์การเรียนรู้ (IOC) ได้ค่าความสอดคล้องตั้งแต่ 0.67 - 1.00

2. ผู้วิจัยนำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ที่จัดทำขึ้นจำนวน 10 ข้อเสนอต่ออาจารย์ที่ปรึกษาวิทยานิพนธ์ และผู้เชี่ยวชาญจำนวน 3 ท่าน เพื่อตรวจสอบความเที่ยงตรง (Validity)

โดยพิจารณาดัชนีความสอดคล้องระหว่างข้อสอบกับจุดประสงค์การเรียนรู้ (IOC) ได้ค่าความสอดคล้องตั้งแต่ 0.67 - 1.00 แล้วนำแบบทดสอบที่ผ่านการคัดเลือกแล้วไปทดสอบกับนักเรียนชั้นมัธยมศึกษาปีที่ 3 ภาคเรียนที่ 2 จำนวน 48 คน ที่ไม่ใช่กลุ่มตัวอย่าง เพื่อหาค่าความยากง่าย (P_E) และอำนาจจำแนก (D) โดยคัดเลือกข้อที่มีค่าความยากง่ายตั้งแต่ 0.45 - 0.55 และอำนาจจำแนกตั้งแต่ 0.71 - 0.77 จำนวน 5 ข้อ ให้ครอบคลุมจุดประสงค์ นำแบบทดสอบที่คัดเลือกแล้วไปทดสอบกับนักเรียนชั้นมัธยมศึกษาปีที่ 3 ที่ไม่เคยใช้แบบทดสอบชุดนี้มาก่อน และไม่ใช่กลุ่มตัวอย่าง จำนวน 30 คน ที่เคยเรียนเรื่อง พื้นที่ผิวและปริมาตรมาแล้ว นำมาตรวจให้คะแนนนำผลที่ได้ไปหาค่าความเชื่อมั่นของข้อสอบทั้งฉบับโดยใช้สัมประสิทธิ์แอลฟา (α- Coefficient) ตามวิธีของครอนบัค (Cronbach) ได้ค่าเท่ากับ 0.83

3. ผู้วิจัยนำแบบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ที่จัดทำขึ้นจำนวน 30 ข้อ เสนอต่ออาจารย์ที่ปรึกษาวิทยานิพนธ์ และผู้เชี่ยวชาญจำนวน 3 ท่าน เพื่อตรวจสอบความเที่ยงตรง (Validity) โดยพิจารณาดัชนีความสอดคล้องระหว่างข้อสอบกับจุดประสงค์การเรียนรู้ (IOC) ได้ค่าความสอดคล้องตั้งแต่ 0.65 - 1.00 แล้วนำแบบทดสอบที่ผ่านการคัดเลือกแล้วไปทดสอบกับนักเรียนชั้นมัธยมศึกษาปีที่ 3 ภาคเรียนที่ 2 จำนวน 48 คน ที่ไม่ใช่กลุ่มตัวอย่าง เพื่อหาค่าความยากง่าย (P_E) และ อำนาจจำแนก (D) โดยคัดเลือกข้อที่มีค่าความยากง่ายตั้งแต่ 0.45 - 0.55 และอำนาจจำแนก ตั้งแต่ 0.71 - 0.77 จำนวน 20 ข้อ ให้ครอบคลุมจุดประสงค์ นำแบบทดสอบที่คัดเลือกแล้วไปทดสอบกับนักเรียนชั้นมัธยมศึกษาปีที่ 3 ที่ไม่เคยใช้แบบทดสอบชุดนี้มาก่อน และไม่ใช่กลุ่มตัวอย่าง จำนวน 30 คน ที่เคยเรียนเรื่อง พื้นที่ผิวและปริมาตรมาแล้ว นำมาตรวจให้คะแนนนำผลที่ได้ไปหาค่าความเชื่อมั่นของข้อสอบทั้งฉบับโดยใช้สัมประสิทธิ์แอลฟา (α- Coefficient) ตามวิธีของครอนบัค (Cronbach) ได้ค่าเท่ากับ 0.81

การเก็บรวบรวมข้อมูล

ผู้วิจัยได้ดำเนินการเก็บรวบรวมข้อมูลตามขั้นตอนการทดลอง ดังนี้

1. ก่อนการทดลอง ให้กลุ่มตัวอย่างทำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ ที่สร้างขึ้นจำนวน 5 ข้อ และแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์เป็นแบบทดสอบปรนัย ให้เลือกตอบจำนวน 20 ข้อ ในวันที่ 1 พฤศจิกายน พ.ศ. 2566 แล้วบันทึกคะแนนจากการทดสอบเป็นคะแนนทดสอบก่อนเรียน (Pre-test)

2. จัดกิจกรรมการเรียนรู้จากการตามแนวคิดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เรื่อง ระบบสมการเชิงเส้นสองตัวแปร ตามแผนการจัดการเรียนรู้ จำนวน 10 คาบ คาบละ 50 นาที ตั้งแต่วันที่ 2 พฤศจิกายน พ.ศ. 2566 ถึงวันที่ 15 พฤศจิกายน พ.ศ. 2566

3. ทดสอบหลังทดลอง หลังจากดำเนินการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดของนักเรียน เรื่อง ระบบสมการเชิงเส้นสองตัวแปรครบแล้ว ทำการทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ และทดสอบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ ในวันที่ 16 พฤศจิกายน พ.ศ. 2566 และบันทึกผลการทดสอบเป็นคะแนนหลังเรียน (Post-test)

4. นำคะแนนที่ได้มาวิเคราะห์ เพื่อตรวจสอบสมมติฐานโดยวิธีการทางสถิติต่อไป

การวิเคราะห์ข้อมูล

การศึกษาวิจัยครั้งนี้เป็นวิจัยกึ่งทดลอง ซึ่งผู้วิจัยนำคะแนนที่ได้จากแบบทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์มาวิเคราะห์หาระดับวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด โดยวิเคราะห์เกณฑ์จากคะแนนสอบหลังเรียนแล้วนำ

คะแนนเฉลี่ยคิดเป็นร้อยละเทียบจากเกณฑ์การตัดสินผลการเรียนกลุ่มสาระการเรียนรู้คณิตศาสตร์ตามหลักสูตรแกนกลาง พุทธศักราช 2551 ซึ่งแบ่งเกณฑ์ออกเป็น 8 ระดับดังนี้

คะแนนร้อยละ 80 - 100 อยู่ในระดับดีเยี่ยม
คะแนนร้อยละ 76 - 79 อยู่ในระดับดีมาก
คะแนนร้อยละ 70 - 75 อยู่ในระดับดี
คะแนนร้อยละ 65 - 69 อยู่ในระดับค่อนข้างดี
คะแนนร้อยละ 60 - 64 อยู่ในระดับปานกลาง
คะแนนร้อยละ 55 - 59 อยู่ในระดับพอใช้
คะแนนร้อยละ 50 - 54 อยู่ในระดับผ่านเกณฑ์
คะแนนร้อยละ 0 - 49 อยู่ในระดับต่ำกว่าเกณฑ์

นอกจากนี้ ผู้วิจัยได้ดำเนินการทดลองโดยใช้แบบแผนการทดลองแบบกลุ่มเดียว ทดลองใช้แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์และแบบวัดผลสัมฤทธิ์ทางการเรียนก่อนจัดการเรียนรู้จากการตามแนวคิดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด และทดลองใช้แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์และแบบวัดผลสัมฤทธิ์ทางการเรียนหลังจัดการเรียนรู้จากการตามแนวคิดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด ซึ่งมีรูปแบบการวิจัย ดังนี้

ตารางที่ 2 แบบแผนการวิจัย

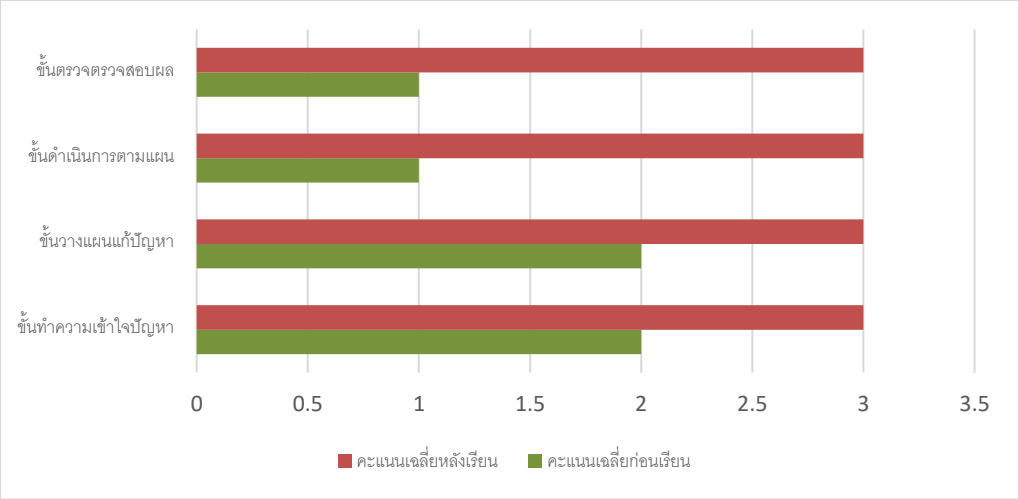
ก่อนเรียน	ทดลอง	หลังเรียน
T_1	X	T_2

สัญลักษณ์ที่ใช้ในการทดลอง

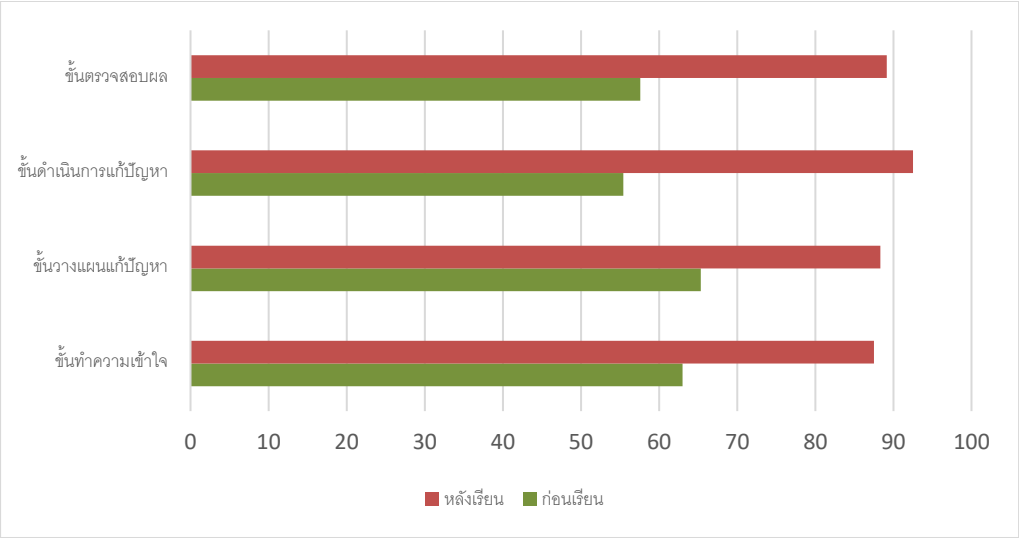
T_1 แทน การทดสอบก่อนการจัดกระทำการทดลอง
T_2 แทน การทดสอบหลังการจัดกระทำการทดลอง
x แทน การจัดกระทำกลุ่มทดลอง

ผลการวิจัย

คะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจำนวน 40 คน พบว่า มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 3 คะแนน คิดเป็นร้อยละ 87.5 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นวางแผนแก้ปัญหา 3 คะแนน คิดเป็นร้อยละ 88.33 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นดำเนินการตามแผน 3 คะแนน คิดเป็นร้อยละ 92.5 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยขั้นตรวจสอบผล 3 คะแนน คิดเป็นร้อยละ 89.17 ซึ่งอยู่ในระดับดีเยี่ยม และมีคะแนนเฉลี่ยรวม 3 คะแนน คิดเป็นร้อยละ 89.38 อยู่ในระดับดีเยี่ยม

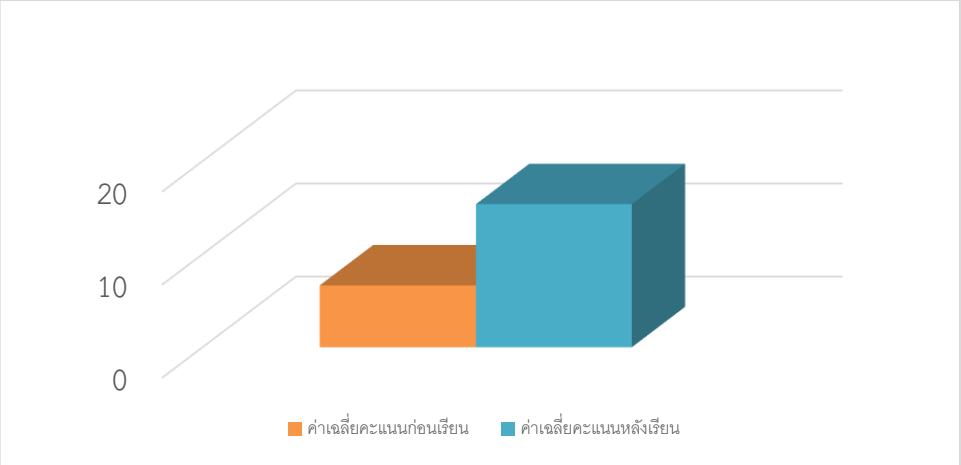


ภาพที่ 1 การเปรียบเทียบคะแนนเฉลี่ยความสามารถในการแก้ปัญหาทางคณิตศาสตร์ในแต่ละขั้น จากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด

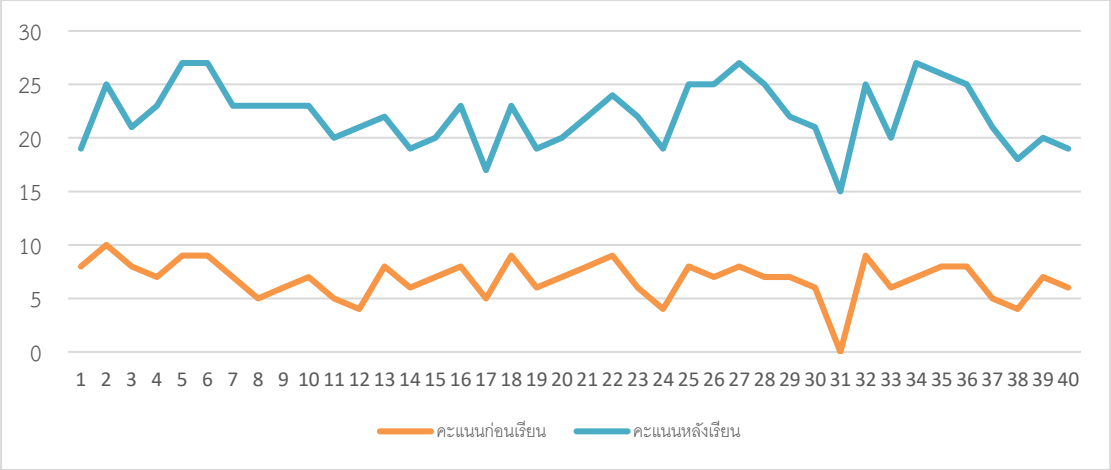


ภาพที่ 2 การเปรียบเทียบความสามารถในการแก้ปัญหาทางคณิตศาสตร์ในแต่ละขั้น จากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดคิดเป็นร้อยละ

ผลสัมฤทธิ์ทางการเรียนของนักเรียน จำนวน 40 คน มีผลการเรียนรู้ก่อนเรียนโดยเฉลี่ยเท่ากับ 6.64 คะแนน ส่วนเบี่ยงเบนมาตรฐานเท่ากับ 1.83 และมีผลการเรียนรู้หลังเรียนโดยเฉลี่ยเท่ากับ 15 คะแนน ส่วนเบี่ยงเบนมาตรฐาน เท่ากับ 2.06 แสดงว่า คะแนนเฉลี่ยหลังจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดสูงกว่าก่อนการจัดการเรียนรู้



ภาพที่ 3 การเปรียบเทียบค่าเฉลี่ยของผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์จากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด



ภาพที่ 4 การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนเรียนและหลังเรียนของนักเรียน

สรุปและอภิปรายผล

จากการศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์และผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง ระบบสมการเชิงเส้นสองตัวแปร การจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เทียบกับเกณฑ์ร้อยละ 70 พบว่า ความสามารถในการแก้ปัญหาคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 3/13 จำนวน 40 คน หลังจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด พบว่า มีคะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์สูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 3 คะแนน คิดเป็นร้อยละ 87.5 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นวางแผนแก้ปัญหา 3 คะแนน คิดเป็นร้อยละ 88.33 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นดำเนินการตามแผน 3 คะแนน คิดเป็นร้อยละ 92.5 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยขั้นตรวจสอบผล 3 คะแนน คิดเป็นร้อยละ 89.17 ซึ่งอยู่ในระดับดีเยี่ยม และมีคะแนนเฉลี่ยรวม 3 คะแนน คิดเป็นร้อยละ 89.38 อยู่ในระดับดีเยี่ยม ทั้งนี้ผลการวิจัยพบว่า ความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังใช้การจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เนื่องมาจากการเรียนรู้โดยใช้ปัญหาเป็นฐาน เป็นการเรียนรู้ที่ใช้สถานการณ์ปัญหาที่มี

ความสัมพันธ์กับชีวิตประจำวันของผู้เรียน เป็นจุดเริ่มต้นของกระบวนการเรียนรู้ กระตุ้นให้ผู้เรียนเกิดความสงสัย คิดหาแนวทางแก้ปัญหาโดยสำรวจ ค้นคว้า เพื่อเป็นข้อมูลในการตัดสินใจเลือกแนวทางแก้ปัญหา โดยอาศัยกระบวนการทำงานกลุ่ม พัฒนาผู้เรียนสู่การเรียนรู้โดยการชี้นำตนเองทำให้ผู้เรียนเกิดทักษะในการแก้ปัญหาร่วมกัน โดยมีครูเป็นผู้ให้คำแนะนำ อำนวยความสะดวก ออกแบบสภาพแวดล้อมส่งเสริมให้ผู้เรียนเกิดการเรียนรู้ ซึ่งสอดคล้องกับการ์เลเกอร์ (Gallagher, 1997) ที่ได้กล่าวว่า การเรียนรู้โดยใช้ปัญหาเป็นฐาน เป็นการเรียนรู้ที่ผู้เรียนต้องเรียนรู้โดยผู้เรียนทำงานร่วมกันเป็นกลุ่ม เพื่อค้นหาวิธีการแก้ปัญหาโดยบูรณาการความรู้ที่ต้องการให้ผู้เรียนได้รับกับการแก้ปัญหาเข้าด้วยกัน ปัญหาที่ใช้ในการเรียนรู้ มีลักษณะเกี่ยวกับชีวิตประจำวันและมีความสัมพันธ์กับผู้เรียน การเรียนรู้โดยใช้ปัญหาเป็นฐานมุ่งเน้นพัฒนาผู้เรียนในด้านทักษะการเรียนรู้มากกว่าความรู้ที่ผู้เรียนจะได้และพัฒนาผู้เรียนสู่การเป็นผู้ที่สามารถเรียนรู้โดยการชี้นำตนเองได้ และเทคนิคเพื่อนคู่คิด เป็นเทคนิคการเรียนรู้แบบจัดให้ผู้เรียนทำงานเป็นกลุ่ม ๆ ละ 4 คน โดยเริ่มจากการที่ผู้สอนกำหนดสถานการณ์ปัญหาหรือโจทย์คำถามให้ผู้เรียนทุกคนคิดหาคำตอบด้วยตนเองก่อน หลังจากนั้นจึงจับคู่กันในกลุ่มนำคำตอบที่ได้ไปอภิปราย แลกเปลี่ยนความคิด ผลัดกันเล่าความคิดหรือคำตอบของตนให้คู่ฟัง เมื่อค้นพบข้อสรุปหรือคำตอบร่วมกันแล้วจึงนำคำตอบของแต่ละคู่มาอภิปรายภายในกลุ่ม 4 คน แล้วสรุปเป็นคำตอบของกลุ่มนำเสนอทั้งชั้น ดังที่ Slavin (1995) กล่าวถึงเทคนิคเพื่อนคู่คิดว่า เป็นเทคนิคที่เริ่มจากปัญหาที่ครูผู้สอนกำหนดนักเรียนแต่ละคนคิดหาคำตอบด้วยตนเองก่อนแล้วนำคำตอบไปอภิปรายกับเพื่อนที่เป็นคู่จากนั้นจึงนำคำตอ บของแต่ละคู่มาอภิปรายพร้อมกัน 4 คน เมื่อมั่นใจว่าคำตอบของตนถูกต้องหรือดี

ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 3/13 จำนวน 40 คน ที่ได้การจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เรื่อง ระบบสมการเชิงเส้นสองตัวแปร จากผลการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังใช้กระบวนการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด ($\bar{X}$ = 15, S.D. = 1.83) สูงกว่าก่อนใช้ ($\bar{X}$ = 6.64, S.D. = 2.06) อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 ทั้งนี้อาจเนื่องมาจากการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิด เป็นวิธีการจัดการเรียนรู้ที่จัดให้ผู้เรียนเรียนเป็นกลุ่มย่อยคละความสามารถประกอบด้วย เก่ง ปานกลาง และอ่อน จับคู่คิด และรายบุคคล โดยใช้ประเด็นปัญหาสถานการณ์กระตุ้นให้ผู้เรียนคิดวิเคราะห์ ค้นหาแนวทางการแก้ปัญหา นำไปสู่การอภิปราย และสรุปองค์ความรู้ที่เป็นคำตอบของปัญหาด้วยตัวของผู้เรียนเอง ประกอบด้วย 6 ขั้นตอน ดังนี้ ขั้น 1 เตรียมความพร้อม ขั้นที่ 2 กำหนดปัญหา ขั้นที่ 3 วิเคราะห์ปัญหา ขั้นที่ 4 ศึกษาค้นคว้า ขั้นที่ 5 สังเคราะห์ความรู้ ขั้นที่ 6 สรุปสิ่งที่ได้เรียนรู้ ซึ่งสอดคล้องกับงานวิจัยของ สิรินทรา มินทะขัติ (2556) ที่ได้ทำการศึกษาผลของการจัดกิจกรรมการเรียนรู้โดยใช้ปัญหาเป็นฐาน เรื่องพื้นที่ผิวและปริมาตรที่มีต่อความสามารถในการคิดวิเคราะห์ และความสามารถในการให้เหตุผลทางคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 ผลการวิจัยพบว่า ความสามารถในการคิดวิเคราะห์และความสามารถในการให้เหตุผลของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังได้รับการจัดการเรียนรู้โดยใช้ปัญหาเป็นฐาน เรื่อง พื้นที่ผิวและปริมาตร สูงกว่าก่อนได้รับการจัดการเรียนรู้อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และยังสอดคล้องกับงานวิจัยของวิลาวัลย์ ลูกสะเดา (2549) ที่ได้ศึกษาผลของการฝึกเทคนิค K-W-L-H ร่วมกับกิจกรรมการเรียนแบบคู่คิดที่มีผลสัมฤทธิ์ทางการเรียนและความคงทนในการเรียนรู้วิชาสังคมศึกษา ของนักเรียนชั้นมัธยมศึกษาปีที่ 2 ผลการวิจัยพบว่า นักเรียนที่ได้รับการฝึกโดยใช้เทคนิค K-W-L-H ร่วมกับกิจกรรมการเรียนแบบคู่คิดมี

ผลสัมฤทธิ์ทางการเรียน และความคงทนในการเรียนรู้วิชาสังคมศึกษาสูงกว่านักเรียนที่ได้รับการฝึกโดยใช้เทคนิค K-W-L-H ร่วมกับกิจกรรมการเรียนแบบปกติอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

ครูควรที่จะต้องศึกษาหลักการ เป้าหมาย ขั้นตอนการจัดกิจกรรมเรียนรู้บทบาทของครู ผู้เรียนให้เข้าใจ เตรียมสื่ออุปกรณ์ เอกสารต่าง ๆ ให้ครบตามจำนวนผู้เรียน ฝึกให้เรียนรู้วิธีการแก้ปัญหาหลาย ๆ วิธีโดยจับคู่คิดและร่วมกันคิดจะทำให้ได้แนวคิดที่หลากหลายในการแก้ปัญหา สนับสนุนให้แสดงออกซึ่งแนวคิดในการแก้ปัญหาของตนเอง อภิปรายแนวคิดในการแก้ปัญหาอย่างอิสระ

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรมีการศึกษาเกี่ยวกับการจัดกิจกรรมการเรียนรู้คณิตศาสตร์จากการจัดการเรียนรู้ โดยใช้ปัญหาเป็นฐานร่วมกับเทคนิคเพื่อนคู่คิดในการพัฒนาทักษะกระบวนการทางคณิตศาสตร์ด้านการให้เหตุผล การเชื่อมโยง และการสื่อสาร

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การศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาของนักเรียนชั้นมัธยมศึกษาปีที่ 4 โรงเรียนสตรีภูเก็ต

The Study of Mathematics Learning Achievement and Mathematics Problems Solving Ability Using Polya's Problem Solving Process of Grade 10 Students of Satreephuket School

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา 2) ศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจากการจัดการเรียนรู้โดยใช้กระบวนการแก้ปัญหาของโพลยา กลุ่มเป้าหมายเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 4 จำนวน 39 คน เครื่องมือที่ใช้ได้แก่ 1) แผนการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาจำนวน 10 แผน 2) แบบวัดผลสัมฤทธิ์ทางการเรียน จำนวน 20 ข้อ และ3) แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ จำนวน 2 ข้อ สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัยพบว่า

1. ผลสัมฤทธิ์ทางการเรียนก่อนเรียนโดยเฉลี่ยเท่ากับ 8.95 ± 1.99 และผลสัมฤทธิ์ทางการเรียนหลังเรียนโดยเฉลี่ยเท่ากับ 14.08 ± 1.56 แสดงว่า คะแนนเฉลี่ยหลังจากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาสูงกว่าก่อนการจัดการเรียนรู้

2. ความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียน มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 5.89 ± 0.64 คิดเป็นร้อยละ 98.16 อยู่ในระดับดีเยี่ยม ขั้นวางแผนแก้ปัญหา 5.12 ± 1.49 คิดเป็นร้อยละ 85.33 อยู่ในระดับดีเยี่ยม ขั้นดำเนินการตามแผน 4.58 ± 1.58 คิดเป็นร้อยละ 76.33 อยู่ในระดับดีมาก และขั้นตรวจสอบผล 4.41 ± 1.48 คิดเป็นร้อยละ 73.5 ซึ่งอยู่ในระดับดี และมีคะแนนเฉลี่ยรวม 5 คิดเป็นร้อยละ 83.33 อยู่ในระดับดีเยี่ยม

คำสำคัญ: ผลสัมฤทธิ์ทางการเรียน, ความสามารถในการแก้ปัญหาทางคณิตศาสตร์, กระบวนการแก้ปัญหาของโพลยา

Abstract

The purposes of this research were: 1) study academic achievement in mathematics by using Polya's Problem Solving Process. 2) study Ability in Solving Mathematics Problems Using Polya's Problem Solving Process. The target group was Mathayom, 4 students, 39 people. The research instruments involved. 1) 10 lesson plans By using Polya's problem-solving process**.** 2) The academic achievement test has 20 questions. 3) Mathematics Problem Solving Ability Test: 2 questions. The data were statistically analyzed by percentage, average, and standard deviation.

The result found that:

1. Academic achievement, the average learning result before studying was 8.95 ± 1.99, and the average learning result after studying was 14.08 ± 1.56. It shows that the average score after organizing learning according to Polya's problem-solving process was higher than before organizing learning.

2 . Mathematics problem solving ability scores, the average score in the understanding stage was 5.89 ± 0.64 98.16% is at an excellent level, the average score in the problem-solving planning stage was 5.12 ± 1.49 85.33% is at an excellent level, the average score in the plan implementation process was 4.58 ± 1.58 76.33% is at a very good level, the average score for checking results was 4.41 ± 1.48 73.5% is at a good level, and had a total average score of 5 points, equivalent to 83.33% is at an excellent level**.**

Keywords: Academic achievement, Mathematics problem solving ability, Polya's Problem Solving Process.

บทนำ

การศึกษาเป็นเครื่องมือสำคัญในการสร้างคน สร้างสังคม และสร้างชาติ เป็นกลไกหลักในการพัฒนากำลังคนให้มีคุณภาพ และสามารถดำรงชีวิตอยู่ร่วมกับบุคคลอื่นในสังคมได้อย่างเป็นสุขในกระแสการเปลี่ยนแปลงอย่างรวดเร็วของโลกศตวรรษที่ 21 เนื่องจากการศึกษามีบทบาทสำคัญในการสร้างความได้เปรียบของประเทศเพื่อการแข่งขันและยืนหยัดในเวทีโลกภายใต้ระบบเศรษฐกิจและสังคมที่เป็นพลวัต ประเทศต่าง ๆ ทั่วโลกจึงให้ความสำคัญและทุ่มเทกับการพัฒนาการศึกษาเพื่อพัฒนาทรัพยากรมนุษย์ของตนให้สามารถก้าวทันการเปลี่ยนแปลงของระบบเศรษฐกิจ และสังคมของประเทศ ภูมิภาค และของโลก ควบคู่กับการธำรงรักษาอัตลักษณ์ของประเทศ ในส่วนของประเทศไทยได้ให้ความสำคัญกับการจัดการศึกษา การพัฒนาศักยภาพ และขีดความสามารถของคนไทยให้มีทักษะ ความรู้ ความสามารถ และสมรรถนะที่สอดคล้องกับความต้องการของตลาดงานและการพัฒนาประเทศ ภายใต้แรงกดดันภายนอกจากกระแสโลกาภิวัตน์ และแรงกดดันภายในประเทศที่เป็นปัญหาและวิกฤตที่ประเทศต้องเผชิญเพื่อให้คนไทยมีคุณภาพชีวิตที่ดี สังคมไทยเป็นสังคมคุณธรรม จริยธรรม และประเทศสามารถก้าวข้ามกับดักประเทศที่มีรายได้ปานกลางไปสู่ประเทศที่พัฒนาแล้ว รองรับการเปลี่ยนแปลงของโลกทั้งในปัจจุบันและ

อนาคต โดยการเปลี่ยนแปลงที่สำคัญจะส่งผลกระทบต่อระบบการศึกษา ระบบเศรษฐกิจและสังคมของประเทศไทย (สำนักงานเลขาธิการสภาการศึกษา กระทรวงศึกษาธิการ, 2560)

คณิตศาสตร์มีบทบาทสำคัญอย่างยิ่งต่อการพัฒนาความคิดมนุษย์ ทำให้มนุษย์มีความคิดสร้างสรรค์ คิดอย่างมีเหตุผล เป็นระบบ มีแบบแผน สามารถวิเคราะห์ปัญหา หรือสถานการณ์ได้อย่างถี่ถ้วนรอบคอบ ช่วยให้คาดการณ์ วางแผน ตัดสินใจ แก้ปัญหา และนำไปใช้ในชีวิตประจำวันได้อย่างถูกต้องเหมาะสม นอกจากนี้คณิตศาสตร์ยังเป็นเครื่องมือในการศึกษาทางด้านวิทยาศาสตร์ เทคโนโลยีและศาสตร์อื่น ๆ คณิตศาสตร์จึงมีประโยชน์ต่อการดำเนินชีวิต ช่วยพัฒนาคุณภาพชีวิตให้ดีขึ้น และสามารถอยู่ร่วมกับผู้อื่นได้อย่างมีความสุข (สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการ, 2560)

ปัจจุบันการเรียนการสอนในรายวิชาคณิตศาสตร์ในประเทศไทยมีปัญหาอย่างมาก จะเห็นได้จากการสอบโครงการประเมินผลการศึกษานานาชาติ หรือ PISA ที่สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี (สสวท.) ได้ร่วมมือกับองค์การเพื่อความร่วมมือทางเศรษฐกิจและการพัฒนา (OECD) ซึ่ง PISA เน้นการประเมินสมรรถนะของนักเรียน เกี่ยวกับการใช้ความรู้และทักษะในชีวิตจริงมากกว่าการเรียนรู้ตามหลักสูตรในโรงเรียน หรือเรียกว่า "ความฉลาดรู้" (Literacy) ใน 3 ด้าน ได้แก่ การอ่าน คณิตศาสตร์และวิทยาศาสตร์ การประเมินนักเรียนจะวัดทั้ง 3 ด้านดังกล่าวไปพร้อมกัน แต่จะเน้นหนักที่ด้านใดด้านหนึ่งในแต่ละรอบการประเมิน ซึ่งความฉลาดรู้ทั้งสามด้านนี้ถือว่าเป็นสิ่งจำเป็นสำหรับการเรียนรู้ตลอดชีวิต และเป็นสิ่งที่ประชากรจำเป็นต้องมีเพื่อการพัฒนาและการแข่งขันทางเศรษฐกิจของประเทศ สำหรับ PISA 2022 เน้นการประเมินด้านคณิตศาสตร์ โดย PISA มองว่า ในปัจจุบันบุคคลที่มีความสามารถทางคณิตศาสตร์จะต้องเป็นบุคคลที่สามารถให้เหตุผลทางคณิตศาสตร์ ในการแก้ปัญหาในชีวิตจริงที่ซับซ้อนร่วมกับการหาวิธีแก้ปัญหาโดยการคิดหรือแปลงปัญหาในเชิงคณิตศาสตร์ ใช้คณิตศาสตร์ในการตีความและประเมินผลลัพธ์ทางคณิตศาสตร์ได้ และมีนักเรียนเข้าร่วมการประเมินประมาณ 690,000 คน ซึ่งถือว่าเป็นตัวแทนของนักเรียนอายุ 15 ปี ประมาณ 29 ล้านคน จาก 81 ประเทศ/เขตเศรษฐกิจ สำหรับในประเทศไทย สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี (สสวท. ทำหน้าที่เป็นศูนย์แห่งชาติ (National Center) ได้ดำเนินการจัดสอบเมื่อเดือนสิงหาคม พ.ศ. 2565 ซึ่งมีนักเรียนกลุ่มตัวอย่างเข้าร่วมการประเมินจาก 279 โรงเรียน ในทุกสังกัดการศึกษา รวม 8,495 คน

ผลการประเมินของประเทศไทย พบว่า นักเรียนไทยมีคะแนนเฉลี่ยด้านคณิตศาสตร์ 394 คะแนน ซึ่งเมื่อเทียบกับ PISA 2018 พบว่า คะแนนเฉลี่ยของประเทศไทยลดลง โดยด้านคณิตศาสตร์มีคะแนนเฉลี่ยลดลง 25 คะแนน ทั้งนี้ ผลการประเมินของประเทศไทยตั้งแต่ PISA 2000 จนถึง PISA 2022 พบว่าคะแนนเฉลี่ย ด้านคณิตศาสตร์มีแนวโน้มลดลง (ศูนย์ดำเนินงาน PISA แห่งชาติ สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี, 2566)

การจัดการเรียนการสอนคณิตศาสตร์ในปัจจุบันจำเป็นต้องเน้นให้ผู้เรียนได้พัฒนาทักษะในการแก้ปัญหา เพราะการที่มนุษย์จะประสบความสำเร็จในเรื่องใดเรื่องหนึ่งนั้น จะต้องพบเจอกับปัญหาและจะต้องหาวิธีการแก้ปัญหาเพื่อให้บรรลุเป้าหมายนั่นเสมอ ดังนั้นครูควรเลือกวิธีการสอนที่สามารถนำมาจัดกิจกรรมการเรียนรู้ เพื่อก่อให้เกิดการพัฒนาทักษะในการแก้ปัญหาให้กับผู้เรียน การจัดการเรียนการสอนเกี่ยวกับการแก้ปัญหา โดยผ่านกระบวนการคิด การวิเคราะห์ การทำความเข้าใจกับสิ่งที่โจทย์ถาม เพื่อค้นหาวิธีการไปสู่คำตอบที่ถูกต้อง โพลยา (Polya, 1957) ได้เสนอขั้นตอนวิธี สอนแก้ปัญหา 4 ขั้นตอน คือ ขั้นที่ 1 ทำความเข้าใจปัญหา (Understanding the Problem) ขั้นที่ 2 วางแผนการแก้ปัญหา (Devising

a Plan) ขั้นที่ 3 ปฏิบัติตามแผน (Carrying Out the Plan) และขั้นที่ 4 ตรวจสอบคำตอบ (Looking Back)

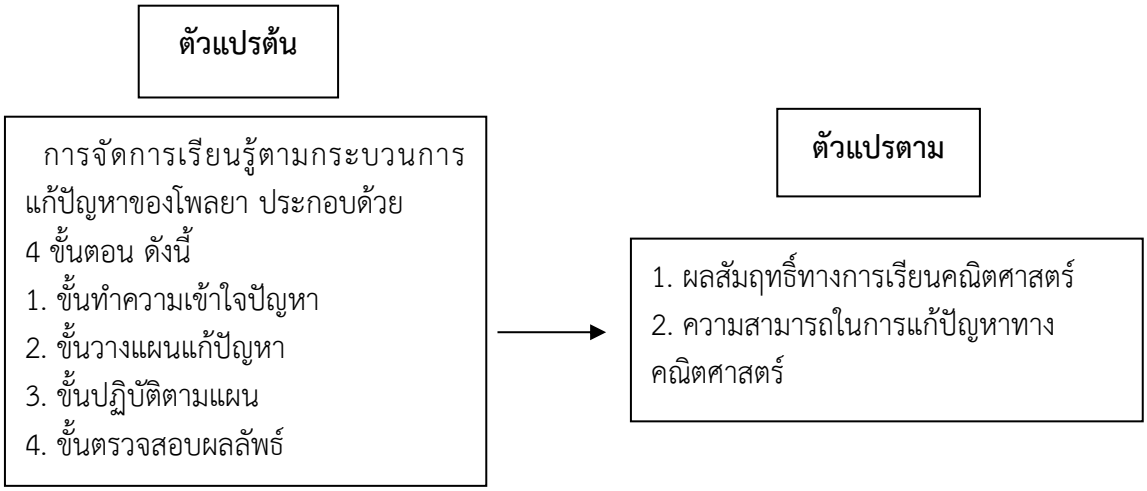
จากความเป็นมาและความสำคัญของปัญหาข้างต้น ผู้วิจัยมีความสนใจในการศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่องความน่าจะเป็นโดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 โรงเรียนสตรีภูเก็ต จังหวัดภูเก็ต โดยในการวิจัยครั้งนี้จะนำกระบวนการแก้ปัญหาตามแนวคิดของโพลยามา ใช้ในการจัดการเรียนรู้ที่ส่งเสริมให้ผู้เรียนเกิดกระบวนการแก้ปัญหาอย่างอย่างเป็นระบบ เพื่อเป็นการช่วยพัฒนาทักษะการแก้ปัญหาทางคณิตศาสตร์ให้แก่นักเรียน ซึ่งสามารถใช้เป็นแนวทางในการจัดกิจกรรมการเรียนรู้กลุ่มสาระการเรียนรู้คณิตศาสตร์ให้เกิดประโยชน์แก่นักเรียนมากที่สุด และทำให้นักเรียนมีผลสัมฤทธิ์ทางการเรียนที่สูงขึ้นต่อไป

วัตถุประสงค์ของการวิจัย

2.1 เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

2.2 เพื่อศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียน จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

แนวคิด ทฤษฎี กรอบแนวคิด



ภาพที่ 1 กรอบแนวคิด

วิธีดำเนินการวิจัย

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้

แผนการจัดการเรียนรู้โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง ความน่าจะเป็น สำหรับนักเรียนระดับชั้นมัธยมศึกษาปีที่ 4 รวมแผนการจัดการเรียนรู้ 10 แผน จำนวน 10 คาบ ผู้วิจัยได้ดำเนินการตามขั้นตอน ต่อไปนี้

1. ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 หนังสือเรียนรายวิชาคณิตศาสตร์พื้นฐาน ชั้นมัธยมศึกษาปีที่ 4 ของสถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการ ตามมาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง 2560) หน่วยที่ 4 เรื่อง ความน่าจะเป็น

2. ศึกษาเอกสารที่เกี่ยวข้องกับการเขียนแผนการจัดการเรียนรู้จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

3. พิจารณาแบ่งเนื้อหา เรื่อง ความน่าจะเป็นออกเป็น 4 เรื่อง จำนวน 10 แผน ใช้เวลาในการจัดการเรียนรู้ จำนวน 10 คาบ ซึ่งมีรายละเอียด ดังตารางต่อไปนี้

ตารางที่ 1 การจัดการเรียนรู้หน่วยการเรียนที่ 4 เรื่องความน่าจะเป็น

ลำดับที่	แผนการจัดการเรียนรู้	ลักษณะกิจกรรมการสอน	จำนวน (คาบ)
1	การทดลองสุ่ม (ปริภูมิตัวอย่าง)	กระบวนการเรียนรู้ตามกรอบแนวคิดของโพลยา	1
2	การทดลองสุ่ม (ปริภูมิตัวอย่าง,เหตุการณ์)	กระบวนการเรียนรู้ตามกรอบแนวคิดของโพลยา	2
3	หลักการนับเบื้องต้น	กระบวนการเรียนรู้ตามกรอบแนวคิดของโพลยา	2
4	ความน่าจะเป็น	กระบวนการเรียนรู้ตามกรอบแนวคิดของโพลยา	5

4. จัดทำแผนการจัดการเรียนรู้ที่สอนตามขั้นตอนจากการจัดการเรียนรู้ตามกรอบแนวคิดของ โพลยา ซึ่งในแผนการจัดการเรียนรู้มีองค์ประกอบ 4 ขั้นตอน ดังต่อไปนี้

ขั้นตอนที่ 1 ทำความเข้าใจโจทย์ปัญหา (Understanding the Problem)

ขั้นตอนที่ 2 วางแผนแก้โจทย์ปัญหา (Devising a Plan)

ขั้นตอนที่ 3 ปฏิบัติตามแผน (Carrying out the Plan)

ขั้นตอนที่ 4 ตรวจสอบผลลัพธ์ (Looking Back)

5. นำเสนอและปรับปรุงแผนการจัดการเรียนรู้

6. นำไปใช้จัดการเรียนการสอน

2. แบบวัดผลสัมฤทธิ์ทางการเรียน

แบบวัดผลสัมฤทธิ์ทางการเรียน มีขั้นตอนการสร้าง ดังต่อไปนี้

1. ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 หนังสือเรียนรายวิชาคณิตศาสตร์พื้นฐาน ชั้นมัธยมศึกษาปีที่ 4 ของสถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการตามมาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง 2560)

2. ศึกษาเอกสารเกี่ยวกับการสร้างแบบวัดผลสัมฤทธิ์ทางการเรียน

3. วิเคราะห์ตัวชี้วัดตามมาตรฐานการเรียนรู้และตัวชี้วัดกลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง 2560) ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551

4. สร้างแบบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง ความน่าจะเป็น แบบปรนัย 4 ตัวเลือก จำนวน 30 ข้อ

5. นำแบบวัดผลสัมฤทธิ์ทางการเรียนเรื่องความน่าจะเป็นไปให้ผู้เชี่ยวชาญ จำนวน 3 ท่าน

6. นำแบบวัดผลสัมฤทธิ์ทางการเรียนไปปรับปรุงแก้ไข

7. นำแบบวัดผลสัมฤทธิ์ทางการเรียนไปเก็บข้อมูลกับกลุ่มเป้าหมาย

3. แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์

แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่องความน่าจะเป็น มีขั้นตอนการสร้าง ดังต่อไปนี้

1. ศึกษาการสร้างแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์จากเอกสารต่าง ๆ จากการจัดการเรียนรู้ตามกรอบแนวคิดของโพลยา

2. สร้างแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เป็นแบบอัตนัย 2 ข้อ รายละเอียดการให้คะแนน แบ่งเป็น 4 ขั้นตอน ตามเกณฑ์ดังนี้

ตารางที่ 2 เกณฑ์การประเมินผลแบบย่อยของการแก้ปัญหาทางคณิตศาสตร์ของสถาบันส่งเสริมการสอนวิทยาศาสตร์ และเทคโนโลยี

รายการประเมิน	**คำอธิบายคุณภาพ**		
	ดี (3)	**พอใช้ (2)**	**ปรับปรุง (1)**
ขั้นที่ 1 ทำความเข้าใจโจทย์	เข้าใจปัญหาได้ถูกต้อง	เข้าใจปัญหาบางส่วนไม่ถูกต้อง	เข้าใจปัญหาน้อยมากหรือไม่ถูกต้อง
ขั้นที่ 2 วางแผนแก้ปัญหา	เลือกวิธีการแก้ปัญหาได้เหมาะสม	เลือกวิธีการแก้ปัญหาซึ่งอาจนำไปสู่คำตอบที่ถูกแต่ยังมีบางส่วนที่ผิด	เลือกวิธีการส่วนใหญ่ไม่ถูกต้อง
ขั้นที่ 3 ปฏิบัติตามแผนที่วางไว้	นำวิธีการแก้ปัญหาไปใช้ได้ถูกต้อง	นำวิธีการแก้ปัญหาไปใช้ได้ถูกต้องเป็นบางครั้ง	นำวิธีการแก้ปัญหาไปใช้ไม่ถูกต้อง
ขั้นที่ 4 ตรวจสอบ	ตรวจคำตอบได้ถูกต้อง และสรุปได้ตรงประเด็น	ตรวจคำตอบได้ถูกต้องและสรุปได้บางประเด็น	ตรวจคำตอบได้เป็นบางส่วนหรือไม่ได้เลย

3. นำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง ความน่าจะเป็น ไปให้ผู้เชี่ยวชาญจำนวน 3 ท่าน

4. นำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ไปปรับปรุงแก้ไข

5. นำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ไปเก็บข้อมูลกับกลุ่มเป้าหมาย

การเก็บรวบรวมข้อมูล

ในการศึกษาวิจัยครั้งนี้ผู้วิจัยดำเนินการเก็บรวบรวมข้อมูลตามขั้นตอน ดังนี้

ขั้นเตรียมการ

1. แผนการจัดการเรียนรู้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาตามแนวคิด ของโพลยา เรื่อง ความน่าจะเป็นรวมแผนการจัดการเรียนรู้ 10 แผน จำนวน 10 คาบ

2. สร้างแบบวัดผลสัมฤทธิ์ทางการเรียนเรื่องความน่าจะเป็น แบบปรนัย 4 ตัวเลือกจำนวน 30 ข้อ เลือก 20 ข้อ

3. สร้างแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์แบบอัตนัยจำนวน 2 ข้อ

ขั้นเก็บรวบรวมข้อมูล

1. ทดสอบนักเรียนโดยใช้แบบวัดผลสัมฤทธิ์ทางการเรียนที่ผู้วิจัยได้สร้างขึ้นทดสอบกับกลุ่มเป้าหมายก่อนใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

2. ดำเนินการสอน โดยผู้วิจัยใช้แผนการจัดการเรียนรู้จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง ความน่าจะเป็น รวมแผนการจัดการเรียนรู้ 10 แผน จำนวน 10 คาบ

3. เมื่อดำเนินการสอนครบตามแผนการจัดการเรียนรู้ จึงวัดผลสัมฤทธิ์ทางการเรียนและวัดความ สามารถในการแก้ปัญหาทางคณิตศาสตร์โดยใช้แบบวัดผลสัมฤทธิ์ทางการเรียนและแบบวัดความสามารถในการแก้ ปัญหาทางคณิตศาสตร์ที่ผู้วิจัยได้สร้างขึ้นทดสอบกับกลุ่มเป้าหมาย

4. ตรวจให้คะแนนแบบวัดผลสัมฤทธิ์ทางการเรียนและคะแนนแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ นำผลคะแนนจากการตรวจสอบแบบวัดผลสัมฤทธิ์ทางการเรียนและแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ที่ผู้วิจัยได้สร้างขึ้นแล้วนำคะแนนที่ได้ไปวิเคราะห์หาค่าทางสถิติ

การวิเคราะห์ข้อมูล

การศึกษาวิจัยครั้งนี้เป็นวิจัยกึ่งทดลอง ซึ่งดำเนินการโดยใช้แบบแผนการทดลองแบบกลุ่มเดียวทดลองใช้แบบวัดผลสัมฤทธิ์ทางการเรียนก่อนจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา และทดลองใช้แบบวัดผลสัมฤทธิ์ทางการเรียนหลังจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ซึ่งมีรูปแบบการวิจัย ดังนี้

ตารางที่ 3 แบบแผนการวิจัย

ก่อนเรียน	ทดลอง	หลังเรียน
T_1	X	T_2

สัญลักษณ์ที่ใช้ในการทดลอง

T_1 แทน การทดสอบก่อนการจัดกระทำการทดลอง

T_2 แทน การทดสอบหลังการจัดกระทำการทดลอง

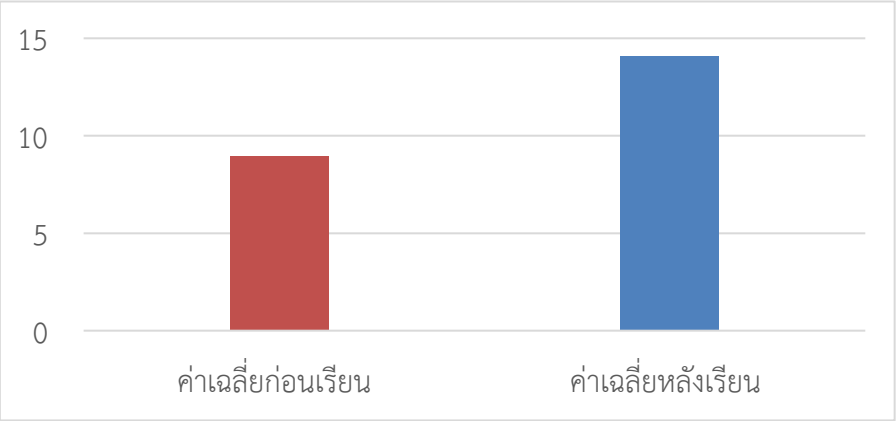
x แทน การจัดกระทำกลุ่มทดลอง

นอกจากนี้ผู้วิจัยนำคะแนนที่ได้จากแบบทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์มาวิเคราะห์หาระดับวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ หลังจากการจัดการเรียนรู้ตามกระบวนการของโพลยา โดยวิเคราะห์เกณฑ์จากคะแนนสอบหลังเรียนแล้วนำคะแนนเฉลี่ยคิดเป็นร้อยละเทียบจากเกณฑ์การตัดสินผลการเรียนกลุ่มสาระการเรียนรู้คณิตศาสตร์ตามหลักสูตรแกนกลาง พุทธศักราช 2551 ซึ่งแบ่งเกณฑ์ออกเป็น 8 ระดับดังนี้

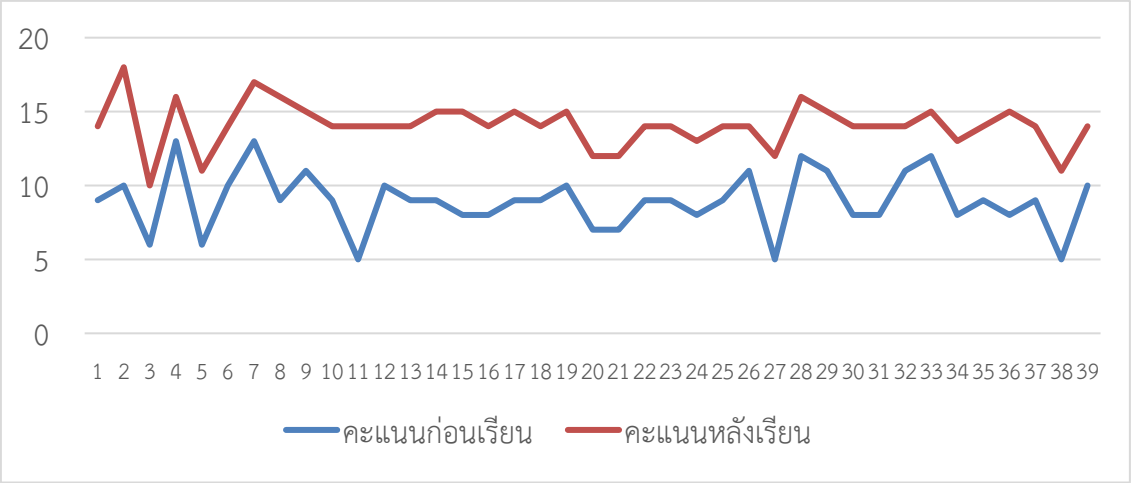
คะแนนร้อยละ 80 – 100 อยู่ในระดับดีเยี่ยม
คะแนนร้อยละ 76 – 79 อยู่ในระดับดีมาก
คะแนนร้อยละ 70 – 75 อยู่ในระดับดี
คะแนนร้อยละ 65 – 69 อยู่ในระดับค่อนข้างดี
คะแนนร้อยละ 60 – 64 อยู่ในระดับปานกลาง
คะแนนร้อยละ 55 – 59 อยู่ในระดับพอใช้
คะแนนร้อยละ 50 – 54 อยู่ในระดับผ่านเกณฑ์
คะแนนร้อยละ 0 – 49 อยู่ในระดับต่ำกว่าเกณฑ์

ผลการวิจัย

ผลสัมฤทธิ์ทางการเรียนนักเรียน จำนวน 39 คน มีผลการเรียนรู้ก่อนเรียนโดยเฉลี่ยเท่ากับ 8.95 ± 1.99 และมีผลการเรียนรู้ หลังเรียนโดยเฉลี่ยเท่ากับ 14.08 ± 1.56 แสดงว่า คะแนนเฉลี่ยหลังจากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาสูงกว่าก่อนการจัดการเรียนรู้

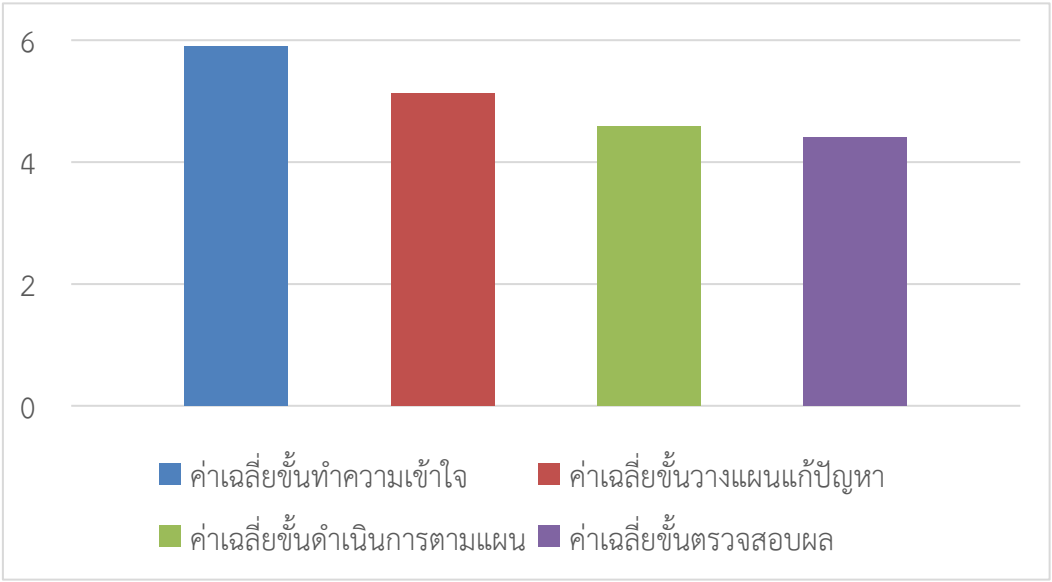


ภาพที่ 2 การเปรียบเทียบค่าเฉลี่ยของผลสัมฤทธิ์จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา



ภาพที่ 3 การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนเรียนและหลังเรียนของนักเรียนรายบุคคล

คะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจำนวน 39 คน พบว่า มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 5.89 ± 0.64 คิดเป็นร้อยละ 98.16 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นวางแผนแก้ปัญหา 5.12 ± 1.49 คิดเป็นร้อยละ 85.33 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นดำเนินการตามแผน 4.58 ± 1.58 คิดเป็นร้อยละ 76.33 อยู่ในระดับดีมาก มีคะแนนเฉลี่ยขั้นตรวจสอบผล 4.41 ± 1.48 คิดเป็นร้อยละ 73.5 ซึ่งอยู่ในระดับดี และมีคะแนนเฉลี่ยรวม 5 คะแนน คิดเป็นร้อยละ 83.33 อยู่ในระดับดีเยี่ยม



ภาพที่ 4 การเปรียบเทียบค่าเฉลี่ยของความสามารถในการแก้ปัญหาทางคณิตศาสตร์ทางการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาทั้ง 4 ขั้นตอน

สรุปและอภิปรายผล

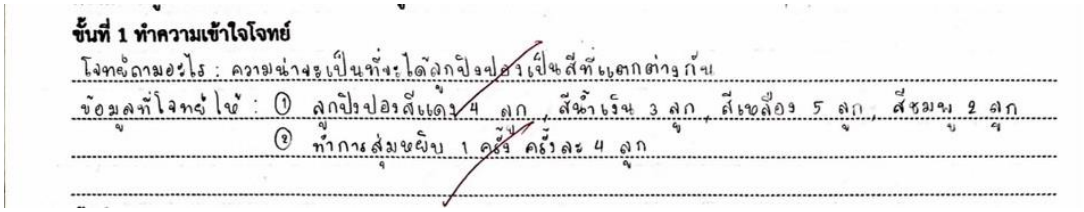
จากการศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง ความน่าจะเป็น โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา พบว่า ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 จำนวน 39 คน ที่ได้จากการจัดการเรียนรู้ฯ ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง ความน่าจะเป็น โดยรวมหลังเรียนสูงกว่าก่อนเรียน ซึ่งสอดคล้องกับ นพชัย ยอดโยม, ดลชนก พัชนี, และ อุไรวรรณ ปานทโชติ (2562) ได้ทำการวิจัยการศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์โดยใช้กระบวนการแก้ปัญหาของโพลยา ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง ความน่าจะเป็น ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังการจัดการเรียนรู้ โดยใช้กระบวนการแก้ปัญหาของโพลยากับเกณฑ์ร้อยละ 70 เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนและหลังการจัดการเรียนรู้ โดยใช้กระบวนการแก้ปัญหาของโพลยา กลุ่มตัวอย่างเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 3/3 โรงเรียนพิไกรวิทยา จังหวัดกำแพงเพชร ปีการศึกษา 2561 จำนวน 30 คน เครื่องมือที่ใช้ในการวิจัย ได้แก่ แผนการจัดการเรียนรู้โดยกระบวนการแก้ปัญหาของโพลยา แบบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ การทำงานเป็นทีมและเจตคติต่อคณิตศาสตร์ วิเคราะห์ข้อมูลโดยการใช้ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบค่าที (Dependent Sample t-test และ One Sample t-test) ผลการวิจัยพบว่า นักเรียนชั้นมัธยมศึกษาปีที่ 3 มีผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง ความน่าจะเป็น หลังการจัดการเรียนรู้โดยใช้กระบวนการแก้ปัญหาของโพลยาสูงกว่าเกณฑ์ ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 มีผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์หลังการจัดการเรียนรู้สูงกว่าก่อนการจัดการเรียนรู้โดยใช้กระบวนการแก้ปัญหาของโพลยาอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 มีการทำงานเป็นทีมหลังการจัดการเรียนรู้โดยใช้กระบวนการแก้ปัญหาของโพลยา เรื่อง ความน่าจะเป็น โดยรวมอยู่ในระดับมาก

ความสามารถในการแก้ปัญหาคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 4/10 จำนวน 39 คน ที่ได้จากการจัดการเรียนรู้กระบวนการของโพลยา มีคะแนนเฉลี่ยรวม 5 คะแนน คิดเป็นร้อยละ 83.33 อยู่ในระดับดีเยี่ยม ซึ่งสอดคล้องกับผลงานวิจัยของ ปานพระจันทร์ จันทร์พรหม (2565) ได้ทำการวิจัยเรื่องการศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โดยใช้กระบวนการแก้ปัญหาตามแนวคิดของโพลยา งานวิจัยนี้มีวัตถุประสงค์เพื่อ 1) เปรียบเทียบความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง กราฟและความสัมพันธ์เชิงเส้น ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โดยใช้กระบวนการแก้ปัญหาตามแนวคิดของโพลยากับเกณฑ์ 2) เปรียบเทียบความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง กราฟและความสัมพันธ์เชิงเส้น ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ก่อนและหลังจัดการเรียนรู้ โดยใช้กระบวนการแก้ปัญหาตามแนวคิดของโพลยา กลุ่มตัวอย่างที่ใช้ในการวิจัยเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนสาธิตมหาวิทยาลัยรามคำแหง (ฝ่ายมัธยม) จำนวน 33 คน เครื่องมือที่ใช้ในการวิจัย ได้แก่ 1) แบบทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง กราฟและความสัมพันธ์เชิงเส้น 2) แบบวัดความพึงพอใจที่มีต่อการจัดการเรียนรู้โดยการใช้กระบวนการแก้ปัญหาตามแนวคิดของโพลยา ผลการวิจัยพบว่า 1) ความสามารถในการแก้ปัญหาทางคณิตศาสตร์สูงกว่าเกณฑ์อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 2) ความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โดยใช้กระบวนการแก้ปัญหาตามแนวคิดของโพลยาหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และ 3) ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่มีต่อการจัดการเรียนรู้โดยใช้กระบวนการแก้ปัญหาตามแนวคิดของโพลยาอยู่ในระดับมาก

การแสดงออกของนักเรียนต่อความสามารถในการแก้ปัญหาทางคณิตศาสตร์ทั้ง 4 ขั้นตอน

ขั้นที่ 1 การทำความเข้าใจปัญหา (Understanding the Problem) เป็นการมองไปที่ตัวปัญหา โดยพิจารณาว่า โจทย์ถามอะไร โจทย์กำหนดอะไรมาให้บ้าง มีสาระความรู้ใดที่เกี่ยวข้องบ้าง มีความเพียงพอสำหรับการแก้ปัญหานั้นหรือไม่

ตัวอย่าง ผลงานนักเรียนที่ได้เขียนอธิบายได้อย่างครบถ้วน มีการอธิบายสิ่งที่โจทย์กำหนดให้มาสิ่งที่โจทย์ถามได้อย่างครบถ้วนสมบูรณ์

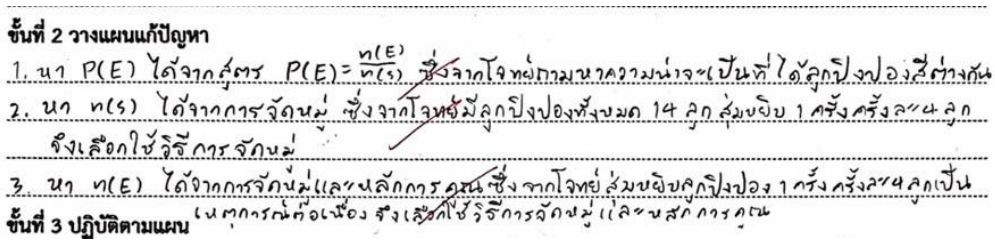

ขั้นที่ 1 ทำความเข้าใจโจทย์
โจทย์ถามอะไร : ความน่าจะเป็นที่จะได้ลูกปิงปองเป็นสีที่แตกต่างกัน
ข้อมูลที่โจทย์ให้ : ① ลูกปิงปองสีแดง 4 ลูก, สีน้ำเงิน 3 ลูก, สีเขียว 5 ลูก, สีชมพู 2 ลูก
② ทำการสุ่มหยิบ 1 ครั้ง ครั้งละ 4 ลูก

ภาพที่ 5 ผลงานของนักเรียนที่ได้เขียนขั้นการทำความเข้าใจปัญหาได้อย่างครบถ้วนสมบูรณ์

ตัวอย่าง ผลงานนักเรียนที่ได้เขียนอธิบายสิ่งที่โจทย์กำหนดให้มาแค่อย่างเดียวไม่ได้แยกเป็นส่วนที่โจทย์ต้องการถามอะไร

ขั้นที่ 2 การวางแผนการแก้ปัญหา (Devising a Plan) เป็นขั้นตอนสำคัญที่จะต้องพิจารณาว่าจะแก้ปัญหาด้วยวิธีใด จะแก้ปัญหาอย่างไร นักเรียนต้องมองเห็นความสำคัญของข้อมูลต่าง ๆ ในโจทย์ปัญหาอย่างชัดเจนมากขึ้น ซึ่งเป็นขั้นที่ค้นหาความสัมพันธ์ระหว่างสิ่งที่โจทย์ถามกับข้อมูลหรือสิ่งที่โจทย์กำหนดให้

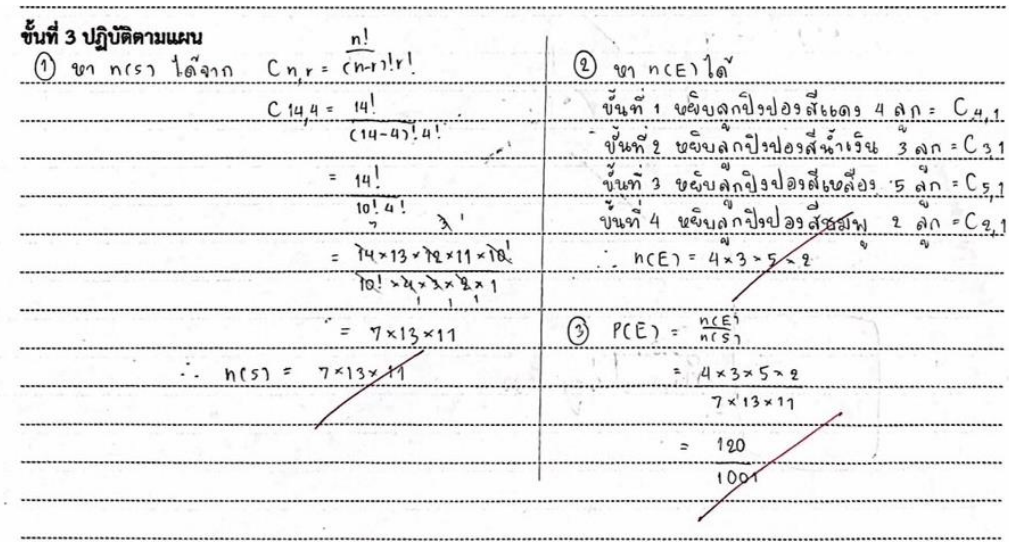
ตัวอย่าง ผลงานนักเรียนที่ได้เขียนอธิบายวางแผนการแก้ปัญหาได้ถูกต้องครบถ้วนในสิ่งที่โจทย์ถามทั้งการหา n (E), n(S) และ P(E)


ขั้นที่ 2 วางแผนแก้ปัญหา
1. หา P(E) ได้จากสูตร $P(E)=\frac{n(E)}{n(S)}$ ซึ่งจากโจทย์ถามหาความน่าจะเป็นที่ได้ลูกปิงปองสีต่างกัน
2. หา n(S) ได้จากการจัดหมู่ ซึ่งจากโจทย์มีลูกปิงปองทั้งหมด 14 ลูก สุ่มหยิบ 1 ครั้ง ครั้งละ 4 ลูก จึงเลือกใช้วิธีการจัดหมู่
3. หา n(E) ได้จากการจัดหมู่และหลักการคูณ ซึ่งจากโจทย์สุ่มหยิบลูกปิงปอง 1 ครั้ง ครั้งละ 4 ลูกเป็นเหตุการณ์ต่อเนื่อง จึงเลือกใช้วิธีการจัดหมู่และหลักการคูณ
ขั้นที่ 3 ปฏิบัติตามแผน

ภาพที่ 6 ผลงานของนักเรียนที่ได้เขียนการวางแผนการแก้ปัญหาได้อย่างถูกต้องครบถ้วน

ขั้นที่ 3 การดำเนินการตามแผน (Carrying Out the Plan) เป็นขั้นตอนที่ลงมือปฏิบัติการตามแผนที่วางไว้เพื่อให้ได้คำตอบของปัญหาด้วยการรู้จักเลือกวิธีการคิดคำนวณ กฎ หรือสูตรที่เหมาะสมมาใช้

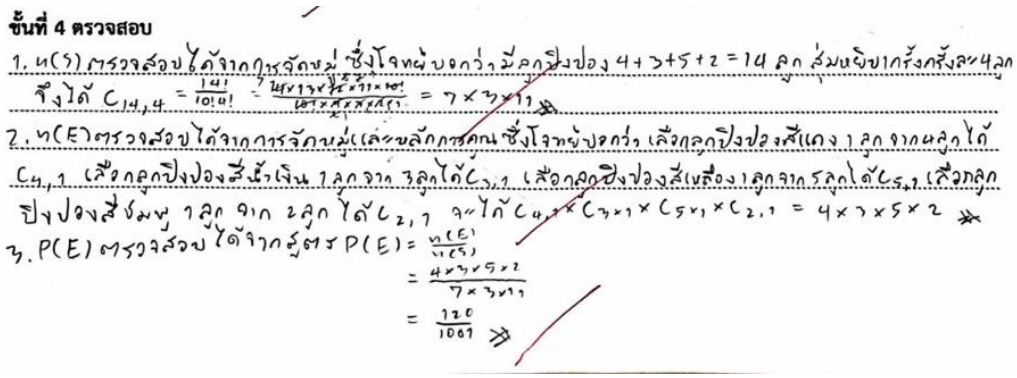
ตัวอย่าง ผลงานนักเรียนที่ได้เขียนอธิบายขั้นการดำเนินการตามแผนได้อย่างถูกต้องครบถ้วน มีการอธิบายเป็นแซมเปิลสเปซและเหตุการณ์ที่สนใจ



ภาพที่ 7 ผลงานของนักเรียนที่ได้เขียนขั้นปฏิบัติตามแผนได้อย่างเข้าใจและถูกต้องครบถ้วน

ขั้นที่ 4 การตรวจสอบผล (Looking Back) เป็นขั้นตอนที่ผู้แก้ปัญหามองย้อนกลับไปที่ขั้นตอนต่าง ๆ ที่ผ่านมาเป็นการตรวจสอบเพื่อให้แน่ใจว่าผลลัพธ์ที่ได้ถูกต้องสมบูรณ์ โดยพิจารณาและตรวจดูว่าผลลัพธ์ถูกต้องและมีเหตุผลที่น่าเชื่อถือได้

ตัวอย่าง ผลงานนักเรียนที่ได้เขียนอธิบายขั้นการตรวจสอบผลได้อย่างถูกต้องครบถ้วน มีการอธิบายถึงคำตอบที่ได้มา



ภาพที่ 8 ผลงานของนักเรียนที่ได้เขียนขั้นตรวจสอบผลได้อย่างถูกต้องครบถ้วน

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. การจัดการเรียนรู้ตามกรอบแนวคิดของโพลยา ควรคำนึงถึงความเหมาะสมระหว่างเวลากับเนื้อหาสาระที่จะสอนในคาบนั้น

2. การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ควรมีการปฐมนิเทศผู้ร่วมศึกษาค้นคว้า นักเรียนให้เกิดความเข้าใจในขั้นตอนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์

3. ครูผู้สอนควรสังเกตนักเรียนกระตุ้นเสริมแรงให้กำลังใจนักเรียนและสร้างบรรยากาศให้เป็นกันเอง ในขณะที่ทำกิจกรรมโดยใช้แผนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์ตามกระบวนการแก้ปัญหา

ของโพลยา เพื่อจะได้พัฒนาแผนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์ให้สอดคล้องกับความต้องการและความสนใจของนักเรียนทำให้การดำเนินกิจกรรมการเรียนรู้เป็นไปอย่างสมบูรณ์และมีประสิทธิภาพ

4. เนื่องจากกิจกรรมการเรียนรู้ส่วนใหญ่ผู้เรียนเป็นผู้ปฏิบัติกิจกรรมการเรียนรู้ จึงควรมีการสรุปบทเรียนทุกครั้งที่ทำกิจกรรมเสร็จเรียบร้อย

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรมีการเปรียบเทียบระหว่างการสอน โดยใช้แผนการจัดกิจกรรมการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยากับการสอนโดยใช้สื่อ/นวัตกรรมอื่น ๆ เพื่อดูความแตกต่าง

2. ควรมีการเปรียบเทียบระหว่างการสอนแบบกลุ่มกับรายบุคคลด้วยแผนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์ตามกระบวนการแก้ปัญหาของโพลยา เพื่อเปรียบเทียบความแตกต่าง

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ผลของการจัดการเรียนรู้โดยใช้ทีมเป็นฐานต่อความรู้และความพึงพอใจในการจัดการเรียนรู้ เรื่อง “ปวดท้อง” ในรายวิชาการบำบัดโรคเบื้องต้น

Effect of Team-Based Learning (TBL) on Knowledge and Satisfaction for Abdominal Pain in Basic Medical Care Subject.

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บทคัดย่อ

การวิจัยแบบกึ่งทดลองชนิดกลุ่มเดียววัดก่อนและหลังนี้ มีวัตถุประสงค์เพื่อศึกษาผลของการจัดการเรียนรู้โดยใช้ทีมเป็นฐานต่อความรู้และความพึงพอใจในการจัดการเรียนรู้เรื่อง “ปวดท้อง” กลุ่มตัวอย่างเป็นนักศึกษาหลักสูตรสาธารณสุขศาสตรบัณฑิต สาขาวิชาทันตสาธารณสุข ชั้นปีที่ 2 จำนวน 53 คน ใช้เวลาในการจัดการเรียนรู้ 8 ชั่วโมง เครื่องมือที่ใช้ในการวิจัยประกอบด้วย 1) แผนการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน มีค่าความเหมาะสมสอดคล้องอยู่ในระดับมาก ค่าเฉลี่ยเท่ากับ 4.47 (S.D. = 0.56) 2) แบบทดสอบความรู้ มีความยากง่ายอยู่ระหว่าง 0.30 - 0.45 มีค่าอำนาจจำแนกอยู่ระหว่าง 0.45 - 0.75 และมีค่าความเชื่อมั่นเท่ากับ 0.80 3) แบบทดสอบความรู้ (ฉบับคู่ขนาน) มีความยากง่ายอยู่ระหว่าง 0.25 - 0.40 มีค่าอำนาจจำแนกอยู่ระหว่าง 0.50 - 0.78 และมีค่าความเชื่อมั่นเท่ากับ 0.81 และ 4) แบบสอบถามความพึงพอใจมีค่าความเชื่อมั่นเท่ากับ 0.85 ใช้สถิติเชิงพรรณนา ได้แก่ ร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน และใช้การทดสอบค่าทีแบบไม่เป็นอิสระต่อกัน เพื่อเปรียบเทียบความรู้ก่อนและหลังการจัดการเรียนรู้ ผลการวิจัยพบว่า หลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน กลุ่มตัวอย่างมีความรู้สูงขึ้นอย่างมีนัยสำคัญทางสถิติ ($t=11.67$, $p<.001$) และมีความพึงพอใจต่อการจัดการเรียนรู้อยู่ในระดับมากที่สุด (ค่าเฉลี่ย = 4.59, S.D. = 0.92) จากผลการศึกษาชี้ให้เห็นว่า สามารถนำการจัดการเรียนรู้โดยใช้ทีมเป็นฐานไปประยุกต์ใช้ในการจัดการเรียนการสอนในรายวิชาอื่น หรือหัวข้ออื่นที่มีลักษณะคล้ายกันเพื่อให้ผู้เรียนมีผลสัมฤทธิ์ที่สูงขึ้นได้ต่อไป

คำสำคัญ: การจัดการเรียนรู้โดยใช้ทีมเป็นฐาน, ความรู้, ความพึงพอใจต่อการจัดการเรียนรู้

Abstract

This quasi-experimental, one group pretest-posttest design, aimed to examine the effects of team-based learning on knowledge and satisfaction regarding the topic of "abdominal pain". The study sample comprised 53 second-year students enrolled in Bachelor of Public Health Program in Dental Public Health. The intervention consisted of 8 hours of team-based learning. Research instruments included: 1) a team-based learning plan with a high level of appropriateness alignment (Mean = 4.47, S.D.=0.56), 2) a knowledge assessment test with the difficulty index or easiness ranging from 0.30 to 0.45, discriminative index between 0.45 and 0.75, and reliability coefficient of 0.80, 3) a knowledge assessment test (Parallel Form) with the difficulty index or easiness ranging from 0.25 to 0.40, discriminative index between 0.50 and 0.78, and reliability coefficient of 0.81, and 4) a satisfaction questionnaire with a reliability coefficient of 0.85. Descriptive statistical analysis included percentages, means, standard deviations, and paired samples t-test to compare pre- and post-intervention levels of knowledge. The research findings revealed a statistically significant increase in knowledge among the sample group following the implementation of team-based learning (t=11.67, p<.001), along with highest levels of satisfaction (Mean = 4.59, S.D. = 0.92) These results suggest the potential applicability of team-based learning in enhancing learning outcomes across various subjects or topics with similar characteristics.

Keywords: Team-based learning, Knowledge, Satisfaction

บทนำ

การนำทักษะการเรียนรู้แห่งศตวรรษที่ 21 มาปรับใช้ในการศึกษาไทยเพื่อให้ผู้เรียนมีทักษะที่มีความจำเป็นต้องใช้ในการดำเนินชีวิตเป็นสิ่งสำคัญ ซึ่งการเรียนรู้แห่งศตวรรษที่ 21 เป็นการเรียนรู้ 3R x 7C ประกอบด้วย 3R ได้แก่ 1) อ่านออก 2) เขียนได้ และ 3) คิดเลขเป็น 7C ได้แก่ 1) ทักษะด้านการคิดอย่างมีวิจารณญาณและทักษะในการแก้ปัญหา 2) ทักษะด้านการสร้างสรรค์และนวัตกรรม 3) ทักษะด้านความเข้าใจต่างวัฒนธรรมต่างกระบวนทัศน์ 4) ทักษะด้านความร่วมมือการทำงานเป็นทีมและภาวะผู้นำ 5) ทักษะด้านการสื่อสารสารสนเทศและรู้เท่าทันสื่อ 6) ทักษะด้านวิทยาศาสตร์และเทคโนโลยีสารสนเทศและการสื่อสาร 7) ทักษะอาชีพและทักษะการเรียนรู้ ดังนั้นการเรียนรู้ในศตวรรษที่ 21 จึงเป็นการเรียนรู้ทักษะเพื่อการดำรงชีวิตในศตวรรษที่ 21 ประเทศจึงจำเป็นต้องเตรียมคนให้พร้อมเผชิญการเปลี่ยนแปลงที่รวดเร็ว รุนแรง พลิกผัน และคาดไม่ถึง คนยุคใหม่จึงต้องมีทักษะสูงในการเรียนรู้และปรับตัว (วิจารณ์ พานิช, 2556)

ทักษะในศตวรรษที่ 21 ถือว่าเป็นเครื่องมือยกระดับการเรียนรู้และผลสัมฤทธิ์ทางการศึกษา ช่วยส่งเสริมการผลิตกำลังคนที่สามารถแข่งขันในเวทีระดับโลก โดยเน้นให้สามารถทำงานร่วมกับผู้อื่นได้ ดังนั้นครูจึงต้องปรับเปลี่ยนรูปแบบการจัดการเรียนการสอนให้สอดคล้องกับการเกิดทักษะศตวรรษที่ 21 เน้นผู้เรียนเป็นสำคัญ คำนึงถึงการจัดการเรียนการสอนที่เป็นกระบวนการเรียนรู้ให้ผู้เรียนเกิดความเข้าใจและมีความรู้ที่ถูกต้อง (กัลยาลักษณ์ ไชยศิริ และ อุบลวรรณ ส่งเสริม, 2566) โดยผ่านกิจกรรมการเรียนรู้

เชิงรุก (Active Learning) ซึ่งทำให้มีอัตราการเรียนรู้ (Retention Rate) ร้อยละ 90 เพราะผู้เรียนได้มีบทบาทในการแสวงหาความรู้และเรียนรู้อย่างมีปฏิสัมพันธ์ จนเกิดความรู้ความเข้าใจนำไปประยุกต์ใช้ สามารถวิเคราะห์ สังเคราะห์ ประเมินค่า หรือสร้างสรรค์สิ่งต่าง ๆ และพัฒนาตนเองได้อย่างเต็มความสามารถ รวมทั้งหากผู้สอนจัดประสบการณ์ฝึกการอภิปราย ฝึกการสื่อสาร ได้นำเสนอผลงานทางการเรียนรู้ในสถานการณ์จำลอง มีการเชื่อมโยงกับสถานการณ์ต่าง ๆ จะทำให้ผลการเรียนรู้เกิดขึ้นได้ถึง 90% (วิจารณ์ พานิช, 2556)

การจัดการเรียนรู้โดยใช้ทีมเป็นฐาน (Team-Based Learning: TBL) เป็น Active Learning ที่นอกจากจะทำให้เกิดอัตราการเรียนรู้สูงดังกล่าวแล้ว ยังช่วยให้ผู้เรียนเกิดทักษะการคิดอย่างมีวิจารณญาณ การมีปฏิสัมพันธ์ระหว่างกัน พัฒนาความสามารถด้านการคิด และการแก้ปัญหา เกิดทักษะการเรียนรู้ด้วยตนเอง และการเรียนรู้ตลอดชีวิต เพราะในกิจกรรมการเรียนรู้มีการระดมสมอง การอภิปรายเพื่อหาคำตอบร่วมกัน การค้นคว้าข้อมูลมาโต้แย้งหรือสนับสนุนกันภายในกลุ่ม การแลกเปลี่ยนความคิดเห็นระหว่างกัน การคิดในเชิงวิพากษ์เพื่อหาคำตอบของปัญหานั้น ๆ ทำให้เกิดความรับผิดชอบในการทำงาน ส่งเสริมทักษะความสัมพันธ์ระหว่างบุคคล และพัฒนาทักษะการทำงานเป็นทีม มีอารมณ์ร่วมในการทำงานและการเป็นเจ้าของงาน (วีระวัฒน์ ทางธรรม และ อัมพร เที่ยงตรงดี, 2562; กัลยาลักษณ์ ไชยศิริ และ อุบลวรรณ ส่งเสริม, 2566) ก่อให้เกิดการพัฒนาทักษะทางสังคม ทักษะการสื่อสาร เกิดความคิดรอบคอบกว้างขวาง และการเรียนรู้ในเรื่องที่ศึกษาได้มาก (ทิศนา แขมมณี, 2564)

จากการศึกษาพบว่า การจัดการเรียนรู้โดยใช้ทีมเป็นฐานช่วยให้ผู้เรียนมีผลสัมฤทธิ์ทางการเรียนที่สูงขึ้น (สมพิศ ใยสุ่น, ปรียารัตน์ รัตนวิบูลย์, และ ชลดา จันทร์ขาว, 2559; ประกายทิพย์ พิชัย, ชษาพิมพ์ สัมนา, วาสนา ดวงใจ, ผกาทิพย์ สุระบุตร, และ ศลาฆนันท์ หงส์สวัสดิ์, 2561; วีระวัฒน์ ทางธรรม และ อัมพร เที่ยงตรงดี, 2562; จุฑารัตน์ คงเพ็ชร, พิสมัย วัฒนสิทธิ์, และ ปิยธิดา เทพประดิษฐ์, 2565; เนติมา บูรพาศิริวัฒน์, 2565)

ผู้วิจัยสนใจที่จะนำการจัดการเรียนรู้โดยใช้ทีมเป็นฐานในหัวข้อ “ปวดท้อง (Abdominal Pain)” ในรายวิชาการรักษาโรคเบื้องต้น จำนวน 3 หน่วยกิต เนื้อหาประกอบด้วย การประเมินสภาพผู้ป่วย การวินิจฉัยโรค การบำบัดโรคเบื้องต้น การใช้ยาเบื้องต้นภายใต้กฎหมายกำหนด การดูแลผู้ป่วยแบบองค์รวม การส่งต่อผู้ป่วยและการเยี่ยมบ้าน ซึ่งหัวข้อ “ปวดท้อง” เป็นกลุ่มอาการที่พบได้ในโรคหลายระบบ ทั้งระบบทางเดินอาหาร ระบบทางเดินปัสสาวะ ระบบอวัยวะสืบพันธุ์ แม้กระทั่งระบบหัวใจและหลอดเลือด หากผู้เรียนมีความรู้ความเข้าใจ สามารถนำหลักการประเมินผู้ป่วย การวินิจฉัยแยกโรค จากการเรียนรู้นี้ก็จะทำให้ผู้เรียนนำประสบการณ์การเรียนรู้นี้ไปประยุกต์ใช้ในกลุ่มอาการอื่น ๆ ได้ ดังนั้นเพื่อให้ผู้เรียนมีความรู้ที่เพิ่มขึ้นจากการเรียนรู้ร่วมกันเป็นทีม เกิดทักษะการค้นคว้า คิดวิเคราะห์ คิดวิจารณญาณและตัดสินใจ และมีความความพึงพอใจในการเรียน ซึ่งมีความสำคัญในการเรียนรู้และเพิ่มทักษะการเรียนรู้แห่งศตวรรษที่ 21

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบความรู้ก่อนและหลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน และความพึงพอใจของผู้เรียนต่อการจัดการเรียนรู้

แนวคิด ทฤษฎี กรอบแนวคิด

การจัดการเรียนรู้โดยใช้ทีมเป็นฐาน (Team-based Learning: TBL) ที่พัฒนาโดย Larry Michaelsen นำมาใช้ในการจัดการศึกษากลุ่มวิชาชีพด้านสุขภาพ ตั้งแต่ปี ค.ศ. 1999 เนื่องจาก TBL ช่วยพัฒนาภาวะผู้นำ การทำงานเป็นทีม และการสื่อสารของผู้เรียน ต่อมาพบว่า TBL ช่วยพัฒนาผลสัมฤทธิ์ทางการเรียนและการคิดเชิงวิจารณญาณของผู้เรียนได้ การสอนแบบ TBL เน้นผู้เรียนเป็นศูนย์กลาง โดยครูเปลี่ยนบทบาทจากการเป็นผู้ให้ข้อมูลไปเป็นผู้ออกแบบและจัดกระบวนการเรียนรู้ และผู้เรียนเปลี่ยนจากการเป็นผู้รับข้อมูลไปเป็นผู้ที่มีความรับผิดชอบเตรียมตัวก่อนเรียน ผู้เรียนได้ศึกษาเนื้อหาจากสื่อการสอนล่วงหน้า โดยมีครูเป็นผู้เอื้อให้เกิดการเรียนรู้ (Facilitator) ผู้เรียนร่วมกันเรียนรู้ในกลุ่มย่อยผ่านโจทย์สถานการณ์ การจัดการเรียนการสอนแบบนี้จะช่วยพัฒนาทักษะด้านการคิดแบบมีวิจารณญาณ การทำงานเป็นทีม และการสื่อสาร ผ่านกระบวนการทำความเข้าใจกับปัญหาและพิจารณาเลือกแนวทางแก้ปัญหาจากหลักฐานเชิงประจักษ์ (ศุภาพิชญ์ โฟน โบร์แมนน์, ศักดา ขำคม, สิริกร ขาวบุญมาศิริ, ปิยอร วจนะทินภัทร, และ รัชดาภรณ์ ใจอ้าย, 2565)

การจัดการเรียนรู้โดยใช้ทีมเป็นฐาน (Team–Based Learning) ประกอบด้วย 3 ขั้นตอนคือ 1) การเตรียมก่อนสอน ผู้สอนเตรียมแผนการสอน อุปกรณ์ สื่อ เอกสารการสอน แบบทดสอบ การเตรียมทีมขนาดเล็กประมาณ 5 - 7 คน โดยให้สมาชิกมีทั้งคนเก่งและอ่อนคละกัน 2) ขั้นดำเนินการสอน แบ่งเป็น (1) มอบหมายให้ผู้เรียนศึกษาด้วยตนเอง (2) การทดสอบความรู้รายบุคคล (3) การทดสอบความรู้เป็นรายทีม ซึ่งเป็นข้อสอบชุดเดียวกัน โดยทำข้อสอบร่วมกันทีละข้อ อภิปรายแลกเปลี่ยนความคิดเห็นเกี่ยวกับคำตอบทุกตัวเลือก และตัดสินใจเลือกคำตอบภายหลังมีการวิเคราะห์ โดยพิจารณาตามหลักการและเหตุผล (4) ทำการเปิดเฉลย หากไม่ถูกต้องจะอภิปรายร่วมกันจนกว่าจะถูกต้อง (5) ครูผู้สอนให้ข้อมูลป้อนกลับในข้อที่ยังสงสัย และสรุปแนวคิดสำคัญที่ผู้เรียนยังขาดความเข้าใจเพื่อให้สามารถนำความรู้ไปใช้ในการแก้ไขโจทย์สถานการณ์ และ 3) ขั้นการประยุกต์ใช้ความรู้ในการแก้ไขปัญหาที่ซับซ้อน (สมพิศ ใยสุ่น และคณะ, 2559; เกษร สายธนู, สงวน ธานี, และ สมจิตต์ ลุประสงค์, 2562; จุฑารัตน์ คงเพ็ชร และคณะ, 2565; กัลยาลักษณ์ ไชยศิริ และ อุบลวรรณ ส่งเสริม, 2566)

วิธีดำเนินการวิจัย

รูปแบบการวิจัย เป็นการวิจัยกึ่งทดลองแบบกลุ่มเดียวทดสอบก่อนหลัง (One Group Pretest-Posttest Design) เพื่อเปรียบเทียบความรู้ก่อนและหลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน และความพึงพอใจของผู้เรียนต่อการจัดการเรียนรู้

ประชากรและกลุ่มตัวอย่าง

ประชากรและกลุ่มตัวอย่างเป็นนักศึกษาชั้นปีที่ 2 หลักสูตรสาธารณสุขศาสตรบัณฑิต สาขาวิชาทันตสาธารณสุข จำนวน 53 คน ที่ลงทะเบียนเรียนรายวิชาการบำบัดโรคเบื้องต้น ภาคเรียนที่ 2 ปีการศึกษา 2566 วิทยาลัยการสาธารณสุขสิรินธร จังหวัดพิษณุโลก

เครื่องมือในการวิจัยและการตรวจสอบคุณภาพเครื่องมือวิจัย

เครื่องมือที่ใช้ในการวิจัยประกอบด้วย 4 ส่วนดังนี้

1. แผนการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน เรื่อง ปวดท้อง (Abdominal Pain) จำนวน 1 แผน รวมระยะเวลา 8 ชั่วโมง ประกอบด้วย 1) จุดประสงค์การเรียนรู้ 2) กิจกรรมการเรียนรู้ 3) สื่อการจัดการเรียนรู้ และ 4) การวัดและประเมินผล ได้ทำการตรวจสอบคุณภาพโดยนำไปให้ผู้ทรงคุณวุฒิที่มีความ

เชี่ยวชาญในด้านการจัดการเรียนการสอน ด้านหลักสูตรและการสอน และอาจารย์พยาบาลด้านเวชปฏิบัติ จำนวน 3 ท่าน พิจารณาตรวจสอบความสอดคล้องเหมาะสม โดยใช้เกณฑ์การประเมินแบบมาตราส่วนประมาณค่า (Rating Scale) 5 ระดับ ของลิเคิร์ท (Likert) ดังนี้

5 หมายถึง มีความสอดคล้อง/เชื่อมโยง/ครอบคลุม/เหมาะสม มากที่สุด

4 หมายถึง มีความสอดคล้อง/เชื่อมโยง/ครอบคลุม/เหมาะสม มาก

3 หมายถึง มีความสอดคล้อง/เชื่อมโยง/ครอบคลุม/เหมาะสม ปานกลาง

2 หมายถึง มีความสอดคล้อง/เชื่อมโยง/ครอบคลุม/เหมาะสม น้อย

1 หมายถึง มีความสอดคล้อง/เชื่อมโยง/ครอบคลุม/เหมาะสม น้อยที่สุด

จากนั้นนำความคิดเห็นของผู้ทรงคุณวุฒิมาหาค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน (S.D.) และแปลความหมายโดยใช้เกณฑ์ดังนี้ (บุญชม ศรีสะอาด, 2553)

ค่าเฉลี่ย 4.51 - 5.00 หมายถึง แผนการสอนมีความเหมาะสมมากที่สุด

ค่าเฉลี่ย 3.51 - 4.50 หมายถึง แผนการสอนมีความเหมาะสมมาก

ค่าเฉลี่ย 2.51 - 3.50 หมายถึง แผนการสอนมีความเหมาะสมปานกลาง

ค่าเฉลี่ย 1.51 - 2.50 หมายถึง แผนการสอนมีความเหมาะสมน้อย

ค่าเฉลี่ย 1.00 - 1.50 หมายถึง แผนการสอนมีความเหมาะสมน้อยที่สุด

ค่าเฉลี่ยคะแนนประเมินของผู้ทรงคุณวุฒิมีค่าตั้งแต่ 3.51 ขึ้นไปและมีค่าเบี่ยงเบนมาตรฐานไม่เกิน 1.00 แสดงว่า องค์ประกอบของแผนการสอนมีความเหมาะสมสอดคล้องกัน ผลการประเมินแผนจัดการเรียนรู้ที่มีค่าเฉลี่ยรวมเท่ากับ 4.47 ค่าเบี่ยงเบนมาตรฐาน เท่ากับ 0.56 เมื่อเทียบเกณฑ์แล้ว อยู่ในเกณฑ์ที่มีความเหมาะสมมาก จากนั้นปรับปรุงแผนการจัดการเรียนรู้ตามข้อเสนอแนะของผู้ทรงคุณวุฒิ เพื่อให้เป็นแผนการจัดการเรียนรู้ที่สมบูรณ์สำหรับใช้กับกลุ่มตัวอย่างในการทดลอง

2. แบบทดสอบความรู้รายบุคคลและแบบทดสอบความรู้เป็นรายทีม เรื่อง ปวดท้อง (Abdominal Pain) ซึ่งเป็นข้อสอบชุดเดียวกัน ชนิดเลือกตอบ 4 ตัวเลือก จำนวน 25 ข้อ กำหนดการให้คะแนนคือ ถูกได้ 1 คะแนน ผิดหรือไม่ตอบ ได้ 0 คะแนน ได้ทำการตรวจสอบคุณภาพโดยนำไปให้ผู้ทรงคุณวุฒิ 3 ท่านตรวจสอบความตรงตามเนื้อหาและการใช้ภาษาได้ค่าดัชนีความสอดคล้อง (IOC) อยู่ระหว่าง 0.66 - 1.00 จากนั้นการทดลองใช้ (Try Out) ในนักศึกษาหลักสูตรสาธารณสุขศาสตรบัณฑิต สาขาวิชาสาธารณสุขชุมชน จำนวน 30 คน (เลขที่ 1 - 30) ได้ค่าความเชื่อมั่นโดยใช้สูตรของคูเดอร์ ริชาร์ดสัน 21 (KR - 21) เท่ากับ 0.80 ค่าความยากง่าย (p) อยู่ระหว่าง 0.30 - 0.45 และค่าอำนาจจำแนก (r) อยู่ระหว่าง 0.45 -0.75

3. แบบทดสอบความรู้หลังการจัดการเรียนรู้ ซึ่งเป็นแบบทดสอบคู่ขนานกับแบบทดสอบรายบุคคล เรื่อง ปวดท้อง (Abdominal Pain) ชนิดเลือกตอบ 4 ตัวเลือก จำนวน 25 ข้อ กำหนดการให้คะแนนคือ ถูกได้ 1 คะแนน ผิดหรือไม่ตอบ ได้ 0 คะแนน ได้ทำการตรวจสอบคุณภาพโดยนำไปให้ผู้ทรงคุณวุฒิ 3 ท่านตรวจสอบความตรงตามเนื้อหาและการใช้ภาษาได้ค่าดัชนีความสอดคล้อง (IOC) อยู่ระหว่าง 0.66 - 1.00 จากนั้นการทดลองใช้ (Try Out) ในนักศึกษาหลักสูตรสาธารณสุขศาสตรบัณฑิต สาขาวิชาสาธารณสุขชุมชน จำนวน 30 คน (เลขที่ 31 - 60) ได้ค่าความเชื่อมั่นโดยใช้สูตรของคูเดอร์ ริชาร์ดสัน 21 (KR - 21) เท่ากับ 0.81 ค่าความยากง่าย (p) อยู่ระหว่าง 0.25 - 0.40 และค่าอำนาจจำแนก (r) อยู่ระหว่าง 0.50 - 0.78

4. แบบสอบถามความพึงพอใจของผู้เรียนต่อการจัดการเรียนรู้เป็นแบบมาตราส่วนประมาณค่า 5 ระดับ จำนวน 20 ข้อ ซึ่งได้แก่ ด้านบรรยากาศการจัดการเรียนรู้ ด้านกิจกรรมการเรียนรู้ และด้านประโยชน์ที่ได้รับจากการเรียนรู้ ได้ทำการตรวจสอบคุณภาพโดยนำไปให้ผู้ทรงคุณวุฒิ 3 ท่านตรวจสอบความตรงตามเนื้อหาและการใช้ภาษาได้ค่าดัชนีความสอดคล้อง (IOC) อยู่ระหว่าง 0.66 - 1.00 จากนั้นการทดลองใช้ (Try Out) ในนักศึกษาหลักสูตรสาธารณสุขศาสตรบัณฑิต สาขาวิชาสาธารณสุขชุมชน จำนวน 30 คน (เลขที่ 1 - 30) หาค่าสัมประสิทธิ์แอลฟา (α-coefficient) คำนวณหาความเชื่อมั่นภายในทั้งฉบับโดยใช้สูตรของ Cronbach โดยผลการหาความเชื่อมั่นมีค่าเท่ากับ 0.85

การเก็บรวบรวมข้อมูล

ผู้วิจัยดำเนินการเก็บข้อมูลด้วยตนเองดังนี้

1. ปฐมนิเทศ ชี้แจงวัตถุประสงค์ของการวิจัยให้ผู้เรียนทราบ (ก่อนชั่วโมงการสอน)

2. ผู้เรียนเรียนรู้ตามแผนการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน เรื่อง ปวดท้อง (Abdominal Pain) 8 คาบเรียน (1 คาบเรียนเท่ากับ 1 ชั่วโมง)

ครั้งที่ 1 (3 ชั่วโมง)

2.1 ทดสอบก่อนจัดการเรียนรู้ (รายบุคคล) เรื่อง ปวดท้อง จำนวน 25 ข้อ (30 นาที)

2.2 แบ่งทีม ๆ ละ 6 คน ให้ทำแบบทดสอบความรู้เป็นรายทีม (ข้อสอบชุดเดียวกัน) โดยทำข้อสอบร่วมกันทีละข้อ จำนวน 25 ข้อ ให้ทุกคนค้นคว้าเอกสาร ตำรา หรือความรู้ในอินเตอร์เน็ต โดยผู้สอนแนะนำเอกสาร ตำรา และเว็บไซต์ให้ จากนั้นอภิปรายแลกเปลี่ยนความคิดเห็นเกี่ยวกับคำตอบ วิเคราะห์ พิจารณาเลือกคำตอบ (1 ชั่วโมง 30 นาที)

2.3 ผู้สอนทำการเปิดเฉลย หากไม่ถูกต้องให้มีการอภิปรายร่วมกันจนกว่าจะถูกต้อง ผู้เรียนสามารถซักถามข้อสงสัยได้ตลอด และผู้สอนให้ข้อมูลป้อนกลับในข้อที่ยังสงสัยหรืออธิบายจนกว่าจะเข้าใจ (1 ชั่วโมง)

ครั้งที่ 2 (2 ชั่วโมง) เป็นขั้นการประยุกต์ใช้ความรู้ในการแก้ไขปัญหาที่ซับซ้อน

2.4 ผู้สอนให้โจทย์สถานการณ์ ผู้ป่วยที่มาด้วยอาการปวดท้อง กลุ่มละ 1 เรื่อง คือ (1) ปวดท้องไส้ติ่งอักเสบเฉียบพลัน (2) ปวดท้องกระเพาะอาหารอักเสบ (3) ปวดท้องจากกรดไหลย้อน (4) ปวดท้องจากลำไส้อุดตัน (5) ปวดท้องจากนิ่วในถุงน้ำดี (6) ปวดท้องจากท่อน้ำดีอักเสบ (7) ปวดท้องจากนิ่วในไต (8) ปวดท้องจากกรวยไตอักเสบเฉียบพลัน และ (9) ปวดท้องจากการแท้งบุตร ให้ผู้เรียนวิเคราะห์สถานการณ์ศึกษาค้นคว้าวิเคราะห์ประเด็นต่าง ๆ ร่วมกันอภิปราย ใช้ความคิดวิจารณญาณในการตัดสินใจคำตอบตามประเด็นที่ผู้สอนตั้งไว้ คือ 1) ให้การวินิจฉัยโรคเบื้องต้น 2) ให้การดูแลรักษาเบื้องต้นที่ รพ.สต. 3) ให้เขียนใบส่งต่อ 4) ให้กำหนดการตรวจทางห้องปฏิบัติการที่โรงพยาบาล 5) ให้บอกการรักษาของแพทย์ และ 6) ให้คำแนะนำในการปฏิบัติตนของผู้ป่วย

โดยผู้สอนกระตุ้นให้ผู้เรียนคิดค้นคว้า แนะแนวให้ศึกษาประเด็นต่าง ๆ แต่ละกรณีศึกษา และสนับสนุนการค้นคว้าและอภิปราย ใช้เวลา 2 ชั่วโมง

ครั้งที่ 3 (3 ชั่วโมง)

2.5 ให้ผู้เรียนนำเสนอผลการศึกษาวิเคราะห์กรณีศึกษา (2 ชั่วโมง)

2.6 ผู้สอนให้ข้อมูลป้อนกลับหรืออธิบายเพิ่มเติมในประเด็นที่ผู้เรียนไม่เข้าใจหรือสงสัย และสรุปแนวคิดสำคัญเพื่อให้ผู้เรียนสามารถนำการเรียนรู้นี้ไปใช้ในการดูแลสุขภาพตนเองหรือผู้รับบริการได้ (30 นาที)

3. เมื่อเสร็จสิ้นการจัดการเรียนรู้แล้วทำการทดสอบความรู้รายบุคคลโดยใช้ข้อสอบคู่ขนาน เรื่อง ปวดท้อง จำนวน 25 ข้อ และแบบสอบถามความพึงพอใจต่อการจัดการเรียนรู้ จำนวน 20 ข้อ (30 นาที) จากนั้นนำข้อมูลไปวิเคราะห์

4. นำข้อมูลที่ได้จากคะแนนการทดสอบทั้งก่อนและหลังเรียนและคะแนนจากแบบประเมินความพึงพอใจต่อการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน วิเคราะห์ทางสถิติ สรุปผล และอภิปรายผลการวิจัย ตามลำดับ

การวิเคราะห์ข้อมูล

สถิติที่ใช้วิเคราะห์ข้อมูล ได้แก่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน การทดสอบค่าทีแบบไม่เป็นอิสระต่อกัน (Paired Samples t-test)

ผลการวิจัย

การวิจัยเรื่อง ผลของการจัดการเรียนรู้โดยใช้ทีมเป็นฐานต่อความรู้และความพึงพอใจในการจัดการเรียนรู้ เรื่อง “ปวดท้อง” รายวิชาการบำบัดโรคเบื้องต้น สามารถสรุปผลการวิจัยได้ดังนี้

1. ข้อมูลทั่วไปของกลุ่มตัวอย่าง พบว่า กลุ่มตัวอย่างส่วนใหญ่เป็นเพศหญิง ร้อยละ 81.13 อายุ 18 - 20 ปี ร้อยละ 83.02 และมีคะแนน GPA สะสมของชั้นปีที่ 1 มากที่สุด ระหว่าง 2.51 - 3.00 ร้อยละ 56.60 รองลงมา 3.01 - 3.50 ร้อยละ 35.85 และมากกว่า 3.51 ร้อยละ 5.66 น้อยกว่า 2.51 ร้อยละ 1.89 ตามลำดับ

2. เปรียบเทียบความรู้ก่อนและหลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน

หลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน เรื่อง “ปวดท้อง” ความรู้ก่อนและหลังการจัดการเรียนรู้ปรากฏดังตารางที่ 1

ตารางที่ 1 แสดงค่าสถิติทดสอบที (t-test) ของคะแนนเฉลี่ยความรู้ก่อนและหลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน (N=53)

ระยะเวลา	คะแนนเต็ม	ค่าเฉลี่ย	S.D.	df	t	p-value
ก่อนเรียน	25	12.26	2.60	52	11.67*	<.001
หลังเรียน	25	19.64	3.92			

*มีนัยสำคัญทางสถิติที่ระดับ 0.05

จากตารางที่ 1 พบว่า ความรู้ก่อนและหลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน แตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 (t = 11.67, p = 0.001) โดยความรู้เฉลี่ยหลังเรียนเท่ากับ 19.64 (S.D. = 3.92) ก่อนเรียนเท่ากับ 12.26 (S.D. = 2.60)

3. ผลการศึกษาความพึงพอใจของผู้เรียนต่อการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน

หลังการจัดการเรียนรู้โดยทีมเป็นฐานผลความพึงพอใจของผู้เรียน ปรากฏดังตารางที่ 2

ตารางที่ 2 แสดงค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และระดับความพึงพอใจของผู้เรียนต่อการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน (N=53)

ความพึงพอใจ	ค่าเฉลี่ย	S.D.	ระดับ
ด้านบรรยากาศการจัดการเรียนรู้			
1. ทำให้ผู้เรียนเกิดความกระตือรือร้นในการเรียนรู้	4.53	0.63	มากที่สุด
2. ทำให้มีปฏิสัมพันธ์กับเพื่อนในกลุ่มมากขึ้น	4.53	0.74	มากที่สุด
3. เกิดการกระตุ้นให้อยากเรียนรู้มากขึ้น	4.42	0.69	มาก
4. ไม่น่าเบื่อ สนุก ไม่เครียด	4.45	0.72	มาก
5. มีเจตคติที่ดีต่อการเรียนรู้	4.55	0.57	มากที่สุด
รวม	**4.49**	**0.09**	**มาก**
ด้านกิจกรรมการเรียนรู้			
1. กิจกรรมมีความเหมาะสมกับเนื้อหา	4.72	0.56	มากที่สุด
2. ส่งเสริมให้เกิดการแลกเปลี่ยนความรู้ความคิดเห็นกันและกัน	4.62	0.65	มากที่สุด
3. ส่งเสริมการทำงานร่วมกันเป็นทีม	4.64	0.65	มากที่สุด
4. ส่งเสริมการเรียนรู้ด้วยตนเอง	4.58	0.63	มากที่สุด
5. ส่งเสริมการเรียนรู้ร่วมกันในกลุ่ม	4.62	0.68	มากที่สุด
6. ส่งเสริมการคิดอย่างมีวิจารณญาณและการตัดสินใจ	4.62	0.62	มากที่สุด
7. ส่งเสริมความรับผิดชอบต่อกลุ่ม	4.62	0.59	มากที่สุด
8. กิจกรรมใช้เวลาเหมาะสม	4.57	0.74	มากที่สุด
9. มีการให้ข้อมูลย้อนกลับในกิจกรรมการเรียนรู้	4.66	0.61	มากที่สุด
10. สื่อ เอกสารการสอน มีเนื้อหาเหมาะสมกับกิจกรรม	4.75	0.58	มากที่สุด
รวม	**4.64**	**0.05**	**มากที่สุด**
ด้านประโยชน์ที่ได้รับจากการเรียนรู้			
1. ทำให้เข้าใจเนื้อหามากขึ้น	4.66	0.61	มากที่สุด
2. นำวิธีการเรียนรู้ร่วมกันไปประยุกต์ใช้กับวิชาอื่น	4.72	0.53	มากที่สุด
3. ผู้เรียนเข้าใจและรู้จักเพื่อนมากขึ้น	4.60	0.66	มากที่สุด
4. ผู้เรียนรับฟังความคิดเห็นของผู้อื่นมากขึ้น	4.58	0.66	มากที่สุด
5. ผู้เรียนสามารถทำงานเป็นทีมได้	4.74	0.44	มากที่สุด
รวม	**4.66**	**0.70**	**มากที่สุด**
รวมทุกด้าน	**4.59**	**0.92**	**มากที่สุด**

จากตารางที่ 2 พบว่า หลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐานผู้เรียนมีความพึงพอใจต่อการจัดการเรียนรู้โดยรวมทุกด้าน อยู่ในระดับมากที่สุด (mean = 4.59, S.D. = 0.92) โดยมีค่าเฉลี่ยความพึงพอใจด้านประโยชน์ที่ได้รับจากการเรียนรู้สูงสุด (mean = 4.66, S.D. = 0.70) รองลงมาเป็นด้านกิจกรรมการเรียนรู้ อยู่ในระดับมากที่สุดเช่นกัน (mean = 4.64, S.D. = 0.05) และด้านบรรยากาศการจัดการเรียนรู้ อยู่ในระดับมาก (mean = 4.49, S.D. = 0.09)

สรุปและอภิปรายผล

การวิจัยเรื่อง ผลการจัดการเรียนรู้โดยใช้ทีมเป็นฐานที่มีต่อผลสัมฤทธิ์ทางการเรียนและความพึงพอใจต่อการจัดการเรียนรู้ เรื่อง “ปวดท้อง” ในรายวิชาการบำบัดโรคเบื้องต้น สรุปและอภิปรายผลการวิจัย ได้ดังนี้

1. ผลการเปรียบเทียบความรู้ก่อนและหลังการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน พบว่า ความรู้ก่อนและหลังการจัดการเรียนรู้แตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 สอดคล้องกับการศึกษาของ สมพิศ ใยสุ่น และคณะ, (2559); ประกายทิพย์ พิชัย และคณะ, (2561); เกษร สายธนู และคณะ, (2562); วีระวัฒน์ ทางธรรม และ อัมพร เที่ยงตรงดี, (2562); ธวัชชัย โพธิบัวทอง และนิวัฒน์ บุญสม, (2564); จุฑารัตน์ คงเพ็ชร และคณะ, (2565); เนติมา บูรพาศิริวัฒน์, (2565) พบว่า การจัดการเรียนรู้โดยใช้ทีมเป็นฐานช่วยให้ผู้เรียนมีผลสัมฤทธิ์ทางการเรียนที่สูงขึ้น และผลสัมฤทธิ์ทางการเรียนก่อนและหลังการจัดการเรียนรู้ของกลุ่มตัวอย่างแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ทั้งนี้อาจเป็นเพราะการเรียนรู้โดยใช้ทีมเป็นฐานเป็นการเรียนรู้ผ่านกิจกรรมกลุ่ม โดยมีแบบทดสอบเป็นตัวกระตุ้นให้ต้องการคิดค้นคว้าหาคำตอบ ซึ่งทุกคนในกลุ่มจะผ่านการทำแบบทดสอบนี้มาก่อนในขั้นตอนการทำแบบทดสอบรายบุคคล กิจกรรมการเรียนรู้ในขั้นตอนทำแบบทดสอบความรู้เป็นรายทีมนี้คนในทีมจะมีสมาชิกคละกันทั้งเก่งและอ่อน ในการเสนอความคิดหาคำตอบที่ถูกต้องจะคุยกันได้ง่ายเพราะเป็นกลุ่มขนาดเล็ก โดยการทำแบบทดสอบจะกำหนดให้ทำทีละข้อและให้ทุกคนมีส่วนร่วม ในการคิดค้นคว้า วิเคราะห์ และตัดสินใจทำให้ผู้เรียนได้เกิดกระบวนการทำงานเป็นทีม ซึ่งสมาชิกในทีมแต่ละคนนั้นมีความรู้และประสบการณ์ที่ต่างกัน มีประเด็นในการคิดพิจารณาต่างกัน จึงได้เกิดการแลกเปลี่ยนความคิดเห็นกัน เกิดการปฏิสัมพันธ์ช่วยเหลือกันและกันในทีม ได้นำความรู้ที่ได้ศึกษาค้นคว้ามาอธิบายปัญหา และหาแนวทางแก้ไขนำไปสู่การเรียนรู้ร่วมกัน (วีระวัฒน์ ทางธรรม และ อัมพร เที่ยงตรงดี, 2562) เมื่อผู้สอนเฉลยคำตอบ หากผู้เรียนสงสัยในคำตอบหรือเนื้อหา ผู้เรียนสามารถยื่นอุทธรณ์ข้อสงสัยให้ผู้สอนอธิบายคำตอบเพื่อให้เกิดความเข้าใจชัดเจนมากยิ่งขึ้น ซึ่งกระบวนการนี้ช่วยให้ผู้เรียนเข้าใจเนื้อหาที่เรียนเพิ่มมากขึ้น (กัลยาลักษณ์ ไชยศิริ และ อุบลวรรณ ส่งเสริม, 2566) การจัดการเรียนรู้โดยใช้ทีมเป็นฐานมีประสิทธิภาพในการถ่ายทอดเนื้อหาความรู้ผ่านทักษะการสื่อสารและการทำงานเป็นทีม (สมพิศ ใยสุ่น และคณะ, 2559)

อีกประการหนึ่งในขั้นตอนการประยุกต์ใช้ความรู้ในการแก้ไขปัญหาที่ซับซ้อน โดยมีกรณีศึกษาที่สร้างสถานการณ์สมมติให้ผู้เรียนวิเคราะห์หาคำตอบโดยผ่านการค้นคว้าเอกสารประกอบการสอน หนังสืออ้างอิง หรือเว็บไซต์ต่าง ๆ แล้วร่วมกันวิเคราะห์ อภิปราย ถกเถียงแลกเปลี่ยนเรียนรู้กันในกลุ่ม ทำให้เกิดการเรียนรู้และความเข้าใจในเนื้อหาลึกซึ้งมากขึ้น สามารถแก้ปัญหาตามสถานการณ์ที่กำหนดได้ การเรียนรู้โดยใช้ทีมเป็นฐานเป็นรูปแบบการเรียนรู้ที่ส่งเสริมทักษะด้านการคิดอย่างมีวิจารณญาณ จากการวิเคราะห์หาคำตอบที่ถูกต้องด้วยตนเอง วิเคราะห์ร่วมกับสมาชิกภายในทีม รวมถึงการวิเคราะห์ขั้นสูงที่มีการอิงโจทย์สถานการณ์ตัวอย่างช่วยส่งเสริมทักษะในการแก้ปัญหา ทักษะด้านความร่วมมือ และทักษะการทำงานเป็นทีมและภาวะผู้นำ จากกิจกรรมการร่วมกันหาคำตอบที่ถูกต้องในคำถามทุกคำถามที่อยู่ในขั้นตอนต่าง ๆ ของการจัดการเรียนรู้ ซึ่งในกระบวนการดังกล่าวสมาชิกของทีมต้องเสนอความคิดเห็นของตนเองและร่วมกันหาข้อสรุปเมื่อสมาชิกในทีมมีความคิดเห็นไม่ตรงกัน การเรียนรู้จึงเกิดจากกระบวนการคิดวิเคราะห์และอภิปรายอย่างแท้จริง

การจัดการเรียนรู้โดยใช้ทีมเป็นฐานจะทำให้ผู้เรียนได้รับความรู้ผ่านการค้นหาคำตอบที่ถูกต้องเป็นระยะ ๆ การประยุกต์ใช้ความรู้แก้ปัญหาตามโจทย์สถานการณ์ที่กำหนด ทำให้ผู้เรียนแต่ละคนได้รับ

การกระตุ้นกระบวนการคิดตลอดระยะเวลาในการทำกิจกรรม จึงส่งเสริมให้เกิดอัตราการเรียนรู้ที่สูงได้ (วีระวัฒน์ ทางธรรม และอัมพร เที่ยงตรงดี, 2562; จุฑารัตน์ คงเพ็ชร และคณะ, 2565)

ตลอดการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน ผู้สอนเป็นผู้อำนวยการเรียนรู้ช่วยกระตุ้นและสร้างบรรยากาศในการส่งเสริมการอภิปรายให้เป็นไปอย่างราบรื่น และตอบรับวัตถุประสงค์การเรียนรู้ ในขณะที่ผู้เรียนเป็นทั้งผู้เรียนและผู้สอนให้เพื่อนด้วยกันเอง ผ่านการอภิปรายถกประเด็นและโต้แย้ง การจัดการเรียนด้วยกระบวนการดังกล่าวจะส่งผลทำให้คะแนนเฉลี่ยความรู้เพิ่มขึ้น และผู้เรียนมีความพึงพอใจในการเรียนมากขึ้น กระบวนการเรียนรู้ในแต่ละขั้นตอนจะเป็นการฝึกฝนให้ผู้เรียนใช้องค์ความรู้มากกว่าการจดจำความรู้ นอกจากนี้การที่ผู้เรียนร่วมกันคิดวิเคราะห์โจทย์สถานการณ์ เป็นกระบวนการช่วยพัฒนาให้ผู้เรียนมีความรับผิดชอบทั้งต่อตนเองและต่อทีม และเกิดการพัฒนาทักษะการคิดวิเคราะห์ เกิดการเรียนรู้ที่มีความเข้าใจเนื้อหาที่ลึกซึ้งมากยิ่งขึ้น (จุฑารัตน์ คงเพ็ชร และคณะ, 2565) การจัดการเรียนรู้โดยใช้ทีมเป็นฐานนี้ช่วยผู้เรียนสามารถพัฒนาความรู้ พัฒนาผลสัมฤทธิ์ทางการเรียน พัฒนาทักษะการคิดแก้ไขปัญหาทางการพยาบาล พัฒนาทักษะการสื่อสารกับเพื่อนร่วมทีมและสหวิชาชีพอื่น ช่วยให้ปฏิสัมพันธ์ระหว่างสมาชิกในทีมดีขึ้น สามารถทำงานร่วมกันได้อย่างราบรื่น และเพิ่มความรับผิดชอบให้แก่ผู้เรียนมากขึ้น และยังเสริมทักษะความสัมพันธ์ระหว่างบุคคล ซึ่งเป็นทักษะที่จำเป็นอย่างยิ่งในการทำงานและการใช้ชีวิตในอนาคต (กัลยาลักษณ์ ไชยศิริ และ อุบลวรรณ ส่งเสริม, 2566)

2. ความพึงพอใจของผู้เรียนต่อการจัดการเรียนรู้โดยใช้ทีมเป็นฐาน พบว่า ผู้เรียนมีความพึงพอใจต่อการจัดการเรียนรู้โดยใช้ทีมเป็นฐานโดยรวมทุกด้านอยู่ในระดับมากที่สุด ค่าเฉลี่ยความพึงพอใจสูงสุดเป็นด้านประโยชน์ที่ได้รับจากการเรียนรู้ รองลงมาเป็นด้านกิจกรรมการเรียนรู้ ซึ่งอยู่ในระดับมากที่สุดเช่นกัน ส่วนด้านบรรยากาศการจัดการเรียนรู้มีค่าเฉลี่ยอยู่ในระดับมาก สอดคล้องกับการศึกษาของสมพิศ ใยสุ่น และคณะ (2559); เกษร สายธนู และคณะ (2562); จุฑารัตน์ คงเพ็ชรและคณะ (2565); เนติมา บูรพาศิริวัฒน์ (2565); ศุภาพิชญ์ โฟน โบร์แมนน์ และคณะ (2565) ที่พบว่า การจัดการสอนโดยใช้ทีมเป็นฐานผู้เรียนมีความพึงพอใจต่อการเรียนรู้โดยรวมอยู่ในระดับมากถึงมากที่สุด ทั้งนี้อาจเป็นเพราะผู้สอนได้ชี้แจงวัตถุประสงค์และขั้นตอนอย่างละเอียดก่อนดำเนินกิจกรรมการเรียนการสอน โดยได้แจกเอกสารประกอบการสอนทั้งรูปแบบไฟล์อิเล็กทรอนิกส์และกระดาษ แนะนำตำรา เว็บไซต์ ที่ต้องค้นคว้า จัดแบบทดสอบทั้งรายบุคคลและรายกลุ่มที่ผ่านการตรวจสอบคุณภาพ จัดทำกรณีศึกษาที่เชื่อมโยงเนื้อหาเพื่อให้ผู้เรียนเกิดการเรียนรู้เข้าใจในบทเรียน ผู้สอนเป็นโค้ชอำนวยการเรียนรู้ กระตุ้น และสร้างบรรยากาศส่งเสริมการอภิปราย และการแสดงความคิดเห็นให้เป็นไปอย่างราบรื่น และผู้สอนให้ข้อมูลป้อนกลับในทันทีที่ผู้เรียนสงสัยหรือต้องการการอธิบายเพิ่มเติม

กระบวนการจัดการเรียนรู้โดยใช้ทีมเป็นฐานเป็นรูปแบบการเรียนรู้ที่ผู้เรียนเป็นบุคคลหลักในกระบวนการเรียนรู้ ในขณะที่ผู้สอนเป็นเพียงผู้อำนวยความสะดวกให้กระบวนการเรียนรู้ดำเนินไปได้อย่างมีประสิทธิภาพบรรยากาศในชั้นเรียนจึงเปรียบเสมือนบรรยากาศของการแลกเปลี่ยนเรียนรู้ระหว่างผู้เรียน โดยมีผู้เรียนทุกคนเป็นเจ้าของชั้นเรียน นอกจากนี้รูปแบบการจัดการเรียนการสอนยังมีการแข่งขันระหว่างกลุ่ม ทำให้ผู้เรียนรู้สึกสนุกสนานและตื่นเต้นตลอดระยะเวลาการทำกิจกรรม (จุฑารัตน์ คงเพ็ชร และคณะ, 2565) การศึกษาของเกษร สายธนู และคณะ (2562) พบว่า ผู้เรียนพึงพอใจการเรียนรู้โดยใช้ทีมเป็นฐานเพราะรู้สึกกระตือรือร้น ได้พูดคุยแสดงความคิดเห็นแลกเปลี่ยนกัน ได้เรียนรู้การทำงานร่วมกับผู้อื่น ฝึกการเป็นผู้นำและผู้ตาม ได้คิดวิเคราะห์โดยนำความรู้เนื้อหาที่เรียน ได้ฝึกหาคำตอบเอง และการทดสอบความรู้ก่อนและหลังเรียนทำให้ผู้เรียนประเมินตนเองได้และเข้าใจเนื้อหามากขึ้น

การเรียนรู้โดยใช้ทีมเป็นฐานเน้นผู้เรียนเป็นศูนย์กลาง ผู้เรียนจึงมีอิสระในการเตรียมความพร้อมและเรียนรู้ร่วมกับเพื่อน ลดความวิตกกังวล ความกลัว และเพิ่มความมั่นใจให้กับผู้เรียน การได้ทำงานร่วมกับเพื่อน การอภิปรายแลกเปลี่ยนในประเด็นที่มีความคิดเห็นแตกต่างกัน ทำให้เกิดการเรียนรู้และได้ปรับทัศนคติของตนเองในการยอมรับฟัง และเรียนรู้ถึงวิธีการคิดของผู้อื่น การยอมรับฟังความคิดเห็นที่แตกต่างของเพื่อนหรือการยืนยันสิ่งที่ตนค้นคว้ามา ช่วยให้ผู้เรียนมีทัศนคติที่ดีขึ้นต่อการเรียนด้วยตนเอง

ดังนั้นการเปิดโอกาสให้ผู้เรียนได้เรียนรู้ผ่านสิ่งที่ไม่แน่นอนระหว่างความเข้าใจของตนเองที่มีอยู่กับประสบการณ์ใหม่ที่พัฒนาขึ้นจากการเรียนรู้ร่วมกับผู้อื่นด้วยการทำงานเป็นทีม จึงทำให้เกิดการพัฒนาจากภายในจิตใจของผู้เรียนทั้งในด้านการรับรู้ ทัศนคติ และการปรับตัว ก่อนที่นำไปสู่การเรียนรู้ในองค์ความรู้ที่เกิดขึ้นจากสิ่งที่ได้รับมอบหมาย (เพิ่มพันธุ์ ธรรมสโรจ, 2565) สิ่งเหล่านี้ ทำให้เกิดความพึงพอใจในการเรียนรู้นำไปสู่การพัฒนาตนเองอีกลำดับต่อไป

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

ควรนำวิธีการจัดการเรียนรู้โดยใช้ทีมเป็นฐานไปใช้ในชั้นปีที่ 2 ในรายวิชาอื่นที่มีลักษณะรายวิชาคล้ายกันและควรจัดการเรียนรู้โดยใช้ทีมเป็นฐานทั้งรายวิชาเพื่อเพิ่มประสิทธิผลของการเรียนรู้

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรวิจัยการจัดการเรียนรู้โดยใช้ทีมเป็นฐานตั้งแต่ในชั้นปี 1 เพื่อพัฒนาทักษะการทำงานเป็นทีม การคิดวิเคราะห์ การคิดอย่างมีวิจารณญาณ หรือการแก้ปัญหา โดยประเมินทักษะต่าง ๆ ดังกล่าวด้วยนอกเหนือจากการประเมินความรู้และความพึงพอใจ

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การศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์ โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โรงเรียนสตรีภูเก็ต

The Study of Mathematics Learning Achievement and Ability in Solving Mathematics Problems Using Polya's Problem Solving Process of Grade 8 Satreephuket School

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บทคัดย่อ

การวิจัยครั้งนี้ มีวัตถุประสงค์ (1) เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา (2) เพื่อศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนโดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

กลุ่มเป้าหมาย นักเรียนชั้นประถมศึกษาปีที่ 2/10 จำนวน 42 คน โรงเรียนสตรีภูเก็ต สังกัดสำนักงานเขตพื้นที่การศึกษามัธยมศึกษาพังงา ภูเก็ต ระนอง ปีการศึกษา 2566 เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลได้แก่ แผนการจัดการเรียนรู้ แบบวัดผลสัมฤทธิ์ทางการเรียน แบบวัดความสามารถ ในการแก้ปัญหาทางคณิตศาสตร์และวิเคราะห์ข้อมูล โดยการศึกษาวิจัยครั้งนี้เป็นวิจัยกึ่งทดลอง ซึ่งดำเนินการทดลองโดยใช้แบบแผนการทดลองแบบกลุ่มเดียวทดลองใช้ แบบวัดผลสัมฤทธิ์ทางการเรียนก่อนและหลังเรียนโดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา นอกจากนี้ผู้วิจัยนำคะแนนที่ได้จากแบบทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์มาวิเคราะห์หาระดับความสามารถในการแก้ปัญหาทางคณิตศาสตร์โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา โดยนำคะแนนสอบหลังเรียนคิดคะแนนเฉลี่ยเป็นร้อยละเทียบจากเกณฑ์การตัดสินผลการเรียนกลุ่มสาระการเรียนรู้คณิตศาสตร์ตามหลักสูตรแกนกลาง พุทธศักราช 2551

ผลการวิจัยสรุปได้ว่า ผลสัมฤทธิ์ทางการเรียนนักเรียน จำนวน 42 คน มีผลการเรียนรู้ก่อนเรียนโดยเฉลี่ยเท่ากับ 7.17 คะแนน ส่วนเบี่ยงเบนมาตรฐานเท่ากับ 5.72 และมีผลการเรียนรู้หลังเรียนโดยเฉลี่ยเท่ากับ 12.60 คะแนน ส่วนเบี่ยงเบนมาตรฐาน เท่ากับ 3.19 แสดงว่า คะแนนเฉลี่ยหลังจากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาสูงกว่าก่อนการจัดการเรียนรู้

คะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจำนวน 42 คน พบว่า มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 5.93 คะแนน คิดเป็นร้อยละ 98.80 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นวางแผนแก้ปัญหา 5.31 คะแนน คิดเป็นร้อยละ 88.49 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นดำเนินการตามแผน 4.69 คะแนน คิดเป็นร้อยละ 78.17 อยู่ในระดับดีมาก มีคะแนนเฉลี่ยขั้นตรวจสอบผล 4.02 คะแนน คิดเป็นร้อยละ 67.06 ซึ่งอยู่ในระดับค่อนข้างดี และมีคะแนนเฉลี่ยรวม 4.99 คะแนน คิดเป็นร้อยละ 83.13 อยู่ในระดับดีเยี่ยม

คำสำคัญ: ผลสัมฤทธิ์ทางการเรียน, ความสามารถในการแก้ปัญหาทางคณิตศาสตร์, การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

Abstract

The objectives of this research were (1) to study mathematics achievement using Polya's problem-solving learning arrangements, (2) to study students' ability to solve mathematical problems using Polya's problem-solving learning arrangements.

Target Group 42 Grade 2/10 students, Satree Phuket School, under the Phang Nga Secondary Education Area Office, Phuket, Ranong, Academic Year 2023 The tools used to collect data include learning management plans, achievement assessments. Mathematical problem-solving ability the data were analyzed in a quasi-experimental study. The experiment was conducted using a single-group trial scheme. Pre- and post-class achievement assessment using learning management based on Polya's problem-solving process. In addition, the researcher used the scores obtained from the mathematical problem-solving test to analyze the level of ability to solve mathematical problems using learning management based on Polya's problem-solving process. The average score after learning is based on the criteria for judging the performance of the mathematics learning subject group according to the core curriculum. Buddhist 2008.

The results of the research concluded that student achievement. The standard deviation was 5.72 and the average post-learning outcome was 12.60 points.

The math problem solving ability scores of 42 students showed an average score of 5.93 points in the comprehension stage, or 98.80 percent, which is excellent. The average score in the problem-solving planning stage was 5.31 points, or 88.49 percent, which is at an excellent level. The average score in the implementation phase of the plan was 4.69 points, or 78.17 percent, which is very good. The average score for the examination was 4.02 points, or 67.06 percent, which is quite good, and the overall average score was 4.99 points, or 83.13 percent, which is at an excellent level.

Keywords: Academic Achievement, Ability to Solve Mathematical Problems, Learning Management Based on Polya's Problem-Solving Process

บทนำ

คณิตศาสตร์มีบทบาทสำคัญยิ่งต่อการพัฒนาความคิดมนุษย์ทำให้มนุษย์มีความคิดสร้างสรรค์ คิดอย่างมีเหตุผล เป็นระบบมีแบบแผน และสามารถวิเคราะห์ปัญหาหรือสถานการณ์ได้อย่างละเอียดรอบคอบ (วัชรี กาญจน์กีรติ, 2554) จากความสำคัญของคณิตศาสตร์กระทรวงศึกษาธิการจึงได้กำหนดหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 ขึ้นเพื่อมุ่งพัฒนาผู้เรียนทุกคนซึ่งเป็นกำลังของชาติให้เป็นมนุษย์ที่มีความสมดุลทั้งร่างกายความรู้ คุณธรรม มีทักษะพื้นฐาน รวมทั้งเจตคติที่จำเป็นต่อการศึกษา ต่อการประกอบอาชีพ โดยมุ่งเน้นผู้เรียนเป็นสำคัญบนพื้นฐานความเชื่อว่าทุกคนสามารถเรียนรู้และพัฒนาตนเองได้เต็มศักยภาพ (กระทรวงศึกษาธิการ, 2551) โดยได้บรรจุคณิตศาสตร์ให้เป็น 1 ใน 8 กลุ่มสาระการเรียนรู้หลักในหลักสูตร ถึงแม้ว่าการจัดการศึกษาให้ความสำคัญกับคณิตศาสตร์มากเพียงใดก็ตาม แต่ก็ยังไม่สามารถทำให้ผู้เรียนประสบผลสำเร็จในการเรียนคณิตศาสตร์ได้ ซึ่งจากการวิเคราะห์ปัญหาการเรียนคณิตศาสตร์ในระดับมัธยมศึกษา พบว่า มีหลายปัจจัยที่ส่งผลต่อคุณภาพของการจัดการเรียนรู้ในวิชาคณิตศาสตร์ เช่น ความเข้าใจในจุดประสงค์การเรียนรู้คณิตศาสตร์ความพร้อมของผู้เรียน วิธีสอนที่ผู้สอนเน้นให้ผู้เรียนหาผลลัพธ์หรือคำตอบเท่านั้น โดยไม่ได้ให้เหตุผลประกอบเพื่ออธิบายความเป็นมาของคำตอบที่ได้จากการแก้ปัญหา เป็นต้น (มหาวิทยาลัยสุโขทัยธรรมาธิราช, 2549)

ธรรมชาติของวิชาคณิตศาสตร์เป็นวิชาที่มีลักษณะเป็นนามธรรม เป็นวิชาที่มีโครงสร้าง ซึ่งโครงสร้างของวิชาคณิตศาสตร์ประกอบด้วยคำอนิยาม บทนิยาม สัจพจน์ และทฤษฎีบท โดยในการสร้างทฤษฎีบทต่าง ๆ จะต้องอาศัยการให้เหตุผลอย่างสมเหตุสมผล และที่สำคัญคือ ต้องปราศจากข้อขัดแย้งใด ๆ (กรมวิชาการ, 2545) เมื่อพิจารณาแล้วจะเห็นได้ว่า ในการศึกษาวิชาคณิตศาสตร์นั้นจะต้องอาศัยการให้เหตุผลเป็นสำคัญ ทำให้ทักษะการให้เหตุผลเป็นทักษะสำคัญในการเรียนวิชาคณิตศาสตร์ และทักษะการให้เหตุผลนี้จะเป็นจุดเริ่มต้นที่จะนำนักเรียนไปสู่ความเข้าใจในการเรียนวิชาคณิตศาสตร์ (Lucast, 2003) สอดคล้องกับการศึกษาในประเทศไทย โดย สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี ได้ระบุในคู่มือการใช้หลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 ฉบับปรับปรุงพุทธศักราช 2560 ว่า ทักษะการให้เหตุผลเป็นหนึ่งในทักษะและกระบวนการทางคณิตศาสตร์ที่สำคัญ เนื่องจากเป็นกระบวนการคิดทางคณิตศาสตร์ที่ต้องอาศัยการคิดวิเคราะห์และความคิดริเริ่มสร้างสรรค์ อีกทั้งทักษะการให้เหตุผลนี้จะช่วยส่งเสริมให้ผู้เรียนมีทักษะที่จำเป็นสำหรับการเรียนรู้ในศตวรรษที่ 21 นั่นคือ การเตรียมผู้เรียนให้มีทักษะด้านการคิดวิเคราะห์ การคิดอย่างมีวิจารณญาณ การแก้ปัญหา การคิดสร้างสรรค์ การใช้เทคโนโลยี การสื่อสาร และการร่วมมือ จากที่กล่าวมาทำให้เห็นได้ชัดว่า ทักษะการให้เหตุผลเป็นทักษะสำคัญที่จะทำให้การศึกษาวิชาคณิตศาสตร์ประสบผลสำเร็จ และเป็นประโยชน์ต่อการเรียนรู้ของนักเรียนในศตวรรษที่ 21 จึงสมควรเป็นอย่างยิ่งที่จะพัฒนาทักษะการให้เหตุผลให้เกิดขึ้นกับผู้เรียน ซึ่งเนื้อหาสาระในวิชาคณิตศาสตร์ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 ฉบับปรับปรุงพุทธศักราช 2560 แบ่งสาระการเรียนรู้ออกเป็น 3 สาระ คือ 1) จำนวนและพีชคณิต 2) การวัดและเรขาคณิต และ 3) สถิติและความน่าจะเป็น แต่เนื้อหาสาระที่มีบทบาทสำคัญในการพัฒนาทักษะการให้เหตุผล คือ เนื้อหาสาระเกี่ยวกับเรขาคณิต เพราะสถานการณ์ปัญหาที่เกี่ยวข้องกับเรขาคณิตต้องมีการให้เหตุผลอ้างอิง เป็นการฝึกให้นักเรียนแก้ปัญหา ฝึกให้นักเรียนมีทักษะการให้เหตุผล และนำไปประยุกต์ใช้ในชีวิตประจำวัน (โกมล ไพศาล, 2540) ซึ่งนักเรียนในระดับมัธยมศึกษาตอนต้นจะได้รับการเรียนรู้และฝึกฝนทักษะการให้เหตุผลนี้ผ่านเนื้อหาสาระเรขาคณิต โดยการพิสูจน์และนำสมบัติหรือทฤษฎี

บททางเรขาคณิตไปใช้ในการให้เหตุผลและแก้ปัญหา (คณะกรรมการการศึกษาขั้นพื้นฐาน, 2560)

เรขาคณิตเป็นสาระหนึ่งของคณิตศาสตร์ ที่เป็นพื้นฐานสำคัญต่อการเรียนคณิตศาสตร์ ประเทศไทยเริ่มนำเนื้อหาทางเรขาคณิตให้นักเรียนศึกษาตั้งแต่ระดับชั้นประถมศึกษา เรขาคณิตเกิดขึ้นในอียิปต์โบราณเมื่อประมาณ 700 ปี ก่อนคริสต์ศักราช ชาวอียิปต์ และชาวบาบิโลนต่างสนใจเรขาคณิตในแง่การนำไปใช้ให้เป็นประโยชน์แก่การดำรงชีวิต เช่น การวัดพื้นที่ การสร้างที่อยู่อาศัย เป็นต้น ปัจจุบันความรู้เกี่ยวกับเรขาคณิตมีส่วนเกี่ยวข้องสัมพันธ์กับชีวิตประจำวันของมนุษย์อย่างมาก เราใช้เรขาคณิตเพื่อทำความเข้าใจหรืออธิบายสิ่งต่าง ๆ รอบตัว เช่น ใช้เรขาคณิต ในการสำรวจพื้นที่ สร้างผังเมือง สร้างถนนหนทาง สิ่งก่อสร้างต่าง ๆ การสำรวจโลก และอวกาศ เรขาคณิตช่วยพัฒนาทักษะที่สำคัญหลายประการ เช่น การคิด การให้เหตุผล การคิดสร้างสรรค์ ทักษะเชิงมิติสัมพันธ์ หรือความรู้สึกเชิงปริภูมิ ซึ่งทักษะเหล่านี้เป็นพื้นฐานการเรียนรู้คณิตศาสตร์เรื่องอื่น ๆ เช่น จำนวน การวัด ตลอดจน เนื้อหาคณิตศาสตร์ชั้นสูงต่อไป นอกจากนี้ยังเป็นพื้นฐานในการเชื่อมโยงความรู้ทางคณิตศาสตร์กับความรู้แขนงอื่น ๆ อีกด้วย (สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการ, 2554)

จากประสบการณ์ของผู้วิจัยพบว่า ในบทที่ผ่านมาหรือภาคเรียนที่ผ่านมานักเรียนทำคะแนนในการสอบย่อย สอบกลางภาค หรือสอบปลายภาคได้ค่อนข้างน้อย ซึ่งส่งผลกระทบต่อผลสัมฤทธิ์ของนักเรียนน้อยตามไปด้วย

กระบวนการแก้ปัญหาของโพลยา (Polya, 1957) เป็นกระบวนการแก้ปัญหาที่ยอมรับกันโดยทั่วไปและนิยมใช้กันอย่างแพร่หลาย โดยการใช้วิธีการแก้โจทย์ปัญหาของโพลยาจะช่วยให้มองเห็นภาพรวมในการแก้ปัญหา และช่วยให้ผู้เรียนมองเห็นแนวทางในการแก้ปัญหาได้ง่ายขึ้น ส่งผลให้ผู้เรียนมีทักษะการแก้ปัญหาทางคณิตศาสตร์สูงขึ้น โพลยาได้เสนอขั้นตอนการแก้โจทย์ปัญหาไว้ 4 ขั้นตอน ดังนี้ 1) การทำความเข้าใจปัญหา (Understanding The Problem) 2) การวางแผนแก้ปัญหา (Devising a Plan) 3) การดำเนินการแก้ปัญหาตามแผน (Carry Out the Plan) และ 4) การตรวจสอบคำตอบ (Looking Back)

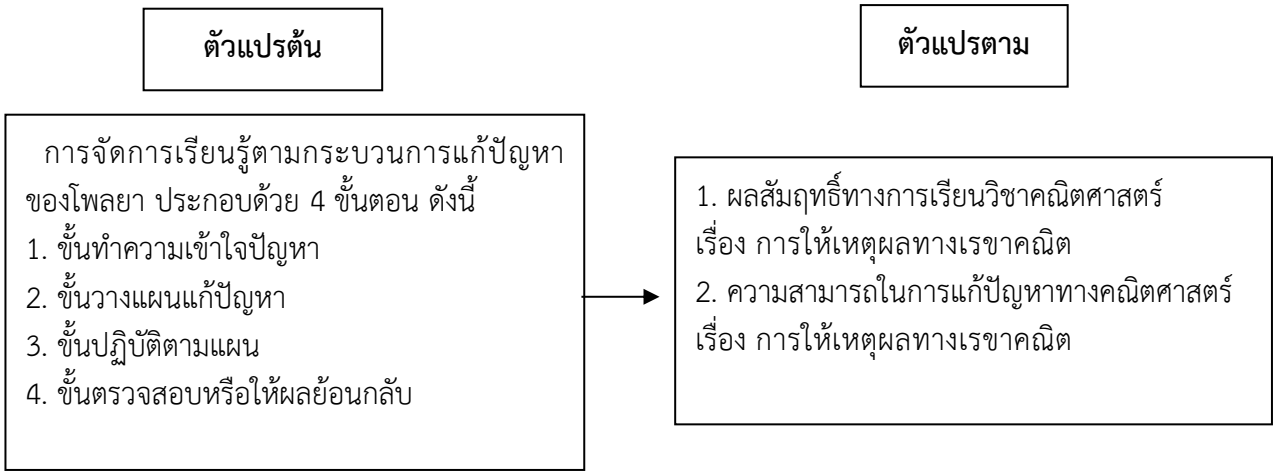
จากที่กล่าวมา ทำให้ผู้วิจัยสนใจในเรื่องของการศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง การให้เหตุผลทางเรขาคณิต โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

2. เพื่อศึกษาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจากการจัดการเรียนรู้โดยใช้กระบวนการแก้ปัญหาของโพลยา

แนวคิด ทฤษฎี กรอบแนวคิด



วิธีดำเนินการวิจัย

1. กลุ่มเป้าหมายใช้ในการวิจัย

กลุ่มเป้าหมายที่ใช้ในการศึกษาครั้งนี้เป็นนักเรียนชั้นมัธยมศึกษาปีที่ 2/10 โรงเรียนสตรีภูเก็ต สังกัดสำนักงาน เขตพื้นที่การศึกษามัธยมศึกษาพังงา ภูเก็ต ระนอง ปีการศึกษา 2566 จำนวน 42 คน

2. การสร้างและตรวจสอบคุณภาพเครื่องมือ

2.1 แผนการจัดการเรียนรู้

แผนการจัดการเรียนรู้โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง การให้เหตุผลทางเรขาคณิต รวมแผนการจัดการเรียนรู้ 10 แผน จำนวน 10 คาบ ผู้วิจัยได้ดำเนินการตามขั้นตอนต่อไปนี้

2.1.1 ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 หนังสือเรียนรายวิชา คณิตศาสตร์พื้นฐาน ชั้นมัธยมศึกษาปีที่ 2 ของสถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการ ตามมาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง 2560) หน่วยที่ 4 เรื่อง การให้เหตุผลทางเรขาคณิต

2.1.2 ศึกษาเอกสารที่เกี่ยวข้องกับการเขียนแผนการจัดการเรียนรู้โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

2.1.3 พิจารณาแบ่งเนื้อหา เรื่อง การให้เหตุผลทางเรขาคณิต ออกเป็น 2 เรื่อง จำนวน 10 แผน ใช้เวลาในการจัดการเรียนรู้ จำนวน 10 คาบ ซึ่งมีรายละเอียด ดังตารางที่ 1

ตารางที่ 1 การจัดการเรียนรู้หน่วยการเรียนที่ 2 เรื่อง การให้เหตุผลทางเรขาคณิต

ลำดับที่	แผนการจัดการเรียนรู้	ลักษณะกิจกรรมการสอน	จำนวน (คาบ)
1	ข้อความคาดการณ์	กระบวนการเรียนรู้ตามกรอบแนวคิดของโพลยา	2
2	การให้เหตุผลทางเรขาคณิต	กระบวนการเรียนรู้ตามกรอบแนวคิดของโพลยา	8

2.1.4 แผนการจัดการเรียนรู้ที่สอนตามขั้นตอนจากการจัดการเรียนรู้โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ซึ่งในแผนการจัดการเรียนรู้มีองค์ประกอบ 4 ขั้นตอน

ขั้นตอนที่ 1 ทำความเข้าใจโจทย์ปัญหา (Understanding the Problem)

ขั้นตอนที่ 2 วางแผนแก้โจทย์ปัญหา (Devising a Plan)

ขั้นตอนที่ 3 ปฏิบัติตามแผน (Carrying Out the Plan)

ขั้นตอนที่ 4 ตรวจสอบผลลัพธ์ (Looking Back)

2.1.5 นำเสนอและปรับปรุงแผนการจัดการเรียนรู้

2.1.6 นำไปใช้จัดการเรียนการสอน

2.2 แบบวัดผลสัมฤทธิ์ทางการเรียน

2.2.1 ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 หนังสือเรียนรายวิชาคณิตศาสตร์พื้นฐาน ชั้นมัธยมศึกษาปีที่ 2 ของสถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการ ตามมาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง 2560)

2.2.2 ศึกษาเอกสารเกี่ยวกับการสร้างแบบวัดผลสัมฤทธิ์ทางการเรียน

2.2.3 วิเคราะห์ตัวชี้วัดตามมาตรฐานการเรียนรู้และตัวชี้วัด กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง 2560) ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551

2.2.4 สร้างแบบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง การให้เหตุผลทางเรขาคณิต แบบปรนัย 4 ตัวเลือก จำนวน 23 ข้อ

2.2.5 นำแบบวัดผลสัมฤทธิ์ทางการเรียนเรื่อง การให้เหตุผลทางเรขาคณิต ไปให้ผู้เชี่ยวชาญ จำนวน 3 ท่าน ซึ่งประกอบด้วย รองหัวหน้ากลุ่มสาระการเรียนรู้คณิตศาสตร์โรงเรียนสตรีภูเก็ต และครูกลุ่มสาระการเรียนรู้คณิตศาสตร์โรงเรียนสตรีภูเก็ต เป็นการตรวจสอบลักษณะการใช้คำถามตัวเลือก ซึ่งต้องมีความสอดคล้องกับพฤติกรรมที่ต้องการวัดความถูกต้อง ทางด้านภาษา และความเที่ยงตรงด้านเนื้อหา โดยพิจารณาหาค่าดัชนีความสอดคล้องระหว่างข้อสอบกับตัวชี้วัด (IOC) ซึ่งผู้เชี่ยวชาญแต่ละท่านจะให้คะแนนตามเกณฑ์ดังนี้

ให้ +1 แทน แน่ใจว่าข้อคำถามสอดคล้องกับตัวชี้วัด

ให้ 0 แทน ไม่แน่ใจว่าข้อคำถามสอดคล้องกับตัวชี้วัด

ให้ -1 แทน แน่ใจว่าข้อคำถามไม่สอดคล้องกับตัวชี้วัด

โดยจะนำผลการพิจารณาของผู้เชี่ยวชาญทั้ง 3 ท่าน มาทำการวิเคราะห์เพื่อหาค่าดัชนี ความสอดคล้อง เป็นรายข้อ (IOC) โดยคัดเลือกข้อสอบที่มีค่าดัชนีความสอดคล้องระหว่าง 0.50 – 1.00

2.2.6 นำแบบวัดผลสัมฤทธิ์ทางการเรียนไปปรับปรุงแก้ไข

2.2.7 นำแบบวัดผลสัมฤทธิ์ทางการเรียนไปเก็บข้อมูลกับกลุ่มเป้าหมาย

2.3 แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์

2.3.1 ศึกษาการสร้างแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์จากเอกสารต่าง ๆ โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา

2.3.2 สร้างแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เป็นแบบอัตนัย 2 ข้อ รายละเอียดการให้คะแนนแบ่งเป็น 4 ขั้นตอน ตามเกณฑ์ดังนี้

ตารางที่ 2 เกณฑ์การประเมินผลแบบย่อยของการแก้ปัญหาทางคณิตศาสตร์ของสถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี

รายการประเมิน	คำอธิบายคุณภาพ		
	ดี (3)	พอใช้ (2)	ปรับปรุง (1)
ขั้นที่ 1 ทำความเข้า ใจโจทย์	เข้าใจปัญหาได้ถูกต้อง	เข้าใจปัญหาบางส่วนไม่ถูกต้อง	เข้าใจปัญหาน้อยมากหรือไม่ถูกต้อง
ขั้นที่ 2 วางแผนแก้ ปัญหา	เลือกวิธีการแก้ปัญหาได้เหมาะสม	เลือกวิธีการแก้ปัญหาซึ่งอาจนำไปสู่คำตอบที่ถูกแต่ยังมีบางส่วนที่ผิด	เลือกวิธีการส่วนใหญ่ไม่ถูกต้อง
ขั้นที่ 3 ปฏิบัติตาม แผนที่วางไว้	นำวิธีการแก้ปัญหาไปใช้ได้ถูกต้อง	นำวิธีการแก้ปัญหาไปใช้ได้ถูกต้อง เป็นบางครั้ง	นำวิธีการแก้ปัญหาไปใช้ไม่ถูกต้อง
ขั้นที่ 4 ตรวจสอบ	ตรวจคำตอบได้ถูกต้อง และสรุปได้ตรงประเด็น	ตรวจคำตอบได้ถูกต้องและสรุปได้บางประเด็น	ตรวจคำตอบได้เป็นบางส่วนหรือไม่ได้เลย

2.3.3 นำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง การให้เหตุผลทางเรขาคณิต ไปให้ผู้เชี่ยวชาญ จำนวน 3 ท่าน ซึ่งประกอบด้วย รองหัวหน้ากลุ่มสาระการเรียนรู้คณิตศาสตร์โรงเรียนสตรีภูเก็ต และครูกลุ่มสาระการเรียนรู้คณิตศาสตร์โรงเรียนสตรีภูเก็ต เป็นการตรวจสอบลักษณะการใช้คำถาม ความสอดคล้องกับพฤติกรรมที่ต้องการวัดความถูกต้องทางด้านภาษา และความเที่ยงตรงด้านเนื้อหา โดยพิจารณาหาค่าดัชนีความสอดคล้องระหว่างข้อสอบกับตัวชี้วัด (IOC) ซึ่งผู้เชี่ยวชาญแต่ละท่านจะให้คะแนนตามเกณฑ์

2.3.4 นำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ไปปรับปรุงแก้ไข

2.3.5 นำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ไปเก็บข้อมูลกับกลุ่มเป้าหมาย

3. การเก็บรวบรวมข้อมูล

3.1 ขั้นเตรียมการ

3.1.1 แผนการจัดการเรียนรู้โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง การให้เหตุผลทางเรขาคณิต รวมแผนการจัดการเรียนรู้ 10 แผน จำนวน 10 คาบ

3.1.2 สร้างแบบวัดผลสัมฤทธิ์ทางการเรียนเรื่อง การให้เหตุผลทางเรขาคณิต แบบปรนัย 4 ตัวเลือก จำนวน 23 ข้อ เลือก 20 ข้อ

3.1.3 จัดทำแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ แบบอัตนัย จำนวน 2 ข้อ

3.2 ขั้นเก็บรวบรวมข้อมูล

3.2.1 ทดสอบนักเรียนโดยใช้แบบวัดผลสัมฤทธิ์ทางการเรียนที่ผู้วิจัยได้สร้างขึ้นทดสอบกับกลุ่มเป้าหมาย

3.2.2 ดำเนินการสอนโดยผู้วิจัยใช้แผนการจัดการเรียนรู้โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง การให้เหตุผลทางเรขาคณิต รวมแผนการจัดการเรียนรู้ 10 แผน จำนวน 10 คาบ

3.2.3 เมื่อดำเนินการสอนครบตามแผนการจัดการเรียนรู้จึงวัดผลสัมฤทธิ์ทางการเรียนและวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ โดยใช้แบบวัดผลสัมฤทธิ์ทางการเรียนและแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ที่ผู้วิจัยได้สร้างขึ้นทดสอบกับกลุ่มเป้าหมาย

3.2.4 ตรวจให้คะแนนแบบวัดผลสัมฤทธิ์ทางการเรียนและคะแนนแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ นำผลคะแนนจากการตรวจสอบแบบวัดผลสัมฤทธิ์ทางการเรียนและแบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ที่ผู้วิจัยได้สร้างขึ้นแล้วนำคะแนนที่ได้ไปวิเคราะห์หาค่าทางสถิติ

4. การวิเคราะห์ข้อมูล

การศึกษาวิจัยครั้งนี้เป็นวิจัยกึ่งทดลอง ซึ่งดำเนินการทดลองโดยใช้แบบแผนการทดลองแบบกลุ่มเดียวทดลองใช้แบบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียน โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา และทดลองใช้แบบวัดผลสัมฤทธิ์ทางการเรียนหลังเรียนโดยใช้การจัดการเรียนรู้ตามกระบวนการ แก้ปัญหาของโพลยา ซึ่งมีรูปแบบการวิจัยดังนี้

ตารางที่ 3 แบบแผนการวิจัย

ก่อนเรียน	ทดลอง	หลังเรียน
T_1	X	T_2

สัญลักษณ์ที่ใช้ในการทดลอง

T_1 แทน การทดสอบก่อนการจัดกระทำการทดลอง

T_2 แทน การทดสอบหลังการจัดกระทำการทดลอง

x แทน การจัดกระทำกลุ่มทดลอง

นอกจากนี้ผู้วิจัยนำคะแนนที่ได้จากแบบทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์มาวิเคราะห์หาระดับวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา โดยวิเคราะห์เกณฑ์จากคะแนนสอบหลังเรียนแล้วนำคะแนนเฉลี่ยคิดเป็นร้อยละเทียบจากเกณฑ์การตัดสินผลการเรียน กลุ่มสาระการเรียนรู้คณิตศาสตร์ตามหลักสูตรแกนกลางพุทธศักราช 2551 ซึ่งแบ่งเกณฑ์ออกเป็น 8 ระดับดังนี้

คะแนนร้อยละ 80 – 100 อยู่ในระดับดีเยี่ยม

คะแนนร้อยละ 76 – 79 อยู่ในระดับดีมาก

คะแนนร้อยละ 70 – 75 อยู่ในระดับดี

คะแนนร้อยละ 65 – 69 อยู่ในระดับค่อนข้างดี

คะแนนร้อยละ 60 – 64 อยู่ในระดับปานกลาง

คะแนนร้อยละ 55 – 59 อยู่ในระดับพอใช้

คะแนนร้อยละ 50 – 54 อยู่ในระดับผ่านเกณฑ์

คะแนนร้อยละ 0 – 49 อยู่ในระดับต่ำกว่าเกณฑ์

5. สถิติที่ใช้ในการวิเคราะห์ข้อมูล

5.1 สถิติที่ใช้สำหรับวิเคราะห์คุณภาพเครื่องมือ

5.1.1 แบบวัดผลสัมฤทธิ์ทางการเรียน

1) ค่าดัชนีความสอดคล้องของข้อคำถามกับตัวชี้วัด IOC

$$IOC = \frac{\sum R}{N}$$

เมื่อ IOC แทน ดัชนีความสอดคล้องระหว่างข้อสอบกับจุดประสงค์การเรียนรู้

R แทน คะแนนความคิดเห็นของผู้เชี่ยวชาญ

$\sum R$ แทน ผลรวมของคะแนนผู้เชี่ยวชาญแต่ละคน

N แทน จำนวนผู้เชี่ยวชาญทั้งหมด

5.1.2 แบบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์

1) ค่าดัชนีความสอดคล้องของข้อคำถามกับตัวชี้วัด IOC

$$IOC = \frac{\sum R}{N}$$

เมื่อ IOC แทน ดัชนีความสอดคล้องระหว่างข้อคำถามกับลักษณะพฤติกรรม

R แทน คะแนนความคิดเห็นของผู้เชี่ยวชาญ

$\sum R$ แทน ผลรวมของคะแนนผู้เชี่ยวชาญแต่ละคน

N แทน จำนวนผู้เชี่ยวชาญทั้งหมด

5.2 สถิติที่ใช้ในการวิจัย

5.2.1 สถิติพื้นฐาน

- ร้อยละ
- ค่าเฉลี่ย
- ค่าเบี่ยงเบนมาตรฐาน

ผลการวิจัย

ผลสัมฤทธิ์ทางการเรียนนักเรียน จำนวน 42 คน มีผลการเรียนรู้ก่อนเรียนโดยเฉลี่ยเท่ากับ 7.17 คะแนน ส่วนเบี่ยงเบนมาตรฐานเท่ากับ 5.72 และมีผลการเรียนรู้ หลังเรียนโดยเฉลี่ยเท่ากับ 12.60 คะแนน ส่วนเบี่ยงเบนมาตรฐาน เท่ากับ 3.19 แสดงว่า คะแนนเฉลี่ยหลังจากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยาสูงกว่าก่อนการจัดการเรียนรู้

คะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนจำนวน 42 คน พบว่า มีคะแนนเฉลี่ยในขั้นทำความเข้าใจ 5.93 คะแนน คิดเป็นร้อยละ 98.80 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นวางแผนแก้ปัญหา 5.31 คะแนน คิดเป็นร้อยละ 88.49 อยู่ในระดับดีเยี่ยม มีคะแนนเฉลี่ยในขั้นดำเนินการตามแผน 4.69 คะแนน คิดเป็นร้อยละ 78.17 อยู่ในระดับดีมาก มีคะแนนเฉลี่ยขั้นตรวจสอบผล 4.02 คะแนน คิดเป็นร้อยละ 67.06 ซึ่งอยู่ในระดับค่อนข้างดี และมีคะแนนเฉลี่ยรวม 4.99 คะแนน คิดเป็นร้อยละ 83.13 อยู่ในระดับดีเยี่ยม

สรุปและอภิปรายผล

จากการศึกษาผลสัมฤทธิ์ทางการเรียนและความสามารถในการแก้ปัญหาทางคณิตศาสตร์ เรื่อง การให้เหตุผลทางเรขาคณิต โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา พบว่า อาจเป็นผลเนื่องมาจากผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 2/10 จำนวน 42 คน ที่ได้จากการจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา เรื่อง การให้เหตุผลทางเรขาคณิต รวมหลังเรียนสูงกว่าก่อนเรียน และสอดคล้องกับ เบญจพร สว่างศรี (2563) ได้ศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์โดยการใช้กิจกรรมการเรียนรู้ที่ส่งเสริมทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์ เพื่อ 1) หาคุณภาพของแผนการจัดการเรียนรู้ใช้กิจกรรมการเรียนรู้ที่ส่งเสริมทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์ 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนโดยการใช้กิจกรรมการเรียนรู้ที่ส่งเสริมทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์ และ 3) ศึกษาความคิดเห็นของนักศึกษาที่มีต่อการจัดกิจกรรมการเรียนรู้โดยการใช้กิจกรรมการเรียนรู้ที่ส่งเสริมทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์กลุ่มตัวอย่าง คือ นักศึกษาระดับประกาศนียบัตรวิชาชีพชั้นสูง คณะบริหารธุรกิจและเทคโนโลยีสารสนเทศ ภาคเรียนที่ 2 ปีการศึกษา2563 จำนวน 24 คน เครื่องมือที่ใช้ในการวิจัยมี 5 ชนิด คือ 1) แผนการจัดการเรียนรู้ 2) แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ 3) แบบทดสอบวัดทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์ 4) แบบสอบถามความคิดเห็นของนักศึกษาที่มีต่อการจัดกิจกรรมการเรียนรู้ และ 5) แบบบันทึกพฤติกรรมทางการเรียน วิเคราะห์ข้อมูลโดยใช้สถิติ คือ ค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน และการทดสอบแบบที ผลการวิจัยพบว่า 1) แผนการจัดการเรียนรู้มีคุณภาพอยู่ระดับมาก 2) ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์โดยการใช้กิจกรรมการเรียนรู้ที่ส่งเสริมทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์สูงกว่าเกณฑ์ร้อยละ 70 และ 3) นักศึกษาเห็นด้วยอย่างยิ่งกับการจัดกิจกรรมการเรียนรู้โดยการใช้กิจกรรมการเรียนรู้ที่ส่งเสริมทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์ว่ามีความเหมาะสม ข้อค้นพบจากงานวิจัยครั้งนี้สามารถสรุปได้ว่า การเลือกใช้สถานการณ์ปัญหาคณิตศาสตร์ในชีวิตประจำวันที่ผู้เรียนสามารถเลือกใช้กลวิธีที่ไม่เป็นทางการ ในการหาคำตอบเป็นจุดเริ่มต้นของการสร้างองค์ความรู้ เป็นแนวทางส่งเสริมให้ผู้เรียนมีทักษะการแก้ปัญหาและการเชื่อมโยงทางคณิตศาสตร์ได้เป็นอย่างดี อาจเป็นผลเนื่องมาจากความสามารถในการแก้ปัญหาคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 2/10 จำนวน 42 คน โดยใช้การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา มีคะแนนเฉลี่ยรวม 4.99 คะแนน คิดเป็นร้อยละ 83.13 อยู่ในระดับดีเยี่ยม และสอดคล้องกับ ผลงานวิจัยของ วิไลวรรณ สุระวนิชกุล และ มนตรี ทองมูล (2562) ได้ทำวิจัยเรื่อง การพัฒนาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ โดยใช้การจัดกิจกรรมการเรียนรู้ตามแนวคิดโพลยา ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 เพื่อพัฒนาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 โดยใช้การจัดกิจกรรมการเรียนรู้ตามแนวคิดโพลยา เทียบกับเกณฑ์ร้อยละ 60 ของคะแนนเต็ม โดยกลุ่มเป้าหมายที่ใช้ในการวิจัยเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 4/11 โรงเรียนสารคามพิทยาคม อำเภอเมือง จังหวัดมหาสารคาม ที่เรียนในภาคเรียนที่ 2 ปีการศึกษา 2561 จำนวน 32 คน ซึ่งได้มาจากการเลือกแบบเจาะจง (Purposive Sampling) โดยเครื่องมือที่ใช้ในการวิจัย ประกอบด้วย 1) แผนการจัดกิจกรรมการเรียนรู้ตามแนวคิดโพลยา เรื่อง เลขยกกำลังและฟังก์ชันเอกซ์โพเนนเชียล จำนวน 8 แผนการจัดการเรียนรู้ และ 2) แบบทดสอบวัดความสามารถในการแก้ปัญหาทางคณิตศาสตร์ ประเภทอัตนัย ซึ่งมีขั้นตอนการแก้ปัญหาตามแนวคิดของโพลยา จำนวน 4 ข้อ และ สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าเฉลี่ย ร้อยละ และส่วนเบี่ยงเบนมาตรฐาน ซึ่งผลการวิจัยปรากฏดังนี้

ความสามารถในการแก้ปัญหาทางคณิตศาสตร์ของนักเรียนชั้นมัธยมศึกษาปีที่ 4 หลังจากได้รับการจัดกิจกรรมการจัดการเรียนรู้ตามแนวคิดโพลยา เรื่อง เลขยกกำลังและฟังก์ชันเอกซ์โพเนนเชียล พบว่า หลังจบวงจรปฏิบัติการที่ 3 นักเรียนกลุ่มเป้าหมาย มีคะแนนเฉลี่ยเท่ากับ 35.06 คะแนน คิดเป็นร้อยละ 73.05 ของคะแนนเต็ม ซึ่งนักเรียนที่มีคะแนนความสามารถในการแก้ปัญหาทางคณิตศาสตร์สูงกว่าเกณฑ์ร้อยละ 60 มีจำนวนทั้งสิ้น 28 คน คิดเป็นร้อยละ 87.50 ของนักเรียนกลุ่มเป้าหมาย

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 การจัดการเรียนรู้ตามกรอบแนวคิดของโพลยา ควรคำนึงถึงความเหมาะสมระหว่างเวลากับเนื้อหาสาระที่จะสอนในคาบนั้น

1.2 การจัดการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยา ก่อนเริ่มสอนควรมีการอธิบายวิธีการสอนของโพลยาอย่างชัดเจนแก่นักเรียนให้เกิดความเข้าใจในขั้นตอนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์

1.3 ครูผู้สอนควรสังเกตนักเรียน กระตุ้นเสริมแรงให้กำลังใจนักเรียน และสร้างบรรยากาศให้เป็นกันเองในขณะที่ทำกิจกรรมโดยใช้แผนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์ตามกระบวนการแก้ปัญหาของโพลยา เพื่อจะได้พัฒนาแผนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์ให้สอดคล้องกับความต้องการและความสนใจของนักเรียน ทำให้การดำเนินกิจกรรมการเรียนรู้เป็นไปอย่างสมบูรณ์และมีประสิทธิภาพ

1.4 เนื่องจากกิจกรรมการเรียนรู้ส่วนใหญ่ผู้เรียนเป็นผู้ปฏิบัติกิจกรรมการเรียนรู้ จึงควรมีการสรุปบทเรียนทุกครั้งที่ทำกิจกรรมเสร็จเรียบร้อย

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ควรมีการเปรียบเทียบระหว่างการสอน โดยใช้แผนการจัดกิจกรรมการเรียนรู้ตามกระบวนการแก้ปัญหาของโพลยากับการสอนโดยใช้สื่อ/นวัตกรรมอื่น ๆ เพื่อดูความแตกต่าง

2.2 ควรมีการเปรียบเทียบระหว่างการสอน แบบกลุ่มกับรายบุคคลด้วยแผนการจัดกิจกรรมการเรียนรู้คณิตศาสตร์ตามกระบวนการแก้ปัญหาของโพลยาเพื่อเปรียบเทียบความแตกต่าง

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The Development of Problem-Solving Skills Toward the Safe Use of The Internet by Using Role-Play Learning of Prathomsuksa 5 Students

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บทคัดย่อ

การวิจัยครั้งนี้มีจุดประสงค์เพื่อเปรียบเทียบทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย ระหว่างก่อนกับหลังการใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 และเพื่อศึกษาความพึงพอใจของนักเรียนที่มีผลต่อการใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 ประโยชน์ของการวิจัยที่ได้รับในครั้งนี้ นักเรียนเกิดทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย หลังการใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติได้อย่างเหมาะสม สามารถคิดวิเคราะห์ ตัดสินใจ และนำความรู้ไปประยุกต์ใช้ในชีวิตประจำวันต่อไปได้ ประชากรและกลุ่มตัวอย่าง คือ นักเรียนชั้นประถมศึกษาปีที่ 5 ห้อง 5/1 จำนวน 37 คน โรงเรียนมุสลิมสันติธรรมมูลนิธิ ภาคการศึกษาที่ 2 ปีการศึกษา 2566 โดยเลือกกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) นักเรียนที่มีปฏิสัมพันธ์กับครูผู้สอน และมีความกระตือรือร้นในการเรียน ใช้เวลาทดลอง จำนวน 6 ชั่วโมง โดยผู้วิจัยดำเนินการพัฒนาและจัดการเรียนรู้ด้วยตนเอง

เครื่องมือที่ใช้ในการวิจัยประกอบด้วย 1) แผนการจัดการเรียนรู้ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย 2) แบบทดสอบ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย ชนิดเลือกตอบมี 4 ตัวเลือก จำนวน 20 ข้อ โดยใช้ฉบับเดียวกันทั้งก่อนและหลังการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ และ 3) แบบสอบถามความพึงพอใจ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ ผลการวิจัยพบว่า 1) การใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติสูงกว่าแบบไม่ใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และ 2) นักเรียนในกลุ่มทดลองมีความพึงพอใจในการพัฒนาทักษะการแก้ปัญหาในภาพรวมอยู่ในระดับมาก ($\bar{X}$ = 4.42, S.D. = 0.45)

คำสำคัญ: ทักษะการแก้ปัญหา, การแสดงบทบาทสมมติ, ทักษะการใช้อินเทอร์เน็ตอย่างปลอดภัย, ความพึงพอใจ

Abstract

The purpose of this research was to compare problem-solving skills regarding safe internet use. Between before and after using the role-play learning method. For Grade 5 students and to study student satisfaction affecting the use of role-play learning methods on using the internet safely. For Grade 5 students. Benefits of this research Students develop problem-solving skills regarding using the internet safely. After using the learning management method using role-playing. Be able to think, analyze, make decisions, and apply knowledge to everyday life. The population and sample were 37 students in Grade 5, Room 5/1, Muslim Santitham Foundation School. Semester 2, academic year 2023, by selecting a purposive sampling group of students who interact with teachers and are enthusiastic about learning. The experiment time was 6 hours, with the researcher developing and organizing the learning on their own.

The research tools include 1) a learning plan on using the internet safely and 2) a test on using the internet safely. The multiple-choice type has 4 options, 20 questions, using the same version before and after the role play, and 3) a satisfaction questionnaire on using the internet safely. By organizing learning using role-playing.

The results of the research found that 1) The use of role-playing learning management methods was higher than those without role-playing learning management methods. Statistically significant at the .01 level and 2) students in the experimental group were satisfied with the overall development of problem-solving skills at a high level ($\bar{X}$ = 4.42, S.D. = 0.45).

Keywords: Problem-solving Skills, Role-Playing, Safe Internet Use Skills, Satisfaction

บทนำ

ปัจจุบันการใช้อินเทอร์เน็ตได้เข้ามามีบทบาทต่อการเรียนรู้ของเด็กและเยาวชนอย่างมาก โดยข้อดีของการนำอินเทอร์เน็ตมาใช้นั้นสามารถทำให้ผู้เรียนติดต่อสื่อสารกับผู้คนทั่วโลกได้อย่างรวดเร็ว และสามารถสืบค้นหรือเผยแพร่ข้อมูลสารสนเทศจากทั่วโลก ข้อเสียคือ การเข้าถึงอินเทอร์เน็ตของเด็กและเยาวชนนั้น ไม่สามารถแยกแยะหรือใช้วิจารญาณได้ว่า เนื้อหาของคลิปวีดีโอนี้ถูกต้องหรือไม่ถูกต้อง และทำตามเป็นกระแสในโลกออนไลน์ แต่ไม่ได้นึกถึงผลกระทบหรือภัยอันตรายที่ตามมา เนื่องจากขาดความรู้การวิเคราะห์ว่าสิ่งที่ทำอยู่ผิดหรือถูก และเสี่ยงต่อภัยออนไลน์ทางอินเทอร์เน็ต

จากหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 และมาตรฐานการเรียนรู้และตัวชี้วัดฯ (ฉบับปรับปรุง พ.ศ. 2560) ว่าด้วยรายวิชาวิทยาการคำนวณที่ผู้เรียนจะต้องมีความรู้ความเข้าใจที่สามารถจะวิเคราะห์และแก้ไขปัญหาได้ซึ่งสอดคล้องกับเหตุการณ์ในปัจจุบันที่การติด ต่อสื่อสารผ่านอินเตอร์เน็ตทำได้หลากหลายสามารถตอบสนองความต้องการของมนุษย์ให้มีความสะดวกสบายมากขึ้น หากมีผู้ใช้คอมพิวเตอร์และเครือข่ายคอมพิวเตอร์เป็นเครื่องมือในการกระทำความผิดเพื่อให้ผู้อื่นเสียหายและเสื่อมเสียชื่อเสียง ดังนั้นผู้ใช้คอมพิวเตอร์ที่ดีนั้นจะต้องมีแนวทางการป้องกันและแก้ไขรวมไปถึงการใช้อินเทอร์เน็ตอย่างมีมารยาทอีกด้วย ซึ่งทำให้เห็นว่าการใช้อินเทอร์เน็ตอย่างปลอดภัยนั้น มีความสำคัญ

ต่อผู้เรียนซึ่งจะต้องมีทักษะสำคัญอย่างมากในการคิดวิเคราะห์แยกแยะมากกว่าการท่องจำ

ขณะเดียวกันโรงเรียนมุสลิมสันติธรรมมูลนิธิ จังหวัดนครศรีธรรมราช ได้มีรายวิชาเทคโนโลยีวิทยาการคำนวณบรรจุอยู่ในหลักสูตรสถานศึกษา ซึ่งเรียนตั้งแต่ชั้นประถมศึกษาปีที่ 1 จนถึงชั้นประถมศึกษาปีที่ 6 ปัญหาที่พบคือ 1) พฤติกรรมการใช้อินเทอร์เน็ต โดยนักเรียนส่วนใหญ่มีโทรศัพท์มือถือและมีแอคเคาท์ แอปพลิเคชันต่าง ๆ ที่เป็นกระแส เช่น Facebook, TikTok, Instagram จากการสังเกตในห้องเรียนนักเรียนมักจะมีการพูดคุยถึงข้อมูลใน Facebook เกี่ยวกับโพสต์ของผู้ใช้ในแอปพลิเคชันนั้น และมีการนำรูปเพื่อนนักเรียนที่ไม่ชอบมาโพสต์ในกลุ่มส่วนตัวแล้ว ด่าทอ นินทา ด้วยถ้อยคำที่รุนแรง ทำให้เพื่อนเกิดความอับอาย 2) นักเรียนส่วนใหญ่ยังขาดทักษะการคิดวิเคราะห์ แยกแยะ ถึงผลเสียของการกระทำจากการใช้อินเทอร์เน็ตของตนเอง จึงทำให้ไม่สามารถแก้ไขปัญหานั้นได้

จากปัญหาดังกล่าวครูผู้สอนจึงจำเป็นต้องเลือกและประยุกต์วิธีการสอนให้สอดคล้องกับเนื้อหาและกิจกรรมการเรียนรู้ เพื่อให้นักเรียนมีความสามารถคิด วิเคราะห์ แก้ปัญหาได้ และมีความกระตือรือร้นในการเรียน การจัดการเรียนรู้ควรให้ผู้เรียนมีส่วนร่วมในกิจกรรมต่าง ๆ ไม่ใช่เพียงแค่ฟังจากการบรรยาย ดังนั้นครูผู้สอนจึงใช้การแสดงบทบาทสมมติในการจัดการเรียนการสอน กิจกรรมบทบาทสมมติ คือ กระบวนการที่ผู้สอนใช้ในการช่วยให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ที่กำหนดโดยการให้ผู้เรียนสวมบทบาทในสถานการณ์ซึ่งมีความใกล้เคียงกับความจริง และแสดงออกตามความรู้สึกนึกคิดของตนและนำเอาการแสดงออกของผู้แสดงทั้งด้านความรู้ ความคิด ความรู้สึก และพฤติกรรมที่สังเกตมาเป็นข้อมูลในการอภิปรายเพื่อให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ (ทิศนา แขมมณี, 2550) ซึ่งสอดคล้องกับงานวิจัยของ นิตยา ดอกกระดิน (2552) ได้ศึกษาผลการจัดประสบการณ์การแสดงบทบาทสมมติประกอบการเล่านิทานที่มีต่อความเชื่อมั่นในตนเองของเด็กปฐมวัย เพื่อเปรียบเทียบความเชื่อมั่นในตนเองของเด็กปฐมวัยก่อนและหลังการจัดประสบการณ์ กลุ่มตัวอย่างนักเรียนอนุบาล ชั้นปีที่ 2 ภาคเรียนที่ 1 ปีการศึกษา 2553 โรงเรียนวัดสุวรรณนาคี จำนวน 15 คน ได้มาโดยการสุ่มแบบกลุ่ม ผลการวิจัยพบว่าความเชื่อมั่นในตนเองของเด็กปฐมวัยหลังการจัดประสบการณ์การแสดงบทบาทสมมติประกอบการเล่านิทานสูงกว่าก่อนการจัดประสบการณ์การแสดงบทบาทสมมติประกอบการเล่านิทานอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

จากงานวิจัยข้างต้นจะเห็นได้ว่า การจัดการเรียนรู้แบบการแสดงบทบาทสมมติ ทำให้นักเรียนมีความเชื่อมั่นในตนเอง มีความสามารถคิด วิเคราะห์ แก้ปัญหาได้ และมีความกระตือรือร้นในการเรียน ซึ่งส่งผลให้นักเรียนสามารถพัฒนาทักษะการแก้ปัญหาได้อย่างมีประสิทธิภาพ ด้วยเหตุผลดังกล่าวผู้วิจัยในฐานะครูผู้สอนวิชาเทคโนโลยีวิทยาการคำนวณจึงเลือกกลุ่มเป้าหมายในการศึกษาโดยมุ่งเน้นให้นักเรียนมีทักษะการแก้ปัญหา จึงได้นำวิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติมาเป็นแนวทางในการจัดการเรียนรู้ในรายวิชาเทคโนโลยีวิทยาการคำนวณ ของนักเรียนชั้นประถมศึกษาปีที่ 5 โรงเรียนมุสลิมสันติธรรมมูลนิธิให้ดีขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัยระหว่างก่อนกับหลังการใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5
2. เพื่อศึกษาความพึงพอใจของนักเรียนที่มีผลต่อการใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5

ประโยชน์ของการวิจัย

นักเรียนเกิดทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย หลังการใช้วิธีการจัดการเรียนรู้โดยแบบการแสดงบทบาทสมมติได้อย่างเหมาะ สามารถคิด วิเคราะห์ ตัดสินใจ และนำความรู้ไปประยุกต์ใช้ในชีวิตประจำวันต่อไปได้

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของบทบาทสมมติ

กิจกรรมบทบาทสมมติเป็นกิจกรรมประเภทหนึ่งที่นิยมนำมาใช้ในการจัดการเรียนการสอน เนื่องจากเป็นกิจกรรมที่สร้างบรรยากาศในห้องเรียนทำให้ผู้เรียนเกิดความสนุกไม่รู้สึกเบื่อหน่ายในการเรียน ช่วยเอื้อให้ผู้เรียนใช้ทักษะในการแสดงความคิดเห็นตามบทบาทที่ได้รับจากสถานการณ์ในการใช้บทบาทสมมติทำให้สามารถนำไปประยุกต์ใช้ในชีวิตประจำวัน ซึ่งมีผู้ให้ความหมายไว้ ดังนี้

Taylor and Wayford (1974) ได้ให้ความหมายของบทบาทสมมติว่า บทบาทสมมติเป็นวิธีการที่จะทำให้ผู้เรียนเข้าใจในเรื่องที่เรียนหรือพฤติกรรมต่าง ๆ ได้อย่างลึกซึ้งทั้งได้ฝึกฝนทักษะการคิดการวิเคราะห์ การอภิปราย การแสดง การแก้ปัญหา การตัดสินใจอย่างมีเหตุผล โดยครูเป็นผู้จัดสถานการณ์ให้ผู้เรียนได้แสดงบทบาทต่าง ๆ ในสถานการณ์นั้น

ทิศนา แขมมณี (2550) วิธีสอนโดยใช้การแสดงบทบาทสมมติ คือ กระบวนการที่ผู้สอนใช้ในการช่วยให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ที่กำหนด โดยการให้ผู้เรียนสวมบทบาทในสถานการณ์ซึ่งมีความใกล้เคียงกับความเป็นจริง และแสดงออกตามความรู้สึกนึกคิดของตน และนำเอาการแสดงออกของผู้แสดงทั้งทางด้านความรู้ ความคิด ความรู้สึก และพฤติกรรมที่สังเกตมาเป็นข้อมูลในการอภิปราย เพื่อให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์

อาภรณ์ ใจเที่ยง (2550) อธิบายถึงวิธีสอนโดยใช้บทบาทสมมติ หมายถึง วิธีสอนที่ผู้สอนสร้างสถานการณ์และบทบาทสมมติขึ้นจากความเป็นจริงมาให้ผู้เรียนได้แสดงออกตามที่ผู้เรียนคิดว่าควรจะเป็น ผู้สอนจะใช้การแสดงออกทั้งด้านความรู้ ความคิด และพฤติกรรมของผู้แสดงมาเป็นพื้นฐานในการให้ความรู้และสร้างความเข้าใจแก่ผู้เรียน อันจะทำให้ผู้เรียนเข้าใจเนื้อหาสาระของบทเรียนอย่างลึกซึ้งและรู้จักปรับเปลี่ยนพฤติกรรมและการแก้ไขปัญหาต่าง ๆ ได้อย่างเหมาะสม

ผู้วิจัยสรุปได้ว่า วิธีการสอนแบบใช้การแสดงบทบาทสมมติ หมายถึง การสอนที่ผู้สอนสร้างสถานการณ์และบทบาทสมมติขึ้นมาที่ใกล้เคียงกับความเป็นจริง โดยให้ผู้เรียนเป็นผู้แสดงบทบาทสมมตินั้น ๆ ตามวัตถุประสงค์ที่ผู้สอนได้กำหนดไว้เพื่อให้ผู้เรียนได้แสดงออกทางด้านความรู้ ความคิดที่คิดว่าตนควรจะเป็น การสอนแบบใช้บทบาทสมมตินี้มีประโยชน์อย่างมาก สำหรับผู้เรียนที่ต้องการฝึกการแก้ปัญหาในบทเรียนหน่วยการเรียนรู้ เรื่องการใช้อินเทอร์เน็ตอย่างปลอดภัย จึงได้นำแนวการสอนนี้มาจัดการเรียนรู้ โดยให้นักเรียนแสดงบทบาทสมมติที่ครูได้นำมาจากสถานการณ์ที่เกิดขึ้นจริงในชีวิตประจำวัน เพื่อให้ผู้เรียนได้เข้าใจเรื่องราวที่เกิดขึ้นตามความรู้สึกของผู้เรียนที่แสดงออกไป และให้ผู้เรียนที่ดูได้มองเห็นภาพ และสามารถสะท้อนถึงแนวทางการแก้ปัญหาได้อย่างเหมาะสม

วัตถุประสงค์ของการแสดงบทบาทสมมติ

วิธีสอนแบบใช้การแสดงบทบาทสมมติ เป็นวิธีที่มุ่งช่วยให้ผู้เรียนได้เรียนรู้การเอาใจเขามาใส่ใจเรา เกิดความเข้าใจในความรู้สึกและพฤติกรรมทั้งของตนเองและผู้อื่น หรือเกิดความเข้าใจในเรื่องต่าง ๆ เกี่ยวกับบทบาทสมมติที่ตนแสดง (ทิศนา แขมณี, 2550)

ผู้วิจัยสรุปได้ว่า วิธีการสอนแบบใช้การแสดงบทบาทสมมติมุ่งให้ผู้เรียนเกิดความเข้าใจในความรู้สึกและพฤติกรรมการแสดงออกของตนและผู้อื่น เกิดความเข้าใจในเนื้อหาที่ตนแสดง

องค์ประกอบของการแสดงบทบาทสมมติ

สุมิตรา อังวัฒนกุล (2540) กล่าวว่า การแสดงบทบาทสมมติมีองค์ประกอบสำคัญ 4 ประการ ได้แก่

1. สถานการณ์ หมายถึง สภาพที่เป็นอยู่หรือหัวเรื่องสนทนา ผู้สอนจะต้องอธิบายสถานการณ์และงานที่ผู้เรียนจะต้องทำให้สำเร็จ งานที่ทำจะมีความยากง่ายตามระดับของผู้เรียน เช่น การรับโทรศัพท์หรือการเจรจาต่อรองธุรกิจ เป็นต้น การอธิบายชี้แจงเกี่ยวกับสถานการณ์ยังสามารถให้ข้อมูลเพิ่มเติมเกี่ยวกับวัฒนธรรมหรือธรรมเนียมปฏิบัติด้วย

2. บทบาท หมายถึง การมอบหมายบทบาทให้ผู้เรียนแสดงตามบทที่กำหนด ผู้เรียนจะต้องมีความเข้าใจในบุคลิกภาพ ประสบการณ์ สถานะทางสังคม ปัญหา และความต้องการของบทบาทที่ตนจะแสดง คำอธิบายชี้แจงเกี่ยวกับบทบาทไม่ควรมากหรือละเอียดจนเกินไป เพื่อเปิดโอกาสให้ผู้แสดงพัฒนาบุคลิกภาพตามภูมิหลังหรือพฤติกรรมที่ผ่านมา

3. สำนวนที่เป็นประโยชน์สำหรับการแสดงบทบาทสมมติ หมายถึง สำนวน วลี คำศัพท์เฉพาะและรูปแบบของภาษา ตลอดจนข้อมูลต่าง ๆ ทั้งด้านภาษาศาสตร์ และด้านสังคม

4. ความรู้พื้นฐานในเนื้อหาของสถานการณ์ หมายถึง ความรู้ทั่วไปที่ผู้เรียนจำเป็นจะต้องมีเกี่ยวกับสถานการณ์ในการแสดง เช่น การแสดงบทบาทสมมติในการประชุมเกี่ยวกับสิ่งแวดล้อมเป็นพิษ ผู้สอนจะต้องให้ความรู้พื้นฐานแก่ผู้เรียนโดยเตรียมเอกสารให้อ่าน ให้ดูภาพยนตร์ หรือเชิญผู้ทรงคุณวุฒิบรรยายเป็นพิเศษ สมาคมสร้างสรรค์ไทย (2548) กล่าวเพิ่มเติมว่า นอกจากองค์ประกอบ 4 ประการข้างต้นแล้ว ฉาก และเค้าโครงเรื่องก็เป็นองค์ประกอบสำคัญของบทบาทสมมติ ดังนี้

1. ฉาก (Prop) เป็นวัสดุอุปกรณ์ที่นำมาใช้ประกอบการเล่นบทบาทสมมติซึ่งบางครั้งอาจจะเป็นการแสดงท่าทาง การหยิบจับโดยไม่มีของจริง เป็นต้น

2. เค้าโครงเรื่อง (Plot) เป็นเค้าโครงเรื่องอย่างง่าย ที่มักเป็นการเลียนแบบชีวิตประจำวันที่ผู้เรียนพบเห็นจากหนังสือที่อ่าน หรือจากละครโทรทัศน์ เป็นต้น

นอกจากนั้น ชลิดา ใจมณี (2554) ได้กล่าวไว้ว่า องค์ประกอบสำคัญ (ที่ขาดไม่ได้) ของวิธีสอนแบบบทบาทสมมติ ไว้ดังนี้

1. มีผู้สอนและผู้เรียน
2. มีสถานการณ์สมมติและบทบาทสมมติ
3. มีการแสดงบทบาทสมติ
4. มีการอภิปรายเกี่ยวกับความรู้ ความคิด ความรู้สึก และพฤติกรรมที่แสดงออกของผู้แสดงและสรุปการเรียนรู้ที่ได้รับ
5. มีผลการเรียนรู้ของผู้เรียน

ผู้วิจัยสรุปได้ว่า องค์ประกอบของการแสดงบทบาทสมมติ ประกอบไปด้วย ส่วนต่าง ๆ ที่สำคัญ ได้แก่ สถานการณ์ เค้าโครงเรื่อง บทบาท สำนวนที่เป็นประโยชน์ ความรู้พื้นฐานในเนื้อหาของสถานการณ์ และฉาก

รูปแบบของการแสดงบทบาทสมมติ

รูปแบบกิจกรรมบทบาทสมมติ มีหลากหลายรูปแบบ เช่น วารี ถิระจิตร (2534) อธิบายลักษณะการแสดงบทบาทสมมติมี 2 ลักษณะ คือ

1. ผู้แสดงบทบาทสมมติจะต้องแสดงบทบาทของคนอื่น โดยละทิ้งแบบแผนพฤติกรรมของตนเอง หรือการเปลี่ยนบทบาทซึ่งกันและกันกับเพื่อนหรือเป็นบุคคลสมมติ

2. ผู้แสดงบทบาทจะยังคงรักษาบทบาทและแบบแผนพฤติกรรมของตนแต่ปฏิบัติอยู่ในสถานการณ์ที่อาจพบในอนาคต บทบาทสมมติประเภทนี้เป็นประโยชน์ต่อการฝึกฝนทักษะเฉพาะ ซึ่งบทบาทสมมติที่ใช้ประกอบการเรียนการสอนอยู่ในปัจจุบันนี้ แยกได้เป็น 3 วิธี ดังนี้

1. การแสดงบทแสดงละคร วิธีนี้ผู้ที่จะแสดงต้องฝึกซ้อมแสดงทำท่าทางตามบทกำหนดขึ้นไว้แล้ว เช่น การแสดงละครเรื่องที่เกี่ยวกับบทเรียนในหนังสือ ผู้แสดงบทบาท ละคร จะต้องพูดตามบทบาทที่ผู้เขียนกำหนดขึ้น

2. การแสดงบทบาทสมมติแบบไม่มีบทเตรียมไว้ ผู้แสดงต้องไม่ฝึกซ้อมมาก่อนเรียน ไปถึงเรื่องใดตอนใด ก็ออกมาแสดงได้ทันที โดยแสดงไปตามความรู้สึกนึกคิดของตนเอง เช่น แสดงเป็นบุคคลต่าง ๆ ในชุมชน เป็นหมอ เป็นทหาร เป็นตำรวจ นักเรียนได้คิด ได้พูด และแสดงพฤติกรรมจากความรู้สึกนึกคิดของเขาเอง

3. การใช้บทบาทสมมติแบบเตรียมบทไว้พร้อม ผู้สอนได้เตรียมบทมาไว้ล่วงหน้าบอกความคิดรวบยอดให้ผู้แสดงทราบ ผู้แสดงอาจต้องแสดงตามบทบาทบ้าง คิดบทบาทขึ้นแสดงเองตามความพอใจบ้าง แต่ต้องตรงกับเนื้อเรื่องที่กำหนดให้ ธิดารัตน์ วิเชียรลม (2554) กล่าวว่า รูปแบบของกิจกรรมการแสดงบทบาทสมมติ สามารถแบ่ง ได้ 2 ประเภท ได้แก่ การแสดงบทบาทสมมติที่มีการเตรียมตัวล่วงหน้า และที่ไม่มีการเตรียมตัวล่วงหน้า โดยมีรายละเอียดดังนี้

1. การแสดงบทบาทสมมติที่มีการเตรียมตัวล่วงหน้า ผู้สอนเป็นผู้กำหนดสถานการณ์ขึ้นมา จากนั้นนำมาถ่ายทอดให้ผู้เรียนได้รับฟัง แล้วมอบบทบาทให้กับผู้เรียนตามความเหมาะสมเพื่อให้เตรียมตัวล่วงหน้าก่อนการแสดง ทั้งนี้ ผู้แสดงอาจสอดแทรกรายละเอียดเพิ่มเติมของเนื้อหาได้ การแสดงบทบาทสมมติที่มีการเตรียมตัวล่วงหน้า เน้นความพร้อมของผู้แสดงที่ทำหน้าที่รับผิดชอบในแต่ละบทบาท รวมถึงการจัดฉากให้เหมาะสมกับเนื้อเรื่องหรือสถานการณ์นั้น ๆ

2. การแสดงบทบาทสมมติที่ไม่มีการเตรียมตัวล่วงหน้า เป็นวิธีการสอนที่ใช้ในการนำเข้าสู่บทเรียนหรือใช้ในระหว่างที่มีการเรียนการสอนโดยให้ผู้เรียนอาสาสมัครแสดงบทบาทสมมติตามเนื้อหาเพื่อให้การเรียนนั้นน่าสนใจ และทำให้ผู้เรียนเกิดความเข้าใจในเนื้อหามากยิ่งขึ้น การแสดงบทบาทสมมติที่ไม่มีการเตรียมล่วงหน้า เน้นไหวพริบ เชาว์ปัญญา และความคิดสร้างสรรค์อย่างฉับไวของผู้แสดง ส่วน สุวิทย์ มูลคำ และ อรทัย มูลคำ (2545) ได้แบ่งการแสดงบทบาทสมมติออกเป็น 3 ประเภท ได้แก่ การแสดงบทบาทสมมติแบบไม่มีบทเตรียมไว้ แบบเตรียมบทไว้พร้อม และแบบแสดงละคร โดยมีรายละเอียดดังนี้

1. การแสดงบทบาทสมมติแบบไม่มีบทเตรียมไว้ ซึ่งผู้แสดงไม่จำเป็นต้องฝึกซ้อมก่อนที่จะแสดง เมื่อเรียนถึงเรื่องใด ตอนใดก็จะแสดงได้ทันทีโดยไม่ต้องฝึก ให้แสดงตามความรู้สึกนึกคิดของตนเอง

2. การแสดงบทบาทสมมติแบบเตรียมบทไว้พร้อม ผู้สอนจัดเตรียมบทล่วงหน้าบอกความคิดรวบยอด และบทบาทให้ผู้แสดงทราบ ซึ่งผู้แสดงอาจแสดงตามบทที่กำหนดบ้าง หรืออาจคิดบทบาทขึ้นเองตามความคิด ความพอใจของตน แต่ต้องตรงกับเนื้อหาที่กำหนดไว้

3. การแสดงบทบาทสมมติแบบแสดงละคร ผู้สอนกำหนดบทบาทไว้แล้ว ผู้แสดงจะต้องฝึกซ้อมแสดง และพูดตามบทที่ผู้สอนกำหนดขึ้น

ผู้วิจัยสรุปได้ว่า รูปแบบของกิจกรรมการแสดงบทบาทสมมติ มี 3 รูปแบบ คือ การแสดงบทแสดงละคร การแสดงบทบาทสมมติแบบไม่มีบทเรียนไว้ และการใช้บทบาทสมมติแบบเตรียมบทไว้

ขั้นตอนของการแสดงบทบาทสมมติ

ทิศนา แขมมณี (2550) ได้อธิบายขั้นตอนของการสอนโดยใช้การแสดงบทบาทสมมติ ไว้ดังนี้

1. ผู้สอน/ผู้เรียน นำเสนอสถานการณ์สมมติและบทบาทสมมติ
2. ผู้สอน/ผู้เรียนเลือกผู้แสดงบทบาท
3. ผู้สอนเตรียมผู้สังเกตการณ์
4. ผู้เรียนแสดงบทบาทและสังเกตพฤติกรรมที่แสดงออก
5. ผู้สอนและผู้เรียนอภิปรายเกี่ยวกับความรู้ ความคิด ความรู้สึก และพฤติกรรมที่แสดงออกของผู้แสดง
6. ผู้สอนและผู้เรียนสรุปการเรียนรู้ที่ได้รับ
7. ผู้สอนประเมินผลการเรียนรู้ของผู้เรียน

ศศิภา ไชยวงศ์ (2553) ได้สรุปขั้นตอนในการจัดการเรียนการสอน โดยใช้การแสดงบทบาทสมมติไว้ ดังต่อไปนี้

1. ขั้นนำเสนอ (Introduction) เป็นขั้นที่ผู้สอนเสนอบทเรียนด้วยกิจกรรมบทบาทสมมติ อาจเป็นการอ่านประกอบท่าทางที่เกี่ยวข้องกับบทเรียนด้วยน้ำเสียงที่แตกต่างกันออกไปในแต่ละรอบของการนำเสนอ แล้วจึงให้ผู้เรียนทำกิจกรรมเลียนแบบท่าทางตามประโยคในเนื้อหาบทเรียนตามแบบซึ่งจะทำให้ผู้เรียนสนุกสนาน และมีเจตคติที่ดีต่อการเรียน

2. ขั้นเตรียมความพร้อม (Preparation) เป็นขั้นที่ผู้สอนให้ข้อมูลทางภาษาแก่ผู้เรียน โดยกระตุ้นและอธิบายเพื่อให้เกิดการเรียนรู้ให้เข้าใจความหมาย และวิธีการใช้ภาษาให้เหมาะสมกับสถานการณ์ต่าง ๆ ควบคู่กับการเรียนรู้กฎเกณฑ์ทางภาษา

3. ขั้นฝึก (Practice) เป็นขั้นที่ผู้เรียนจะได้ทำความเข้าใจกับบทเรียนอย่างละเอียดและฝึกซ้อมการใช้ภาษารวมทั้งสาธิตการใช้ภาษาตามบทเรียน เช่น การแสดงเลียนแบบ และฝึกซ้อมใช้ภาษาเองรวมทั้งการสาธิตการใช้ภาษาตามบทเรียน เช่น แสดงเลียนแบบ

4. ขั้นแสดง (Presentation) ในขั้นนี้ ผู้เรียนต้องแสดงบทบาทที่ตนเองได้รับจากบัตรบทบาทหน้าชั้นเรียนอย่างมีชีวิตชีวา โดยจัดฉากและเตรียมอุปกรณ์ไว้ หรือไปแสดงในสถานที่จริง

5. ขั้นผลิตภาษา (Production) เป็นขั้นตอนที่ให้ผู้เรียนนำความรู้ที่ได้เรียนมาประยุกต์ใช้ในการแสดงบทบาทสมมติตามที่กำหนด เพื่อที่จะให้ผู้เรียนสามารถใช้ภาษาในการสื่อสารได้อย่างเหมาะสมทั้งในและนอกห้องเรียน

Krish (2001) ได้สรุปขั้นตอนการจัดกิจกรรมการเรียนรู้โดยใช้การแสดงบทบาทสมมติไว้ 3 ขั้นตอน ดังนี้

ขั้นตอนที่ 1 การเตรียมการ (Preparation Stage) ในขั้นนี้ผู้สอนเป็นผู้สร้างบรรยากาศในการเรียนและเตรียมความพร้อมด้านภาษาแก่ผู้เรียน รวมถึงการคัดเลือกบทบาทของผู้แสดงในกลุ่มและการฝึกซ้อมก่อนการแสดงจริง

ขั้นตอนที่ 2 การแสดง (Presentation Stage) กลุ่มผู้แสดงจะนำเสนอหน้าชั้นเรียนอย่างมีชีวิตชีวา ในขณะที่กลุ่มผู้ชมจะต้องจดบันทึกการแสดงเกี่ยวกับจุดอ่อน จุดแข็ง ของการแสดงและการใช้ภาษา โดยไม่ทำให้กลุ่มผู้แสดงรู้สึกกลัวต่อคำวิพากษ์วิจารณ์

ขั้นตอนที่ 3 หลังการแสดง (Post Presentation Stage) ผู้เรียนแสดงความคิดเห็นต่อการแสดงของแต่ละกลุ่มตามที่ได้จดบันทึกไว้ และให้ข้อเสนอแนะรวมทั้งข้อคิดเห็น เพื่อที่ผู้สอนจะได้นำข้อมูลไปปรับปรุงในการจัดกิจกรรมการเรียนต่อไป

ผู้วิจัยสรุปได้ว่า ขั้นตอนของการสอนโดยใช้การแสดงบทบาทสมมตินั้น ประกอบไปด้วยส่วนที่สำคัญ 5 ขั้นตอน ได้แก่ 1) ขั้นนำเสนอ 2) ขั้นเตรียมความพร้อม 3) ขั้นฝึก 4) ขั้นแสดง และ5) ขั้นผลิตภาษา

ประโยชน์ของการแสดงบทบาทสมมติ

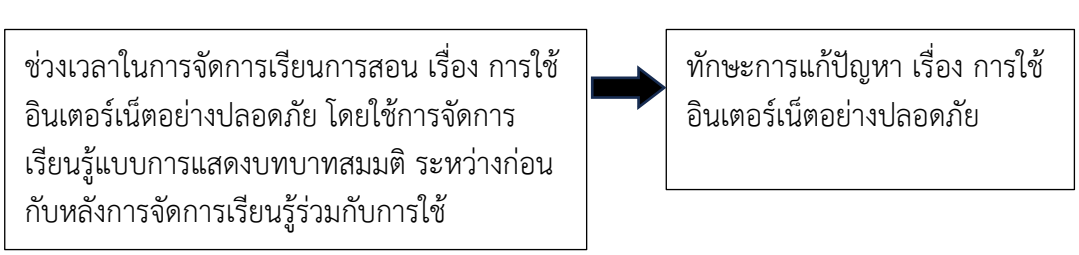
Ments (1986) ได้กล่าวไว้ว่า การแสดงบทบาทสมมติช่วยให้ผู้เรียนแสดงออกซึ่งความรู้สึกที่ซ่อนอยู่ ได้อธิบายถึงหัวข้อสนทนา และปัญหาส่วนตัว เข้าใจผู้อื่น และเข้าใจตนเอง ได้ฝึกพฤติกรรมหลายรูปแบบ มีปฏิสัมพันธ์ในกลุ่มทั้งเป็นแบบทางการและไม่เป็นทางการ และกล้าแสดงความคิดเห็น

ศศิภา ไชยวงศ์ (2553) กล่าวว่า การแสดงบทบาทสมมติทำให้ผู้เรียนได้เรียนรู้และเข้าใจความรู้สึกของตนเองและผู้อื่น สามารถปรับความสัมพันธ์ระหว่างเพื่อนในกลุ่ม ได้ฝึกการแก้ปัญหา และการตัดสินใจจากบทบาทสมมติ รู้จักใช้ไหวพริบในการแก้ปัญหาและตัดสินใจและรู้จักวิเคราะห์หาสาเหตุของปัญหาเพื่อแก้ไขปัญหาได้ตรงจุด ได้เห็นแนวทางการนำความรู้และประสบการณ์ที่ได้รับไปประยุกต์ใช้ในชีวิตจริงได้ สร้างความสามัคคีระหว่างกลุ่มการทำงานร่วมกัน จะทำให้ทุกคนมีความเข้าใจกัน และรู้จักปรับตนเองให้เข้ากับผู้อื่น ได้เกิดการเรียนรู้ในการปฏิบัติตนให้เหมาะสมกับเหตุการณ์และสถานการณ์ต่าง ๆ ในสังคม

ทิศนา แขมมณี (2545) กล่าวว่า การจัดการเรียนการสอนโดยใช้การแสดงบทบาทสมมติ เป็นกระบวนการเรียนรู้ที่ดีวิธีหนึ่งที่ผู้สอนสามารถใช้ในการช่วยให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ที่กำหนด โดยการให้ผู้เรียนสวมบทบาทในสถานการณ์ที่มีความใกล้เคียงกับความเป็นจริงและแสดงออกตามความรู้สึกนึกคิดของตน และนำเอาอาการแสดงออกของผู้แสดงทั้งทางด้านความรู้ ความคิด ความรู้สึก และพฤติกรรมที่สังเกตพบมาเป็นข้อมูลในการอภิปรายเพื่อให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ เป็นวิธีการจัดการเรียนการสอนที่ผู้เรียนได้มีการพัฒนาทักษะการเผชิญสถานการณ์ การตัดสินใจ และแก้ปัญหา ผู้เรียนมีส่วนร่วมในการเรียนรู้เป็นอย่างมาก ผู้เรียนสามารถเรียนรู้ได้อย่างสนุกสนานและการเรียนรู้มีความหมายต่อผู้เรียน

ผู้วิจัยสรุปได้ว่า การแสดงบทบาทสมมติ ช่วยให้ผู้เรียนแสดงออกซึ่งความรู้สึกที่ซ่อนอยู่ ทำให้ผู้เรียนได้เรียนรู้และเข้าใจความรู้สึกของตนเองและผู้อื่น สามารถปรับความสัมพันธ์ระหว่างเพื่อนในกลุ่ม ได้ฝึกการแก้ปัญหา และการตัดสินใจจากบทบาทสมมติ การจัดการเรียนการสอนโดยใช้การแสดงบทบาทสมมติ เป็นกระบวนการเรียนรู้ที่ดีวิธีหนึ่งที่ผู้สอนสามารถใช้ในการช่วยให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ที่กำหนด

กรอบแนวคิดที่ใช้ในการวิจัย



ภาพที่ 1 กรอบแนวคิดที่ใช้ในการวิจัย

วิธีการดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากรที่ใช้ในการวิจัยครั้งนี้เป็นนักเรียนชั้นประถมศึกษาปีที่ 5 ห้อง 5/1 จำนวน 37 คน ของโรงเรียนมุสลิมสันติธรรมมูลนิธิ ภาคเรียนที่ 2 ปีการศึกษา 2566 โดยเลือกกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) นักเรียนที่มีปฏิสัมพันธ์กับครูผู้สอน และมีความกระตือรือร้นในการเรียน

เครื่องมือที่ใช้ในการวิจัย

1) แผนการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย

2) แบบทดสอบ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย ชนิดเลือกตอบมี 4 ตัวเลือก จำนวน 20 ข้อ โดยใช้ฉบับเดียวกันทั้งก่อนและหลังการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ

3) แบบสอบถามความพึงพอใจ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ

วิธีการเก็บรวบรวมข้อมูล

ในการดำเนินการวิจัยและการเก็บรวบรวมข้อมูล ผู้วิจัยได้ดำเนินการทดลองและเก็บรวบรวมข้อมูลด้วยตนเองที่โรงเรียนมุสลิมสันติธรรมมูลนิธิ แผนกอนุบาลและประถมศึกษา โดยใช้สถานที่ คือ ห้องปฏิบัติการคอมพิวเตอร์และห้องเรียนชั้นประถมศึกษาปีที่ 5/1 ของโรงเรียน ซึ่งมีขั้นตอน ดังนี้

1. ให้ผู้เรียนทำแบบทดสอบสำหรับทักษะการแก้ปัญหาก่อนเรียนที่ผู้วิจัยสร้างขึ้นโดยอ้างอิงจาก (หนังสือคู่มือครูอักษรเจริญทัศน์ อจท. วิชาเทคโนโลยีวิทยาการคำนวณ ชั้นประถมศึกษาปีที่ 5 จำนวน 20 ข้อ กับนักเรียนจำนวน 37 คน ซึ่งในการวิจัย ผู้วิจัยได้เก็บบันทึกข้อมูลเป็นรายบุคคล เพื่อนำไปวิเคราะห์ข้อมูลทางสถิติ และใช้ในการทดสอบสมมติฐานของการวิจัยต่อไป

2. ผู้วิจัยแนะนำวิธีการเรียนด้วยบทเรียน เรื่องการใช้อินเทอร์เน็ตอย่างปลอดภัยด้วยการจัดการเรียนรู้แบบการแสดงบทบาทสมมติกับกลุ่มตัวอย่าง

3. คณะผู้วิจัยให้ผู้เรียนศึกษาบทเรียน เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัยด้วยการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ ครบทั้ง 3 ตอน

4. ให้ผู้เรียนทำแบบทดสอบ เรื่องการใช้อินเทอร์เน็ตอย่างปลอดภัยด้วยการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ หลังเรียนซึ่งเป็นทำแบบทดสอบชุดเดียวกับก่อนเรียน

5. ผู้วิจัยเก็บรวบรวมคะแนนแบบทดสอบ ก่อนและหลังเรียนโดยให้คะแนน 1 คะแนนสำหรับข้อที่ตอบได้ถูกต้อง และให้คะแนน 0 คะแนน สำหรับข้อที่ตอบไม่ถูกต้องหรือไม่ตอบ แล้วนำข้อมูลที่ได้จากการทดลองไปวิเคราะห์หาค่าทางสถิติต่อไป

การวิเคราะห์ข้อมูลและสถิติที่ใช้

การวิเคราะห์ข้อมูลในครั้งนี้ผู้วิจัยได้นำข้อมูลมาวิเคราะห์ ดังนี้

1. การเปรียบเทียบแบบทดสอบก่อนกับหลังการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยวิเคราะห์หาค่าที (t-test for Dependent group)

2. หาค่าระดับความพึงพอใจต่อการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย ทำการวิเคราะห์ข้อมูลโดยการหาค่าระดับความพึงพอใจ ได้แก่ ค่าเฉลี่ย ($\bar{X}$) และค่าส่วนเบี่ยงเบนมาตรฐาน (S.D.)

ผลการวิจัย

ตารางที่ 1 ผลการทดสอบก่อนกับหลังการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ (n=37)

คะแนน	n	$\bar{X}$	S.D.	$\bar{d}$	t	P-value
ผลการทดสอบก่อนเรียน	37	9.70	4.29			
ผลการทดสอบหลังเรียน	37	11.84	2.26	2.14	3.30	.002**

จากตารางที่ 1 พบว่า คะแนนเฉลี่ยผลการทดสอบก่อนเรียนเท่ากับ 9.70 คะแนน คะแนนเฉลี่ยผลการทดสอบหลังเรียนเท่ากับ 11.84 คะแนน เมื่อทดสอบความแตกต่างทางสถิติ พบว่า คะแนนเฉลี่ยผลการทดสอบก่อนเรียนมีความแตกต่างกับคะแนนเฉลี่ยผลการทดสอบหลังเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

ตารางที่ 2 การประเมินความพึงพอใจในการพัฒนาทักษะการแก้ปัญหา (n = 37)

รายการ	$\bar{X}$	S.D.	ระดับความพึงพอใจ
1. ด้านบทบาทผู้สอน			
1.1 ครูมีความสามารถในการถ่ายทอดความรู้ช่วยให้นักเรียนบรรลุผลตามวัตถุประสงค์	4.51	0.69	มากที่สุด
1.2 ครูให้คำปรึกษา แนะนำ และดูแลนักเรียนอย่างทั่วถึง	4.46	0.83	มาก
1.3 ครูเปิดโอกาสให้นักเรียนซักถามแสดงความคิดเห็นเมื่อมีข้อสงสัย	4.49	0.87	มาก
1.4 ครูมีความครอบครัวเกี่ยวกับเนื้อหาที่ทำการสอน	4.38	0.75	มาก
2. ด้านบทบาทของผู้เรียน			
2.1 ผู้เรียนมีส่วนร่วมในการอภิปรายและแสดงความคิดเห็นในกลุ่ม	4.32	0.85	มาก
2.2 ผู้เรียนรับฟังความคิดเห็นของสมาชิกในกลุ่ม	4.38	0.89	มาก

รายการ	$\bar{X}$	S.D.	ระดับความพึงพอใจ
2.3 ผู้เรียนอยากเรียนวิชาเทคโนโลยีวิทยาการคำนวณมากขึ้น	4.30	0.61	มาก
2.4 ผู้เรียนชอบวิธีการจัดการเรียนรู้ด้วยการสอนแบบการแสดงบทบาทสมมติ	4.65	0.58	มากที่สุด
3. ด้านการจัดการเรียนรู้			
3.1 การจัดการเรียนรู้ทำให้ผู้เรียนมีส่วนร่วมในกิจกรรม	4.81	0.46	มากที่สุด
3.2 กิจกรรมการเรียนรู้ทำให้ผู้เรียนเข้าใจเนื้อหามากยิ่งขึ้น	4.57	0.72	มากที่สุด
3.3 กิจกรรมการเรียนรู้ทำให้ผู้เรียนได้พัฒนาทักษะการแก้ปัญหา	4.30	0.81	มาก
4. ด้านการวัดและประเมินผล			
4.1 การวัดและประเมินผลการเรียนมีความชัดเจนและยุติธรรม	4.16	0.89	มาก
4.2 มีการเฉลยหรือแนะแนวทางของคำตอบเพื่อให้ทราบถึงผลการเรียนรู้	4.41	0.86	มาก
4.3 ครูเปิดเผยคะแนนที่ได้จากการวัดผล	4.19	0.87	มาก
4.4 ครูใช้เครื่องมือในการวัดผลได้อย่างเหมาะสมกับการเรียนรู้	4.19	1.12	มาก
4.5 ผู้เรียนมีทักษะการคิดกันแก้ปัญหามากขึ้น	4.51	0.65	มากที่สุด
4.6 ผู้เรียนมีความเข้าใจเนื้อหาวิชาเทคโนโลยีวิทยาการคำนวณมากขึ้น	4.27	0.93	มาก
4.7 ผู้เรียนสามารถนำความรู้และทักษะการแก้ปัญหามาประยุกต์ใช้ในชีวิตประจำวันได้	4.54	0.98	มากที่สุด
4.8 ผู้เรียนมีปฏิสัมพันธ์ที่ดีกับเพื่อนร่วมชั้น	4.54	0.98	มากที่สุด
ภาพรวม	**4.42**	**0.45**	**มาก**

จากตารางที่ 2 พบว่า การประเมินความพึงพอใจในการพัฒนาทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 โดยภาพรวมอยู่ในระดับมาก ($\bar{X}$= 4.42, S.D. = 0.45) และเมื่อพิจารณาเป็นรายด้าน พบว่า ด้านที่มีค่าเฉลี่ยมากที่สุด คือ ด้านบทบาทของผู้เรียน ($\bar{X}$ = 4.65, S.D. = 0.46) รองลงมา คือ ด้านการจัดการเรียนรู้ ($\bar{X}$ = 4.48, S.D. = 0.59) ด้านบทบาทผู้สอน ($\bar{X}$ = 4.45, S.D. = 0.49) และด้านการวัดและประเมินผล ($\bar{X}$= 4.32, S.D. = 0.65) ตามลำดับ

สรุปและอภิปรายผล

จากการทดลองและวิเคราะห์ข้อมูลการวิจัย สามารถสรุปผลการวิจัยได้ ดังนี้

1. ผลการเปรียบเทียบทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย หลังการใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติสูงกว่าแบบไม่ใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 อาจเป็นผลมาจากวิธีการสอนโดยใช้การแสดงบทบาทสมมติ เป็นการสอนที่ผู้สอนสร้างสถานการณ์และบทบาทสมมติขึ้นมาที่ใกล้เคียงกับความเป็นจริง โดยให้ผู้เรียนเป็นผู้แสดงบทบาทสมมตินั้น ๆ ตามวัตถุประสงค์ที่ผู้สอนได้กำหนดไว้เพื่อให้ผู้เรียนได้แสดงออกทางด้านความรู้ ความคิดที่คิดว่าตนควรจะเป็น ซึ่งสอดคล้องกับแนวคิดของ ทิศนา แขมณี (2550) ได้อธิบายไว้ว่า กระบวนการที่ผู้สอนใช้ในการช่วยให้ผู้เรียนเกิดการเรียนรู้ตามวัตถุประสงค์ที่กำหนด โดยการให้ผู้เรียนสวมบทบาทในสถานการณ์ซึ่งมีความใกล้เคียงกับความเป็นจริง และแสดงออกตามความรู้สึกนึกคิดของตน

2. ความพึงพอใจในการพัฒนาทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยใช้วิธีการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 โดยภาพรวมอยู่ในระดับมาก ($\bar{X}$= 4.42, S.D. = 0.45) และเมื่อพิจารณาเป็นรายด้าน พบว่า ด้านที่มีค่าเฉลี่ยมากที่สุด คือ ด้านบทบาทของผู้เรียน ($\bar{X}$= 4.65, S.D. = 0.46) รองลงมา คือ ด้านการจัดการเรียนรู้ ($\bar{X}$= 4.48, S.D. = 0.59) ด้านบทบาทผู้สอน ($\bar{X}$= 4.45, S.D. = 0.49) และด้านการวัดและประเมินผล ($\bar{X}$= 4.32, S.D. = 0.65) ตามลำดับ ทั้งนี้ เนื่องจากผู้วิจัยได้จัดการเรียนรู้โดยยึดนักเรียนเป็นศูนย์กลาง ทำให้นักเรียนได้มีโอกาสแสดงออกในสถานการณ์บทบาทสมมติ นักเรียนมีโอกาสได้แสดงความคิดเห็น โดยใช้ทักษะการวิเคราะห์ส่งผลให้มีการกระตือรือร้นต่อการเรียน สามารถทำงานร่วมกับผู้อื่นได้ ซึ่งสอดคล้องกับอุทัยพรรณ สุดใจ (2545) ได้กล่าวถึงความพึงพอใจว่า เป็นความรู้สึกรัก ชอบ ยินดี เต็มใจหรือมีเจตคติที่ดีของบุคคลต่อสิ่งใดสิ่งหนึ่ง ความพอใจจะเกิดเมื่อได้การตอบสนองความต้องการ ด้านวัตถุ และด้านจิตใจ ความพึงพอใจเป็นเรื่องเกี่ยวกับอารมณ์ ความรู้สึกทัศนคติของบุคคล อันเนื่องมาจากสิ่งเร้าและสิ่งจูงใจ โดยอาจเป็นไปในเชิงประเมินค่าว่าความรู้สึกหรือทัศนคติต่อสิ่งเหล่านั้นเป็นไปในทิศทางลบหรือบวก

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

การเปรียบเทียบทักษะการแก้ปัญหา เรื่อง การใช้อินเทอร์เน็ตอย่างปลอดภัย โดยการจัดการเรียนรู้แบบการแสดงบทบาทสมมติ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 ผู้วิจัยขอเสนอแนะแนวทางในการนำผลการวิจัยไปใช้ต่อไป ดังนี้

1. ครูผู้สอนรายวิชาเทคโนโลยีวิทยาการคำนวณสามารถนำผลการวิจัยครั้งนี้ไปใช้เป็นแนวทางในการจัดการเรียนรู้รายวิชาวิทยาการคำนวณโดยนำเอาการจัดการเรียนรู้ โดยใช้การจัดการเรียนรู้แบบการแสดงบทบาทสมมติ เพื่อพัฒนาทักษะการแก้ปัญหากับผู้เรียนในระดับชั้นต่าง ๆ ได้

2. ครูผู้สอนควรกระตุ้นให้นักเรียนได้ฝึกการแสดงออกและฝึกทักษะการแก้ปัญหาด้วยตนเองก่อน โดยครูผู้สอนทำหน้าที่เป็นเพียงผู้ชี้แนะหรือให้คำปรึกษาเพื่อเปิดโอกาสให้นักเรียนเกิดความมั่นใจในการทำกิจกรรมและกล้าแสดงความคิดเห็นของตนแก่สมาชิกในกลุ่ม

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรนำรูปแบบการจัดการเรียนรู้โดยการแสดงบทบาทสมมติ ที่ผู้วิจัยจัดทำขึ้นไปใช้กับนักเรียนโรงเรียนอื่น ๆ เพื่อศึกษาเปรียบเทียบทักษะการแก้ปัญหาของนักเรียน

2. ควรทำวิจัยเกี่ยวกับการจัดการเรียนรู้การแสดงบทบาทสมมติกับรายวิชาอื่น ๆ หรือระดับชั้นอื่น ๆ เพื่อศึกษาทักษะการแก้ปัญหาของนักเรียน

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การพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกต โดยวิธีการจัดการเรียนรู้แบบโครงการ ของนักเรียนชั้นอนุบาล 1

Development of Scientific Basic Skills in Observation by Using the Project Approach of Learning Management of Kindergarten Students 1

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บทคัดย่อ

การวิจัยครั้งนี้มีจุดประสงค์ เพื่อเปรียบเทียบทักษะพื้นฐานทางวิทยาศาสตร์ โดยวิธีการจัดการเรียนรู้แบบโครงการของนักเรียนระดับชั้นอนุบาล 1 กับเกณฑ์ร้อยละ 70 ประชากรที่ใช้ในการวิจัยครั้งนี้ คือ นักเรียนชั้นอนุบาลปีที่ 1 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนบ้านหนองคล้า จังหวัดตรัง จำนวน 18 คน เครื่องมือที่ใช้ในการวิจัยได้แก่ 1) แผนการพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกต โดยการจัดการเรียนรู้แบบโครงการ 2) แบบประเมินทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกต ผลการวิจัยพบว่า 1) ผลการเปรียบเทียบคะแนนเฉลี่ยผลสัมฤทธิ์ทางการทดสอบวัดการสังเกตกับเกณฑ์สำหรับนักเรียนชั้นอนุบาล 1 มีค่าคะแนนเฉลี่ยเท่ากับ 8.06 ซึ่งสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 2) การประเมินพฤติกรรม การพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต ของนักเรียนชั้นอนุบาล 1 มีค่าเฉลี่ยเท่ากับ 2.68 ซึ่งมีทักษะด้านการสังเกตมาก

คำสำคัญ: การจัดการเรียนรู้แบบโครงการ, ทักษะพื้นฐานทางวิทยาศาสตร์

Abstract

The purpose of this research was to compare science basic skills by using the project approach of learning management of kindergarten students 1 with the 70 percent criteria. The population is 18 students in Kindergarten Year 1, Semester 2, Academic Year 2023, Ban Nong Kla School, Trang Province. The tools used in the research are: 1) a plan to develop of scientific basic skills in observation by organizing project approach and 2) an assessment form for basic scientific skills in observation. The results of the research found that 1) the average achievement scores in the observation test with the criteria for

kindergarten 1 students had an average score of 8.06, which is higher than the 70 percent threshold with statistical significance at the .05 level. 2) Behavioral assessment Development of scientific basic skills in terms of observation, the students in kindergarten 1 had an average of 2.68, which has very good observation skills.

Keywords: Project Approach**,** Science Basic Skills

บทนำ

ในปัจจุบันนี้สภาพแวดล้อมของสังคมมีการเปลี่ยนแปลงไปอย่างมาก และการเปลี่ยนแปลงดังกล่าวเป็นผลมาจากความสามารถทางสติปัญญาของมนุษย์ ทำให้วิทยาการทางด้านวิทยาศาสตร์และเทคโนโลยีเจริญก้าวหน้ามากขึ้น สร้างความสะดวกสบายให้กับมนุษย์และในขณะเดียวกันผู้ที่ใช้บริการทางวิทยาศาสตร์และเทคโนโลยีควรมีความสามารถในการคิด รู้จักหาแนวทางในการแสวงหาความรู้ มีความรู้เท่าทันการเปลี่ยนแปลง รู้จักเลือกรับปรับเปลี่ยนสิ่งต่าง ๆ ให้เหมาะสมและแก้ไขปัญหาได้ด้วยตนเอง โดยเฉพาะปัญหาที่เกี่ยวข้องกับชีวิตประจำวัน ซึ่งคุณลักษณะต่าง ๆ ดังกล่าว ควรได้รับการฝึกฝนตั้งแต่เด็กปฐมวัย ซึ่งเป็นที่ยอมรับกันแล้วว่าเป็นวัยแห่งการวางรากฐานของการพัฒนาในทุก ๆ ด้าน ไม่ว่าจะเป็นทางด้านร่างกาย อารมณ์ สังคมหรือสติปัญญา โดยให้ความสำคัญในด้านการพัฒนาความคิดและกำลังคนด้านวิทยาศาสตร์และเทคโนโลยี โดยให้ปรับระบบการศึกษาเพื่อเสริมสร้างพื้นฐานด้านวิทยาศาสตร์เริ่มตั้งแต่ปฐมวัยจนถึงระดับอุดมศึกษาให้ผู้เรียนรู้จักวิเคราะห์และแก้ปัญหาอย่างมีระบบ หลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 (ฉบับปรับปรุง พุทธศักราช 2560) จึงมุ่งพัฒนาผู้เรียนทุกคนซึ่งเป็นกำลังของชาติให้เป็นมนุษย์ที่มีความสมดุลทั้งด้านร่างกาย ความรู้ คุณธรรม มีจิตสำนึก ในความเป็นพลเมืองไทยและเป็นพลเมืองโลก ยึดมั่นในการปกครองตามระบอบประชาธิปไตยอันมีพระมหากษัตริย์ทรงเป็นประมุข มีความรู้และทักษะพื้นฐานรวมทั้งเจตคติที่จำเป็นต่อการศึกษาต่อการประกอบอาชีพ และการศึกษาตลอดชีวิต โดยมุ่งเน้นผู้เรียนเป็นสำคัญบนพื้นฐานความเชื่อว่าทุกคนสามารถเรียนรู้และพัฒนาตนเองได้เต็มศักยภาพ (กระทรวงศึกษาธิการ, 2551)

ปรัชญาการศึกษาปฐมวัยได้ระบุว่า การศึกษาปฐมวัยเป็นการพัฒนาเด็กตั้งแต่แรกเกิดถึง 6 ปีบริบูรณ์ โดยเป็นองค์รวมบนพื้นฐานการอบรมเลี้ยงดูและการส่งเสริมกระบวนการเรียนรู้ที่สนองต่อธรรมชาติและพัฒนาการตามวัยของเด็กแต่ละคนให้เต็มตามศักยภาพ ภายใต้บริบทสังคมและวัฒนธรรมที่เด็กอาศัยอยู่ด้วยความรักความเอื้ออาทรและความเข้าใจของทุกคนเพื่อสร้างรากฐานคุณภาพชีวิตให้เด็กพัฒนาไปสู่ความเป็นมนุษย์ที่สมบูรณ์ เกิดคุณค่าต่อตนเอง ครอบครัว ชุมชน สังคม และประเทศชาติ (กระทรวงศึกษาธิการ, 2560) จากการจัดการเรียนรู้พบว่า เด็กนักเรียนชั้นอนุบาล 1 ยังขาดทักษะในด้านการสังเกต ดังนั้นจึงมีความจำเป็นยิ่งที่จะมีการจัดประสบการณ์การเรียนรู้ทางวิทยาศาสตร์ด้านทักษะการสังเกตตั้งแต่ระดับปฐมวัย ซึ่งเป็นช่วงอายุที่มีความสามารถในการเรียนรู้และจดจำมากที่สุด มีความอยากรู้อยากเห็นและมีความกระตือรือร้น อันเป็นกุญแจหลักที่จะเปิดประตูสู่วิทยาศาสตร์และเทคโนโลยี การจัดกิจกรรมแบบโครงการเป็นการจัดกิจกรรมการเรียนการสอนที่มุ่งเน้นให้เด็กมีส่วนร่วมและกระตุ้นให้เด็กเรียนรู้ด้วยตัวเอง พร้อมเปิดโอกาสให้เด็กเรียนรู้ในสิ่งที่เด็กสนใจเกี่ยวกับสิ่งแวดล้อมรอบ ๆ ตัวเด็ก และตอบสนองตามความต้องการที่หลากหลายของเด็ก ๆ โดยการทำกิจกรรมเชิงปฏิบัติที่เน้นให้เด็กลงมือทำได้ด้วยตัวเอง การสอนแบบโครงการนี้ถือเป็นเครื่องมือการสอนที่ดีอย่างยิ่งสำหรับคุณครู เพราะจะแสดงให้เห็นถึงสิ่งต่าง ๆ ตั้งแต่แนวคิดในเรื่องแห่งความเป็นจริง การตั้งคำถามจากความสนใจที่แท้จริง และการ

ค้นหาคำตอบในเชิงลึกของเด็กแล้ว ยังส่งเสริมทักษะและกระบวนการทางวิทยาศาสตร์ผ่านการสำรวจ การสืบค้น การจดบันทึก และการคิดวิเคราะห์ เพื่อให้ได้ข้อมูลและความรู้ต่าง ๆ ตามเรื่องที่เด็กสนใจ ผ่านประสบการณ์ตรงที่หลากหลายที่จะช่วยส่งเสริมทักษะทางด้านการสังเกตและการเรียนรู้ของเด็กได้อย่างเหมาะสม (ขนิษฐา บุนนาค, 2562) คุณครูผู้สอนจะต้องรู้จักปรับปรุงพัฒนา เทคนิคการสอน และเทคนิคการจัดกิจกรรมต่าง ๆ ให้มีความเหมาะสมกับเด็กในแต่ละช่วงวัยเพื่อให้เด็กได้รับประสบการณ์ การเรียนรู้กระบวนการทางวิทยาศาสตร์จึงมีบทบาทสำคัญยิ่งในสังคมโลกปัจจุบันและอนาคต เพราะวิทยาศาสตร์เกี่ยวข้องกับชีวิตของทุกคน ทั้งในการดำรงชีวิตประจำวันและในงานอาชีพต่าง ๆ เครื่องมือเครื่องใช้ เพื่ออำนวยความสะดวกในชีวิตและในการทำงาน ล้วนเป็นผลของความรู้วิทยาศาสตร์ผสมผสานกับความคิดสร้างสรรค์และศาสตร์อื่น ๆ

ดังนั้นผู้วิจัยจึงมีความสนใจศึกษาการพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกตของนักเรียนชั้นอนุบาล 1 โดยวิธีการจัดการเรียนรู้แบบโครงการเพื่อเป็นแนวทางให้ครูปฐมวัยและผู้ที่เกี่ยวข้องในการส่งเสริมทักษะทางวิทยาศาสตร์ของนักเรียนชั้นอนุบาล 1 ได้นำแนวทางไปใช้ให้เกิดประโยชน์ต่อนักเรียนชั้นอนุบาล 1 ต่อไป

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบทักษะพื้นฐานทางวิทยาศาสตร์ โดยวิธีการจัดการเรียนรู้แบบโครงการของนักเรียนระดับชั้นอนุบาล 1 กับเกณฑ์ร้อยละ 70

แนวคิด ทฤษฎี กรอบแนวคิด

วัฒนา มัคคสมัน (2539) กล่าวว่า การจัดการเรียนรู้แบบโครงการ หมายถึง รูปแบบการสอนที่ให้ความสำคัญกับความสนใจและความต้องการของเด็ก โดยเด็กจะเป็นผู้มีบทบาทในการเลือกหัวข้อเรื่องที่จะเรียน เลือกวิธีการที่จะศึกษาหาความรู้ด้วยตนเอง โดยมีครูเป็นผู้ชี้แนะแนวทาง และยอมรับความคิดเห็นของเด็ก แสดงให้เด็กเห็นว่าครูให้ความสนใจ ให้โอกาสเด็กได้เรียนรู้ตามความสนใจ ตามความคิดของตนเอง และวิธีการของตนเอง

จิรภรณ์ วสุวัต (2540) กล่าวว่า การจัดการเรียนรู้แบบโครงการ หมายถึง วิธีการสอนที่ส่งเสริมและสนับสนุนให้เด็กได้มีการศึกษาค้นคว้าอย่างลึกซึ้ง ในหัวข้อที่ตนเองสนใจด้วยการบูรณาการวิชาต่างสาขาเข้าด้วยกัน วิธีการนี้จึงเป็นการส่งเสริมการเรียนรู้อย่างมีความหมาย เน้นการให้ความร่วมมือกันของเด็ก ๆ ช่วยเหลือซึ่งกันและกัน

การจัดการเรียนรู้แบบโครงการ

การจัดการเรียนรู้แบบโครงการ เป็นการศึกษาอย่างลุ่มลึกในเรื่องที่เด็กสนใจ การสืบค้นเป็นกระบวนการที่เด็กใช้ระหว่างการศึกษาเพื่อหาคำตอบ ระยะเวลาการทำโครงการขึ้นอยู่กับความยากง่ายของเนื้อหาอาจจะเพียงสัปดาห์เดียว บางโครงการอาจใช้เวลา 3 - 4 สัปดาห์ มีขั้นตอนและกระบวนการเรียนรู้ดังนี้

1. ขั้นกระตุ้นความสนใจ เป็นขั้นการอธิบายเบื้องต้น ระหว่างครูกับเด็กในการแลกเปลี่ยนความคิดเห็นเกี่ยวกับการกำหนดหัวข้อเรื่อง ระยะเวลาที่ใช้ในการจัดโครงการ และรายละเอียดของโครงการ

2. ขั้นการกำหนดวัตถุประสงค์โครงการ เป็นขั้นที่ให้เด็กกำหนดว่าสิ่งที่ต้องการเรียนรู้ มีอะไรบ้างและจะศึกษาอย่างไร

3. ขั้นฝึกทักษะที่จำเป็นต้องใช้กับโครงการที่ต้องการทักษะการดำเนินการที่ต้องมีการฝึกทักษะเหล่านั้นก่อน เช่น การสัมภาษณ์

4. ขั้นเตรียมวัสดุอุปกรณ์ เป็นขั้นที่เด็กกำหนดแผน และจัดหาอุปกรณ์ที่ต้องใช้ในโครงการ

5. ขั้นกิจกรรมกลุ่ม หมายถึง การทำงานกลุ่มในกิจกรรมโครงการ

6. ขั้นเก็บรวบรวมข้อมูล เป็นการออกนอกสถานที่สืบค้นข้อมูล

7. ขั้นสรุปผลการดำเนินการ เป็นการนำข้อมูลที่ได้เรียนรู้มาเรียบเรียงเป็นเรื่องราวแล้วนำเสนอผลการเรียนรู้

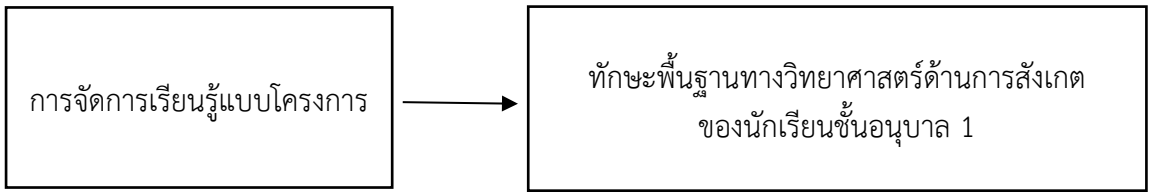
8. ขั้นเสนอผลโครงการ ส่วนใหญ่จะเป็นการนำเสนอด้วยการจัดแสดงนิทรรศการ (กุลยา ตันติผลาชีวะ, 2551)

งานวิจัยที่เกี่ยวข้อง

ชนิดาภา กุลสุวรรณ์ (2558) ได้ศึกษาทักษะพื้นฐานทางวิทยาศาสตร์ และพฤติกรรมการเรียนรู้วิทยาศาสตร์ของเด็กปฐมวัยที่ได้รับการจัดประสบการณ์การเรียนรู้แบบโครงการของเด็กปฐมวัยชั้นเตรียมอนุบาล 2/2 ศูนย์พัฒนาเด็กเล็ก จังหวัดมหาสารคาม พบว่า เด็กปฐมวัยที่ได้รับการจัดประสบการณ์การเรียนรู้แบบโครงการมีคะแนนเฉลี่ยกระบวนการทักษะพื้นฐานทางวิทยาศาสตร์หลังเรียนสูงขึ้นกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

นันทิยา ชัยชนะเลิศ (2561) ได้ศึกษาผลการจัดประสบการณ์แบบโครงการ เพื่อพัฒนาทักษะกระบวนการพื้นฐานทางวิทยาศาสตร์ของเด็กปฐมวัย ชั้นอนุบาล 3 โรงเรียนบ้านรวมมิตร พบว่า ทักษะกระบวนการทางวิทยาศาสตร์ของเด็กปฐมวัย ชั้นอนุบาล 3 ที่ได้รับการจัดประสบการณ์แบบโครงการในภาพรวมหลังจากจัดประสบการณ์สูงกว่าก่อนการจัดประสบการณ์

Safaruddin (2020) ได้ศึกษาผลของการจัดการเรียนรู้แบบโครงการ (Project Based Learning) โดยมีสื่ออิเล็กทรอนิกส์ช่วยในการเพิ่มแรงจูงใจในการเรียนรู้และทักษะกระบวนการทางวิทยาศาสตร์ (Science Process Skills) โดยมีการทดสอบกับนักเรียน จำนวน 59 คน กลุ่มทดลองใช้การจัดการเรียนรู้แบบ PBL และกลุ่มควบคุมใช้การจัดการเรียนรู้แบบปกติทั่วไป ผลลัพธ์พบว่า คะแนนเฉลี่ยของการจัดการเรียนรู้แบบ PBL เท่ากับ 86.33 และคะแนนเฉลี่ยของการจัดการเรียนรู้แบบปกติ เท่ากับ 74.52 สรุปได้ว่าการจัดการเรียนรู้แบบ PBL โดยมีสื่ออิเล็กทรอนิกส์ช่วยเพิ่มแรงจูงใจในการเรียนรู้และมีอิทธิพลต่อการเรียนรู้ของนักเรียนสูงกว่าการจัดการเรียนรู้แบบปกติ



ภาพที่ 1 กรอบแนวคิดในการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

นักเรียนชั้นอนุบาลปีที่ 1 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนบ้านหนองคล้า สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษาตรัง เขต 2 อำเภอวังวิเศษ จังหวัดตรัง จำนวน 1 ห้อง ทั้งหมด 18 คน

เครื่องมือที่ใช้ในการวิจัย

1. แผนการพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต โดยการจัดการเรียนรู้แบบโครงการ จำนวน 1 แผน 5 ชั่วโมง

2. แบบประเมินทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต

การสร้างและการหาคุณภาพของเครื่องมือ

1. การสร้างแผนการพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต โดยการจัดการเรียนรู้แบบโครงการ

1.1 ศึกษาหลักสูตรและคู่มือหลักสูตรการศึกษาปฐมวัย พุทธศักราช 2560 และงานวิจัยที่เกี่ยวข้องกับโครงการทางวิทยาศาสตร์

1.2 ศึกษาวิเคราะห์หลักการและแนวคิดจากเอกสารเกี่ยวกับแผนการจัดกิจกรรมการเรียนการสอนวิทยาศาสตร์

1.3 สร้างแผนการจัดกิจกรรมการเรียนการสอน โดยวิธีการจัดการเรียนรู้แบบโครงการเพื่อพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต จำนวน 1 แผน 5 ชั่วโมง

1.4 นำแผนการจัดกิจกรรมเสนอต่ออาจารย์ที่ปรึกษาแล้วนำไปปรับปรุงแก้ไขตามข้อเสนอแนะของอาจารย์ที่ปรึกษา

2. แบบประเมินทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต มีขั้นตอนการสร้างดังต่อไปนี้

2.1 ศึกษาหลักการและทฤษฎีเกี่ยวกับการมีทักษะด้านการสังเกตและการมีทักษะด้านการสังเกตของนักเรียนชั้นอนุบาล 1 เพื่อเป็นแนวทางในการสร้างแบบประเมินทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกต

2.2 สร้างแบบประเมินทักษะพื้นฐานทางวิทยาศาสตร์ด้านการสังเกตของเด็กปฐมวัย ซึ่งเป็นแบบมาตรส่วนประมาณค่า 3 ระดับ ตามวิธีของกระทรวงศึกษาธิการ (2553) จำนวน 6 ข้อ โดยใช้เกณฑ์การให้คะแนนดังนี้

เมื่อปฏิบัติได้	ให้	3	คะแนน
เมื่อปฏิบัติได้บางครั้ง	ให้	2	คะแนน
เมื่อควรเสริม	ให้	1	คะแนน

2.3 แปลความหมายของคะแนน โดยปรับปรุงการแปลความหมายแบบมาตราส่วนประมาณค่า (Rating Scales) ที่กระทรวงศึกษาธิการ (2553) อธิบายไว้มาใช้ ดังนี้

ค่าเฉลี่ย	2.51 – 3.00	หมายถึง มีพฤติกรรมการมีทักษะด้านการสังเกตมาก
ค่าเฉลี่ย	1.51 – 2.50	หมายถึง มีพฤติกรรมการมีทักษะด้านการสังเกตปานกลาง
ค่าเฉลี่ย	1.00 – 1.50	หมายถึง มีพฤติกรรมการมีทักษะด้านการสังเกตน้อย

2.4 นำแบบสังเกตพฤติกรรมการมีทักษะด้านการสังเกตของนักเรียนชั้นอนุบาล 1 ที่สร้างขึ้นเสนอต่ออาจารย์ที่ปรึกษาเพื่อพิจารณาตรวจสอบความถูกต้อง ความเที่ยงตรงเชิงเนื้อหาความเหมาะสมด้านเนื้อหาด้านภาษาและปรับปรุงตามข้อเสนอแนะ

2.5 นำแบบสังเกตพฤติกรรมการมีทักษะด้านการสังเกตของนักเรียนชั้นอนุบาล 1 ที่สร้างขึ้นเสนออาจารย์ที่ปรึกษาเพื่อพิจารณาตรวจสอบคุณภาพด้านความเที่ยงตรงความเหมาะสมของภาษาโดยพิจารณาประเมินความสอดคล้องระหว่างข้อคำถามกับพฤติกรรมชี้วัดด้านทักษะการสังเกต และหาคุณภาพของเครื่องมือโดยการตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67-1.00

2.6 จัดทำฉบับจริงเพื่อนำไปใช้

การเก็บรวบรวมข้อมูล

ผู้วิจัยดำเนินการทดลองและเก็บรวบรวมข้อมูลกับกลุ่มเป้าหมายตนเอง โดยดำเนินการตามลำดับขั้นตอน ดังต่อไปนี้

1. ก่อนการทดลองผู้วิจัยได้ทำการชี้แจงขั้นตอนในการเรียนและการปฏิบัติ กิจกรรมการเรียนให้เด็กนักเรียนเข้าใจ

2. สังเกตและประเมินพฤติกรรมการมีทักษะการสังเกตของกลุ่มตัวอย่างขณะทำกิจกรรมโดยวิธีการจัดการเรียนรู้แบบโครงการ ในสัปดาห์ก่อนการทดลอง จำนวน 1 กิจกรรม โดยใช้แบบทดสอบที่ผู้วิจัยสร้างขึ้นโดยผู้สังเกตเป็นผู้วิจัย

3. ดำเนินการฝึกโดยใช้กิจกรรมโดยวิธีการจัดการเรียนรู้แบบโครงการ เพื่อพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต จำนวน 1 สัปดาห์ สัปดาห์ละ 5 วัน วันละ 1 ครั้ง ครั้งละ 1 ชั่วโมง ตั้งแต่วันที่ 12 กุมภาพันธ์ พ.ศ. 2567 ถึงวันที่ 16 กุมภาพันธ์ พ.ศ. 2567

4. ตรวจแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนและแบบประเมินเพื่อวัดการพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกต โดยใช้กิจกรรมวิธีการจัดการเรียนรู้แบบโครงการ แล้วนำคะแนนที่ได้มาวิเคราะห์เปรียบเทียบกับเกณฑ์

5. วิเคราะห์ข้อมูลและสรุปผล

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

1. ร้อยละ (Percentage)
2. ค่าเฉลี่ย (Mean)
3. ส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation)
4. การทดสอบสมมติฐานทางสถิติ (t-test)

ผลการวิเคราะห์ข้อมูล

ตารางที่ 1 แสดงผลการเปรียบเทียบคะแนนเฉลี่ยผลสัมฤทธิ์ทางการทดสอบวัดการสังเกตกับเกณฑ์สำหรับนักเรียนชั้นอนุบาล 1

หัวข้อ	เกณฑ์	$\bar{x}$	S.D.	t	P-value
คะแนนเฉลี่ยผลสัมฤทธิ์ทางการเรียน	7	8.06	1.626	2.754	0.007*

จากตารางที่ 1 พบว่า นักเรียนที่ใช้การทดสอบวัดด้านการสังเกต มีคะแนนเฉลี่ยผลสัมฤทธิ์ทางการเรียนของนักเรียนเท่ากับ 8.06 ซึ่งสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05

ตารางที่ 2 แสดงผลเกณฑ์การประเมินพฤติกรรม การพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกตของนักเรียนชั้นอนุบาล 1

รายการประเมิน	$\bar{X}$	S.D.	แปลความ
การสังเกตลักษณะต่าง ๆ โดยใช้ประสาทสัมผัสทั้ง 5 โดยไม่ต้องบอกปริมาณ เช่น บอก สี กลิ่น รส เสียง และความรู้สึกต่อผิวกาย	2.72	0.57	มีทักษะด้านการสังเกตมาก
ความสามารถในการแสดงหรือบอกคุณลักษณะของวัตถุได้	2.67	0.59	มีทักษะด้านการสังเกตมาก
การรับรู้ข้อมูล รายละเอียดของสิ่งเหล่านั้นโดยปราศจากความคิดเห็นส่วนตน	2.44	0.78	มีทักษะด้านการสังเกตปานกลาง
การสังเกตโดยการคาดคะเน การกะ หรือการประมาณได้	2.67	0.59	มีทักษะด้านการสังเกตมาก
การสังเกตวัตถุหรือสถานการณ์ ในขณะที่เกิดการเปลี่ยนแปลง	2.83	0.51	มีทักษะด้านการสังเกตมาก
ความสามารถในการบอกลักษณะการเปลี่ยนแปลงของวัตถุได้	2.78	0.54	มีทักษะด้านการสังเกตมาก
ภาพรวม	**2.68**	**0.60**	**มีทักษะด้านการสังเกตมาก**

จากตารางที่ 2 พบว่า การประเมินพฤติกรรม การพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกตของนักเรียน ชั้นอนุบาล 1 ภาพรวมมีค่าคะแนนเฉลี่ยเท่ากับ 2.68 ภาพรวมส่วนเบี่ยงเบนมาตรฐานคะแนนเฉลี่ยเท่ากับ 0.60 มีทักษะด้านการสังเกตมาก

สรุปผลการวิจัย

จากผลการวิจัย พบว่า

1. ผลการเปรียบเทียบคะแนนเฉลี่ยผลสัมฤทธิ์ทางการทดสอบวัดการสังเกตกับเกณฑ์ สำหรับนักเรียนชั้นอนุบาล 1 เท่ากับ 8.06 ซึ่งสูงกว่าเกณฑ์ อย่างมีนัยสำคัญทางสถิติที่ระดับ .05
2. การประเมินพฤติกรรม การพัฒนาทักษะพื้นฐานทางวิทยาศาสตร์ ด้านการสังเกตของนักเรียนชั้นอนุบาล 1 มีค่าเฉลี่ยโดยรวม เท่ากับ 2.68 ซึ่งมีทักษะด้านการสังเกตมาก

การอภิปรายผล

ผลการเปรียบเทียบผลสัมฤทธิ์ทางการทดสอบด้านการสังเกตของนักเรียนชั้นอนุบาล 1 มีคะแนนเฉลี่ย 8.06 ซึ่งสูงกว่าเกณฑ์อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ที่ผลเป็นเช่นนี้ เพราะการจัดการเรียนรู้แบบโครงการส่งเสริมให้นักเรียนได้เรียนรู้จากการปฏิบัติจริง นักเรียนได้รับความรู้และเข้าใจและมีทักษะพื้นฐานทางวิทยาศาสตร์ ซึ่งทำให้นักเรียนมีส่วนร่วมในการจัดการเรียนการสอนมากยิ่งขึ้น ซึ่งสอดคล้องกับงานวิจัย ชนิดาภา กุลสุวรรณ์ (2558) ได้ศึกษาทักษะพื้นฐานทางวิทยาศาสตร์และพฤติกรรมการเรียนรู้

วิทยาศาสตร์ของเด็กปฐมวัยที่ได้รับการจัดประสบการณ์การเรียนรู้แบบโครงการ ของเด็กปฐมวัยชั้นเตรียมอนุบาล 2/2 ศูนย์พัฒนาเด็กเล็ก จังหวัดมหาสารคาม พบว่า เด็กปฐมวัยที่ได้รับการจัดประสบการณ์การเรียนรู้แบบโครงการมีคะแนนเฉลี่ยกระบวนการทักษะพื้นฐานทางวิทยาศาสตร์หลังเรียนสูงขึ้นกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. ในการจัดการเรียนรู้แบบโครงการ ครูจะต้องศึกษาแนวคิด หลักการ รูปแบบ และสาระสำคัญของรูปแบบการสอนแบบโครงการ ตลอดจนศึกษาขั้นตอน และกระบวนการจัดการเรียนการสอนให้เข้าใจ

2. ระยะเวลาการทำโครงการแต่ละโครงการต้องยืดหยุ่นตามความเหมาะสมของโรงเรียน

3. การจัดสภาพแวดล้อมควรจัดให้เหมาะสม ทั้งสิ่งแวดล้อมการเรียนรู้นอกชั้นเรียนและในชั้นเรียน

4. ครูจะต้องเป็นผู้ที่ใช้คำถามกระตุ้นให้เด็กคิด คอยช่วยเหลือ และเรียนรู้ร่วมกันไปพร้อมกับเด็ก

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรนำสื่อเกมใช้ในการสอนร่วมกับการจัดการเรียนรู้แบบโครงการ เพื่อให้การจัดการเรียนการสอนน่าสนใจยิ่งขึ้น

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การพัฒนาผลสัมฤทธิ์การเขียนคำควบกล้ำที่มักเขียนผิด โดยใช้แบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5

Developing Writing Achievement Diphthongs that are Often Misspelled Using Student Exercises Grade 5

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อสร้างแบบฝึกทักษะ เรื่อง คำควบกล้ำสำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 2) เพื่อเปรียบเทียบผลการเขียนคำควบกล้ำก่อนและหลังเรียนโดยใช้แบบฝึกทักษะ 3) เพื่อศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีต่อการเรียนโดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ กลุ่มตัวอย่างที่วิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 5 โรงเรียนชุมชนบ้านนากัน จำนวน 1 ห้อง นักเรียน 20 คน ศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีผลต่อการจัดการเรียนรู้โดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบฝึกทักษะเรื่องคำควบกล้ำ แผนการจัดการเรียนรู้ แบบทดสอบวัดผลการเรียน และแบบสอบความพึงพอใจของนักเรียน ใช้สถิติในการวิเคราะห์ข้อมูล ได้แก่ ค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัยพบว่า แบบฝึกทักษะ เรื่อง คำควบกล้ำมีผลการเรียนหลังการเรียนรู้โดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ สูงกว่าก่อนการจัดการเรียนรู้โดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ และความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีผลต่อการจัดการเรียนรู้โดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ มีค่าเฉลี่ยมากที่สุด ($\bar{X}$=4.34, S.D.=0.61)

คำสำคัญ: แบบฝึกทักษะ, คำควบกล้ำ

Abstract

The objectives of this research are 1) To create skill training on diphthongs for grade 5 students 2) To compare the results of writing diphthongs before and after studying using skill training. 3) To study the satisfaction of grade 5 students towards learning using skill training About diphthong. The research sample was 5th grade students at Ban Na Kan Community School, 1 room, 20 students. The satisfaction of 5th grade students was

studied in relation to learning management by using skill exercises. About diphthongs The tools used in the research were practice exercises on diphthongs. Learning management plan Academic performance test and student satisfaction test Use statistics to analyze data, including mean and standard deviation.

The results of the research found that the skill training. The subject of diphthongs has academic results after learning using skill exercises. About diphthongs which is higher than before organizing learning using skills training About diphthongs and the satisfaction of Grade 5 students with the effect on learning management using skill exercises on diphthongs has the highest mean ($\bar{X}$=4.34, S.D.=0.61).

Keywords: Skill Practice, Diphthongs

บทนำ

การเขียน เป็นทักษะของการสื่อสารอย่างหนึ่งที่มีความสำคัญในการถ่ายทอดความรู้สึก ความนึกคิดความรู้ ความสามารถและประสบการณ์ประสบการณ์ต่าง ๆ ที่เป็นลายลักษณ์อักษร เพื่อให้ผู้อ่านรับรู้ถึงจุดมุ่งหมายและเจตนาของผู้เขียน จึงจำเป็นอย่างยิ่งที่ผู้เขียนต้องเรียบเรียงเนื้อหาให้เป็นระบบ เพื่อการสื่อสารออกมาได้อย่างมีประสิทธิภาพและเกิดผลสัมฤทธิ์ ดังนั้นการจัดลำดับความคิด ด้วยการเขียนสะกดคำให้ถูกต้องความสามารถในการใช้ภาษา โดยมีความชัดเจนและถูกต้องตามหลักภาษาใช้ภาษาเพื่อสื่อสารให้ผู้อ่านนั้น สามารถเข้าใจได้อย่างถูกต้องและชัดเจน

วิชาภาษาไทยเป็นวิชาที่สำคัญและเป็นวิชาที่เป็นพื้นฐานในการเรียนรู้ในทุกวิชา ซึ่งในกระทรวงศึกษาธิการ (2551) หลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 ได้กำหนดสาระการเรียนรู้ในกลุ่มสาระการเรียนรู้ภาษาไทยทั้ง 5 สาระ ได้แก่ การอ่าน การเขียน การฟัง การดู และการพูด หลักการใช้ภาษาไทย วรรณคดี และวรรณกรรม โดยจะมุ่งเน้นให้นักเรียนมีการพัฒนาศักยภาพของตัวเองในแต่ละด้าน ให้มีความสัมพันธ์และมีการเชื่อมโยงกันในแต่ละด้านเพื่อเป็นทักษะสำคัญในการพัฒนาตนเองได้อย่างเหมาะสม เนื่องจากทักษะภาษาไทยประกอบด้วยการฟัง การพูด การอ่าน และการเขียนที่นักเรียนต้องมีการฝึกฝนเพื่อใช้ภาษาไทยในการสื่อสารได้อย่างถูกต้อง โดยเฉพาะการเขียนสะกดคำซึ่งเป็นส่วนหนึ่งของการใช้ภาษาไทย ซึ่งสอดคล้องกับความคิดเห็นของ ดุสิตา แดงประเสริฐ (2549) ที่กล่าวไว้ว่าเด็กไทยทุกคนควรเรียนรู้และใช้ภาษาไทยได้อย่างถูกต้องทุกโอกาส ซึ่งการเรียนการสอนภาษาไทยเป็นทักษะที่ต้องฝึกฝนจนเกิดความชำนาญ ในการใช้ภาษาเพื่อการสื่อสารการอ่านและการฟังเป็นทักษะของการรับรู้เรื่องราว ความรู้ ประสบการณ์ ส่วนการพูดและการเขียนเป็นทักษะของการแสดงออกด้วยการแสดงความคิดเห็น ความรู้และประสบการณ์ การเรียนภาษาไทยจึงต้องเรียนเพื่อการสื่อสาร ให้สามารถรับรู้ข้อมูลข่าวสารได้อย่างพินิจพิเคราะห์ สามารถนำความรู้ ความคิด มาเลือกใช้เรียบเรียงคำมาใช้ตามหลักภาษาได้ถูกต้องตรงตามความหมาย กาลเทศะ และใช้ภาษาได้อย่างมีประสิทธิภาพ

การเขียนเป็นทักษะอย่างหนึ่งในสี่ทักษะทางภาษา ซึ่งทั้งสี่ทักษะ ได้แก่ การฟัง การพูด การอ่านและการเขียน ดังนั้นทักษะการเขียนนับว่าเป็นเครื่องมือที่สำคัญที่ใช้ในการสื่อสาร เป็นเครื่องมือในการบันทึกและถ่ายทอดเรื่องราว แสดงความรู้สึกนึกคิดและความต้องการให้ผู้อื่นทราบเป็นลายลักษณ์อักษร ซึ่งสอดคล้องกับงานวิจัยของ ตรีศิลป์ บุญขจร (2530) ได้กล่าวถึงการเขียนไว้ว่า การเขียนเป็นการแสดงออกเพื่อการติดต่อสื่อสารอย่างหนึ่งของมนุษย์ โดยใช้สัญลักษณ์ภาษา ตัวอักษร เป็นสื่อเพื่อถ่ายทอดความรู้

ความคิดของตนให้คนอื่นทราบ สำหรับปัจจัยสำคัญพื้นฐานในการเขียนเพื่อให้เกิดประโยชน์ สามารถสื่อสารความหมายได้ตามต้องการดังกล่าว คือ การสะกดคำให้ถูกต้อง หากสะกดไม่ถูกต้องแล้วย่อมก่อให้เกิดผลเสียเกิดความเข้าใจคลาดเคลื่อนได้ การสะกดคำที่ถูกต้องเป็นส่วนหนึ่งของภาษาไทย คนไทยทุกคนจึงควรตระหนักถึงปัญหาการเขียนสะกดคำ และช่วยกันแก้ไขข้อบกพร่องอย่างจริงจัง เพราะถ้าสะกดเขียนไม่ได้ ไม่ถูกต้องจะส่งผลถึงการสื่อความ ย่อมทำให้เกิดผลเสีย เกิดความเข้าใจที่คลาดเคลื่อนได้ ส่งผลให้ทักษะการเขียนไม่เกิดประสิทธิภาพ

ในปัจจุบันวิชาภาษาไทยจะประสบกับปัญหานักเรียนโรงเรียนชุมชนบ้านนากัน ชั้นประถมศึกษาปีที่ 5 ขาดทักษะการเขียนในการสื่อสารที่ถูกต้องในด้านของการเขียนมักเขียนด้วยอักษรที่ผิด มีการเขียนตัวคำศัพท์และตัวสะกดที่สลับอักษร เช่น จาก ร เป็น ล และการเขียนคำควบการสะกดตัวอักษร ว จึงทำให้ทักษะด้านอื่น ๆ ได้รับผลกระทบด้วยอย่างต่อเนื่อง โดยเฉพาะทักษะการเขียนซึ่งเป็นทักษะที่มีความสำคัญ เพราะการที่นักเรียนเขียนไม่ได้ส่งผลให้ผลสัมฤทธิ์ทางการเรียนของนักเรียนต่ำ และยังมีผลกระทบต่อไปในการเรียนการสอนในกลุ่มสาระการเรียนรู้อื่นอีกด้วย การเขียน เป็นทักษะทางภาษาที่สำคัญยิ่งอย่างหนึ่งที่ใช้ถ่ายทอดความรู้สึกนึกคิด และความเข้าใจออกมาเป็นอักษร เพื่อสื่อความหมายให้ผู้อื่นเข้าใจ เป็นเครื่องมือพัฒนาสติปัญญาของบุคคล ซึ่งเป็นการแสดงออกถึงภูมิปัญญาและการพัฒนาความคิดสร้างสรรค์ของผู้เขียน นอกจากนี้การเขียนยังเป็นทักษะพื้นฐานในการแสดงออกที่สำคัญในการเรียนการสอนเกือบทุกวิชา เพราะต้องอาศัยการจดบันทึกเพื่อรวบรวมหรือสรุปเรื่องราวที่ได้ยิน ได้ฟัง ได้เรียนรู้ มาเรียบเรียงเป็นองค์ความรู้ใหม่จากความเข้าใจของตนเอง ซึ่งส่งผลต่อความคงทนในการเรียนรู้

จากสภาพปัญหาดังกล่าวข้างต้น คณะผู้วิจัยซึ่งปฏิบัติหน้าที่สอนวิชาภาษาไทยระดับชั้นประถมศึกษาตอนปลาย ทำการศึกษาพบว่า การใช้แบบฝึกทักษะ การใช้สมุดคำศัพท์ และการทำแบบฝึกทักษะการเขียนตามคำบอก เป็นวิธีการอีกอย่างหนึ่งที่จะช่วยพัฒนานักเรียน เพราะทำให้นักเรียนมีการฝึกทักษะด้านการเขียนคำศัพท์ที่มักจะเขียนผิด จึงทำให้ผู้เรียนสามารถเข้าใจวิธีการเขียนคำศัพท์ที่ถูกต้องและสามารถนำไปใช้ได้อย่างถูกต้องเช่นกัน แต่ในงานวิจัยครั้งนี้คณะผู้วิจัยได้เลือกใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ เนื่องจากคำควบกล้ำเป็นคำศัพท์ที่ใช้ในชีวิตประจำวันค่อนข้างมาก และเกิดการสะกดคำผิดบ่อย ๆ เช่นกัน ดังนั้นคณะผู้วิจัยมีวัตถุประสงค์เพื่อพัฒนาทักษะการเขียน เรื่องคำควบกล้ำ โดยใช้แบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5

วัตถุประสงค์ของการวิจัย

1. เพื่อสร้างแบบฝึกทักษะ เรื่อง คำควบกล้ำสำหรับนักเรียนชั้นประถมศึกษาปีที่ 5
2. เพื่อเปรียบเทียบผลการเขียนคำควบกล้ำก่อนและหลังเรียนโดยใช้แบบฝึกทักษะ
3. เพื่อศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีต่อการเรียน โดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาไทย

กระทรวงศึกษาธิการ. (2551) ภาษาไทยเป็นเอกลักษณ์ของชาติเป็นสมบัติทางวัฒนธรรมอันก่อให้เกิดความเป็นเอกภาพ และเสริมสร้างบุคลิกภาพของคนในชาติให้มีความเป็นไทย เป็นเครื่องมือ

ในการติดต่อสื่อสารเพื่อสร้างความเข้าใจและความสัมพันธ์ที่ดีต่อกัน และดำรงชีวิตร่วมกันในสังคมประชาธิปไตยได้อย่างสันติสุข และเป็นเครื่องมือในการแสวงหาความรู้ ประสบการณ์จากแหล่งข้อมูลสารสนเทศต่าง ๆ ตลอดจนนำไปใช้ในการพัฒนาอาชีพให้มีความมั่นคงทางเศรษฐกิจ นอกจากนี้ยังเป็นสื่อแสดงภูมิปัญญาของบรรพบุรุษด้านวัฒนธรรม ประเพณี และสุนทรียภาพ เป็นสมบัติล้ำค่าควรแก่การเรียนรู้ อนุรักษ์ และสืบสานให้คงอยู่คู่ชาติไทยตลอดไป

แนวคิดเกี่ยวกับการเขียน

ฐะปะนีย์ นาครทรรพ (2552) ได้ให้ความหมายของการเขียนไว้ว่า การเขียนเป็นทักษะที่ต้องใช้เวลาฝึกนานกว่าทักษะอื่น ๆ เริ่มตั้งแต่การคัดลายมือ การเขียนตัวหนังสือให้ถูกแบบการสะกดตัวหนังสือให้ถูกต้อง การถ่ายทอดความคิดออกมาเป็นตัวหนังสือให้ผู้อื่นอ่านเข้าใจ ตลอดจนการเขียนถ้อยคำสำนวนให้สละสลวยได้ประโยชน์ตรงตามจุดประสงค์

จากความหมายของการเขียนดังกล่าว ทำให้มองเห็นความสำคัญของการเขียนว่า มีความจำเป็นอย่างยิ่งต่อการสื่อสารในชีวิตประจำวัน เช่น นักเรียนใช้การเขียนบันทึกความรู้ ทำแบบฝึกหัด และตอบข้อสอบ บุคคลทั่วไปใช้การเขียนเพื่อเขียนจดหมาย ทำสัญญา พินัยกรรม การค้ำประกัน เป็นต้น

การสะกดคำเป็นสาขาหนึ่งของการเขียนและเป็นทักษะที่สำคัญทางภาษาที่มีอิทธิพลต่อการใช้ภาษาของมนุษย์ ไพทูลย์ มูลดี (2546) ได้อธิบายความหมายของการเขียนสะกดคำ คือ การจัดเรียงพยัญชนะ สระ วรรณยุกต์ ให้เป็นคำที่มีความหมาย และถูกต้องตามพจนานุกรมฉบับราชบัณฑิตสถาน และสามารถนำคำดังกล่าวไปใช้ในการสื่อสารในชีวิตประจำวันได้

คณะผู้วิจัยได้สรุปว่า แนวคิดเกี่ยวกับการเขียนมีความจำเป็นอย่างยิ่งต่อการสื่อสารในชีวิตประจำวัน เช่น นักเรียนใช้การเขียนบันทึกความรู้ ทำแบบฝึกหัดและตอบข้อสอบ ส่วนการเขียนสะกดคำ คือ การจัดเรียงพยัญชนะ สระ วรรณยุกต์ ให้เป็นคำที่มีความหมายและถูกต้องตามพจนานุกรมฉบับราชบัณฑิตสถาน และสามารถนำคำดังกล่าวไปใช้ในการสื่อสารในชีวิตประจำวันได้

แนวคิดเกี่ยวกับคำควบกล้ำ

สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน (2553) ได้ให้ความหมาย คำควบกล้ำ หมายถึง พยัญชนะที่ควบกับ ร ล ว ประสมสระเดียวกัน ออกเสียงควบกล้ำเป็นพยางค์เดียว โดยออกเสียงวรรณยุกต์ตามพยัญชนะตัวหน้า

คณะผู้วิจัยได้สรุปว่า คำควบกล้ำ หมายถึง พยัญชนะสองตัวที่มีการเรียงกันและประสมในสระเดียวกันและออกเสียงพร้อมกันโดยแบ่งออกเป็น 2 ชนิด ได้แก่ 1) คำควบกล้ำแท้ คือ คำที่มีพยัญชนะสองตัวมาอยู่ในรูปสระเดียวกัน พยัญชนะที่ทำหน้าที่จะเป็นตัวควบ คือ ร ล ว 2) คำควบกล้ำไม่แท้ คือ คำที่อ่านออกเสียงเฉพาะพยัญชนะตัวหน้าเพียงตัวเดียว

แนวคิดเกี่ยวกับแบบฝึกทักษะ

จินตนา ใบกาซูยี (2542) ได้กล่าวว่า แบบฝึกหรือแบบฝึกหัดเป็นสื่อการเรียนสำหรับให้ผู้เรียนได้ฝึกปฏิบัติ เพื่อช่วยเสริมให้เกิดทักษะและความแตกฉานในบทเรียน

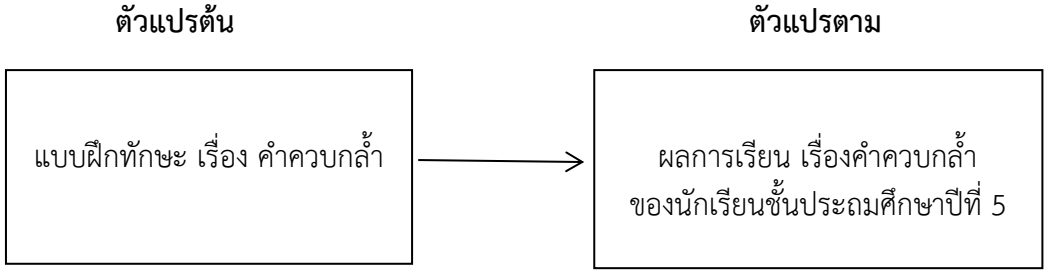
คณะผู้วิจัยสรุปได้ว่า การสร้างแบบฝึกจะทำได้โดยการวิเคราะห์ปัญหาและต้องศึกษาหลักสูตร หาแนวทางแก้ปัญหาโดยใช้แบบฝึกสร้างและออกแบบชุดฝึกให้ผู้เชี่ยวชาญตรวจสอบ แล้วนำไปทดลองใช้และปรับปรุงนำไปใช้จริงและเผยแพร่ต่อไป

งานวิจัยที่เกี่ยวข้อง

สุวรรณา แย้มอรุณ (2563) ได้ทำการวิจัยเรื่องการทดลองสอนโดยใช้แบบฝึกทักษะการเขียนสะกดคำกับนักเรียนชั้นประถมศึกษาปีที่ 6 โดยทดสอบนักเรียนในกลุ่มตัวอย่างก่อนการฝึกแบบการเขียนสะกดคำ ให้นักเรียนฝึกแบบการเขียนสะกดคำทั้ง 2 ชุด จำนวน 10 ครั้ง ผลการศึกษาพบว่า การใช้แบบฝึกทักษะการเขียนสะกดคำทำให้ผลสัมฤทธิ์ในการเขียนสะกดคำ ภายหลังการทดลองสูงกว่าผลสัมฤทธิ์ในการเขียนสะกดคำก่อนทดลอง ร้อยละ 56 อยู่ในเกณฑ์พอใช้ เพิ่มขึ้นจากเดิม ร้อยละ 24

สุรัสวดี จันทพันธ์ (2566) ได้ทำการวิจัยเรื่อง การวิจัยปฏิบัติการเพื่อส่งเสริมการอ่านและการเขียนคำควบกล้ำของนักเรียนระดับชั้นประถมศึกษาปีที่ 6 โรงเรียนบ้านโพนสว่าง โดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกร จากการทำวิจัยพบว่า 1) นักเรียนกลุ่มเป้าหมายทุกคน คิดเป็นร้อยละ 100 มีความสามารถในการอ่านและการเขียนภายหลังการส่งเสริมโดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกรสูงกว่าก่อนเรียนและผ่านเกณฑ์ที่กำหนดไว้ที่ร้อยละ 80 2) นักเรียนกลุ่มเป้าหมายทุกคน คิดเป็นร้อยละ 100 มีความก้าวหน้าในการอ่านและการเขียนคำควบกล้ำภายหลังการส่งเสริมโดยใช้ชุดกิจกรรมการอ่าน และการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกร ผ่านเกณฑ์ดัชนีความก้าวหน้าที่ตั้งไว้ที่ร้อยละ 50 ขึ้นไป

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากรและกลุ่มตัวอย่างการวิจัยครั้งนี้ ได้แก่ นักเรียนระดับชั้นประถมศึกษาปีที่ 5 โรงเรียนชุมชนบ้านนากัน ตำบลบ้านโหนด อำเภอสะบ้าย้อย จังหวัดสงขลา ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 1 ห้อง จำนวน 20 คน

เครื่องมือที่ใช้ในการวิจัย

1. แบบฝึกทักษะการเขียนตามคำบอก เรื่อง คำควบกล้ำ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 5
2. แผนการจัดการเรียนรู้เพื่อควบคู่กับแบบฝึกทักษะ เรื่อง คำควบกล้ำ จำนวน 4 แผน ระยะเวลา 4 ชั่วโมง
3. แบบทดสอบวัดผลการเรียน เรื่องคำควบกล้ำ ของนักเรียนชั้นประถมศึกษาปีที่ 5 มีลักษณะเป็นแบบอัตนัย 4 ตัวเลือก จำนวน 20 ข้อ
4. แบบสอบถามความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีต่อการเรียนโดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ

การสร้างและการหาคุณภาพเครื่องมือ

1. การสร้างแบบฝึกทักษะวิชาภาษาไทย เรื่อง คำควบกล้ำ ระดับชั้นประถมศึกษาปีที่ 5 ผู้วิจัยได้ดำเนินการสร้างเครื่องมือในการวิจัย โดยการศึกษาสภาพปัญหาการจัดกิจกรรมการเรียนรู้ศึกษาหลักสูตร ค้นคว้าข้อมูล ทำการสร้างแบบฝึกทักษะการเขียน เรื่อง คำควบกล้ำ วิชาภาษาไทย ทั้งหมด 3 แบบฝึกทักษะ ดังนี้

แบบฝึกทักษะที่ 1 มีลักษณะเป็นแบบฝึกทักษะที่ให้นักเรียนเขียนคำควบกล้ำ หมายถึง พยัญชนะ ที่ควบกับ ร ล ว ประสมสระเดียวกัน ออกเสียงควบกล้ำเป็นพยางค์เดียว โดยออกเสียงวรรณยุกต์ตามพยัญชนะตัวหน้า ให้ถูกต้องตามภาพที่ครูจัดไว้ให้

แบบฝึกทักษะที่ 2 มีลักษณะเป็นแบบฝึกทักษะที่ครูให้บทความมา 1 บทความ แล้วให้นักเรียนวงกลมคำควบกล้ำแท้ คือ คำที่มีพยัญชนะสองตัวมาอยู่ในรูปสระเดียวกัน พยัญชนะที่ทำหน้าที่จะเป็นตัวควบ คือ ร ล ว ต่อมานำคำควบกล้ำแท้ที่นักเรียนวงกลมมาแต่งประโยคให้สมบูรณ์

แบบฝึกทักษะที่ 3 มีลักษณะเป็นแบบฝึกทักษะที่ครูให้บทความมา 1 บทความ แล้วให้นักเรียนวงกลมคำควบกล้ำไม่แท้ คือ คำที่อ่านออกเสียงเฉพาะพยัญชนะตัวหน้าเพียงตัวเดียว ต่อมานำคำควบกล้ำไม่แท้ที่นักเรียนวงกลมมาแต่งประโยคให้สมบูรณ์

นำแบบฝึกทักษะที่สร้างขึ้นเสนอต่อผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

2. แผนการจัดการเรียนรู้ เพื่อควบคู่กับแบบฝึกทักษะเรื่องคำควบกล้ำ ชั้นประถมศึกษาปีที่ 5 โดยจะเป็นแผนการจัดเรียนการเรียนรู้ จำนวน 4 แผนการเรียนรู้ ระยะเวลา 4 ชั่วโมง ดังนี้

แผนการจัดการเรียนรู้ที่ 1 เรื่องคำควบกล้ำ

แผนการจัดการเรียนรู้ที่ 2 เรื่องคำควบกล้ำแท้

แผนการจัดการเรียนรู้ที่ 3 เรื่องคำควบกล้ำไม่แท้

แผนการจัดการเรียนรู้ที่ 4 เรื่องคำควบกล้ำแท้ และคำควบกล้ำไม่แท้

ซึ่งผู้วิจัยได้ศึกษาข้อมูล ที่เกี่ยวข้องกับการจัดทำแผนการเรียนรู้และหาคุณภาพของเครื่องมือโดยตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67-1.00

3. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาภาษาไทย เรื่องคำควบกล้ำของนักเรียนชั้นประถมศึกษาปีที่ 5 มีลักษณะเป็นแบบอัตนัย จำนวน 20 คำ ผู้วิจัยได้ศึกษาข้อมูลที่เกี่ยวข้องจัดทำแบบทดสอบวัดผลสัมฤทธิ์และหาคุณภาพเครื่องมือโดยตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

4. แบบวัดความพึงพอใจของนักเรียนที่มีผลต่อการเรียน โดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำระหว่างก่อนกับหลังเรียนโดยใช้แบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5 ผู้วิจัยได้ศึกษาข้อมูลที่เกี่ยวข้องเพื่อจัดทำแบบวัดความพึงพอใจของนักเรียน และหาคุณภาพของเครื่องมือโดยการตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

การเก็บรวบรวมข้อมูล

1. ทดสอบก่อนเรียนด้วยแบบทดสอบวัดการเรียน เรื่อง คำควบกล้ำ แบบอัตนัย 4 ตัวเลือก จำนวน 20 ข้อ

2. การสอนโดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ จำนวน 1 แบบฝึกทักษะ โดยเป็นสมุดคำศัพท์ เรื่อง คำควบกล้ำ ใช้ระยะเวลา 4 ชั่วโมง ในการเรียนรู้

3. ทดสอบนักเรียนหลังเรียน (Post-test) โดยใช้แบบฝึกทักษะการเขียนตามคำบอก จำนวน 20 ข้อ โดยคำศัพท์จะเลือกสุ่มมาจากสมุดคำศัพท์ จำนวน 50 คำ

4. แบบสอบถามความพึงพอใจต่อการเรียนโดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ

การวิเคราะห์ข้อมูล

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

1. วิเคราะห์และเปรียบเทียบการเรียนระหว่างก่อนเรียนและหลังเรียน โดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ ของนักเรียนชั้นประถมศึกษาปีที่ 5

2. วิเคราะห์ผลการตอบแบบสอบถามความพึงพอใจต่อการเรียนโดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ ค่าเฉลี่ย (Mean) และส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation) ผู้วิจัยมีเกณฑ์การแปลความหมาย (พล เหลืองรังษี, 2566) ดังนี้

ค่าเฉลี่ย 4.21 - 5.00 มีความพึงพอใจอยู่ในระดับมากที่สุด

ค่าเฉลี่ย 3.41 - 4.20 มีความพึงพอใจระดับมาก

ค่าเฉลี่ย 2.61 - 3.40 มีความพึงพอใจระดับปานกลาง

ค่าเฉลี่ย 1.81 - 2.60 มีความพึงพอใจระดับน้อย

ค่าเฉลี่ย 1.00 - 1.80 มีความพึงพอใจระดับน้อยที่สุด

ผลการวิจัย

1. การสร้างแบบฝึกทักษะ เรื่อง คำควบกล้ำ มีแบบฝึกหัด เรื่อง คำควบกล้ำ ทั้งหมด 3 ลักษณะด้วยกัน คือ

แบบฝึกทักษะที่ 1 มีลักษณะเป็นแบบฝึกทักษะที่ให้นักเรียนเขียนคำควบกล้ำ หมายถึง พยัญชนะที่ควบกับ ร ล ว ประสมสระเดียวกัน ออกเสียงควบกล้ำเป็นพยางค์เดียว โดยออกเสียงวรรณยุกต์ตามพยัญชนะตัวหน้าให้ถูกต้องตามภาพที่ครูจัดไว้ให้

แบบฝึกทักษะที่ 2 มีลักษณะเป็นแบบฝึกทักษะที่ครูให้บทความมา 1 บทความ แล้วให้นักเรียนวงกลมคำควบกล้ำแท้ คือ คำที่มีพยัญชนะสองตัวมาอยู่ในรูปสระเดียวกัน พยัญชนะที่ทำหน้าที่จะเป็นตัวควบ คือ ร ล ว ต่อมานำคำควบกล้ำแท้ที่นักเรียนวงกลมมาแต่งประโยคให้สมบูรณ์

แบบฝึกทักษะที่ 3 มีลักษณะเป็นแบบฝึกทักษะที่ครูให้บทความมา 1 บทความ แล้วให้นักเรียนวงกลมคำควบกล้ำไม่แท้ คือ คำที่อ่านออกเสียงเฉพาะพยัญชนะตัวหน้าเพียงตัวเดียว ต่อมานำคำควบกล้ำไม่แท้ที่นักเรียนวงกลมมาแต่งประโยคให้สมบูรณ์

และผลการหาคุณภาพของแบบฝึกทักษะโดยตรวจสอบความตรงของเนื้อหาจากผู้เชี่ยวชาญ 3 ท่าน พบว่า มีค่าระหว่าง 0.67 - 1.00

2. ผลการการวิเคราะห์เปรียบเทียบความแตกต่างของคะแนนก่อนเรียนกับหลังเรียน โดยใช้แบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5 เรื่อง คำที่มักเขียนผิด การเขียนคำควบกล้ำแท้และคำควบกล้ำไม่แท้

ตารางที่ 1 แสดงผล คะแนนก่อนเรียนกับหลังเรียนโดยใช้แบบฝึกทักษะ ของนักเรียนชั้นประถมศึกษาปีที่ 5 เรื่อง คำที่มักเขียนผิด การเขียนคำควบกล้ำแท้และไม่แท้ ผลการวิเคราะห์ปรากฏดังตาราง

คะแนนสอบ	$\bar{x}$	S.D.
ก่อนเรียน	14.45	2.24
หลังเรียน	17.25	2.20

จากตารางที่ 1 พบว่า คะแนนเฉลี่ยทดสอบหลังเรียน ($\bar{x}$ = 17.25) สูงกว่าก่อนเรียน ($\bar{x}$ = 14.45)

3. ผลความพึงพอใจของนักเรียนที่มีต่อโดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ ของนักเรียนชั้นประถมศึกษาปีที่ 5

ตารางที่ 2 แสดงผลความพึงพอใจของนักเรียนที่มีต่อโดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ ของนักเรียนชั้นประถมศึกษาปีที่ 5

	รายการประเมิน	$\bar{x}$	S.D.	แปลความ
1	แบบฝึกทักษะการเขียนคำควบกล้ำมีประโยชน์และน่าสนใจ	4.45	0.51	มากที่สุด
2	แบบฝึกทักษะการเขียนคำควบกล้ำมีความชัดเจนและเข้าใจง่าย	4.25	0.55	มากที่สุด
3	นักเรียนได้เรียนรู้พร้อมกัน ทำแบบฝึกทักษะการเขียนคำควบกล้ำอย่างสนุกสนาน	4.25	0.72	มากที่สุด
4	นักเรียนสามารถนำความรู้เรื่องการเขียนคำควบกล้ำไปใช้ในชีวิตประจำวันได้	4.40	0.50	มากที่สุด
5	ครูผู้สอนใช้ภาษาชัดเจน เข้าใจง่าย	4.35	0.59	มากที่สุด
6	ครูผู้สอนให้คำแนะนำในการทำแบบฝึกทักษะการเขียนคำควบกล้ำ	4.40	0.69	มากที่สุด
7	ระยะเวลาของการทำแบบฝึกทักษะการเขียนคำควบกล้ำมีความเหมาะสม	4.25	0.72	มากที่สุด
	ค่าเฉลี่ย	**4.34**	**0.61**	**มากที่สุด**

จากตารางที่ 2 พบว่า การประเมินความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีต่อการเรียนโดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำ ทั้งหมด 7 รายการ มีค่าเฉลี่ยในภาพรวมอยู่ในระดับมากที่สุด ($\bar{x}$=4.34, S.D.=0.61)

สรุปผลการวิจัย

1. แบบฝึกทักษะ เรื่อง คำควบกล้ำ มีคุณภาพในระดับดีมาก
2. ผลการเรียนของนักเรียนชั้นประถมศึกษาปีที่ 5 คะแนนหลังเรียนสูงกว่าคะแนนก่อนเรียน
3. ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีต่อการเรียนโดยใช้แบบฝึกทักษะ เรื่อง คำควบกล้ำ มีค่าเฉลี่ยในระดับมากที่สุด ($\bar{X}$=4.34, S.D.=0.61)

การอภิปรายผล

จากการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียน โดยใช้แบบฝึกทักษะ เรื่องคำควบกล้ำสำหรับนักเรียน มีคุณภาพในระดับดีมาก และผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังเรียนด้วยการจัดกิจกรรมการเรียนรู้โดยใช้แบบฝึกทักษะ ทดสอบการวัดผลสัมฤทธิ์เพื่อเสริมทักษะการเขียน เรื่อง คำควบกล้ำ หลังเรียนสูงกว่าก่อนเรียน ที่ผลเป็นเช่นนี้ เนื่องจากการพัฒนาทักษะการเขียนโดยใช้แบบฝึกทักษะนั้นส่งเสริมให้ผู้เรียนมีพัฒนาการเขียนที่ถูกต้องมากขึ้น ซึ่งการเขียนเป็นทักษะหนึ่งในการถ่ายทอดอารมณ์ความรู้สึกนึกคิดผ่านตัวอักษร พัฒนากระบวนการคิดวิเคราะห์ และสามารถนำไปใช้ได้ถูกต้องในชีวิตประจำวัน ซึ่งสอดคล้องกับงานวิจัยของ สุวรรณา แย้มอรุณ (2563) ได้ทำการวิจัย เรื่อง การทดลองสอนโดยใช้แบบฝึกทักษะการเขียนสะกดคำกับนักเรียนชั้นประถมศึกษาปีที่ 6 โดยทดสอบนักเรียนในกลุ่มตัวอย่างก่อนการฝึกการเขียนสะกดคำ ให้นักเรียนฝึกการเขียนสะกดคำทั้ง 2 ชุด จำนวน 10 ครั้ง ผลการศึกษาพบว่า การใช้แบบฝึกทักษะการเขียนสะกดคำทำให้ผลสัมฤทธิ์ในการเขียนสะกดคำภายหลังการทดลองสูงกว่าผลสัมฤทธิ์ในการเขียนสะกดคำก่อนทดลอง ร้อยละ 56 อยู่ในเกณฑ์พอใช้ เพิ่มจากร้อยละ 24

ผลการศึกษาความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่มีต่อการเขียน เรื่อง คำควบกล้ำระหว่างก่อนกับหลังเรียนโดยใช้แบบฝึกทักษะมีค่าเฉลี่ยในระดับมากที่สุด ($\bar{X}$=4.34, S.D.=0.61)

ซึ่งจากงานวิจัยดังกล่าว แสดงให้เห็นว่าแบบฝึกทักษะการเขียน เรื่องคำควบกล้ำ ของนักเรียนชั้นประถมศึกษาปีที่ 5 มีประสิทธิภาพด้านกระบวนการการจัดการเรียนรู้ ช่วยให้นักเรียนนั้นเกิดการเรียนรู้ มีประสิทธิภาพด้านผลลัพธ์ เนื่องจากนักเรียนได้ฝึกกระบวนการเรียนรู้จากการทำแบบฝึกทักษะ และครูเป็นผู้แนะนำในการจัดการเรียนรู้ ซึ่งในกระบวนการจัดการเรียนรู้ทำให้เห็นถึงปัญหาในด้านการเขียน ซึ่งทำให้การเลือกเนื้อหาและพัฒนาศักยภาพของผู้เรียนเหมาะแก่ เรื่อง คำควบกล้ำ เพราะเป็นการฝึกจากสาเหตุที่นักเรียนนั้นมักเขียนคำผิดบ่อยและนำปัญหาเหล่านั้นมาแก้ไขในการเรียน เรื่อง คำควบกล้ำ โดยการใช้แบบฝึกทักษะจึงเป็นเครื่องมือสำคัญที่ช่วยให้ผลสัมฤทธิ์ทางการเรียนของนักเรียนนั้นสูงขึ้น มีความสำคัญและจำเป็นต่อการเรียนวิชาที่ต้องฝึกฝนเพื่อให้เกิดความชำนาญ มีความเข้าใจในเนื้อหามากยิ่งขึ้น ดังนั้นการวิจัย เรื่อง การพัฒนาผลสัมฤทธิ์การเขียนคำควบกล้ำที่มักเขียนผิด โดยใช้แบบฝึกของนักเรียนชั้นประถมศึกษาปีที่ 5 ผู้วิจัยสร้างขึ้นเป็นนวัตกรรมที่สามารถส่งผลให้นักเรียนนั้นมีผลสัมฤทธิ์ทางการเรียนที่สูงขึ้นและสามารถบรรลุผลได้ตามเป้าหมายที่วางไว้

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

การเขียนคำควบกล้ำโดยใช้ชุดกิจกรรมการเขียนคำควบกล้ำ ควรคำนึงถึงความเหมาะสมความยากง่าย หรือปรับเปลี่ยนได้ตามความเหมาะสมไม่ควรมากเกินไปหรือไม่น้อยเกินไป เพื่อเพิ่มทักษะการพัฒนาผู้เรียนในด้านของการเขียนมากขึ้น

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ควรนำกระบวนการวิจัยไปปฏิบัติใช้ในการแก้ปัญหาการจัดการเรียนรู้ของนักเรียนในเรื่องอื่น ๆ ที่เป็นปัญหาที่ผู้สอนค้นพบในชั้นเรียน

2.2 ควรมีการส่งเสริมความสามารถของการเขียนคำควบกล้ำ โดยใช้รูปแบบหรือเทคนิคอื่น ๆ เพื่อหาทางเลือกในการส่งเสริมความสามารถการเขียนที่เหมาะสมกับนักเรียน

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The Development of Reading Skill Thai Consonant True Cluster Using Reading Exercise Methods for Pratomsuksa 4 Student

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บทคัดย่อ

การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อ 1) เปรียบเทียบทักษะการอ่านระหว่างก่อนกับหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 และ 2) ประเมินความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 ประชากรที่ใช้ในการวิจัยครั้งนี้ เป็นนักเรียนระดับชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนวิทยาพิพัฒน์ อำเภอมะนัง จังหวัดสตูล สังกัดสำนักงานการศึกษาเอกชนจังหวัดสตูล จำนวน 1 ห้องเรียน รวมนักเรียน 22 คน ได้มาจากการสุ่มแบบเจาะจง เครื่องมือที่ใช้ในการวิจัย ได้แก่ 1) แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ 2) แผนการจัดการเรียนรู้วิชาภาษาไทย เรื่องคำควบกล้ำแท้ จำนวน 2 แผน 3) แบบวัดผลสัมฤทธิ์ทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ก่อนและหลังเรียน และ 4) แบบประเมินความพึงพอใจของนักเรียนที่มีต่อการใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ประโยชน์ของการวิจัยในครั้งนี้สามารถเป็นแนวทางแก่ครูภาษาไทยในการคิดค้นเครื่องมือเพื่อพัฒนาทักษะการอ่านคำควบกล้ำแก่นักเรียน

ผลการวิจัยสรุปได้ว่า 1) ผลการเปรียบเทียบทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 หลังใช้แบบฝึกทักษะการอ่านสูงกว่าก่อนใช้แบบฝึกทักษะการอ่านอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และ 2) ความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 มีค่าเฉลี่ยโดยรวมเท่ากับ 4.13 อยู่ในระดับมาก

คำสำคัญ: คำควบกล้ำแท้, ทักษะการอ่าน

Abstract

The objective of this research were to 1) To compare reading skills by using the Thai language reading skills of Consonant true cluster practice exercises Methods for the Pratomsuksa 4 and 2) to assess satisfaction with using the Thai language reading skills practice exercises About Consonant true cluster of Pratomsuksa 4, the population used in this research Is Pratomsuksa 4, semester 2, academic year 2023, Wittayapipat School, Manang District, Satun Province, under the Satun Provincial Private Education Office, 1 classroom, totaling 22 students. which was obtained from purposive random sampling. The tools used in the research is a 1) Thai reading skills practice. About Consonant true cluster, 2) Language learning plan. Thai About Consonant true cluster, 2 plans, 3) Achievement test for reading skills in Thai language About Consonant true cluster, before and after class and 4) Assessment of student satisfaction with the using of Thai reading skills of consonant true cluster practice exercises. The benefits of this research can be a guideline for Thai language teachers in devising tools to develop Consonant true cluster reading skills for students.

The research found that 1) Comparative results of reading skills in Thai language subjects. About Consonant true cluster of students in Pratomsuksa 4 after using the reading skill practice exercises were higher than before using the reading skill practice exercises. Statistically significant at the .01 level. And 2) Satisfaction with using the Thai language reading skill practice exercise of Consonant true cluster For Pratomsuksa 4, the overall average was 4.13, which was at a high level of satisfaction.

Keywords: Consonant True Cluster, Reading Skills

บทนำ

ภาษาไทยเป็นเอกลักษณ์ของชาติ เป็นสมบัติทางวัฒนธรรมอันก่อให้เกิดความเป็นเอกภาพ และเสริมสร้างบุคลิกภาพของคนในชาติให้มีความเป็นไทย เป็นเครื่องมือในการติดต่อสื่อสารเพื่อสร้างความเข้าใจและความสัมพันธ์ที่ดีต่อกัน ภาษาไทยเป็นทักษะที่ต้องฝึกฝนจนเกิดความชำนาญในการใช้ภาษาเพื่อการสื่อสาร การเรียนรู้อย่างมีประสิทธิภาพ และเพื่อนำไปใช้จริง โดยเฉพาะทักษะการอ่าน เพราะการอ่านทำให้ทราบเหตุการณ์ ทราบปัญหา เพิ่มพูนสติปัญญา โดยเฉพาะในการศึกษาหาความรู้ เพราะทักษะการอ่านเป็นหัวใจของการศึกษาทุกระดับ ผู้ที่มีทักษะการอ่านที่ดีจะช่วยให้ทักษะอื่น ๆ ทางด้านภาษาดีขึ้นตามไปด้วย วรรณฤดี สุขชื่น (2563) กล่าวถึงการอ่านไว้ว่า การอ่านที่มีประสิทธิภาพจะต้องสามารถประสมประสานตัวอักษรอย่างคล่องตัว แล้วไตร่ตรองออกเสียงคำ ประโยค ข้อความสั้นอย่างคล่องแคล่ว มีความชำนาญในการอ่าน สามารถอ่านออกเสียงได้ทันที ย่อมสามารถนำความรู้ความเข้าใจ ประสบการณ์ในการอ่านไปใช้ในการพัฒนาตนเองและสังคมได้

คำควบกล้ำเป็นเอกลักษณ์เฉพาะที่สำคัญอย่างหนึ่งของภาษาไทย เพราะคำควบกล้ำมีลักษณะที่ทำให้เสียงในภาษาไทยมีความไพเราะ และแสดงถึงความประณีตของการออกเสียงคำ การออกเสียงคำควบกล้ำจะแตกต่างจากการออกเสียงคำที่มีพยัญชนะต้นตัวเดียว หากไม่ระวังในการออกเสียงจะทำให้

ออกเสียงผิด เป็นสาเหตุที่ทำให้ความหมายที่ต้องการสื่อสารผิดไปด้วย สุรัสวดี จันทพันธ์ (2566) กล่าวถึงปัญหาการออกเสียงคำควบกล้ำว่า ปัจจุบันคนไทยส่วนใหญ่ไม่ค่อยให้ความสำคัญต่อการออกเสียงคำควบกล้ำให้ถูกต้องชัดเจน ขาดความระมัดระวังในเรื่องการออกเสียงคำประเภทนี้ โดยส่วนมากจะออกเสียงเฉพาะพยัญชนะต้นหน้า ส่วนตัวควบจะไม่ออกเสียงเลย ทำให้ภาษาผิดเพี้ยนไป ครูผู้สอนจึงควรสร้างความตระหนักให้นักเรียนเห็นความจำเป็นและความสำคัญ ในเรื่องการอ่านออกเสียงคำควบกล้ำให้ถูกต้องและส่งเสริมความสามารถในการอ่านคำควบกล้ำให้นักเรียนอย่างสม่ำเสมอ ซึ่งเป็นการจัดการปัญหาตั้งแต่ระยะเริ่มต้นก่อนจะติดเป็นนิสัย เพื่อการสื่อสารที่มีประสิทธิภาพ และเป็นการวางรากฐานในการใช้ภาษาไทยอันเป็นภาษาประจำชาติให้ถูกต้อง

ผู้วิจัยเป็นครูผู้สอนในรายวิชาภาษาไทย ซึ่งสอนในระดับชั้นประถมศึกษาปีที่ 4 ปีการศึกษา 2566 จำนวน 22 คน จากการทดสอบและสังเกตพฤติกรรมการอ่านคำควบกล้ำของนักเรียน พบว่า นักเรียนมีปัญหาในทักษะการอ่านคำควบกล้ำ ซึ่งไม่บรรลุตามวัตถุประสงค์ ผู้วิจัยได้ศึกษาและวิเคราะห์หาสาเหตุ พบว่า สาเหตุหนึ่งคือ นักเรียนขาดทักษะในการออกเสียงคำควบกล้ำ เนื่องจากการสอนในห้องเรียนยังใช้ภาษาถิ่นใต้ทำให้นักเรียนออกเสียงอักขระไม่ถูกต้อง จึงเกิดปัญหาในการอ่านคำควบกล้ำที่เป็นสาเหตุที่จะทำให้การสื่อความหมายของคำหรือประโยคผิดเพี้ยน นอกจากนี้ยังพบว่า นักเรียนนิยมอ่านในใจโดยไม่เปล่งเสียงออกมา จึงทำให้ตนเองไม่ทราบถึงสิ่งที่อ่านว่ามีการออกเสียงถูกต้องหรือไม่ มีการนำคำผิดเพี้ยนเหล่านั้นมาใช้พูดคุยกันในกลุ่มวัยรุ่นโดยที่ไม่ทราบว่าถูกหรือผิด

จากสภาพปัญหาดังกล่าว จะเห็นได้ว่าการอ่านออกเสียงคำควบกล้ำมีความสำคัญจำเป็นต้องแก้ไขและพัฒนาทักษะการอ่านคำควบกล้ำของนักเรียนให้มีทักษะที่สูงขึ้น ผู้วิจัยจึงศึกษาเครื่องมือที่จะใช้ในการจัดการเรียนการสอน เพื่อส่งเสริมทักษะการอ่านคำควบกล้ำ ซึ่ง วรรณาภรณ์ พระเมเด (2562) กล่าวว่า แบบฝึกทักษะการอ่านเป็นสื่อประเภทที่ช่วยเสริมให้นักเรียนได้ฝึกปฏิบัติ เพื่อพัฒนาให้นักเรียนเกิดความรู้ ความเข้าใจ มีทักษะที่เพิ่มขึ้น และสามารถนำความรู้ความเข้าใจไปใช้ในชีวิตประจำวันได้ ผู้วิจัยจึงสนใจที่จะใช้แบบฝึกทักษะการอ่าน ช่วยพัฒนาทักษะการอ่านคำควบกล้ำของนักเรียน ดังนั้นจึงนำแบบฝึกทักษะดังกล่าวมาใช้ในการส่งเสริมความสามารถในการอ่านออกเสียงคำควบกล้ำ และพัฒนาทักษะการอ่านคำควบกล้ำของนักเรียน ชั้นประถมศึกษาปีที่ 4 ให้สูงขึ้นรวมถึงสร้างความตระหนักถึงความสำคัญของเอกลักษณ์ทางภาษาไทยที่ควรค่าแก่การเรียนรู้ให้คงอยู่ต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบทักษะการอ่าน ระหว่างก่อนกับหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4
2. เพื่อประเมินความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4

แนวคิด ทฤษฎี กรอบแนวคิด

การอ่าน นับเป็นอีกหนึ่งทักษะที่มีความสำคัญอย่างมาก การอ่านทำให้เกิดปัญญาความคิดที่ทำให้เกิดความสร้างสรรค์ช่วยให้พัฒนาตนเอง ทั้งยังทำให้เป็นผู้ที่ทันต่อเหตุการณ์ สภาพความเคลื่อนไหวของโลกในปัจจุบัน และยังทำให้รู้จักปรับตัวในการอยู่ในสังคมได้อย่างสงบสุข ผ่อนคลายความเครียดที่เกิดจาก

การทำกิจกรรมการงานต่าง ๆ ส่งเสริมความรู้ ประสบการณ์ให้เพิ่มพูนยิ่งขึ้น ทั้งนี้ มีผู้ให้ความหมายของคำศัพท์ไว้ดังนี้

ไขศิริ ปราโมช ณ อยุธยา (2533) กล่าวว่า การอ่าน หมายถึง การแปลของสัญลักษณ์ออกมาเป็นคำพูด โดยการผสมเสียงเพื่อใช้ในการออกเสียงให้ตรงกับคำพูด การอ่านแบบนี้เป็นการอ่านเพื่ออ่านออกมุ่งให้อ่านหนังสือให้แตกฉาน

วรรณี โสมประยูร (2537) กล่าวว่า การอ่านเป็นกระบวนการทางสมองที่ต้องการใช้สายตาสัมผัสตัวอักษรหรือสิ่งพิมพ์อื่น ๆ รับรู้ และเข้าใจความหมายของคำหรือสัญลักษณ์ โดยแปลออกมาเป็นความหมายที่ใช้สื่อความคิด และความรู้ระหว่างผู้เขียนกับผู้อ่านให้เข้าใจตรงกัน และผู้อ่านสามารถนำเอาความหมายนั้นไปใช้ให้เกิดประโยชน์ได้

บันลือ พฤกษะวัน (2545) ได้ให้ความหมายของการอ่านไว้ว่า การอ่านเป็นการแปลสัญลักษณ์เป็นเสียงพูด การสังเกต การจำรูปคำที่เคยอ่าน และรูปคำใหม่ให้เกิดความเข้าใจที่ตรงกันเป็นแนวทางช่วยให้ผู้อ่านได้รับความความรู้จากการผสมผสานของตัวอักษร

ราชบัณฑิตยสถาน (2546) ให้ความหมายของคำว่า "อ่าน" ไว้ดังนี้ "อ่าน" หมายถึง ว่าตามตัวหนังสือ ออกเสียงตามตัวหนังสือดูหรือเข้าใจความหมายจากตัวหนังสือ สังเกตหรือพิจารณาดูเพื่อเข้าใจ

ผู้วิจัยสรุปได้ว่า การอ่าน คือ การแปลตัวอักษรมาเป็นคำ ซึ่งทำให้ทราบความหมายของคำนั้น ๆ เพื่อทำให้เข้าใจเนื้อหาสาระในการอ่านและสามารถจับประเด็นสำคัญ ๆ ที่ผู้ส่งสารต้องการสื่อให้ผู้รับสารทราบ การอ่านมีความสำคัญต่อการเรียนรู้ของมนุษย์ ซึ่งทำให้เกิดการพัฒนาด้านสติปัญญา ความรู้ความสามารถ พฤติกรรม และค่านิยมต่าง ๆ เป็นพื้นฐานในการเรียนในวิชาอื่น ๆ เป็นเครื่องมือที่ช่วยให้เกิดความสำเร็จในการประกอบอาชีพ เป็นเครื่องมือที่ช่วยในการถ่ายทอดมรดกทางวัฒนธรรม อันมีผลต่อเนื่องไปสู่การพัฒนาคุณภาพชีวิตของพลเมืองในชาติด้วย

คำควบกล้ำ

คำควบกล้ำ คือ คำที่มีพยัญชนะสองตัวเขียนเรียงกันอยู่ต้นพยางค์ และใช้สระเดียวกัน อ่านออกเสียงกล้ำเป็นพยางค์เดียวกัน เสียงวรรณยุกต์ของพยางค์นั้นจะผันไปตามเสียงพยัญชนะตัวหน้า สุรัสวดี จันทพันธ์ (2566) ได้กล่าวถึงนักการศึกษา ได้แก่ ศิวการท์ ปทุมสูติ, สิริพัชร์ เจษฎาวิโรจน์, เอกรินทร์ สี่มหาศาล และคณะ ซึ่งให้ความหมายของคำควบกล้ำสอดคล้องกันว่า คำควบกล้ำ คือ คำที่มีพยัญชนะต้น 2 ตัว เรียงกัน ออกเสียงควบหรือกล้ำอยู่ในสระเดียวกัน ตัวแรกจะเป็นพยัญชนะหลัก ตัวหลังคือตัวกล้ำมีเพียง 3 ตัว คือ ร ล และ ว คำควบกล้ำ แบ่งออกเป็น 2 ชนิด ได้แก่

1. คำควบกล้ำแท้ คือ คำที่มีพยัญชนะสองตัวเรียงกัน โดยพยัญชนะตัวหน้าเป็น ก ข ค ต ป ผ พ และพยัญชนะตัวควบเป็น ร ล ว ประสมด้วยสระเดียวกัน เวลาอ่านจะออกเสียงพยัญชนะทั้งสองตัวพร้อมกัน เช่น กรุง กลม ไกว

2. คำควบไม่แท้ คือ คำที่มีพยัญชนะ 2 ตัวเรียงกัน พยัญชนะตัวหน้าเป็นตัว จ ซ ท ศ ส พยัญชนะตัวควบเป็นตัว ร ประสมสระเดียวกัน เช่น จริง ไซร้ ทราย เศร้า สร้าง เวลาอ่านออกเสียงคำควบกล้ำไม่แท้ที่มีตัว จร ซร ศร และ สร จะอ่านออกเสียงพยัญชนะตัวหน้าเท่านั้นไม่ต้องออกเสียงตัว ร เช่น เศร้า อ่านว่า เส้า หากเป็นคำควบกล้ำ ไม่แท้ที่มีตัว ทร ให้อ่านออกเสียงเป็น ซ เช่น ทรง อ่านว่า ซง

ในการออกเสียงคำที่มี ร ล ว ควบกล้ำนั้น จะต้องรู้ถึงวิธีการออกเสียงพยัญชนะ ร ล ว แต่ละตัวก่อน วิเชียร เกษประทุม (2543) กล่าวว่า การออกเสียงพยัญชนะควบกลำ้ ร ล ว จะต้องรู้ถึงวิธีออกเสียงพยัญชนะ ร ล ว แต่ละตัวให้ถูกต้อง

จากการศึกษาหลักการและวิธีการอ่านคำควบคล้ำ จะเห็นได้ว่า ในการอ่านออกเสียงคำควบกล้ำนั้นจำเป็นต้องอาศัยความสม่ำเสมอในการฝึกฝนอย่างต่อเนื่อง ซึ่งครูควรฝึกให้นักเรียนอ่านออกเสียงคำควบกล้ำให้ถูกต้อง

แนวคิดเกี่ยวกับการสร้างแบบฝึกทักษะ

แบบฝึกทักษะ คือ ชุดเสริมการเรียนรู้ที่ครูสร้างขึ้นเพื่อฝึกให้ผู้เรียนได้เรียนรู้ ทบทวนเนื้อหาที่เรียนเพื่อสร้างความรู้ความเข้าใจในเนื้อหาบทเรียน เป็นสื่อการเรียนการสอนที่สร้างขึ้น โดยมีลักษณะเป็นแบบฝึกที่มีกิจกรรมให้นักเรียนฝึกปฏิบัติด้วยตนเองจนเกิดทักษะ ความเข้าใจ รวมถึงความชำนาญในเรื่องนั้น ๆ อย่างกว้างขวางมากขึ้น สามารถแก้ปัญหาการเรียนการสอนได้ (มาลีรัตน์ มะลิป่า, 2554) ซึ่งนักการศึกษาหลายท่านให้ความหมายของแบบฝึกทักษะไว้ ดังนี้

ไพทูลย์ มูลดี (2546) กล่าวถึงความหมายของแบบฝึกทักษะว่า คือ ชุดฝึกการเรียนรู้ที่ครูสร้างขึ้นให้นักเรียนได้ทบทวนเนื้อหาที่เรียนรู้มาแล้วเพื่อสร้างความรู้ความเข้าใจ และช่วยเพิ่มทักษะความชำนาญและการฝึกกระบวนการคิดให้มากขึ้น ทั้งยังมีประโยชน์ในการลดภาระการสอนให้กับครู อีกทั้งพัฒนาความสามารถของผู้เรียน และทำให้ผู้เรียนสามารถมองเห็นความก้าวหน้าจากผลการเรียนรู้ของตนเองได้

ฐานิยา อมรพลัง (2548) อธิบายถึงความหมายของแบบฝึกทักษะว่า คือ งานกิจกรรมหรือประสบการณ์ที่ครูจัดให้นักเรียนได้ฝึกหัดกระทำเพื่อทบทวนฝึกฝนเนื้อหาความรู้ต่าง ๆ ที่ได้เรียนไปแล้วให้เกิดความจำ จนสามารถปฏิบัติได้ด้วยความชำนาญให้ผู้เรียนสามารถนำไปใช้ในชีวิตประจำวันได้

อกนิษฐ์ กรไกร (2549) กล่าวถึงความหมายของแบบฝึกทักษะว่า หมายถึง สื่อที่สร้างขึ้นเพื่อเสริมสร้างทักษะให้แก่นักเรียน มีลักษณะเป็นแบบฝึกหัดที่มีกิจกรรมให้นักเรียนทำโดยมีการทบทวนสิ่งที่เรียนผ่านมาแล้วจากบทเรียน ให้เกิดความเข้าใจและเป็นการฝึกทักษะ และแก้ไขในจุดบกพร่องเพื่อให้นักเรียนได้มีความสามารถและศักยภาพยิ่งขึ้นเข้าใจบทเรียนดีขึ้น

สุนันทา สุนทรประเสริฐ (2553) ได้กล่าวถึงความหมายของแบบฝึกทักษะไว้ว่า แบบฝึกทักษะเป็นสื่อที่ใช้ในการฝึกทักษะการคิด การวิเคราะห์ การแก้ปัญหาของนักเรียน นิยมใช้ในกลุ่มสาระภาษาไทย คณิตศาสตร์ วิทยาศาสตร์ การงาน และพื้นฐานอาชีพ และกล่าวอีกว่า เมื่อครูได้สอนแนวคิด หลักการให้กับนักเรียน และนักเรียนมีความรู้ความเข้าใจในเรื่องนั้นแล้ว ขั้นต่อไปครูต้องจัดกิจกรรมให้นักเรียนได้ฝึกฝน เพื่อให้ความเข้าใจ ความรู้ ความชำนาญ คล่องแคล่ว แม่นยำ และรวดเร็วหรือที่เรียกว่า ฝึกฝนจนเกิดรู้และชำนาญ มีทักษะในเรื่องใดเรื่องหนึ่ง

จากความหมายของแบบฝึกทักษะข้างต้น สรุปได้ว่าแบบฝึกทักษะ หมายถึง สื่อการเรียนการสอนประเภทหนึ่งที่สร้างขึ้นเพื่อให้นักเรียนได้ทบทวนเนื้อหาที่เรียนรู้มาหรือฝึกฝนทักษะของนักเรียนในเรื่องใดเรื่องหนึ่งให้ดียิ่งขึ้น ทำให้นักเรียนมีความรู้ความเข้าใจในเรื่องที่เรียน และเพื่อตรวจสอบความรู้ของนักเรียนในเรื่องนั้น ๆ ว่า มีพัฒนาการและความรู้ ความเข้าใจ ความสามารถ และนำความรู้นั้นไปใช้ในชีวิตประจำวัน ทั้งนี้ มีนักการศึกษาได้สรุปหลักในการสร้างแบบฝึกทักษะไว้ดังต่อไปนี้

สุวิทย์ มูลคำ และ สุนันทา สุนทรประเสริฐ (2550) ได้สรุปหลักในการสร้างแบบฝึกทักษะเพิ่มเติมว่า ต้องมีการกำหนดเงื่อนไขที่จะช่วยให้ผู้เรียนทุกคนสามารถผ่านลำดับขั้นตอนของทุกหน่วยการเรียนได้ ถ้านักเรียนได้เรียนตามอัตราการเรียนของตนก็จะทำให้นักเรียนประสบความสำเร็จมากขึ้น ซึ่งการสร้างแบบฝึกทักษะมีขั้นตอนการสร้างคล้ายคลึงกับการสร้างนวัตกรรมทางการศึกษาประเภทอื่น ๆ ดังรายละเอียดต่อไปนี้

1. วิเคราะห์ปัญหาและสาเหตุจากการจัดกิจกรรมการเรียนการสอน เช่น
    1.1 ปัญหาที่เกิดขึ้นในขณะทำการสอน
    1.2 ปัญหาการผ่านจุดประสงค์ของนักเรียน
    1.3 ผลจากการสังเกตพฤติกรรมที่ไม่พึงประสงค์
    1.4 ผลสัมฤทธิ์ทางการเรียน
2. ศึกษารายละเอียดในหลักสูตรเพื่อวิเคราะห์เนื้อหา จุดประสงค์ และกิจกรรม
3. พิจารณาแนวทางแก้ปัญหาที่เกิดขึ้นจากข้อ 1 โดยการสร้างแบบฝึก และเลือกเนื้อหาในส่วนที่จะสร้างแบบฝึกนั้นว่าจะทำเรื่องใด กำหนดเป็นโครงเรื่องไว้
4. ศึกษารูปแบบของการสร้างแบบฝึกจากเอกสารตัวอย่าง
5. ออกแบบชุดฝึกแต่ละชุดให้มีรูปแบบที่หลากหลายน่าสนใจ
6. ลงมือสร้างแบบฝึกในแต่ละชุด พร้อมทั้งข้อทดสอบก่อนและหลังเรียนให้สอดคล้องกับเนื้อหาและจุดประสงค์การเรียนรู้
7. ส่งให้ผู้เชี่ยวชาญตรวจสอบ
8. นำไปทดลองใช้แล้วบันทึกผล เพื่อนำมาปรับปรุงแก้ไขส่วนที่บกพร่อง
9. ปรับปรุงจนมีประสิทธิภาพตามเกณฑ์ที่ตั้งไว้
10. นำไปใช้จริงและเผยแพร่ต่อไป

งานวิจัยที่เกี่ยวข้อง

วรรณาภรณ์ พระเมเด (2562) ได้ศึกษาวิจัยเรื่อง การพัฒนาชุดฝึกทักษะการอ่านและการเขียนภาษาไทยเพื่อแก้ปัญหาการอ่านไม่ออกเขียนไม่ได้ ของนักเรียนระดับประถมศึกษาปีที่ 5 โดยมีวัตถุประสงค์เพื่อ 1) สำรวจคำพื้นฐานภาษาไทยที่เป็นปัญหาต่อการอ่านไม่ออกเขียนไม่ได้ ของนักเรียนระดับชั้นประถมศึกษาปีที่ 5 อำเภอบุณฑริก จังหวัดอุบลราชธานี 2) พัฒนาชุดฝึกทักษะการอ่านและการเขียนภาษาไทย ระดับชั้นประถมศึกษาปีที่ 5 ให้มีประสิทธิภาพตามเกณฑ์ 80/80 3) เพื่อศึกษาผลการใช้ชุดฝึกทักษะการอ่านและการเขียนภาษาไทย ระดับชั้นประถมศึกษาปีที่ 5 ซึ่งผลการวิจัยพบว่า

1) คำพื้นฐานภาษาไทยที่เป็นปัญหาต่อการอ่านออกเขียนได้ของนักเรียนชั้นประถมศึกษาปีที่ 5 มากที่สุด มีจำนวน 150 คำ

2) ชุดฝึกทักษะการอ่านและการเขียนภาษาไทยเพื่อแก้ปัญหาการอ่านไม่ออกเขียนไม่ได้ ของนักเรียนระดับชั้นประถมศึกษาปีที่ 5 ประกอบด้วยแบบฝึกทักษะจำนวน 15 แบบฝึก โดยมีความเหมาะสมอยู่ระหว่าง 4.27 - 4.58 โดยรวมมีความเหมาะสมอยู่ในระดับมากที่สุด และมีประสิทธิภาพเท่ากับ 80.72/80.33

3) นักเรียนที่เรียนรู้ด้วยชุดฝึกทักษะมีผลคะแนนทักษะการอ่านหลังเรียนและทักษะการเขียนหลังเรียนสูงกว่าทักษะการอ่านการเขียนก่อนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และผลการประเมินความเหมาะสมของชุดฝึกทักษะการอ่าน และการเขียนภาษาไทยโดยครูผู้สอนชั้นประถมศึกษาปีที่ 5 โดยรวมอยู่ในระดับมากที่สุด

สุรัสวดี จันทพันธ์ (2566) ได้ศึกษาวิจัยเรื่อง การวิจัยปฏิบัติการเพื่อส่งเสริมการอ่านและการเขียนคำควบกล้ำของนักเรียนระดับชั้นประถมศึกษาปีที่ 6 โรงเรียนบ้านโพนสว่าง โดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกร โดยมีวัตถุประสงค์เพื่อ 1) เปรียบเทียบ

ความสามารถในการอ่านและการเขียนคำควบกล้ำของนักเรียนก่อนและหลังการส่งเสริม โดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกร และเปรียบเทียบหลังการส่งเสริมกับเกณฑ์ร้อยละ 80 ของคะแนนเต็ม และ 2) เปรียบเทียบความก้าวหน้าในการอ่านและการเขียนคำควบกล้ำของนักเรียนหลังการส่งเสริม โดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกร กับเกณฑ์ดัชนีความก้าวหน้าที่ตั้งไว้ร้อยละ 50 ขึ้นไป ซึ่งผลการวิจัยพบว่า

1) นักเรียนกลุ่มเป้าหมายทุกคน คิดเป็นร้อยละ 100 มีความสามารถในการอ่านและการเขียนภายหลังการส่งเสริมโดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกรสูงกว่าก่อนเรียน และผ่านเกณฑ์ที่กำหนดไว้ที่ร้อยละ 80

2) นักเรียนกลุ่มเป้าหมายทุกคน คิดเป็นร้อยละ 100 มีความสามารถในการอ่านและการเขียนภายหลังการส่งเสริมโดยใช้ชุดกิจกรรมการอ่านและการเขียนคำควบกล้ำร่วมกับการเสริมแรงด้วยเบี้ยอรรถกร ผ่านเกณฑ์ดัชนีความก้าวหน้าที่ตั้งไว้ที่ร้อยละ 50 ขึ้นไป

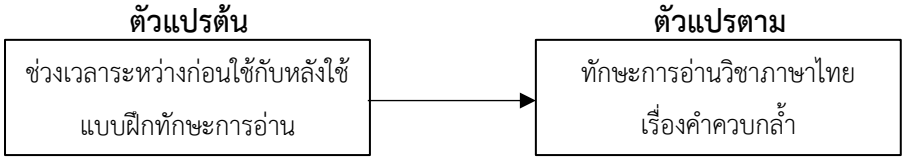
ไหมฟ้า รัตนะ (2566) ได้ศึกษาวิจัยเรื่อง การพัฒนาทักษะการอ่านจับใจความสำคัญวิชาภาษาไทยโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5 มีวัตถุประสงค์เพื่อ 1) เปรียบเทียบทักษะการอ่านจับใจความสำคัญวิชาภาษาไทยโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะระหว่างก่อนและหลังเรียนของนักเรียนชั้นประถมศึกษาปีที่ 5 2) ศึกษาระดับความพึงพอใจ เรื่อง การอ่านจับใจความสำคัญวิชาภาษาไทยโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะระหว่างก่อนและหลังเรียนของนักเรียนชั้นประถมศึกษาปีที่ 5 ซึ่งผลการศึกษาพบว่า

1) เปรียบเทียบทักษะการอ่านจับใจความสำคัญวิชาภาษาไทยโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะระหว่างก่อนและหลังเรียนของนักเรียนชั้นประถมศึกษาปีที่ 5 จากกลุ่มตัวอย่างจำนวน 30 คน พบว่า หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

2) ความพึงพอใจเรื่อง การอ่านจับใจความสำคัญวิชาภาษาไทยโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะระหว่างก่อนและหลังเรียนของนักเรียนชั้นประถมศึกษาปีที่ 5 โดยภาพรวมอยู่ในระดับมากที่สุด

จากการศึกษาเอกสารและงานวิจัยที่เกี่ยวกับการใช้แบบฝึกทักษะ ซึ่งแบบฝึกทักษะถือเป็นเครื่องมือที่มีความสำคัญในการพัฒนาทักษะการเรียนรู้วิชาภาษาไทยของนักเรียน เพราะการทำแบบฝึกซ้ำ ๆ มาก ๆ บ่อย ๆ เป็นการช่วยให้นักเรียนได้นำความรู้ที่เรียนมาแล้วฝึกให้เกิดความรู้ความเข้าใจที่กว้างขวาง และเกิดความชำนาญมากยิ่งขึ้น

กรอบแนวคิดที่ใช้ในการวิจัย



ภาพที่ 1 กรอบแนวคิดที่ใช้ในการวิจัย

วิธีดำเนินการวิจัย

กลุ่มเป้าหมาย

กลุ่มเป้าหมายที่ใช้ในการวิจัยครั้งนี้เป็นนักเรียนระดับชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนวิทยาพิพัฒน์ อำเภอมะนัง จังหวัดสตูล สังกัดสำนักงานการศึกษาเอกชน จังหวัดสตูล จำนวน 1 ห้องเรียน รวมนักเรียน 22 คน ได้มาจากการสุ่มแบบเจาะจง

เครื่องมือที่ใช้ในการวิจัย

1. แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 มีค่าความเที่ยงตรงอยู่ที่ 0.75

2. แผนการจัดการเรียนรู้วิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 จำนวน 2 แผน แผนละ 1 ชั่วโมง รวม 2 ชั่วโมง มีค่าความเที่ยงตรงอยู่ที่ 0.78

3. แบบวัดผลสัมฤทธิ์ทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 ก่อนและหลังเรียนมีค่าความเที่ยงตรงอยู่ที่ 0.75

4. แบบประเมินความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 มีค่าความเที่ยงตรงอยู่ที่ 0.61

การเก็บรวบรวมข้อมูล

1. ทำแบบทดสอบก่อนเรียน โดยใช้แบบวัดผลสัมฤทธิ์ทักษะการอ่านคำควบกล้ำแท้ก่อนเรียนที่ผู้วิจัยสร้างขึ้น โดยใช้เวลา 2 ชั่วโมง

2. ดำเนินการจัดการเรียนรู้ โดยให้นักเรียนกลุ่มเป้าหมายได้เรียนกับแผนการจัดการเรียนรู้ โดยใช้แบบทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4

3. ทำแบบทดสอบก่อนเรียนและหลังเรียน โดยใช้แบบวัดผลสัมฤทธิ์ทักษะการอ่านคำควบกล้ำแท้ก่อนเรียนและหลังเรียนที่ผู้วิจัยสร้างขึ้น

4. นำคะแนนที่ได้จากการทดสอบผลสัมฤทธิ์ทักษะการอ่านคำควบกล้ำแท้หลังเรียนและก่อนเรียนของนักเรียนมาเปรียบเทียบความต่าง

5. วิเคราะห์ข้อมูลและสรุปผล

การวิเคราะห์ข้อมูล

สถิติที่ใช้ในการวิเคราะห์ข้อมูล ดังนี้

1. วิเคราะห์ผลการเปรียบเทียบทักษะการอ่านระหว่างก่อนกับหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 โดยใช้ T-test แบบสองกลุ่มสัมพันธ์ (Dependent Sample t-test)

2. วิเคราะห์ผลการประเมินความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 โดยใช้ ค่าร้อยละ ค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัย

1. ผลการวิเคราะห์เปรียบเทียบทักษะการอ่านระหว่างก่อนและหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4

ตารางที่ 1 การเปรียบเทียบทักษะการอ่านระหว่างก่อนและหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4

คะแนน	n	$\bar{x}$	S.D.	$\bar{d}$	t	p
ทดสอบก่อนเรียน	22	19.50	5.33	7.50	7.60**	.000
ทดสอบหลังเรียน	22	27.00	2.07			

จากตารางที่ 1 พบว่า ผลการเปรียบเทียบทักษะการอ่านระหว่างก่อนกับหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 มีคะแนนเฉลี่ยทดสอบก่อนเรียนเท่ากับ 19.50 ค่าส่วนเบี่ยงเบนมาตรฐาน เท่ากับ 5.33 และมีคะแนนเฉลี่ยทดสอบหลังเรียนเท่ากับ 27.00 ค่าส่วนเบี่ยงเบนมาตรฐาน เท่ากับ 2.07 เมื่อเปรียบเทียบความแตกต่างของคะแนนระหว่างก่อนกับหลังใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 พบว่า นักเรียนมีคะแนนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

2. ผลการประเมินความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่องคำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4

ตารางที่ 2 การประเมินความพึงพอใจของการใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 (n = 22)

รายการ	$\bar{x}$	S.D.	ระดับความพึงพอใจ
1. ด้านเนื้อหา			
1.1 แบบฝึกทักษะมีการกำหนดวัตถุประสงค์ของการเรียนไว้อย่างชัดเจน	4.09	0.53	มาก
1.2 การออกแบบเนื้อหาของแบบฝึกทักษะเหมาะสมกับความสนใจ ความถนัดและความสามารถของนักเรียน	4.36	0.80	มาก
2. ด้านกิจกรรมการเรียนรู้			
2.1 แบบฝึกทักษะมีวิธีการเรียนรู้ที่เหมาะสมกับนักเรียน	4.00	0.76	มาก
2.2 แบบฝึกทักษะมีขั้นตอน หรือกระบวนการที่กระตุ้นให้นักเรียนเกิดการเรียนรู้อย่างมีประสิทธิภาพ	3.60	0.60	มาก
3. ด้านการวัดและการประเมินผล			
3.1 แบบฝึกทักษะสร้างความรู้ให้นักเรียนได้มากขึ้น	4.23	0.53	มาก
3.2 แบบฝึกทักษะใช้วิธีการประเมินผลการเรียนตามสภาพจริง	4.60	0.60	มากสุด
ภาพรวม	**4.13**	**0.43**	**มาก**

จากตารางที่ 2 พบว่า ความพึงพอใจของการใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ของนักเรียนชั้นประถมศึกษาปีที่ 4 โดยภาพรวมอยู่ในระดับมาก ($\overline{X}$ = 4.13, S.D. = 0.43) และเมื่อพิจารณาเป็นรายด้าน พบว่า ด้านที่มีค่าเฉลี่ยมากที่สุด คือ ด้านการวัดและการประเมินผล ($\overline{X}$ = 4.40, S.D. = 0.50) รองลงมาคือ ด้านเนื้อหา ($\overline{X}$ = 4.23, S.D. = 0.53) และ สุดท้ายด้านกิจกรรมการเรียนรู้ ($\overline{X}$ = 3.80, S.D. = 0.53) ตามลำดับ

สรุปผลการวิจัย

จากการทดลองและวิเคราะห์ข้อมูลการวิจัย สามารถสรุปผลการวิจัยได้ดังนี้

1. ผลการเปรียบเทียบทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 หลังใช้แบบฝึกทักษะการอ่านสูงกว่าก่อนใช้แบบฝึกทักษะการอ่านอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

2. ความพึงพอใจของการใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 มีค่าเฉลี่ยโดยรวมเท่ากับ 4.13 อยู่ในระดับมาก

การอภิปรายผล

จากผลการวิจัยพบว่า

1. ผลการเปรียบเทียบทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 4 หลังใช้แบบฝึกทักษะการอ่านสูงกว่าก่อนใช้แบบฝึกทักษะการอ่าน อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 อาจเป็นผลมาจากการใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ ซึ่งจะช่วยให้ผู้เรียนได้นำความรู้ที่เรียนมาแล้ว มาฝึกฝนอย่างเป็นขั้นตอนจากง่ายไปยาก และฝึกฝนอย่างต่อเนื่อง ทำให้ผู้เรียนเกิดความรู้ความเข้าใจที่กว้างขวาง และเกิดความชำนาญมากขึ้น สอดคล้องกับ วรรณาภรณ์ พระเมเด (2562) ที่กล่าวไว้ว่า แบบฝึกทักษะการอ่านจะช่วยให้ผู้เรียนเข้าใจบทเรียนได้ดีขึ้น สามารถจดจำเนื้อหาในบทเรียนและคำศัพท์ต่าง ๆ ได้คงทน ซึ่งสอดคล้องกับ สุรัสวดี จันทพันธ์ (2566) ที่กล่าวไว้ว่า แบบฝึกทักษะการอ่านช่วยให้พฤติกรรมการเรียนรู้ของผู้เรียนบรรลุจุดประสงค์ที่กำหนดไว้ และ ไหมฟ้า รัตนะ (2566) ที่ชี้ให้เห็นว่า การใช้แบบฝึกทักษะการอ่านช่วยให้ผู้เรียนพัฒนาทักษะการอ่านได้ดียิ่งขึ้น

2. ผลการศึกษาความพึงพอใจของแบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ โดยใช้แบบฝึกทักษะการอ่าน ของนักเรียนชั้นประถมศึกษาปีที่ 4 พบว่า นักเรียนมีความพึงพอใจในระดับมาก ทั้งนี้ เนื่องจากแบบฝึกทักษะการอ่านที่ผู้วิจัยสร้างขึ้นเป็นแบบฝึกทักษะที่นำบทอ่าน และนิทานที่มีเนื้อเรื่องสนุกสนาน อ่านง่าย เหมาะสำหรับนักเรียนในระดับชั้นดังกล่าว ซึ่งเป็นไปตามทฤษฎีความพึงพอใจของ Michael Beer Beer (1964 อ้างใน ไหมฟ้า รัตนะ, 2566) ที่กล่าวว่า ความพึงพอใจเป็นทัศนคติของคนที่มีต่อสิ่งใดสิ่งหนึ่ง ดังนั้นจึงต้องกระทำด้วยวิธีใดวิธีหนึ่ง เพื่อตอบสนองความต้องการหรือสิ่งที่คาดหวังเอาไว้ เมื่อได้รับการตอบสนองตามที่คาดหวังไว้ บุคคลนั้นก็จะได้รับความพึงพอใจสูงขึ้นเรื่อย ๆ และสอดคล้องกับ ไหมฟ้า รัตนะ (2566) ได้ทำวิจัยเรื่อง การพัฒนาทักษะการอ่านจับใจความสำคัญวิชาภาษาไทยโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะ ของนักเรียนชั้นประถมศึกษาปีที่ 5 ผลการวิจัยพบว่า ความพึงพอใจเรื่องการอ่านจับใจความสำคัญโดยการสอนแบบเพื่อนช่วยเพื่อนร่วมกับแบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 5 ภาพรวมอยู่ในระดับมากที่สุด

ข้อเสนอแนะ

1. ควรจัดกิจกรรมการอ่านคำควบกล้ำควบคู่กับกับการเขียน เพื่อให้นักเรียนอ่านออกเสียงและเขียนได้อย่างถูกต้อง

2. ควรทำการศึกษากระบวนการจัดการเรียนรู้อื่น ๆ ร่วมกับการใช้แบบฝึกทักษะการอ่านวิชาภาษาไทย เรื่อง คำควบกล้ำแท้ เพื่อให้ผู้เรียนได้พัฒนาทักษะการอ่านได้อย่างมีประสิทธิภาพมากขึ้น

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การพัฒนาผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหาร โดยใช้วัตถุดิบท้องถิ่น นักเรียนชั้นมัธยมศึกษาปีที่ 5

The Development of Academic Achievement in the Food for Business about Creating Food Recipes Using Local Ingredients for Mathayom 5 Students

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บทคัดย่อ

การวิจัยครั้งนี้ มีจุดประสงค์เพื่อ 1) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 กับเกณฑ์ร้อยละ 70 และ 2) ศึกษาความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ ได้แก่ นักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนเทศบาล 6 (วัดตันตยาภิรม) จังหวัดตรัง ภาคเรียนที่ 2 ปีการศึกษา 2566 ที่เรียนรายวิชาอาหารเพื่อธุรกิจ จำนวน 10 คน ได้มาจากวิธีการเลือกแบบเจาะจง เครื่องมือที่ใช้ในการวิจัย ได้แก่ 1) แผนการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าความเที่ยงตรงอยู่ที่ 0.87 2) แบบประเมินผลงานเพื่อวัดความคิดสร้างสรรค์ มีค่าความเที่ยงตรงอยู่ที่ 0.83 และ 3) แบบวัดความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าความเที่ยงตรงอยู่ที่ 0.87

ผลการวิจัยพบว่า

1) ผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่น มีค่าคะแนนเฉลี่ยเท่ากับ 8.50 มีค่าคะแนนเฉลี่ยสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001

2) ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าเฉลี่ย ($\bar{X}$ = 4.66) อยู่ในระดับมากที่สุด

ประโยชน์ของการวิจัย เป็นแนวทางการจัดกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่น เรื่อง การสร้างสรรค์สูตรอาหาร รายวิชาอาหารเพื่อธุรกิจ

คำสำคัญ: ผลสัมฤทธิ์ทางการเรียน, วัตถุดิบท้องถิ่น, ความพึงพอใจ

Abstract

The purposes of this research are to 1) Compare academic achievement in the food for business subject, about creating food recipes using local ingredients of Mathayom 5 students with the criteria of 70 percent and 2) To study the satisfaction of Mathayom 5 students with learning management, about creating food recipes using local ingredients. The sample group used in this research includes Mathayom 5 students at Thesaban 6 School (Wat Tantayapirom), Trang Province, Semester 2, academic year 2023, with 10 students studying food for business were obtained through a purposive selection method. The tools used in the research include 1) Learning management plan, bout creating food recipes using local ingredients It has a precision value of 0.87 2) Performance evaluation form to measure creativity has a precision value of 0.83 and 3) Measurement of satisfaction of Mathayom 5 students with learning management, about creating food recipes using local ingredients It has a precision value of 0.87

The research results found that

1) Academic achievement in the food for business subject of Mathayom 5 students after teaching activities using local ingredients. The average score was 8.50 with the average score higher than 70 percent at the statistical significance level of 0.001

2) The satisfaction of Mathayom 5 students with learning management, about creating food recipes using local ingredients, the average value ($\bar{x}$=4.66) was at the highest level.

Benefits of research it is a guideline for organizing teaching and learning activities using local ingredients, about creating food recipes food for business subject.

Keywords: Learning Achievements, Local Ingredient, Satisfaction

บทนำ

การศึกษาเป็นสิ่งสำคัญ เป็นกระบวนการที่มุ่งพัฒนาคนให้เป็นมนุษย์ที่มีคุณภาพ มีความสามารถเต็มศักยภาพ การศึกษาเป็นกระบวนการถ่ายทอดและเรียนรู้ในการที่จะสร้างสรรค์ และพัฒนาคนทั้งในแง่ความรู้ ความคิด ตลอดจนคุณธรรมและจริยธรรม เพื่อให้สามารถดำรงชีวิตอยู่ในสังคมได้อย่างมีความสุข สามารถสนองตอบทิศทางในการพัฒนาเศรษฐกิจและสังคมของประเทศชาติ ซึ่งประเทศที่ต้องการความก้าวหน้าต่างให้ความสำคัญกับการพัฒนาคนโดยอาศัยการศึกษาเป็นเครื่องมือ ในสถานการณ์โลกยุคศตวรรษที่ 21 ที่มีการเปลี่ยนแปลงไปอย่างรวดเร็วตลอดเวลา ทั้งด้านเทคโนโลยี การสื่อสาร การเรียนรู้สิ่งต่าง ๆ ซึ่งมีผลทำให้แนวคิด ค่านิยม ตลอดจนวิถีการดำรงชีวิตของคนไทยเปลี่ยนแปลงไปจากเดิม รูปแบบการจัดการศึกษาจึงจำเป็นต้องมีการพัฒนาและเปลี่ยนแปลง เพื่อให้ทันกับสภาพที่เปลี่ยนแปลงไปในสังคม ต้องเป็นการจัดการศึกษาที่เน้นผู้เรียนเป็นสำคัญ เน้นการสร้างนวัตกรรม หรือผลผลิตตามความสนใจ โดย

ใช้เทคโนโลยีเป็นเครื่องมือช่วยสนับสนุนในการสร้างความรู้

ความสามารถในการคิดวิเคราะห์ คิดสังเคราะห์ มีวิจารณญาณ มีความคิดสร้างสรรค์ คิดไตร่ตรองนั้น ถือว่าทักษะเหล่านี้เป็นทักษะการเรียนรู้ในศตวรรษที่ 21 ดังที่ วิจารณ์ พานิช (2556) กล่าวถึงการศึกษาในศตวรรษที่ 21 จะส่งเสริมให้ผู้เรียนเป็นศูนย์กลางของการเรียนรู้ในการพัฒนาทักษะต่าง ๆ โดยเฉพาะความคิดสร้างสรรค์ เพื่อผู้เรียนจะได้นำความรู้ที่ได้ไปใช้ได้อย่างสร้างสรรค์ และทำงานได้อย่างมีประสิทธิภาพในอนาคต จึงกล่าวได้ว่า ความคิดสร้างสรรค์ถือเป็นทักษะที่สำคัญทักษะหนึ่งที่ควรส่งเสริมให้เกิดขึ้นในการพัฒนาผู้เรียนในยุคศตวรรษที่ 21 ซึ่งสอดคล้องกับความคิดเห็นของ อารี พันธ์มณี (2557) ที่กล่าวว่า ความคิดสร้างสรรค์ถือเป็นการค้นพบสิ่งแปลกใหม่ สามารถคิดค้นสิ่งประดิษฐ์ที่ทันสมัยอยู่ตลอดเวลา รวมทั้งการค้นพบแนวคิดทฤษฎีที่เป็นประโยชน์อย่างมากทำให้มนุษย์สามารถปรับปรุงเปลี่ยนแปลงสิ่งต่าง ๆ ที่อยู่รอบตัวไปในทางสร้างสรรค์และสามารถเชื่อมโยงให้เข้ากับสถานการณ์ใหม่ ๆ ได้ ความคิดสร้างสรรค์จึงมีความสามารถสำคัญที่ทำให้ได้ใช้ความคิดและจินตนาการควบคู่กัน เพื่อที่จะสร้างสรรค์สิ่งใหม่ ๆ ให้เกิดขึ้น ความคิดสร้างสรรค์จึงเป็นพลังความคิดที่สำคัญหากได้รับการกระตุ้น และส่งเสริมพัฒนาอย่างเหมาะสมก็จะเกิดประโยชน์อย่างมาก ถ้ามีคนในสังคมที่มีความคิดสร้างสรรค์สูงก็จะเป็นแรงขับเคลื่อนทำให้เกิดการพัฒนาและเจริญก้าวหน้าอย่างรวดเร็ว การพัฒนาให้บุคคลมีความคิดสร้างสรรค์จึงเป็นเป้าหมายที่สำคัญอย่างยิ่งของสังคมและประเทศชาติ (วิจารณ์ พานิช, 2556)

ในการจัดการเรียนการสอนรายวิชาอาหารเพื่อธุรกิจ กลุ่มสาระการเรียนรู้การงานอาชีพ พบว่านักเรียนมักสร้างสรรค์ผลิตภัณฑ์จากประสบการณ์เดิมโดยขาดความคิดสร้างสรรค์ เช่น การนำผลงานในท้องตลาด ผลงานจากรุ่นพี่ หรือผลงานที่นักเรียนเคยพบเห็น มาดัดแปลงให้กลายเป็นผลงานของตนเอง โดยการเปลี่ยนวัตถุดิบในการผลิต ปรับปรุงสูตรอาหารไม่ให้ซ้ำเดิม ซึ่งแสดงให้เห็นว่านักเรียนไม่สามารถประยุกต์ใช้ความคิดสร้างสรรค์ที่มีอยู่สร้างผลิตภัณฑ์ใหม่ได้

ด้วยสาเหตุดังกล่าว จะเห็นได้ว่าความคิดสร้างสรรค์มีสำคัญต่อนักเรียนที่เรียนรายวิชาอาหารเพื่อธุรกิจเป็นอย่างมาก เนื่องจากวัตถุประสงค์หลักในการจัดการเรียนการสอนรายวิชาอาหารเพื่อธุรกิจนั้น ต้องการให้นักเรียนสามารถสร้างสรรค์สูตรได้ โดยความคิดสร้างสรรค์เป็นกระบวนการทางปัญญาระดับสูงที่ใช้กระบวนการทางความคิดหลาย ๆ อย่างมารวมกัน ซึ่งประกอบด้วย ความคิดคล่องแคล่ว (Fluency) ความคิดยืดหยุ่น (Flexibility) ความคิดริเริ่ม (Originality) และความคิดละเอียดลออ (Elaboration) ของผู้เรียนที่แสดงออกมา ความคิดสร้างสรรค์ถือว่าเป็นคุณลักษณะทางความคิดอย่างหนึ่งที่สำคัญต่อผู้เรียน ซึ่งการสอนความคิดสร้างสรรค์และการฝึกฝนให้ผู้เรียนสามารถคิดอย่างสร้างสรรค์ เป็นส่วนหนึ่งที่ช่วยยกระดับคุณภาพของผู้เรียน ทำให้ผู้เรียนมีชีวิตอย่างมั่นใจในตนเอง และมีคุณภาพมากขึ้น (สำนักงานเลขาธิการสภาการศึกษา, ม.ป.ป.) จากปัญหาดังกล่าวผู้ศึกษาค้นคว้าจึงได้หาวิธีการและแนวทางแก้ปัญหาที่เกิดขึ้น เพื่อให้นักเรียนสามารถคิดอย่างสร้างสรรค์ได้ดียิ่งขึ้น

ผู้วิจัยเห็นว่า ความคิดสร้างสรรค์มีความจำเป็นควรส่งเสริมให้เกิดกับผู้เรียนในยุคปัจจุบัน ด้วยเหตุนี้ผู้วิจัยจึงสนใจใช้วิธีการจัดการเรียนรู้โดยการนำวัตถุดิบท้องถิ่นมาใช้แทนการนำวัตถุดิบทั่วไป เพื่อให้นักเรียนสามารถเชื่อมโยงความรู้เกี่ยวกับวัตถุดิบท้องถิ่นผ่านการสร้างสรรค์สูตรอาหาร โดยทำการวิจัยเรื่อง การพัฒนาผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่องการสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 เพื่อนำผลการศึกษาไปเป็นแนวทางในการพัฒนาการจัดการเรียนรู้ ในรายวิชาอาหารเพื่อธุรกิจให้มีประสิทธิภาพมากยิ่งขึ้นต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 กับเกณฑ์ร้อยละ 70

2. เพื่อศึกษาความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดเกี่ยวกับความคิดสร้างสรรค์

ความคิดสร้างสรรค์เป็นความสามารถทางสมองของมนุษย์ที่สามารถคิดค้นและผลิตสิ่งแปลกใหม่ที่มีคุณค่า มีนักการศึกษาหลายท่านได้มองเห็นคุณค่าของความคิดสร้างสรรค์ และได้ให้ความหมายของความคิดสร้างสรรค์ไว้ในแง่มุมต่าง ๆ ดังนี้

กิลฟอร์ด (Guilford, 1967 อ้างถึงใน กนิษฐา ชูขันธ์, 2541) กล่าวว่า ความคิดสร้างสรรค์เป็นความคิดแบบอเนกนัย คือ ความคิดหลายทิศทาง หลายแง่ หลายมุม คิดได้กว้างไกล ลักษณะความคิดเช่นนี้จะนำไปสู่การประดิษฐ์สิ่งแปลกใหม่

ทอแรนซ์ (Torrance, 1962 อ้างถึงใน สุเมตตา คงสง, 2543) กล่าวว่า ความคิดสร้างสรรค์เป็นกระบวนการของความรู้สึกที่มีต่อปัญหา สิ่งที่ขาดหายไป หรือสิ่งที่ยังไม่ประสานกันแล้วเกิดความพยายามที่จะสร้างแนวคิด ตั้งสมมุติฐาน ทดสอบสมมุติฐาน นำเสนอผลที่ได้ให้ผู้อื่นได้รับรู้และเข้าใจ อันเป็นแนวทางค้นพบสิ่งใหม่ต่อไป

ทวีศักดิ์ จินดานุรักษ์ (2559) กล่าวว่า การคิดสร้างสรรค์ (Creative Thinking) เป็นการคิดประเภทหนึ่ง มีลักษณะเป็นการคิดนอกกรอบจากความคิดเดิมที่มีจุดมุ่งหมายเพื่อให้ได้ความคิดใหม่ ความคิดริเริ่มหรือความคิดต้นแบบ ซึ่งสามารถนำไปใช้ประโยชน์ได้ดี ดังนั้นความคิดสร้างสรรค์จึงเป็นสิ่งที่มนุษย์ทุกคนมีอยู่ และสามารถพัฒนาได้ หากว่าใช้รูปแบบที่มีความเหมาะสมจะก่อให้เกิดความเจริญก้าวหน้าและเพื่อสรรค์สร้างความเจริญต่อไป

ชาญณรงค์ พรรุ่งโรจน์ (2546) กล่าวว่า ความคิดสร้างสรรค์หมายถึง ความสามารถของสมองที่คิดได้กว้างไกลหลายแง่มุม เรียกว่า ความคิดแบบอเนกนัย ซึ่งทำให้เกิดความคิดแปลกใหม่แตกต่างไปจากเดิม เป็นความสามารถในการมองเห็นความสัมพันธ์ของสิ่งต่าง ๆ รวมตัวเกิดการเรียนรู้เข้าใจ จนเกิดปฏิกิริยาตอบสนองให้เกิดความคิดเชิงจินตนาการ ซึ่งเป็นลักษณะสำคัญของความคิดสร้างสรรค์อันจะนำไปสู่การประดิษฐ์หรือคิดค้นสิ่งแปลกใหม่ หรือเพื่อการแก้ไขปัญหา ซึ่งจะต้องอาศัยการบูรณาการจากประสบการณ์และความรู้ทั้งหมดที่ผ่านมา

วิทยากร เชียงกูล (2551) กล่าวว่า ความคิดสร้างสรรค์หมายถึง ความคิดที่แปลกแตกต่าง เป็นสิ่งใหม่ และเป็นประโยชน์ต่อมนุษย์ชาติ

แพง ชินพงศ์ (2551) กล่าวว่า ความคิดสร้างสรรค์หมายถึง ความสามารถในการคิดได้หลายทิศทาง การคิดริเริ่ม การใช้จินตนาการในการคิดประดิษฐ์สิ่งใหม่ ๆ ที่ไม่เคยมีมาก่อนตลอดจนการคิดปรับปรุงดัดแปลงสิ่งที่มีอยู่แล้วให้กลายเป็นสิ่งใหม่ที่ไม่ซ้ำกับใคร

สุภาวดี หาญเมธี (2551) กล่าวว่า ความคิดสร้างสรรค์หมายถึง กระบวนการคิดของสมองมนุษย์ซึ่งมีความสามารถในการคิดได้หลากหลายและแปลกใหม่จากเดิม โดยสามารถนำไปประยุกต์ทฤษฎีหรือหลักการได้อย่างรอบคอบ และมีความถูกต้องจนนำไปสู่การคิดค้นต่อยอดจากความคิดเดิมและสร้าง

สิ่งประดิษฐ์ที่แปลกใหม่หรือรูปแบบความคิดใหม่

องค์ประกอบของความคิดสร้างสรรค์

กิลฟอร์ด (Guilford, 1969 อ้างถึงใน อารี พันธ์มณี, 2557) กล่าวว่า ความคิดสร้างสรรค์เป็นลักษณะการคิดแบบอเนกนัย ซึ่งประกอบด้วยองค์ประกอบ 4 ประการ คือ

1. ความคิดคล่องแคล่ว (Fluency) หมายถึง ความสามารถของบุคคลในการคิดหาคำตอบได้อย่างคล่องแคล่ว รวดเร็ว และมีปริมาณที่มากในเวลาที่จำกัด แบ่งเป็นความคิดคล่องแคล่วทางด้านถ้อยคำเป็นความสามารถในการใช้ถ้อยคำอย่างคล่องแคล่ว, ความคิดคล่องแคล่วทางการแสดงออกเป็นความสามารถในการใช้วลีหรือประโยค และนำคำมาเรียงกันอย่างรวดเร็วเพื่อให้ได้ประโยคที่ต้องการ และความคิดคล่องแคล่วในการคิดเป็นความสามารถที่จะคิดในสิ่งที่ต้องการภายในเวลาที่กำหนด

2. ความคิดยืดหยุ่น (Flexibility) หมายถึง ความสามารถของบุคคลในการคิดหาคำตอบได้หลายประเภทและหลายทิศทาง แบ่งออกเป็น ความคิดยืดหยุ่นที่เกิดขึ้นทันที เป็นความสามารถที่จะคิดได้หลายอย่างอย่างอิสระ และความคิดยืดหยุ่นทางด้านการดัดแปลง เป็นความสามารถที่จะคิดได้หลากหลาย และสามารถคิดดัดแปลงจากสิ่งหนึ่งไปเป็นหลายสิ่งได้ ซึ่งคนที่มีความคิดยืดหยุ่นจะคิดได้ไม่ซ้ำกัน

3. ความคิดริเริ่ม (Originality) หมายถึง ลักษณะความคิดที่แปลกใหม่และแตกต่างไปจากความคิดธรรมดา เป็นความคิดที่เป็นประโยชน์ต่อตนเองและสังคม ความคิดริเริ่มอาจเกิดจากการนำเอาความรู้เดิมมาคิดดัดแปลงประยุกต์ให้เกิดเป็นสิ่งใหม่ขึ้น

4. ความคิดละเอียดลออ (Elaboration) หมายถึง ความคิดในรายละเอียดเพื่อตกแต่งหรือขยายความคิดหลักให้ได้ความหมายสมบูรณ์ยิ่งขึ้น ความคิดละเอียดลออเป็นคุณลักษณะที่จำเป็นอย่างยิ่งในการสร้างผลงานที่มีความแปลกใหม่ให้สำเร็จ

แนวทางการส่งเสริมและพัฒนาความคิดสร้างสรรค์

ความคิดสร้างสรรค์ เป็นความสามารถที่มีอยู่ในตัวบุคคลทุกคน สามารถสอน แนะนำ ส่งเสริมและพัฒนาให้เกิดความคิดสร้างสรรค์ในระดับที่สูงขึ้นได้ มีนักการศึกษาได้ให้แนวคิดเกี่ยวกับแนวทางการส่งเสริมและการพัฒนาความคิดสร้างสรรค์ไว้ ดังนี้

ฮอลล์แมน (Hallman, 1971 อ้างถึงใน สายสุนีย์ กลิ่นสุคนธ์, 2545) ได้ให้ข้อเสนอในการพัฒนาความคิดสร้างสรรค์แก่นักเรียน 12 ประการ ดังนี้

1. ให้นักเรียนได้มีโอกาสเรียนรู้ด้วยความคิดริเริ่มของตัวเอง ซึ่งจะเป็นการกระตุ้นให้อยากเป็นผู้ค้นพบและอยากทดลอง

2. จัดบรรยากาศในการเรียนรู้แบบเสรีให้นักเรียนมีอิสระในการคิดและการแสดงออกที่มีอิสระในการศึกษาค้นคว้าในกรอบของความสนใจ และความสามารถของเขา

3. สนับสนุนให้นักเรียนเรียนรู้เพิ่มขึ้น โดยการให้ข้อมูลข่าวสารที่กระตุ้นให้นักเรียนเกิดความสนใจที่จะเรียนรู้เพิ่มขึ้นด้วยตนเอง

4. ส่งเสริมกระบวนการคิดสร้างสรรค์ โดยให้นักเรียนคิดหาความสัมพันธ์ระหว่างข้อมูลในรูปแบบที่แปลกใหม่กว่าเดิม ส่งเสริมการคิดจินตนาการ ส่งเสริมให้นักเรียนคิดวิธีการแก้ปัญหาแปลก ๆ ใหม่ ๆ ตลอดจนส่งเสริมให้นักเรียนมีความกล้าเสี่ยงทางสติปัญญา

5. ไม่เข้มงวดกับผลหรือคำตอบหรือข้อสรุปที่ได้จากการค้นพบของนักเรียนมากจนเกินไป ครูต้องไม่ให้ความสำคัญของความคลาดเคลื่อนจนเกินไปนัก ต้องยอมรับว่าความคลาดเคลื่อนและความ

ผิดพลาดนั้นเป็นเรื่องปกติที่เกิดขึ้นได้

6. ส่งเสริมให้นักเรียนมีความยืดหยุ่นทางสติปัญญา โดยยั่วยุให้นักเรียนคิดหาคำตอบหรือแก้ปัญหาหลาย ๆ วิธีด้วยการพยายามคิดหาความหมายใหม่ โดยใช้ประสบการณ์เดิมในบริบทใหม่ ไม่ให้ยึดมั่นกับประสบการณ์เดิมอย่างมั่นคงเพียงด้านเดียว

7. สนับสนุนให้นักเรียนรู้จักประเมินผลสัมฤทธิ์และความก้าวหน้าของตนด้วยตนเอง ให้นักเรียนเกิดความกระตือรือร้นด้วยตนเอง มีความรับผิดชอบ และรู้จักประเมินตนเอง พยายาม หลีกเลี่ยงการใช้เกณฑ์มาตรฐานหรือข้อสอบมาตรฐาน

8. ส่งเสริมให้นักเรียนเป็นผู้ว่องไวต่อการรับรู้ในสิ่งเร้าต่าง ๆ ทั้งในด้านความรู้สึกและปัญหาด้านสังคมและบุคคล

9. ส่งเสริมให้นักเรียนตอบปัญหาประเภทปลายเปิดที่มีความหมายและไม่มีคำตอบที่เป็นจริงที่แน่นอนตายตัว คำถามประเภทนี้จะสนับสนุนให้นักเรียนค้นคว้าหาข้อมูลเพิ่มเติม

10. เปิดโอกาสให้นักเรียนเป็นผู้เตรียมวัสดุอุปกรณ์ ความคิด และเครื่องมือแก้ไขปัญหาด้วยตนเอง ซึ่งจะเป็นการเปิดโอกาสให้นักเรียนได้เข้าใจกระบวนการโดยตลอด

11. ฝึกให้นักเรียนต่อสู้ความล้มเหลวและความคับข้องใจ ผู้ที่มีความคิดสร้างสรรค์จะต้องมีความสามารถที่จะอยู่ในสถานการณ์ที่คลุมเครือ และสามารถจัดการกับสถานการณ์เหล่านั้นได้อย่างเหมาะสม

12. ฝึกให้นักเรียนพิจารณาปัญหาในภาพรวมมากกว่าจะพิจารณาปัญหาย่อย ๆ ให้รู้จักบูรณาการปัญหาและเข้าใจปัญหาเหล่านั้น

แนวคิดความพึงพอใจ

อเนก สุวรรณบัณฑิต และ ภาสกร อดุลพัฒกิจ (2548) กล่าวว่า ความพึงพอใจเป็นระดับของความรู้สึกในทางบวกของบุคคลต่อสิ่งใดสิ่งหนึ่ง เป็นพฤติกรรมการแสดงออกในทางบวกของบุคคลที่เกิดจากการประเมินความแตกต่างระหว่างสิ่งที่คาดหวังกับสิ่งที่ได้รับจริงในสถานการณ์อันหนึ่งอันใด ซึ่งสามารถเปลี่ยนแปลงได้ตามปัจจัยแวดล้อมและสถานการณ์ที่เกิดขึ้น

สุดาพร กุณฑลบุตร (2550) ได้กล่าวว่า ความพึงพอใจ หมายถึง ถ้าบุคคลหนึ่งได้มองเห็นช่องทางหรือโอกาสจะสามารถสนองแรงจูงใจที่ตนมีอยู่แล้วก็จะทำให้ความพึงพอใจของเขาดีขึ้นหรืออยู่ในระดับสูง

จิตตินันท์ นันทไพบูลย์ (2551) ได้กล่าวว่า ความรู้สึกที่เกิดจากความต้องการของบุคคลเมื่อได้รับการตอบสนองตามที่คาดหวังไว้จะก่อให้เกิดความพึงพอใจ จะแสดงออกถึงความรู้สึกชอบ เห็นด้วย ประทับใจ แต่ในทางกลับกันถ้าได้รับการตอบสนองไม่ตรงตามสิ่งที่คาดหวังไว้ก็จะเกิดความไม่พึงพอใจ แสดงความรู้สึกไม่ชอบ ไม่เห็นด้วย

สรุป ความพึงพอใจ หมายถึง ระดับความรู้สึกที่บุคคลประเมินความแตกต่างระหว่างสิ่งที่คาดหวังกับสิ่งที่ได้รับจริงจากสิ่งหนึ่งสิ่งใดหรือจากสถานการณ์ใด ๆ และจะแสดงออกถึงความรู้สึกชอบ เห็นด้วย ไม่เห็นด้วย และไม่ชอบ

งานวิจัยที่เกี่ยวข้อง

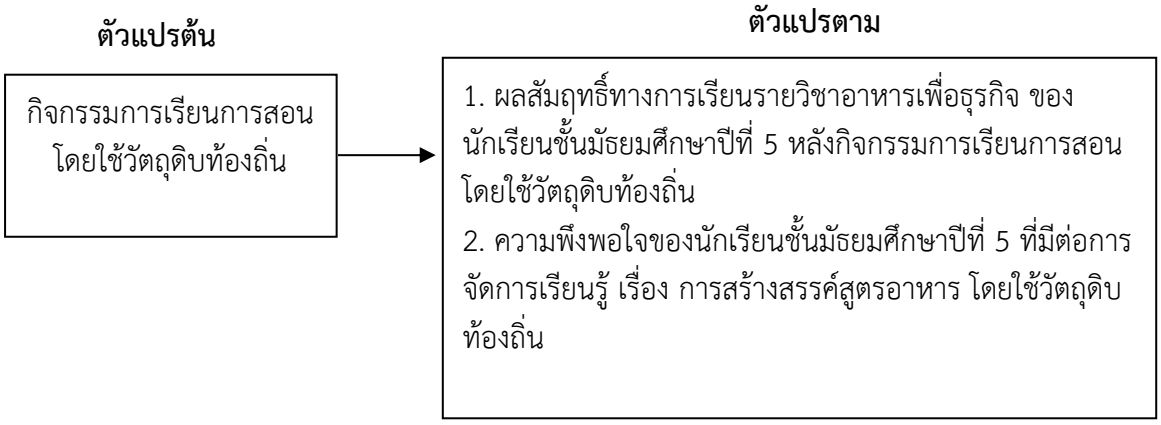
รักษณาลี สวนพลู (2561) ได้ทำการศึกษาเรื่อง การจัดกิจกรรมการเรียนรู้โดยเน้นทักษะกระบวนการทำงานในรายวิชาการงานอาชีพ กลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี ชั้นประถมศึกษาปีที่ 2 ผลการวิจัยพบว่า 1) แผนการจัดการเรียนรู้โดยใช้ทักษะกระบวนการทำงานในรายวิชา

การงานอาชีพ กลุ่มสาระการงานอาชีพและเทคโนโลยี ชั้นประถมศึกษาปีที่ 2 มีประสิทธิภาพ 80.73/82.88 สูงกว่าเกณฑ์ 80/80 ที่กำหนด 2) นักเรียนมีผลสัมฤทธิ์หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยทางสถิติที่ระดับ .05 และมีทักษะกระบวนการทำงาน คิดเป็นร้อยละ 80.73 อยู่ในระดับดีมากและ 3) นักเรียนมีความพึงพอใจต่อการจัดการเรียนโดยเน้นทักษะกระบวนการทำงานอยู่ในระดับมาก

นงลักษณ์ เขียวมณี (2562) ได้ทำการศึกษาเรื่อง การศึกษาผลสัมฤทธิ์ทางการเรียน กลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี และความสามารถในการคิดสร้างสรรค์ ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 โดยวิธีการจัดการเรียนรู้แบบใช้โครงงานเป็นฐาน ผลการวิจัยพบว่า 1) ผลสัมฤทธิ์ทางการเรียนกลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังได้รับวิธีการจัดการเรียนรู้โดยใช้โครงงานเป็นฐาน สูงกว่าเกณฑ์ที่กำหนด คือ ร้อยละ 70 ของคะแนนเต็ม อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 2) ความสามารถในการคิดสร้างสรรค์ กลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี ของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังได้รับวิธีการจัดการเรียนรู้แบบใช้โครงงานเป็นฐานอยู่ในระดับดีมาก

หัทยา อุปแก้ว (2562) ได้ทำการศึกษาเรื่อง การพัฒนาผลสัมฤทธิ์ทางการเรียนและทักษะปฏิบัติ เรื่อง การจัดดอกไม้สด กลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ ชั้นมัธยมศึกษาปีที่ 2 ผลการวิจัยพบว่า 1) กิจกรรมการจัดการเรียนรู้เรื่องการจัดดอกไม้สด โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ มีประสิทธิภาพเท่ากับ 82.32/80.87 ซึ่งสูงกว่าเกณฑ์ที่ตั้งไว้ 2) นักเรียนมีผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังการจัดการเรียนรู้ มีค่าเท่ากับ 24.26 คิดเป็นร้อยละ 80.87 ซึ่งสูงกว่าเกณฑ์ร้อยละ 75 อย่างมีนัยสำคัญทางสถิติที่ .05 3) นักเรียนมีทักษะปฏิบัติ เรื่อง การจัดดอกไม้สด โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ สูงกว่าเกณฑ์ร้อยละ 75 และ 4) นักเรียนมีความพึงพอใจต่อการจัดกิจกรรมการเรียนรู้เรื่อง การจัดดอกไม้สด โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ อยู่ในระดับมากที่สุด ซึ่งมีค่าเฉลี่ย 4.58 และมีส่วนเบี่ยงเบนมาตรฐาน 0.58

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่างในการวิจัย

ประชากรที่ใช้ในการวิจัยครั้งนี้เป็นนักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนเทศบาล 6 (วัดตันตยาภิรม) จังหวัดตรัง ปีการศึกษา 2566

กลุ่มตัวอย่างที่ใช้ในการศึกษาครั้งนี้ ได้แก่ นักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนเทศบาล 6 (วัดตันตยาภิรม) จังหวัดตรัง ที่เรียนรายวิชาอาหารเพื่อธุรกิจ ในภาคเรียนที่ 2 ปีการศึกษา 2566 โดยใช้วิธีการเลือกแบบเจาะจง จำนวน 10 คน โดยมีรูปแบบการวิจัยแบบ (One Group Posttest Only Design) คือ เป็นการศึกษากลุ่มทดลองกลุ่มเดียว

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าความเที่ยงตรงอยู่ที่ 0.87

2. แบบประเมินผลงานเพื่อวัดความคิดสร้างสรรค์ มีค่าความเที่ยงตรงอยู่ที่ 0.83 มาเปรียบเทียบกับเกณฑ์เป็นร้อยละ 70 ใช้สถิติเทียบกับเกณฑ์ที่กำหนดตามหลักสูตรของโรงเรียนเทศบาล 6 (วัดตันตยาภิรม) พุทธศักราช 2563 แนวการปฏิบัติการวัดผลมีดังนี้

ร้อยละ 70 ขึ้นไป	หมายถึง ดีเยี่ยม
ร้อยละ 60-69	หมายถึง ดี
ร้อยละ 50-59	หมายถึง พอใช้
ต่ำกว่าร้อยละ 50	หมายถึง ไม่ผ่าน

3. แบบวัดความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น เป็นมาตราส่วนประมาณค่า 5 ระดับ ได้แก่ ระดับที่ 1 พึงพอใจน้อยที่สุด ระดับที่ 2 พึงพอใจน้อย ระดับที่ 3 พึงพอใจปานกลาง ระดับที่ 4 พึงพอใจมาก และระดับที่ 5 พึงพอใจมากที่สุด มีค่าความเที่ยงตรงอยู่ที่ 0.87

การเก็บรวบรวมข้อมูล

วิธีดำเนินการวิจัยเชิงทดลองการพัฒนาผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น นักเรียนชั้นมัธยมศึกษาปีที่ 5 ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 10 คน มีวิธีดำเนินการวิจัยดังนี้

1. ขั้นเตรียม

ผู้สอนจัดเตรียมแผนการสอนและรายละเอียด เกี่ยวกับการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น นักเรียนชั้นมัธยมศึกษาปีที่ 5

2. ขั้นทดลอง

การวิจัยในครั้งนี้ ดำเนินการทดลองในภาคเรียนที่ 2 ปีการศึกษา 2566 โดยคณะผู้วิจัยดำเนินการสอนตามแผนจัดการเรียนรู้รายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น จำนวน 1 แผนจัดการเรียนรู้ รวม 4 ชั่วโมง โดยให้นักเรียนทำกิจกรรมจากนั้น ครูประเมินผลงานโดยใช้แบบประเมินผลงานเพื่อวัดความคิดสร้างสรรค์ รายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น นักเรียนชั้นมัธยมศึกษาปีที่ 5

3. ขั้นสรุป

หลังการจัดกิจกรรมการเรียนรู้ครบทั้ง 4 ชั่วโมงเรียบร้อยแล้ว ผู้วิจัยได้ดำเนินการให้นักเรียนชั้นมัธยมศึกษาปีที่ 5 ทำแบบสอบถามความพึงพอใจต่อการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น

การวิเคราะห์ข้อมูล

สถิติที่ใช้ในการวิเคราะห์ข้อมูล ดังนี้

1. วิเคราะห์และเปรียบผลสัมฤทธิ์ทางการเรียน รายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่นเทียบกับเกณฑ์ร้อยละ 70 โดยใช้ One Sample t-test

2. วิเคราะห์แบบประเมินความพึงพอใจต่อการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น โดยใช้ ค่าร้อยละ ค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน ผู้วิจัยมีเกณฑ์การแปลความหมาย ดังนี้

ค่าเฉลี่ย 4.51 – 5.00 หมายถึง พึงพอใจมากที่สุด
ค่าเฉลี่ย 3.51 – 4.50 หมายถึง พึงพอใจมาก
ค่าเฉลี่ย 2.51 – 3.50 หมายถึง พึงพอใจปานกลาง
ค่าเฉลี่ย 1.51 – 2.50 หมายถึง พึงพอใจน้อย
ค่าเฉลี่ย 1.00 – 1.50 หมายถึง พึงพอใจน้อยที่สุด

ผลการวิจัย

ตารางที่ 1 แสดงผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่นเทียบกับเกณฑ์ร้อยละ 70

รายการ	เกณฑ์	$\bar{x}$	$S.D.$	t	P
คะแนนเฉลี่ยผลสัมฤทธิ์ทางการเรียน	7	8.50	0.53	9.00	.000***

***p < .001

จากตารางที่ 1 พบว่า ผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่นเทียบกับเกณฑ์ร้อยละ 70 มีคะแนนเฉลี่ยเท่ากับ 8.5 ซึ่งสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001

ตารางที่ 2 แสดงผลความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่องการสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น ชั้นมัธยมศึกษาปีที่ 5

รายการประเมิน	$\bar{x}$	$S.D.$	แปลความ
ด้านครูผู้สอน			
1. ครูได้อธิบายวัตถุประสงค์การเรียนรู้ก่อนสอนอย่างชัดเจน	4.73	0.46	มากที่สุด
2. ครูให้คำปรึกษา แนะนำ และดูแลนักเรียนอย่างทั่วถึง	4.60	0.51	มากที่สุด

รายการประเมิน	$\bar{x}$	$S.D.$	แปลความ
3. ครูกระตุ้นให้นักเรียนความกระตือรือร้นและมีส่วนร่วมในกิจกรรมการเรียนรู้	4.60	0.51	มากที่สุด
4. ครูเปิดโอกาสให้นักเรียนได้ซักถาม เมื่อนักเรียนมีปัญหาหรือข้อสงสัย	4.60	0.51	มากที่สุด
5. ครูมีกระบวนการสอนอย่างเป็นระบบ มีขั้นตอน การสอนที่ชัดเจน และอธิบายเนื้อหาให้นักเรียนเข้าใจ	4.53	0.52	มากที่สุด
ค่าเฉลี่ย	**4.83**	**0.13**	**มากที่สุด**
ด้านการจัดกิจกรรม			
6. นักเรียนมีส่วนร่วมในกิจกรรมการเรียนรู้และสนุกสนานในการเรียนมากขึ้น	4.73	0.46	มากที่สุด
7. ขั้นตอนการจัดกิจกรรมการเรียนรู้เรียงลำดับจากง่ายไปยาก	4.60	0.51	มากที่สุด
8. กิจกรรมการเรียนรู้ส่งเสริมให้นักเรียนมีกระบวนการคิด วิเคราะห์และการตัดสินใจ ทำให้นักเรียนกล้าแลกเปลี่ยนความคิด และกล้าตอบคำถามมากขึ้น	4.67	0.49	มากที่สุด
9. การจัดกิจกรรมการเรียนรู้มีความสอดคล้องและเหมาะสมกับเนื้อหา	4.67	0.49	มากที่สุด
10. กิจกรรมการเรียนรู้เปิดโอกาสให้นักเรียนได้ลงมือปฏิบัติจริงเพื่อเสริมสร้างความรู้ความเข้าใจ	4.67	0.49	มากที่สุด
ค่าเฉลี่ย	**4.87**	**0.14**	**มากที่สุด**
ด้านประโยชน์ที่ได้รับ			
11. นักเรียนได้ฝึกทักษะความคิดสร้างสรรค์ สามารถนำความรู้ไปประยุกต์ใช้ในการทำงานอื่นส่งผลให้งานมีประสิทธิภาพมากขึ้น	4.80	0.41	มากที่สุด
12. นักเรียนได้ฝึกทักษะการปฏิบัติงานด้านงานอาหาร	4.67	0.49	มากที่สุด
13. ช่วยให้นักเรียนสามารถจัดการปัญหาที่เกิดขึ้นได้ดีด้วยวิธีที่เหมาะสม	4.60	0.51	มากที่สุด
14. นักเรียนสนุกและมีความสุขในการเรียนรู้	4.87	0.35	มากที่สุด
15. การจัดการเรียนรู้ช่วยให้นักเรียนรู้จักและเข้าใจเพื่อนร่วมชั้นเรียนมากขึ้น	4.60	0.51	มากที่สุด
ค่าเฉลี่ย	**4.84**	**0.15**	**มากที่สุด**
ค่าเฉลี่ยรวม	**4.66**	**0.10**	**มากที่สุด**

จากตารางที่ 2 พบว่า ผลประเมินความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น ชั้นมัธยมศึกษาปีที่ 5 โดยภาพรวม ($\bar{x}$ = 4.66, S.D. = 0.10) อยู่ในระดับมากที่สุด และเมื่อพิจารณาเป็นรายด้าน พบว่า ด้านที่มีค่าเฉลี่ย ($\bar{x}$ = 4.87, S.D. = 0.14) คือ ด้านการจัดกิจกรรมอยู่ในระดับมากที่สุด รองลงมาค่าเฉลี่ย ($\bar{x}$ = 4.84, S.D. = 0.15) คือ ด้านประโยชน์ที่ได้รับอยู่ในระดับมากที่สุด และลำดับสุดท้ายค่าเฉลี่ย ($\bar{x}$ = 4.83, S.D. = 0.13) คือ ด้านครูผู้สอนอยู่ในระดับมากที่สุด ตามลำดับ

สรุปผลการวิจัย

จากผลการวิจัย พบว่า

1. ผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่น มีค่าคะแนนเฉลี่ยเท่ากับ 8.50 มีค่าคะแนนเฉลี่ยสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001

2. ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าเฉลี่ย ($\bar{X}$=4.66) อยู่ในระดับมากที่สุด

การอภิปรายผล

ผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่น มีค่าคะแนนเฉลี่ยเท่ากับ 8.50 มีค่าคะแนนเฉลี่ยสูงกว่าเกณฑ์ร้อยละ 70 อย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ผลเป็นเช่นนี้เพราะการจัดการเรียนรู้โดยใช้วัตถุดิบท้องถิ่นมีความน่าสนใจ นักเรียนสนุกกับการเรียน และเกิดการเรียนรู้สามารถเชื่อมโยงความรู้ที่ได้รับไปสู่การคิดสร้างสรรค์ได้ดียิ่งขึ้น ทำให้นักเรียนสามารถสร้างสรรค์สูตรอาหารขึ้นได้ ส่งผลให้ผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังกิจกรรมการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่นสูงกว่าเกณฑ์ที่กำหนด ซึ่งสอดคล้องกับงานวิจัยของ หัทยา อุปแก้ว (2562) ได้ทำการวิจัยเรื่อง การพัฒนาผลสัมฤทธิ์ทางการเรียนและทักษะปฏิบัติ เรื่อง การจัดดอกไม้สด กลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ ชั้นมัธยมศึกษาปีที่ 2 ผลการวิจัยพบว่า นักเรียนมีผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังการจัดการเรียนรู้ มีค่าเท่ากับ 24.26 คิดเป็นร้อยละ 80.87 ซึ่งสูงกว่าเกณฑ์ร้อยละ 75 อย่างมีนัยสำคัญทางสถิติที่ .05

ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าเฉลี่ย ($\bar{X}$ = 4.66) อยู่ในระดับมากที่สุด ผลเป็นเช่นนี้เพราะว่า การจัดการเรียนการสอนโดยใช้วัตถุดิบท้องถิ่น เป็นการสอนที่จัดวางไว้อย่างเป็นระบบ มีความน่าสนใจ ทำให้นักเรียนสนุกกับการเรียน และกล้าแสดงความคิดเห็นมากขึ้น สร้างแรงจูงใจในการคิดสร้างสรรค์สูตรอาหารได้ดียิ่งขึ้น และหัวข้อที่นักเรียนพึงพอใจมากที่สุดลำดับแรกคือ นักเรียนสนุกและมีความสุขในการเรียนรู้ รองลงมาคือ นักเรียนได้ฝึกทักษะความคิดสร้างสรรค์ สามารถนำความรู้ไปประยุกต์ใช้ในการทำงานอื่น ส่งผลให้งานมีประสิทธิภาพมากขึ้น ส่งผลให้ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่มีต่อการจัดการเรียนรู้ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น มีค่าเฉลี่ยในระดับมาก ซึ่งสอดคล้องกับงานวิจัยของ หัทยา อุปแก้ว (2562) ได้ทำการวิจัยเรื่อง การพัฒนาผลสัมฤทธิ์ทางการเรียนและทักษะปฏิบัติ เรื่อง การจัดดอกไม้สด กลุ่มสาระการเรียนรู้การงานอาชีพและเทคโนโลยี โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ ชั้นมัธยมศึกษาปีที่ 2 ผลการวิจัยพบว่า นักเรียนมีความพึงพอใจต่อการจัดกิจกรรมการเรียนรู้เรื่องการจัดดอกไม้สด โดยใช้รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ อยู่ในระดับมากที่สุด ซึ่งมีค่าเฉลี่ย 4.58 และมีส่วนเบี่ยงเบนมาตรฐาน 0.58

ข้อเสนอแนะ

การวิจัยเรื่อง การพัฒนาผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น นักเรียนชั้นมัธยมศึกษาปีที่ 5 ในครั้งนี้ ผู้วิจัยมีข้อเสนอแนะ ดังนี้

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. ผู้สอนควรศึกษารูปแบบวิธีการจัดการเรียนรู้โดยใช้วัตถุดิบท้องถิ่น ให้เกิดความรู้ความเข้าใจอย่างชัดเจนก่อนนำไปใช้ในการจัดการเรียนการสอน เพื่อให้เกิดประสิทธิภาพ และการพัฒนาผลสัมฤทธิ์ทางการเรียนให้สูงมากขึ้น

2. ในการจัดการเรียนรู้ โดยวิธีการจัดการเรียนรู้โดยใช้วัตถุดิบท้องถิ่น ผู้สอนควรกระตุ้นและเปิดโอกาสให้นักเรียนได้คิดอย่างอิสระ และใช้วิธีการให้กำลังใจนักเรียนเพื่อให้เกิดความมั่นใจ ในการเรียน ในการทำกิจกรรม และกล้าแสดงความคิดเห็นของตนแก่สมาชิกในกลุ่ม ซึ่งเป็นการส่งเสริมให้เกิดความคิดสร้างสรรค์มากขึ้น

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรศึกษาเปรียบเทียบผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่นกับวิธีการสอนตามรูปแบบอื่น เพื่อศึกษาว่าผลที่ได้รับมีความแตกต่างกันอย่างไร

2. ควรมีการศึกษาพัฒนาการผลสัมฤทธิ์ทางการเรียนรายวิชาอาหารเพื่อธุรกิจ เรื่อง การสร้างสรรค์สูตรอาหารโดยใช้วัตถุดิบท้องถิ่น กับผู้เรียนในระดับชั้นอื่น ๆ โดยการใช้สื่อการเรียน การสอนที่มีความหลากหลาย การใช้แหล่งการเรียนรู้นอกห้องเรียนเพื่อให้เกิดการเรียนรู้ที่หลากหลายมากยิ่งขึ้น

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การพัฒนาทักษะศิลปะการพูดด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด

Developing Speaking Skills by Role-Playing Learning Methods for First-Year Vocational Certificate Students in the Marketing Department

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ เพื่อเปรียบเทียบคะแนนเฉลี่ยทักษะศิลปะการพูดหลังการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด กับเกณฑ์ ร้อยละ 80 กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด วิทยาลัยการอาชีพหลวงประธานราษฎร์นิกร อำเภอหาดใหญ่ จังหวัดสงขลา ปีการศึกษา 2566 ที่เรียนวิชาการพัฒนาบุคลิกภาพนักขาย จำนวน 1 ห้องเรียน ที่ลงทะเบียนเรียนในแบบปกติ รวมจำนวน นักเรียนทั้งสิ้น 20 คน ที่ได้มาโดยการเลือกแบบเจาะจง (Purposive Sampling) เครื่องมือที่ใช้ในการวิจัย แผนการจัดการเรียนรู้ด้วยวิธีแบบบทบาทสมมติ แบบประเมินทักษะศิลปะการพูด มีลำดับการให้คะแนนแบบ 4 ลำดับ โดยใช้เกณฑ์การให้คะแนนแบบ Rubric’s Score โดยใช้การจัดการเรียนรู้แบบบทบาทสมมติ ประโยชน์จากการวิจัยทำให้ผู้เรียนมีความกล้าแสดงออกมาขึ้น

ผลการวิจัยพบว่า ผลการเปรียบเทียบผลการประเมินเฉลี่ยการพัฒนาทักษะศิลปะการพูด ด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด กับเกณฑ์ร้อยละ 80 พบว่า สูงกว่าเกณฑ์ร้อยละ 80 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ที่มีผลเช่นนี้เพราะใช้การจัดการเรียนรู้โดยวิธีบทบาทสมมติ ส่งเสริมให้ผู้เรียนได้เรียนรู้จากการปฏิบัติจริง นักเรียนได้รับความรู้และความเข้าใจเนื้อหาหลักของศิลปะการพูด และวิธีปฏิบัติในการขาย พัฒนาความสามารถต่าง ๆ ด้วยตัวเอง โดยมีประโยชน์เพื่อนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด มีการพัฒนาทักษะศิลปะการพูดด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติในระดับที่สูงขึ้น

คำสำคัญ: ศิลปะการพูด, บทบาทสมมติ, พัฒนาบุคลิกภาพ

Abstract

This research has the objective to compare average speaking skills score speaking skills after role-playing learning method of 1st Year students in the Marketing Department of Luangprathanratnikorn Vocational and Communication College with the criterion of 80 percent. Sampling used in this research is First year Vocational Certificate students in Marketing Department of Luangprathanratnikorn Vocational and Communication College, Hat Yai District, Songkhla Province, academic year 2023, studying salesperson personality development, 1 classroom enrolled in the normal course. Total number of students is 20. Obtained through purposive sampling. Research tools are learning management plan using role-playing methods and Speaking Arts Assessment There are 4 scoring sequences using Rubric's score scoring criteria.

The research results found that Comparative results of the average assessment results for the development of speaking art skills. Using role-play learning methods for first-year Vocational Diploma students in the Marketing Department. With the criteria of 80 percent, it was found to be higher than the specified criteria. (sig 0.05). It has this effect because it uses role-playing learning. Encourage students to learn from actual practice. Students gain knowledge and understanding of the content. Principles of the art of speaking and sales practices Develop various abilities by yourself. It is useful for first-year Vocational Certificate student in marketing department has developed speaking skills through role-play learning method at a higher level.

Keywords: Communication, Role Play, Personality Development

บทนำ

การสื่อสารเป็นสิ่งจำเป็นอย่างยิ่งสำหรับมนุษย์ เพราะจะต้องมีการถ่ายทอดความคิดความรู้สึกความต้องการ ตลอดจนอารมณ์ต่าง ๆ ให้แก่กันและกัน เพื่อพัฒนาและสร้างความเป็นเอกภาพให้แก่สังคมมนุษย์ มนุษย์มีภาษาเป็นเครื่องมือสู่การเรียนรู้ต่าง ๆ ตลอดจนศิลปะและวิทยาการในทุก ๆ ด้านสังคมและมนุษย์ยังใช้ภาษาเป็นเครื่องมือรอบ ๆ ตัว ตลอดจนได้เรียนรู้อดีตและแนวทางในอนาคต นอกจากนี้มนุษย์ใช้ภาษาเพื่อปรับปรุงเปลี่ยนแปลง พัฒนาอาชีพให้มีความเจริญก้าวหน้า ชนชาติไทยของเรามีภาษาไทยเป็นภาษาประจำชาติ เป็นสิ่งที่แสดงความเป็นเอกลักษณ์ของชาติ ตลอดจนเป็นมรดกทางวัฒนธรรมที่ล้ำค่าที่ชนชาวไทยใช้ในการติดต่อสื่อสารระหว่างคนในชาติให้เกิดความเข้าใจต่อกัน มีความรักความรู้สึกเป็นชาติเดียวกัน การสื่อสารประกอบด้วยทักษะ 4 ทักษะ คือ 1) ทักษะการฟัง (เครื่องมือรับสาร) 2) ทักษะการอ่าน (เครื่องมือรับสาร) 3) ทักษะการพูด (เครื่องมือส่งสาร) 4) ทักษะการเขียน (เครื่องมือส่งสาร) (thaiforcommunication.weebly.com, มปป.) ในกระบวนการใช้ภาษาเพื่อสื่อสารนั้น ทักษะการพูดมีบทบาทสำคัญอย่างยิ่ง

คณะผู้วิจัยในฐานะผู้รับผิดชอบในสาขาวิชาการการตลาด ในรายวิชาการพัฒนาบุคลิกภาพนักขายระดับชั้นประกาศนียบัตรวิชาชีพชั้นปีที่ 1 จากการวัดและประเมินผลในรายวิชาการตลาด พบปัญหาเกี่ยวกับการสอน ในปัจจุบันนักเรียนสาขาการตลาด วิทยาลัยการอาชีพหลวงประธานราษฎร์นิกร ในระดับชั้น

ประกาศนียบัตรวิชาชีพชั้นปีที่ 1 ปัญหาหลักคือ การไม่กล้าที่จะสื่อสาร และไม่ค่อยกล้าแสดงออก ผู้วิจัยจึงหาวิธีให้นักเรียนนักศึกษา มีทักษะในด้านการสื่อสารมากขึ้น มีความกล้าแสดงออกผ่านการแสดงบทบาทสมมติในรายวิชาการพัฒนาบุคลิกภาพนักขายโดยให้นักเรียนนักศึกษาเกิดกระบวนการสำคัญที่ผู้แสดงต้องสร้างอารมณ์ให้สะท้อนของตัวละครออกมาให้จริง โดยผู้แสดงต้องสมมติว่าถ้าตนกำลังเผชิญอยู่

การสาธิตวิธีในระหว่างการขายมีความสำคัญ ลูกค้าหลายคนพิจารณาเห็นว่า รูปแบบต่าง ๆ ของการสาธิตเป็นแหล่งความรู้ที่สามารถสร้างความน่าเชื่อถือในสินค้าและบริการได้ ลูกค้าอาจจะยังซื้อหรือมีความลังเลในการตัดสินใจซื้อ หากเขาไม่มีความมั่นใจในคุณภาพของสินค้าหรือไม่เป็นไปตามสิ่งที่เขาคาดหวังได้

จากเหตุที่กล่าวมาแล้วข้างต้น จะเห็นได้ว่าการจัดการเรียนรู้โดยวิธีบทบาทสมมติที่มีต่อการสื่อสารในวิชาการพัฒนาบุคลิกภาพนักขาย สามารถพัฒนาทักษะศิลปะการพูดของนักเรียนได้อย่างมีประสิทธิภาพ ด้วยเหตุผลดังกล่าวผู้วิจัยในฐานะครูผู้สอนการตลาด จึงเลือกกลุ่มเป้าหมายในการศึกษาโดยมุ่งเน้นให้นักเรียนมีทักษะการขายที่สูงขึ้น จึงได้นำวิธีการจัดการเรียนรู้โดยวิธีบทบาทสมมติมาเป็นแนวทางในการจัดการเรียนการสอนในวิชาการตลาด โดยมุ่งเน้นในรายวิชาการพัฒนาบุคลิกภาพนักขาย เพื่อให้นักเรียนมีผลสัมฤทธิ์ทางเรียนที่สูงขึ้นของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นที่ 1

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบคะแนนเฉลี่ยทักษะศิลปะการพูด หลังการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด กับเกณฑ์ร้อยละ 80

แนวคิด ทฤษฎี กรอบแนวคิด

ศิลปะการพูด

เกรียงศักดิ์ พลอยแสง (2561) ศิลปะการพูดเป็นพฤติกรรมการสื่อสารที่เกิดจากการถ่ายทอดความรู้ ความคิด ความรู้สึก หรือความต้องการของผู้พูด ซึ่งเป็นผู้ส่งสารที่มีความหมายไปยังผู้ฟัง ซึ่งเป็นผู้รับสาร โดยใช้ถ้อยคำ น้ำเสียง สีหน้า แววตา และอากัปกิริยาท่าทาง เพื่อให้ผู้ฟังรับรู้ เข้าใจ และสนองตอบต่อสารที่ผู้พูดได้สื่อมาถึงตนการพูดเป็นสิ่งจำเป็นและมีความสำคัญต่อการติดต่อสื่อสารในทุกสาขาอาชีพ เพราะทุกสาขาอาชีพต้องอาศัยการพูดเพื่อสื่อความหมายตามที่ตนต้องการไปยังผู้ฟัง โดยมีวัตถุประสงค์เพื่อให้เกิดความเข้าใจและรับรู้ตรงกัน การพูดจึงมีความสำคัญต่อการดำรงชีวิตมนุษย์เป็นอย่างมาก ล้วนต้องอาศัยทักษะการพูดให้เกิดประโยชน์ทั้งแก่ตนเองและผู้อื่นแทบทั้งสิ้น ปัจจัยเกื้อหนุนที่ช่วยให้การพูดประสบความสำเร็จก็คือ การรู้จักกำหนดวัตถุประสงค์ที่ชัดเจนก่อนการพูด เพราะนอกจากจะช่วยให้ผู้พูดสามารถกำหนดทิศทางการพูดได้ถูกต้องแล้ว และยังช่วยให้ผู้ฟังสามารถรับรู้เรื่องราวได้อย่างต่อเนื่องตามลำดับ การพูดโดยทั่วไปมีวัตถุประสงค์เพื่อให้ความรู้ จูงใจ หรือโน้มน้าวใจ จรรโลงใจ และตอบข้อสงสัย

ในปัจจุบัน “การพูด” เป็นทักษะหนึ่งในการสื่อสารที่สำคัญ การจะพูดให้ลูกค้าตัดสินใจซื้อสินค้าหรือบริการของเรานั้นต้องกระตุ้นให้ลูกค้าเกิดความรู้สึกอยากรู้อยากลอง เช่น อยากรู้ว่าสินค้าดีจริงไหม อร่อยจริงรึเปล่า หรือมีคุณภาพที่ตอบโจทย์การใช้งานหรือไม่ (พัชรสิตา สกุลวงศ์สิริโชค, 2564)

การขาย

สายชล วิสุทธิ์สมุทร (2562) กล่าวว่า การขาย คือ การตอบสนองความต้องการของลูกค้า การค้นหาให้พบว่า ลูกค้าต้องการอะไร และสามารถตอบสนองความต้องการของเขาได้ ทั้งนี้เพราะสินค้าและบริการที่มีอยู่บนท้องตลาดมีอยู่มากมายหลายชนิด แตกต่างกันไปตามลักษณะ คุณประโยชน์ คุณสมบัติ และลักษณะของการใช้งาน ดังนั้นการขายสินค้าจึงเป็นงานที่แตกต่างกันตามลักษณะของสินค้าและบริการ ตลอดจนนโยบายของกิจการนั้น ๆ ด้วยเหตุนี้ พนักงานต้องใช้ความสามารถเฉพาะตัวสูงมากจึงจะประสบความสำเร็จได้ จึงเป็นสาเหตุหนึ่งที่ต้องศึกษาว่า การขายมีประเภทใดบ้าง และลักษณะของการขายนั้นเป็นอย่างไร เพื่อจะได้นำไปใช้กับลูกค้าได้อย่างถูกต้องและเหมาะสม

แนวความคิดของการตลาดและการขาย

แนวความคิดของการตลาด แบ่งออกเป็น 5 แนวคิด ดังนี้ (ห้างหุ้นส่วนจำกัด เลิศศิลป์สาส์ณ โฮลดิ้ง, 2564)

1. แนวความคิดมุ่งการผลิต (The Production Concept) เป็นแนวความคิดทางการตลาดที่เก่าแก่ที่สุด ซึ่งการผลิตยุคนั้น เป็นการผลิตที่เป็นเพียงอุตสาหกรรมในครัวเรือนเพื่อการบริโภค ถ้าจะมีการค้าขายก็น้อยยังไม่มีคู่แข่งขัน หรือถ้ามีคู่แข่งขันจะมีเพียงน้อยราย แนวความคิดนี้จะเน้นการผลิตเป็นสำคัญ โดยไม่คำนึงถึงผลผลิตจำนวนมากเพื่อลดต้นทุนให้ต่ำลงและหาวิธีที่จะเลือกช่องทางการจัดจำหน่ายให้เกิดประสิทธิผลให้ดีที่สุด

2. แนวความคิดมุ่งผลิตภัณฑ์ (The Product Concept) ซึ่งแนวความคิดนี้ผู้ผลิตจะเน้นปรับปรุงคุณภาพของผลิตภัณฑ์ให้ดีที่สุด เนื่องจากในตลาดได้มีคู่แข่งขันเพิ่มมากขึ้น แนวความคิดนี้เกิดขึ้นในขณะที่ตลาดได้มีการแข่งขันกันมากขึ้น ทำให้ลูกค้ามีโอกาสได้พิจารณาและเปรียบเทียบสินค้าในด้านต่าง ๆ ก่อนที่จะตัดสินใจซื้อ

3. แนวความคิดมุ่งการขาย (The Selling Concept) แนวความคิดนี้ได้มุ่งความสำคัญกับพนักงานขาย (Salesman) ได้มีส่วนช่วยกระตุ้นผู้บริโภคให้มีความสนใจในสินค้าและบริการ สภาวะทางการตลาดจึงกลายเป็นตลาดผู้ซื้อ (Buyer's Market)

4. แนวความคิดมุ่งการตลาด (The Marketing Concept) เป็นแนวความคิดที่ผู้ทำธุรกิจในตลาดสมัยใหม่จะต้องทำการวิเคราะห์ (Analysis) แล้วนำผลการวิเคราะห์มาวางแผน (Planning) แล้วทำการผลิตตามแบบที่วางไว้ เมื่อพบข้อผิดพลาดเกิดขึ้นก็จะทำการปรับปรุงแก้ไขให้ดีขึ้น ตอบสนองความต้องการของตลาดได้ โดยคำนึงถึงส่วนผสมทางการตลาด (Marketing Mix) หรือ 4Ps ได้แก่ Product (ผลิตภัณฑ์), Price (ราคา), Place (สถานที่หรือช่องทางการจัดจำหน่าย), และ Promotion (การส่งเสริมการตลาด)

5. แนวความคิดทางการตลาดเพื่อสังคม (The Marketing for Social Oriented) เป็นการตลาดที่สร้างความพึงพอใจให้กับลูกค้า การประกอบการที่ดีนั้นจะต้องคำนึงถึงสวัสดิภาพของสังคม รับผิดชอบต่อสังคมและลูกค้าให้มากที่สุด ในการผลิตสินค้านั้นไม่ทำให้สภาพแวดล้อมของสังคมเสีย เช่น ไม่ปล่อยน้ำเสีย ไม่ปล่อยมลพิษ ฯลฯ ที่จะเป็นอันตรายต่อประชาชนและผู้บริโภค หรือด้านการผลิตสินค้าที่มีคุณภาพดีใช้วัตถุดิบที่มีคุณภาพไม่ปลอมปนสินค้า หรือกักตุนสินค้า การใช้สื่อโฆษณา โดยใช้ข้อความอยู่บนพื้นฐานของความเป็นจริงไม่ทำการโฆษณาชวนเชื่อ ดังนั้นการตลาดที่เน้นสังคมจะมีผลทำให้ลูกค้ามีความรู้สึกที่ดีต่อกิจการ

การจัดการเรียนรู้ด้วยรูปแบบบทบาทสมมติ

ณัฐชญา บุปผาชาติ (2561) กล่าวว่า บทบาทสมมติเป็นวิธีการอย่างหนึ่งที่ใช้ในการจัดกิจกรรมการสอนที่เปิดโอกาสให้นักเรียนได้แสดงออกทั้งการพูด การแสดง อารมณ์ ตามสถานการณ์ที่สมมติขึ้น หลังจากแสดงบทบาทสมมติแล้วจะมีการอภิปรายเนื้อหาตามบทบาทสมมติที่แสดง เพื่อให้นักเรียนเกิดความรู้ความเข้าใจอย่างลึกซึ้งในเรื่องที่ได้เรียน เป็นการฝึกให้นักเรียนได้ทดลองและเรียนรู้ที่จะปรับพฤติกรรมของตนเพื่อให้อยู่ในสังคมได้อย่างมีความสุขและเหมาะสมตามสภาพต่าง ๆ ที่เป็นจริง

การใช้กิจกรรมบทบาทสมมติมีจุดมุ่งหมายให้นักเรียนได้มีโอกาสได้ฝึกใช้ภาษาที่เรียนมาในสถานการณ์ที่ใกล้เคียงความเป็นจริงที่หลากหลายเป็นกิจกรรมการเรียนรู้ที่สนับสนุนให้นักเรียนได้ใช้ประสบการณ์ อีกทั้งยังเป็นกิจกรรมที่ช่วยสร้างบรรยากาศที่เอื้อต่อการเรียนรู้และส่งเสริม ความมั่นใจในการกล้าแสดงออกในรูปแบบที่ถูกต้องและเหมาะสมอีกด้วย

ขั้นตอนของการสอนโดยใช้กิจกรรมบทบาทสมมติ

ทิศนา แขมมณี (2550); กาญจนา คุณารักษ์ (2558) และ Richards (2008). กล่าวถึงขั้นตอนของการสอนโดยใช้กิจกรรมบทบาทสมมติไว้ ดังนี้

ขั้นเตรียม เป็นขั้นทบทวนคำศัพท์ให้ผู้เรียนเพื่อนำความรู้ไปเชื่อมโยงกับเนื้อหาความรู้ ในโลกแห่งความจริงและบริบทของบทบาทสมมติ ระบุ ตีความปัญหา หรือแนะนำปัญหาให้ชัดเจน เปิดประเด็น อธิบายบทบาท ผู้สอน และผู้เรียนนำเสนอสถานการณ์และบทบาทสมมติ

ขั้นคัดเลือกตัวแสดง ผู้สอนและผู้เรียนอธิบายลักษณะของตัวละครวิเคราะห์บทผู้เรียนกำหนดฉาก เลือกผู้แสดงบทบาท แต่ยังไม่ต้องสร้างบทสนทนา

ขั้นสาธิตและดึงความรู้เป็นขั้นแบบอย่าง ที่มีส่วนเกี่ยวข้องกับความสัมพันธ์ระหว่างบุคคล เป็นการแนะนำและดึงความรู้แต่ละขั้นออกมาและเป็นการสอนหน้าที่ของภาษาที่จำเป็นสำหรับแต่ละขั้นตอน

ขั้นฝึกและทบทวน เป็นการช่วยเหลือและฝึกผู้เรียนโดยใช้บัตรสนทนาที่เตรียมไว้บอกบทบาทหรือจัดเตรียมภาษาเพื่อการฝึกรวมถึงการช่วยเหลืออื่น ๆ ตามความเหมะสม

ขั้นแสดง ผู้แสดงแสดงตามบทบาทที่ได้รับและสังเกตพฤติกรรมที่แสดงออก

ขั้นอภิปรายและประเมินผล ผู้สอนและผู้เรียนอภิปรายเกี่ยวกับ ประเด็นสำคัญ ความรู้ ความคิดความรู้สึก ตลอดถึงพฤติกรรมที่แสดงออกของผู้แสดง สรุปการเรียนรู้ที่ได้รับ อาจรวมถึงความถูกต้องในด้านการใช้ภาษา ประเมินผลการเรียนรู้ของผู้เรียน การแก้ไขข้อผิดพลาดเพื่อความเข้าใจที่ชัดเจนตลอดถึงปรับปรุงการแสดงครั้งต่อไป

งานวิจัยที่เกี่ยวข้อง

นุชจรี ภู่เงิน (2556) ได้ทำการศึกษาเรื่อง การพัฒนาทักษะการพูดภาษาอังกฤษ โดยใช้บทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 3 สาขางานคอมพิวเตอร์ธุรกิจ โรงเรียนกรุงเทพการบัญชีวิทยาลัย ปีการศึกษา 2555 จำนวน 22 คน โดยสุ่มกลุ่มตัวอย่างสุ่มอย่างง่าย โดยใช้เครื่องมือที่ใช้เก็บข้อมูลดังนี้ 1) แบบทดสอบวัดทักษะการพูด 2) แบบบันทึกพฤติกรรมการพูดของนักเรียน ในการรวบรวมข้อมูลมีขั้นตอน ดังนี้ 1) ทดสอบความสามารถด้าน การพูดภาษาอังกฤษของนักเรียนก่อนการทดลอง 2) ครูสอนตามแผนการจัดการเรียนรู้โดยใช้กิจกรรมบทบาทสมมติ 3) สังเกตพฤติกรรมการพูดของนักเรียน โดยใช้แบบสังเกตพฤติกรรมด้านการพูด 4) ทดสอบความสามารถด้านการพูดภาษาอังกฤษของนักเรียนหลังทดลอง โดยใช้แบบทดสอบวัดความสามารถด้านการพูดภาษาอังกฤษ ชุดเดียวกันกับก่อนการทดลอง ผลการวิจัยพบว่า คะแนนการพูดภาษาอังกฤษของนักเรียนก่อนการสอนโดยใช้บทบาทสมมติ

สอบได้ 1 - 2 คะแนน มีค่าเฉลี่ยเป็น 1.47 คะแนน ส่วนการพูดภาษาอังกฤษ หลังการใช้บทบาทสมมติ สอบได้ 3 - 8 คะแนน มีค่าเฉลี่ยเป็น 4.47 คะแนน และเมื่อพิจารณาคะแนนพัฒนาการ พบว่า นักเรียนกลุ่มตัวอย่างทุกคนมีพัฒนาการที่ดีขึ้น คือ ได้ร้อยละ 16.57 - 75.00 ค่าเฉลี่ยเป็นร้อยละ 34.89 และพฤติกรรมของนักเรียนจะเกิดทักษะในการสนทนาภาษาอังกฤษ นักเรียนมีการพัฒนาทักษะการพูดภาษาอังกฤษได้อย่างถูกต้อง และทำให้มีความเชื่อมั่นในการอ่านออกเสียง อีกทั้งยังช่วยให้นักเรียนเกิดความเข้าใจในการเรียนมากยิ่งขึ้น

อาภัสรา สังขวาส (2564) ได้ศึกษาการพัฒนาทักษะการพูดภาษาอังกฤษ ของนักเรียนระดับชั้นประกาศนียบัตรวิชาชีพชั้นสูงปีที่ 2/1 สาขาการโรงแรมและการท่องเที่ยว โดยการใช้บทบาทสมมติ ซึ่งใช้บทบาทสมมติเป็นเหตุการณ์ที่มีความใกล้เคียงกับชีวิตจริงของนักเรียน และเป็นการปรับเปลี่ยนทัศนคติที่ดีในการเรียนวิชาภาษาอังกฤษ โดยการวิจัยจะใช้รูปแบบการสอนตามปกติในชั้นเรียน และใช้เครื่องมือ คือ แบบฟอร์มการประเมินความสามารถด้านการสื่อสารภาษาอังกฤษ ซึ่งแต่ละสัปดาห์จะมีความแตกต่างกันไป ครูและนักเรียนจะร่วมกันให้สถานการณ์ที่ใกล้เคียงกับความเป็นจริง และนำไปใช้ในชีวิตประจำวันได้ และผลการวิจัยพบว่า นักเรียนมีคะแนนอยู่ในเกณฑ์เฉลี่ยร้อยละ 82.50 -85.00 จำนวน 3 คน ซึ่งอยู่ในระดับการพัฒนาที่ดี คะแนนเฉลี่ยร้อยละ 50.00 - 75.00 จำนวน 10 คน อยู่ในระดับพอใช้ และคะแนนเฉลี่ยร้อยละ 37.50 - 45.00 จำนวน 9 คน อยู่ในระดับที่ต้องปรับปรุง

วิธีดำเนินการวิจัย

การวิจัยเรื่อง การพัฒนาทักษะศิลปะการพูดด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด การวิจัยครั้งนี้เป็นการวิจัยเชิงทดลอง (Experimental Research) แบบแผนกลุ่มเดียวทดสอบหลัง (One Group Post-test Only Design) (พล เหลืองรังษี, 2566)

การกำหนดกลุ่มประชากร

1. ประชากร คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด วิทยาลัยการอาชีพหลวงประธานราษฎร์นิกร อำเภอหาดใหญ่ จังหวัดสงขลา ปีการศึกษา 2566 ที่เรียนวิชาการพัฒนาบุคลิกภาพนักขาย จำนวน 1 ห้องเรียน ที่ลงทะเบียนเรียนในแบบปกติและแบบสมทบ รวมจำนวนนักเรียนทั้งสิ้น 24 คน

2. กลุ่มตัวอย่าง คือ นักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด วิทยาลัยการอาชีพหลวงประธานราษฎร์นิกร อำเภอหาดใหญ่ จังหวัดสงขลา ปีการศึกษา 2566 ที่เรียนวิชาการพัฒนาบุคลิกภาพนักขาย จำนวน 1 ห้องเรียนที่ลงทะเบียนเรียนในแบบปกติ จำนวนนักเรียน 20 คนที่ได้มาโดยการเลือกแบบเจาะจง (Purposive Sampling)

แบบแผนการวิจัย

ตารางที่ 1 แบบแผนกลุ่มเดียวทดสอบหลัง (One Group Post-test Only Design)

การสุ่ม	กลุ่ม	ทดสอบก่อนเรียน	สิ่งที่ทดลอง	ทดสอบหลัง
-	E	-	X	O

E หมายถึง กลุ่มทดลอง
O หมายถึง การประเมินทักษะศิลปะการพูด
X หมายถึง การจัดการเรียนรู้ด้วยวิธีแบบบทบาทสมมติ

เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้ด้วยวิธีแบบบทบาทสมมติ จำนวน 1 แผน วิทยาลัยการอาชีพหลวงประธานราษฎร์นิกร อำเภอหาดใหญ่ จังหวัดสงขลา เรื่อง ศิลปะการพูด 1 บทเรียนใช้ในการจัดการเรียนรู้ทั้งหมด 2 คาบเรียน คาบเรียนละ 3 ชั่วโมงต่อเนื่องกัน

2. แบบประเมินทักษะศิลปะการพูด มีลำดับการให้คะแนนแบบ 4 ลำดับ โดยใช้เกณฑ์การให้คะแนนแบบ Rubric's Score โดยใช้การจัดการเรียนรู้แบบบทบาทสมมติ กำหนดเกณฑ์การประเมินการพูด ทั้ง 3 ด้าน ดังนี้ ความถูกต้อง ความคล่องแคล่ว การแสดงท่าทาง/น้ำเสียงประกอบการพูด โดยการประเมินแต่ละองค์ประกอบทั้ง 3 ด้าน ประกอบด้วย

ความถูกต้อง ระดับ 4 หมายถึง ออกเสียงคำศัพท์และประโยคได้ถูกต้องตามหลักการอออกเสียงเน้นหนักในคำ/ประโยคอย่างสมบูรณ์ ระดับ 3 หมายถึง ออกเสียงคำศัพท์และประโยคได้ถูกต้องตามหลักการออกเสียงมีเสียงเน้นหนักในคำ/ประโยคส่วนใหญ่ ระดับ 2 หมายถึง ออกเสียงคำศัพท์และประโยคได้ถูกต้องเป็นส่วนใหญ่ ขาดการออกเสียงเน้นหนัก ระดับ 1 ออกเสียงคำ/ประโยคผิดหลักการออกเสียงทำให้สื่อสารไม่ได้

ความคล่องแคล่ว ระดับ 4 หมายถึง พูดต่อเนื่อง ไม่ติดขัด พูดชัดเจน ทำให้สื่อสารได้ ระดับ 3 หมายถึง พูดตะกุก ตะกักบ้าง แต่ยังพอสื่อสารได้ ระดับ 2 หมายถึง พูดเป็นคำ ๆ หยุดเป็นช่วง ๆ ทำให้สื่อสารได้ไม่ชัดเจน ระดับ 1 หมายถึง พูดได้บางคำ ทำให้สื่อความหมายไม่ได้

การแสดงท่าทาง/น้ำเสียงประกอบการพูด ระดับ 4 หมายถึง แสดงท่าทางและพูดด้วยน้ำเสียงเหมาะสมกับสถานการณ์บทบาทสมมติ ระดับ 3 หมายถึง พูดด้วยน้ำเสียงเหมาะสมกับสถานการณ์บทบาทสมมติ แต่ไม่มีท่าทางประกอบ ระดับ 2 หมายถึง พูดเหมือนอ่าน ไม่เป็นธรรมชาติ ขาดความน่าสนใจ ระดับ 1 หมายถึง พูดได้น้อยมาก

การเก็บรวบรวมข้อมูล

ในการวิจัยครั้งนี้ได้ดำเนินการทดลองและเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่างดังนี้

1. ชี้แจงวัตถุประสงค์ของการจัดการเรียนรู้โดยใช้วิธีการจัดการเรียนรู้แบบบทบาทสมมติ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด เป็นกลุ่มตัวอย่างซึ่งจัดทำขึ้นจำนวน 1 บทเรียน ใช้เวลาในการทดลอง 2 วัน ๆ ละ 1 คาบ ๆ ละ 3 ชั่วโมงเรียนที่ต่อเนื่องกัน เนื่องจากว่าวิธีการจัดการเรียนรู้แบบบทบาทสมมติต้องใช้เวลาในการจัดเตรียม และทำการแสดงตามขั้นตอน ซึ่งนักเรียนจะต้องทำแบบประเมินหลังการจัดการเรียนรู้แบบบทบาสมมติ ซึ่งในการประเมินศิลปะการพูดนั้นจะมีสถานการณ์กำหนดให้ 4 สถานการณ์ โดยให้นักเรียนแต่ละคู่จับสลากเลือกเพียง 2 สถานการณ์ จากนั้นให้นักเรียนตกลงเลือกบทบาทและพูดสนทนาแสดงบทบาทสมมติตามสถานการณ์ที่คู่ของตนได้รับ กำหนดเวลาให้สถานการณ์ละ 3 - 5 นาทีต่อ 1 คู่ โดยนักเรียนที่ทำการทดสอบแล้วจะถูกแยกออกไป เพื่อป้องกันการสอบถามข้อมูลซึ่งกันและกันและการเหลื่อมล้ำในการทำการทดสอบ

2. ดำเนินการเรียนการสอน โดยใช้กิจกรรมบทบาทสมมติ จำนวน 1 แผนการจัดเรียนรู้

3. ทำการประเมินโดยคณะผู้วิจัย โดยใช้เครื่องมือแบบประเมินวัดศิลปะการพูด โดยมีผู้วิจัยผู้สอนรายวิชาการพัฒนาบุคลิกภาพนักขาย 1 ท่าน และครูแผนกวิชาการตลาด 2 ท่าน รวม 3 ท่าน เป็นผู้ประเมินและบันทึกคะแนน

4. นำผลไปวิเคราะห์ทางสถิติ

การวิเคราะห์ข้อมูลและสถิติที่ใช้

การเปรียบเทียบการพัฒนาคะแนนเฉลี่ยทักษะศิลปะการพูด วิชาการพัฒนาบุคลิกภาพนักขาย โดยวิธีบทบาทสมมติ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 โดยใช้สถิติ t–test (One Sample Test) โดยใช้โปรแกรมสำเร็จรูปวิเคราะห์ค่าสถิติ เพื่อเปรียบเทียบคะแนนเฉลี่ยทักษะศิลปะการพูดหลังการจัดการเรียนรู้แบบบทบาทสมมติ ของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด กับเกณฑ์ร้อยละ 80

ผลการวิจัย

ตารางที่ 2 แสดงผลการวิเคราะห์ทักษะศิลปะการพูดด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาดกับเกณฑ์ร้อยละ 80

หัวข้อ	เกณฑ์	$\overline{X}$	S.D.	t	P
ค่าเฉลี่ยผลการประเมินทักษะศิลปะการพูด	16	16.60	1.43	1.88	.04

จากตารางที่ 2 พบว่า คะแนนเฉลี่ยผลการประเมินหลังการจัดการเรียนรู้แบบบทบาทสมมติท่ากับ 16.60 คะแนน สูงกว่าเกณฑ์ร้อยละ 80 (16 คะแนน) อย่างมีนัยสำคัญทางสถิติที่ระดับ .05

สรุปและอภิปรายผล

ผลการเปรียบเทียบคะแนนเฉลี่ยการพัฒนาทักษะศิลปะการพูด ด้วยวิธีการจัดการเรียนรู้แบบบทบาทสมมติของนักเรียนระดับประกาศนียบัตรวิชาชีพชั้นปีที่ 1 แผนกวิชาการตลาด กับเกณฑ์ร้อยละ 80 พบว่า คะแนนหลังเรียนสูงกว่าเกณฑ์ร้อยละ 80 อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ที่มีผลเช่นนี้เพราะใช้การจัดการเรียนรู้โดยวิธีบทบาทสมมติ ส่งเสริมให้ผู้เรียนได้เรียนรู้จากการปฏิบัติจริง นักเรียนได้รับความรู้และความเข้าใจเนื้อหาหลักของศิลปะการพูด และวิธีปฏิบัติในการขาย พัฒนาความสามารถต่าง ๆ ด้วยตัวเองสอดคล้องกับผลวิจัยของ ณัฐชญา บุปผาชาติ (2561) และ อาภัสรา สังขวาส (2564) ซึ่งทำให้เห็นว่าการจัดการเรียนรู้วิธีแบบบทบาทสมมติช่วยให้ผู้เรียนพัฒนาทักษะการสื่อสารได้ดียิ่งขึ้น

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

ควรสาธิตทักษะศิลปะการพูด ด้วยวิธีการใช้บทบาทสมมติก่อนให้นักเรียนได้ปฏิบัติจริง

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรนำไปวิจัยในรายวิชาอื่น

เอกสารอ้างอิง

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การพัฒนาผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณโดยใช้แบบฝึกของนักเรียนชั้นประถมศึกษาปีที่ 4

The Development of Mathematics Academic Achievement in Multiplication Using Skill Exercises of Prathomsuksa 4

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ ระหว่างก่อนใช้แบบฝึกกับหลังใช้แบบฝึก และเพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อแบบฝึก กลุ่มเป้าหมาย ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 4 โรงเรียนบ้านโหล๊ะท่อม (ราษฎร์พิพัฒน์) ที่กำลังศึกษาในภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 12 คน เครื่องมือที่ใช้ในการวิจัยได้แก่ 1) แบบฝึก 2) แผนการจัดการเรียนรู้ 3) แบบทดสอบผลสัมฤทธิ์ทางการเรียน และ 4) แบบวัดความพึงพอใจ ผลการวิจัยพบว่า นักเรียนได้คะแนนเฉลี่ยทดสอบก่อนเรียนเท่ากับ 3.67 คะแนน และได้คะแนนเฉลี่ยทดสอบหลังเรียนเท่ากับ 7.42 คะแนน พบว่า คะแนนเฉลี่ยทดสอบหลังเรียนสูงกว่าคะแนนเฉลี่ยทดสอบก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 และความพึงพอใจของนักเรียนที่มีต่อแบบฝึกมีความพึงพอใจในระดับมากที่สุด (คะแนน เฉลี่ย 4.67)

คำสำคัญ: ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์, การคูณ, แบบฝึกทักษะ

Abstract

This research has the objective to compare learning achievement in the subject of multiplication between before using the exercises and after using the exercises and to study student satisfaction with the exercises. The target group includes 12 Grade 4 students at Ban Lo Thom School (Ratphiphat) who are studying in the second semester of the 2023 academic year. The tools used in the research include 1) exercises 2) learning management plans 3) Academic achievement test and 4) Satisfaction test the research results found that students received an average pre-test score of 3.67 points and an average post-test score of 7.42 points. It was found that the average post-test score was higher than the

pre-test average score with statistical significance at the .001 level and student satisfaction. with the training exercises were satisfied at the highest level (average score 4.67)

Keywords: Mathematics Learning Achievement, Multiplication, Skill Exercises

บทนำ

คณิตศาสตร์มีบทบาทสำคัญยิ่งต่อความสำเร็จในการเรียนรู้ในศตวรรษที่ 21 เนื่องจากคณิตศาสตร์ช่วยให้มนุษย์มีความคิดริเริ่มสร้างสรรค์ คิดอย่างมีเหตุผล เป็นระบบ มีแบบแผน สามารถวิเคราะห์ปัญหาหรือสถานการณ์ได้อย่างรอบคอบและถี่ถ้วน ช่วยให้คาดการณ์ วางแผน ตัดสินใจ แก้ปัญหาได้อย่างถูกต้องเหมาะสม และสามารถนำไปใช้ในชีวิตจริงได้อย่างมีประสิทธิภาพ นอกจากนี้คณิตศาสตร์ยังเป็นเครื่องมือในการศึกษาวิทยาศาสตร์ เทคโนโลยี และศาสตร์อื่น ๆ อัน เป็นรากฐานในการพัฒนาทรัพยากรบุคคลของชาติให้มีคุณภาพและพัฒนาเศรษฐกิจของประเทศให้ทัดเทียมกับนานาชาติ การศึกษาคณิตศาสตร์จึงจำเป็นต้องมีการพัฒนาอย่างต่อเนื่อง เพื่อให้ทันสมัยและสอดคล้องกับสภาพเศรษฐกิจ สังคม และความรู้ทางวิทยาศาสตร์และเทคโนโลยีที่เจริญก้าวหน้าอย่างรวดเร็วในยุคโลกาภิวัฒน์ (กระทรวงศึกษาธิการ, 2560)

จากผลการทดสอบทางการศึกษาระดับชาติขั้นพื้นฐาน (Ordinary National Educational Test : O-NET) ในปีการศึกษา 2561 - 2564 พบว่า นักเรียนในระดับชั้นประถมศึกษาปีที่ 6 ทั่วประเทศ สังกัดสำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน มีคะแนนคิดเป็นค่าเฉลี่ยร้อยละในวิชาคณิตศาสตร์เท่ากับ 31.18 , 29.44 , 31.34 และ 30.14 ตามลำดับ ซึ่งอยู่ในระดับต่ำกว่าร้อยละ 50 ต่อเนื่องกันมาหลายปี (สถาบันทดสอบทางการศึกษาแห่งชาติ, 2564) จากคะแนนเฉลี่ยดังกล่าวแสดงให้เห็นว่า นักเรียนไทยยังประสบปัญหาด้านการเรียนวิชาคณิตศาสตร์มาก ดังนั้นครูและบุคลากรที่เกี่ยวข้องกับการจัดการศึกษาควรหาแนวทางในการพัฒนาและปรับปรุงแก้ไขในเรื่องการเรียนการสอนคณิตศาสตร์ใหม่ เพื่อยกระดับผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนให้สูงขึ้น

ความสำคัญและเหตุผลดังกล่าวข้างต้น การจัดการเรียนรู้โดยใช้แบบฝึก เรื่อง การคูณ ของนักเรียนชั้นประถมศึกษาปีที่ 4 คาดว่าจะสามารถลดปัญหา เรื่อง การคูณ ของนักเรียนที่มีปัญหาด้านคณิตศาสตร์ได้ เนื่องจากครูในฐานะที่มีบทบาทสำคัญในการจัดประสบการณ์และสร้างบรรยากาศในการเรียนรู้ จึงจำเป็นต้องมีการปรับปรุงระบบการเรียนการสอนใหม่โดยเลือกใช้วิธีสอนที่เหมาะสมกับเนื้อหา และความต้องการของผู้เรียนจัดกิจกรรมที่เหมาะกับความสามารถ และความสนใจของผู้เรียน ให้ผู้เรียนได้มีโอกาสเข้าร่วมกิจกรรมการเรียนการสอนอย่างทั่วถึง เพื่อพัฒนาการเรียนการสอนวิชาคณิตศาสตร์ให้มีผลสัมฤทธิ์สูงขึ้น การใช้แบบฝึกช่วยในการสอนทำให้ให้นักเรียนได้สัมผัสและปฏิบัติด้วยต้นเอง ตามกรอบที่ครูวางไว้ในแบบฝึก จากการที่นักเรียนได้ปฏิบัติด้วยตัวเองทำให้นักเรียนเข้าใจได้เร็วกว่าการนั่งฟังครูอธิบายเพียงอย่างเดียวแล้วให้นักเรียนปฏิบัติด้วยตัวเองท้ายคาบ และสามารถนำความคิดรวบยอดไปใช้ประโยชน์ได้ทำให้ผู้เรียนสนใจเรียนและตั้งใจเรียนยิ่งขึ้น มีความจำเป็นในการนำไปใช้ในชีวิตจริง เพื่อช่วยพัฒนาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์และเป็นพื้นฐานในการเรียนคณิตศาสตร์ในชั้นที่สูงขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ ระหว่างก่อนใช้แบบฝึกและหลังใช้แบบฝึก
2. เพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อแบบฝึก เรื่อง การคูณ

แนวคิด ทฤษฎี กรอบแนวคิด

การวิจัย เรื่องการพัฒนาผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ โดยใช้แบบฝึกของนักเรียนชั้นประถมศึกษาปีที่ 4 ผู้วิจัยได้ศึกษาเอกสารและงานวิจัยที่เกี่ยวข้อง ดังนี้

วิไลวรรณ ธานี (2550) ได้ให้ความหมายของแบบฝึกว่า หมายถึง สื่อการสอนประเภทหนึ่งที่ครูสร้างขึ้นเพื่อเป็นสิ่งเร้า สำหรับให้นักเรียนฝึกปฏิบัติด้วยความสนใจ และเพื่อเป็นการฝึกฝนหรือทบทวนความรู้ที่เรียนไปแล้ว ให้ผู้เรียนเกิดความจำ ความชำนาญ มีทักษะเพิ่มขึ้น และสามารถนำไปใช้ในชีวิตประจำวันได้

สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน (2552) ได้กล่าวถึงแบบฝึกไว้ว่า แบบฝึกหรือแบบฝึกหัดหรือแบบฝึกเสริมทักษะ เป็นสื่อการเรียนประเภทหนึ่งสำหรับให้นักเรียนได้ฝึกปฏิบัติ เพื่อให้เกิดความรู้ ความเข้าใจ และมีทักษะเพิ่มขึ้น ส่วนใหญ่จะมีแบบฝึกหัดอยู่ท้ายบทเรียนในบางแบบฝึกจะมีลักษณะเป็นแบบฝึกปฏิบัติ

ราชบัณฑิตยสถาน (2555) ได้ให้ความหมายของแบบฝึกว่า หมายถึง แบบฝึกหัดหรือชุดการสอนที่เป็นแบบฝึกที่ใช้เป็นตัวอย่างปัญหาหรือคำสั่งที่ตั้งขึ้นให้นักเรียนฝึกตอบ

จากความหมายของแบบฝึกข้างต้น ผู้วิจัยสรุปได้ว่า แบบฝึก หมายถึง เครื่องมือที่ผู้สอนสร้างขึ้นอย่างหลากหลาย โดยมีจุดมุ่งหมายเพื่อฝึกทักษะของผู้เรียนให้เกิดความชำนาญในเรื่องนั้น ๆ โดยนักเรียนสามารถกลับไปทบทวนใหม่ได้กรณีที่ไม่เข้าใจ โดยผู้เรียนจะต้องลงมือทำด้วยตัวเอง ซึ่งแบบฝึกนั้นเป็นเครื่องมือในการพัฒนาทักษะได้เป็นอย่างดี

พิชิต ฤทธิ์จรูญ (2552) ให้ความหมายแบบทดสอบวัดผลสัมฤทธิ์ว่า เป็นแบบทดสอบที่ใช้วัดความรู้ ทักษะ และความสามารถที่ผู้เรียนได้เรียนรู้มาแล้วว่าบรรลุผลสำเร็จตามจุดประสงค์ที่กำหนดไว้เพียงใด

เยาวดี วิบูลย์ศรี (2550) ให้ความหมายแบบทดสอบผลสัมฤทธิ์ว่า เป็นแบบทดสอบวัดความรู้เชิงวิชาการ มักใช้วัดผลสัมฤทธิ์ทางการเรียน เน้นการวัดความรู้ความสามารถจากการเรียนรู้ในอดีต หรือในสภาพปัจจุบันของแต่ละบุคคล

สมนึก ภัททิยธนี (2560) ให้ความหมายแบบทดสอบวัดผลสัมฤทธิ์ว่า หมายถึง แบบทดสอบที่วัดสมรรถภาพสมองด้านต่าง ๆ ที่นักเรียนได้รับการเรียนรู้ผ่านมาแล้วว่ามีอยู่เท่าใด

จากที่กล่าวมา ผู้วิจัยสรุปได้ว่า ผลสัมฤทธิ์ทางการเรียน หมายถึง แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนเป็นแบบทดสอบที่ใช้สำหรับวัดพฤติกรรมทางสมองของผู้เรียนว่า มีความรู้ความสามารถในเรื่องที่เรียนรู้มาแล้วหรือได้รับการฝึกฝนอบรมมาแล้วมากน้อยเพียงใด

งานวิจัยที่เกี่ยวข้อง

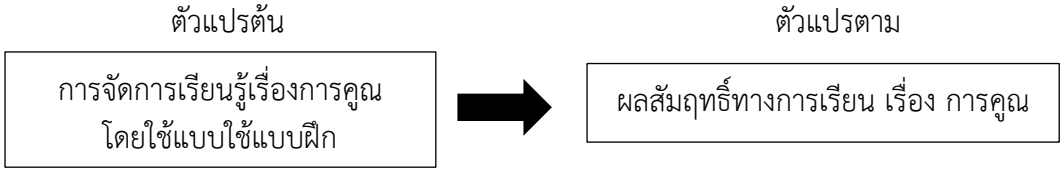
พิศุทธ์ปภาณ จินะวงค์ (2564) ได้ศึกษาผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ โดยใช้แบบฝึกทักษะประสิทธิภาพของแบบฝึกทักษะคณิตศาสตร์ เรื่อง การคูณ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 มีค่าเท่ากับ 82.33/83.67 ซึ่งเป็นไปตามเกณฑ์ประสิทธิภาพ 80/80 ที่กำหนดไว้ และผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์หลังเรียนด้วยแบบฝึกทักษะคณิตศาสตร์ เรื่อง การคูณ สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

สาวินา บุญเสน (2565) ได้ศึกษาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การคูณ โดยใช้แบบฝึกทักษะสำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนสุเหร่าหะยีมินา ผลการวิจัยพบว่า 1)

ประสิทธิภาพของแบบฝึกทักษะคณิตศาสตร์ เรื่อง การคูณ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 มีค่า 83.63/85.16 ซึ่งสูงกว่าเกณฑ์ที่กำหนดไว้ และ 2) ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ของนักเรียนที่เรียนด้วยแบบฝึกทักษะการคูณหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ.05

กรอบแนวคิดที่ใช้ในการวิจัย

การวิจัยในครั้งนี้เป็นการพัฒนาผลสัมฤทธิ์ เรื่อง การคูณ โดยใช้แบบฝึกของนักเรียนชั้นประถมศึกษาปีที่ 4 โดยมีกรอบแนวคิดดังภาพที่ 1



ภาพที่ 1 กรอบแนวคิดที่ใช้ในการวิจัย

วิธีดำเนินการวิจัย

กลุ่มเป้าหมาย

นักเรียนชั้นประถมศึกษาปีที่ 4 โรงเรียนบ้านโหล๊ะท่อม (ราษฎร์พิพัฒน์) ที่กำลังศึกษาในภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวนนักเรียน 12 คน

แบบแผนการวิจัย

ตารางที่ 1 แบบแผนกลุ่มเดียวทดสอบก่อนหลัง (One group pretest - posttest design)

การสุ่ม	กลุ่ม	ทดสอบก่อน	สิ่งทดลอง	ทดสอบหลัง
-	E	O1	X	O2

เครื่องมือที่ใช้ในการวิจัย

1. แบบฝึก เรื่อง การคูณ ของนักเรียนชั้นประถมศึกษาปีที่ 4
2. แผนการจัดการเรียนรู้ จำนวน 2 หน่วยการเรียนรู้
3. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนรู้ เรื่อง การคูณ ก่อนเรียนและหลังเรียน
4. แบบวัดความพึงพอใจของนักเรียนที่มีต่อแบบฝึก โดยมีแบบมาตราส่วนประมาณค่า (Rating Scale) 5 ระดับ ตามวิธีของลิเคิร์ท บุญชม ศรีสะอาด (2545) ดังนี้ ระดับที่ 1 พึงพอใจน้อยที่สุด, ระดับที่ 2 พึงพอใจน้อย ระดับที่ 3 พึงพอใจปานกลาง ระดับที่ 4 พึงพอใจมาก ระดับที่ 5 พึงพอใจมากที่สุด และมีเกณฑ์การแปลความหมาย ดังนี้

ค่าเฉลี่ย 4.51 – 5.00 หมายถึง พึงพอใจมากที่สุด
ค่าเฉลี่ย 3.51 – 4.50 หมายถึง พึงพอใจมาก
ค่าเฉลี่ย 2.51 – 3.50 หมายถึง พึงพอใจปานกลาง
ค่าเฉลี่ย 1.51 – 2.50 หมายถึง พึงพอใจน้อย
ค่าเฉลี่ย 1.00 – 1.50 หมายถึง พึงพอใจน้อยที่สุด

การสร้างเครื่องมือและคุณภาพเครื่องมือ

1. ศึกษาวิธีการ หลักการ ทฤษฎี และเทคนิควิธีการสร้าง แบบฝึกคณิตศาสตร์ จากเอกสารต่าง ๆ และงานวิจัยที่เกี่ยวข้อง

2. ศึกษา วิเคราะห์ เนื้อหาเกี่ยวกับการคูณ และตัดสินใจเลือกกำหนดเนื้อหาที่ต้องการสร้างแบบฝึกการคูณ

3. ศึกษาความรู้เพิ่มเติมจากแหล่งการเรียนรู้ สื่อ หนังสือ เกี่ยวกับเรื่อง การคูณ เพื่อออกแบบแบบฝึกให้เหมาะสมกับลักษณะของนักเรียน

4. ศึกษาหลักสูตรการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 (ฉบับปรับปรุง 2560) ช่วงชั้นที่ 2 ชั้นประถมศึกษาปีที่ 4 ในมาตรฐาน ค 1.1 เข้าใจความหลากหลายของการแสดงจำนวน ระบบจำนวน การดำเนินการของจำนวนผลที่เกิดขึ้นจากการดำเนินการ สมบัติของการดำเนินการ และนำไปใช้ในระดับชั้นประถมศึกษาปีที่ 4 ตามสาระการเรียนรู้แกนกลางคณิตศาสตร์ที่เกี่ยวข้องกับการคูณ และวิเคราะห์จนได้เนื้อหาที่ใช้ในการวิจัยตลอดจนการกำหนดจำนวนชั่วโมงการจัดการเรียนรู้

5. สร้างแผนจัดการเรียนรู้ เรื่อง การคูณ จำนวน 2 หน่วยการเรียนรู้ ทั้งหมด 2 แผนการเรียนรู้ มีความตรงเชิงเนื้อหาโดยวิเคราะห์ความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์การวิจัย เท่ากับ 0.67 - 1.00

6. สร้างแบบฝึกตามแผนจัดการเรียนรู้มีความตรงเชิงเนื้อหา โดยวิเคราะห์ความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์การวิจัยเท่ากับ 0.67 - 1.00

7. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การคูณ ชั้นประถมศึกษาปีที่ 4 ที่ผู้วิจัยสร้างขึ้นตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน เป็นข้อสอบปรนัย แบบชนิด 4 ตัวเลือก จำนวน 10 ข้อ 10 คะแนน ครอบคลุมสาระการเรียนรู้และจุดประสงค์การเรียนรู้มีความตรงเชิงเนื้อหาโดยวิเคราะห์ความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์การวิจัยเท่ากับ 0.67 - 1.00

8. สร้างแบบวัดความพึงพอใจของนักเรียนมีความตรงเชิงเนื้อหาโดยวิเคราะห์ความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์การวิจัยเท่ากับ 0.67 - 1.00

การเก็บรวบรวมข้อมูล

ในการเก็บรวบรวมข้อมูล ผู้วิจัยมีขั้นตอนการเก็บรวบรวมข้อมูล ดังนี้

1. ผู้วิจัยอธิบายให้นักเรียนเข้าใจถึงการจัดกิจกรรมการเรียนรู้ด้วยแบบฝึกทักษะ เรื่อง การคูณ ชั้นประถมศึกษาปีที่ 4 แล้วจึงดำเนินการจัดการเรียนรู้

2. นักเรียนทำการทดสอบก่อนเรียน โดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ ชั้นประถมศึกษาปีที่ 4 ผู้วิจัยสร้างขึ้นจำนวน 10 ข้อ

3. ดำเนินการทดลองใช้แบบฝึก เรื่อง การคูณ ชั้นประถมศึกษาปีที่ 4 ตามแผนการจัดการเรียนรู้

4. ให้นักเรียนศึกษาแบบฝึกทัก และทำแบบฝึก ตรวจสอบความถูกต้อง ครบถ้วนในการทำแบบฝึกของนักเรียน

5. ผู้วิจัยดำเนินการทดสอบหลังเรียน เมื่อเสร็จสิ้นการจัดกิจกรรมการเรียนรู้โดยใช้แบบฝึก เรื่อง การคูณ ด้วยแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนฉบับเดียวกับที่ใช้ทดสอบก่อนเรียนมาทดสอบ

6. ผู้วิจัยดำเนินการเก็บข้อมูลความพึงพอใจของนักเรียนที่มีต่อแบบฝึก

7. นำผลการทดสอบมาวิเคราะห์ข้อมูลและรายงานผลการวิจัยต่อไป

การวิเคราะห์ข้อมูล

1. เปรียบเทียบผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ ของนักเรียนชั้นประถมศึกษาปีที่ 4 ก่อนเรียนและหลังเรียนโดยใช้แบบฝึกทักษะคณิตศาสตร์ เรื่อง การคูณ โดยใช้สถิติ Dependent Samples t- test

2. ความพึงพอใจของนักเรียนที่มีต่อแบบฝึก ใช้ค่าสถิติ คือ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัย

ตารางที่ 2 ผลการวิเคราะห์เปรียบเทียบผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ ของนักเรียนชั้นประถมศึกษาปีที่ 4 ก่อนและหลังการจัดการเรียนรู้โดยใช้แบบฝึก

รายการ	$\bar{x}$	S. D.	$\bar{d}$	t	p
ก่อนเรียน	3.67	1.969	3.750	17.234***	.000
หลังเรียน	7.42	1.505			

*** $p < .001$

จากตารางที่ 2 นักเรียนได้คะแนนเฉลี่ยทดสอบก่อนเรียนเท่ากับ 3.67 คะแนน และได้คะแนนเฉลี่ยทดสอบหลังเรียนเท่ากับ 7.42 คะแนน พบว่า คะแนนเฉลี่ยทดสอบหลังเรียนสูงกว่าคะแนนเฉลี่ยทดสอบก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001

ตารางที่ 3 ผลวิเคราะห์ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 4 ที่มีต่อแบบฝึก

รายการประเมิน	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน	แปลความ
1. แบบฝึกทักมีวิธีการเรียนรู้ที่เหมาะสมกับนักเรียน	4.75	0.45	มากที่สุด
2. แบบฝึกมีขั้นตอนหรือกระบวนการที่กระตุ้นให้นักเรียนเรียนรู้อย่างมีประสิทธิภาพ	4.58	0.52	มากที่สุด
3. แบบฝึกช่วยให้นักเรียนมีความรู้และทักษะในเรื่องการคูณมากยิ่งขึ้น	4.67	0.49	มากที่สุด
4. แบบฝึกช่วยให้นักเรียนมีความรู้สึกว่าเรื่อง การคูณมีความน่าสนใจ น่าเรียนรู้	4.58	0.80	มากที่สุด
5. นักเรียนสามารถคูณเลขได้อย่างถูกต้อง	4.75	0.45	มากที่สุด
6. นักเรียนคูณเลขได้รวดเร็วขึ้นมากยิ่งขึ้น	4.67	0.50	มากที่สุด
7. นักเรียนสามารถนำความรู้เรื่องการคูณไปใช้ในชีวิตประจำวันได้	4.75	0.45	มากที่สุด
ค่าเฉลี่ย	**4.67**	**0.39**	**มากที่สุด**

จากตารางที่ 3 พบว่า ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 4 ที่มีต่อแบบฝึก เรื่อง การคูณ มีความพึงพอใจในระดับมากที่สุด (คะแนนเฉลี่ย 4.67) เมื่อพิจารณาเป็นรายข้อพบว่า ด้านแบบฝึกมีวิธีการเรียนรู้ที่เหมาะสมกับนักเรียน ด้านนักเรียนสามารถคูณเลขได้อย่างถูกต้อง และด้านนักเรียนสามารถนำความรู้เรื่องการคูณไปใช้ในชีวิตประจำวันได้มีความพึงพอใจในระดับมากที่สุด (คะแนนเฉลี่ย 4.75)

สรุปและอภิปรายผล

สรุปผล

จากผลการวิจัย พบว่า

1. นักเรียนได้คะแนนเฉลี่ยทดสอบก่อนเรียนเท่ากับ 3.67 คะแนน และได้คะแนนเฉลี่ยทดสอบหลังเรียนเท่ากับ 7.42 คะแนน พบว่า คะแนนเฉลี่ยทดสอบหลังเรียนสูงกว่าคะแนนเฉลี่ยทดสอบก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001

2. ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 4 ที่มีต่อแบบฝึก เรื่อง การคูณ มีความพึงพอใจในระดับมากที่สุด (คะแนนเฉลี่ย 4.67) เมื่อพิจารณาเป็นรายข้อพบว่า ด้านแบบฝึกมีวิธีการเรียนรู้ที่เหมาะสมกับนักเรียน ด้านนักเรียนสามารถคูณเลขได้อย่างถูกต้อง และด้านนักเรียนสามารถนำความรู้เรื่องการคูณไปใช้ในชีวิตประจำวันได้ มีความพึงพอใจในระดับมากที่สุด (คะแนนเฉลี่ย 4.75)

การอภิปรายผล

1. ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนทางคณิตศาสตร์ของนักเรียนชั้นประถมศึกษาปีที่ 4 มีคะแนนเฉลี่ยหลังการจัดการเรียนรู้โดยใช้แบบฝึกสูงกว่าคะแนนเฉลี่ยก่อนการจัดการเรียนรู้โดยใช้แบบฝึกอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 ที่ผลเป็นเช่นนี้ เพราะการจัดการเรียนรู้โดยใช้แบบฝึก ส่งเสริมนักเรียนได้เรียนรู้จากการปฏิบัติจริง นักเรียนได้รับความรู้และเข้าใจเนื้อหาหลักการในการคูณ สอดคล้องกับงานวิจัย พิศุทธ์ปภาณ จินะวงค์ (2564) ได้ศึกษาการศึกษาผลสัมฤทธิ์ทางการเรียน เรื่อง การคูณ โดยใช้แบบฝึกประสิทธิภาพของแบบฝึกทักษะคณิตศาสตร์ เรื่อง การคูณ สำหรับนักเรียนชั้นประถมศึกษาปีที่ 4 มีค่าเท่ากับ 82.33/83.67 ซึ่งเป็นไปตามเกณฑ์ประสิทธิภาพ 80/80 ที่กำหนดไว้ และผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์หลังเรียนด้วยแบบฝึกคณิตศาสตร์ เรื่อง การคูณ สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 อีกทั้งสอดคล้องกับ ทิวาพร แก้วคำสอน (2564) การพัฒนาแบบฝึกทักษะคณิตศาสตร์ เรื่อง ความน่าจะเป็น โดยใช้การเรียนรู้แบบร่วมมือเทคนิค TAI ร่วมกับเทคนิค KWDL สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 3 พบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียนที่เรียนด้วยแบบฝึกทักษะคณิตศาสตร์ที่พัฒนาขึ้น หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

2. ความพึงพอใจของนักเรียนชั้นประถมศึกษาปีที่ 4 ที่มีต่อแบบฝึก เรื่อง การคูณ พบว่า โดยภาพรวมอยู่ในระดับมากที่สุด และเมื่อพิจารณาเป็นด้าน พบว่า ด้านที่มีค่าเฉลี่ยมากที่สุดคือ ด้านแบบฝึกมีวิธีการเรียนรู้ที่เหมาะสมกับนักเรียน ด้านนักเรียนสามารถคูณเลขได้อย่างถูกต้องและด้านนักเรียนสามารถนำความรู้เรื่องการคูณไปใช้ในชีวิตประจำวันได้ ทั้งนี้ เนื่องจากการจัดการเรียนรู้ด้วยแบบฝึกทำให้นักเรียนเข้าใจบทเรียนได้ง่าย และนำความรู้ไปประยุกต์ใช้ได้จริง สอดคล้องกับ นูรีมาน สือรี (2563) ที่ศึกษาการพัฒนาผลสัมฤทธิ์ทางการเรียน เรื่อง เลขยกกำลัง โดยใช้แบบฝึกทักษะสำหรับนักเรียนระดับชั้นมัธยมศึกษาปีที่ 1 พบว่า โดยรวมมีความพึงพอใจอยู่ในระดับมาก

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

ครูควรนำเกมเป็นส่วนร่วมกับแบบฝึกเพื่อให้การจัดการเรียนรู้น่าสนใจยิ่งขึ้น

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรพัฒนาแบบฝึกทักษะและการจัดการสอนโดยใช้แบบฝึกทักษะ ในกลุ่มสาระการเรียนรู้อื่น ๆ เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนให้สูงขึ้น

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The Development of Learning Achievement on Addition, Subtraction, Multiplication, and Division by Using the Game Based Learning (GBL) for Prathomsuksa 4 Students

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคน ของนักเรียน ระหว่างก่อนเรียนกับหลังเรียน โดยใช้วิธีการจัดเรียนรู้แบบเกม และ 2) เพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม ใช้ระเบียบวิธีวิจัยแบบทดลอง ประชากรที่ใช้ในการวิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 2 ปีการศึกษา 2566 เครือข่ายสถานศึกษาบ้านพรุพะตง ทั้งหมด 7 โรงเรียน กลุ่มตัวอย่างที่ใช้ในการวิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 4 โรงเรียนบ้านโปะหมอ (พรหมเทพราษฎร์บำรุง) จำนวน 1 ห้องเรียน ใช้วิธีการสุ่มแบบหลายขั้นตอน เครื่องมือที่ใช้ในการวิจัย ได้แก่ 1) เกม Code Math เรื่องการบวก ลบ คูณ หาร 2) แผนการจัดการเรียนรู้ 3) แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ และ 4) แบบวัดความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม สถิติที่ใช้วิเคราะห์ข้อมูล ได้แก่ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน และการเปรียบเทียบค่าเฉลี่ยสองกลุ่มสัมพันธ์ ประโยชน์ที่ได้จากการวิจัยในครั้งนี้ เป็นแนวทางของครูในการสอนโดยใช้วิธีการจัดการเรียนรู้แบบเกม เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคน ผลการวิจัยพบว่า 1) คะแนนเฉลี่ยหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 2) ความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม อยู่ในระดับมากที่สุด (ค่าเฉลี่ย 4.73)

คำสำคัญ: วิธีจัดการเรียนรู้แบบเกม, คณิตศาสตร์, ผลสัมฤทธิ์ทางการเรียน

Abstract

The purpose of this research were to 1) to compare learning achievement in mathematics by using the game based learning regarding addition, subtraction, multiplication, and division of fourth- grade students between before and after learning.

and 2) to investigate the level of satisfaction among students with game-based learning methods. Use experimental research methods. The population is the fourth-grade students, in the second semester of the year 2023 from network schools in Ban Phru Phatong, a total of 7 schools. The sample was the fourth-grade students at Ban Pho Mo School (Phrom Thep Ratch Bum Rung), Using a multistage sampling method. The research instruments used were 1) Code Math game about addition, subtraction, multiplication, and division. 2) a learning management plan 3) the learning achievement tests in mathematics. The statistics used in data analysis are the means, standard deviation, and means comparison of two independent groups. The benefits obtained from this research It is a teacher's guideline for teaching using game-based learning methods. To develop academic achievement in mathematics regarding addition, subtraction, multiplication, and division. The research found that 1) after studying, usually search for information before studying to find statistics at the .001 level 2) search for students who know the most about game-based learning methods (average 4.73)

Keywords: Game-Based Learning Methods, Mathematics, Academic Achievement

บทนำ

การศึกษาเป็นสิ่งที่มนุษย์เรานั้นควรมีกันทุกคน มุ่งเน้นให้พัฒนาคุณภาพของความรู้ พัฒนาส่งเสริมทักษะต่าง ๆ ที่จำเป็น เพื่อให้พร้อมที่จะใช้ประโยชน์ในสังคม ปรมินทร์ ธัญญะภู (2566) กล่าวว่า การศึกษาเป็นหัวใจสำคัญของการพัฒนามนุษย์ให้มีคุณภาพ ทำให้มนุษย์สามารถดำรงชีวิตอยู่ในสังคมได้อย่างมีความสุข รู้เท่าทันข้อมูลข่าวสาร และการเปลี่ยนแปลงที่เกิดขึ้นอย่างรวดเร็ว เป็นกระบวนการพัฒนาที่นำไปสู่ความสำเร็จในอนาคต และการเรียนวิชาคณิตศาสตร์ในศตวรรษที่ 21 เป็นสิ่งที่สำคัญ คณิตศาสตร์ช่วยให้มนุษย์มีความคิดริเริ่มสร้างสรรค์ คิดอย่างมีเหตุผล เป็นระบบ มีแบบแผน สามารถวิเคราะห์ปัญหา หรือนั่นคือ การเตรียมนักเรียนให้มีทักษะด้านการคิด วิเคราะห์ การคิดอย่างมีวิจารณญาณ การแก้ปัญหา การใช้เทคโนโลยี การสื่อสาร และการร่วมมือ ซึ่งจะส่งผลให้นักเรียนรู้เท่าทันการเปลี่ยนแปลงของระบบเศรษฐกิจ สังคม วัฒนธรรม และสภาพแวดล้อม (กระทรวงศึกษาธิการ, 2560) นอกจากนี้ลำดับของการดำเนินการทางคณิตศาสตร์ การบวก ลบ คูณ หารระคน เป็นความเข้าใจที่ตรงกันทั่วโลก เพื่อให้การแก้ปัญหาทางคณิตศาสตร์ที่มีการดำเนินการมากกว่าหนึ่งครั้งเป็นไปอย่างถูกต้อง

จากผลการทดสอบความสามาถพื้นฐานของผู้เรียนระดับชาติ (National Test: NT) นักเรียนชั้นประถมศึกษาปีที่ 3 ปีการศึกษา 2565 สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษาสงขลา เขต 2 มีผลรายวิชาคณิตศาสตร์ เฉลี่ย 45.26 คะแนน มีค่าน้อยกว่าคะแนนเฉลี่ยระดับประเทศ 49.12 คะแนน (สถาบันทดสอบทางการศึกษาแห่งชาติ (องค์การมหาชน), 2565) ผลการทดสอบเป็นข้อมูลที่สำคัญที่สะท้อนคุณภาพการจัดการเรียนรู้ในสถานศึกษา บ่งบอกถึงปัญหาการเรียนคณิตศาสตร์ของนักเรียนที่ขาดความเข้าใจการดำเนินการทางคณิตศาสตร์ การบวก ลบ คูณ หาร ที่นำไปประยุกต์ใช้ในการแก้สมการทางคณิตศาสตร์และใช้ในชีวิตประจำวัน ผู้วิจัยจึงหาแนวทางพัฒนาผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคน โดยทดลองใช้วิธีการจัดเรียนรู้แบบเกม

การจัดการเรียนรู้แบบเกม เป็นวิธีการที่ช่วยให้นักเรียนได้เรียนรู้สิ่งต่าง ๆ อย่างสนุกสนานและท้าทายความสามารถ โดยนักเรียนทำหน้าที่เป็นผู้เล่นทำให้สามารถรับประสบการณ์โดยตรงได้ การจัดการเรียนรู้แบบเกม จึงเป็นวิธีที่เปิดโอกาสให้นักเรียนได้มีส่วนร่วมและมีปฏิสัมพันธ์กับผู้อื่นได้เป็นอย่างดี (กฤษฎา กาญจนวงศ์, 2566) สอดคล้องกับ สำนวน คุณพล (2566) กล่าวว่า การเรียนรู้โดยใช้เกมเป็นฐาน (Game-Based Learning) เป็นวิธีการจัดการเรียนรู้ที่ทำให้นักเรียนเกิดการเรียนรู้ด้วยความสนุกสนานไปพร้อม ๆ กับการได้รับความรู้ โดยสอดแทรกเนื้อหาไว้ในเกม และนักเรียนจะได้รับความรู้ต่าง ๆ ผ่านการเล่นเกม

จากเหตุผลดังกล่าว ผู้วิจัยจึงสนใจในการพัฒนาผลสัมฤทธิ์ทางการเรียน เรื่อง การบวก ลบ คูณ หารระคน โดยใช้วิธีการจัดเรียนรู้แบบเกม เพื่อกระตุ้นให้นักเรียนอยากเรียนรู้ นักเรียนสามารถเรียนรู้ด้วยตนเอง กระตุ้นให้นักเรียนมีส่วนร่วมในกิจกรรมและได้ประสบการณ์โดยตรง บทความฉบับนี้เป็นส่วนหนึ่งของวิทยานิพนธ์ เรื่องการพัฒนาเกมเสริมหลักสูตรคณิตศาสตร์ เรื่องการบวก ลบ คูณ หารระคน นักเรียนชั้นประถมศึกษาปีที่ 4

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคน ของนักเรียนระหว่างก่อนเรียนกับหลังเรียน โดยใช้วิธีการจัดการเรียนรู้แบบเกม
2. เพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดการเรียนรู้แบบเกม

แนวคิด ทฤษฎี กรอบแนวคิด

พงษ์เทพ บุญศรีโรจน์ (2533) ได้ให้ความหมายว่า เกมประกอบการสอน หมายถึง การนำเอาจุดประสงค์ใด ๆ ของการเรียนรู้ตามหลักสูตรมาประกอบขึ้นเป็นการเล่นเกม ผู้เล่นจะเล่นเกมไปตามกติกาที่กำหนด ซึ่งจะต้องใช้ความรู้ในเนื้อหามามีส่วนร่วมในการเล่นด้วย

ทิศนา แขมมณี (2558) กล่าวว่า วิธีสอนโดยใช้เกมเป็นวิธีการที่ช่วยให้นักเรียนได้เรียนรู้เรื่องต่าง ๆ อย่างสนุกสนาน และท้าทายความสามารถ โดยนักเรียนเป็นผู้เล่นเองทำให้ได้รับประสบการณ์ตรง เป็นวิธีการที่เปิดโอกาสให้นักเรียนมีส่วนร่วมสูง

อันธิฌา สายบุญศรี, จิราพร เกษรสุวรรณ์, ศิริพร นันทเสนีย์, และ อริยา ดีประเสริฐ (2565) กล่าวว่า การจัดการเรียนรู้แบบใช้เกมเป็นวิธีที่สามารถดึงดูดผู้เรียนให้สนใจเนื้อหาวิชา เป็นการสร้างบรรยากาศในการเรียนให้มีความน่าสนใจ และยังเป็นการส่งเสริมการเรียนรู้ การมีส่วนร่วมในชั้นเรียนได้อย่างเท่าเทียมกัน ทำให้ผู้เรียนเกิดความสนิทกับเพื่อน ๆ เพราะเกมสามารถช่วยละลายพฤติกรรมที่ไม่พึงประสงค์ด้วยการช่วยเหลือซึ่งกันและกัน ส่งผลให้ผู้เรียนได้รับทั้งความรู้ ความสนุกสนาน สัมพันธภาพที่ดีต่อกัน และสามารถเพิ่มผลสัมฤทธิ์ทางการเรียนได้ ทำให้ผู้เรียนเกิดการเรียนรู้เข้าใจเนื้อหาบทเรียนมากขึ้น และส่งผลให้ผลสัมฤทธิ์ทางการเรียนเพิ่มขึ้นได้

กฤษฎา กาญจนวงศ์ (2566) กล่าวว่า การจัดการเรียนรู้แบบเกม เป็นวิธีการที่ช่วยให้นักเรียนได้เรียนรู้สิ่งต่าง ๆ อย่างสนุกสนาน และท้าทายความสามารถ โดยนักเรียนทำหน้าที่เป็นผู้เล่น ทำให้สามารถรับประสบการณ์โดยตรงได้ การจัดการเรียนรู้แบบเกม จึงเป็นวิธีที่เปิดโอกาสให้นักเรียนได้มีส่วนร่วมและมีปฏิสัมพันธ์กับผู้อื่นได้เป็นอย่างดี

จากการความหมายของการจัดการเรียนรู้แบบเกมที่กล่าวมาข้างต้นสรุปได้ว่า การจัดการเรียนรู้แบบเกม หมายถึง วิธีสอนที่นำเอาจุดประสงค์ของการเรียนรู้ตามหลักสูตรมาประยุกต์ใช้กับการเล่นเกม

เป็นวิธีการที่ช่วยให้นักเรียนได้เรียนรู้เรื่องต่าง ๆ ผ่านการเล่นเกม สามารถดึงดูดผู้เรียนให้สนใจเนื้อหาวิชา ทำให้การเรียนมีความน่าสนใจ และยังเป็นการส่งเสริมการเรียนรู้ให้ทุกคนส่วนร่วมในชั้นเรียน

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่างในการวิจัย

ประชากรที่ใช้ในการวิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 2 ปีการศึกษา 2566 เครือข่ายสถานศึกษาบ้านพรุพะตง มีทั้งหมด 7 โรงเรียน

กลุ่มตัวอย่างที่ใช้ในการวิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 4 ภาคการเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนบ้านโปะหมอ (พรหมเทพราษฎร์บำรุง) จำนวน 1 ห้องเรียน โดยใช้วิธีการสุ่มแบบหลายขั้นตอน ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 4/1 จำนวน 37 คน

เครื่องมือที่ใช้ในการวิจัย

1. เกม Code Math เรื่อง การบวก ลบ คูณ หาร

2. แผนการจัดการเรียนรู้ จำนวน 4 แผน แผนละ 3 ชั่วโมง ครอบคลุมเนื้อหา เรื่อง การบวก ลบ คูณ หารระคน

3. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง การบวก ลบ คูณ หารระคน แบบเลือกตอบ 4 ตัวเลือก จำนวน 20 ข้อ

4. แบบวัดความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดการเรียนรู้แบบเกม มีลักษณะเป็นมาตรประมาณค่า 5 ระดับ (Rating Scale) ได้แก่

5 คะแนน หมายถึง พึงพอใจอยู่ในระดับมากที่สุด
4 คะแนน หมายถึง พึงพอใจอยู่ในระดับมาก
3 คะแนน หมายถึง พึงพอใจอยู่ในระดับปานกลาง
2 คะแนน หมายถึง พึงพอใจอยู่ในระดับน้อย
1 คะแนน หมายถึง พึงพอใจอยู่ในระดับน้อยที่สุด

การสร้างและการหาคุณภาพของเครื่องมือ

1. การสร้างแผนการจัดการเรียนรู้ จำนวน 4 แผน แผนละ 3 ชั่วโมง ครอบคลุมเรื่อง การบวก ลบ คูณ หารระคน ดังนี้

1.1 ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 (ฉบับปรับปรุง พ.ศ. 2560) กลุ่มสาระการเรียนรู้คณิตศาสตร์ ชั้นประถมศึกษาปีที่ 4

1.2 ดำเนินการเขียนแผนการจัดการเรียนรู้

1.3 นำแผนการจัดการเรียนรู้ เพื่อให้ผู้เชี่ยวชาญจำนวน 3 ท่าน ประเมินความถูกต้องและความเหมาะสมของแผนการจัดการเรียนรู้ ซึ่งใช้เกณฑ์การพิจารณาค่าเฉลี่ยความถูกต้องและเหมาะสมตั้งแต่ 3.51 คะแนน เป็นต้นไป หมายความว่า มีความถูกต้องและเหมาะสมระดับดี กรณีที่ค่าเฉลี่ยน้อยกว่า 3.51 คะแนน ถือว่าต้องปรับปรุงตามประเด็นการประเมินนั้น ๆ (รัตนะ บัวสนธ์, 2562) ผลการประเมิน พบว่า ค่าความถูกต้องอยู่ในระดับมากที่สุด มีค่าเฉลี่ย 4.88 คะแนน และค่าความเหมาะสมอยู่ในระดับมากที่สุด มีค่าเฉลี่ย 4.91 คะแนน

1.4 ปรับปรุงแผนการจัดการเรียนรู้ตามข้อเสนอแนะของผู้เชี่ยวชาญ หลังจากนั้นนำไปทดลองใช้กับนักเรียนที่มีคุณสมบัติเดียวกับกลุ่มตัวอย่างที่ใช้ในการวิจัย

1.5 ปรับปรุงแผนกการจัดการเรียนรู้ พร้อมทั้งเสนออาจารย์ที่ปรึกษาวิทยานิพนธ์พิจารณาความถูกต้องตามหลักวิชาการ

1.6 จัดทำแผนการจัดการเรียนรู้ฉบับสมบูรณ์ และนำไปใช้กับกลุ่มตัวอย่าง

2. การสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หาร ระคน มีขั้นตอนในการดำเนินการสร้าง ดังนี้

2.1 ศึกษาหลักสูตรแกนกลางกลุ่มสาระการเรียนรู้คณิตศาสตร์ ชั้นประถมศึกษาปีที่ 4 ศึกษาทฤษฎี หลักการ และวิธีการสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน จากเอกสารหลักสูตรและงานวิจัยที่เกี่ยวข้อง

2.2 ออกแบบและสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เป็นแบบปรนัย 4 ตัวเลือก จำนวน 20 ข้อ กำหนดเกณฑ์การให้คะแนน คือ ถูกได้ 1 คะแนน ผิดได้ 0 คะแนน

2.3 นำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนให้อาจารย์ที่ปรึกษาวิทยานิพนธ์ เพื่อรับคำแนะนำจากอาจารย์ที่ปรึกษา

2.4 นำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนเพื่อให้ผู้เชี่ยวชาญจำนวน 3 ท่าน ตรวจสอบความตรงเชิงเนื้อหา โดยวิเคราะห์ค่าดัชนีความสอดคล้องข้อคำถามสอดคล้องกับวัตถุประสงค์ (Index of Objective Congruence: IOC) โดยกำหนดเกณฑ์การให้คะแนน ดังนี้

+1 หมายถึง เมื่อแน่ใจว่าข้อคำถามสอดคล้องกับวัตถุประสงค์

0 หมายถึง เมื่อไม่แน่ใจว่าข้อคำถามสอดคล้องกับวัตถุประสงค์

-1 หมายถึง เมื่อแน่ใจว่าข้อคำถามไม่สอดคล้องกับวัตถุประสงค์

โดยพิจารณาเลือกข้อคำถามที่มีค่าดัชนีความสอดคล้องมากกว่า 0.5 จึงจะถือว่า ข้อคำถามมีเนื้อหาที่สอดคล้องกับวัตถุประสงค์ (พล เหลืองรังษี, 2564) ผลการประเมินพบว่า ค่าดัชนีความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์การวิจัย อยู่ระหว่าง 0.67 – 1.00

2.5 นำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ไปปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ หลังจากนั้นนำไปทดลองใช้กับนักเรียนที่มีคุณสมบัติเดียวกับกลุ่มตัวอย่างที่ใช้ในการวิจัย เพื่อตรวจสอบหาคุณภาพของแบบทดสอบรายวิชาคณิตศาสตร์ ชั้นประถมศึกษาปีที่ 4

2.6 นำคะแนนจากการทดสอบวัดผลสัมฤทธิ์ทางการเรียน คำนวณค่าความยากง่าย (p) พบว่าค่าความยากง่าย มีค่าเฉลี่ยระหว่าง 0.35 – 0.75 ซึ่งเป็นไปตามเกณฑ์ 0.20 – 0.80 (พล เหลืองรังษี, 2564)

2.7 จัดทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนฉบับสมบูรณ์ และนำไปใช้กับกลุ่มตัวอย่าง

3. การสร้างแบบวัดความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม

3.1 ศึกษาแนวคิด ทฤษฎี และองค์ความรู้ที่เกี่ยวข้องกับแบบวัดความพึงพอใจของนักเรียน

3.2 สร้างแบบวัดความพึงพอใจของนักเรียนโดยมีลักษณะเป็นมาตรวัด 5 ระดับ ของลิเคิร์ท (สมชาย รัตนทองคำ, 2556) จำนวน 8 ข้อ มีเกณฑ์การให้คะแนนดังนี้

5 คะแนน หมายถึง พึงพอใจอยู่ในระดับมากที่สุด

4 คะแนน หมายถึง พึงพอใจอยู่ในระดับมาก

3 คะแนน หมายถึง พึงพอใจอยู่ในระดับปานกลาง

2 คะแนน หมายถึง พึงพอใจอยู่ในระดับน้อย

1 คะแนน หมายถึง พึงพอใจอยู่ในระดับน้อยที่สุด

โดยมีเกณฑ์การแปลความหมายค่าเฉลี่ยค่าความพึงพอใจ (ชูศรี วงศ์รัตนะ, 2560) ดังนี้

ค่าเฉลี่ย 4.50 - 5.00 หมายถึง มีความพึงพอใจในระดับมากที่สุด
ค่าเฉลี่ย 3.50 - 4.49 หมายถึง มีความพึงพอใจในระดับมาก
ค่าเฉลี่ย 2.50 - 3.49 หมายถึง มีความพึงพอใจในระดับปานกลาง
ค่าเฉลี่ย 1.50 - 2.49 หมายถึง มีความพึงพอใจในระดับน้อย
ค่าเฉลี่ย 1.00 - 1.49 หมายถึง มีความพึงพอใจในระดับน้อยที่สุด

3.3 นำแบบวัดความพึงพอใจของนักเรียนที่สร้างขึ้นเสนอต่ออาจารย์ที่ปรึกษาวิทยานิพนธ์เพื่อรับคำแนะนำจากอาจารย์ที่ปรึกษา

3.4 นำแบบวัดความพึงพอใจของนักเรียนเสนอผู้เชี่ยวชาญ 3 ท่าน เพื่อรับคำแนะนำจากอาจารย์ที่ปรึกษาตรวจสอบความตรงเชิงเนื้อหา โดยวิเคราะห์ค่าดัชนีความสอดคล้องข้อคำถามสอดคล้องกับวัตถุประสงค์ โดยกำหนดเกณฑ์การให้คะแนน ดังนี้

+1 หมายถึง เมื่อแน่ใจว่าข้อคำถามสอดคล้องกับวัตถุประสงค์
0 หมายถึง เมื่อไม่แน่ใจว่าข้อคำถามสอดคล้องกับวัตถุประสงค์
-1 หมายถึง เมื่อแน่ใจว่าข้อคำถามไม่สอดคล้องกับวัตถุประสงค์

โดยพิจารณาเลือกข้อคำถามที่มีค่าดัชนีความสอดคล้องมากกว่า 0.5 จึงจะถือว่าข้อคำถามมีเนื้อหาที่สอดคล้องกับวัตถุประสงค์ (พล เหลืองรังษี, 2564) ผลการประเมินพบว่า ค่าดัชนีความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์การวิจัย อยู่ระหว่าง 0.67 – 1.00

3.5 นำแบบวัดความพึงพอใจของนักเรียนไปปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ

3.6 นำแบบวัดความพึงพอใจของนักเรียนที่ปรับปรุงแก้ไขแล้วนำไปใช้กับนักเรียนกลุ่มทดลอง

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

ในการวิจัยครั้งนี้ผู้วิจัยใช้สถิติในการวิเคราะห์ข้อมูล ประกอบด้วย ค่าเฉลี่ย (Mean) ค่าเบี่ยงเบนมาตรฐาน (Standard Deviation) และการเปรียบเทียบค่าเฉลี่ยสองกลุ่มสัมพันธ์ (t-test for Dependent Samples)

ผลการวิจัย

1. ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคนของนักเรียนชั้นประถมศึกษาปีที่ 4 ระหว่างก่อนเรียนกับหลังเรียน

ตารางที่ 1 ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ระหว่างก่อนเรียนกับหลังเรียน

รายการ	$\bar{x}$	S.D.	$\bar{d}$	t	df	Sig
ก่อนเรียน	8.16	2.279	7.35	15.38	36	.000
หลังเรียน	15.51	2.305				

จากตารางที่ 1 แสดงให้เห็นว่า คะแนนก่อนเรียนมีค่าเฉลี่ยเท่ากับ 8.16 และคะแนนหลังเรียนมีค่าเฉลี่ยเท่ากับ 15.51 เมื่อทดสอบความแตกต่างทางสถิติ พบว่า คะแนนเฉลี่ยหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001

2. ผลการประเมินความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม

ตารางที่ 2 ผลการประเมินความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม

รายการประเมิน	$\bar{x}$	S.D.	ระดับความพึงพอใจ
1. ประโยชน์จากการเล่นเกม นักเรียนสามารถนำความรู้ไปใช้ในชีวิตประจำวัน/วิชาอื่นได้	4.81	0.40	มากที่สุด
2. วิธีจัดการเรียนรู้เข้าใจง่าย ไม่วกวน	4.73	0.45	มากที่สุด
3. เนื้อหามีความยาก ง่าย เหมาะสมกับตัวเอง	4.68	0.58	มากที่สุด
4. นักเรียนเรียนโดยใช้วิธีการจัดเรียนรู้แบบเกมได้อย่างสนุกสนาน	4.76	0.43	มากที่สุด
5. การเล่นเกมทำให้นักเรียนเข้าใจ บวก ลบ คูณ หารระคน ได้มีมากขึ้น	4.70	0.52	มากที่สุด
6. การเล่นเกมทำให้นักเรียนอยากเรียนวิชาคณิตศาสตร์	4.78	0.42	มากที่สุด
7. การเล่นเกมทำให้นักเรียนอยากเรียนอยากทำใบงาน	4.65	0.54	มากที่สุด
8. คำสั่งหรือคำอธิบายในคำถาม/ข้อสอบ ชัดเจน ง่ายต่อการปฏิบัติ	4.70	0.57	มากที่สุด
ค่าเฉลี่ย	**4.73**	**0.07**	**มากที่สุด**

จากตารางที่ 2 แสดงให้เห็นว่า ความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม อยู่ในระดับมากที่สุด (ค่าเฉลี่ย 4.73) เมื่อพิจารณาเป็นรายข้อ พบว่า ทุกข้อคำถามมีระดับความพึงพอใจมากที่สุด โดยนักเรียนพึงพอใจ 3 อันดับแรก ได้แก่ ประโยชน์จากการเล่นเกม นักเรียนสามารถนำความรู้ไปใช้ในชีวิตประจำวัน/ วิชาอื่นได้ (ค่าเฉลี่ย 4.81) การเล่นเกมทำให้นักเรียนอยากเรียนวิชาคณิตศาสตร์ (ค่าเฉลี่ย 4.78) และนักเรียนเรียนได้อย่างสนุกสนาน (ค่าเฉลี่ย 4.76) ตามลำดับ

สรุปและอภิปรายผล

สรุปผล

1. ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคน ของนักเรียนชั้นประถมศึกษาปีที่ 4 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01

2. ความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม มีค่าเฉลี่ยโดยรวมเท่ากับ 4.73 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.07 ซึ่งมีความพึงพอใจอยู่ในระดับมากที่สุด

การอภิปรายผล

ผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ เรื่อง การบวก ลบ คูณ หารระคน หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .001 เนื่องจากวิธีการจัดการเรียนรู้แบบเกมมีส่วนทำให้นักเรียนตั้งใจและสนใจในการจัดการเรียนรู้มากขึ้น เนื่องจากเกม Code Math เรื่อง การบวก ลบ คูณ หาร มีระดับการเล่นทั้งหมด 3 ระดับ ได้แก่ ระดับการบวก ลบ ระดับการคูณ หาร และระดับการบวก ลบ คูณ หาร ทำให้นักเรียนได้เรียนรู้จากการปฏิบัติจริงมีความท้าทายในการเรียน การเรียนมีความสนุกสนาน นักเรียนมีเกมที่สามารถทบทวนความรู้ อีกทั้งยังฝึกการทำงานเป็นกลุ่ม การร่วมมือ ร่วมคิด การวางแผน นักเรียนที่เรียน

เก่งช่วยนักเรียนที่เรียนอ่อน ซึ่งสอดคล้องกับงานวิจัยของ สรวีย์ กรกชงาม และ ผุสดี กลิ่นเกษร (2566) ได้ศึกษาการพัฒนาบอร์ดเกมคณิตศาสตร์เพื่อส่งเสริมทักษะทางคณิตศาสตร์ ของนักเรียนชั้นประถมศึกษาตอนต้น ผลการศึกษาพบว่า ผลการเรียนรู้ทักษะทางคณิตศาสตร์ ของนักเรียนชั้นประถมศึกษาตอนต้น โรงเรียนวัดบางจะเกร็ง (ประโชตประชานุกูล) หลังจัดกิจกรรมการเรียนรู้สูงกว่าก่อนการจัดกิจกรรมการเรียนรู้ด้วยบอร์ดเกมคณิตศาสตร์อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 และ ลดาวัลย์ แย้มควญ และ ศุภกฤษฎิ์ นิวัฒนากูล (2560) ได้ศึกษาการใช้เกมเพื่อการเรียนรู้สำหรับส่งเสริมทักษะกระบวนการทางคณิตศาสตร์ของนักเรียนชั้นประถมศึกษาปีที่ 6 ผลการศึกษาพบว่า กลุ่มทดลองที่ใช้เกมเพื่อการเรียนรู้สำหรับส่งเสริมทักษะกระบวนการทางคณิตศาสตร์ มีทักษะกระบวนการทางคณิตศาสตร์หลังเรียนสูงกว่าก่อนเรียน และจากผลการทดลองการใช้เกมเพื่อการเรียนรู้ในการเรียนการสอน ทำให้นักเรียนมีแรงจูงใจในการเรียนนำไปสู่การเรียนรู้ทำให้มีทักษะกระบวนการทางคณิตศาสตร์ที่ดีขึ้น

ความพึงพอใจของนักเรียนที่มีต่อวิธีการจัดเรียนรู้แบบเกม อยู่ในระดับมากที่สุด (ค่าเฉลี่ย 4.73) ทุกรายการประเมินอยู่ในระดับมากที่สุด ที่ผลเป็นเช่นนี้เพราะวิธีการจัดเรียนรู้แบบเกม ทำให้นักเรียนกลุ่มอ่อนและนักเรียนกลุ่มเก่งช่วยเหลือซึ่งกันและกัน ได้ฝึกทักษะความชำนาญมากขึ้น โดยคำนึงถึงมาตรฐานการเรียนรู้และตัวชี้วัด วัตถุประสงค์การเรียนรู้ เนื้อหาการเรียนรู้ อีกทั้งให้สอดคล้องกับบริบทของโรงเรียน การจัดการเรียนรู้มีการเสริมแรงให้แก่นักเรียน พบว่า ทุกรายการประเมินอยู่ในระดับมากที่สุด นักเรียนมีความพึงพอใจด้านประโยชน์จากการเล่นเกม นักเรียนสามารถนำความรู้ไปใช้ในชีวิตประจำวัน/วิชาอื่นได้อยู่ในอันดับแรก มีค่าเฉลี่ย 4.81 และด้านคำสั่งหรือคำอธิบายในคำถาม/ข้อสอบ ชัดเจน ง่ายต่อการปฏิบัติ ด้านการเล่นเกมทำให้นักเรียนเข้าใจ บวก ลบ คูณ หารระคน ได้มากขึ้น มีค่าเฉลี่ย 4.70 น้อยที่สุด เนื่องจาก เกม Code Math เป็นเกมใหม่สำหรับนักเรียน คำสั่งหรือกฎกติกาใหม่ทำให้นักเรียนสับสน สอดคล้องกับงานวิจัยของ สิรีธร ลาพรม, สุทัตตา สินชัย, สุกัสสร เคษจันทร์, และ วีรวัฒน์ ไทยขำ (2565) ที่ศึกษาการจัดกิจกรรมการเรียนรู้โดยใช้เกมที่สร้างขึ้นจาก Word wall เพื่อส่งเสริมผลสัมฤทธิ์ทางการเรียน เรื่อง ทฤษฎีบทพีทาโกรัส ของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โรงเรียนลาดยาววิทยาคม ผลการศึกษาความพึงพอใจของนักเรียนต่อการจัดกิจกรรมการเรียนรู้โดยใช้เกมที่สร้างขึ้นจาก Word wall เรื่อง ทฤษฎีบทพีทาโกรัส โดยรวมอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.43

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้ จากผลการวิจัยการพัฒนาผลสัมฤทธิ์ทางการเรียนเรื่อง การบวก ลบ คูณ หารระคน โดยใช้วิธีการจัดเรียนรู้แบบเกม ให้ครูผู้สอนใช้วิธีการจัดเรียนรู้แบบเกมในการจัดการเรียนรู้ ซึ่งดีกว่าการจัดการเรียนรู้แบบปกติ

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป ควรจะทำการศึกษาเพิ่มเติมในเรื่องของโจทย์ปัญหาการบวก ลบ คูณ หารระคน เพื่อให้นักเรียนพัฒนาทักษะที่เกี่ยวข้องกับการแก้โจทย์ปัญหาการบวก ลบ คูณ หารระคน อีกทั้งควรมีการนำวิธีการจัดเรียนรู้แบบเกมไปใช้กับระดับชั้นอื่น ๆ หรือบูรณาการในการจัดการเรียนการสอนในกลุ่มสาระการเรียนรู้อื่น ๆ เพื่อให้นักเรียนเกิดการเรียนรู้ได้อย่างเหมาะสมกับวัย

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การพัฒนาความสามารถด้านการอ่านจับใจความสำคัญ โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา

The Developing of Comprehension Reading through the Use of Reading Comprehension Exercises in Conjunction with 5W1H Techniques for Mathayom 1 Students, Rattaphum Wittaya School Rattaphum District, Songkhla Province

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บทคัดย่อ

งานวิจัยนี้มีจุดประสงค์เพื่อพัฒนาแบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา ให้มีประสิทธิภาพตามเกณฑ์ 80/80 และเพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา ผลการวิจัยพบว่า 1) แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 มีประสิทธิภาพเท่ากับ 84.75/90.67 ซึ่งเป็นไปตามเกณฑ์ 80/80 2) ผลสัมฤทธิ์ทางการเรียนของนักเรียนที่เรียนรู้ โดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน (ข้อสอบชุดเดียวกัน) เป็นข้อคำถามปรนัย จำนวน 20 ข้อ ข้อละ 1 คะแนน รวม 20 คะแนน คะแนนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 โดยมีประโยชน์ในการวิจัยดังนี้ 1) ได้แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H เพื่อส่งเสริมการอ่านจับใจความสำคัญ สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา ที่มีประสิทธิภาพตามเกณฑ์ 80/80 2) ได้ทราบผลสัมฤทธิ์ทางการเรียนก่อนและหลังเรียนด้วยแบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา

คำสำคัญ: การอ่านจับใจความ, เทคนิค 5W1H, พัฒนาแบบฝึกทักษะ

Abstract

This research aims to develop reading comprehension exercises along with 5W1H techniques of Mathayom 1 students at Rattaphum Witthaya School, Rattaphum District, Songkhla Province to have efficiency according to the 80/80 criteria and to compare

academic performance. Pre-study and post-study reading comprehension exercises in conjunction with 5W1H techniques for Mathayom 1 students at Rattaphum Witthaya School. The results of the study show that 1) the reading comprehension exercises Along with the 5W1H technique of Mathayom 1 students, the efficiency is 84.75/90.67, which meets the criteria of 80/80. 2) The academic performance of the students who study with the achievement test before and after (The same set of exams) is a multiple-choice question, 20 questions, 1 point each, for a total of 20 points. The post-study score is higher than the pre-study score. Statistically significant at the .01 level. There are benefits to this research as follows: 1) Gain practice in reading comprehension skills together with the 5W1H technique to promote reading comprehension for Mathayom 1 students at Rattaphumwittaya School. It is effective according to the criteria of 80/80. 2) Know the academic achievement before and after studying with reading comprehension skills exercises together with 5W1H techniques for Mathayom 1 students at Rattaphum Witthaya School.

Keywords: Comprehension Reading, 5W1H Technique, Skill Exercises of Developing

บทนำ

กระทรวงศึกษาธิการ (2505) ได้กล่าวไว้ว่า ภาษาไทยเป็นภาษาประจำชาติที่มีความสำคัญต่อคนไทยเป็นอย่างยิ่ง ดังพระราชดำรัสในพระบาทสมเด็จพระเจ้าอยู่หัวภูมิพลอดุลยเดช ที่ว่า “...ประเทศไทยนั้นมีภาษาของเราเอง ซึ่งต้องหวงแหน...เราโชคดีที่มีภาษาของตนเองแต่โบราณกาล จึงสมควรอย่างยิ่งที่จะรักษาไว้”

กระทรวงศึกษาธิการ (2505) ได้กล่าวไว้ว่า ภาษาไทยมีความสำคัญต่อการดำรงชีวิตของคนไทยในฐานะที่เป็นวัฒนธรรมประจำชาติ และยังเป็นเอกลักษณ์ที่สำคัญ เป็นเครื่องมือในการเสริมสร้างเอกภาพของชาติทำให้เกิดความรู้สึกเป็นอันหนึ่งอันเดียวกัน ตลอดจนเป็นเครื่องมือที่ใช้พัฒนาคนในชาติ เพราะการศึกษาเล่าเรียนการแลกเปลี่ยนความคิดเห็น และการถ่ายทอดความคิดศิลปวิทยาการล้วนต้องใช้ภาษาทั้งสิ้น ดังนั้นภารกิจของการศึกษาประการหนึ่งก็คือ การสอนภาษาไทยให้คนในชาติสามารถติดต่อสื่อสารกันได้อย่างมีประสิทธิภาพ และใช้ภาษาไทยเพื่อการพัฒนาความรู้ ความสามารถของตนเอง และสามารถสืบทอดมรดกทางภาษาซึ่งเป็นวัฒนธรรมของชาติ มีความชื่นชมที่จะใช้ภาษาไทยได้อย่างถูกต้อง และมีเจตนคติที่ดีต่อภาษาไทย ซึ่ง วรรณี โสมประยูร (2534) ได้สรุปความสำคัญของการสอนภาษาไทยไว้ตอนหนึ่งว่า มนุษย์ได้ใช้ทักษะการฟัง พูด อ่าน และเขียน เป็นเครื่องมือในการศึกษาความรู้ เพื่อประกอบอาชีพ พัฒนาบุคลิกภาพ และสร้างเสริมคุณภาพชีวิตในด้านอื่น ๆ เพราะคนเราได้รับความรู้ ความคิดต่าง ๆ จากการฟัง การอ่าน และการเขียนบันทึกไว้ เพื่อพูดหรือเขียนถ่ายทอดให้ผู้อื่นเข้าใจอีกทอดหนึ่ง การเขียนของนักเรียนที่อ่อนภาษาจึงทำให้อ่อนวิชาอื่น ๆ ด้วย

ฉวีวรรณ คูหาภินันท์ (2542) ได้กล่าวไว้ว่า การอ่านมีความสำคัญต่อชีวิตมนุษย์ตั้งแต่เกิดจนโตและจนกระทั่งถึงวัยชรา การอ่านทำให้รู้ข่าวสารข้อมูลต่าง ๆ ทั่วโลก ซึ่งปัจจุบันเป็นโลกของข้อมูลต่าง ๆ ทั่วโลก ทำให้ผู้อ่านมีความสุข มีความหวัง และมีความอยากรู้อยากเห็น อันเป็นความต้องการของมนุษย์ทุกคน การอ่านมีประโยชน์ในการพัฒนาตนเอง คือ พัฒนาการศึกษา พัฒนาอาชีพ พัฒนาคุณภาพชีวิต

ทำให้เป็นคนทันสมัย ทันต่อเหตุการณ์ และมีความอยากรู้อยากเห็น การที่จะพัฒนาประเทศเจริญรุ่งเรืองก้าวหน้าได้ต้องอาศัยประชาชนที่มีความรู้ความสามารถ ซึ่งความรู้ต่าง ๆ ก็ได้มาจากการอ่านนั่นเอง สอดคล้องกับ จินตนา ใบกาซูยี (2543) กล่าวว่า การอ่านหนังสือนั้น มีความสำคัญและเป็นประโยชน์ต่อชีวิตคนเราอย่างยิ่ง และนอกจากนั้นยังได้สรุปบทบรรยายของสมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี ถึงความสำคัญของการอ่านหนังสือว่า

1. การอ่านหนังสือทำให้ได้เนื้อหาสาระความรู้มากกว่าการศึกษาหาความรู้ด้วยวิธีอื่น ๆ เช่น การฟัง
2. ผู้อ่านสามารถอ่านหนังสือได้โดยไม่มีการจำกัดเวลาและสถานที่ สามารถนำไปไหนมาไหนได้
3. หนังสือเก็บได้นานกว่าสื่ออย่างอื่น ซึ่งมักมีอายุการใช้งานจำกัด
4. ผู้อ่านสามารถฝึกการคิดและสร้างจินตนาการได้เองในขณะอ่าน
5. การอ่านส่งเสริมให้มีสมองดี มีสมาธินานกว่าและมากกว่าสื่ออย่างอื่น ทั้งนี้เพราะขณะอ่านจิตใจจะต้องมุ่งมั่นอยู่กับข้อความ พินิจพิเคราะห์ข้อความนั้น ๆ
6. ผู้อ่านเป็นผู้กำหนดการอ่านได้ด้วยตนเอง จะอ่านคร่าว ๆ อ่านละเอียด อ่านข้าม หรืออ่านทุกตัวอักษร เป็นไปตามใจของผู้อ่าน หรือจะเลือกอ่านเล่มไหนก็ได้ เพราะหนังสือมีมากสามารถเลือกอ่านเองได้
7. หนังสือมีหลากหลายรูปแบบและราคาถูกกว่าสื่ออย่างอื่น จึงทำให้สมองของผู้อ่านเปิดกว้าง สร้างแนวคิดและทัศนคติได้มากกว่า ทำให้ผู้อ่านไม่ติดยึดอยู่กับแนวคิดใด ๆ โดยเฉพาะ
8. ผู้อ่านเกิดความคิดเห็นได้ด้วยตนเองวินิจฉัยเนื้อหาสาระได้ด้วยตนเอง รวมทั้งหนังสือบางเล่มสามารถนำไปปฏิบัติแล้วเกิดผลดี

ภัทรสุดา นาคสุข (2564) ได้กล่าวไว้ว่า การอ่านจับใจความเป็นทักษะพื้นฐานที่จำเป็นของการอ่านทุกรูปแบบเพื่อทำความเข้าใจเนื้อเรื่อง เข้าใจจุดมุ่งหมายสาระสำคัญของเรื่องที่อ่าน และเนื้อหาที่ผู้เขียนต้องการสื่อให้ถึงผู้อ่าน ซึ่ง ชุติมา ยอดตา (2561) ได้อธิบายเกี่ยวกับความสำคัญของการอ่านจับใจความไว้ว่า การอ่านจับใจความมีความสำคัญเพราะเป็นทักษะพื้นฐานที่สำคัญสำหรับการอ่านระดับขั้นสูงขึ้นไป เพราะถ้าหากนักเรียนไม่สามารถอ่านจับใจความได้ก็จะส่งผลให้ไม่สามารถเข้าใจเรื่องที่อ่าน เนื่องจากการอ่านจับใจความมีส่วนช่วยให้ผู้อ่านเกิดความเข้าใจในแก่นเรื่องที่อ่านได้ถูกต้อง และสำหรับผู้เรียนในรายวิชาต่าง ๆ ทุกสาขาวิชาจำเป็นอย่างยิ่งที่ต้องอาศัยทักษะการอ่านจับใจความ เพื่อใช้เป็นเครื่องมือในการแสวงหาความรู้และประสบการณ์ต่าง ๆ ดังนั้นผู้เรียนที่ขาดทักษะการอ่านจับใจความก็จะไม่สามารถสรุปเนื้อหาสาระเรื่องที่อ่านได้ ในด้านการเรียนการสอน การอ่านจับใจความถือว่ามีความสำคัญเพราะเป็นพื้นฐานในการอ่านทำความเข้าใจเนื้อหาของการเรียนในทุกรายวิชา โดยการเรียนการสอนนั้นจำเป็นต้องปลูกฝังให้นักเรียนมีนิสัยรักการอ่าน และพัฒนาให้นักเรียนสามารถอ่านจับใจความได้อย่างมีประสิทธิภาพ แต่การที่จะพัฒนานักเรียนให้สามารถอ่านจับใจความได้อย่างมีประสิทธิภาพนั้น จะต้องอาศัยการฝึกปฏิบัติอย่างสม่ำเสมอ เพราะเป็นประโยชน์อย่างมากในการแสวงหาความรู้ นอกจากนี้ แวมยุรา เหมือนนิล (2556) ได้กล่าวถึงการอ่านจับใจความว่า เป็นการอ่านเพื่อทำความเข้าใจเรื่องที่อ่านอันดับต้น และเป็นพื้นฐานที่สำคัญมากสำหรับการอ่านระดับสูงต่อไป เช่น ถ้านักเรียนอ่านจับใจความเรื่องที่อ่านไม่ได้ ก็คงไม่สามารถอ่านเพื่อวิจารณ์ว่าเรื่องนั้นดีไม่ดีได้เลย สอดคล้องกับ จุไรรัตน์ ลักษณะศิริ (2556) ที่ได้กล่าวเกี่ยวกับความสำคัญของการอ่านจับใจความว่า เป็นการอ่านในระดับเบื้องต้น ผู้อ่านต้องสามารถสรุปสาระสำคัญและถ่ายทอดเรื่องราวที่อ่านต่อได้ ซึ่งการอ่านจับใจความต้องได้รับการฝึกฝนจาก

การอ่านสารประเภทต่าง ๆ จนเกิดเป็นความเข้าใจในสารที่อ่าน โดยความเข้าใจในการอ่านทั่วไปนั้นแบ่งออกเป็น 3 ประเภท ได้แก่ เข้าใจองค์ความรู้ ความเข้าใจ และอารมณ์ ซึ่งทั้ง 3 สิ่งนี้ล้วนเป็นกลยุทธ์สำคัญที่ผู้อ่านจำเป็นต้องได้รับการฝึกฝน จนเกิดเป็นนิสัยรักการอ่าน สอดคล้องกับ กมลชนก แจ่มจำรัส (2556) ที่ได้กล่าวถึงความสำคัญของการอ่านจับใจความเพิ่มเติมไว้ว่า ความสามารถในการอ่านจับใจความมีความสำคัญและจำเป็นในการศึกษาวิชาการต่าง ๆ ทำให้ได้รับข้อมูลอย่างฉับไว ตรงประเด็น และสามารถแสดงความคิดเห็นต่อเรื่องที่อ่านได้ การเรียนการสอนในทุกระดับชั้นจำเป็นต้องอาศัยการอ่านจับใจความให้ผู้เรียนได้พัฒนาความเข้าใจในการอ่าน นั่นคือ เราจะเน้นการอ่านเพื่อการเรียนรู้มากกว่าการเรียนรู้เพื่อการอ่าน ซึ่งจากที่กล่าวมาข้างต้นแสดงให้เห็นว่า การอ่านจับใจความมีความสำคัญเป็นอย่างยิ่ง ถือได้ว่าเป็นการอ่านขั้นพื้นฐานที่สำคัญ โดยการอ่านจับใจความให้ได้นั้นต้องอาศัยกระบวนการฝึกฝนอย่างสม่ำเสมอจนเกิดเป็นความสามารถทางด้านการอ่านจับใจความ และสามารถนำความรู้ไปต่อในการอ่านระดับที่สูงขึ้นได้

สุภาพร เหล่ารอด (2565) ได้กล่าวไว้ว่า การสอนอ่านนั้นจะมีประสิทธิภาพจำเป็นต้องมีเทคนิควิธีการที่หลากหลาย ผู้สอนจำเป็นจะต้องหาเทคนิควิธีการสอนที่เหมาะสมแก่ผู้เรียน ผู้วิจัยได้ศึกษาเทคนิควิธีการสอนต่าง ๆ ที่สามารถนำมาใช้ให้เหมาะสมกับนักเรียน หนึ่งในเทคนิคที่ผู้วิจัยศึกษาที่สามารถช่วยพัฒนาทักษะด้านการอ่านจับใจความ คือ 5W1H ดังที่ นิตติยา เหง้าโอสา (2563) ได้ศึกษาค้นคว้าเอกสารและงานเกี่ยวกับการจัดการเรียนรู้ โดยใช้เทคนิคการใช้คำถาม 5W1H พบว่า การจัดการเรียนรู้โดยใช้เทคนิคการใช้คำถาม 5W1H เป็นเทคนิคการสอนด้วยการใช้คำถามที่ประกอบด้วย 6 คำถาม ได้แก่ Who (ใคร) What (อะไร) Where (ที่ไหน) When (เมื่อไร) Why (ทำไม) และ How (อย่างไร) สามารถกระตุ้นให้นักเรียนเกิดทักษะการอ่านจับใจความ และช่วยให้นักเรียนมีความเข้าใจในเนื้อเรื่องที่อ่านมากยิ่งขึ้น อีกทั้งการถามเป็นการเปิดโอกาสให้นักเรียนได้คิดและสร้างองค์ความรู้ด้วยตนเอง มุ่งให้นักเรียนสามารถหาความรู้แก้ปัญหา และสรุปแนวคิดหลักได้ด้วยตนเอง และดังที่ กรองทิพย์ สุราตะโก (2559) ได้กล่าวไว้ว่า นวัตกรรมที่จะช่วยพัฒนาความสามารถด้านการอ่านคิดวิเคราะห์นั้นก็คือ การจัดกิจกรรมการเรียนรู้โดยใช้เทคนิค 5W1H ซึ่งเป็นการตั้งประเด็นถามตอบเพื่อให้นักเรียนได้บรรลุตามเป้าหมายที่กำหนดไว้ โดยใช้คำถาม 5W1H ซึ่งเป็นส่วนหนึ่งของคำถาม 6 ประเภท ตามความคิดของบลูม (Bloom) ได้แก่ 1) Who (ใคร) เช่น ใครอยู่ในเหตุการณ์บ้าง ใครจะเกี่ยวข้องกับเหตุการณ์เช่นนี้บ้าง 2) What (อะไร) เช่น เกิดอะไรขึ้นบ้าง มีอะไรเกี่ยวข้องกับเหตุการณ์นี้ 3) Where (ที่ไหน) เช่น เรื่องนี้เกิดขึ้นที่ไหน เหตุการณ์นี้น่าจะเกิดขึ้นที่ใดมากที่สุด 4) When (เมื่อไร) เช่น เหตุการณ์นั้นน่าจะเกิดขึ้นเมื่อไร เวลาใดบ้างที่สถานการณ์เช่นนี้จะเกิดขึ้นได้ 5) Why (ทำไม) เช่น เหตุใดต้องเป็นคนนี้ เป็นเวลานี้ เป็นสถานที่นี้ เพราะเหตุใดเหตุการณ์นี้จึงเกิดขึ้น 6) How (อย่างไร) เช่น ผลที่เกิดขึ้นเป็นอย่างไร การจัดกิจกรรมการเรียนรู้โดยใช้เทคนิค 5W1H จะช่วยให้ผู้เรียนมีความสามารถด้านการอ่านคิดวิเคราะห์เพิ่มขึ้น

ในการเรียนการสอนรายวิชาภาษาไทย ผู้วิจัยได้รับมอบหมายให้จัดการเรียนการสอนในระดับชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา ตำบลกำแพงเพชร อำเภอรัตภูมิ จังหวัดสงขลา ผู้วิจัยพบว่านักเรียนชั้นมัธยมศึกษาปีที่ 1 จากการให้นักเรียนชั้นมัธยมศึกษาปีที่ 1 จำนวน 3 ห้อง อ่านจับใจความสำคัญ นักเรียนส่วนใหญ่สามารถอ่านได้แต่ยังพบปัญหาคือ นักเรียนอ่านไม่เป็น นักเรียนอ่านแล้วไม่สามารถจะจับประเด็นสำคัญจากเรื่องที่ตนอ่านได้ นักเรียนไม่สามารถจะบอกได้ว่า ในเรื่องที่อ่าน มีใครทำอะไร ที่ไหน เมื่อไหร่ และอย่างไร ซึ่งหากนักเรียนยังมีพฤติกรรมที่ไม่สามารถจะจับประเด็นจากการอ่านได้จะส่งผลกระทบแก่ตัวนักเรียนอย่างยิ่ง ไม่ว่าจะเป็นในเรื่องการเรียน ตลอดจนเรื่องของ

ผลสัมฤทธิ์ทางการเรียน รวมถึงการเรียนการสอนในรายวิชาอื่น ๆ อีกด้วย ผู้เรียนจะต้องมีทักษะในด้านการอ่านเป็นอันดับแรก ซึ่งปัญหาเหล่านี้จะทำให้ผู้เรียนไม่ชอบที่จะอ่าน และเกิดความเบื่อหน่ายต่อการเรียน จากปัญหาที่ได้กล่าวมาทั้งหมดจะเห็นได้ว่า การอ่านมีความสำคัญอย่างยิ่ง ดังนั้นผู้วิจัยเห็นว่าปัญหานี้ควรที่จะแก้ไขและปรับปรุงเพื่อให้การอ่านจับใจความของนักเรียนมีประสิทธิภาพมากยิ่งขึ้น

จากสภาพปัญหาและความสำคัญที่กล่าวมาข้างต้นจะเห็นได้ว่า การอ่านจับใจความมีความสำคัญอย่างยิ่งต่อตัวเด็ก ผู้วิจัยจึงเห็นว่า เป็นปัญหาที่ควรจะเร่งแก้ไขและพัฒนา เพื่อจะสามารถเพิ่มทักษะในการอ่าน ผลสัมฤทธิ์ตลอดจนเพิ่มประสิทธิภาพทางการอ่านมากยิ่งขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อพัฒนาแบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา โรงเรียนรัตภูมิวิยา อำเภอรัตภูมิ จังหวัดสงขลาให้มีประสิทธิภาพตามเกณฑ์ 80/80

2. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา

แนวคิด ทฤษฎี กรอบแนวคิด

1. การอ่านจับใจความ

1.1 ความหมายของการอ่านจับใจความ

สายใจ ทองเนียม (2560) การอ่านจับใจความว่า คือ การอ่านในใจ ที่มุ่งค้นหาสาระสำคัญของเรื่อง ใจความหลัก เพื่อให้ทราบว่าเป็นเรื่องอะไร ใครทำอะไร ที่ไหน เมื่อไร อย่างไร ทำไม และมีใจความรองหรือใจความขยาย ซึ่งเป็นรายละเอียดเพื่อสนับสนุนใจความหลักให้ชัดเจนยิ่งขึ้น

1.2 ความสำคัญของการอ่านจับใจความสำคัญ

ธนาธิป เสือขำ (2564) กล่าวว่า การอ่านจับใจความเป็นสิ่งที่สำคัญ เพราะนอกจากทำให้ผู้อ่านสามารถจับใจความจากเรื่องที่อ่านได้ดี แล้วยังเป็นทักษะที่เป็นประโยชน์ต่อการเรียนในการดำรงชีวิต

2. แบบฝึกทักษะ

นารี ศรีปัญญา (2556) ได้กล่าวว่า แบบฝึกทักษะ หมายถึง สื่อการเรียนการสอนที่ใช้ในการฝึกทักษะให้กับผู้เรียน เพื่อให้ผู้เรียนได้ฝึกฝนทบทวนความรู้ความเข้าใจหลังจากเรียนจบเนื้อหาไปแล้วทำให้เกิดความรู้ความเข้าใจ และเกิดความชำนาญในเรื่องนั้น ๆ

3. การสอนแบบ 5W1H

ชนกพร สุริโย (2562) กล่าวว่า เทคนิค 5W1H เป็นการตั้งคำถามเพื่อวิเคราะห์องค์ประกอบของเรื่องราวนั้น ๆ ว่า ใคร (Who) ทำอะไร (What) ที่ไหน (Where) เมื่อไร (When) ทำไม (Why) อย่างไร (How) โดยการวิจัยในครั้งนี้ ผู้วิจัยได้ใช้เทคนิค 5W1H ในการจัดกิจกรรมการเรียนรู้ ซึ่งจะทำให้ผู้เรียนสามารถแยกแยะองค์ประกอบและตั้งคำถามจากเรื่องที่อ่านได้ และยังช่วยในการพัฒนาความสามารถด้านการอ่านคิดวิเคราะห์ของผู้เรียนได้อีกด้วย

4. วิจัยที่เกี่ยวข้อง

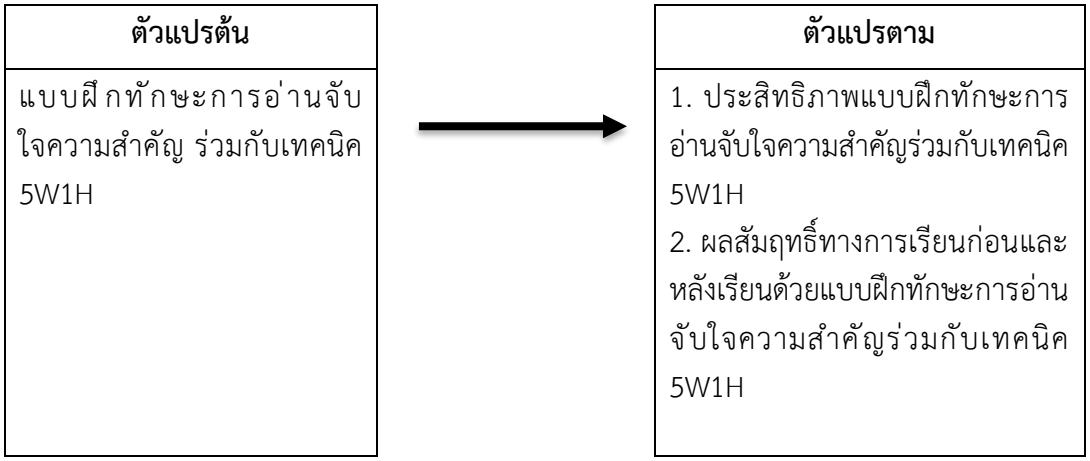
ดวงพร เฟื่องฟู (2560) ศึกษาการพัฒนาชุดกิจกรรมการอ่านจับใจความ โดยใช้เทคนิค 5W1H เพื่อส่งเสริมการอ่าน กลุ่มสาระการเรียนรู้วิชาภาษาไทย ของนักเรียนชั้นมัธยมศึกษาปีที่ 6 พบว่า 1) จาก

การศึกษาประสิทธิภาพของชุดกิจกรรมการอ่านจับใจความ โดยใช้เทคนิค 5W1H พบว่า ประสิทธิภาพของชุดกิจกรรม E1/E2 = 84/87.50 ตามสมมติฐาน

นิตติยา เหง้าโอสา (2563) ได้ศึกษาค้นคว้าเอกสารและงานเกี่ยวกับการจัดการเรียนรู้ โดยใช้เทคนิคการใช้คำถาม 5W1H พบว่า การจัดการเรียนรู้โดยใช้เทคนิคการใช้คำถาม 5W1H เป็นเทคนิคการสอนด้วยการใช้คำถามที่ประกอบด้วย 6 คำถาม ได้แก่ Who (ใคร) What (อะไร) Where (ที่ไหน) When (เมื่อไร) Why (ทำไม) และ How (อย่างไร) สามารถกระตุ้นให้นักเรียนเกิดทักษะการอ่านจับใจความและช่วยให้นักเรียนมีความเข้าใจในเนื้อเรื่องที่อ่านมากยิ่งขึ้น อีกทั้งการถามเป็นการเปิดโอกาสให้นักเรียนได้คิดและสร้างองค์ความรู้ด้วยตนเองมุ่งให้นักเรียนสามารถหาความรู้แก้ปัญหาและสรุปแนวคิดหลักได้ด้วยตนเอง

5. กรอบแนวคิด

ในการวิจัยเรื่อง การพัฒนาความสามารถด้านการอ่านจับใจความสำคัญ โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา ซึ่งผู้วิจัยได้กำหนดกรอบแนวคิดไว้ ดังนี้



ภาพที่ 1 กรอบงานวิจัย

วิธีดำเนินการวิจัย

การวิจัยเรื่อง “การพัฒนาความสามารถด้านการอ่านจับใจความสำคัญ โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา” มีวัตถุประสงค์การวิจัย 2 ประการ คือ เพื่อพัฒนาแบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา ให้มีประสิทธิภาพตามเกณฑ์ 80/80 และเพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา ซึ่งมีวิธีการดำเนินวิจัยดังต่อไปนี้

1. ประชากรและกลุ่มตัวอย่างที่ใช้ในการวิจัย ประชากร คือ นักเรียนชั้นมัธยมศึกษาปีที่ 1 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิวิทยา จังหวัดสงขลา จำนวน 3 ห้อง นักเรียนทั้งหมด 88 คน กลุ่มตัวอย่าง คือ นักเรียนชั้นมัธยมศึกษาปีที่ 1/1 ภาคเรียนที่ 2 ปีการศึกษา

2566 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิวิทยา จังหวัดสงขลา จำนวน 1 ห้อง นักเรียนทั้งหมด 30 คน ได้มาซึ่งกลุ่มตัวอย่างโดยใช้วิธีการสุ่มตัวอย่างแบบกลุ่ม (Cluster Random Sampling)

2. เครื่องมือที่ใช้ในการวิจัย ได้แก่ 1) แผนจัดการเรียนรู้การอ่านจับใจความ จำนวน 4 แผน แผนละ 2 ชั่วโมง 2) แบบฝึกการอ่านจับใจความร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ประกอบด้วยแบบฝึกการอ่านจับใจความ 4 แบบฝึก ได้แก่ แบบฝึกที่ 1 แบบฝึกความรู้เบื้องต้นการอ่านจับใจความ แบบฝึกที่ 2 แบบฝึกการอ่านจับใจความจากเรื่องสั้น แบบฝึกที่ 3 แบบฝึกการอ่านจับใจความจากบทความ และแบบฝึกที่ 4 แบบฝึกการอ่านจับใจความสำคัญจากสารคดี 3) แบบทดสอบวัดผลสัมฤทธิ์การอ่านจับใจความร่วมกับเทคนิค 5W1H ก่อนเรียนและหลังเรียน แบบปรนัย 4 ตัวเลือก จำนวน 20 ข้อ ข้อละ 1 คะแนน รวม 20 คะแนน กำหนดการให้ค่าคะแนน คือ ตอบถูกได้ 1 คะแนน ตอบผิดหรือไม่ตอบได้ 0 คะแนน (ข้อสอบเป็นชุดเดียว)

ผลการวิจัย

ผู้วิจัยได้นำเสนอผลการวิจัยตามวัตถุประสงค์ของการวิจัย ดังรายละเอียดต่อไปนี้

1. แบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา ที่ผู้วิจัยสร้างขึ้นมีประสิทธิภาพเท่ากับ 84.75/90.67 ซึ่งเป็นไปตามเกณฑ์ 80/80

ตารางที่ 1 ประสิทธิภาพของแบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H

จำนวนนักเรียน	ผลความก้าวหน้าจากการทำแบบฝึกระหว่างเรียน (E1)			ผลสัมฤทธิ์ทางการเรียน (E2)			ประสิทธิภาพ (E1/ E2)
	คะแนนเต็ม	ค่าเฉลี่ย	ร้อยละ	คะแนนเต็ม	ค่าเฉลี่ย	ร้อยละ	
30	40	33.9	84.75	20	18.13	90.67	84.75/90.67

จากตารางที่ 1 การวิเคราะห์หาประสิทธิภาพ แบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 กับกลุ่มตัวอย่าง จำนวน 30 แสดงว่า แบบฝึกทักษะมีประสิทธิภาพเท่ากับ 84.75/90.67 ซึ่งเป็นตามเกณฑ์มาตรฐานที่กำหนด

2. ผลสัมฤทธิ์ทางการเรียนของนักเรียนที่เรียนรู้โดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน (ข้อสอบชุดเดียวกัน) เป็นข้อคำถามปรนัย จำนวน 20 ข้อ ข้อละ 1 คะแนน รวม 20 คะแนน คะแนนหลังเรียนสูงกว่าก่อนเรียน อย่างมีนัยสำคัญ ทางสถิติที่ระดับ .01

ตารางที่ 2 ผลการทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนด้วยแบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H

ผลสัมฤทธิ์ทางการเรียน	คะแนนเฉลี่ย $\overline{X}$	ส่วนเบี่ยงเบนมาตรฐาน (S.D)	t-test
ก่อนเรียน	5.27	2.20	-8.15
หลังเรียน	8.53		

จากตารางที่ 2 ผลการวิเคราะห์ข้อมูล พบว่า นักเรียนที่เรียนโดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H มีผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 โดยผลสัมฤทธิ์ทางการเรียนเฉลี่ยของนักเรียนหลังเรียนสูงกว่าก่อนเรียน

สรุปและอภิปรายผล

จากการวิจัยเรื่อง การพัฒนาความสามารถด้านการอ่านจับใจความสำคัญ โดยใช้แบบฝึกทักษะการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนรัตภูมิวิทยา อำเภอรัตภูมิ จังหวัดสงขลา สามารถอภิปรายผลได้ดังต่อไปนี้

1. แบบฝึกทักษะการอ่านจับใจความสำคัญ ร่วมกับเทคนิค 5W1H ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่ผู้วิจัยสร้างขึ้น มีประสิทธิภาพเท่ากับ 84. 75/90. 67 เป็นไปตามเกณฑ์ 80/80 แบบฝึกของผู้วิจัยมีคุณภาพตามมาตรฐานที่ตั้งไว้ เนื่องจากก่อนนำไปใช้จริง ได้ผ่านการตรวจสอบจากผู้เชี่ยวชาญและมีการปรับแก้หลายครั้งจนได้แบบฝึกฉบับสมบูรณ์ ทั้งนี้พบว่า แบบฝึกที่ดีควรมีกิจกรรมที่หลากหลายให้ผู้เรียนได้ฝึกปฏิบัติ ร่วมกับการออกแบบที่มีความสวยงาม ดึงดูดใจผู้เรียน โดยใช้รูปภาพที่เป็นการ์ตูนและสีสันสดใส เข้ากับช่วงวัยของผู้เรียน ทำให้ผู้เรียนมีความสนใจอยากทำแบบฝึกมากยิ่งขึ้น ซึ่งสอดคล้องกับงานวิจัยของ ดวงพร เฟื่องฟู (2560) ศึกษาการพัฒนาชุดกิจกรรมการอ่านจับใจความ โดยใช้เทคนิค 5W1H เพื่อส่งเสริมการอ่าน กลุ่มสาระการเรียนรู้วิชาภาษาไทย ของนักเรียนชั้นมัธยมศึกษาปีที่ 6 พบว่า 1) จากการศึกษาประสิทธิภาพของชุดกิจกรรมการอ่านจับใจความ โดยใช้เทคนิค 5W1H พบว่า ประสิทธิภาพของชุดกิจกรรม E1/E2 = 84/87.50 ตามสมมติฐาน และสอดคล้องกับ สุภาพร เหล่ารอด (2565) ได้กล่าวไว้ว่า การสอนอ่านนั้นจะมีประสิทธิภาพจำเป็นต้องมีเทคนิควิธีการที่หลากหลาย ผู้สอนจำเป็นจะต้องหาเทคนิควิธีการสอนที่เหมาะสมแก่ผู้เรียน ผู้วิจัยได้ศึกษาเทคนิควิธีการสอนต่าง ๆ ที่สามารถนำมาใช้ให้เหมาะสมกับนักเรียน หนึ่งในเทคนิคที่ผู้วิจัยศึกษาที่สามารถช่วยพัฒนาทักษะด้านการอ่านจับใจความ คือ 5W1H ดังที่ นิตติยา เหง้าโอสา (2563) ได้ศึกษาค้นคว้าเอกสารและงานเกี่ยวกับการจัดการเรียนรู้ โดยใช้เทคนิคการใช้คำถาม 5W1H พบว่า การจัดการเรียนรู้โดยใช้เทคนิคการใช้คำถาม 5W1H เป็นเทคนิคการสอนด้วยการใช้คำถามที่ประกอบด้วย 6 คำถาม ได้แก่ Who (ใคร) What (อะไร) Where (ที่ไหน) When (เมื่อไร) Why (ทำไม) และ How (อย่างไร) สามารถกระตุ้นให้นักเรียนเกิดทักษะการอ่านจับใจความและช่วยให้นักเรียนมีความเข้าใจในเนื้อเรื่องที่อ่านมากยิ่งขึ้น อีกทั้งการถามเป็นการเปิดโอกาสให้นักเรียนได้คิดและสร้างองค์ความรู้ด้วยตนเองมุ่งให้นักเรียนสามารถหาความรู้แก้ปัญหาและสรุปแนวคิดหลักได้ด้วยตนเอง

2. ผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังเรียนโดยใช้แบบฝึกทักษะการอ่านจับใจความสูงกว่าก่อนเรียนอย่างมีนัยสำคัญที่ระดับ .01 เป็นไปตามสมมติฐานข้อ 2 ทั้งนี้ เนื่องจากผู้วิจัยได้จัดทำการจัดการเรียนรู้ร่วมกับเทคนิค 5W1H สามารถช่วยให้ความสามารถในการอ่านจับใจความวิชาภาษาไทยของนักเรียนสูงขึ้น เมื่อผู้สอนได้นำเทคนิค 5W1H ในการเรียนการสอนจึงทำให้นักเรียนสามารถทำคะแนนหลังเรียนสูงกว่าก่อนเรียน ซึ่งสอดคล้องกับ ชฎารัตน์ ภูทางนา (2562) ได้ทำการวิจัยเรื่อง การเปรียบเทียบความสามารถในการอ่านจับใจความสำคัญ โดยวิธีสอนแบบสื่อประสมกับวิธีสอนแบบ SQ4R ของนักเรียนชั้นประถมศึกษาปีที่ 6 โรงเรียนเทศบาลเมืองขลุง1 (บุรวิทยาคาร) ผลการวิจัยพบว่า ความสามารถการอ่านจับใจความสำคัญก่อนเรียนและหลังเรียนของนักเรียนด้วยวิธีสอนแบบสื่อประสมกับวิธีสอนแบบ SQ4R พบว่า ความสามารถในการอ่านจับใจความสำคัญ โดยวิธีสอนแบบสื่อประสมกับวิธีสอนแบบ SQ4R

คะแนนหลังเรียนสูงกว่าก่อนเรียน และสอดคล้องกับงานวิจัยของ นิตติยา เหง้าโอสา (2563) ได้ทำการวิจัยเรื่อง การสร้างชุมชนการเรียนรู้ทางวิชาชีพ (PLC) ครูภาษาไทย ระดับชั้นประถมศึกษาปีที่ 5 เพื่อพัฒนาความสามารถด้านการอ่านจับใจความ โดยใช้เทคนิคคำถาม 5W1H ผลการวิจัยพบว่า ความสามารถด้านการอ่านจับใจความ ของนักเรียนประถมศึกษาปีที่ 5 ที่เรียนโดยใช้เทคนิคคำถาม 5W1H หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และสอดคล้องกับงานวิจัยของ ธนาธิป เสือขำ (2564) ได้ทำการวิจัย เรื่องการพัฒนาความสามารถการอ่านจับใจความภาษาไทย ด้วยการจัดกิจกรรมการเรียนรู้ ดีอาร์-ทีเอ (DR-TA: Directed Reading-Thinking Activity) นักเรียนมัธยมศึกษาปีที่ 3 ผลวิจัยพบว่า ผลการเปรียบเทียบผลสัมฤทธิ์การเรียนวิชาภาษาไทยนักเรียนมีคะแนนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

ข้อเสนอแนะ

จากผลการวิจัยที่เสนอไปแล้ว ผู้วิจัยมีข้อเสนอแนะในการวิจัยไปใช้โดยมีรายละเอียด ดังนี้

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 จากผลการวิจัย กล่าวได้ว่า การจัดกิจกรรมการเรียนการสอนโดยใช้แบบฝึกของนักเรียนที่ได้รับจากการที่ครูได้สอนไป โดยใช้ชุดฝึกการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 1 สามารถนำไปใช้กับนักเรียนในระดับเดียวกัน ซึ่งครูผู้สอนอาจจะประยุกต์ชุดฝึกนี้ไปพัฒนาการอ่านจับใจความในระดับชั้นอื่น ๆ ได้ ทั้งนี้ เพื่อจะพัฒนาทักษะการอ่านจับใจความในระดับที่สูงขึ้น

1.2 ในการทำชุดฝึกการอ่านจับใจความ ครูควรที่จะออกแบบให้มีความน่าสนใจ ได้แก่ กิจกรรม เนื้อหาสาระควรที่จะเป็นเรื่องที่มีความน่าสนใจและเป็นเรื่องใกล้ตัวของผู้เรียน ซึ่งรูปแบบต่าง ๆ ในชุดฝึกควรที่จะมีรูปภาพประกอบ ออกแบบให้มีความเหมาะสมกับตัวของผู้เรียนและวัยของผู้เรียนสิ่งต่าง ๆ เหล่านี้ จะเป็นการเพิ่มความดึงดูดและความสนใจจากผู้เรียน

1.3 การจัดการเรียนการสอนโดยใช้แบบฝึกการอ่านจับใจความสำคัญร่วมกับเทคนิค 5W1H สามารถนำไปบูรณาการกับวิชาอื่น ๆ ได้อีกด้วย

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 การวิจัยครั้งนี้เป็นการวิจัยเชิงปริมาณเท่านั้น ควรมีการศึกษาวิจัยเชิงคุณภาพ เพื่อจะได้ผลการวิจัยที่ลึก และสามารถนำไปปรับปรุงและการพัฒนาผลสัมฤทธิ์ทางการเรียนของผู้เรียนได้อย่างมีประสิทธิภาพ

2.2 ควรมีการศึกษาเปรียบเทียบความสามารถในการอ่านจับใจความร่วมกับเทคนิค 5W1H กับการจัดการเรียนรู้ในรูปแบบอื่น ๆ ในกลุ่มสาระการเรียนรู้ภาษาไทยและกลุ่มสาระการเรียนรู้ต่าง ๆ

2.3 ควรพัฒนารูปแบบการจัดกิจกรรมการเรียนรู้อื่น ๆ มาใช้ เพื่อพัฒนาการอ่านจับใจความ

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ผลการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมเพื่อพัฒนาความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัวของนักเรียนชั้นประถมศึกษาปีที่ 2

The Results of Cooperative Learning Using the Think-Pair-Share Technique Combined with Games for Develop the Problem-Solving Ability on Division in Mathematics of Grade 2 Students

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บทคัดย่อ

การวิจัยในครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาและเปรียบเทียบความสามารถในการแก้ปัญหาเรื่องการหาร รายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมกับเกณฑ์ร้อยละ 60 กลุ่มที่ใช้ในการศึกษาครั้งนี้ ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 2 ห้อง C2 จำนวน 27 คน ของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ภาคเรียนที่ 2 ปีการศึกษา 2566 เครื่องมือที่ใช้ในการวิจัย คือ แผนการจัดการเรียนรู้โดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม จำนวน 12 แผน และแบบทดสอบวัดความสามารถในการแก้ปัญหาเรื่องการหาร สถิติที่ใช้ในการวิเคราะห์ข้อมูล ประกอบด้วย ค่าร้อยละ ค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัย พบว่า นักเรียนที่มีความสามารถในการแก้ปัญหาเรื่องการหารอยู่ในระดับยอดเยี่ยม จำนวน 3 คน คิดเป็นร้อยละ 11.11 ของจำนวนนักเรียนกลุ่มที่ศึกษา ระดับทำได้แล้ว จำนวน 24 คน คิดเป็นร้อยละ 88.89 และพบว่าความสามารถในการแก้ปัญหาเรื่องการหารหลังการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมสูงกว่าเกณฑ์ร้อยละ 60 โดยมีค่าเฉลี่ยเท่ากับ 14.19 คิดเป็นร้อยละ 70.95

คำสำคัญ: การจัดการเรียนรู้แบบร่วมมือ, เทคนิคเพื่อนคู่คิด, สอนผ่านเกม

Abstract

The purpose of this research is to study and compare the ability to solve problems. Division, general mathematics course of 2nd-grade students who received cooperative learning using think-pair-share technique combined with games with a criterion of 60

percent. The group used in this study included 2nd-grade students in Room C2. 27 people from Demonstration Primary School Phranakhon Rajabhat University, Semester 2, Academic Year 2023. The research tools were 12 learning plans using the think-pair-share technique combined with games and a test to measure the ability to solve division problems. Statistics used in data analysis include percentages, means, and standard deviations.

The results of the research found that 3 students could solve division problems at an excellent level, accounting for 11.11 percent of the total number of students in the study group. The level has been achieved by 24 people. It was 88.89 percent, and it was found that the ability to solve division problems after organizing cooperative learning using the peer-to-peer technique combined with games was higher than the threshold of 60 percent, with an average of 14.19 or 70.95 percent.

Keywords: Cooperative Learning, Think-Pair-Share, Game-Based Learning

บทนำ

คณิตศาสตร์เป็นศาสตร์แห่งการคิด มีบทบาทสำคัญยิ่งต่อการพัฒนาความคิดมนุษย์ ทำให้มนุษย์มีความคิดริเริ่มสร้างสรรค์ คิดอย่างมีเหตุผล เป็นระบบ มีแบบแผน สามารถวิเคราะห์ปัญหาหรือสถานการณ์ได้อย่างรอบคอบและถี่ถ้วน ช่วยให้คาดการณ์ วางแผน ตัดสินใจ แก้ปัญหาได้อย่างถูกต้องเหมาะสม และสามารถนำไปใช้ในชีวิตจริงได้อย่างมีประสิทธิภาพ (กระทรวงศึกษาธิการ, 2560) หลักสูตรสถานศึกษาของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ชั้นประถมศึกษาปีที่ 1-6 เป็นหลักสูตรสถานศึกษาที่มุ่งเน้น “นักทำงานที่น้อมนำศาสตร์พระราชามาสู่การปฏิบัติ” น้อมนำศาสตร์พระราชามากำหนดเป็นสมรรถนะสายงาน (Functional Competency) ที่ทำให้ผู้เรียนมีความรู้เกี่ยวกับงาน (Knowledge) ทักษะวิธีการต่าง ๆ (Skills) และสมรรถนะเชิงพฤติกรรรม (Behavior Competency) ซึ่งเป็นค่านิยม คุณธรรม จริยธรรมเกี่ยวกับการทำงาน โดยคาดหวังให้ผู้เรียนมีทักษะ 3 ด้าน คือ เป็นผู้เรียนรู้ เป็นผู้ร่วมสร้างนวัตกรรม และเป็นพลเมืองที่เข้มแข็ง

ผลการทดสอบการจัดการเรียนการสอนวิชาคณิตศาสตร์จากอดีตที่ผ่านมา ซึ่งสามารถเห็นได้ว่าผู้เรียนมีผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ในแนวโน้มที่ลดลง ทั้งยังไม่ได้รับการพัฒนาให้มีความรู้ความสามารถและทักษะสำหรับชีวิตยุคใหม่เพียงพอ นอกจากนี้กระบวนการเรียนการสอนยังคงมุ่งเน้นการท่องจำเพื่อการสอบมากกว่าการมุ่งให้ผู้เรียนคิดวิเคราะห์เสาะแสวงหาความรู้ด้วยตนเอง ทำให้นักเรียนจำนวนมากคิดและแสดงเหตุผลไม่เป็น ไม่ชอบอ่านหนังสือ ไม่รู้วิธีเรียน จากการเรียนการสอนในวิชาคณิตศาสตร์ที่ผ่านมายังคงเป็นการสอนที่เน้นการบรรยายและอธิบายเป็นส่วนใหญ่ ซึ่งไม่เหมาะกับนักเรียนในระดับประถมศึกษา ทำให้ผู้เรียนขาดปฏิสัมพันธ์กัน ขาดการช่วยเหลือในการทำงานและมีส่วนร่วมในการเรียนน้อย การประเมินผลสัมฤทธิ์ทางการเรียน พบว่า คะแนนสาระที่หนึ่งจำนวนและการดำเนินการ หน่วยการเรียนรู้เรื่อง การหาร อยู่ในเกณฑ์ขั้นต่ำ แสดงว่า การเรียนการสอนในหน่วยเรียนรู้เรื่องการหารยังประสบปัญหาและไม่บรรลุตามมาตรฐานตัวชี้วัดที่กำหนดไว้

การเรียนการสอนในวิชาคณิตศาสตร์ และผลการทดสอบที่ผ่านมาของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร มีคะแนนในรายวิชาคณิตศาสตร์ เรื่องการหาร มีคะแนนเฉลี่ย 41.25 ซึ่งถือว่าต่ำกว่าการทดสอบความสามารถพื้นฐานของผู้เรียนและอยู่ในเกณฑ์ระดับพอใช้ ผู้วิจัยจึงสนใจทำการศึกษาวิจัยเรื่องผลการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม เพื่อพัฒนาความสามารถในการแก้ปัญหา เรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ทำให้ผู้เรียนได้พัฒนาการเรียนรู้ของตนเองเกิดการช่วยเหลือซึ่งกันและกันลดการแข่งขันเป็นมุ่งส่งเสริมทักษะทางสังคม เพื่อพัฒนาผู้เรียนให้เกิดการเรียนรู้ตามศักยภาพและเรียนอย่างมีความสุข สามารถนำความรู้ที่ได้ไปปรับใช้ในชีวิตประจำวันได้อย่างมีประสิทธิภาพ ผู้วิจัยจึงนำรูปแบบการจัดการเรียนรู้แบบร่วมมือ ช่วยให้ผู้เรียนมีสุขภาพจิตดีขึ้น มีความรู้สึกที่ดี เกี่ยวกับตนเองและมีความเชื่อมั่นในตนเองมากขึ้น นอกจากนั้น ยังช่วยพัฒนาทักษะทางสังคม และความสามารถในการเผชิญกับความเครียดและความผันแปรต่าง ๆ โดยใช้เทคนิคเพื่อนคู่คิด ช่วยให้ผู้เรียนจดจ่อและคิดตามในประเด็นที่กำลังเรียนรู้ ได้ตรวจสอบความรู้ความเข้าใจของตนเอง ทำให้เข้าใจเนื้อหาที่เรียนมากยิ่งขึ้น ได้ฝึกทักษะการสื่อสารด้วยเหตุผล กล้าแสดงความคิดเห็น ลดปัญหาการแย่งตอบหรือไม่ตอบ การผสมผสานการใช้เกมนี้ ช่วยให้ผู้เรียนมีแรงจูงใจใฝ่สัมฤทธิ์และเกิดความผูกพันในการเรียนรู้ ทำให้ผู้เรียนรู้จักบริหารจัดการอารมณ์และการตอบสนองต่อสถานการณ์ต่าง ๆ อย่างเหมาะสม ได้ฝึกทักษะการคิดวิเคราะห์ การบูรณาการ และสร้างกลยุทธ์เพื่อความสำเร็จ การสื่อสาร การทำงานร่วมกับผู้อื่น จากที่กล่าวผู้วิจัยจึงนำรูปแบบการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม เพื่อพัฒนาความสามารถในการแก้ปัญหาของผู้เรียนมาใช้ในการจัดการเรียนรู้ให้บรรลุเป้าหมายของหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม

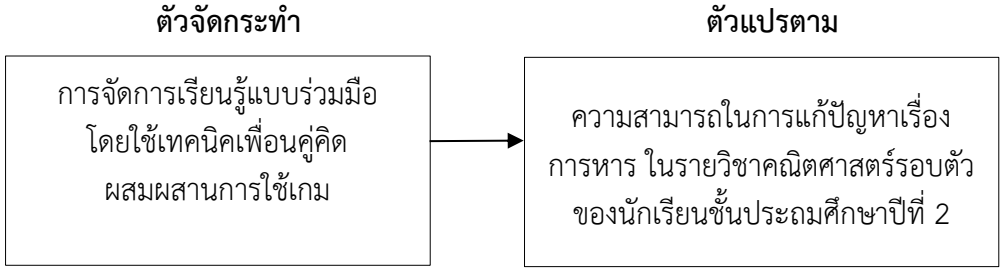
2. เพื่อเปรียบเทียบความสามารถในการแก้ปัญหาเรื่อง การหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมกับเกณฑ์ร้อยละ 60

แนวคิด ทฤษฎี กรอบแนวคิด

ในการวิจัยครั้งนี้ ผู้วิจัยได้ดำเนินการวิจัยพัฒนาความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ผ่านการจัดเรียนรู้แบบร่วมมือ โดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม เทคนิคเพื่อนคู่คิด (Think-Pair-Share) เป็นเทคนิคการสอนที่กระตุ้นให้ผู้เรียนมีส่วนร่วมในการเรียนรู้อย่างทั่วถึง ได้เกิดคิดหาคำตอบด้วยตนเอง การแลกเปลี่ยนเรียนรู้ระหว่างผู้เรียนด้วยกัน และกระตุ้นให้ผู้เรียนหาข้อสรุปร่วมกับผู้อื่นอย่างเป็นระบบ โดยกำหนดขอบเขตการคิดและการพูดคุยอย่างเป็นลำดับขั้นตอน ซึ่งเป็นแนวคิดของ Frank Lymman แห่งมหาวิทยาลัยแมรีแลนด์ Game-Based Learning เป็นสื่อในการเรียนรู้แบบหนึ่ง ซึ่งถูกออกแบบมาเพื่อให้

มีความสนุกสนานไปพร้อม ๆ กับการได้รับความรู้ โดยสอดแทรกเนื้อหาทั้งหมดของหลักสูตรนั้น ๆ เอาไว้ในเกม และให้ผู้เรียนลงมือเล่นเกมโดยที่ผู้เรียนจะได้รับความรู้ต่าง ๆ ของหลักสูตรนั้นผ่านการเล่นเกมนั้น (ประหยัด จิระวรพงศ์, 2556) โดยการพัฒนาความสามารถในการแก้ปัญหาทางคณิตศาสตร์ โดยใช้กระบวนการแก้ปัญหาของโพลยา ประกอบด้วย 4 ขั้นตอน ดังนี้ 1) ขั้นทำความเข้าใจโจทย์ 2) ขั้นวางแผนแก้ปัญหา 3) ขั้นปฏิบัติตามแผน 4) ขั้นตรวจสอบ

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ผู้วิจัยได้ดำเนินศึกษาตามหัวข้อ ต่อไปนี้

1. แบบแผนการวิจัย

การวิจัยครั้งนี้ เป็นการวิจัยเชิงทดลองอย่างง่าย (Pre-experimental) ที่ศึกษา 1 กลุ่ม วัดผลหลังการทดลอง 1 ครั้ง ดังนี้

X	O

X แทน การจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม

O แทน ความสามารถในการแก้ปัญหาเรื่องการหาร

2. กลุ่มเป้าหมายที่ใช้ในการศึกษา

กลุ่มเป้าหมายที่ใช้ในการศึกษาเป็นนักเรียนชั้นประถมศึกษาปีที่ 2 ภาคเรียนที่ 2 ปีการศึกษา 2566 ของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร จำนวน 1 ห้องเรียน มีนักเรียนทั้งสิ้น 27 คน โดยเป็นห้องที่ผู้วิจัยเป็นผู้สอน

3. เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ ได้แก่

3.1 เครื่องมือที่ใช้ในการทดลอง แผนการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม เรื่องการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 จำนวน 1 แผนการเรียนรู้ จำนวน 17 คาบ โดยมีรายละเอียดแผนการจัดการเรียนรู้ ดังตารางที่ 1 ซึ่งผ่านการตรวจสอบคุณภาพโดย

ผู้เชี่ยวชาญด้านการสอนคณิตศาสตร์ จำนวน 3 ท่าน พิจารณาคุณภาพของแผนการจัดการเรียนรู้และปรับปรุงแก้ไขตามข้อเสนอแนะ โดยแผนการจัดการเรียนรู้ดังกล่าวมีรายละเอียดดังนี้

ตารางที่ 1 แผนการจัดการเรียนรู้ เรื่อง การหาร

หน่วยการเรียนรู้	เรื่อง	จำนวนคาบเรียน
1	ความหมายการหาร	1
2	การหาผลหารโดยใช้ตัวนับ	1
3	ความสัมพันธ์ของการคูณและการหาร	1
4	การหาผลหารโดยใช้ความสัมพันธ์ของการคูณและการหาร	2
5	การหารลงตัวและการหารไม่ลงตัว	1
6	การหาผลหารและเศษ	2
7	การพัฒนาความรู้สึกเชิงจำนวนเกี่ยวกับการหาร	2
8	การหาค่าของตัวไม่ทราบค่าในประโยคสัญลักษณ์การหาร	2
9	โจทย์ปัญหาการหาร (1)	1
10	โจทย์ปัญหาการหาร (2)	1
11	การสร้างโจทย์ปัญหาการหารจากภาพ	1
12	การสร้างโจทย์ปัญหาการหารจากประโยคสัญลักษณ์	2

3.2 เครื่องมือที่ใช้ในการเก็บข้อมูล คือ แบบทดสอบวัดความสามารถในการแก้ปัญหาเรื่องการหาร วิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 เป็นแบบทดสอบแบบเลือกตอบ 4 ตัวเลือก จำนวน 15 ข้อ และแบบทดสอบอัตนัย จำนวน 5 ข้อ

3.2.1 ขั้นตอนในการสร้างแบบทดสอบ

ขั้นตอนที่ 1 ศึกษาและวิธีการสร้างแบบทดสอบ เรื่อง การหาร

ขั้นตอนที่ 2 กำหนดขอบเขต เนื้อหา เรื่องการหาร

ขั้นตอนที่ 3 สร้างแบบทดสอบให้สอดคล้องกับการแก้ปัญหา เรื่อง การหาร เป็นแบบทดสอบปรนัย จำนวน 15 ข้อ ๆ ละ 1 คะแนน และอัตนัย 5 ข้อ ๆ ละ 3 คะแนน ผู้วิจัยได้ใช้เป็นแบบทดสอบหลังเรียน รวมคะแนนเต็ม 30 คะแนน กำหนดเกณฑ์การประเมินความสามารถในการแก้ปัญหาเรื่องการหาร ดังตารางต่อไปนี้

ขั้นตอนที่ 4 นำแบบทดสอบให้ผู้เชี่ยวชาญตรวจสอบเที่ยงตรงเชิงเนื้อหา (Content Validity) ระหว่างข้อสอบกับจุดประสงค์การเรียนรู้ หลังจากนั้นจะนำข้อมูลที่ได้ไปคำนวณดัชนีความสอดคล้องระหว่างข้อสอบกับจุดประสงค์การเรียนรู้ (Index of Item Objective Congruence: IOC) แล้วคัดเลือกข้อสอบที่มีค่า IOC อยู่ตั้งแต่ 0.5 ขึ้นไปไว้ จำนวน 17 ข้อ และปรับปรุงข้อสอบที่มีค่า IOC ไม่ผ่านเกณฑ์ตามคำแนะนำของผู้เชี่ยวชาญเพื่อให้ข้อสอบทุกข้อมีคุณภาพด้านความเที่ยงตรง

ตารางที่ 2 เกณฑ์การประเมินความสามารถในการแก้ปัญหา ตามแนวทางของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร

เกณฑ์การประเมิน	ระดับความสามารถ	พฤติกรรมนักเรียน
0 – 5 คะแนน	เริ่มต้น	แสดงขั้นตอนการแก้ปัญหาตามแนวคิดของโพลยาได้ 1 ข้อ
6 – 10 คะแนน	พยายามอีดนิด	แสดงขั้นตอนการแก้ปัญหาตามแนวคิดของโพลยาได้ 2 ข้อ
11 – 15 คะแนน	ทำได้แล้ว	แสดงขั้นตอนการแก้ปัญหาตามแนวคิดของโพลยาได้ 3 ข้อ
16 – 20 คะแนน	ยอดเยี่ยม	แสดงขั้นตอนการแก้ปัญหาตามแนวคิดของโพลยาได้ 4 ข้อ ขึ้นไป

4. ขั้นตอนในการดำเนินการวิจัย

ขั้นตอนที่ 1 ชี้แจงแนวทางการจัดการเรียนรู้ให้นักเรียนทราบเกี่ยวกับบทบาทหน้าที่ในการเรียนรู้ ผู้สอนจะทำหน้าที่อะไร นักเรียนจะต้องปฏิบัติตนอย่างไร และมีการวัดและการประเมินผลอย่างไร นักเรียนต้องเรียนรู้อะไรบ้าง

ขั้นตอนที่ 2 ผู้วิจัยดำเนินการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมเรื่องการหาร รวมทั้งการทดสอบ จำนวน 17 คาบเรียน คาบเรียนละ 50 นาที โดยผู้วิจัยเป็นผู้สอน

ขั้นตอนที่ 3 เมื่อสิ้นสุดการจัดการเรียนรู้ทั้ง 17 คาบเรียนแล้ว ผู้วิจัยดำเนินการทดสอบกลุ่มที่ใช้ในการศึกษาโดยใช้แบบทดสอบวัดความสามารถในการแก้ปัญหา เรื่องการหาร ซึ่งเป็นการทดสอบหลังเรียน (Post-test) โดยใช้ข้อสอบเลือกตอบ จำนวน 15 ข้อ ข้อสอบอัตนัย จำนวน 5 ข้อ รวม 20 คะแนน

ขั้นตอนที่ 4 ตรวจให้คะแนนแบบทดสอบแล้วนำผลที่ได้มาวิเคราะห์โดยใช้วิธีการทางสถิติโดยหาค่าเฉลี่ยแล้วเทียบกับเกณฑ์ร้อยละ 60

การวิเคราะห์ข้อมูล

การวิจัยครั้งนี้ ผู้วิจัยกำหนดวิธีการวิเคราะห์ข้อมูลดังนี้ ผลการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม เพื่อวัดความสามารถในการแก้ปัญหาในรายวิชาคณิตศาสตร์รอบตัว เรื่องการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 ผู้วิจัยดำเนินการวิเคราะห์ข้อมูล ดังนี้

1. วิเคราะห์ความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัวของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมโดยวิเคราะห์ค่าร้อยละ ค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน

2. เปรียบเทียบค่าเฉลี่ยของคะแนนความสามารถในการแก้ปัญหาเรื่องการหาร รายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 กับเกณฑ์ร้อยละ 60 โดยวิเคราะห์ค่าร้อยละ ค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัย

การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาและเปรียบเทียบความสามารถในการแก้ปัญหาเรื่อง การหาร รายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมกับเกณฑ์ร้อยละ 60 ผู้วิจัยนำเสนอผลการวิจัยโดยแบ่งเป็น 2 ตอน ดังนี้

ตอนที่ 1 ผลการศึกษาความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม

ตารางที่ 3 แสดงความสามารถในการแก้ปัญหาผู้เรียนในรายวิชาคณิตศาสตร์รอบตัวเรื่อง การหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2

ลำดับที่	คะแนนหลังเรียน	ร้อยละ	ระดับความสามารถ	ระดับความสามารถในการแก้ปัญหาตามแนวคิดของโพลยา
1	14	70	ทำได้แล้ว	ทำได้แล้ว
2	15	75	ทำได้แล้ว	ทำได้แล้ว
3	14	70	ทำได้แล้ว	ทำได้แล้ว
4	13	65	ทำได้แล้ว	ทำได้แล้ว
5	14	70	ทำได้แล้ว	ทำได้แล้ว
6	13	65	ทำได้แล้ว	ทำได้แล้ว
7	14	70	ทำได้แล้ว	ทำได้แล้ว
8	16	80	ยอดเยี่ยม	ทำได้แล้ว
9	15	75	ทำได้แล้ว	ทำได้แล้ว
10	17	85	ยอดเยี่ยม	ยอดเยี่ยม
11	13	65	ทำได้แล้ว	ทำได้แล้ว
12	12	60	ทำได้แล้ว	ทำได้แล้ว
13	15	75	ทำได้แล้ว	ทำได้แล้ว
14	15	75	ทำได้แล้ว	ทำได้แล้ว
15	13	65	ทำได้แล้ว	ทำได้แล้ว
16	14	70	ทำได้แล้ว	ทำได้แล้ว
17	16	80	ยอดเยี่ยม	ยอดเยี่ยม
18	15	75	ทำได้แล้ว	ทำได้แล้ว
19	14	70	ทำได้แล้ว	ทำได้แล้ว
20	14	70	ทำได้แล้ว	ทำได้แล้ว
21	13	65	ทำได้แล้ว	ทำได้แล้ว
22	13	65	ทำได้แล้ว	ทำได้แล้ว
23	14	70	ทำได้แล้ว	ทำได้แล้ว

ลำดับที่	คะแนนหลังเรียน	ร้อยละ	ระดับความสามารถ	ระดับความสามารถในการแก้ปัญหาตามแนวคิดของโพลยา
24	13	65	ทำได้แล้ว	ทำได้แล้ว
25	15	75	ทำได้แล้ว	ทำได้แล้ว
26	15	75	ทำได้แล้ว	ทำได้แล้ว
27	14	70	ทำได้แล้ว	ทำได้แล้ว
ค่าเฉลี่ย = 14.19 , ค่าส่วนเบี่ยงเบนมาตรฐาน = 1.12				

จากตารางที่ 3 จะเห็นว่าคะแนนความสามารถในการแก้ปัญหาผู้เรียนในรายวิชาคณิตศาสตร์รอบตัวเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 สูงสุดเท่ากับ 17 คะแนน คิดเป็นร้อยละ 85 ต่ำสุดเท่ากับ 12 คะแนน คิดเป็นร้อยละ 60 โดยมีค่าเฉลี่ยเท่ากับ 14.19 คะแนน และค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 1.12 คะแนน มีนักเรียนที่มีความสามารถในการแก้ปัญหาในระดับยอดเยี่ยม จำนวน 3 คน คิดเป็นร้อยละ 11.11 ระดับทำได้แล้ว จำนวน 24 คน คิดเป็นร้อยละ 88.89 และจากการพิจารณาพฤติกรรมการแก้ปัญหาตามระดับขั้นของโพลยาจากการทำข้อสอบอัตนัย จำนวน 5 ข้อ พบว่า นักเรียนส่วนใหญ่สามารถทำข้อสอบอัตนัยโดยแสดงวิธีการ ขั้นตอนตามแนวคิดของโพลยาได้จำนวน 3 ข้อ ซึ่งอยู่ในระดับทำได้แล้ว จำนวน 25 คน คิดเป็นร้อยละ 92.59 และทำได้ 4 ข้อ จำนวน 2 คน คิดเป็นร้อยละ 7.41

ตอนที่ 2 ผลการเปรียบเทียบความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัวของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม กับเกณฑ์ร้อยละ 60

ตารางที่ 4 เปรียบเทียบความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม (เกณฑ์ร้อยละ 60 เท่ากับ 12 คะแนน)

การแก้ปัญหาเรื่องการหาร	N	μ	σ	ร้อยละ
หลังเรียน	27	14.19	1.12	70.95

จากตารางที่ 4 จะเห็นว่าคะแนนความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 หลังได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกม มีคะแนนเฉลี่ยเท่ากับ 14.19 คิดเป็นร้อยละ 70.95 ซึ่งสูงกว่าเกณฑ์ร้อยละ 60

สรุปและอภิปรายผล

สรุปผลการวิจัย

1. คะแนนความสามารถในการแก้ปัญหาผู้เรียนในรายวิชาคณิตศาสตร์รอบตัว เรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 มีค่าเฉลี่ยเท่ากับ 14.19 คะแนน และค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 1.12 คะแนน มีนักเรียนที่มีความสามารถในการแก้ปัญหาในระดับยอดเยี่ยม จำนวน 3 คน คิดเป็นร้อยละ 11.11 ระดับทำได้แล้ว จำนวน 24 คน คิดเป็นร้อยละ 88.89

2. คะแนนความสามารถในการแก้ปัญหาเรื่องการหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 หลังได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมมีคะแนนเฉลี่ยเท่ากับ 14.19 คิดเป็นร้อยละ 70.95 ซึ่งสูงกว่าเกณฑ์ร้อยละ 60

การอภิปรายผล

1. จากผลการวิจัยพบว่า ความสามารถในการแก้ปัญหา เรื่อง การหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 จำนวน 27 คน อยู่ในระดับยอดเยี่ยม จำนวน 3 คน คิดเป็นร้อยละ 11.11 ระดับทำได้แล้ว จำนวน 24 คน คิดเป็นร้อยละ 88.89 โดยไม่มีระดับพยายามอีกนิด และจากการพิจารณาพฤติกรรมการแก้ปัญหาตามขั้นตอนของโพลยา พบว่า มีนักเรียน จำนวน 25 คน ซึ่งคิดเป็นร้อยละ 92.59 ของจำนวนนักเรียนทั้งหมด สามารถแสดงกระบวนการแก้ปัญหาตามขั้นตอนของโพลยาได้ 3 ข้อ จาก 5 ข้อ โดยมีนักเรียน 2 คน ซึ่งคิดเป็นร้อยละ 7.41 สามารถแก้ปัญหาได้ 4 ข้อจาก 5 ข้อ ของแสดงว่านักเรียนทุกคนสามารถในการแก้ปัญหาเรื่อง การหารได้ แสดงว่า การจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมสามารถพัฒนาความสามารถในการแก้ปัญหาคณิตศาสตร์เรื่องการหารได้ ซึ่งสอดคล้องกับผลการวิจัยของ ชลธิชา ทับทวี (2554) ที่พบว่าความสามารถในการคิดอย่างมีเหตุผลของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังได้รับการจัดการเรียนรู้แบบร่วมมือด้วยเทคนิคเพื่อนคู่คิด สูงกว่าก่อนได้รับการจัดการเรียนรู้อย่างมีนัยสำคัญทางสถิติที่ระดับ .01

2. จากผลการวิจัย พบว่า ความสามารถในการแก้ปัญหาเรื่อง การหาร ในรายวิชาคณิตศาสตร์รอบตัว ของนักเรียนชั้นประถมศึกษาปีที่ 2 หลังได้รับการจัดการเรียนรู้แบบร่วมมือโดยใช้เทคนิคเพื่อนคู่คิดผสมผสานการใช้เกมสูงกว่าเกณฑ์ร้อยละ 60 โดยมีคะแนนเฉลี่ยเท่ากับ 14.19 คิดเป็นร้อยละ 70.95 ซึ่งสอดคล้องกับผลการวิจัยของ ชลธิชา ทับทวี (2554) ที่พบว่า ความสามารถในการคิดอย่างมีเหตุผลของนักเรียนชั้นมัธยมศึกษาปีที่ 3 หลังได้รับการจัดการเรียนรู้แบบร่วมมือด้วยเทคนิคเพื่อนคู่คิด สูงกว่าเกณฑ์ร้อยละ 60 อย่างมีนัยสำคัญทางสถิติที่ระดับ .01 และสอดคล้องกับแนวคิดของ ศักรินทร์ หมื่นนรินทร์ (2555) ที่กล่าวว่า นวัตกรรมการเรียนรู้ใหม่จากเกมช่วยให้ผลการเรียนรู้หลังสูงขึ้นอย่างมีนัยสำคัญทางสถิติ

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 การจัดการเรียนรู้ค่อนข้างจะใช้เวลานานเนื่องจากนักเรียนยังไม่คุ้นชินกับกระบวนการในช่วงแรกอาจจะใช้เวลาพอสมควร ครูผู้สอนควรฝึกให้นักเรียนได้ลองเล่นเกมผสมผสานการใช้เทคนิคเพื่อนคู่คิดให้คุ้นชินก่อน

1.2 ในระหว่างจัดกิจกรรมครูผู้สอนควรใช้เทคนิคเสริมแรง เช่น คำชมเชย การให้รางวัล เพื่อกระตุ้นให้นักเรียนมีความกระตือรือร้น มีแรงจูงใจ และเกิดความภูมิใจในตัวเอง ทำให้นักเรียนสนใจในการจัดการเรียนการสอนมากขึ้น

2. ข้อเสนอแนะสำหรับการทำวิจัยครั้งต่อไป

2.1 ควรศึกษาตัวแปรอื่น ๆ เช่น ความคงทนในการเรียนรู้ การคิดวิเคราะห์ การสื่อสารสื่อความหมายทางคณิตศาสตร์

2.2 ควรศึกษาผลการจัดการเรียนรู้โดยใช้การผสมผสานการเรียนรู้ แบบร่วมมือเทคนิคเพื่อนคู่คิดผสมผสานการสอนผ่านเกม ในเนื้อหาอื่น ๆ หรือระดับชั้นอื่น ๆ

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การพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์

Development of Table Tennis Serving Skills for Primary 5 Students Using Concepts of Davies' Learning Management Techniques.

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์ เพื่อศึกษาและเปรียบเทียบทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ กับเกณฑ์ร้อยละ 70 กลุ่มที่ใช้ในการศึกษาเป็นนักเรียนชั้นประถมศึกษาปีที่ 5 ของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 27 คน เครื่องมือในการวิจัยประกอบด้วย แผนการจัดการเรียนรู้เทคนิคการจัดการเรียนรู้ของเดวีส์ จำนวน 4 คาบ และแบบประเมินทักษะการเสิร์ฟลูกเทเบิลเทนนิส วิเคราะห์ข้อมูลโดยหาค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน และวิเคราะห์คะแนนพัฒนาการสัมพัทธ์

ผลการวิจัยพบว่า นักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์มีคะแนนพัฒนาการเสิร์ฟลูกเทเบิลเทนนิสในระดับสูงมาก โดยมีค่าเฉลี่ยของคะแนนพัฒนาการสัมพัทธ์เท่ากับ 83.60 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 26.55 โดยคะแนนทักษะการเสิร์ฟลูกเทเบิลเทนนิสหลังได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์สูงกว่าเกณฑ์ร้อยละ 70 โดยมีค่าเฉลี่ยเท่ากับ 18.43 คะแนน คิดเป็นร้อยละ 92.15 ของคะแนนเต็ม

คำสำคัญ: ทักษะการเสิร์ฟลูกเทเบิลเทนนิส, เทคนิคการจัดการเรียนรู้ของเดวีส์

Abstract

This research aims to study and compare the table tennis serving skills of fifth-grade students who received instruction using Dewey's learning management technique with a passing grade of 70%. The study group consisted of fifth-grade students from the demonstration elementary school of Rajabhat Phanakhon University during the second semester of the 2566 academic year, totaling 27 students. The research tools included Dewey's learning management technique lesson plans (four sessions) and an assessment form for table tennis serving skills. Data were analyzed by calculating the mean, standard

deviation, and analyzing the developmental scores.

The research findings revealed that fifth-grade students who received instruction using Dewey's learning management technique achieved significantly higher scores in table tennis serving skills. The average developmental score was 83.60, with a standard deviation of 26.55. This score exceeded the passing grade of 70%, with an average of 18.43 points, equivalent to 92.15% of the maximum score.

Keywords: Table Tennis Serving Skills, Davies's Conceptual Learning Management

บทนำ

หลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 (ฉบับปรับปรุง พ.ศ. 2560) มุ่งพัฒนาผู้เรียนให้เป็นคนดี มีปัญญา มีความสุข มีศักยภาพในการศึกษาต่อ จึงกำเนิดเป็นจุดมุ่งหมายเพื่อให้เกิดกับผู้เรียนเมื่อจบการศึกษาขั้นพื้นฐาน โดยหวังให้ผู้เรียนมีคุณธรรม จริยธรรม และค่านิยมที่พึงประสงค์เห็นคุณค่าของตนเอง มีความรู้อันเป็นสากล มีความสามารถในการสื่อสาร มีความรักชาติ มีจิตสำนึกในความเป็นพลเมืองไทยและเป็นพลโลก ยึดมั่นในวิถีชีวิตและการปกครองตามระบบประชาธิปไตยอันมีพระมหากษัตริย์ทรงเป็นประมุข มีจิตสำนึกในการอนุรักษ์วัฒนธรรมและภูมิปัญญาไทย และมีสุขภาพกายสุขภาพจิตที่ดี มีสุขนิสัยและการรักในการออกกำลังกาย ซึ่งกลุ่มสาระการเรียนรู้สุขศึกษาและพลศึกษาเป็นกลุ่มสาระที่มีความหมายและมีความสำคัญอย่างยิ่งต่อการส่งเสริมและพัฒนาคุณภาพชีวิตของผู้เรียนแต่ละคน โดยมุ่งพัฒนาพฤติกรรมการเรียนรู้ของผู้เรียนทั้งด้านสาระความรู้เกี่ยวกับสุขภาพที่จำเป็นที่ผู้เรียนต้องรู้ด้านการสร้างเจตคติ และค่านิยมที่ดี คุณธรรม จริยธรรม และคุณลักษณะนิสัยที่พึงประสงค์ ผู้เรียนจะได้รับโอกาสให้เข้าร่วมกิจกรรมทางกายและกีฬาทั้งประเภทบุคคลและประเภททีมอย่างหลากหลายทั้งของไทยและสากล กิจกรรมทางกายและกีฬาต่าง ๆ ช่วยให้ผู้เรียนเกิดการพัฒนาทักษะกลไก ได้เรียนรู้ถึงความสำคัญของการฝึกฝนตนเองตามกฎ กติกา ระเบียบ และหลักการทางวิทยาศาสตร์ ได้แข่งขันและได้ทำงานร่วมกันเป็นทีม ได้รับประสบการณ์จากการลงมือปฏิบัติด้วยตนเอง ได้ค้นหาความพึงพอใจจากการเข้าร่วมกิจกรรมทางกาย กีฬา กิจกรรมนันทนาการ กิจกรรมสร้างเสริมสมรรถภาพทางกายและรักการออกกำลังกาย ดังนั้นเมื่อผู้เรียนที่เรียนพลศึกษาแล้วจะมีความรู้ความเข้าใจที่ถูกต้องในการเคลื่อนไหว การออกกำลังกาย การเล่นเกมกีฬาไทย และกีฬาสากล และทำให้ผู้เรียนมีทักษะในการเคลื่อนไหวกิจกรรมทางกาย การเล่นเกม และกีฬา (กระทรวงศึกษาธิการ, 2560)

กีฬาเทเบิลเทนนิสจัดเป็นกิจกรรมกีฬาที่เหมาะสำหรับทุกเพศทุกวัย เพราะอุปกรณ์มีราคาไม่แพง มีลักษณะการเล่นที่ง่าย ใช้สถานที่ไม่มาก อุปกรณ์สามารถเก็บรักษาง่าย และกติกาการเล่นหรือแข่งขันไม่ยุ่งยากซับซ้อน เป็นกีฬาที่ช่วยให้ผู้เล่นมีความคล่องตัวในการเล่น ทำให้จังหวะการเคลื่อนไหวของขามีความฉับไวในการรุก และความรู้สึกในการตอบสนองในการรับได้อย่างรวดเร็ว เกิดการประสานงานระหว่างประสาทกล้ามเนื้อและสายตาได้ดี ก่อให้เกิดความสนุกสนานและผ่อนคลายความเครียดได้อีกด้วย โรงเรียนจำนวนมากในประเทศไทยได้บรรจุกีฬาเทเบิลเทนนิสในหลักสูตรการเรียนการสอน ทั้งระดับประถมศึกษาและมัธยมศึกษา (Collins and Hodges, 2001 อ้างถึงใน ต่อศักดิ์ แก้วจรัญวิไล, 2545) ในส่วนของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ได้พัฒนาหลักสูตรสถานศึกษาที่มุ่งเน้นการพัฒนาผู้เรียนให้เป็น “นักทำงานที่น้อมนำศาสตร์พระราชามาสู่การปฏิบัติ” น้อมนำศาสตร์ พระราชามากำหนดเป็นสมรรถนะสายงาน (Functional Competency) ที่ทำให้ผู้เรียนมีความรู้เกี่ยวกับงาน

(Knowledge) ทักษะวิธีการต่าง ๆ (Skills) และสมรรถนะเชิงพฤติกรรรม (Behavior Competency) ซึ่งเป็นค่านิยม คุณธรรม จริยธรรมเกี่ยวกับการทำงาน โดยคาดหวังให้ผู้เรียนมีทักษะ 3 ด้าน คือ เป็นผู้เรียนรู้ เป็นผู้ร่วมสร้างนวัตกรรม และเป็นพลเมืองที่เข้มแข็ง กลุ่มวิชาเสริมสร้างสุขภาวะมุ่งให้ผู้เรียนมีสมรรถนะดูแลสุขภาพ เน้นการดูแลสุขภาพผ่านการเรียนสุขศึกษาและพลศึกษา น้อมนำศาสตร์พระราชามาใช้ในการเรียนและการสร้างสุขภาวะ ครูผู้สอนเล็งเห็นถึงการสร้างเสริมสมรรถภาพทางกายและทักษะทางกีฬาที่เป็นประโยชน์ต่อตัวผู้เรียนโดยใช้กีฬาเทเบิลเทนนิสเป็นสื่อกลางในการจัดการเรียนการสอน

การสอนกีฬาเทเบิลเทนนิสในระดับประถมศึกษาซึ่งเป็นระยะเริ่มต้น สิ่งสำคัญมาก คือ การพัฒนาทักษะพื้นฐานในกีฬาเทเบิลเทนนิส เช่น ทักษะการจับไม้และท่าเตรียม ทักษะการเสิร์ฟลูกหน้ามือและหลังมือ ซึ่งนักเรียนส่วนใหญ่ยังขาดทักษะดังกล่าว เนื่องจากนักเรียนไม่ได้รับการฝึกอย่างต่อเนื่อง ประกอบกับการจัดการเรียนการสอนอาจยังไม่ดึงดูดความสนใจของนักเรียนให้มีความอยากและมีความสนใจในการเรียนอย่างจริงจัง การที่นักเรียนจะทักษะมีพื้นฐานกีฬาเทเบิลเทนนิสที่ดีนั้น ครูผู้สอนจำเป็นต้องปรับเปลี่ยนวิธีการจัดการเรียนรู้ เลือกใช้เทคนิคหรือวิธีการจัดการเรียนรู้ที่สามารถดึงดูดความสนใจให้นักเรียนอยากเรียน อยากลงมือฝึกปฏิบัติทักษะต่าง ๆ ด้วยความเต็มใจ เน้นการฝึกซ้อมฝึกฝนที่ถูกวิธีเหมาะสมกับกีฬาแต่ละประเภท เรียนรู้ไปทีละขั้นตอนและฝึกทำบ่อย ๆ จนประสบผลสำเร็จ การเรียนการสอนจึงควรเน้นบทบาทของผู้เรียนรูปแบบใหม่ โดยให้ผู้เรียนได้มีโอกาสกระทำด้วยตนเอง แสวงหาความรู้เอง รับผิดชอบต่อการเรียนของตนเองมากขึ้น รู้จักตัดสินใจเอง นอกจากนี้ยังต้องให้ผู้เรียนได้ร่วมกิจกรรมแลกเปลี่ยนความคิดเห็นซึ่งกันและกัน และรับผิดชอบร่วมกัน รูปแบบการสอนของครู หรือบทบาทของครูจะต้องเปลี่ยนแปลงจากผู้สอนให้ความรู้ หรือแสดงออกมาเป็นผู้เสนอแนะแนวทางในการหาประสบการณ์ เพื่อส่งเสริมให้ผู้เรียนสามารถพัฒนาและเปลี่ยนแปลงพฤติกรรมของผู้เรียน ให้ผู้เรียนได้ประกอบกิจกรรมการเรียนรู้ด้วยตนเองให้มากที่สุด

รูปแบบการจัดการเรียนรู้รูปแบบหนึ่งที่น่าสนใจและสามารถนำมาใช้ในการจัดกิจกรรมการเรียนรู้เพื่อพัฒนาทักษะกีฬาเทเบิลเทนนิส คือ รูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ ซึ่งเป็นรูปแบบการสอนทักษะปฏิบัติที่มุ่งพัฒนาทักษะปฏิบัติของนักเรียน ช่วยให้นักเรียนประสบผลสำเร็จได้ดีและรวดเร็วขึ้น ผ่านกระบวนการเรียนรู้ 5 ขั้นตอน (สมปรารถนา ทองนาค, 2558) ได้แก่ ขั้นตอนที่ 1 ขั้นสาธิตทักษะหรือการกระทำ ขั้นตอนที่ 2 ขั้นสาธิตและให้ผู้เรียนปฏิบัติทักษะย่อย ขั้นตอนที่ 3 ขั้นผู้เรียนปฏิบัติทักษะย่อย ขั้นตอนที่ 4 ขั้นให้เทคนิควิธีการ และขั้นตอนที่ 5 ขั้นให้ผู้เรียนเชื่อมโยงทักษะย่อย ๆ เป็นทักษะที่สมบูรณ์

จากที่กล่าวข้างต้นผู้วิจัยในฐานะที่เป็นครูผู้สอนรายวิชาพลศึกษาและสุขศึกษา จึงมีความสนใจในการใช้วิธีการจัดการเรียนรู้ตามรูปแบบการเรียนการสอนทักษะปฏิบัติของเดวีส์ เพื่อพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนระดับชั้นประถมศึกษาปีที่ 5 โดยออกแบบการจัดการเรียนรู้ตามขั้นตอน 5 ขั้นตอนของเดวีส์ และศึกษาผลการจัดการเรียนรู้ที่ได้ว่าวิธีการดังกล่าวจะสามารถพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ได้มากน้อยเพียงใด โดยหากการจัดการเรียนรู้ตามแนวทางดังกล่าว ประสบผลสำเร็จจะทำให้ได้แนวทางในการจัดการเรียนรู้ที่มีประสิทธิภาพสามารถนำไปใช้และนำไปปรับใช้ให้เกิดประโยชน์ต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์

2. เพื่อเปรียบเทียบทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ กับเกณฑ์ร้อยละ 70

แนวคิด ทฤษฎี กรอบแนวคิด

การเสิร์ฟและการรับลูกเสิร์ฟ (Service and Return)

ทักษะกีฬาเทเบิลเทนนิส กีฬาเทเบิลเทนนิสจะเริ่มเล่นด้วยการเสิร์ฟ ซึ่งจะต้องทำตามที่กติกากำหนดไว้ คือ ก่อนเสิร์ฟ ลูกเทเบิลเทนนิสต้องวางอยู่กลางฝ่ามือข้างที่ไม่ได้รับไม้ เมื่อพร้อมแล้วจึงโยนลูกให้ลอยขึ้นไปในแนวดิ่ง เมื่อลูกลอยขึ้นไปจนถึงสูงสุดแล้วตกลงมา จึงจะตีกระทบลูกได้ จะตีลูกขณะที่กำลังลอยขึ้นไม่ได้ เมื่อเสิร์ฟลูกออกไป ลูกต้องกระทบพื้นหน้าโต๊ะฝ่ายผู้เสิร์ฟก่อนแล้วกระดอนข้ามตาข่ายหรืออ้อมเสาขึงตาข่ายไปยังพื้นโต๊ะของฝ่ายผู้รับ ถ้าลูกที่เสิร์ฟไปสัมผัสตาข่ายหรือเสาขึงตาข่าย แล้วข้ามไปตกในแดนของผู้รับถือว่าเป็น “เล็ท” (Let) ให้เสิร์ฟใหม่ โดยไม่มีการได้หรือเสียคะแนน (นำชัย เสวัลย์, 2530) การเสิร์ฟลูก การส่งลูก ต้องโยนลูกขึ้นก่อนทำการเสิร์ฟ โดยก่อนทำการเสิร์ฟให้ผู้เสิร์ฟผู้เล่นจะต้องวางลูกไว้บนมือที่ไม่ได้ถือไม้ โดยจะต้องแบมือนิ้วทั้ง 4 เรียงชิดติดกันส่วนนิ้วหัวแม่มือแยกออก ฝ่ามือจะไม่ห่อเข้าก่อนโยนลูกขึ้นมือต้องนิ่งอยู่เหนือระดับแนวโต๊ะ จากนั้นโยนลูกขึ้นกลางฝ่ามือ โดยให้ผู้ตัดสินเห็นตลอดเวลา แล้วจึงทำการเสิร์ฟลูกออกไป การเสิร์ฟลูกถือเป็นเทคนิคแรกในการเปิดเกมที่จะเรียกคะแนนได้ตั้งแต่เริ่มเกมเลยก็ว่าได้ หากทำการเสิร์ฟดีจะเป็นการเริ่มเกมในเชิงรุกและเรียกแต้มได้อย่างง่ายดาย แต่ในทางตรงกันข้ามหากทำการตีส่งลูกไปไม่ดีเราจะเป็นฝ่ายรับและเสียแต้มได้ง่ายมากยิ่งขึ้น

1. เริ่มจากท่ายืนเตรียมพร้อมในการเริ่มเกม ควรยืนพร้อมอยู่ตรงกลางเพื่อความคล่องแคล่วในการเคลื่อนที่ได้ทั้งซ้ายและขวา จับไม้ให้กระชับโดยการคว่ำหน้าไม้ลง แขนพร้อมรับส่งลูกอยู่ตลอดเวลา โดยงอแขนเล็กน้อยทำมุม 90 องศา

2. โยนลูกบอลให้ตกลงมาในแนวดิ่งในระดับที่เหมาะสม เหวี่ยงแขนโดยใช้แรงที่พอดีซึ่งขึ้นอยู่กับว่าจุดหมายที่ต้องการให้ลูกตกลงบริเวณใดของฝ่ายตรงข้าม โดยการเคลื่อนที่นั้นจะใช้ปลายเท้าเพื่อให้รวดเร็ว โดยการเสิร์ฟลูกนั้นสามารถเสิร์ฟได้หลายแบบ

3. เสิร์ฟลูกแบบหน้ามือ เป็นการเสิร์ฟลูกแบบพื้นฐานสามารถทำได้โดยเอียงตัว 45 องศา โยนลูกปิงปองขึ้นในอากาศลงแนวดิ่งและตีด้วยหน้าไม้ การเสิร์ฟลูกแบบนี้ต้องให้เฉียดเน็ตมากที่สุดจะสามารถทำคะแนนได้ดียิ่งขึ้น

4. การเสิร์ฟลูกแบบหมุนขึ้น ลูกเสิร์ฟแบบนี้จะเสิร์ฟไปยังหลังมือคู่ต่อสู้ ซึ่งเป็นทิศทางที่คู่แข่งนั้นมักจะลังเลที่จะเลือกรับด้วยหน้ามือหรือหลังมือจึงทำให้ได้แต้มง่ายยิ่งขึ้น

5. การเสิร์ฟลูกหมุนกลับ แนะนำให้ตีลูกต่ำ การเสิร์ฟลูกแบบนี้จะทำให้ลูกหมุนเร็ว มีผลให้คู่แข่งของเราควบคุมทิศทางการตีลูกไม่ได้

การจัดเรียนรู้ตามแนวคิดของเดวีส์ เป็นการจัดการเรียนการสอนที่เน้นทักษะการปฏิบัติ โดยผู้สอนกำหนดเนื้อหาออกเป็นหน่วยใหญ่ก่อน จากนั้นแบ่งเนื้อออกเป็นเนื้อหาย่อยให้ละเอียดและมากที่สุดเพื่อให้นักเรียนได้ฝึกทักษะย่อยเหล่านั้นจนเกิดความชำนาญ และก่อนที่จะให้ผู้เรียนฝึกปฏิบัติ ครูผู้สอนจะต้องเป็นผู้ที่สาธิตทักษะในการปฏิบัติก่อนแล้วจากนั้นให้ผู้เรียนปฏิบัติด้วยตนเองจนเกิดความชำนาญ

ในระหว่างการฝึกปฏิบัติของผู้เรียน ครูผู้สอนจะคอยให้คำแนะนำ ชี้แนะแนวทางการปฏิบัติโดยไม่มีการสอนสาธิตให้ดูเป็นตัวอย่างอีก เมื่อผู้เรียนปฏิบัติจนเกิดความชำนาญแล้วครูจึงสอนเทคนิควิธีการที่ช่วยให้การปฏิบัติได้รวดเร็วและมีคุณภาพยิ่งขึ้น เมื่อนำกระบวนการจัดการเรียนรู้เข้ามาใช้กับทักษะการเสิร์ฟลูกเทเบิลเทนนิสที่มีรายละเอียดทักษะท่าทางในการปฏิบัติจะทำให้ผู้เรียนสามารถฝึกทักษะย่อยต่าง ๆ ในการปฏิบัติทักษะการเสิร์ฟได้ชำนาญมากยิ่งขึ้น และเมื่อนักเรียนสามารถปฏิบัติทักษะย่อยจนเกิดความชำนาญแล้ว ผู้เรียนก็จะสามารถเชื่อมโยงทักษะย่อยดังกล่าว จนสามารถปฏิบัติทักษะการเสิร์ฟลูกเทเบิลเทนนิสได้อย่างสมบูรณ์

สำหรับการสอนทักษะปฏิบัติของเดวีส์ (ทิศนา แขมมณี, 2560) ได้อธิบาย ทฤษฎี หลักการ แนวคิด วัตถุประสงค์ กระบวนการเรียนการสอนที่เน้นให้ผู้เรียนได้ลงมือปฏิบัติจริง ฝึกฝนให้ทักษะทีละอย่าง เมื่อได้ทำแล้วจึงค่อยไปฝึกทักษะต่อไปจนกว่าจะครบทุกทักษะแล้วค่อยเชื่อมโยงทุกทักษะเข้าด้วยกันให้สมบูรณ์ ส่งผลให้ผู้เรียนมีผลสัมฤทธิ์และมีทักษะที่พัฒนาขึ้นได้ตามการจัดการเรียนรู้ โดยมุ่งเน้นในการจัดกิจกรรมการเรียนการสอนที่เน้นความยืดหยุ่น โดยมุ่งเน้นจัดกิจกรรมการเรียนที่ให้นักเรียนสามารถเรียนรู้ด้วยตนเองตามแนวคิดของรูปแบบการเรียนการสอนทักษะของเดวีส์ Davies (1971) ได้นำเสนอแนวคิดเกี่ยวกับการพัฒนาทักษะปฏิบัติไว้ว่า ทักษะส่วนใหญ่จะประกอบไปด้วย ทักษะย่อย ๆ จำนวนมาก การฝึกให้ผู้เรียนสามารถทำทักษะย่อย ๆ เหล่านั้นได้ก่อนแล้วค่อยเชื่อมโยงต่อกันไปเป็นทักษะใหญ่ จะช่วยให้ผู้เรียนประสบผลสำเร็จได้ดีและรวดเร็วขึ้น วัตถุประสงค์ของรูปแบบการเรียนการสอนทักษะของ เดวีส์ รูปแบบนี้มุ่งช่วยพัฒนาความสามารถด้านทักษะปฏิบัติของผู้เรียน โดยเฉพาะอย่างยิ่งทักษะที่ประกอบด้วยทักษะย่อยจำนวนมาก กระบวนการเรียนการสอนของรูปแบบการเรียนการสอนทักษะของเดวีส์

ขั้นที่ 1 ขั้นสาธิตทักษะหรือการกระทำ ขั้นนี้เป็นขั้นที่ให้ผู้เรียนได้เห็นทักษะหรือการกระทำที่ต้องการให้ผู้เรียนทำได้ในภาพรวม โดยการสาธิตให้ผู้เรียนดูตั้งแต่ต้นจนจบ ทักษะหรือการกระทำที่สาธิตให้ผู้เรียนดูนั้น จะต้องเป็นการกระทำในลักษณะที่เป็นธรรมชาติไม่ช้าหรือเร็วเกินปกติ ก่อนการสาธิตครูควรให้คำแนะนำแก่ผู้เรียนในการสังเกต ควรชี้แนะจุดสำคัญที่ควรให้ความสนใจเป็นพิเศษในการสังเกต

ขั้นที่ 2 ขั้นสาธิตและให้ผู้เรียนปฏิบัติทักษะย่อย เมื่อผู้เรียนได้เห็นภาพรวมของการกระทำหรือทักษะทั้งหมดแล้ว ผู้สอนควรแตกทักษะทั้งหมดให้เป็นทักษะย่อย ๆ หรือแบ่งสิ่งที่กระทำออกเป็นส่วนย่อย ๆ และสาธิตส่วนย่อยแต่ละส่วนให้ผู้เรียนสังเกตและทำตามไปทีละส่วนอย่างช้า ๆ

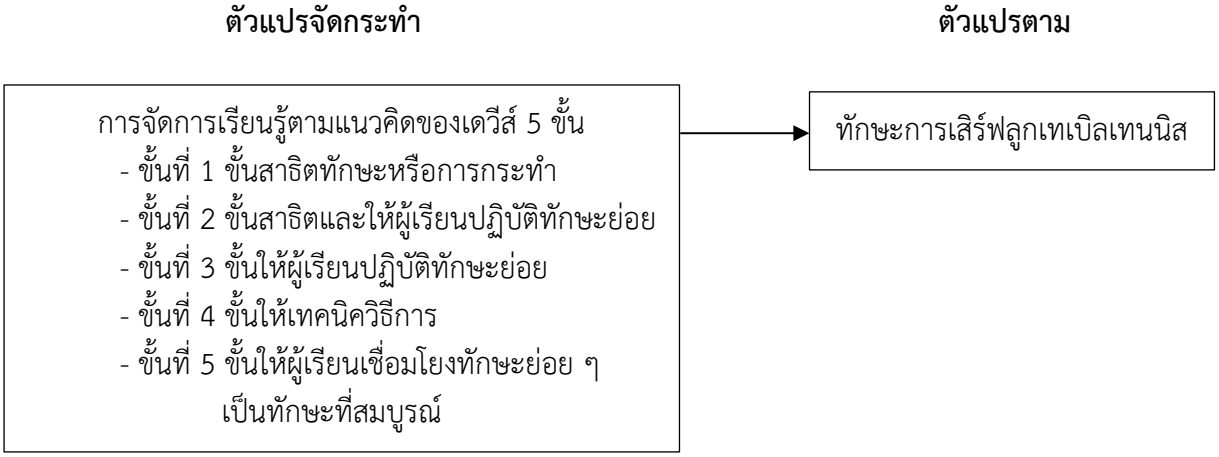
ขั้นที่ 3 ขั้นให้ผู้เรียนปฏิบัติทักษะย่อย ผู้เรียนลงมือปฏิบัติทักษะย่อยโดยไม่มีการสาธิตหรือการแสดงแบบอย่างให้ดู หากติดขัดจุดใดผู้สอนควรให้คำชี้แนะและช่วยแก้ไข จนกระทั่งผู้เรียนทำได้ เมื่อได้แล้วผู้สอนจึงเริ่มสาธิตทักษะย่อยส่วนต่อไป และให้ผู้เรียนปฏิบัติทักษะย่อยนั้นจนทำได้ ทำเช่นนี้เรื่อยไปจนกระทั่งครบทุกส่วน

ขั้นที่ 4 ขั้นให้เทคนิควิธีการ เมื่อผู้เรียนปฏิบัติได้แล้ว ผู้สอนอาจจะแนะนำเทคนิควิธีการที่จะช่วยให้ผู้เรียนนั้นทำงานได้ดีขึ้น เช่น ทำได้ประณีตสวยงามขึ้น ทำได้รวดเร็วขึ้น ทำได้ง่ายขึ้น หรือสิ้นเปลืองน้อยลง เป็นต้น

ขั้นที่ 5 ขั้นให้ผู้เรียนเชื่อมโยงทักษะย่อย ๆ เป็นทักษะที่สมบูรณ์ เมื่อผู้เรียนสามารถปฏิบัติแต่ละส่วนได้แล้ว จึงให้ผู้เรียนปฏิบัติทักษะย่อย ๆ ต่อเนื่องกันตั้งแต่ต้นจนจบ และฝึกปฏิบัติหลาย ๆ ครั้งจนสามารถปฏิบัติทักษะที่สมบูรณ์ได้อย่างชำนาญ

ในการวิจัยครั้งนี้ผู้วิจัยกำหนดกรอบแนวคิดการวิจัยโดยนำแนวทางของเดวีส์มาใช้ในการพัฒนานักเรียน ดังนี้

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ผู้วิจัยได้ดำเนินศึกษาตามหัวข้อ ต่อไปนี้

1. กลุ่มเป้าหมายที่ใช้ในการศึกษา

กลุ่มที่ใช้ในการศึกษาเป็นนักเรียนชั้นประถมศึกษาปีที่ 5 โรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 27 คน เป็น ชาย 13 คน หญิง 14 คน โดยเป็นห้องที่ผู้วิจัยเป็นผู้สอน

2. เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ ประกอบด้วย

2.1. เครื่องมือที่ใช้ในการทดลอง ได้แก่ แผนการจัดการเรียนรู้สำหรับพัฒนาทักษะการเสิร์ฟลูก เทเบิลเทนนิสตามแนวคิดของเดวีส์ จำนวน 1 แผนการเรียนรู้ ประกอบด้วยคาบเรียน 4 คาบ คาบละ 50 นาที ดังนี้

คาบที่ 1 ให้นักเรียนได้ทราบขั้นตอนและกระบวนการพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิส ได้แก่ (1) การจับไม้ (2) จุดกระทบลูก (3) ลักษณะการตีลูกเทเบิลเทนนิสที่ถูกต้อง และให้นักเรียนทำการฝึกในคาบโดยผู้สอนคอยให้คำแนะนำ และให้นักเรียนฝึกปฏิบัติที่บ้านโดยถ่ายคลิปการฝึกปฏิบัติทักษะส่งครูผู้สอนเพื่อให้ในการประเมินทักษะจากคลิป

คาบที่ 2 สำรวจทักษะโดยเริ่มจากทบทวนทักษะที่ได้เรียนรู้ในคาบก่อนหน้ามาเป็นทักษะตั้งต้น โดยเริ่มสอนขั้นสาธิตและให้ผู้เรียนปฏิบัติทักษะย่อยโดยเพิ่มเติมทักษะการยืนและการถือลูกขณะเสิร์ฟ

คาบที่ 3 ขั้นให้ผู้เรียนปฏิบัติทักษะย่อย ผู้เรียนลงมือปฏิบัติทักษะย่อยโดยไม่มีการสาธิตโดยนำทุกทักษะมาเชื่อมโยงกันแล้วปฏิบัติให้ถูกต้องครบถ้วน

คาบที่ 4 ทดสอบทักษะการเสิร์ฟลูกเทเบิลเทนนิสหลังเรียนหลังจากได้รับการเรียนการสอนทักษะการเสิร์ฟลูกเทเบิลเทนนิสตามแผนการจัดการเรียนรู้ที่พัฒนาขึ้น

ตรวจสอบคุณภาพแผนการจัดการเรียนรู้โดยผู้เชี่ยวชาญด้านการจัดการเรียนรู้พลศึกษา จำนวน 3 ท่าน พิจารณาความถูกต้องเหมาะสม และความเป็นไปได้ในการนำแผนการจัดการเรียนรู้ไปใช้ พร้อมทั้ง

ให้ข้อเสนอแนะในการปรับแผนการจัดการเรียนรู้ให้มีความถูกต้องสมบูรณ์ยิ่งขึ้น โดยผู้วิจัยได้ปรับแก้ไขแผนการจัดการเรียนรู้ตามข้อเสนอแนะดังกล่าว

2.2. เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล ได้แก่ แบบประเมินทักษะกีฬาเทเบิลเทนนิส เป็นแบบประเมินเพื่อวัดความสามารถในการฝึกทักษะกีฬาเทเบิลเทนนิสของนักเรียนชั้นมัธยมศึกษาตอนต้น ประกอบด้วย การเดาะลูกหน้ามือ หลังมือ การเสิร์ฟลูกเทเบิลเทนนิส โดยนำแบบประเมินทักษะกีฬาเทเบิลเทนนิส ของ ชุติมา ศรีเมืองซอง (2555) ซึ่งนำมาจากงานวิจัยการพัฒนาแบบประเมินทักษะกีฬาเทเบิลเทนนิสตามแนวคิดการประเมินตามสภาพจริง สำหรับนักเรียนมัธยมศึกษาตอนต้น ได้แก่ แบบประเมินทักษะการเสิร์ฟลูกเทเบิลเทนนิส ประกอบไปด้วยการประเมิน 2 ตอน ตอนที่ 1 ดำเนินการประเมินตามองค์ประกอบท่าทางการปฏิบัติ องค์ประกอบละ 2 คะแนน ตอนที่ 2 ประเมินผลการเสิร์ฟลูกเทเบิลเทนนิสโดยทำการทดสอบจำนวน 5 ครั้ง ลูกละ 2 คะแนน รวมคะแนนการประเมินองค์ประกอบทักษะการเสิร์ฟลูกเทเบิลเทนนิส 20 คะแนน

2.3 ขั้นตอนในการดำเนินการวิจัย

1. ปฐมนิเทศ ชี้แจงข้อตกลงในการจัดกิจกรรมการเรียนรู้ แจ้งจุดประสงค์การเรียนรู้ให้นักเรียนทราบ แจ้งบทบาทของครูและนักเรียนและวิธีการปฏิบัติกิจกรรม

2. จัดกิจกรรมการเรียนรู้ ตามแผนการจัดการเรียนรู้ จำนวน 4 คาบ

คาบที่ 1 โดยให้นักเรียนได้ทราบถึงขั้นตอนและกระบวนการทักษะในการเสิร์ฟลูกเทเบิลเทนนิส ดังนี้ (1) การจับไม้ (2) จุดกระทบลูก (3) ลักษณะการตีลูกเทเบิลเทนนิสที่ถูกต้อง และให้นักเรียนทำการฝึกในคาบโดยผู้สอนคอยให้คำแนะนำ และให้นักเรียนถ่ายคลิปขณะปฏิบัติทักษะเพื่อให้ผู้วิจัยประเมิน

คาบที่ 2 สำรวจทักษะโดยเริ่มจากทบทวนทักษะที่ได้เรียนรู้ในคาบก่อนหน้าว่านักเรียนสามารถทำได้ครบหรือไม่ และให้ผู้เรียนนำมาเป็นทักษะตั้งต้น โดยเริ่มสอนขั้นสาธิตและให้ผู้เรียนปฏิบัติทักษะย่อยโดยเพิ่มเติมทักษะการยืนและการถือลูกขณะเสิร์ฟ

คาบที่ 3 ขั้นให้ผู้เรียนปฏิบัติทักษะย่อย ผู้เรียนลงมือปฏิบัติทักษะย่อยโดยไม่มีการสาธิต โดยนำทุกทักษะมาเชื่อมโยงกันแล้วปฏิบัติให้ถูกต้องครบถ้วน

คาบที่ 4 ให้นักเรียนทำการทดสอบหลังเรียนหลังจากได้รับการเรียนการสอนทักษะการเสิร์ฟลูกเทเบิลเทนนิส ผ่านจัดการเรียนรู้ตามแผนการจัดการเรียนรู้ตามแนวคิดของเดวีส์

3. ทำการทดสอบทักษะพื้นฐานกีฬาเทเบิลเทนนิส โดยใช้แบบตรวจสอบรายการแสดงทักษะการเสิร์ฟลูกเทเบิลเทนนิส จำนวน 5 รายการ และแบบสังเกตทักษะ 1 รายการ

4. จัดกิจกรรมการเรียนรู้ โดยใช้แผนการจัดการเรียนรู้ตามแนวคิดของเดวีส์ รายวิชาเทเบิลเทนนิสกับนักเรียนชั้นประถมศึกษาปีที่ 5 โรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร และทำการทดสอบทักษะพื้นฐานกีฬาเทเบิลเทนนิสระหว่างเรียนจนครบทุกแผนการจัดการเรียนรู้ โดยใช้แบบตรวจสอบรายการแสดงทักษะการเสิร์ฟลูกเทเบิลเทนนิสชุดเดิม

5. ทำการทดสอบทักษะพื้นฐานกีฬาเทเบิลเทนนิสหลังเรียน นัดหมายผู้เรียนในการทดสอบทักษะการเสิร์ฟลูกปฏิบัติ โดยนำทักษะย่อยที่ได้เรียนรู้มาทำการทดสอบ โดยใช้แบบตรวจสอบรายการแสดงทักษะการเสิร์ฟลูกเทเบิลเทนนิส

3. การวิเคราะห์ข้อมูล

การวิจัยครั้งนี้ ผู้วิจัยดำเนินการวิเคราะห์ข้อมูลและใช้สถิติที่ใช้ในการวิเคราะห์ข้อมูล ดังนี้

1. วิเคราะห์ข้อมูลผลการศึกษาทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับโดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ โดยการวิเคราะห์ค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน และวิเคราะห์คะแนนพัฒนาการสัมพัทธ์ โดยใช้สูตรคะแนนพัฒนาการ (ศิริชัย กาญจนวาสี, 2552)

ตารางที่ 1 เกณฑ์คะแนนพัฒนาการเทียบระดับพัฒนาการ (ศิริชัย กาญจนวาสี, 2552)

คะแนนพัฒนาการสัมพัทธ์	ระดับพัฒนาการ
76 - 100	พัฒนาการสูงมาก
51 - 75	พัฒนาการระดับสูง
26 - 50	พัฒนาการระดับปานกลาง
0 - 25	พัฒนาการระดับต้น

2. เปรียบเทียบทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์กับเกณฑ์ร้อยละ 70 โดยการหาค่าร้อยละของคะแนนเกณฑ์ ค่าร้อยละของคะแนนเฉลี่ย และเปรียบเทียบคะแนนดังกล่าว

ผลการวิจัย

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาและเปรียบเทียบทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ กับเกณฑ์ร้อยละ 70 โดยผู้วิจัยได้ดำเนินการจัดการเรียนรู้และประเมินทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนกลุ่มที่ศึกษาจำนวน 4 ครั้ง คะแนนเต็มครั้งละ 20 คะแนน วิเคราะห์คะแนนพัฒนาการสัมพัทธ์โดยใช้คะแนนครั้งที่ 1 และ ครั้งที่ 4 ผลการวิเคราะห์ข้อมูลเป็นดังตารางต่อไปนี้

ตารางที่ 2 ตารางแสดงคะแนนทักษะการเสิร์ฟลูกเทเบิลเทนนิส และคะแนนพัฒนาการสัมพัทธ์

ลำดับที่	ครั้งที่ 1	ครั้งที่ 2	ครั้งที่ 3	ครั้งที่ 4	คะแนนพัฒนาการสัมพัทธ์	ระดับพัฒนาการ
1	10	10	12	16	60.00	สูง
2	12	12	12	16	50.00	ปานกลาง
3	10	12	14	18	80.00	สูงมาก
4	10	14	14	18	80.00	สูงมาก
5	10	12	16	18	80.00	สูงมาก
6	10	16	16	18	80.00	สูงมาก
7	12	14	18	18	75.00	สูง
8	12	10	16	16	50.00	ปานกลาง
9	10	12	16	20	100.00	สูงมาก
10	10	14	18	20	100.00	สูงมาก
11	10	16	18	20	100.00	สูงมาก
12	10	12	16	18	80.00	สูงมาก

ตารางที่ 2 (ต่อ)

ลำดับที่	ครั้งที่ 1	ครั้งที่ 2	ครั้งที่ 3	ครั้งที่ 4	คะแนนพัฒนาการสัมพัทธ์	ระดับพัฒนาการ
13	14	12	18	20	100.00	สูงมาก
14	12	14	14	18	75.00	สูง
15	10	12	16	20	100.00	สูงมาก
16	10	14	14	20	100.00	สูงมาก
17	14	16	16	18	66.67	สูง
18	16	16	16	20	100.00	สูงมาก
19	10	10	14	18	80.00	สูงมาก
20	8	10	12	20	100.00	สูงมาก
21	12	14	16	20	100.00	สูงมาก
22	6	8	12	16	71.43	สูง
23	8	10	12	18	83.33	สูงมาก
24	8	10	12	16	66.67	สูง
25	10	14	16	18	80.00	สูงมาก
26	10	14	18	20	100.00	สูงมาก
27	10	14	18	20	100.00	สูงมาก
ค่าเฉลี่ย	10.52	12.67	15.19	18.43	83.60	**สูงมาก**
ส่วนเบี่ยงเบนมาตรฐาน	2.01	2.18	2.13	1.48	26.55	**สูงมาก**

จากตารางที่ 2 จะเห็นว่าในภาพรวมนักเรียนพัฒนาการในระดับสูงมาก โดยมีค่าเฉลี่ยของคะแนนพัฒนาการสัมพัทธ์เท่ากับ 83.60 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 26.55 โดยในจำนวนนักเรียน 27 คน มีนักเรียนจำนวน 19 คนที่มีพัฒนาการในระดับสูงมาก จำนวน 6 คน มีพัฒนาการในระดับสูง และจำนวน 2 คน มีพัฒนาการในระดับปานกลาง

เมื่อพิจารณาผลการประเมินเป็นรายครั้ง พบว่า

ผลการประเมินครั้งที่ 1 มีคะแนนต่ำสุดและคะแนนสูงสุดเท่ากับ 6 และ 10 คะแนน ตามลำดับ ค่าเฉลี่ยเท่ากับ 10.52 คะแนน ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 2.01 คะแนน

ผลการประเมินครั้งที่ 2 มีคะแนนต่ำสุดและคะแนนสูงสุดเท่ากับ 8 และ 16 คะแนน ตามลำดับ ค่าเฉลี่ยเท่ากับ 12.67 คะแนน ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 2.18 คะแนน

ผลการประเมินครั้งที่ 3 มีคะแนนต่ำสุดและคะแนนสูงสุดเท่ากับ 12 และ 18 คะแนน ตามลำดับ ค่าเฉลี่ยเท่ากับ 15.19 คะแนน ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 2.13 คะแนน

และผลการประเมินครั้งที่ 4 มีคะแนนต่ำสุดและคะแนนสูงสุดเท่ากับ 16 และ 20 คะแนน ตามลำดับ มีค่าเฉลี่ยเท่ากับ 18.43 คะแนน และค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 1.48 คะแนน

จากคะแนนเฉลี่ยครั้งที่ 4 มีค่าเท่ากับ 18.43 คะแนน คิดเป็นร้อยละ 92.15 ของคะแนนเต็ม ซึ่งสูงกว่าคะแนนเกณฑ์ร้อยละ 70 ซึ่งเท่ากับ 14 คะแนน

สรุปและอภิปรายผลการวิจัย

สรุปผล

1. นักเรียนมีคะแนนพัฒนาการในระดับสูงมาก โดยมีค่าเฉลี่ยของคะแนนพัฒนาการสัมพัทธ์เท่ากับ 83.60 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 26.55 โดยในจำนวนนักเรียน 27 คน มีนักเรียนที่มีพัฒนาการในระดับสูงมาก สูง และปานกลางจำนวน 19 คน 6 คน และ 2 คน ตามลำดับ

2. คะแนนทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ สูงกว่าเกณฑ์ร้อยละ 70 โดยมีค่าเฉลี่ยเท่ากับ 18.43 คะแนน คิดเป็นร้อยละ 92.15 ของคะแนนเต็ม

การอภิปรายผล

จากผลการวิจัยซึ่งพบว่า นักเรียนมีคะแนนพัฒนาการในระดับสูงมาก โดยมีค่าเฉลี่ยของคะแนนพัฒนาการสัมพัทธ์เท่ากับ 83.60 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 26.55 คะแนน ทักษะการเสิร์ฟลูกเทเบิลเทนนิสของนักเรียนชั้นประถมศึกษาปีที่ 5 ที่ได้รับการจัดการเรียนรู้โดยใช้เทคนิคการจัดการเรียนรู้ของเดวีส์ สูงกว่าเกณฑ์ร้อยละ 70 โดยมีค่าเฉลี่ยเท่ากับ 18.43 คะแนน คิดเป็นร้อยละ 92.15 ของคะแนนเต็ม แสดงว่า การจัดการเรียนรู้เพื่อพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิสตามแนวทางของเดวีส์ประสบผลสำเร็จเป็นอย่างดี ทำให้นักเรียนชั้นประถมศึกษาปีที่ 5 ได้เกิดการพัฒนาทักษะการเสิร์ฟลูกมากขึ้นอย่างเห็นได้เป็นรูปธรรม นักเรียนได้มีส่วนร่วมในการจัดกิจกรรมการเรียนรู้กับเนื้อหาที่สอนมากขึ้น มีการฝึกปฏิบัติเพื่อเสริมสร้างทักษะด้วยตนเอง ทำให้เกิดความรู้ความเข้าใจในทักษะการเสิร์ฟในกีฬาเทเบิลเทนนิส อีกทั้งการจัดการเรียนรู้ตามแนวคิดของเดวีส์ ซึ่งเป็นรูปแบบการเรียนการสอนที่เน้นในเรื่องทักษะการปฏิบัติ และมีการเรียงลำดับขั้นตอนในการฝึกปฏิบัติจากง่ายไปยาก จึงให้นักเรียนสามารถปฏิบัติตามในขณะที่สอนอย่างเป็นขั้นตอน และในแต่ละขั้นตอนจะมีการเชื่อมโยงซึ่งกันและกัน สอดคล้องกับทฤษฎีการสอนทักษะปฏิบัติของเดวีส์ (ทิศนา แขมมณี, 2560) ได้อธิบายกระบวนการเรียนการสอนที่เน้นให้ผู้เรียนได้ลงมือปฏิบัติจริง ฝึกฝนให้ทักษะทีละอย่าง เมื่อได้ทำแล้วจึงค่อยไปฝึกทักษะต่อไปจนกว่าจะครบทุกทักษะแล้วค่อยเชื่อมโยงทุกทักษะเข้าด้วยกันให้สมบูรณ์ ส่งผลให้ผู้เรียนมีผลสัมฤทธิ์และมีทักษะที่พัฒนาขึ้นได้ตามการจัดการเรียนรู้ โดยมุ่งเน้นในการจัดกิจกรรมการเรียนการสอนที่เน้นความยืดหยุ่น

ครูผู้สอนจะคอยให้คำแนะนำอย่างใกล้ชิดเพื่อช่วยกระตุ้นให้นักเรียนสามารถเรียนรู้ได้ดีขึ้นจนเกิดเป็นความรู้และทักษะที่คงทนติดตัวนักเรียน ซึ่งส่งผลให้นักเรียนมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าเกณฑ์ ร้อยละ 70

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 ครูผู้สอนวิชาพลศึกษาสามารถนำแผนการจัดการเรียนรู้ที่พัฒนาขึ้น รวมทั้งเครื่องมือประเมินทักษะการเสิร์ฟลูกเทเบิลเทนนิสไปใช้ในการพัฒนาทักษะการเสิร์ฟลูกเทเบิลเทนนิสสำหรับนักเรียนชั้นประถมศึกษาได้

1.2. ควรเน้นให้นักเรียนได้ฝึกฝนทักษะพื้นฐานในการเสิร์ฟลูกเทเบิลเทนนิสด้วยตนเอง ด้วยการพัฒนาตนเองอย่างต่อเนื่องและสม่ำเสมอ

1.3. ครูผู้สอนควรมีกิจกรรมเพื่อเสริมสร้างทักษะการเสิร์ฟลูกเทเบิลเทนนิสที่เป็นกิจกรรมในลักษณะเกมการแข่งขันเพื่อให้ผู้เรียนเกิดความสนุกสนานและรู้สึกสนุกเมื่อได้เข้าร่วมกิจกรรม

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1. ควรพัฒนาแผนการจัดการเรียนรู้โดยจัดการเรียนรู้ด้วยเทคนิคของเดวีส์กับทักษะทางกีฬาเทเบิลเทนนิสอื่น ๆ หรือกีฬาอื่น ๆ

2.2. ควรพัฒนาเครื่องมือประเมินที่เป็นมาตรฐาน และพัฒนาเกณฑ์การประเมินสำหรับประเมินทักษะทางกีฬาเทเบิลเทนนิส และกีฬาอื่น ๆ สำหรับใช้ในการประเมินผู้เรียนระดับประถมศึกษา

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ผลการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ที่มีต่อสมรรถนะด้านผู้เรียนรู้ในรายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3

The Results of Learning Management by Using Activity-Based Learning Combined with the Use of Multimedia Affecting Grade 3 Students' Learning Person Competency in Explorer's Mathematics on Volume Measurement.

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บทคัดย่อ

การวิจัยในครั้งนี้มีวัตถุประสงค์ เพื่อศึกษาสมรรถนะด้านผู้เรียนรู้ในรายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่ได้รับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม กลุ่มเป้าหมายที่ใช้ในการวิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 3 ภาคเรียนที่ 2 ปีการศึกษา 2566 ของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร จำนวน 2 ห้องเรียน มีนักเรียนทั้งสิ้น 48 คน เครื่องมือที่ใช้ในการวิจัย คือ แผนการจัดการเรียนรู้ จำนวน 6 แผน ซึ่งมี 9 คาบ แบบประเมินสมรรถนะด้านผู้เรียนรู้เรื่องการวัดปริมาตร ประกอบด้วย แบบทดสอบ เรื่องการวัดปริมาตร แบบประเมินทักษะการวัดปริมาตร และแบบสังเกตพฤติกรรมความสนใจและการเข้าร่วมกิจกรรม สถิติที่ใช้ในการวิเคราะห์ข้อมูลประกอบด้วยค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัยพบว่า นักเรียนมีสมรรถนะด้านผู้เรียนรู้ในรายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตร โดยรวมอยู่ในระดับทำได้แล้ว โดยมีค่าเฉลี่ยเท่ากับ 22.67 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 3.04

คำสำคัญ: สมรรถนะด้านผู้เรียนรู้, การจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐาน, สื่อประสม, ทักษะการตวง, รายวิชาคณิตศาสตร์นักสำรวจ

Abstract

The objective of this research is to study learner competencies in the subject of Explorer's Mathematics, Volume Measurement for Grade 3 students who receive Activity-Based Learning Management combined with combined Usage of Multimedia. The target group are Grade 3 students that are currently enrolled in the 2nd semester of the academic year 2023 from Phranakhon Rajabhat University Demonstration Elementary School, Consisting of 2 sections, with a total of 48 students. Research instruments consists of 6 lesson plans, accounting to 9 class periods and a learner's competency assessment form, student behavior, interest, and participation.

The results of the research found that students have an achievable level of competency in learning the subject. With a Mean of 22.67 and a standard deviation of 3.04.

Keywords: Learning Person Competency, Activity Based Learning, Multimedia, Measuring skills, Explorer's Mathematics

บทนำ

คณิตศาสตร์มีบทบาทสำคัญยิ่งต่อความสำเร็จในการเรียนรู้ในศตวรรษที่ 21 เนื่องจากคณิตศาสตร์ช่วยให้มนุษย์มีความความคิดสร้างสรรค์ คิดอย่างเป็นระบบมีแบบแผนสามารถวิเคราะห์ปัญหาสถานการณ์ได้อย่างถี่ถ้วนรอบคอบ ช่วยให้คาดการณ์ วางแผน ตัดสินใจ แก้ปัญหา และนำไปใช้ในชีวิตประจำวันได้อย่างถูกต้องเหมาะสมและสามารถนำไปใช้ในชีวิตจริงได้อย่างมีประสิทธิภาพ นอกจากนี้คณิตศาสตร์ยังเป็นเครื่องมือในการศึกษาทางวิทยาศาสตร์เทคโนโลยี และศาสตร์อื่น ๆ อันเป็นรากฐานในการพัฒนาทรัพยากรบุคคลของชาติให้มีคุณภาพและพัฒนาเศรษฐกิจของประเทศให้ทัดเทียมกับนานาชาติ การศึกษาคณิตศาสตร์จึงจำเป็นต้องมีการพัฒนาอย่างต่อเนื่อง เพื่อให้ทันสมัยและสอดคล้องกบสภาพเศรษฐกิจสังคม และความรู้ทางวิทยาศาสตร์และเทคโนโลยีที่เจริญกาวหน้าอย่างรวดเร็วในยุคโลกาภิวัตน์ (กระทรวงศึกษาธิการ, 2560b)

จะเห็นได้ว่าวิชาคณิตศาสตร์เป็นศาสตร์ที่มีความสำคัญศาสตร์หนึ่ง ซึ่งการศึกษาวิชาคณิตศาสตร์สำหรับหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง พ.ศ. 2560) (กระทรวงศึกษาธิการ, 2560a) มีเป้าหมายที่ต้องการให้ผู้เรียนมีความรู้ความเข้าใจเกี่ยวกับแนวคิด หลักการ ทฤษฎีในสาระคณิตศาสตร์ที่จำเป็น พร้อมทั้งสามารถนำไปประยุกต์ได้ มีความสามารถในการแก้ปัญหา สื่อสารและสื่อความหมายทางคณิตศาสตร์ เชื่อมโยง ให้เหตุผล และมีความคิดสร้างสรรค์ มีเจตคติที่ดีต่อคณิตศาสตร์ เห็นคุณค่าและตระหนักถึงความสำคัญของคณิตศาสตร์ สามารถนำความรู้ทางคณิตศาสตร์ไปเป็นเครื่องมือในการเรียนรู้ในระดับการศึกษาที่สูงขึ้น ตลอดจนการประกอบอาชีพ และมีความสามารถในการเลือกสื่อ อุปกรณ์ เทคโนโลยี และแหล่งข้อมูลที่เหมาะสมเพื่อเป็นเครื่องมือในการเรียนรู้ การสื่อสาร การทำงาน และการแก้ปัญหาอย่างถูกต้อง และมีประสิทธิภาพ (สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี, 2560)

จากผลการประเมินคุณภาพผู้เรียน (NT) สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 ปีการศึกษา 2565 ด้านคณิตศาสตร์ในระดับประเทศ พบว่า เรื่องปริมาตรและความจุที่หน่วยเป็นลิตรและมิลลิลิตรมีคะแนน

ร้อยละ 43.15 อยู่ในระดับคุณภาพพอใช้ ซึ่งผลการประเมินเรื่องดังกล่าวของนักเรียนโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนครอยู่ในระดับคุณภาพพอใช้เช่นกัน โดยนักเรียนได้คะแนนเรื่องดังกล่าวร้อยละ 39.76 ต่ำกว่าระดับประเทศ ซึ่งข้อมูลข้างต้นสอดคล้องกับ โชติกา เขียวงาม (2565) ที่กล่าวว่า การวัดปริมาตรนั้น นักเรียนมักสับสนในเรื่องของหน่วยการวัด เนื่องจากมีหน่วยการวัดปริมาตรที่คล้ายคลึงกัน ประกอบกับสาเหตุหนึ่งที่ทราบกันดีว่าทำให้ผู้เรียนไม่ประสบความสำเร็จในการเรียนวิชาคณิตศาสตร์ คือ นักเรียนขาดความกระตือรือร้นในการเรียน เนื่องจากเนื้อหาไม่มีความน่าสนใจ โดย วรัญญา พลหาร (2564) กล่าวว่า การเรียนการสอนที่ขาดการจัดกิจกรรมไม่ดึงดูดความสนใจนักเรียน ส่งผลให้ไม่เกิดความคงทนในการเรียนรู้ และนักเรียนสับสนเกี่ยวกับหน่วยการวัดปริมาตร

จากเหตุผลข้างต้น ผู้วิจัยจึงมีความสนใจในการพัฒนาสมรรถนะด้านผู้เรียนรู้ รายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3 ตามหลักสูตรสถานศึกษาของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ด้วยจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐาน ซึ่งกระบวนการจัดการเรียนรู้เน้นการทำกิจกรรม การทดลอง การแก้ปัญหาและลงมือปฏิบัติของผู้เรียนของผู้เรียนเป็นหลัก (เยาวเรศ ภักดีจิตร, 2557) ผสมผสานการใช้สื่อประสม ซึ่งจะช่วยให้นักเรียนมีประสบการณ์ได้ใช้ประสาทสัมผัสจนเกิดการเรียนรู้ตามวัตถุประสงค์ที่ตั้งไว้อย่างมีประสิทธิภาพ (มหาวิทยาลัยสุโขทัยธรรมาธิราช, 2557) ออกแบบกิจกรรมให้ผู้เรียนเกิดทักษะการวัดปริมาตรตามหลักสูตรบูรณาการฐานสมรรถนะของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร นอกจากนี้ผลการวิจัยที่ได้จะเป็นแนวทางให้ครูผู้สอนคณิตศาสตร์ ในการจัดการเรียนรู้กลุ่มวิชาสร้างสรรค์การคิด (นักคิดคณิตศาสตร์) ให้มีประสิทธิภาพมากยิ่งขึ้น

วัตถุประสงค์ของการวิจัย

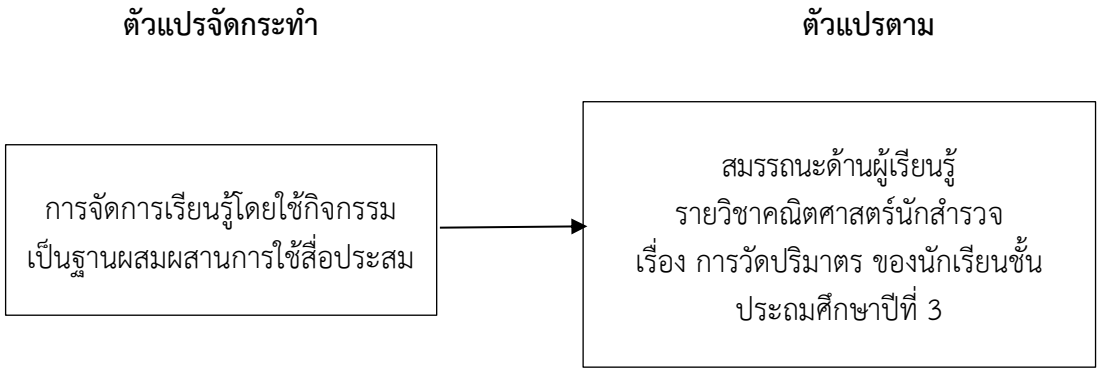
เพื่อศึกษาสมรรถนะด้านผู้เรียนรู้ในรายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่ได้รับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม

แนวคิด ทฤษฎี กรอบแนวคิด

การเรียนโดยใช้กิจกรรมเป็นฐาน เป็นรูปแบบการจัดการเรียนรู้ที่ให้ความสำคัญกับการสร้างประสบการณ์ ความสนใจ ความกระตือรือร้น และการมีส่วนร่วมในการเรียนรู้ภายในชั้นเรียนของนักเรียนผ่านกิจกรรมที่จะนำนักเรียนไปสู่การเรียนรู้แบบมีส่วนร่วมจากการได้ทำงานกลุ่ม ก่อให้เกิดการเรียนรู้ด้วยตนเองที่มุ่งเน้นความรับผิดชอบ การมีส่วนร่วม (ภูริ วงศ์วิเชียร, 2560) และเมื่อนำรูปแบบการสอนดังกล่าวผสมผสานกับสื่อประสม เพื่อให้เกิดบทเรียนที่ประกอบด้วยสื่อการเรียนรู้ และวัสดุอุปกรณ์หลายชนิดประกอบกัน ได้แก่ ของจริง ของจำลอง รูปภาพ แผนภูมิ เอกสารคำอธิบาย หนังสือประกอบการสอน เทปเสียง ภาพยนตร์ แบบฝึกหัด และสื่ออื่น ๆ ที่นำมาใช้ให้สัมพันธ์กันเพื่อถ่ายทอดเนื้อหาสาระ ซึ่งสื่อแต่ละชิ้นจะส่งเสริมสนับสนุนกันให้นักเรียนเกิดการเรียนรู้มากยิ่งขึ้น (ธีรธร เลอศิลป์, 2554) ซึ่งทักษะการวัดปริมาตรเป็นความสามารถในการคิดวิเคราะห์ พร้อมมีความรู้ความเข้าใจเกี่ยวกับปริมาตรและความจุ สามารถวัดได้อย่างเหมาะสม และนำความรู้เกี่ยวกับการวัดปริมาตรไปใช้แก้ปัญหาในสถานการณ์ต่าง ๆ ได้ (กระทรวงศึกษาธิการ, 2560b) โดยหลักสูตรสถานศึกษาของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร เป็นหลักสูตรบูรณาการฐานสมรรถนะที่อิงตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 (ฉบับปรับปรุง พ.ศ. 2560) และมาตรฐานการเรียนรู้และตัวชี้วัด ประกอบด้วยรายวิชาพื้นฐาน 5

กลุ่มวิชาการเรียนรู้ ซึ่งหนึ่งในกลุ่มวิชาดังกล่าว คือ กลุ่มวิชาสร้างสรรค์การคิดโดยจะแยกออกเป็น 2 กลุ่มวิชาย่อย ได้แก่ นักคิดคณิตศาสตร์และนักคิดวิทยาศาสตร์และเทคโนโลยี ผนวกกับการงานอาชีพและศาสตร์พระราชา เพื่อมุ่งเน้นให้ผู้เรียนมีสมรรถนะในการทำงาน

จากแนวคิดดังกล่าว การจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานที่มุ่งเน้นการทำกิจกรรมโดยใช้สื่อประสมร่วมด้วย จะสามารถจัดกิจกรรมให้นักเรียนเกิดความเข้าใจและสามารถดึงดูดความสนใจนักเรียนได้ดีมากยิ่งขึ้น จึงส่งผลให้นักเรียนเกิดทักษะการวัดปริมาตรดียิ่งขึ้น โดยในการวิจัยครั้งนี้ผู้วิจัยกำหนดกรอบแนวคิดการวิจัยดังนี้



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

1. แบบแผนการวิจัย

การวิจัยครั้งนี้ ใช้แบบแผนการวิจัยเชิงทดลองอย่างง่าย (Pre-experimental Design) โดยทำการวิจัย 1 กลุ่ม วัดผลการทดลอง 1 ครั้ง (อัญชลี สารรัตนะ, 2565) ดังนี้

X	O

X แทน การจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม

O แทน การประเมินสมรรถนะด้านผู้เรียนรู้ รายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3

2. กลุ่มเป้าหมายที่ใช้ในการวิจัย

กลุ่มเป้าหมายที่ใช้ในการวิจัยครั้งนี้ คือ นักเรียนชั้นประถมศึกษาปีที่ 3 ภาคเรียนที่ 2 ปีการศึกษา 2566 ของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร จำนวน 2 ห้องเรียน มีนักเรียนทั้งสิ้น 48 คน ซึ่งเป็นห้องเรียนที่ผู้วิจัยเป็นผู้สอน

3. เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ ประกอบด้วย

3.1 เครื่องมือวิจัย ได้แก่ แผนการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ซึ่งมีจำนวน 6 แผนการจัดการเรียนรู้ ดังตารางต่อไปนี้

ตารางที่ 1 ตารางกำหนดระยะเวลาที่ใช้ในการวิจัย

แผนการจัดการเรียนรู้ที่	กระบวนการเรียนรู้	กิจกรรมที่ใช้	สื่อประสมที่ใช้	จำนวน (คาบเรียน)
1	การวัดปริมาตรและความจุเป็นมิลลิลิตร	กิจกรรม เตรียมความพร้อม	Word wall คลิปวีดิโอ	2
2	การเลือกใช้เครื่องตวงที่เหมาะสม	กิจกรรม ฉันเหมาะกับเครื่องตวงชิ้นใดกันนะ	เครื่องมือตวง บัตรภาพ	2
3	การคาดคะเนความจุเป็นลิตร	กิจกรรม ลองทายสิ	Word wall บัตรภาพ	1
4	การวัดปริมาตรและความจุเป็นลิตร และมิลลิลิตร	กิจกรรม มาร่วมใจ ดูแลผักของเรา	Word wall บัตรภาพ คลิปวีดิโอ	1
5	การวัดปริมาตรและความจุเป็นลิตร และมิลลิลิตร	กิจกรรม Magic Potion น้ำยาวิเศษ	บัตรภาพ คลิปวีดิโอ	1
6	การเปรียบเทียบปริมาตรและความจุ	กิจกรรม เธอกับฉัน	บัตรคำ บัตรภาพ	1
ประเมินผู้เรียน โดยใช้แบบทดสอบ เรื่อง การวัดปริมาตร				**1**

ซึ่งผ่านการตรวจคุณภาพด้านความถูกต้อง เหมาะสม และความเป็นไปได้ในการนำแผนการจัดการเรียนรู้ไปใช้ในการจัดการเรียนรู้ โดยผู้เชี่ยวชาญด้านสอนทางคณิตศาสตร์และปรับแก้ตามข้อเสนอแนะก่อนนำไปเก็บข้อมูล

3.2 เครื่องมือที่ใช้ในการเก็บรวมรวมข้อมูล ได้แก่ แบบประเมินสมรรถนะด้านผู้เรียนรู้เรื่องการวัดปริมาตร ประกอบด้วย

3.2.1 แบบทดสอบ เรื่องการวัดปริมาตร เป็นแบบทดสอบปรนัย 4 ตัวเลือก จำนวน 15 ข้อ ซึ่งมีคะแนนเต็ม 15 คะแนน ซึ่งผ่านการตรวจคุณภาพด้านความตรงเชิงเนื้อหา (Content Validity) โดยผู้เชี่ยวชาญด้านการสอนคณิตศาสตร์จำนวน 3 ท่าน มีค่าดัชนีความสอดคล้องเท่ากับ 1.00 ทุกข้อ

3.2.2 แบบประเมินทักษะการวัดปริมาตร มีคะแนนเต็ม 10 คะแนน ผ่านการตรวจคุณภาพโดยผู้เชี่ยวชาญด้านการสอนคณิตศาสตร์ และปรับแก้ตามข้อเสนอแนะ

3.2.3 แบบสังเกตพฤติกรรมความสนใจและการมีส่วนร่วมในเรียน ซึ่งผู้วิจัยได้กำหนดพฤติกรรมไว้ 2 ด้าน ได้แก่ ด้านความสนใจ (2 คะแนน) และด้านการเข้าร่วมกิจกรรม (3 คะแนน) รวม 5 คะแนน ตรวจสอบคุณภาพโดยผู้เชี่ยวชาญด้านการสอนคณิตศาสตร์พิจารณาและให้ข้อเสนอแนะ จากนั้นนำมาปรับปรุงแก้ไขตามข้อเสนอแนะเพื่อให้มีคุณภาพและมีความสมบูรณ์ยิ่งขึ้น

แบบประเมินสมรรถนะด้านผู้เรียนรู้ คะแนนรวมคิดเป็น 30 คะแนน กำหนดเกณฑ์การประเมินสมรรถนะด้านผู้เรียนรู้ 4 ระดับ ดังตารางต่อไปนี้

ตารางที่ 2 เกณฑ์การประเมินสมรรถนะด้านผู้เรียนรู้ตามแนวทางของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร

เกณฑ์การประเมิน	ระดับสมรรถนะ
0 – 11 คะแนน	เริ่มต้น
12 – 17 คะแนน	พยายามอีกนิด
18 – 23 คะแนน	ทำได้แล้ว
24 – 30 คะแนน	ยอดเยี่ยม

4. ขั้นตอนในการดำเนินการวิจัย

ผู้วิจัยเป็นผู้จัดการเรียนรู้ตามแผนการจัดการเรียนรู้ โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ซึ่งมีจำนวน 6 แผนการจัดการเรียนรู้และประเมินผู้เรียนโดยใช้แบบทดสอบ เรื่องการวัดปริมาตร ซึ่งมีขั้นตอนในการดำเนินการดังนี้

ขั้นตอนที่ 1 จัดการเรียนรู้ตามแผนการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ซึ่งใช้แผนการจัดการเรียนรู้ที่ 1 และ 2 และเก็บรวบรวมข้อมูลพฤติกรรมจากการสังเกตและบันทึกพฤติกรรม

ขั้นตอนที่ 2 จัดการเรียนรู้ตามแผนการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ซึ่งใช้แผนการจัดการเรียนรู้ที่ 3 และ 4 เก็บรวบรวมข้อมูลพฤติกรรมจากการสังเกตและบันทึกพฤติกรรม

ขั้นตอนที่ 3 จัดการเรียนรู้ตามแผนการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ซึ่งใช้แผนการจัดการเรียนรู้ที่ 5 และ 6 เก็บรวบรวมข้อมูลพฤติกรรมจากการสังเกตและบันทึกพฤติกรรม

ขั้นตอนที่ 4 ประเมินผู้เรียนโดยใช้แบบทดสอบ เรื่องการวัดปริมาตร

ขั้นตอนที่ 5 ประเมินทักษะการวัดปริมาตร โดยใช้แบบประเมินทักษะการวัดปริมาตร

ขั้นตอนที่ 6 นำผลการประเมินเพื่อวิเคราะห์ โดยใช้วิธีการทางสถิติ

5. การวิเคราะห์ข้อมูล

การวิจัยในครั้งนี้ ผู้วิจัยกำหนดวิธีการวิเคราะห์ข้อมูล โดยเปรียบเทียบคะแนนสมรรถนะด้านผู้เรียนรู้ เรื่องการวัดปริมาตรที่ได้รับการจัดการเรียนรู้ โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสมของนักเรียนชั้นประถมศึกษาปีที่ 3 แล้วแปลผลตามเกณฑ์การประเมินสมรรถนะด้านผู้เรียนรู้ และหาค่าเฉลี่ย (μ) และส่วนเบี่ยงเบนมาตรฐาน ($\boldsymbol{\sigma}$)

ผลการวิจัย

จากการวิเคราะห์ข้อมูล ผลการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสมที่มีต่อสมรรถนะด้านผู้เรียนรู้ในรายวิชาคณิตศาสตร์นักสำรวจ เรื่องการวัดปริมาตรของนักเรียนชั้นประถมศึกษาปีที่ 3 ผู้วิจัยนำเสนอผลการวิเคราะห์ข้อมูล ดังนี้

ตารางที่ 3 แสดงผลการประเมินสมรรถนะด้านผู้เรียนรู้ เรื่อง การวัดปริมาตร ของนักเรียนชั้นประถมศึกษา ปีที่ 3 ที่ได้รับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม (N=48)

ลำดับที่	คะแนนสมรรถนะด้านผู้เรียนรู้ แบบบันทึกพฤติกรรม (A)						
	แบบทดสอบ(K)	แบบประเมินทักษะ(S)	ด้านความสนใจ	ด้านการเข้าร่วมกิจกรรม	รวม 2 ด้าน	รวม	ระดับสมรรถนะ
คะแนนเต็ม	**15**	**10**	**2**	**3**	**5**	**30**	
1	9	7	2	3	5	21	ทำได้แล้ว
2	11	7	2	2	4	22	ทำได้แล้ว
3	14	8	2	3	5	27	ยอดเยี่ยม
4	15	9	2	3	5	29	ยอดเยี่ยม
5	12	7	2	3	5	24	ยอดเยี่ยม
6	12	8	2	3	5	25	ยอดเยี่ยม
7	7	6	2	2	4	17	พยายามอีกนิด
8	15	8	2	3	5	28	ยอดเยี่ยม
9	10	7	2	2	4	21	ทำได้แล้ว
10	12	7	2	3	5	24	ยอดเยี่ยม
11	10	7	2	3	5	22	ทำได้แล้ว
12	10	6	2	2	4	20	ทำได้แล้ว
13	11	7	2	3	5	23	ทำได้แล้ว
14	9	7	2	2	4	20	ทำได้แล้ว
15	8	8	2	2	4	20	ทำได้แล้ว
16	8	7	2	3	5	20	ทำได้แล้ว
17	7	7	2	3	5	19	ทำได้แล้ว
18	12	7	2	3	5	24	ยอดเยี่ยม
19	14	8	2	3	5	27	ยอดเยี่ยม
20	13	8	2	3	5	26	ยอดเยี่ยม
21	10	7	2	3	5	22	ทำได้แล้ว
22	10	7	2	2	4	21	ทำได้แล้ว
23	11	7	2	2	4	22	ทำได้แล้ว
24	12	8	2	3	5	25	ยอดเยี่ยม
25	10	7	2	2	4	21	ทำได้แล้ว
26	12	8	2	3	5	25	ยอดเยี่ยม
27	13	8	2	3	5	26	ยอดเยี่ยม
28	13	7	2	3	5	25	ยอดเยี่ยม

ลำดับที่	คะแนนสมรรถนะด้านผู้เรียนรู้ แบบบันทึกพฤติกรรม (A)						
	แบบทดสอบ(K)	แบบประเมินทักษะ(S)	ด้านความสนใจ	ด้านการเข้าร่วมกิจกรรม	รวม 2 ด้าน	รวม	ระดับสมรรถนะ
คะแนนเต็ม	**15**	**10**	**2**	**3**	**5**	**30**	
29	10	7	2	2	4	21	ทำได้แล้ว
30	11	7	1	2	3	21	ทำได้แล้ว
31	12	8	2	3	5	25	ยอดเยี่ยม
32	6	6	1	2	3	15	พยายามอีกนิด
33	9	7	2	3	5	21	ทำได้แล้ว
34	11	8	2	3	5	24	ยอดเยี่ยม
35	9	8	2	2	4	21	ทำได้แล้ว
36	14	8	2	3	5	27	ยอดเยี่ยม
37	10	7	2	2	4	21	ทำได้แล้ว
38	11	7	2	2	4	22	ทำได้แล้ว
39	10	6	2	2	4	20	ทำได้แล้ว
40	13	7	2	2	4	24	ยอดเยี่ยม
41	11	7	2	3	5	23	ทำได้แล้ว
42	12	7	2	2	4	23	ทำได้แล้ว
43	7	6	2	2	4	17	พยายามอีกนิด
44	11	8	2	3	5	24	ยอดเยี่ยม
45	12	8	2	3	5	25	ยอดเยี่ยม
46	14	9	2	3	5	28	ยอดเยี่ยม
47	10	7	2	2	4	21	ทำได้แล้ว
48	9	6	2	2	4	19	ทำได้แล้ว
ค่าเฉลี่ย(μ)	**10.88**	**7.27**	**1.96**	**2.56**	**4.52**	**22.67**	
ส่วนเบี่ยงเบนมาตรฐาน(σ)	**2.13**	**0.74**	**0.20**	**0.50**	**0.58**	**3.04**	**ทำได้แล้ว**

จากตารางที่ 3 พบว่า คะแนนสมรรถนะด้านผู้เรียนรู้ เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่ได้รับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม โดยรวมอยู่ในระดับทำได้แล้ว โดยมีค่าเฉลี่ยเท่ากับ 22.67 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 3.04 คะแนนสูงสุดเท่ากับ 29 คะแนน คิดเป็นร้อยละ 96.67 คะแนนต่ำสุดเท่ากับ 15 คะแนน คิดเป็นร้อยละ 50.00 โดยมีนักเรียนที่มีผลการประเมินอยู่ในระดับยอดเยี่ยมจำนวน 20 คน คิดเป็นร้อยละ 41.67 ผลการประเมินอยู่ในระดับทำได้แล้วจำนวน 25 คน คิดเป็นร้อยละ 52.08 และผลการประเมินอยู่ในระดับพยายามอีกนิดจำนวน 3 คน คิดเป็นร้อยละ 6.25

สรุปและอภิปรายผล

สรุปผล

สมรรถนะด้านผู้เรียนรู้ เรื่อง การวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่ได้รับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม โดยรวมอยู่ในระดับทำได้แล้วมีค่าเฉลี่ยเท่ากับ 22.67 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 3.04 โดยจากคะแนนเต็ม 30 คะแนน นักเรียนได้คะแนนสูงสุดต่ำสุดเท่ากับ 29 และ 15 คะแนน คิดเป็นร้อยละ 96.67 และ 50.00 ตามลำดับ ในจำนวนนักเรียน 48 คน มีนักเรียนที่มีผลการประเมินสมรรถนะด้านผู้เรียนรู้ในระดับยอดเยี่ยม ทำได้แล้วและพยายามอีกนิดจำนวน 20, 25 และ 3 คน คิดเป็นร้อยละ 41.67, 52.08 และ 6.25 ตามลำดับ

การอภิปรายผล

จากผลการวิจัย ซึ่งพบว่า สมรรถนะด้านผู้เรียนรู้เรื่องการวัดปริมาตร ของนักเรียนชั้นประถมศึกษาปีที่ 3 ที่ได้รับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ภาพรวมอยู่ในระดับทำได้แล้ว โดยมีค่าเฉลี่ยเท่ากับ 22.67 ซึ่งคิดเป็นร้อยละ 75.56 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 3.04 ซึ่งหากพิจารณาจากคะแนนเต็ม 30 คะแนน นักเรียนได้คะแนนสูงสุด และต่ำสุดเท่ากับ 29 และ 15 คะแนน คิดเป็นร้อยละ 96.67 และ 50.00 ตามลำดับ โดยในจำนวนนักเรียน 48 คนมีนักเรียนที่มีผลการประเมินสมรรถนะด้านผู้เรียนรู้ในระดับยอดเยี่ยม และทำได้แล้วจำนวน 20 และ 25 คิดเป็นร้อยละ 41.67 และ 52.08 ตามลำดับ และจากการสังเกตพฤติกรรมการเรียนรู้และจากการประเมินการเรียนรู้ พบว่านักเรียนสามารถวัดปริมาตรและความจุ เป็นลิตรและมิลลิลิตรได้อย่างคล่องแคล่วสามารถเปรียบเทียบปริมาตรและความจุได้ เนื่องจากการจัดการเรียนการสอนโดยใช้กิจกรรมเป็นฐานทำให้ส่งผลให้นักเรียนเกิดการเรียนรู้โดยประสบการณ์ตรงผ่านการทำกิจกรรม แสดงว่าการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสมเพื่อพัฒนาสมรรถนะด้านผู้เรียนรู้ เรื่องการวัดปริมาตรสำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 ประสบผลสำเร็จ สอดคล้องกับ เยาวเรศ ภักดีจิตร (2557) ที่กล่าวว่า การจัดกระบวนการสอนที่เน้นการทำแก้ปัญหา การทดลอง และลงมือปฏิบัติของผู้เรียนเป็นหลัก ส่งผลให้ผู้เรียนเกิดการเรียนรู้จากประสบการณ์ตรง ส่งผลให้เกิดทักษะที่สามารถนำมาต่อยอดในระดับที่สูงขึ้นต่อไป และการนำสื่อประสมมาผสมผสานกับการจัดการเรียนรู้ดังกล่าว ส่งผลให้นักเรียนมีความสนใจในกิจกรรมมากยิ่งขึ้น ช่วยกระตุ้นผู้เรียนให้เกิดการเรียนรู้มากยิ่งขึ้น รวมถึงทำให้เนื้อหาการเรียนการสอนถูกถ่ายทอดออกมาได้เข้าใจง่ายมากยิ่งขึ้น สอดคล้องกับ วิภาภรณ์ กอนแก้ว (2565) กล่าวว่า การนำสื่อประสมมาใช้ในการจัดการเรียนการสอน นักเรียนมีโอกาสศึกษาตามความสามารถและความสนใจจากสื่อหลายประเภท และได้รับประสบการณ์ที่มีคุณค่าช่วยทำให้ผู้เรียนเข้าใจเนื้อหาได้ง่ายและรวดเร็ว โดยประสิทธิภาพการเรียนไม่ลดลง

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 การจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม ก่อนจัดกิจกรรมการเรียนรู้ ครูต้องศึกษาขั้นตอนในการใช้สื่อประสม และการใช้แผนการจัดการเรียนรู้อย่างละเอียด เพื่อความถูกต้องและความเข้าใจที่ตรงกันในระหว่างการจัดกิจกรรมการเรียนรู้ ครูต้องชี้แจงให้นักเรียนทราบถึงบทบาทในการเรียนรู้ของตนเองเพื่อจะได้ปฏิบัติได้อย่างเหมาะสม

1.2 ผลการวิจัยพบว่า การจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อ

ประสมสามารถพัฒนาสมรรถนะด้านผู้เรียนรู้ของนักเรียนได้อย่างชัดเจน จึงควรนำสื่อประสมไปใช้ในการจัดการเรียนรู้อย่างต่อเนื่อง โดยใช้กับนักเรียนในระดับชั้นเดียวกันหรืออาจปรับตามความเหมาะสม เพื่อให้นักเรียนเกิดทักษะพื้นฐานที่สามารถนำมาใช้ในการเรียนคณิตศาสตร์ในระดับสูงต่อไป

2. ข้อเสนอแนะสำหรับการทำวิจัยครั้งต่อไป

2.1 ควรศึกษาการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานให้เข้าใจเพื่อสามารถนำเทคนิคการสอนดังกล่าวมาปรับใช้ได้อย่างเหมาะสมกับบริบทของสถานศึกษา

2.2 ควรศึกษาวิจัยเกี่ยวกับการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐานผสมผสานการใช้สื่อประสม และพัฒนาทักษะและกระบวนการทางคณิตศาสตร์ในประเด็นอื่น ๆ เช่น การแก้ปัญหา การให้เหตุผล การเชื่อมโยงและการคิดสร้างสรรค์

2.3 ควรศึกษาการจัดการเรียนรู้โดยใช้กิจกรรมเป็นฐาน เพื่อสร้างแรงจูงใจในการเรียนคณิตศาสตร์ เพื่อเพิ่มประสิทธิภาพในการจัดการเรียนการสอนคณิตศาสตร์ให้ดีมากยิ่งขึ้น

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การพัฒนาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์เรื่องเศษส่วน โดยใช้บาร์โมเดล ของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด

Developing the Ability to Solve Math Problems Fractions Using the Bar Model of 4th Grade Students by Organizing Cooperative Learning Using the Think-Pair-Share Technique.

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บทคัดย่อ

การวิจัยในครั้งนี้มีวัตถุประสงค์ เพื่อพัฒนาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดล สำหรับนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด กลุ่มเป้าหมายที่ใช้ในการศึกษาเป็นนักเรียนชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร จำนวน 2 ห้องเรียน มีนักเรียนทั้งสิ้น 46 คน เครื่องมือที่ใช้ในการวิจัย ประกอบด้วย แผนการจัดการเรียนรู้ จำนวน 7 คาบ แบบทดสอบวัดความสามารถในการแก้โจทย์ปัญหาเป็นแบบทดสอบอัตนัย จำนวน 6 ข้อ สถิติที่ใช้ในการวิเคราะห์ข้อมูล ประกอบด้วย ค่าร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

ผลการวิจัยพบว่า ความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดล ของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อน อยู่ในระดับยอดเยี่ยม จำนวน 11 คน คิดเป็นร้อยละ 23.91 ระดับความสามารถทำได้แล้ว จำนวน 7 คน คิดเป็น ร้อยละ 15.22 และระดับพยายามอีกนิด จำนวน 28 คน คิดเป็นร้อยละ 60.87 และผลการเปรียบเทียบความสามารถ ในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดล ของนักเรียนชั้นประถมศึกษาปีที่ 4 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดร่วมกับบาร์โมเดล พบว่า คะแนนเฉลี่ยรวมเท่ากับ 19.26 คิดเป็นร้อยละ 64.20 ซึ่งสูงกว่าเกณฑ์ร้อยละ 60

คำสำคัญ: การพัฒนาความสามารถ, การแก้โจทย์ปัญหาคณิตศาสตร์, บาร์โมเดล, การจัดการเรียนรู้แบบร่วมมือ, เทคนิคเพื่อนคู่คิด

Abstract

The objective of this research is to develop the ability to solve math problems. Fractions using the bar model for 4th grade students by organizing cooperative learning using the peer-to-peer technique. The target group used in the study were 4th grade students, 2nd semester, academic year 2023, PNRU Demonstration Elementary, 2 classrooms, with a total of 46 students. The research tools consisted of a lesson plan for 7 periods, a test to measure problem solving ability. It is a subjective test with 6 questions. Statistics used in data analysis include percentage, mean and standard deviation.

The results of the research found that the ability to solve mathematical problems Fractions using the bar model of 4th grade students by organizing cooperative learning using the peer-to-peer technique Students who received an excellent level of ability, 11 people, accounting for 23.91 percent, followed by students who achieved a level of ability, 7 people, accounting for 15.22 percent, and students who received a level of ability to try a little, accounting for 28 people, accounting for 60.87 percent and the results of comparing the ability to solve math problems Fractions using the bar model After studying for Grade 4 students who received cooperative learning using the peer-to-peer technique along with the bar model, it was found that the overall average score was 19.26, accounting for 64.20 percent, which is higher than the 60 percent threshold.

Keywords: Talent Development, Solving Math Problems, Bar Model, Cooperative Learning Management, Think-Pair-Share Technique

บทนำ

คณิตศาสตร์มีบทบาทสำคัญยิ่งต่อความสำเร็จในการเรียนรู้ในศตวรรษที่ 21 เนื่องจากคณิตศาสตร์ช่วยให้มนุษย์มีความความคิดสร้างสรรค์ คิดอย่างเป็นระบบมีแบบแผน สามารถวิเคราะห์ปัญหาสถานการณ์ได้อย่างถี่ถ้วน รอบคอบ ช่วยให้คาดการณ์ วางแผน ตัดสินใจ แก้ปัญหา และนำไปใช้ในชีวิตประจำวันได้อย่างถูกต้องเหมาะสม และสามารถนำไปใช้ในชีวิตจริงได้อย่างมีประสิทธิภาพ นอกจากนี้คณิตศาสตร์ยังเป็นเครื่องมือในการศึกษาทางวิทยาศาสตร์ เทคโนโลยี และศาสตร์อื่น ๆ อันเป็นรากฐานในการพัฒนาทรัพยากรบุคคลของชาติให้มีคุณภาพและพัฒนาเศรษฐกิจของประเทศให้ทัดเทียมกับนานาชาติ การศึกษาคณิตศาสตร์จึงจำเป็นต้องมีการพัฒนาอย่างต่อเนื่อง เพื่อให้ทันสมัยและสอดคล้องกับสภาพเศรษฐกิจสังคมและความรู้ทางวิทยาศาสตร์และเทคโนโลยีที่เจริญก้าวหน้าอย่างรวดเร็วในยุคโลกาภิวัตน์ (กระทรวงศึกษาธิการ, 2560) จากความสำคัญดังกล่าวจะเห็นได้ว่า วิชาคณิตศาสตร์เป็นศาสตร์ที่มีความสำคัญศาสตร์หนึ่ง ซึ่งการศึกษาวิชาคณิตศาสตร์สำหรับหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 กลุ่มสาระการเรียนรู้คณิตศาสตร์ (ฉบับปรับปรุง พ.ศ. 2560) มีเป้าหมายให้ผู้เรียนมีความรู้ความเข้าใจเกี่ยวกับแนวคิด หลักการ ทฤษฎีในสาระคณิตศาสตร์ที่จำเป็น พร้อมทั้งสามารถนำไปประยุกต์ได้ มีความสามารถในการแก้ปัญหา สื่อสาร และสื่อความหมายทางคณิตศาสตร์ เชื่อมโยง ให้เหตุผล และมีความคิดสร้างสรรค์ มีเจตคติที่ดีต่อคณิตศาสตร์ เห็นคุณค่าและตระหนักถึงความสำคัญของคณิตศาสตร์ สามารถนำความรู้ทางคณิตศาสตร์ไปเป็นเครื่องมือในการเรียนรู้ในระดับการศึกษาที่สูงขึ้น ตลอดจนการ

ประกอบอาชีพ และมีความสามารถในการเลือกสื่ออุปกรณ์เทคโนโลยี และแหล่งข้อมูลที่เหมาะสมเพื่อเป็นเครื่องมือในการเรียนรู้การสื่อสาร การทำงาน และการแก้ปัญหาอย่างถูกต้องและมีประสิทธิภาพ (สถาบันส่งเสริมการสอนวิทยาศาสตร์และเทคโนโลยี, 2560)

บาร์โมเดล (Bar Model) เป็นยุทธวิธีการแก้โจทย์ปัญหาทางคณิตศาสตร์ที่กำหนดให้ใช้การวาดรูปบาร์โมเดลในการแก้โจทย์ปัญหาคณิตศาสตร์ โดยจะวาดเป็นรูปบล็อกหรือบาร์ เป็นรูปสี่เหลี่ยมผืนผ้า เรียกว่า Singapore Bar Model หรือ Singapore Block Model หรือเรียกสั้น ๆ ว่า Bar Model การแก้โจทย์ปัญหาโดยใช้ Bar Model สามารถทำให้นักเรียนคิดวิเคราะห์ข้อความจากโจทย์ปัญหา นำมาเชื่อมโยงกับการคิดวิเคราะห์ทางคณิตศาสตร์ของนักเรียนแล้ววาดออกมาเป็นรูป บาร์โมเดล ซึ่งจะช่วยให้ผู้เรียนเข้าใจ เกิดความคิดรวบยอด และสามารถสร้างองค์ความรู้ด้วยตนเอง ทำให้นักเรียนสามารถแก้โจทย์ปัญหาได้อย่างถูกต้อง (ศิริลักษณ์ ใชสงคราม, 2562)

เทคนิคเพื่อนคู่คิด (Think-Pair-Share) เป็นเทคนิคการเรียนรู้แบบร่วมมือรูปแบบหนึ่งที่ส่งเสริมการทำกิจกรรมร่วมกันของนักเรียน ทำให้นักเรียนได้มีการแลกเปลี่ยนอธิบายความคิดหรือแนวคิดที่จะนำมาประกอบการแก้ปัญหาให้เพื่อน ๆ ได้ฟัง ทำให้นักเรียนฝึกการคิด การสื่อสาร แลกเปลี่ยนความคิดเห็น มีความกล้าแสดงความคิดออกมาได้อย่างมั่นใจในการทำกิจกรรม และเป็นเทคนิคที่ส่งเสริมการฝึกคิด ฝึกทักษะ ฝึกการคิดในเชิงลึก และทักษะขั้นสูงอย่างการแก้ปัญหาอย่างสร้างสรรค์ (ทิพย์วรรณ จันทร์เขียว, 2564)

จากผลการทดสอบความสามารถพื้นฐานของผู้เรียน National Test (NT) ชั้นประถมศึกษาปีที่ 3 ปีการศึกษา 2565 ของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร พบว่า ผลการประเมินระดับประเทศด้านคณิตศาสาตร์ เรื่อง การหาผลบวก การลบของเศษส่วน มีคะแนนเฉลี่ยร้อยละ 44.09 เมื่อเทียบกับผลการประเมินระดับโรงเรียนมีคะแนนเฉลี่ยร้อยละ 35.08 ซึ่งถือว่าต่ำกว่าการทดสอบความสามารถพื้นฐานของผู้เรียน National Test (NT) ระดับประเทศและอยู่ในเกณฑ์ระดับพอใช้ แสดงให้เห็นว่า นักเรียนส่วนใหญ่ยังขาดความเข้าใจในเรื่องการหาผลบวก การลบของเศษส่วน ซึ่งเป็นพื้นฐานของเรื่องเศษส่วน

จากเหตุผลดังกล่าว ผู้วิจัยจึงมีความสนใจที่จะพัฒนาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน ของนักเรียนชั้นประถมศึกษาปีที่ 4 ปีการศึกษา 2566 ซึ่งเป็นนักเรียนกลุ่มเดียวกันที่เข้ารับการทดสอบความสามารถพื้นฐานของผู้เรียน National Test (NT) โดยใช้บาร์โมเดล (Bar Model) ซึ่งวิธีการแก้โจทย์ปัญหาทางคณิตศาสตร์ โดยใช้รูปสี่เหลี่ยมผืนผ้าในการวิเคราะห์และแก้โจทย์ปัญหา ช่วยให้นักเรียนมองเห็นสิ่งที่เป็นนามธรรมมากขึ้น และการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด (Think-Pair-Share) ที่ช่วยส่งเสริมบรรยากาศในชั้นเรียนและเปิดโอกาสให้นักเรียนได้มีการแลกเปลี่ยนอธิบายความคิดหรือแนวคิด วิธีการแก้ปัญหาร่วมกันผู้อื่น ๆ เป็นไปตามหลักสูตรบูรณาการฐานสมรรถนะของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ที่เน้นให้นักเรียนเรียนรู้ผ่านการปฏิบัติหรือลงมือทำ นอกจากนี้ผลการวิจัยที่ได้จะเป็นแนวทางให้ครูผู้สอนคณิตศาสตร์ในการจัดการเรียนรู้กลุ่มวิชาสร้างสรรค์การคิด (นักคิดคณิตศาสตร์) ให้มีประสิทธิภาพมากยิ่งขึ้น

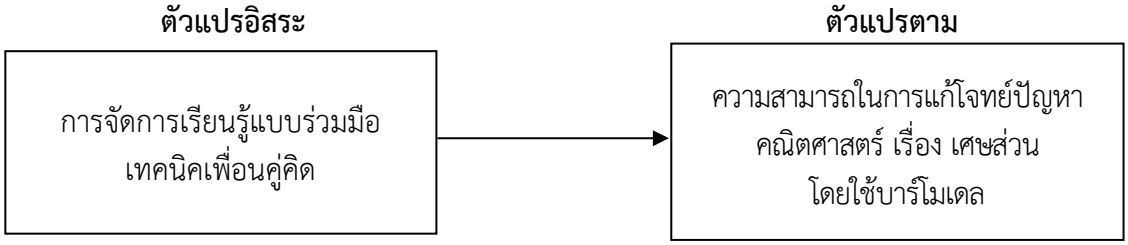
วัตถุประสงค์ของการวิจัย

เพื่อศึกษาและเปรียบเทียบความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล ของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด กับเกณฑ์ร้อยละ 60

แนวคิด ทฤษฎี กรอบแนวคิด

การวิจัยครั้งนี้ ผู้วิจัยได้ดำเนินการวิจัยพัฒนาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดลเป็นวิธีการการทำโจทย์ปัญหา โดยอาศัยการวาดรูปภาพแท่งสี่เหลี่ยมผืนผ้า เป็นสัญลักษณ์แทนข้อมูลจากการแปลงจากโจทย์ปัญหา ตามแนวทางการเรียนการสอนคณิตศาสตร์สิงคโปร์ ผ่านการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด ตามแนวคิด Frank Lyman แห่งมหาวิทยาลัยแมรีแลนด์ โดยเป็นเทคนิคการเรียนรู้แบบร่วมมือรูปแบบหนึ่งที่ส่งเสริมการทำกิจกรรมร่วมกันของนักเรียน ทำให้นักเรียนได้มีการแลกเปลี่ยน อธิบายความคิด หรือแนวคิดที่จะนำมาประกอบการแก้ปัญหา (พรทิพย์ ดิษฐปัญญา, 2563) โดยผู้วิจัยกำหนดกรอบแนวคิดวิจัย ดังนี้

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ผู้วิจัยได้ดำเนินการวิจัยโดยกำหนดประเด็นต่าง ๆ ต่อไปนี้

1. แบบแผนการวิจัย

แบบแผนการวิจัยครั้งนี้ เป็นการวิจัยเชิงทดลองอย่างง่าย (Pre-experimental) โดยดำเนินการศึกษา 1 กลุ่ม วัดผลหลังการทดลอง 1 ครั้ง (กิตติยา วงษ์ขันธ์, 2561) ดังนี้

X	O

X แทน การจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด

O แทน ความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล

2. กลุ่มเป้าหมายที่ใช้ในการศึกษา

กลุ่มที่ใช้ในการศึกษาเป็นนักเรียนชั้นประถมศึกษาปีที่ 4 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร จำนวน 2 ห้องเรียน มีนักเรียนทั้งสิ้น 46 คน โดยผู้วิจัยเป็นผู้สอน

3. เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ประกอบด้วย

3.1 เครื่องมือที่ใช้ในการทดลอง ได้แก่ แผนการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด จำนวน 1 แผนการเรียนรู้ ซึ่งมีจำนวน 7 คาบ คาบเรียนละ 50 นาที ในแต่ละแผนมีกิจกรรมการแก้โจทย์ปัญหาเศษส่วน โดยใช้บาร์โมเดล ดังตารางต่อไปนี้

ตารางที่ 1 การจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด เรื่องเศษส่วน โดยใช้บาร์โมเดล

คาบเรียนที่	การจัดการเรียนรู้	การดำเนินกิจกรรม
1	โจทย์ปัญหา สถานการณ์การบวกเศษส่วน	1. เริ่มเรียนครูทบทวนเรื่องการหาผลบวก ผลลบของเศษส่วนและจำนวนคละ 2. นักเรียนและครูร่วมกันวิเคราะห์โจทย์ปัญหาโดยใช้บาร์โมเดล 3. ให้นักเรียนจับคู่แล้วลองวิเคราะห์โจทย์ปัญหาโดยใช้บาร์โมเดล สุ่ม 2 - 3 คู่ออกมานำเสนอวิธีการแก้โจทย์ปัญหา โดยใช้บาร์โมเดล (ฟิวเจอร์บอร์ด) อธิบายหน้าชั้นเรียน และเปลี่ยนความคิดเห็นร่วมกันในห้องเรียน 4. ให้นักเรียนจับกลุ่ม 4 - 5 คน แก้โจทย์ปัญหาพร้อมแสดงวิธีทำหาคำตอบลงในใบงาน 5. นักเรียนแต่ละกลุ่มออกมาเฉลยคำตอบบนกระดานและแลกเปลี่ยนเรียนรู้ร่วมกัน 6. นักเรียนและครูสรุปกิจกรรม
2	โจทย์ปัญหา สถานการณ์การลบเศษส่วน	
3	โจทย์ปัญหา สถานการณ์การบวก ลบเศษส่วน 2 ขั้นตอน	
4	โจทย์ปัญหา สถานการณ์การบวกจำนวนคละ	
5	โจทย์ปัญหา สถานการณ์การลบจำนวนคละ	
6	โจทย์ปัญหา สถานการณ์การบวก ลบจำนวนคละ 2 ขั้นตอน	
7	ทดสอบการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดล	แบบทดสอบอัตนัย (รายบุคคล)

ซึ่งแผนการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดผ่านการตรวจสอบคุณภาพ โดยผู้เชี่ยวชาญด้านการสอนคณิตศาสตร์ และปรับแก้ตามข้อเสนอแนะ

3.2 เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล ได้แก่ แบบทดสอบความสามารถในการแก้โจทย์ปัญหา เรื่อง เศษส่วน โดยใช้บาร์โมเดล เป็นแบบทดสอบอัตนัย จำนวน 6 ข้อ ซึ่งผู้วิจัยได้ใช้เป็นแบบทดสอบหลังเรียน ผ่านการตรวจสอบความตรงเชิงเนื้อหา (Content Validity) โดยผู้เชี่ยวชาญด้านการสอนคณิตศาสตร์จำนวน 3 ท่าน มีค่าดัชนีความสอดคล้องเท่ากับ 1.00 ทุกข้อและปรับแก้ตามข้อเสนอแนะ

ซึ่งแบบประเมินสมรรถนะด้านผู้เรียนรู้คะแนนรวมคิดเป็น 30 คะแนน กำหนดเกณฑ์การประเมินสมรรถนะด้านผู้เรียนรู้ 4 ระดับ ดังตารางต่อไปนี้

ตารางที่ 2 เกณฑ์การประเมินสมรรถนะด้านผู้เรียนรู้ตามแนวทางของโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร

เกณฑ์การประเมิน	ระดับความสามารถ
0 – 14 คะแนน	เริ่มต้น
15 – 19 คะแนน	พยายามอีกนิด
20 – 24 คะแนน	ทำได้แล้ว
25 – 30 คะแนน	ยอดเยี่ยม

4. ขั้นตอนในการวิจัย

ผู้วิจัยได้ดำเนินการวิจัยตลอดจนนำไปทดลอง ดังต่อไปนี้

4.1 ชี้แจงแนวทางการจัดการเรียนรู้ให้นักเรียนทราบว่า ในการจัดการเรียนรู้ ผู้สอนจะทำหน้าที่อะไร นักเรียนจะต้องปฏิบัติตนอย่างไร และมีการวัดและการประเมินผลอย่างไร นักเรียนต้องเรียนรู้อะไรบ้าง

4.2 ผู้วิจัยดำเนินการจัดการเรียนรู้ตามแผนการจัดการเรียนรู้ที่กำหนดขึ้น จำนวน 7 คาบเรียน คาบเรียนละ 50 นาที

4.3 เมื่อสิ้นสุดการจัดการเรียนรู้ตามข้อ 2 แล้วผู้วิจัยทดสอบนักเรียน ซึ่งเป็นกลุ่มที่ใช้ในการศึกษาโดยใช้แบบทดสอบความสามารถในการแก้โจทย์ปัญหา เรื่อง เศษส่วน โดยใช้บาร์โมเดล เป็นแบบทดสอบอัตนัย จำนวน 6 ข้อ ข้อละ 5 คะแนน รวม 30 คะแนน

4.4 ตรวจให้คะแนนแบบทดสอบแล้วนำผลที่ได้มาวิเคราะห์โดยใช้วิธีการทางสถิติ

5. การวิเคราะห์ข้อมูล

การวิจัยครั้งนี้ผู้วิจัยกำหนดวิธีการวิเคราะห์ข้อมูล โดยวิเคราะห์ความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล โดยใช้ค่าร้อยละ (Percentage) และวิเคราะห์ผลการเปรียบเทียบความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดลของนักเรียนชั้นประถมศึกษาปีที่ 4 เทียบกับเกณฑ์ร้อยละ 60 โดยหาร้อยละค่าเฉลี่ย (μ) และส่วนเบี่ยงเบนมาตรฐาน (σ)

ผลการวิจัย

จากการวิเคราะห์ข้อมูล ผู้วิจัยได้ดำเนินการวิเคราะห์ข้อมูลแต่ละตอน ดังนี้

ตอนที่ 1 ศึกษาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดลของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด

ตารางที่ 3 แสดงความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดลของนักเรียนชั้นประถมศึกษาปีที่ 4 จำนวน 46 คน เป็นรายบุคคล (คะแนนเต็ม 30 คะแนน)

ลำดับที่	คะแนนหลังเรียน	ร้อยละ	ระดับความสามารถ	ลำดับที่	คะแนนหลังเรียน	ร้อยละ	ระดับความสามารถ
1	27	90.00	ยอดเยี่ยม	24	15	50.00	พยายามอีกนิด
2	15	50.00	พยายามอีกนิด	25	17	56.67	พยายามอีกนิด
3	15	50.00	พยายามอีกนิด	26	15	50.00	พยายามอีกนิด
4	24	80.00	ทำได้แล้ว	27	15	50.00	พยายามอีกนิด
5	19	63.33	พยายามอีกนิด	28	15	50.00	พยายามอีกนิด
6	27	90.00	ยอดเยี่ยม	29	15	50.00	พยายามอีกนิด
7	25	83.33	ยอดเยี่ยม	30	16	53.33	พยายามอีกนิด
8	15	50.00	พยายามอีกนิด	31	15	50.00	พยายามอีกนิด
9	25	83.33	ยอดเยี่ยม	32	28	93.33	ยอดเยี่ยม
10	20	66.67	ทำได้แล้ว	33	15	50.00	พยายามอีกนิด
11	15	50.00	พยายามอีกนิด	34	18	60.00	พยายามอีกนิด
12	15	50.00	พยายามอีกนิด	35	29	96.67	ยอดเยี่ยม
13	15	50.00	พยายามอีกนิด	36	15	50.00	พยายามอีกนิด
14	15	50.00	พยายามอีกนิด	37	24	80.00	ทำได้แล้ว
15	15	50.00	พยายามอีกนิด	38	21	70.00	ทำได้แล้ว
16	25	83.33	ยอดเยี่ยม	39	16	53.33	พยายามอีกนิด
17	30	100.00	ยอดเยี่ยม	40	23	76.67	ทำได้แล้ว
18	21	70.00	ทำได้แล้ว	41	15	50.00	พยายามอีกนิด
19	16	53.33	พยายามอีกนิด	42	28	93.33	ยอดเยี่ยม
20	28	93.33	ยอดเยี่ยม	43	16	53.33	พยายามอีกนิด
21	23	76.67	ทำได้แล้ว	44	15	50.00	พยายามอีกนิด
22	25	83.33	ยอดเยี่ยม	45	15	50.00	พยายามอีกนิด
23	15	50.00	พยายามอีกนิด	46	15	50.00	พยายามอีกนิด
ค่าเฉลี่ย (μ)					**19.26**	64.20	พยายามอีกนิด
ส่วนเบี่ยงเบนมาตรฐาน (σ)					**5.11**	17.03	

จากตารางที่ 3 จะเห็นว่าความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดลของนักเรียนชั้นประถมศึกษาปีที่ 4 พบว่า นักเรียนที่ได้ระดับความสามารถยอดเยี่ยม จำนวน

11 คน คิดเป็นร้อยละ 23.91 รองลงมานักเรียนที่ได้ระดับความสามารถทำได้แล้ว จำนวน 7 คน คิดเป็นร้อยละ 15.22 และนักเรียนที่ได้ระดับความสามารถพยายามอีกนิด จำนวน 28 คน คิดเป็นร้อยละ 60.87 ตามลำดับ โดยมีค่าเฉลี่ยรวมเท่ากับ 19.26 และส่วนเบี่ยงเบนมาตรฐานเท่ากับ 5.11 คะแนนสูงสุดเท่ากับ 30 คะแนน คิดเป็นร้อยละ 100.00 คะแนนต่ำสุดเท่ากับ 15 คะแนน คิดเป็นร้อยละ 50

ตอนที่ 2 ผลการเปรียบเทียบความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดล ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด ของนักเรียนชั้นประถมศึกษาปีที่ 4 เทียบกับเกณฑ์ร้อยละ 60

ตารางที่ 4 ผลการเปรียบเทียบความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด ของนักเรียนชั้นประถมศึกษาปีที่ 4 เทียบกับเกณฑ์ร้อยละ 60 (μ= 18 คะแนน)

การแก้โจทย์ปัญหาคณิตศาสตร์	N	μ	σ	ร้อยละ
หลังเรียน	46	19.26	5.11	64.20

จากตารางที่ 4 พบว่า ความสามารถในการแก้โจทย์คะแนนแบบทดสอบวัดความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วนของนักเรียนชั้นประถมศึกษาปีที่ 4 หลังได้รับการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดร่วมกับบาร์โมเดล จำนวน 46 คน พบว่า นักเรียนมีคะแนนเฉลี่ยเท่ากับ 19.26 คิดเป็นร้อยละ 64.20 ซึ่งสูงกว่าเกณฑ์ร้อยละ 60

สรุปและอภิปรายผล

จากการวิจัยในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์เรื่องเศษส่วน โดยใช้บาร์โมเดลของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด และเพื่อเปรียบเทียบความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล ของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดกับเกณฑ์ร้อยละ 60 ผู้วิจัยแบ่งการนำเสนอการวิจัยเป็น 2 ตอนดังนี้

1. ผลการศึกษาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่องเศษส่วน โดยใช้บาร์โมเดลของนักเรียนชั้นประถมศึกษาปีที่ 4 ด้วยการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิด พบว่า นักเรียนที่ได้ระดับความสามารถยอดเยี่ยม จำนวน 11 คน คิดเป็นร้อยละ 23.91 รองลงมานักเรียนที่ได้ระดับความสามารถทำได้แล้ว จำนวน 7 คน คิดเป็นร้อยละ 15.22 และนักเรียนที่ได้ระดับความสามารถพยายามอีกนิด จำนวน 28 คน คิดเป็นร้อยละ 60.87 ตามลำดับ แสดงให้เห็นว่า นักเรียนชั้นประถมศึกษาปีที่ 4 มีความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล เป็นไปในทิศทางที่ดีขึ้น เนื่องจากการตรวจแบบทดสอบแบบอัตนัย จำนวน 6 ข้อ พบว่า นักเรียนทุกคนมีคะแนนร้อยละ 50 ขึ้นไป และสามารถเขียนแสดงวิธีทำได้อย่างน้อย 2 ข้อ แต่ส่วนใหญ่นักเรียนขาดความรอบคอบ ในการตรวจสอบคำตอบ ซึ่งสอดคล้องกับการศึกษาวิจัยของ Thirunavukkarasu and Senthilnathan (2014) กล่าวว่า การสอนโดยใช้บาร์โมเดลร่วมกับการจัดการเรียนการสอนจะทำให้เกิดประสิทธิภาพมากกว่าวิธีการสอนคณิตศาสตร์ทั่วไปในระดับชั้นประถมศึกษา นอกจากนี้ผลวิจัยของ Gani Tengah and Said (2019) จาก

การได้ให้นักเรียนได้คิดด้วยตนเอง ทำงานคู่กับเพื่อน ได้แลกเปลี่ยนความรู้กับเพื่อน ได้ทำแผนภาพความคิด มีจินตนาการ สามารถช่วยให้นักเรียนมีความเข้าใจเนื้อหาคณิตศาสตร์มากขึ้น นอกจากนี้การทดสอบนักเรียน จำนวน 45 คน ของโรงเรียนรัฐบาลแห่งหนึ่งในประเทศบรูไน ระดับเกรด 9 พบว่า นักเรียนมีผลคะแนนสอบสูงขึ้น เมื่อนำวิธีบาร์โมเดลมาใช้ในการเรียนการสอน และสอดคล้องกับคำกล่าวของ Sampsel (2013) กล่าวถึงการจัดการเรียนรู้ด้วยเทคนิคเพื่อนคู่คิดเป็นการเปิดโอกาสให้นักเรียนแบ่งปันความคิด แลกเปลี่ยนความคิดเห็นซึ่งกันและกัน ทำให้มีส่วนร่วมในชั้นเรียนมากขึ้น มีการอภิปรายกัน เพิ่มความมั่นใจในความสามารถทางคณิตศาสตร์ การนำเสนอแนวคิดการแก้โจทย์ปัญหาของตนเองออกมาให้นักเรียนคนอื่น ๆ ในชั้นเรียนฟังมากขึ้น

2. ผลการเปรียบเทียบความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ เรื่อง เศษส่วน โดยใช้บาร์โมเดล หลังเรียนของนักเรียนชั้นประถมศึกษาปีที่ 4 ที่ได้รับการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดร่วมกับบาร์โมเดล จำนวน 46 คน จากการที่นักเรียนทำแบบทดสอบความสามารถการแก้โจทย์ปัญหาทางคณิตศาสตร์จำนวน 6 ข้อ คะแนนเต็ม 30 คะแนน พบว่า นักเรียนมีคะแนนเฉลี่ยเท่ากับ 19.26 คิดเป็นร้อยละ 64.20 ซึ่งสูงกว่าเกณฑ์ร้อยละ 60

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 ในการจัดการเรียนรู้ค่อนข้างจะใช้เวลานาน เนื่องจากนักเรียนยังไม่คุ้นชินกับกระบวนการในช่วงแรกอาจจะใช้เวลาพอสมควร เพราะต้องมีการทบทวนเรื่องของการหาผลบวก ผลลบเศษส่วนก่อนเข้าสู่บทเรียน และครูผู้สอนควรฝึกให้นักเรียนได้ใช้เทคนิคบาร์โมเดลให้คุ้นชินก่อน

1.2 ในระหว่างจัดกิจกรรมครูผู้สอนควรใช้เทคนิคการเสริมแรง เช่น การให้รางวัลหรือคำชมเชยกับนักเรียนที่ออกมาแสดงความคิดเห็นหรือนักเรียนที่อ่อน เพื่อกระตุ้นให้นักเรียนมีความกระตือรือร้น มีแรงจูงใจ และเกิดความภูมิใจในตัวเอง

1.3 ในระหว่างจัดกิจกรรมครูผู้สอนควรยืดหยุ่นในเรื่องเวลามากกว่านี้ และเพิ่มโอกาสสำหรับนักเรียนที่อ่อนให้ได้นำเสนอแนวคิดการแก้โจทย์ปัญหา เพราะจะทำให้นักเรียนมีกำลังใจในการเรียน และอยากมีส่วนร่วมในกิจกรรมมากยิ่งขึ้น

2. ข้อเสนอแนะสำหรับทำวิจัยครั้งต่อไป

2.1 ควรศึกษาการจัดการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดให้ละเอียด ทำความเข้าใจในการดำเนินจัดการเรียนรู้แต่ละขั้นตอน เพื่อให้เกิดแนวคิดในการแก้ปัญหาที่เกิดขึ้นเวลาที่ใช้ในการจัดกิจกรรมการเรียนรู้

2.2 ควรศึกษาเครื่องมือการวัดและประเมินความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์เรื่องเศษส่วน โดยใช้บาร์โมเดล เพื่อให้เครื่องมือวัดและประเมินมีความครอบคลุมและตรงความสามารถของผู้เรียนตามช่วงวัย

2.3 ควรมีการวิจัยเพื่อพัฒนากิจกรรมการเรียนรู้พัฒนาความสามารถ ในการแก้โจทย์ปัญหาคณิตศาสตร์โดยใช้กิจกรรมการเรียนรู้แบบร่วมมือเทคนิคเพื่อนคู่คิดร่วมกับเนื้อหาอื่น หรือกลุ่มวิชาอื่น ๆ เพื่อพัฒนาความสามารถในการแก้โจทย์ปัญหาคณิตศาสตร์ให้ดียิ่งขึ้น

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การเปรียบเทียบผลสัมฤทธิ์ด้านการอ่านและการเขียนคำศัพท์พื้นฐานวิชาภาษาไทย โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน ของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา

A Comparative Study of Reading and Writing Achievement of Basic Thai Vocabulary Using Basic Vocabulary Reading and Writing Skill Worksheets for Grade 2 Students at Bannongnaikui School, Hat Yai District, Songkhla Province

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานก่อนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน กลุ่มตัวอย่างในการวิจัยคือ นักเรียนระดับชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย ภาคการเรียนที่ 2 ปีการศึกษา 2566 จำนวน 15 คน ได้มาโดยวิธีเจาะจง เครื่องมือที่ใช้ในการรวบรวมข้อมูลได้แก่ 1) แผนการจัดการเรียนรู้ 2) แบบทดสอบวัดผลสัมฤทธิ์ เรื่องการอ่านและการเขียนคำศัพท์พื้นฐาน 3) แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน สถิติวิเคราะห์ข้อมูล ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐานและ ค่า t-test แบบ Dependent

ผลการศึกษาพบว่า ผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานวิชาภาษาไทย โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐานของนักเรียนชั้นประถมศึกษาปีที่ 2 หลังการใช้แบบฝึกทักษะสูงกว่าก่อนใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน อย่างมีนัยสำคัญทางสถิติที่ระดับ .05

คำสำคัญ: ผลสัมฤทธิ์ทางการเรียน, แบบฝึกทักษะ, การเขียนคำศัพท์พื้นฐาน

Abstract

This research aims to compare the learning outcomes in reading and basic vocabulary writing before and after using a basic vocabulary reading and writing skills exercise. The research sample consists of 15 second-grade students from Ban Nong Na Khuai School, second semester of the academic year 2566, selected by purposive sampling method. The tools used for data collection include: 1) Learning management plan, 2) Test measuring proficiency in reading and basic vocabulary writing, and 3) Exercise sheets for reading and basic vocabulary writing skills. Data analysis involved statistical measures such as means, standard deviations, and dependent t-test.

The study found that the proficiency in reading and basic vocabulary writing in the Thai language of second-grade students improved significantly after using the exercise sheets for reading and basic vocabulary writing skills compared to before, with statistical significance at the .05 level.

Keywords: Learning Outcomes, Exercise Format, Basic Vocabulary Writing

บทนำ

ภาษาไทย เป็นเอกลักษณ์ของชาติเป็นสมบัติทางวัฒนธรรมอันก่อให้เกิดความเป็นเอกภาพ และเสริมสร้างบุคลิกภาพของคนในชาติให้มีความเป็นไทย เป็นเครื่องมือในการติดต่อสื่อสารเพื่อสร้างความเข้าใจและความสัมพันธ์ที่ดีต่อกัน ทำให้สามารถประกอบกิจธุระการงานและดำเนินชีวิตร่วมกันในสังคมประชาธิปไตยได้อย่างสันติสุข และเป็นเครื่องมือในการแสวงหาความรู้ประสบการณ์จากแหล่งข้อมูลสารสนเทศต่าง ๆ เพื่อพัฒนาความรู้กระบวนการคิดวิเคราะห์วิจารณ์และสร้างสรรค์ให้ทันต่อการเปลี่ยนแปลงทางสังคมและความก้าวหน้าทางวิทยาศาสตร์เทคโนโลยี ตลอดจนนำไปใช้ในการพัฒนาอาชีพให้มีความมั่นคงทางเศรษฐกิจ นอกจากนี้ยังเป็นสื่อแสดงภูมิปัญญาของบรรพบุรุษด้านวัฒนธรรมประเพณีสุนทรียภาพเป็นสมบัติล้ำค่าควรแก่การเรียนรู้ อนุรักษ์ และสืบสานให้คงอยู่คู่ชาติไทยตลอดไป (กรมวิชาการ, 2551)

ด้วยความจำเป็นดังกล่าว หลักสูตรการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 จึงกำหนดให้กลุ่มสาระการเรียนรู้ภาษาไทย เป็นสาระการเรียนรู้ที่สถานศึกษาต้องใช้เป็นหลักในการเรียนการสอนเพื่อสร้างพื้นฐานการคิด และใช้เป็นกลยุทธ์ในการแก้ปัญหาวิกฤติของชาติ (กรมวิชาการ, 2551) โดยได้กำหนดสาระและมาตรฐานการเรียนรู้เพื่อให้นักเรียนมีทักษะการการอ่าน การเขียน การฟัง และการพูด เพื่อนำไปใช้ในการแสวงหาความรู้และสื่อความคิดความเข้าใจ อันจะเป็นประโยชน์ต่อการดำรงชีวิตประจำวัน กลุ่มสาระการเรียนรู้ภาษาไทยเป็นกลุ่มสาระที่จำเป็นพื้นฐานทางวิชาการและการเรียนรู้ซึ่งมีจุดเน้นในการเรียนคือ ให้ความสำคัญของการออกเสียงภาษาไทยได้อย่างถูกต้อง ออกเสียงตัวควบกล้ำ การเขียนเรียงความ ย่อความ การส่งเสริมนิสัยรักการอ่าน การเขียนภาษาไทยให้ถูกต้องตามอักขรวิธี และรู้จักเลือกใช้ถ้อยคำที่เหมาะสม (กรมวิชาการ, 2551) จากจุดเน้นดังกล่าวเรื่องการเขียนที่ถูกต้องตามอักขรวิธี การเขียนสะกดคำให้ถูกต้องจึงเป็นเรื่องหนึ่งที่สำคัญ ทั้งนี้เพราะข้อความที่เขียนสะกดคำผิดอาจทำให้เกิดความเข้าใจที่คาดเคลื่อนก่อให้เกิดความผิดพลาดในการติดต่อสื่อสาร นอกจากนี้ยังทำให้ผู้อ่านเกิดความรู้สึกที่ไม่ดีต่องานเขียน

ทักษะการอ่านและการเขียนสะกดคำนับว่าเป็นสิ่งจำเป็น เพราะเป็นพื้นฐานการเรียนรู้ที่สำคัญของนักเรียนในการเริ่มต้นเรียน ถ้าละเลยข้อบกพร่องนั้นไปอาจทำให้นักเรียนอ่านและเขียนผิดได้ตลอดไป การฝึกทักษะการเขียนสะกดคำให้ถูกต้องและคล่องแคล่วแก่ผู้เรียน เป็นการปูพื้นฐานการเขียนที่ดี เพราะสามารถไปใช้ในการเขียนรูปแบบอื่น ๆ ได้เช่น บรรยาย การเขียนแสดงความคิดเห็น การเขียนเชิงสร้างสรรค์ เป็นต้น ปัญหาการเขียนสำคัญอีกประการหนึ่ง คือ การเขียนที่ไม่ถูกต้อง วางวรรณยุกต์หรือสระไม่ตรงตามตำแหน่งทำให้เกิดคำที่ไม่มีความหมาย สาเหตุเพราะเด็กไม่ได้รับการฝึกเขียนคำอย่างถูกวิธี และเพียงพอ ฉะนั้นครูควรจัดกิจกรรมในการสอนที่เกี่ยวข้องกับการอ่านและการเขียนคำ โดยใช้แบบฝึกคำศัพท์พื้นฐาน ให้นักเรียนเกิดความรู้สนุกสนานเพื่อให้นักเรียนรักที่จะเรียน (ปัทมา ไตรคุป, 2547) จะเห็นได้ว่าการเรียนการสอน ครูต้องเน้นการฝึกให้มาก ๆ ฝึกบ่อย ๆ เมื่อเด็กเข้าใจความหมายของคำ เด็กก็จะสามารถใช้คำได้ ถ้าเราฝึกให้เขารู้จักใช้และฝึกสม่ำเสมอการฝึกใช้คำมาก ๆ ฝึกเขียนกันจริง ๆ เด็กจะเกิดทักษะถาวรขึ้น (พรรณี แพงวังทอง, 2542)

ทักษะการอ่านและการเขียนจึงเป็นทักษะที่น่าเป็นห่วง โดยเฉพาะปัญหาการอ่านและการเขียนสะกดคำให้ถูกต้อง เพราะเป็นปัญหาที่พบมากในการเรียนการสอน ได้แก่ การเขียนวางวรรณยุกต์และสระผิด ผู้วิจัยเกี่ยวข้องกับรายวิชาภาษาไทยโดยตรงเพราะเป็นผู้สอนวิชาภาษาไทย ระดับชั้นประถมศึกษาปีที่ 2 ภาคเรียนที่ 2 ปีการศึกษา 2566 นักเรียนระดับชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย สังเกตจากการเขียนสะกดคำของนักเรียนพบว่า เขียนไม่ถูกต้อง โดยเฉพาะการวางตำแหน่งของวรรณยุกต์ในคำพื้นฐานและคำที่อยู่ในหนังสือเรียน

จากเหตุผลดังกล่าว ผู้วิจัยจึงสนใจที่จะจัดทำแบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐานเพื่อแก้ปัญหาด้านการอ่านและการเขียนของนักเรียน ชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย โดยรวบรวมคำศัพท์พื้นฐานที่ปรากฏในหนังสือแบบเรียนภาษาไทย (ภาษาพาที) ชั้นประถมศึกษาปีที่ 2 และบัญชีคำพื้นฐานของนักเรียนชั้นประถมศึกษาปีที่ 2 เพื่อแก้ไขการอ่านและการเขียนสะกดคำ โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน เรื่อง การอ่านและการเขียนคำศัพท์พื้นฐาน เพื่อนำผลวิจัยที่ได้ไปใช้เป็นแนวทางในการจัดการเรียนรู้วิชาภาษาไทย ซึ่งปัญหาการอ่านและการเขียน เป็นเรื่องที่น่าสนใจมากที่ควรแก้ไข เพราะเป็นการเน้นให้ผู้เรียนมีทักษะการอ่านและการเขียนสะกดคำดีขึ้น เพื่อพัฒนาทักษะด้านต่าง ๆ และเป็นการมุ่งเน้นผู้เรียนเป็นสำคัญในการจัดการเรียนการสอน ซึ่งเป็นปัจจัยสำคัญอย่างยิ่งที่จะช่วยให้การสอนเกิดการเรียนรู้อย่างแท้จริงและจะช่วยให้ประสิทธิภาพของการเรียนและผลสัมฤทธิ์ทางการเรียนวิชาภาษาไทยดีขึ้น

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานก่อนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย

สมมติฐานของการวิจัย

ผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐาน โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย หลังเรียนสูงกว่าก่อนเรียน

แนวคิด ทฤษฎี กรอบแนวคิด

การอ่าน

สุมิตรา อังวัฒนกุล (2540) ได้กล่าวถึงทฤษฎีการอ่านไว้ดังนี้

1. การอ่านที่เน้นพฤติกรรมการเรียนรู้ เป็นการเชื่อมโยงระหว่างสิ่งเร้าและตอบสนอง โดยการให้การเสริมแรงที่เหมาะสม ในขณะที่ตอบสนองต่อสิ่งเร้าจะทำให้เกิดการเรียนรู้ได้ดีขึ้น ดังนั้นการอ่าน จึงเกี่ยวข้องกับการจัดลำดับไว้อย่างต่อเนื่อง ซึ่งหมายถึง การอ่านต้องประกอบด้วยทักษะเบื้องต้นและทักษะที่มีความซับซ้อน แต่ทักษะที่เป็นพื้นฐานก็จะถูกหลอมรวมเข้าด้วยกัน โดยผ่านกลวิธีการฝึกให้นักเรียนแยกแยะได้ว่า ส่วนใดเป็นเรื่องเกี่ยวข้องกับอักษรและส่วนใดเป็นเรื่องเกี่ยวกับเนื้อหา

2. การอ่านที่เน้นความรู้ความเข้าใจ ทฤษฎีความรู้ความเข้าใจมีแนวคิดว่า พฤติกรรมทุกอย่างจะต้องประกอบด้วยองค์ประกอบและการนำความรู้ไปใช้ ดังนั้นจึงเป็นหน้าที่ของสมองส่วนกลางในการตีความตัวแปรต่าง ๆ การเรียนรู้จึงขึ้นอยู่กับการเชื่อมโยงความรู้ใหม่เข้ากับประสบการณ์เดิม และแสดงออกอย่างเหมาะสม

3. การอ่านที่เน้นทฤษฎีพัฒนาการ มีแนวคิดในการเรียนรู้เกิดขึ้นตั้งแต่วัยที่ต้องพึ่งผู้อื่น และจะพัฒนาไปเรื่อย ๆ ตามวัย สิ่งสำคัญของช่วงอายุคือ จะมีการเรียนรู้ทักษะเฉพาะอย่างในแต่ละช่วงอายุถ้าช่วงนั้นไม่เกิดการเรียนรู้ที่เหมาะสมพัฒนาการเรียนรู้ในช่วงนั้นก็จะบกพร่องไป และจะมีผลกระทบต่อการเรียนรู้ในส่วนภายหลัง ดังนั้นการอ่านจึงเป็นกระบวนการรับรู้ซึ่งมีพื้นฐานมาจากช่วงพัฒนาการต่าง ๆ ตามความสามารถที่นักเรียนแสดงออกในการอ่าน เป็นเครื่องชี้ให้เห็นระดับพัฒนาการของนักเรียน

การเขียน

การสอนเขียนในระดับชั้นประถมศึกษา มีจุดมุ่งหมายเพื่อให้มีทักษะในการเขียน เขียนได้ถูกต้องสวยงาม สื่อความหมายได้ สามารถคิดลำดับเหตุการณ์เกี่ยวกับเรื่องที่เขียน มีนิสัยที่ดีในการเขียน รักการเขียน และนำการเขียนไปใช้ประโยชน์ในชีวิตประจำวัน

สำนักวิชาการและมาตรฐานการศึกษา (2551) ได้ให้ความหมายการเขียนว่า หมายถึง การสื่อสารด้วยตัวอักษรเพื่อถ่ายทอดความรู้ ความคิด อารมณ์ ความรู้สึกประสบการณ์ ข่าวสาร และจิตนาการ โดยการใช้ภาษาที่ถูกต้องเหมาะสมตามหลักการใช้ภาษาและตรงตามเจตนาของผู้เขียน เป็นเครื่องมือการถ่ายทอดความรู้สึกนึกคิดและความต้องการของบุคคลออกมาเป็นสัญลักษณ์หรือตัวอักษร เพื่อสื่อความหมายให้ผู้อื่นได้เข้าใจ เพราะการเขียนเป็นทักษะการส่งออกตามหลักของภาษาศิลป์ จากความหมายของการเขียนดังกล่าว ทำให้มองเห็นความสำคัญของการเขียนว่า มีความจำเป็นอย่างยิ่งต่อการสื่อสารในชีวิตประจำวัน เช่น นักเรียนใช้การเขียนบันทึกความรู้ ทำแบบฝึกหัด และตอบข้อสอบ บุคคลทั่วไปใช้การเขียนเพื่อเขียนจดหมาย ทำสัญญา พินัยกรรม การค้ำประกัน เป็นต้น การสะกดคำเป็นสาขาหนึ่งของการเขียนและเป็นทักษะที่สำคัญทางภาษาที่มีอิทธิพลต่อการใช้ภาษาของมนุษย์

ปัญหาของการเขียน

การเขียนสะกดคำเป็นปัญหาที่สำคัญของนักเรียนและครูสอนภาษาไทยเป็นอย่างมาก และจากการศึกษาพบว่า สาเหตุของการเขียนสะกดคำผิด มีดังนี้ (กรรณิการ์ พวงเกษม, 2540)

(1) การเขียนพยัญชนะ สระ และคำไม่ได้ มักเป็นนักเรียนที่เริ่มต้นเรียน ได้แก่ ชั้นประถมศึกษาปีที่ 1

(2) การสะกดคำผิด เช่น วางวรรณยุกต์ไม่ถูกที่คำพ้องเสียง เขียนคำที่ใช้ตัวสะกดไม่ตรงมาตรา ตัวสะกดผิด เขียนคำที่มีตัวการันต์ผิดคำที่สระเสียงสั้นและเสียงยาวเขียนสลับกัน เขียนคำควบกล้ำผิด เขียนพยัญชนะบางตัวในคำเบียดกันบางตัวห่างออกไป และเขียนคำที่มาจากภาษาต่างประเทศผิด

(3) เว้นวรรคตอนย่อหน้าไม่ถูกต้อง

(4) ใช้คำไม่เหมาะสม นำภาษาพูดมาใช้เป็นภาษาเขียน

(5) เขียนคำที่ใช้อักษรย่อไม่ถูกต้อง

(6) ลำดับความคิดในการเขียนไม่ได้

(7) ลายมืออ่านยาก

(8) ไม่มีความคิดในการเขียน

ความสำคัญของการสอนเขียน

การเขียนนับว่าเป็นสิ่งจำเป็นอย่างยิ่งในการสื่อความหมายอย่างหนึ่งของมนุษย์ สามารถตรวจสอบได้และคงทนถาวร

เรวดี อาษานาม (2537) ได้สรุปความสำคัญของการเขียนไว้ดังนี้ คือ เด็กที่มีความสามารถในการอ่านและประสบความสำเร็จในการเขียนมากจะมีจินตนาการในการใช้ภาษาได้ดี เพราะได้มีโอกาสเรียนรู้แนวทางการใช้คำต่าง ๆ จากสำนวนภาษาในหนังสือต่าง ๆ ที่อ่านพบ โดยปกติครูมักสอนให้เด็กอ่านได้ก่อนจึงให้เขียนคำที่ตนอ่านได้ แต่ทักษะในการเขียนเป็นทักษะที่สลับซับซ้อนกว่าทักษะอื่น เด็กจึงจำเป็นต้องมีความพร้อมโดยฝึกทักษะการฟัง การพูด และการอ่านได้ก่อน แล้วจึงเริ่มทักษะการเขียนในระดับชั้นประถมศึกษาปีที่ 1- 2 มุ่งเน้นทักษะพื้นฐานในการเขียนและยั่วยุให้เขียนด้วยความสนุกสนานไม่เบื่อ โดยจัดกิจกรรมต่าง ๆ ให้ฝึกจากง่ายไปหายากและให้สัมพันธ์กับการพูดและอ่าน

แบบฝึกทักษะ

แบบฝึก หมายถึง แบบฝึกหัดหรือชุดการสอนที่เป็นแบบฝึกที่ใช้เป็นตัวอย่าง ปัญหาหรือคำสั่ง ที่ตั้งขึ้นเพื่อให้นักเรียนฝึกตอบ (ราชบัณฑิตยสถาน, 2525)

ศศิธร วิสุทธิแพทย์ (2558) ได้แสดงความคิดเห็นเกี่ยวกับความสำคัญของแบบฝึกว่า สิ่งหนึ่งที่จะช่วยให้การสอนของครูประสบผลสำเร็จได้ดีก็คือ แบบฝึก เพราะการใช้แบบฝึกครอบคลุมเนื้อหาทั้งหมดจะช่วยทุ่นเวลาในการสอนกฎเกณฑ์ การยกตัวอย่าง ทั้งยังเป็นการวัดผลการเรียนการสอนในแต่ละเรื่องด้วย

รัชนี ศรีไพรวรรณ (2557) กล่าวถึงประโยชน์ของแบบฝึกทักษะไว้ดังนี้

1. ทำให้นักเรียนเข้าใจบทเรียนได้มากขึ้น
2. ให้ครูทราบความเข้าใจของนักเรียนที่มีต่อการเรียน
3. ช่วยให้ครูสามารถปรับปรุงเนื้อหาวิธีการสอนและกิจกรรมในแต่ละบทเรียน
4. ช่วยให้นักเรียนได้เรียนตามความสามารถของตนเอง
5. ฝึกให้นักเรียนมีความเชื่อมั่นและสามารถประเมินผลงานของตนเองได้
6. ฝึกให้นักเรียนทำงานตามลำดับ และมีความรับผิดชอบงานที่ได้รับมอบหมาย

เห็นได้ว่า แบบฝึกมีความจำเป็นต่อการจัดกิจกรรมการเรียนการสอน จึงถือได้ว่าแบบฝึกเป็นสื่อและอุปกรณ์อย่างหนึ่งของการจัดกิจกรรมการเรียนการสอน ซึ่งครูสามารถนำไปประกอบการสอนได้เป็นอย่างดี

การสร้างชุดฝึกหรือแบบฝึกปฏิบัติ

ชัยยงค์ พรมหมวงศ์ (2556) กล่าวว่า การสร้างชุดฝึกหรือแบบฝึกปฏิบัติ ควรประกอบด้วย

1. คำชี้แจงการใช้ที่มีการกำหนดทิศทางไว้เด่นชัด เช่น เมื่อให้ผู้เรียนอ่านข้อความใดข้อความหนึ่งแล้ว ก็จะเขียนว่า “โปรดอ่านเรื่อง.....หน้า” “โปรดพลิกไป หน้า.....เรื่อง.....”

2. มีตารางการปฏิบัติเพื่อให้นักเรียนวางแผนได้เอง ซึ่งเรียกว่า “ใบแนะทาง” หรือ“Guide Sheet”

3. ไม่ว่าจะเป็นแบบแผ่นหรือเป็นเล่มควรมี “แผนการสอน” โดยสังเขปไว้ด้วยโดยเฉพาะความคิดรวบยอด วัตถุประสงค์ กิจกรรมการเรียน สื่อการเรียนการสอน และประเมินผล เพื่อให้ผู้เรียนได้ทราบทิศทางเป้าหมาย และบทบาทของตนเอง

4. ในกรณีที่กิจกรรมให้นักเรียนตอบ เติมคำ เขียนภาพ ฯลฯ ต้องเตรียมเนื้อที่ไว้ในแบบฝึกให้ตรงกัน โดยใช้หมายเลขและรหัสไว้เด่นชัดพอที่จะให้ผู้เรียนตอบได้ตรงตามที่ครูกำหนดไว้ และควรมี “บัตรเฉลย” ไว้ให้แต่ไม่เด่นชัดจนเกินไป เพื่อป้องกันการดูเฉลยก่อนทำกิจกรรม การมีเฉลยไว้จะช่วยแบ่งเบาภาระของครู เพราะนักเรียนช่วยกันตรวจเอง และส่งเสริมการเรียนรายบุคคลได้ด้วย “บัตรเฉลย” อาจอยู่ในแบบฝึกปฏิบัติหรือแยกต่างหาก

5. ควรออกแบบให้สะอาด น่าอ่าน ใช้ภาษาที่เป็นกันเอง และมีการ์ตูนประกอบเนื้อหาให้น่าสนใจ

6. เนื้อหาในชุดแบบฝึกปฏิบัติในส่วนที่เกี่ยวข้องกับหัวเรื่องต่าง ๆ ควรให้ตรงกับเนื้อหาหรือประสบการณ์อื่นใดที่ครูกำหนด

หลักการสร้างแบบฝึกเสริมทักษะ

รัชนี ศรีไพวรรณ (2557) กล่าวถึง หลักการสร้างแบบฝึกเสริมทักษะไว้หลายประการ ดังนี้

1. ให้สอดคล้องกับจิตวิทยาพัฒนาการของเด็ก และลำดับขั้นของการเรียนรู้
2. ให้ตั้งจุดมุ่งหมายว่าจะฝึกในด้านใด แล้วจัดเนื้อหาให้ตรงกับความมุ่งหมายที่วางไว้
3. ต้องคำนึงถึงความแตกต่างของเด็ก
4. ในแบบฝึก ควรมีคำชี้แจงง่าย ๆ สั้น ๆ เพื่อให้เด็กเข้าใจ ถ้าเด็กยังอ่านไม่ได้ครูต้องชี้แจงด้วยคำพูดที่ใช้ภาษาง่าย ๆ ให้เด็กสามารถทำตามคำสั่งได้
5. แบบฝึกต้องมีความถูกต้อง ครูต้องตรวจพิจารณาดูให้ถี่ถ้วนอย่าให้มีข้อผิดพลาดได้
6. การให้เด็กทำแบบฝึกหัดแต่ละครั้ง ต้องให้เหมาะสมกับเวลา และความเข้าใจของเด็ก
7. ควรทำแบบฝึกหลาย ๆ แบบ เพื่อให้เด็กรู้กว้างขวาง และส่งเสริมให้เกิดความคิด
8. กระดาษที่ให้เด็กทำแบบฝึกหัด ต้องเหนียวและทนทานพอสมควร

ผลสัมฤทธิ์ทางการเรียน

พัฒนพงษ สีกา (2551) ไดให้ความหมายของผลสัมฤทธิ์ทางการเรียน หมายถึง ผลที่เกิดจากการกระทำของบุคคล ซึ่งเปนการเปลี่ยนแปลงพฤติกรรมเนื่องจากการได้รับประสบการณโดยการเรียนรู้ด้วยตนเอง หรือจากการเรียนการสอนในชั้นเรียน และสามารถประเมินหรือวัดไดจากการทดสอบ จากที่กลาวมาแล้วสรุปได้ว่า ผลสัมฤทธิ์ทางการเรียน หมายถึง พฤติกรรมที่แสดงออกถึงความรู้ ทักษะที่เกิดจากการเรียนรูหรือฝึกฝนทักษะที่ไดเรียนมาแลว ซึ่งสามารถวัดหรือประเมินไดโดยใชเครื่องมือวัด

ประเภทของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน

ทิวัตถ มณีโชติ (2549) ได้แบ่งประเภทของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนได้ดังนี้

แบบทดสอบปรนัย (Objective Tests) แบ่งได้เป็น 4 ชนิด ได้แก

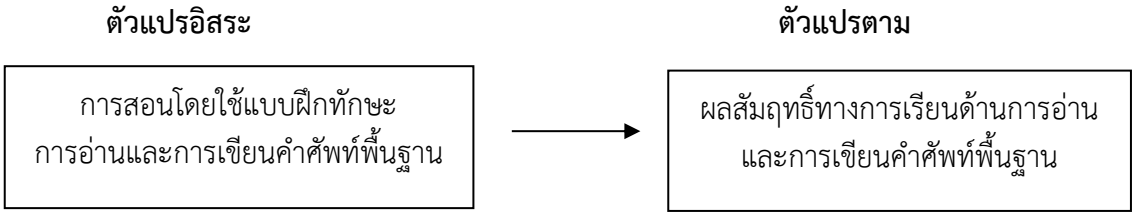
1) แบบถูก - ผิด (True - False Items) เป็นแบบทดสอบที่ให้ผู้ตอบตัดสินใจเลือกว่าแต่ละข้อนั้นถูกหรือผิด แบ่งเป็น 2 ประเภท คือ ข้อคำถามเดี่ยว และข้อคำถามชุดจากสาระที่กำหนด

2) แบบจับคู่ (Matching Items) แบบทดสอบประเภทนี้ เป็นการหาความสัมพันธ์ระหว่าง 2 ข้อความ คือ ข้อความที่เป็นคำถาม (Premises หรือ Descriptions) กับข้อความที่เป็นคำตอบ

3) แบบเติมคำ (Completion Items) เป็นข้อสอบที่ต้องการให้ผู้สอบเติมคำ หรือข้อความสั้น ๆ ในส่วนที่เว้นว่างไว้ ให้เป็นประโยคที่ถูกต้องสมบูรณ์

4) แบบเลือกตอบ (Multiple Choice Test) เป็นแบบทดสอบที่นิยมใช้กันมาก สำหรับแบบทดสอบแบบปรนัย เพราะสามารถวัดได้ทุกระดับพฤติกรรมของการวัดศักยภาพทางสมอง ข้อสอบแบบเลือกตอบเป็นข้อสอบที่นิยมใช้มากในปัจจุบันทั่วโลก

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

1. ประชากรและกลุ่มตัวอย่าง

ประชากรในการวิจัย ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย ภาคเรียนที่ 2 ปีการศึกษา 2566 มีนักเรียนทั้งหมด 15 คน

กลุ่มเป้าหมายในการวิจัย ได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย ภาคเรียนที่ 2 ปีการศึกษา 2566 มีนักเรียนทั้งหมด 15 คน ได้มาโดยวิธีการเจาะจง

2. เครื่องมือที่ใช้ในการศึกษา

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ได้แก่

1. แผนการจัดการเรียนรู้ทักษะการอ่านและการเขียนคำพื้นฐาน จำนวน 10 ชั่วโมง

2. แบบฝึกทักษะการอ่านและการเขียนคำพื้นฐาน สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย จำนวน 10 ชุด

3. แบบทดสอบวัดผลสัมฤทธิ์ทางการอ่านและการเขียนคำพื้นฐานก่อนเรียนและหลังเรียน กลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 2 เป็นแบบทดสอบแบบปรนัย ชนิดเลือกตอบ 3 ตัวเลือก จำนวน 20 ข้อ

4. แบบสอบถามความพึงพอใจที่มีต่อแบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน

3. การสร้างและการหาคุณภาพเครื่องมือที่ใช้ในการศึกษา

ผู้วิจัยได้ดำเนินการสร้างเครื่องมือในการศึกษาตามลำดับ ดังนี้

1. แผนการจัดการเรียนรู้ทักษะการอ่านและการเขียน เรื่อง การอ่านและการเขียนคำพื้นฐาน ผู้วิจัยได้สร้างแผนการเรียนรู้ตามขั้นตอนดังนี้

1.1 ศึกษาหลักสูตรกลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 2 (ช่วงชั้นที่ 1 จากหลักสูตรการศึกษาขั้นพื้นฐาน พุทธศักราช 2551)

1.2 ศึกษาหลักการสอน วิธีการสอน โดยเน้นผู้เรียนเป็นสำคัญ

1.3 วิเคราะห์เนื้อหาและผลการเรียนรู้ที่คาดหวัง จากสาระการเรียนรู้กลุ่มสาระภาษาไทย เพื่อเขียนผลการเรียนรู้ที่คาดหวัง สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2

1.4 นำคำยากที่ได้จากการสำรวจมาใช้ประกอบการเขียนแผนการจัดการเรียนรู้ทักษะการอ่านและการเขียน เรื่อง คำพื้นฐาน สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2

1.5 เขียนแผนการจัดการเรียนรู้ทักษะการอ่านและการเขียนคำพื้นฐานสำหรับนักเรียน ชั้นประถมศึกษาปีที่ 2 ซึ่งมีแผนการจัดการเรียนรู้จำนวน 10 แผน

1.6 จัดทำแบบประเมินแผนการจัดการเรียนรู้ทักษะการอ่านและการเขียน เรื่อง คำพื้นฐาน กลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 2

1.7 นำแผนการจัดการเรียนรู้พร้อมแบบประเมินที่สร้างขึ้นเสนอให้ผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบคุณภาพ ความเหมาะสมของแผนการจัดการเรียนรู้ และความถูกต้องของภาษา ซึ่งผู้เชี่ยวชาญประกอบด้วย ครูในโรงเรียนบ้านหนองนายขุ้ย ดังนี้

1. นางสาวณัฐภัชศร มูนีกุล ตำแหน่งครูชำนาญการพิเศษ
2. นางณิชากานต์ รอดระกำ ตำแหน่งครูชำนาญการพิเศษ
3. นางสาวแวรุสนานี ปะจูลี ตำแหน่งครู (ครูผู้สอนภาษาไทย)

1.8 นำแผนการจัดการเรียนรู้ที่ปรับปรุงแก้ไขแล้ว เสนอให้ผู้เชี่ยวชาญ 3 ท่าน ที่มีความเชี่ยวชาญด้านเนื้อหาผู้เชี่ยวชาญด้านแบบฝึก และเชี่ยวชาญด้านการวัดและประเมินผลการศึกษาพิจารณาตรวจสอบคุณภาพ ความเที่ยงตรงตามเนื้อหา (Content Validity) โดยใช้แบบตรวจสอบประเมินค่าดัชนีความสอดคล้องระหว่างคุณลักษณะของแผนการจัดการเรียนรู้กับวัตถุประสงค์ของแผนการจัดการเรียนรู้ IOC (Index of Item Objective Congruence) ผลการพิจารณาการลงความเห็นของผู้เชี่ยวชาญมีค่าอยู่ระหว่าง 0.67 - 1.0

1.9 นำแผนการจัดการเรียนรู้ทักษะการอ่านและการเขียนคำศัพท์พื้นฐานที่ผ่านการตรวจสอบไปใช้ในการจัดการเรียนการสอนกับกลุ่มทดลอง

2. การสร้างแบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐานกลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 2 ผู้วิจัยได้ดำเนินการสร้างเครื่องมือในการวิจัย ดังนี้

2.1 ศึกษาทฤษฎีและรูปแบบของการสร้างแบบฝึกทักษะ จากเอกสารและงานวิจัยที่เกี่ยวข้อง

2.2 ศึกษาจุดมุ่งหมายของกลุ่มสาระการเรียนรู้ภาษาไทย มาตรฐานการเรียนรู้ สาระการเรียนรู้ตัวชี้วัดจากหลักสูตรการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 และหลักสูตรสถานศึกษาโรงเรียนบ้านหนองนายขุ้ย โดยนำเนื้อหาในส่วนของคำพื้นฐานมาจัดทำเป็นแบบฝึกทักษะการอ่านและการเขียนคำพื้นฐานสำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย จำนวน 10 ชุด ได้แก่ แบบฝึกหัดที่ 1 ถึง แบบฝึกหัดที่ 10

2.3 จัดลำดับเนื้อหาและส่วนประกอบในแบบฝึกทักษะ โดยมีคำชี้แจง จุดประสงค์ และคำแนะนำการใช้แบบฝึกทักษะ

2.4 จัดทำแบบประเมินแบบฝึกทักษะการเขียนคำศัพท์พื้นฐาน กลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 2

2.5 นำแบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน พร้อมแบบประเมินที่สร้างขึ้นเสนอต่อผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบความเที่ยงตรงเชิงเนื้อหา (IOC) ผลการพิจารณาการลงความเห็นของผู้เชี่ยวชาญมีค่าอยู่ระหว่าง 0.67 - 1.0

2.6 นำแบบฝึกทักษะที่ตรวจสอบแล้วมาแก้ไขปรับปรุงตามคำแนะนำของผู้เชี่ยวชาญ

3. การสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานของนักเรียนชั้นประถมศึกษาปีที่ 2 ผู้วิจัยได้ดำเนินการสร้าง ดังนี้

3.1 ศึกษาทฤษฎีและวิธีการสร้างแบบทดสอบวัดผลสัมฤทธิ์การอ่านและการเขียนคำศัพท์พื้นฐานและเกณฑ์การให้คะแนนจากเอกสารและงานวิจัยที่เกี่ยวข้อง

3.2 ศึกษาเนื้อหาจุดประสงค์การเรียนรู้ในแผนการจัดการเรียนรู้

3.3 สร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน แบบปรนัย ชนิดเลือกตอบ 3 ตัวเลือก จำนวน 20 ข้อ ให้ครอบคลุมตามจุดประสงค์ที่กำหนดไว้

3.4 จัดทำแบบประเมินแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนด้านการอ่าน และการเขียนคำศัพท์พื้นฐาน กลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 2 โดยถามแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ครอบคลุมองค์ประกอบของแบบฝึกทักษะตามจุดประสงค์ที่กำหนดไว้

3.5 นำแบบทดสอบพร้อมแบบประเมินที่สร้างขึ้นที่สร้างขึ้น เสนอผู้เชี่ยวชาญตรวจสอบ จำนวน 3 ท่าน เพื่อตรวจสอบความเที่ยงตรงเชิงเนื้อหา คุณภาพ ความเหมาะสมของภาษาที่ใช้และประเมินความสอดคล้องระหว่างแบบทดสอบกับจุดประสงค์การเรียนรู้ ผลการพิจารณาการลงความเห็นของผู้เชี่ยวชาญมีค่าอยู่ระหว่าง 0.67 - 1.0

3.6 จัดทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐาน เป็นแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน แล้วนำไปใช้สำหรับทดสอบก่อนเรียนและหลังเรียนกับกลุ่มทดลอง ชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย จำนวน 15 คน

3.7 จากนั้นวิเคราะห์หาค่าความยาก (P) ได้ค่าระหว่าง 0.51-0.8 ค่าอำนาจจำแนก (r) ได้ค่าระหว่าง 0.4-0.82 และค่าความเชื่อมั่น (KR20) ของแบบวัดผลสัมฤทธิ์การอ่านและการเขียนคำศัพท์พื้นฐาน ของนักเรียนระดับชั้นประถมศึกษาปีที่ 2 ได้ค่า 0.68

4. การเก็บรวบรวมข้อมูล

ผู้วิจัยทำการใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน ประกอบการจัดการเรียนรู้กลุ่มสาระการเรียนรู้ภาษาไทย เรื่อง การอ่านและการเขียนคำพื้นฐาน ในภาคเรียนที่ 2 ปีการศึกษา 2566 ระหว่างวันที่ 8 มกราคม ถึง 19 มกราคม พ.ศ. 2567 โดยใช้เวลาในการสอนจำนวน 2 สัปดาห์ สัปดาห์ละ 5 คาบ คาบละ 1 ชั่วโมง รวมทั้งหมด 10 ชั่วโมง

ตารางที่ 1 ขั้นตอนการเก็บรวบรวมข้อมูล

คาบที่	วัน / เดือน / ปี	เวลา	กิจกรรม
1	8 มกราคม พ.ศ. 2567 เวลา 08.30 – 09.30 น.	1 ชั่วโมง	- ปฐมนิเทศ - ทำแบบทดสอบก่อนเรียน (Pre - test) - สอนตามแผนการจัดการเรียนรู้ที่ 1
2	9 มกราคม พ.ศ. 2567 เวลา 10.40 – 11.40 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 2 - แบบฝึกทักษะ ชุดที่ 1
3	10 มกราคม พ.ศ. 2567 เวลา 08.30 – 09.40น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 3 - แบบฝึกทักษะ ชุดที่ 2
4	11 มกราคม พ.ศ. 2567 เวลา 09.40 – 10.40 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 4 - แบบฝึกทักษะ ชุดที่ 3
5	12 มกราคม พ.ศ. 2567 เวลา 12.40 – 13.40 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 5 - แบบฝึกทักษะ ชุดที่ 4
6	15 มกราคม พ.ศ. 2567 เวลา 08.30 – 09.30 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 6 - แบบฝึกทักษะ ชุดที่ 5
7	16 มกราคม พ.ศ. 2567 เวลา 10.40 – 11.40 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 7 - แบบฝึกทักษะ ชุดที่ 6
8	17 มกราคม พ.ศ. 2567 เวลา 08.30 – 09.30 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 8 - แบบฝึกทักษะ ชุดที่ 7
9	18 มกราคม พ.ศ. 2567 เวลา 09.40 – 10.40 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 9 - แบบฝึกทักษะ ชุดที่ 8
10	19 มกราคม พ.ศ. 2567 เวลา 12.40 – 13.40 น.	1 ชั่วโมง	- สอนตามแผนการจัดการเรียนรู้ที่ 10 - แบบทดสอบหลังเรียน (Post - test) โดยใช้แบบทดสอบชุดเดียวกับการทดสอบก่อนเรียน (Pre - test)

* หมายเหตุ เวลา 1 ชั่วโมง เท่ากับ 1 คาบเรียน

5. การวิเคราะห์ข้อมูล

การวิจัยในครั้งนี้ ผู้วิจัยได้ใช้สถิติในการวิเคราะห์และประมวลผลข้อมูล ดังต่อไปนี้

ผู้วิจัยวิเคราะห์ข้อมูล โดยนำคะแนนที่ได้จากการทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนมาวิเคราะห์ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน (S.D.) และ t-test Dependent

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

1. การหาค่าสถิติพื้นฐาน ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน
2. สถิติทดสอบเครื่องมือวิจัย ได้แก่ IOC ความเที่ยง ความยาก และอำนาจจำแนก
3. สถิติทดสอบสมมุติฐานการวิจัย ได้แก่ t-test Dependent

ผลการวิจัย

การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานก่อนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน สำหรับนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุย

ตารางที่ 2 ผลการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานก่อนและหลังเรียนโดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน ของนักเรียนชั้นประถมศึกษาปีที่ 2

คะแนนทดสอบ	N	$\bar{x}$	S.D.	df	t	Sig
ก่อนเรียน	15	12.93	3.83	14	7.12 *	.000
หลังเรียน	15	17.26	2.76			

** มีนัยสำคัญทางสถิติที่ระดับ .05

จากตารางที่ 2 พบว่า นักเรียนที่ได้รับการจัดการเรียนรู้ โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐานก่อนเรียนมีค่าคะแนนเฉลี่ย 12.93 หลังเรียนมีค่าคะแนนเฉลี่ย 17.26 เมื่อนำค่าคะแนนเฉลี่ยมาเปรียบเทียบกัน พบว่า นักเรียนที่ได้รับการจัดการเรียนรู้โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐานมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

ภาพที่ 2 แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน
ที่มา: ชนิตา ลาวัลย์ (2566)

สรุปและอภิปรายผล

ผลสัมฤทธิ์ทางการเรียนด้านการอ่านและการเขียนคำศัพท์พื้นฐานก่อนและหลังเรียน โดยใช้แบบฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐาน พบว่า หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 เป็นไปตามสมมติฐานที่ตั้งไว้ เนื่องจากฝึกทักษะการอ่านและการเขียนคำศัพท์พื้นฐานมีเนื้อหาที่ให้ความรู้ การจัดรูปแบบมีความน่าสนใจ สีสันสวยงาม เรียงลำดับจากง่ายไปหายาก และมีภาพประกอบ ทำให้กลุ่มทดลองมีความสนใจ และทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนหลังเรียนได้สูงกว่าก่อนเรียน ซึ่งสอดคล้องกับ วรรณาภรณ์ พระเมเด (2562) ได้ศึกษา ผลการใช้ชุดฝึกทักษะการอ่านและการเขียนภาษาไทย ระดับชั้นประถมศึกษา ปีที่ 5 หลังเรียนดีกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.5 ทั้งนี้ อาจเนื่องจากชุดฝึกทักษะที่นำมาใช้กับนักเรียนได้ผ่านกระบวนการในการสร้างพัฒนาทดลองใช้และปรับปรุงแก้ไขมาแล้วในขั้นตอนของการพัฒนาชุดฝึกทักษะ การอ่าน และการเขียนภาษาไทยจนมีประสิทธิภาพตามเกณฑ์ที่กำหนดแล้วจึงนำมาใช้กับนักเรียน ซึ่งการทำชุดฝึกทักษะช่วยให้นักเรียนเข้าใจเนื้อหาได้ดีขึ้น จดจำความรู้ได้นานและคงทน รวมทั้งพัฒนาความรู้ทักษะและเจตคติด้านต่าง ๆ ของนักเรียนให้ดียิ่งขึ้น และสอดคล้องกับ รอน น้อมถวาย (2560) ได้ศึกษาการพัฒนาแบบฝึกทักษะการเขียนคำศัพท์พื้นฐาน เพื่อส่งเสริมทักษะการเขียนสะกดคำของนักเรียนชั้นประถมศึกษาปีที่ 6 โรงเรียนอนุบาลสามเสน (สำนักงานสลากกินแบ่งรัฐบาลอุปถัมภ์) พบว่า ความสามารถของนักเรียนในการเขียนสะกดคำที่เรียนด้วยแบบฝึกทักษะการเขียนคำศัพท์พื้นฐานหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ ระดับ .05

ข้อเสนอแนะ

จากผลการวิจัยที่ได้เสนอไปแล้วนั้น ผู้วิจัยมีข้อเสนอแนะดังต่อไปนี้

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. การจัดกิจกรรมการเรียนรู้ควรเริ่มจากกิจกรรมที่ง่ายไปหากิจกรรมที่ยาก และต้องให้นักเรียนทราบผลของการปฏิบัติกิจกรรมทันที เพื่อทราบความก้าวหน้าของตนเอง

2. การใช้แบบฝึกทักษะควรคำนึงถึงความแตกต่างระหว่างบุคคล ทั้งนี้ สามารถปรับเวลาตามความเหมาะสมกับศักยภาพของผู้เรียน

3. การทำแบบฝึกทักษะแต่ละแบบฝึก ถ้านักเรียนทำแบบฝึกไม่ผ่านควรให้ทำใหม่ซ้ำ ๆ อีกครั้งจนกว่าจะผ่าน

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรศึกษาวิจัยเกี่ยวกับการสร้างแบบฝึกทักษะอื่น ๆ เช่น การฟัง การคิดวิเคราะห์ และความคิดสร้างสรรค์

2. ควรศึกษาวิจัยการสร้างแบบฝึกทักษะในกลุ่มสาระการเรียนรู้อื่น ๆ

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การพัฒนาทักษะการออกเสียงคำศัพท์ภาษาอังกฤษ โดยใช้ชุดฝึกอ่านคำศัพท์ของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี อำเภอหาดใหญ่ จังหวัดสงขลา

Development of English Vocabulary Pronunciation Skills Using a Set of Vocabulary Reading Worksheets for Grade 3 Students at Ban Koh Mee School, Hat Yai District, Songkhla Province

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ เพื่อเปรียบเทียบผลสัมฤทธิ์ในการอ่านออกเสียงคำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี ก่อนและหลังได้รับการสอน โดยใช้แบบฝึกทักษะการอ่านออกเสียงคำศัพท์ภาษาอังกฤษ กลุ่มตัวอย่างได้แก่ นักเรียนชั้นประถมศึกษาปีที่ 3 จำนวน 30 คน ได้มาโดยการเลือกแบบเจาะจง เครื่องมือวิจัยได้แก่ 1) แผนการจัดการเรียนรู้ 2) แบบทดสอบวัดผลสัมฤทธิ์ทางการอ่าน 3) ชุดฝึกอ่านคำศัพท์ สถิติวิเคราะห์ข้อมูล ได้แก่ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และค่า t-test แบบ Dependent

ผลการวิจัย พบว่า นักเรียนที่เรียนโดยใช้ชุดฝึกอ่านคำศัพท์สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 มีผลสัมฤทธิ์ทางการเรียนการอ่านออกเสียงภาษาอังกฤษหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

คำสำคัญ: พัฒนาทักษะ, การอ่านออกเสียงคำศัพท์, ชุดฝึกทักษะ

Abstract

This research aims to compare the effectiveness of English pronunciation reading among third-grade students at Ban Kho Mee School before and after being taught using a pronunciation reading skills training module. The sample group consists of 30 grade 3 students selected through targeted sampling. Research tools include: 1) a learning management plan, 2) a test to measure pronunciation reading performance, and 3) a set of vocabulary reading exercises. Statistical analysis includes means, standard deviations, and dependent t-test.

Research findings reveal that students who were taught using the vocabulary reading exercises for grade 3 students demonstrated significantly higher post-learning pronunciation reading performance in English compared to their pre-learning performance, with statistical significance at the .05 level.

Keywords: Skill Development, Pronunciation Reading, Skills Training Module

บทนำ

ปัจจุบัน เป็นโลกที่การสื่อสารมีความสำคัญ หากสามารถสื่อสารกับผู้คนได้มากเท่าไร จะสามารถเพิ่มโอกาสหรือทางเลือกในด้านต่าง ๆ มากขึ้น ทั้งการติดต่อเพื่อค้าขาย การติดต่อเพื่อเผยแพร่วัฒนธรรม การติดต่อเพื่อเจรจาและการติดต่อ เพื่อจะสื่อความหมายหรือกระจายข่าวสารไปให้กว้างไกล ดังนั้นผู้คนจึงเรียนรู้ที่จะสื่อสารกันมากกว่าภายในประเทศ และตัวกลางในการสื่อสารของคนบนโลกนั้นคือ ภาษาอังกฤษ ภาษาอังกฤษนั้น มีความสำคัญในทุก ๆ ด้านในโลกปัจจุบัน และภาษาอังกฤษอยู่รอบ ๆ ตัวเรามากขึ้นเรื่อย ๆ การเรียนรู้ภาษาอังกฤษให้มากขึ้นจึงเป็นการเพิ่มโอกาสดี ๆ ในชีวิตทั้งเรื่องการงาน การศึกษา วัฒนธรรม รวมถึงผู้คนยิ่งรู้มากเท่าไหร่ก็ทำให้เข้าใจและมีโอกาสที่มากขึ้นได้มากเท่านั้น

ด้วยเหตุนี้ กระทรวงศึกษาธิการจึงได้จัดทำหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 โดยกำหนดให้มีการเรียนการสอนภาษาอังกฤษทุกช่วงชั้น เพื่อให้ประชากรของชาติสามารถสื่อสารกับนานาชาติด้วยภาษาอังกฤษ ทั้งทางด้านการฟัง การพูด การอ่าน และการเขียนโดยกำหนดให้กลุ่มสาระการเรียนรู้ภาษาต่างประเทศเป็นกลุ่มสาระการเรียนรู้ที่มีส่วนสำคัญในการสร้างและส่งเสริมศักยภาพในการคิดของตัวผู้เรียน ให้สามารถเติบโตเป็นผู้ใหญ่ที่มีคุณภาพและมีความสามารถ (กระทรวงศึกษาธิการ, 2551) ดังนั้นภาษาอังกฤษจึงมีความสำคัญเป็นอย่างยิ่งในการพัฒนาประชากรของประเทศเพื่อพัฒนาประเทศต่อไปได้ มุ่งเน้นไปที่การพัฒนาหนึ่งในสี่ทักษะภาษาอังกฤษ คือ การอ่าน โดยการอ่านออกเสียงมีความสำคัญและเป็นทักษะที่จำเป็นในการเรียนรู้ เนื่องจากการอ่านเป็นส่วนหนึ่งในชีวิตประจำวัน ยิ่งปัจจุบันเป็นยุคของ "ข่าวสารข้อมูล" การอ่านยิ่งมีความสำคัญมากขึ้นต่อการพัฒนาคุณภาพชีวิต การอ่านออกเสียงควรเป็นส่วนหนึ่งของกิจวัตรประจำวันของเด็กทุกคน แต่อย่างไรก็ตามนักวิชาการไทยพบว่ามีเสียงพยัญชนะภาษาอังกฤษอยู่หลายเสียงที่ไม่มีในภาษาไทย และมีเสียงจำนวนหนึ่งที่คล้ายกับเสียงภาษาไทย คนไทยจึงใช้เสียงของภาษาไทยแทนเสียงภาษาอังกฤษซึ่งไม่ถูกต้อง การใช้เสียงภาษาไทยแทนมักทำให้เกิดความไม่เข้าใจหรือบางครั้งความหมายของคำก็เปลี่ยนไปเลย

ดังนั้นจึงจำเป็นต้องออกเสียงภาษาอังกฤษให้ถูกต้องเพื่อให้นักเรียนได้รับรู้ข่าวสารที่ถูกต้องเพื่อพัฒนาตนเองต่อไป จากความสำคัญดังกล่าว การพัฒนาทักษะการอ่านออกเสียงภาษาอังกฤษจึงเป็นสิ่งสำคัญอย่างยิ่งในการเรียนภาษาอังกฤษ จากการสังเกตในรายวิชาภาษาอังกฤษพื้นฐาน ระดับชั้นประถมศึกษาปีที่ 3 ภาคเรียนที่ 1 ปีการศึกษา 2566 โรงเรียนบ้านเกาะหมี อำเภอหาดใหญ่ จังหวัดสงขลา พบว่า ปัญหาส่วนใหญ่ของนักเรียน คือ นักเรียนไม่สามารถอ่านออกเสียงคำศัพท์ได้ ถึงแม้ว่านักเรียนจะสามารถพูดคำศัพท์และฟังแล้วเข้าใจว่าคำศัพท์คำนั้นแปลว่าอะไร แต่เมื่ออยู่ในรูปของตัวอักษรแล้วนักเรียนส่วนใหญ่จะไม่สามารถอ่านออกเสียงและแปลให้เข้าใจได้ สังเกตได้จากการเข้าร่วมกิจกรรมในชั้นเรียนที่มีการอ่านออกเสียง นักเรียนมักจะมีความกังวลเนื่องจากทำกิจกรรมไม่ได้หรือได้ไม่ดีเท่าที่ควร และผลคะแนนทักษะด้านการอ่านที่น้อยกว่าทักษะด้านอื่น ๆ ด้วยเหตุนี้ จึงทำให้มีแนวคิดในการแก้ไขปัญหาและพัฒนาทักษะการอ่านออกเสียงภาษาอังกฤษของนักเรียนด้วยการใช้ชุดฝึกอ่านคำศัพท์ เป็นวิธีการสอน

ที่เริ่มจากการรู้จักการออกเสียงของแต่ละตัวอักษร นำไปสู่หลักการผสมเสียง และการออกเสียง ทำให้นักเรียนสามารถอ่านออกเสียงได้เองและสามารถพัฒนาการอ่านออกเสียงได้ด้วยตนเองผ่านการทำซ้ำ ๆ ยิ่งนักเรียนฝึกการผสมเสียงมาก จะทำให้นักเรียนสามารถจำการออกเสียงแต่ละตัวอักษรได้แม่นยำขึ้น จนนำไปสู่พื้นฐานการเรียนรู้ที่มีประสิทธิภาพเนื่องจากนักเรียนจะได้เรียนรู้ภาษาอังกฤษจากการอ่านมากขึ้น จนเกิดเป็นนิสัยรักการอ่าน และทำให้เกิดองค์ความรู้ต่าง ๆ ตามมา ซึ่งเป็นสิ่งจำเป็นในยุคสมัยนี้ที่การพัฒนาตนเองอยู่เสมอเป็นเรื่องสำคัญ

ด้วยเหตุผลดังกล่าว ผู้วิจัยจึงสนใจที่จะพัฒนาการอ่านออกเสียงคำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี อำเภอหาดใหญ่ จังหวัดสงขลา โดยใช้ชุดฝึกอ่านคำศัพท์ เพื่อพัฒนาความสามารถในการออกเสียงคำศัพท์ได้อย่างถูกต้องชัดเจน และยังช่วยให้ผู้เรียนเข้าใจความหมายของคำที่ผู้เรียนออกเสียงนั้น ตลอดจนจดจำได้อย่างรวดเร็ว ซึ่งการใช้ชุดฝึกอ่านคำศัพท์ประกอบการเรียนจะสามารถพัฒนาผู้เรียนให้มีประสิทธิภาพ และตอบสนองการเรียนรู้ของผู้เรียน เพื่อช่วยให้ผู้เรียนได้พัฒนาการเรียนรู้ภาษาอังกฤษ เพื่อการสื่อสารได้อย่างเข้าใจและมั่นใจมากยิ่งขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบผลสัมฤทธิ์ในการอ่านออกเสียงคำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี ก่อนและหลังได้รับการสอนโดยใช้แบบฝึกทักษะการอ่านออกเสียงคำศัพท์ภาษาอังกฤษ

สมมุติฐานของการวิจัย

ผลสัมฤทธิ์ในการอ่านออกเสียงคำศัพท์ภาษาอังกฤษของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี โดยใช้แบบฝึกทักษะการอ่านออกเสียงคำศัพท์ภาษาอังกฤษ หลังเรียนสูงกว่าก่อนเรียน

แนวคิด ทฤษฎี กรอบแนวคิด

การอ่านออกเสียงคำศัพท์ภาษาอังกฤษ

ความหมายของการออกเสียงภาษาคำศัพท์อังกฤษ

ลลิดา ทองรัตน์ (2563) การอ่านออกเสียงภาษาอังกฤษ คือ ความสามารถในการถอดรหัสคำภาษาอังกฤษและพูดออกเสียงได้อย่างชัดเจน ถูกต้อง และคล่องแคล่ว เกิดจากการฝึกฝนจนกระทั่งสามารถกระทำได้อย่างเป็นธรรมชาติ

สุธามาศ คชรัตน์ และ พุทธชาด ลิ้มศิริเรืองไร (2557) ที่ได้ศึกษาถึงความหมายของการออกเสียงภาษาอังกฤษแล้วได้สรุปไว้ว่า การออกเสียงภาษาอังกฤษ คือ วิธีที่บุคคลเปล่งเสียงออกมาตามลักษณะการผสมเสียงของภาษาใดภาษาหนึ่งเข้าเป็นคำ และจากคำเป็นประโยค โดยมีการเน้นเสียงหนักเบา การลงทำนองเสียงสูง-ต่ำ การเน้นเสียงถ้อยคำ การจัดช่วงทำนองจังหวะ ลีลาท่าทาง การสื่อด้วยสายตา และการแสดงออกต่าง ๆ ซึ่งวิธีการออกเสียงเหล่านี้ ได้รับการยอมรับและสามารถเข้าใจได้ง่าย

สรุปทักษะการอ่านออกเสียงภาษาอังกฤษ หมายถึง การกระทำที่เปล่งเสียงออกมาจากการสะกดคำศัพท์ โดยการสะกดจะมีทั้งที่อยู่ในรูปแบบ และที่นอกเหนือจากรูปแบบ ซึ่งจะสามารถศึกษาตามรูปแบบได้ และต้องใช้หลักการสังเกตและจดจำ เพื่ออ่านออกเสียงคำศัพท์ที่ไม่ได้ตรงตามรูปแบบ โดยจะต้องดูในเรื่องของการลงสูง-ต่ำ เสียงหนัก-เบา เสียงต้น-เสียงปลายด้วย

วิธีการสอนเพื่อเพิ่มทักษะการอ่านออกเสียงภาษาอังกฤษ

การอ่านออกเสียง หรือ Reading Aloud ไม่เท่ากับการอ่านออกเสียงที่เน้น Phonic การ Pronounce ของเด็ก แต่จะเป็นการให้ผู้สอนอ่านออกเสียงบทความ เนื้อหาที่จะใช้ให้ผู้เรียนฟัง และคิดตาม ด้วยการใช้ "คำถามประกอบการอ่าน" ตัวอย่างเช่น ใช้ What does that word mean? เมื่อเจอคำศัพท์ใหม่ และใช้อธิบายการยกตัวอย่างคำให้ง่ายลงด้วยคำที่มีความหมายเหมือนกัน ใกล้เคียงสัมพันธ์กัน Why is that happening? ใช้ถามเมื่อเกิดประเด็นที่เป็นใจความในเนื้อเรื่อง หรือใช้การเช็คความเข้าใจในเนื้อหาที่อ่านด้วย What this sentence mean? เป็นต้น เทคนิคนี้ผู้สอนจะต้องเตรียมตัวในการอธิบายเพิ่มเติม เพื่อขยายความเข้าใจให้ผู้เรียนเข้าใจได้ง่าย และเคลียร์ที่สุด และจะแลกมาด้วยทัศนคติที่ดีขึ้นของผู้เรียนต่อการอ่านภาษาอังกฤษแน่นอน เพราะเขาจะไม่รู้สึกว่าการอ่านมันยากเกินไป เนื่องจากเขามีครูคอยช่วยอ่านขยายความเข้าใจ

การอ่านออกเสียง (Reading Aloud) เป็นการอ่านเพื่อฝึกความถูกต้อง (Accuracy) และความคล่องแคล่ว (Fluency) ในการออกเสียงทักษะการอ่านภาษาอังกฤษ เป็นทักษะที่สามารถฝึกฝนให้ผู้เรียนเกิดความชำนาญ และมีความสามารถเพิ่มพูนขึ้นได้ ด้วยเทคนิควิธีการโดยเฉพาะครูผู้สอน จึงควรมีความรู้และเทคนิคในการสอนทักษะการอ่านให้แก่ผู้เรียนอย่างไร เพื่อให้การอ่านแต่ละลักษณะประสบผลสำเร็จโดยมีวิธีปฏิบัติในการพัฒนาการอ่านออกเสียง ดังนี้

1. Basic Steps of Teaching (BST) มีเทคนิคขั้นตอนการฝึกต่อเนื่องกันไป ดังนี้

1.1 ครูอ่านข้อความทั้งหมด 1 ครั้ง/นักเรียนฟัง

1.2 ครูอ่านทีละประโยค/นักเรียนทั้งหมดอ่านตาม

1.3 ครูอ่านทีละประโยค/นักเรียนอ่านตามทีละคน (อาจข้ามขั้นตอนนี้ได้ ถ้านักเรียนส่วนใหญ่อ่านได้ดีแล้ว)

1.4 นักเรียนอ่านคนละประโยคให้ต่อเนื่องกันไปจนจบข้อความทั้งหมด

1.5 นักเรียนฝึกอ่านเอง

1.6 สุ่มนักเรียนอ่าน

2. Reading for Fluency (Chain Reading) คือ เทคนิคการฝึกให้นักเรียนอ่านประโยคคนละประโยคอย่างต่อเนื่องกันไป เสมือนคนอ่านคนเดียวกัน โดยครูสุ่มเรียกผู้เรียนจากหมายเลขลูกโซ่ เช่น ครูเรียก Chain-number One นักเรียนที่มีหมายเลขลงท้ายด้วย 1, 11, 21, 31, 41, 51 จะเป็นผู้อ่านข้อความคนละประโยคต่อเนื่องกันไป หากสะดุดหรือติดขัดที่ผู้เรียนคนใดถือว่าโซ่ขาด ต้องเริ่มต้นที่คนแรกใหม่หรือเปลี่ยน Chain-number ใหม่

3. Reading and Look up คือ เทคนิคการฝึกให้นักเรียนแต่ละคน อ่านข้อความโดยใช้วิธีอ่านแล้วจำประโยค แล้วเงยหน้าขึ้นพูดประโยคนั้น ๆ อย่างรวดเร็วคล้ายวิธีอ่านแบบนักข่าว

4. Speed Reading คือ เทคนิคการฝึกให้นักเรียนแต่ละคน อ่านข้อความโดยเร็วที่สุดเท่าที่จะเร็วได้การอ่านแบบนี้ อาจไม่คำนึงถึงความถูกต้องทุกตัวอักษรแต่ต้องอ่านโดยไม่ข้ามคำ เป็นการฝึกธรรมชาติในการอ่านเพื่อความคล่องแคล่ว (Fluency) และเป็นการหลีกเลี่ยงการอ่านแบบสะกดทีละคำ

5. Reading for Accuracy คือ การฝึกอ่านที่มุ่งเน้นความถูกต้องชัดเจนในการออกเสียงทั้ง Stress/Intonation/Cluster/Final Sounds ให้ตรงตามหลักเกณฑ์ของการออกเสียง (Pronunciation) โดยอาจนำเทคนิค Speed Reading มาใช้ในการฝึก และเพิ่มความถูกต้องชัดเจนในการออกเสียง สิ่งที่

ต้องการจะเป็นผลให้ผู้เรียนมีความสามารถในการอ่านได้อย่างถูกต้อง (Accuracy) และคล่องแคล่ว (Fluency) ควบคู่กันไป

สรุปวิธีการสอน เพื่อเพิ่มทักษะการอ่านออกเสียงภาษาอังกฤษนั้นมีหลายวิธีมากมาย ซึ่งแต่ละวิธีจะเน้นไปที่การฝึกฝนและการเรียนรู้ เพื่อให้รู้พื้นฐานและแนวทางการทำแล้วทำซ้ำไปจนจำได้แล้วนำไปประยุกต์ใช้ใหม่ และหนึ่งในวิธีการสอนจากทั้งหมดนั้นคือ การสอนแบบโฟนิกส์ที่เรียนรู้จากพื้นฐานของเสียงของตัวอักษรก่อน แล้วนำมาใช้เพื่อให้เข้าใจหลักการอ่าน ซึ่งเป็นวิธีการที่ผู้วิจัยเลือกในการพัฒนาทักษะการอ่านออกเสียงภาษาอังกฤษของผู้เรียน

ชุดฝึกอ่านคำศัพท์

ความหมายชุดฝึกอ่านคำศัพท์ มีชื่อเรียกแตกต่างออกไป เช่น แบบฝึก แบบฝึกหัด แบบฝึกเสริมทักษะ ชุดฝึก หรือชุดการฝึกในการเรียนการสอน การฝึกมีความจำเป็นอย่างมาก เพราะช่วยส่งเสริมและพัฒนา ให้ผู้เรียนเกิดทักษะและเข้าใจในบทเรียนมากขึ้น นอกจากนี้ผู้เรียนยังสามารถแก้ไขข้อบกพร่องทางการเรียนด้วยการฝึกจากแบบฝึกที่ผู้สอนสร้างขึ้น การฝึกปฏิบัติอย่างสม่ำเสมอ จะทำให้ผู้เรียนเกิดการเรียนรู้ได้ดียิ่งขึ้น ได้มีผู้ให้คำจำกัดความของแบบฝึกทักษะไว้

อังศุมาลิน เพิ่มผล (2542) ได้ให้คำจำกัดความไว้ว่า แบบฝึก หมายถึง งานกิจกรรมหรือประสบการณ์ที่ผู้สอนจัดให้ผู้เรียนได้ฝึกหัด เพื่อทบทวนฝึกฝนเนื้อหาความรู้ต่าง ๆ ที่ได้เรียนไปแล้วจนสามารถปฏิบัติได้ด้วยความชำนาญและผู้เรียนสามารถนำไปใช้ในชีวิตประจำวันได้

ความสำคัญของชุดฝึกอ่านคำศัพท์

ชาลิสา ทองติด (2556) ความสำคัญของแบบฝึกเสริมทักษะว่า เป็นหัวใจของการสอนวิชาทักษะ เพราะผู้เรียนจะมีทักษะมากน้อยเพียงใดขึ้นอยู่กับการฝึก การฝึกอย่างถูกวิธีจะทำให้เกิดความชำนิชำนาญ คล่องแคล่วว่องไวและทำได้โดยอัตโนมัติ แบบฝึกเสริมทักษะเป็นส่วนเพิ่มเติมหรือเสริมหนังสือเรียนแบบฝึกเสริมทักษะ ช่วยลดภาระของผู้สอน ช่วยส่งเสริมให้ทักษะทางภาษาคงทน ช่วยในเรื่องความแตกต่างระหว่างบุคคล เพราะการให้ผู้เรียนทำแบบฝึกเสริมทักษะที่เหมาะสมกับความสามารถของตนเอง จะทำให้ประสบผลสำเร็จทางด้านจิตใจมาก ทั้งยังช่วยให้ผู้เรียนสามารถทบทวนสิ่งที่เรียนได้ด้วยตนเอง และใช้เป็นเครื่องมือวัดผลการเรียนได้อีกด้วย จึงอาจกล่าวสรุปได้ว่า แบบฝึกเสริมทักษะเป็นเครื่องมือสำคัญที่จะช่วยให้ผลสัมฤทธิ์ทางการเรียนของผู้เรียนสูงขึ้น มีความสำคัญและจำเป็นต่อการเรียนวิชาที่ต้องการฝึกฝนเพื่อให้เกิดทักษะ ความชำนาญ มีความเข้าใจเนื้อหาบทเรียนมากยิ่งขึ้น และทำได้โดยอัตโนมัติ

การวัดผลสัมฤทธิ์ทางการเรียน

ความหมายของผลสัมฤทธิ์ทางการเรียน

ผลสัมฤทธิ์ทางการเรียน หมายถึง ความรู้ ความเข้าใจ ความสามารถ และทักษะทางด้านวิชาการ รวมทั้งสมรรถภาพทางสมอง และมวลประสบการณ์ทั้งปวงที่เด็กได้รับการเรียนการสอน ทำให้เกิดการเปลี่ยนแปลงพฤติกรรมในด้านต่าง ๆ ซึ่งแสดงให้เห็นได้ด้วยคะแนนจากแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน

ปัญจา ชูช่วย (2551) กล่าวว่า ผลสัมฤทธิ์ทางการเรียน หมายถึง ความสำเร็จที่ได้จากการเรียน ซึ่งเกิดจากการกระทำที่ต้องอาศัยความพยายามในการเรียน โดยต้องอาศัยความสามารถเฉพาะบุคคล การวัดผลสัมฤทธิ์ทางการเรียนเป็นการตรวจสอบระดับความสามารถของผู้เรียน แสดงออกในรูปของคะแนนหรือเกรดเฉลี่ยสะสม

กัลยาภรณ์ ศิริวรประสาท (2555) กล่าวถึงผลสัมฤทธิ์ทางการเรียนไว้ว่า ผลสัมฤทธิ์ทางการเรียนหมายถึง ความสามารถทักษะและความรู้ที่เกิดขึ้นภายหลังจากที่บุคคลได้รับประสบการณ์ ทั้งที่ครูกำหนดให้และจากการเรียนรู้ด้วยตนเองในกระบวนการเรียนการสอน ซึ่งอาจเป็นผลมาจากความสามารถทางด้านร่างกายและสมองเฉพาะตัวของแต่ละบุคคล ซึ่งวัดได้ด้วยเครื่องมือทางจิตวิทยาหรือแบบวัดผลสัมฤทธิ์ทั่วไป

จุดมุ่งหมายของการวัดผลสัมฤทธิ์ทางการเรียน

การวัดผลสัมฤทธิ์ เป็นการตรวจสอบระดับความสามารถของสมรรถภาพทางสมองของบุคคลว่าเรียนรู้แล้วรู้อะไรบ้าง และมีความสามารถในด้านใดมากน้อยเพียงใด เช่น มีพฤติกรรมด้านความรู้ ความจำ ความเข้าใจ การนำไปใช้ การวิเคราะห์ การสังเคราะห์ และการประเมินค่ามากน้อยอยู่ระดับใด นั่นคือการวัดผลสัมฤทธิ์เป็นการตรวจสอบพฤติกรรมของผู้เรียนในด้านพุทธพิสัยนั่นเอง ซึ่งเป็นการวัด 2 องค์ประกอบตามจุดมุ่งหมาย และลักษณะของวิชาการที่เรียน (พวงรัตน์ ทวีรัตน์, 2538)

1. การวัดด้านปฏิบัติ เป็นการตรวจสอบความรู้ ความสามารถทางการปฏิบัติ โดยให้ผู้เรียนได้ปฏิบัติจริงให้เห็นเป็นผลงานปรากฏออกมาที่สังเกตและวัดได้ เช่น วิชาศิลปศึกษา พลศึกษา การช่าง เป็นต้น การวัดแบบนี้จึงต้องวัดโดยใช้ข้อสอบภาคปฏิบัติ ซึ่งการประเมินผลจะพิจารณาที่วิธีปฏิบัติและผลงานที่ปฏิบัติ

2. การวัดด้านเนื้อหา เป็นการตรวจสอบความรู้ความสามารถเกี่ยวกับเนื้อหารวมทั้งพฤติกรรมความสามารถในด้านต่าง ๆ อันเป็นผลมาจากการเรียนการสอน มีวิธีการสอบวัดได้ 2 ลักษณะคือ

2.1 การสอบปากเปล่า การสอบแบบนี้มักจะทำโดยรายบุคคล ซึ่งเป็นการสอบที่ต้องการดูแลเฉพาะอย่าง เช่น การสอบอ่านหนังสือ การสอบสัมภาษณ์ ซึ่งต้องการดูการใช้ถ้อยคำในการตอบคำถาม รวมทั้งการแสดงความคิดเห็นและบุคลิกภาพต่าง ๆ เช่น การสอบปริญญานิพนธ์ ซึ่งต้องการวัดความรู้ความเข้าใจในเรื่องที่ทำ และคำถามก็สามารถเปลี่ยนแปลงหรือเพิ่มเติมได้ตามที่ต้องการ

2.2 การสอบแบบให้เขียนตอบ เป็นการสอบวัดที่ให้ผู้สอบเขียนเป็นตัวหนังสือตอบ ซึ่งมีรูปแบบตอบอยู่ 2 แบบคือ

1) แบบไม่จำกัดคำตอบ ซึ่งได้แก่ การสอบวัดที่ใช้ข้อสอบแบบอัตนัยหรือความเรียง

2) แบบจำกัดคำตอบ ซึ่งเป็นการสอบที่กำหนดขอบเขตของคำถามที่จะให้ตอบหรือกำหนดคำตอบที่ให้เลือก ซึ่งมีรูปแบบของคำตอบอยู่ 4 รูปแบบคือ

(1) แบบเลือกทางใดทางหนึ่ง

(2) แบบจับคู่

(3) แบบเติมคำ

(4) แบบเลือกคำตอบ

การวัดผลสัมฤทธิ์ทางการเรียน เป็นการวัดพฤติกรรม 3 กลุ่มพฤติกรรมด้วยกัน คือ

1. พฤติกรรมการเรียนรู้ด้านพุทธิพิสัย เป็นพฤติกรรมที่แสดงออกถึงความสามารถ และความคิดรวมทั้งการแก้ปัญหาเกี่ยวกับสิ่งต่าง ๆ อันเป็นผลจากการเรียนการสอน ซึ่งพฤติกรรมด้านความรู้และความคิดประกอบด้วยพฤติกรรมย่อย 6 ขั้นตอน ดังต่อไปนี้

1) ความรู้ ความจำ หมายถึง ความสามารถของบุคคลที่จะรักษาไว้ ซึ่งเรื่องราวต่าง ๆ ที่ได้รับจากการเรียนการสอนและประสบการณ์ต่าง ๆ รวมทั้งสิ่งที่สัมผัสกับประสบการณ์นั้น ๆ และสามารถถ่ายทอดออกมาได้ถูกต้อง

2) ความเข้าใจ หมายถึง ความสามารถในการแปลความ ตีความ และสรุปความเกี่ยวกับสิ่งที่ได้พบ ซึ่งเป็นเรื่องราวและเหตุการณ์ต่าง ๆ ที่ได้รับรู้และสามารถสื่อความเข้าใจที่ตนมีอยู่นั้นไปสู่ผู้อื่นได้อย่างถูกต้อง

3) การนำไปใช้ หมายถึง ความสามารถในการนำความรู้ ทฤษฎี หลักการ กฎเกณฑ์ และวิธีการต่าง ๆ ซึ่งได้รับจากการเรียนรู้ไปใช้แก้ปัญหาในสถานการณ์จริงในชีวิตประจำวัน หรือสถานการณ์ใหม่ที่คล้ายคลึงกันได้อย่างถูกต้องเหมาะสม

4) การวิเคราะห์ หมายถึง ความสามารถในการจำแนกเรื่องราว ข้อเท็จจริงหรือเหตุการณ์ใด ๆ ออกเป็นส่วนย่อย ๆ และสามารถบอกได้ว่าส่วนย่อย ๆ นั้นแต่ละส่วนสำคัญอย่างไร ส่วนใดสำคัญที่สุด แต่ละส่วนมีความสัมพันธ์กันอย่างไร และมีหลักการใดร่วมกันอยู่

5) การสังเคราะห์ หมายถึง ความสามารถในการผสมผสานส่วนย่อย ๆ ให้เข้าด้วยกันเป็นส่วนใหญ่ ทำให้ได้ผลผลิตที่แปลกใหม่และดีไปกว่าเดิม พฤติกรรมด้านนี้เน้นให้เกิดความคิดสร้างสรรค์สิ่งใหม่

6) การประเมินค่า หมายถึง ความสามารถในการวินิจฉัย ตีราคาสิ่งต่าง ๆ หรือเรื่องต่าง ๆ ได้อย่างมีหลักเกณฑ์ เป็นที่ยอมรับโดยทั่วไป

สรุปพฤติกรรมการเรียนรู้ด้านพุทธพิสัย คือ พฤติกรรมย่อยด้านความรู้ ความจำเป็นพฤติกรรมที่มีระดับต่ำสุดถือเป็นพฤติกรรมขั้นพื้นฐาน ส่วนพฤติกรรมย่อยด้านความเข้าใจการนำไปใช้ การวิเคราะห์ การสังเคราะห์ และการประเมินค่า เป็นพฤติกรรมที่สูงขึ้นตามลำดับ ในการเรียนการสอนโดยหลักทั่วไปนั้น ต้องการให้ผู้เรียนเกิดพฤติกรรมสูงกว่าความรู้ ความจำ คือ เป็นการพัฒนาให้เกิดความคิด

พฤติกรรมการเรียนรู้ด้านจิตพิสัย

เป็นพฤติกรรมที่แสดงออกถึงการเปลี่ยนแปลงทางด้านจิตใจ เจตคติ ค่านิยม ความสนใจ ความชื่นชมของบุคคลต่อสิ่งต่าง ๆ ประกอบด้วยพฤติกรรมย่อย 5 ขั้น ดังนี้

1) การรับรู้ เป็นความสามารถในการฉับไวต่อการรับรู้สิ่งเร้าต่าง ๆ ได้มากในเวลาจำกัด

2) การตอบสนอง เป็นพฤติกรรมที่แสดงออกในการตอบสนองต่อสิ่งเร้าในลักษณะของความยินยอม เต็มใจ และพอใจ

3) การสร้างคุณค่าหรือค่านิยม เป็นพฤติกรรมที่แสดงออกถึงความรู้สำนึกในคุณค่าของสิ่งต่าง ๆ จนเกิดการยอมรับ และเชื่อถือในสิ่งนั้น

4) การจัดระบบคุณค่าหรือค่านิยม เป็นการนำค่านิยมมาจัดให้เป็นระบบ โดยอาศัยกระบวนการจัดพวก หาความสัมพันธ์ และกำหนดค่านิยมที่เด่นและสำคัญแล้วนำกระบวนการนั้นมาสร้างระบบค่านิยมที่เหมาะสมกับเหตุการณ์ต่าง ๆ ต่อไป

5) การสร้างลักษณะนิสัย เป็นความสามารถในการจัดระบบค่านิยมที่บุคคลยึดถืออยู่ จนสามารถควบคุมพฤติกรรม และทำให้เกิดบูรณาการทางความเชื่อ ความคิด เจตคติ และก่อให้เกิดพฤติกรรมที่เป็นลักษณะนิสัยประจำตัวของบุคคลแต่ละคน

พฤติกรรมการเรียนรู้ด้านทักษะพิสัย

เป็นพฤติกรรมที่แสดงออกถึงความสามารถในการใช้กลไกทางกาย และทางสมองได้สัมพันธ์กันจนสามารถใช้ส่วนต่าง ๆ ของร่างกายทำงานอย่างมีจุดหมาย ซึ่งแบ่งออกเป็นพฤติกรรมย่อย ๆ 7 ขั้น ดังนี้

1) การรับรู้ เป็นการรับรู้โดยประสาทสัมผัสเกี่ยวกับรูปธรรม เช่น วัตถุ สิ่งของและนามธรรม เช่น คุณสมบัติหรือความสัมพันธ์

2) การเตรียมพร้อม เป็นความพร้อมทั้งทางใจ ความพร้อมทางกาย และความพร้อมทางอารมณ์

3) การเลียนแบบ เป็นการทำตามหรือเลียนแบบ

4) การปฏิบัติได้ เป็นพฤติกรรมตอบสนองที่พัฒนาจนเป็นนิสัย

5) การตอบสนองที่ซับซ้อน เป็นการแสดงออกที่ซับซ้อนตามกระบวนการปฏิบัติอย่างไม่ลังเล และเป็นไปโดยอัตโนมัติ

6) การดัดแปลง เป็นขั้นที่ทดลองหาวิธีอื่นมาปฏิบัติหลังจากที่ได้ปฏิบัติวิธีเดิมจนชำนาญแล้ว เพื่อเพิ่มประสิทธิภาพให้มากขึ้น

7) การริเริ่ม เป็นการประยุกต์สิ่งที่ได้ดัดแปลงแล้ว เพื่อให้เกิดสิ่งใหม่ขึ้น

กรอบแนวคิดในการวิจัย

ตัวแปรต้น		ตัวแปรตาม
การอ่านออกเสียงคำศัพท์ภาษาอังกฤษโดยใช้ชุดฝึกอ่านคำศัพท์	→	ผลสัมฤทธิ์ด้านการอ่านออกเสียงคำศัพท์ภาษาอังกฤษโดยใช้ชุดฝึกอ่านคำศัพท์

วิธีดำเนินการวิจัย

1. ประชากรและกลุ่มตัวอย่าง

ประชากร คือ นักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 1 ห้องเรียน รวมทั้งสิ้น 30 คน

กลุ่มตัวอย่าง คือ นักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 1 ห้องเรียน รวมทั้งสิ้น 30 คน ได้มาจากการเลือกแบบเจาะจง

2. เครื่องมือที่ใช้ในการทดลอง

2.1 เครื่องมือที่ใช้ในการวิจัย

1. แผนการจัดการเรียนรู้ วิชา ภาษาอังกฤษ ชั้นประถมศึกษาปีที่ 3 จำนวน 5 แผน
2. แบบทดสอบวัดผลสัมฤทธิ์ทางการอ่าน ชุดฝึกอ่านคำศัพท์ 5 ชุด
3. ชุดฝึกอ่านคำศัพท์
   - 3.1 ชุดฝึกอ่านคำศัพท์ ชุดที่ 1 เกี่ยวกับอาชีพ (Occupations)
   - 3.2 ชุดฝึกอ่านคำศัพท์ ชุดที่ 2 เกี่ยวกับโรงเรียน (School)
   - 3.3 ชุดฝึกอ่านคำศัพท์ ชุดที่ 3 เกี่ยวกับโรงพยาบาล (Hospital)
   - 3.4 ชุดฝึกอ่านคำศัพท์ ชุดที่ 4 เกี่ยวกับสถานที่ (Places)
   - 3.5 ชุดฝึกอ่านคำศัพท์ ชุดที่ 5 เกี่ยวกับอารมณ์และความรู้สึก (Emotions and Feelings)

2.2 การพัฒนาเครื่องมือที่ใช้ในการวิจัย ผู้วิจัยดำเนินการสร้าง ดังนี้

1) แผนการจัดการเรียนรู้การอ่านออกเสียงคำศัพท์ภาษาอังกฤษ โดยใช้ชุดฝึกอ่านคำศัพท์

(1) ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาต่างประเทศ สาระและมาตรฐานการเรียนรู้ คุณภาพผู้เรียน ตัวชี้วัดและสาระการเรียนรู้แกนกลาง

(2) ศึกษาหลักสูตรสถานศึกษากลุ่มสาระการเรียนรู้ภาษาต่างประเทศ ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานเพื่อศักราช 2551 เกี่ยวกับเนื้อหาโครงสร้างเวลาเรียนการวัดและการประเมินผล

(3) ศึกษาและวิเคราะห์มาตรฐานการเรียนรู้ ตัวชี้วัด เนื้อหา และสาระการเรียนรู้ภาษาอังกฤษ กลุ่มสาระการเรียนรู้ภาษาต่างประเทศ เพื่อแบ่งเนื้อหาในการสร้างแผนการจัดการเรียนรู้

(4) ศึกษาแนวคิด หลักการ และทฤษฎีที่เกี่ยวข้องกับการสร้างแผนการจัดการเรียนรู้เพื่อฝึกทักษะการอ่านออกเสียง สำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 จากเอกสารและงานวิจัยที่เกี่ยวข้อง

(5) สร้างแผนการจัดการเรียนรู้การอ่านออกเสียงคำศัพท์ภาษาอังกฤษ โดยใช้ชุดฝึกอ่านคำศัพท์ ประกอบการเรียนการสอนตามเนื้อหา

(6) นำแผนการจัดการเรียนรู้ที่สร้างเรียบร้อยแล้วให้ผู้เชี่ยวชาญด้านการสอนภาษาอังกฤษจำนวน 3 ท่าน ประเมินคุณภาพของแผนการจัดการเรียนรู้ ด้วยแบบประเมินคุณภาพแบบมาตรประมาณค่า 5 ระดับ (Rating Scale) ของลิเคิร์ท (Likert) โดยมีคะแนนประเมินเฉลี่ยอยู่ที่ 4.24 ซึ่งมีค่ามากกว่า 3.5 ขึ้นไป แสดงว่า แผนการจัดการเรียนรู้อยู่ในเกณฑ์ที่เหมาะสมที่สามารถนำไปใช้ได้

(7) นำแผนการจัดการเรียนรู้มาปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ

(8) นำแผนการสอนไปใช้กับกลุ่มตัวอย่างต่อไป

2) การสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการอ่าน

(1) ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาต่างประเทศ สาระ และมาตรฐานการเรียนรู้ คุณภาพผู้เรียน ตัวชี้วัด และสาระการเรียนรู้แกนกลาง

(2) ศึกษาหลักสูตรสถานศึกษา กลุ่มสาระการเรียนรู้ภาษาต่างประเทศตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 เกี่ยวกับเนื้อหาโครงสร้างเวลาเรียน การวัด และการประเมินผล

(3) ศึกษาและวิเคราะห์มาตรฐานการเรียนรู้ ตัวชี้วัด เนื้อหาและสาระการเรียนรู้ภาษาอังกฤษ กลุ่มสาระการเรียนรู้ภาษาต่างประเทศ เพื่อแบ่งเนื้อหาในการสร้างชุดฝึกอ่านคำศัพท์

(4) ศึกษาแนวคิด หลักการ และทฤษฎีที่เกี่ยวข้องกับการสร้างแบบทดสอบ วัดผลสัมฤทธิ์ทางการอ่านสำหรับนักเรียนชั้นประถมศึกษาปีที่ 3 จากเอกสารและงานวิจัยที่เกี่ยวข้อง

(5) สร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการอ่านคำศัพท์ จำนวน 5 ชุด ได้แก่

- ชุดฝึกอ่านคำศัพท์ ชุดที่ 1 เกี่ยวกับอาชีพ (Occupations)
- ชุดฝึกอ่านคำศัพท์ ชุดที่ 2 เกี่ยวกับโรงเรียน (School)
- ชุดฝึกอ่านคำศัพท์ ชุดที่ 3 เกี่ยวกับโรงพยาบาล (Hospital)
- ชุดฝึกอ่านคำศัพท์ ชุดที่ 4 เกี่ยวกับสถานที่ (Places)

- ชุดฝึกอ่านคำศัพท์ ชุดที่ 5 เกี่ยวกับอารมณ์และความรู้สึก (Emotions and Feelings)

(6) นำแบบทดสอบวัดผลสัมฤทธิ์ทางการอ่าน เสนอให้อาจารย์ที่ปรึกษาตรวจสอบความถูกต้องแล้วนำไปให้ผู้เชี่ยวชาญ จำนวน 3 ท่าน เพื่อตรวจสอบความถูกต้อง ความเหมาะสม และประเมินคุณภาพของชุดฝึกอ่านคำศัพท์ โดยใช้แบบประเมินคุณภาพแบบมาตรประมาณค่า 5 ระดับ (Rating Scale) ของลิเคิร์ท (Likert)

(7) จากนั้นวิเคราะห์หาค่าความยาก (P) ได้ค่าระหว่าง 0.5 - 0.8 ค่าอำนาจจำแนก (r) ได้ค่าระหว่าง 0.4 - 0.8 และค่าความเชื่อมั่น (KR20) ของแบบวัดผลสัมฤทธิ์การอ่าน คำศัพท์พื้นฐานของนักเรียนระดับชั้นประถมศึกษาปีที่ 3 ได้ค่า 0.78

(8) นำแบบการสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการอ่านมาปรับปรุง

3) การสร้างแบบฝึกทักษะการอ่านคำศัพท์พื้นฐาน ผู้วิจัยได้ดำเนินการสร้างเครื่องมือในการวิจัย ดังนี้

(1) ศึกษาทฤษฎีและรูปแบบของการสร้างแบบฝึกทักษะจากเอกสารและงานวิจัยที่เกี่ยวข้อง

(2) ศึกษาหลักสูตรสถานศึกษากลุ่มสาระการเรียนรู้ภาษาต่างประเทศตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 เกี่ยวกับเนื้อหาโครงสร้างเวลาเรียน การวัดและการประเมินผล

(3) จัดลำดับเนื้อหาเละส่วนประกอบในแบบฝึกทักษะ โดยมีคำชี้แจง จุดประสงค์และคำแนะนำการใช้แบบฝึกทักษะ

(4) จัดทำแบบแบบฝึกทักษะการเขียนคำศัพท์พื้นฐาน

(5) นำแบบฝึกทักษะการอ่านคำศัพท์พื้นฐานพร้อมแบบประเมินที่สร้างขึ้นเสนอต่อผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบความเที่ยงตรงเชิงเนื้อหา (IOC) ผลการพิจารณาการลงความเห็นของผู้เชี่ยวชาญมีค่าอยู่ระหว่าง 0.67 - 1.0

(6) นำแบบฝึกทักษะที่ตรวจสอบแล้วมาแก้ไขปรับปรุงตามคำแนะนำของผู้เชี่ยวชาญ

3. วิธีการเก็บรวบรวมข้อมูล

1) ผู้วิจัยชี้แจงกับนักเรียนทั้งห้องให้เข้าใจวัตถุประสงค์ของการจัดการเรียนรู้วิชาภาษาอังกฤษ ชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี

2) ทดสอบโดยการอ่านชุดฝึกอ่านคำศัพท์

3) ดำเนินการจัดกิจกรรมการเรียนรู้

4) ทดสอบหลังเรียนโดยการอ่านชุดฝึกอ่านคำศัพท์

4. การเก็บรวบรวมข้อมูล

1) ผู้วิจัยทำการทดสอบก่อนเรียนใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการอ่านชุดฝึกอ่านคำศัพท์แล้วบันทึกลงแบบการให้คะแนน

2) ผู้วิจัยดำเนินการทดลองโดยให้นักเรียนใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการอ่านชุดฝึกอ่านคำศัพท์

3) ทำการทดสอบหลังสอนโดยแบบทดสอบวัดผลสัมฤทธิ์ทางการอ่านชุดฝึกอ่านคำศัพท์แบบเดียวกับก่อนเรียน

5. การวิเคราะห์ข้อมูล

การวิจัยครั้งนี้ ผู้วิจัยวิเคราะห์ข้อมูลตามค่าคะแนนที่ได้จากการทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนมาวิเคราะห์ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน (S.D.) และค่า t-test Independent

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

1. การหาค่าสถิติพื้นฐาน ได้แก่ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน
2. สถิติทดสอบเครื่องมือวิจัย ได้แก่ IOC ความเที่ยง ความยาก และอำนาจจำแนก
3. สถิติทดสอบสมมุติฐานการวิจัย ได้แก่ t-test Independent

ผลการวิจัย

ผลการวิเคราะห์การพัฒนาทักษะการออกเสียงคำศัพท์ภาษาอังกฤษ โดยใช้ชุดฝึกอ่านคำศัพท์ของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี อำเภอหาดใหญ่ จังหวัดสงขลา มีดังนี้

ตารางที่ 1 การเปรียบเทียบผลสัมฤทธิ์ทางการอ่านของนักเรียนชั้นประถมศึกษาปีที่ 3 ก่อนเรียนและหลังเรียนโดยชุดฝึกอ่าน

คะแนนทดสอบ	N	$\overline{x}$	S.D.	df	t	Sig
ก่อนเรียน	30	12.69	1.32	29	7.12 *	.000
หลังเรียน	30	18.67	1.80			

* มีนัยสำคัญทางสถิติที่ระดับ .05

จากตาราง 1 พบว่า นักเรียนที่เรียนโดยใช้ชุดฝึกอ่านคำศัพท์ มีคะแนนเรียนก่อนเรียนเฉลี่ย 12.96 ค่าความเบี่ยงเบนมาตรฐาน เท่ากับ 1.32 และคะแนนหลังเรียนเฉลี่ย 18.67 ค่าความเบี่ยงเบนมาตรฐาน เท่ากับ 1.80 เมื่อนำคะแนนเฉลี่ยมาเปรียบเทียบผลสัมฤทธิ์ทางการอ่าน พบว่า หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

ภาพที่ 1 แบบฝึกทักษะการอ่านคำศัพท์
ที่มา: ผู้วิจัย

ภาพที่ 2 การทดลองใช้แบบฝึกทักษะการอ่านคำศัพท์
ที่มา: ผู้วิจัย

สรุปและอภิปรายผล

นักเรียนที่เรียนโดยใช้ชุดฝึกอ่านคำศัพท์ ของนักเรียนชั้นประถมศึกษาปีที่ 3 โรงเรียนบ้านเกาะหมี มีผลสัมฤทธิ์ในการอ่านหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ทั้งนี้อาจเป็นเพราะว่า ชุดกิจกรรมการเรียนรู้ด้วยชุดฝึกอ่านคำศัพท์ร่วมกับการใช้แผนการจัดการเรียนรู้ด้วยการสอนหน่วยการเรียนรู้จำนวน 5 แผน มีการพัฒนานักเรียนในด้านการอ่านออกเสียง โดยเริ่มในระดับพื้นฐานจากการสะกดคำที่นำสระภาษาอังกฤษมาผสมกับเสียงพยัญชนะ พร้อมทั้งใช้วิธีการฝึกเชื่อมโยงเสียงของคำและภาพที่มีความหมายให้ตรงกับเสียงได้ ตลอดจนการฝึกอ่านออกเสียงในระดับคำเป็นจังหวะช้า ๆ โดยคำศัพท์ที่เลือกใช้มาออกแบบเพื่อให้นักเรียนและผู้สอนที่ไม่ใช่เจ้าของภาษาสามารถออกเสียงตามได้ง่าย และตรงกับตัวชี้วัดในหลักสูตรแกนกลางปี การศึกษา 2551 ในวงคำศัพท์ที่เด็กประถมศึกษาควรรู้จักเป็นวิธีการสอนให้ออกเสียงได้ชัด ถูกต้อง และหัดสะกดคำได้อย่างมีระบบ จะเริ่มจากการฝึกออกเสียงตัวอักษรแต่ละตัวไปจนถึงการอ่านเป็นคำ ซึ่งเป็นพื้นฐานในการเรียนรู้ภาษาอังกฤษในระดับสูงต่อไป เกิดเป็นผลสัมฤทธิ์ทางการเรียนด้านความรู้ ความจำ ความเข้าใจ และการนำไปใช้ อีกทั้งยังมีชุดกิจกรรมการเรียนรู้ที่เข้าใจง่าย มีภาพประกอบเนื้อหาที่น่าสนใจสามารถฝึกซ้ำได้ สอดคล้องกับ รัชดากาญจน์ ใยดี (2565) ได้ศึกษาการพัฒนาทักษะการอ่านออกเสียงคำศัพท์ภาษาอังกฤษโดยใช้แบบฝึกทักษะการอ่านออกเสียงแบบโฟนิกส์ ของนักเรียนชั้นประถมศึกษาปีที่ 4 ผลปรากฏว่า คะแนนการอ่านออกเสียงคำศัพท์

ภาษาอังกฤษหลังเรียน ของนักเรียนชั้นประถมศึกษาปีที่ 4 โดยใช้แบบฝึกทักษะการอ่านออกเสียงแบบโฟนิกส์สูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และ อัจจิมา ไชยชิต (2563) ได้ศึกษาการพัฒนาทักษะการอ่านออกเสียงสะกดคำภาษาอังกฤษ (Phonics) โดยใช้แบบฝึกทักษะของนักเรียนชั้นประถมศึกษาปีที่ 2 ผลวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนด้านการอ่านออกเสียงสะกดคำศัพท์ภาษาอังกฤษ พบว่า หลังเรียนสูงกว่าก่อนเรียน แสดงให้เห็นว่า ในการทดสอบก่อนเรียนนักเรียนสามารถอ่านออกเสียงสะกดคำได้เฉลี่ย 1.25 คะแนนจากคะแนนเต็ม 5 คะแนน คิดเป็นร้อยละ 25.00 และเมื่อทำการทดสอบหลังเรียนนักเรียนสามารถอ่านออกเสียงได้เฉลี่ย 4.05 คะแนนคิดเป็น ร้อยละ 81.00 แสดงว่าหลังจากการจัดการเรียนรู้โดยใช้แบบฝึกทักษะและสอนซ่อมเสริมแล้ว นักเรียนมีทักษะการอ่านออกเสียงสะกดคำที่ดีขึ้น

ข้อเสนอแนะ

จากผลการวิจัยที่ได้เสนอไปแล้วนั้น ผู้วิจัยมีข้อเสนอแนะดังต่อไปนี้

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 การจัดการเรียนการสอน ควรกำหนดกิจกรรมและระยะเวลาให้สอดคล้องกันในการวิจัยในครั้งนี้ ควรจะลดกิจกรรมลง เนื่องจากไม่สามารถทำกิจกรรมทั้งหมดภายใน 1 คาบเรียน จึงต้องเพิ่มเวลาภายในคาบเรียนจาก 2 ชั่วโมงเป็น 3 ชั่วโมงต่อสัปดาห์

1.2 ควรเพิ่มกิจกรรมให้นักเรียนได้ออกเสียงคำศัพท์รายบุคคลมากกว่านี้ เพื่อตรวจสอบความเข้าใจของผู้เรียนแต่ละคน และเป็นการเสริมสร้างกระบวนการนำไปใช้พูดในการสื่อสารภาษาอังกฤษ เนื่องจากแบบฝึกหัดสามารถพัฒนาถึงกระบวนการอ่านได้ แต่หากไม่นำมาใช้สื่อสารก็จะยังคงอยู่ในเรื่องของทักษะการอ่านเพียงอย่างเดียว

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ในการวิจัยครั้งนี้ เนื้อหาในการจัดกิจกรรมการเรียนการสอนยังอยู่ในส่วนของการออกคำศัพท์เท่านั้น ดังนั้นในการวิจัยครั้งต่อไปควรมีการอ่านที่ไม่เน้นแต่เพียงแค่ระดับคำ แต่ควรเพิ่มในระดับประโยคสั้น ๆ เป็นลำดับต่อไป เพื่อหาศักยภาพของการสอนว่าสามารถพัฒนาการอ่านของนักเรียนได้ถึงระดับใด

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การพัฒนาผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่องการหาร โดยใช้แบบฝึกทักษะการหารของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา

Development of Mathematics Achievement in Division Using a Set of Division Skill Worksheets for Grade 2 Students at Ban Nong Nai Kui School, Hat Yai District, Songkhla Province,

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์ เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนคณิตศาสตร์ก่อนและหลังใช้แบบฝึกทักษะการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 จากการจัดการเรียนรู้โดยใช้แบบฝึกทักษะการหาร กลุ่มตัวอย่างที่ใช้ในการวิจัย คือ นักเรียนชั้นประถมศึกษาปีที่ 2 ปีการศึกษา 2566 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา จำนวนนักเรียน 15 คน ซึ่งได้มาโดยการเจาะจง เครื่องมือในการวิจัย ได้แก่ 1) แผนการจัดการเรียนรู้ 2) แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน 3) แบบฝึกทักษะการหาร สถิติวิเคราะห์ข้อมูล ได้แก่ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตราฐาน และ t-test Dependent

ผลการวิจัยพบว่า การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนการใช้แบบฝึกทักษะวิชาคณิตศาสตร์ เรื่องการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

คำสำคัญ: การพัฒนาผลสัมฤทธิ์ทางการเรียน, การหาร, คณิตศาสตร์, แบบฝึกทักษะ

Abstract

This research aims to compare the mathematics learning performance before and after using a Division Skills Training Module among second-grade elementary students. The study was conducted by implementing the training module for a sample group of grade 2 students in the academic year 2023 at Ban Nong Nai Kui School, Hat Yai District, Songkhla Province. The sample consisted of 15 students selected through targeted sampling. Research tools included: 1) a learning management plan, 2) a test to measure learning

performance, and 3) a Division Skills Training Module. Statistical analysis involved calculating means, standard deviations, and dependent t-tests.

The research findings indicate that there is a statistically significant improvement in mathematics learning performance after using the Division Skills Training Module among second-grade elementary students, with significance level at .05.

Keywords: Improving Learning Performance, Division, Mathematics, Skills Training

บทนำ

ในการจัดการเรียนการสอนที่สอดคล้องกับหลักสูตรแกนกลางศึกษาพื้นฐาน พุทธศักราช 2551 มุ่งพัฒนาผู้เรียนทุกคนให้เป็นมนุษย์ที่มีความสมดุลทั้งด้านร่างกาย ด้านความรู้ คุณธรรม มีความสุข เป็นหลักสูตรที่เน้นพัฒนาเป็นสำคัญ และเป็นหลักสูตรสำหรับการศึกษาทั้งในระบบ นอกระบบ และตามอัธยาศัย ดังนั้นการจัดกิจกรรมการเรียนการสอนจึงมุ่งให้ผู้เรียนเป็นผู้สร้างความรู้ด้วยตนเอง ผู้เรียนมีปฏิสัมพันธ์ต่อกันและกัน ผู้เรียนมีบทบาทสำคัญในการจัดการเรียนการสอนรวม ทั้งมีส่วนร่วมในกระบวนการเรียนรู้ควบคู่ไปกับพัฒนาการเรียนรู้ และสามารถนำความรู้ที่ได้ปรับไปใช้ในระดับที่สูงขึ้นไป

คณิตศาสตร์มีบทบาทสำคัญยิ่งต่อการพัฒนาความคิดของมนุษย์ ทำให้มนุษย์มีความคิดสร้างสรรค์ คิดอย่างมีเหตุผลเป็นระบบมีแบบแผน สามารถวิเคราะห์ปัญหาหรือสถานการณ์ได้อย่างถี่ถ้วนรอบคอบ ช่วยให้คาดการณ์วางแผนตัดสินใจแก้ปัญหา และนำไปใช้ในชีวิตประจำวันได้ถูกต้องเหมาะสม นอกจากนี้ คณิตศาสตร์ยังเป็นเครื่องมือในการศึกษาทางด้านวิทยาศาสตร์ เทคโนโลยี และศาสตร์อื่น ๆ คณิตศาสตร์จึงมีประโยชน์ต่อการดำเนินชีวิต ช่วยพัฒนาคุณภาพชีวิตให้ดีขึ้น และสามารถอยู่ร่วมกับผู้อื่นได้อย่างมีความสุข (กระทรวงศึกษาธิการ, 2553) โดยธรรมชาติของคณิตศาสตร์จะช่วยพัฒนาความสามารถในการคิดวิเคราะห์ แก้ปัญหา และอุปสรรคต่าง ๆ บนพื้นฐานของหลักเหตุผล ประยุกต์ความรู้มาใช้ในการป้องกันและแก้ปัญหา มีการตัดสินใจที่มีประสิทธิภาพ และเป็นวิชาที่ว่าด้วยเหตุผลกระบวนการคิด และการแก้ปัญหาคณิตศาสตร์เป็นวิชาที่ช่วยเสริมสร้างให้นักเรียนเป็นคนมีเหตุผล มีความคิดอย่างมีวิจารญาณและเป็นระบบ ตลอดจนมีทักษะการแก้ปัญหาทำให้สามารถวิเคราะห์ปัญหาและสถานการณ์ได้อย่างถี่ถ้วนรอบคอบ สามารถคาดการณ์ วางแผนตัดสินใจ และแก้ปัญหาได้อย่างเหมาะสม ซึ่งเป็นประโยชน์ในชีวิตประจำวันยิ่งกว่านั้น คณิตศาสตร์ยังเป็นเครื่องมือสำคัญ ในการศึกษาวิทยาศาสตร์ เทคโนโลยี และศาสตร์อื่น ๆ อย่างมากมายในปัจจุบันนี้ ดังนั้นจึงได้มีการให้มีการเรียนการสอนคณิตศาสตร์ในทุกระดับชั้น ตั้งแต่ประถมศึกษาจนมาถึงอุดมศึกษา

การจัดการเรียนการสอนในกลุ่มสาระการเรียนรู้คณิตศาสตร์ที่ผ่านมาพบว่า นักเรียนบางส่วนมีผลสัมฤทธิ์ทางการเรียนอยู่ในเกณฑ์ต่ำ ทั้งนี้อาจเนื่องมาจากสาเหตุและปัจจัยหลายประการ เช่น หลักสูตรเนื้อหา ครูผู้สอน นักเรียน สภาพแวดล้อม ผู้ปกครอง การจัดกิจกรรมการเรียนการสอน ตลอดจนเทคนิคและวิธีการสอนของครู และอาจเนื่องมาจากครู ทั่วไปมักเข้าใจว่าการสอนคณิตศาสตร์ คือ สอนหรืออธิบายเนื้อหาสาระแล้วให้นักเรียนทำแบบฝึกหัดเป็นการเพียงพอ แท้ที่จริงการสอนคณิตศาสตร์ ทุกเรื่องต้องพยายามให้นักเรียนได้ปฏิบัติจริงควบคู่กับการคำนวณ สิ่งแรก คือ การลงมือปฏิบัติ การพิสูจน์ การตรวจสอบแล้วให้ทำแบบฝึกหัด และในบางเรื่องครูต้องสาธิตให้เข้าใจหลักการควบคู่กับการอธิบาย โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา จากการประเมินคุณภาพการศึกษาขั้นพื้นฐานเพื่อประกันคุณภาพผู้เรียนหรือการสอบในระดับชั้นประถมศึกษาปีที่ 2 ปีการศึกษา 2566 และจาก

การศึกษาสภาพปัญหาการจัดการเรียนการสอนกลุ่มสาระคณิตศาสตร์ชั้นประถมศึกษาปีที่ 2 โดยการสัมภาษณ์ครูผู้สอนคณิตศาสตร์ จำนวน 2 คน พบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียนชั้นประถมศึกษาปีที่ 2 กลุ่มสาระการเรียนรู้คณิตศาสตร์ มีผลสัมฤทธิ์ทางการเรียนยังต่ำกว่าเกณฑ์ที่โรงเรียนกำหนด เมื่อตรวจสอบรายละเอียดด้านเนื้อหา พบว่า เนื้อหาที่มีคะแนนต่ำสุด คือ เรื่องการหาร ผู้วิจัยจึงคิดว่า ต้องมีการทบทวนความรู้เดิม สอนเนื้อหาใหม่โดยใช้สื่อของจริงอย่างหลากหลาย โดยใช้แบบฝึกทักษะเพื่อให้นักเรียนได้ฝึกทักษะนำความรู้ไปใช้ และสอดคล้องกับผลการวิจัยที่เกี่ยวข้องกับการใช้แบบฝึกทักษะของจิราวรรณ จิตรบรรจง (2563) ทำการวิจัยเรื่องการพัฒนาผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่องการหารของนักเรียนชั้นประถมศึกษาปีที่ 6 โรงเรียนวัดเสาธงนอก โดยใช้แบบฝึกทักษะ ผลการวิจัยพบว่าการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนด้วยชุดฝึกทักษะเรื่องการหาร สำหรับนักเรียนชั้นประถมศึกษาปีที่ 6 พบว่า ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์เรื่องการหารของนักเรียนชั้นประถมศึกษาปีที่ 6 โดยใช้แบบฝึกทักษะหลังเรียนสูงกว่าก่อนเรียน

ด้วยเหตุนี้ ทำให้ผู้วิจัยมีความสนใจที่จะสร้างแบบฝึกทักษะในรายวิชาคณิตศาสตร์ เรื่อง การหารของนักเรียนชั้นประถมศึกษาปีที่ 2 เพื่อใช้ในแก้ไขข้อบกพร่องของนักเรียนในการเรียนรู้ได้ตรงจุดและใช้เป็นแนวทางในการปรับปรุงการเรียนการสอนวิชาคณิตศาสตร์ของครูผู้สอนให้มีประสิทธิภาพสูงขึ้น และช่วยส่งผลให้นักเรียนมีเจตคติที่ดีต่อคณิตศาสตร์ เพื่อเป็นพื้นฐานในการดำเนินชีวิตและในการเรียนชั้นสูงต่อไป

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร โดยใช้แบบฝึกทักษะการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา

สมมติฐานของการวิจัย

ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย โดยใช้แบบฝึกทักษะการหารหลังเรียนสูงกว่าก่อนเรียน

แนวคิด ทฤษฎี กรอบแนวคิด

แบบฝึกทักษะ

ความหมายของแบบฝึกทักษะ

ศุภรณ์ ภูวัด (2553) กล่าวถึง แบบฝึกทักษะ หมายถึง สื่อประกอบกิจกรรมการเรียนการสอนซึ่งช่วยให้ผู้เรียนเกิดการเรียนรู้จากการปฏิบัติด้วยตนเอง ได้ฝึกทักษะเพิ่มเติมจากเนื้อหาจนปฏิบัติได้อย่างชำนาญ และให้ผู้เรียนสามารถไปใช้ในชีวิตประจำวันได้โดยมีครูเป็นผู้นำ

สุวิทย์ มูลคำ และ สุนันทา สุนทรประเสริฐ (2555) ได้สรุปความสำคัญของแบบฝึกทักษะว่าแบบฝึกทักษะมีความสำคัญต่อผู้เรียนไม่น้อย ในการที่จะช่วยส่งเสริมสร้างทักษะให้กับผู้เรียนได้เกิดการเรียนรู้และเข้าใจได้เร็วขึ้น ชัดเจนขึ้น กว้างขวางขึ้น ทำให้การสอนของครู และการเรียนของนักเรียนประสบผลสำเร็จอย่างมีประสิทธิภาพ

ณัฐชา อักษรเคช (2554) กล่าวว่า แบบฝึกทักษะ หมายถึง สื่อการเรียนรู้ที่สร้างขึ้นอย่างมีจุดหมายที่แน่นอน เพื่อให้ผู้เรียนเกิดการเรียนรู้จากการกระทำจริง เป็นประสบการณ์ตรงของผู้เรียนทำให้

ผู้เรียนเห็นคุณค่าของสิ่งที่เรียน สามารถเรียนรู้และจดจำสิ่งที่เรียนได้ดี และนำการเรียนรู้และความรู้ที่ได้ไปใช้ในประสบการณ์อื่นที่มีลักษณะคล้ายกันได้

สรุปได้ว่า แบบฝึกทักษะเป็นสื่อที่สร้างขึ้น เพื่อให้นักเรียนได้ฝึกฝนความรู้ที่ได้เรียนรู้ไปหรือเป็นการเสริมความรู้ให้กับนักเรียน เพื่อให้เกิดความถูกต้องและชำนาญ

ลักษณะของแบบฝึกทักษะที่ดี

ในการสร้างแบบฝึกทักษะสำหรับเด็ก มีองค์ประกอบหลายประการ ข้อเสนอแนะเกี่ยวกับลักษณะของแบบฝึกทักษะที่ดีไว้ ดังนี้

หยาดนภา ยัพราษฎร์ (2552) กล่าวว่า ลักษณะของแบบฝึกทักษะที่ดีควรมีหลากหลายรูปแบบ เพื่อไม่ให้เกิดความน่าเบื่อหน่าย และควรมีภาพดึงดูดความสนใจเหมาะสมกับวัยของผู้เรียนตรงกับจุดประสงค์การเรียนรู้ มีคำสั่ง และคำชี้แจงชัดเจนเข้าใจง่าย มีตัวอย่างประกอบเนื้อหาพอเหมาะ ไม่มากหรือน้อยเกินไป

สุวิทย์ มูลคำ และ สุนันทา สุนทรประเสริฐ (2555) ได้สรุปลักษณะของแบบฝึกที่ดี ควรคำนึงถึงหลักจิตวิทยาการเรียนรู้ ผู้เรียนได้ศึกษาด้วยตนเอง ความครอบคลุม ความสอดคล้องกับเนื้อหา รูปแบบน่าสนใจ และคำสั่งชัดเจน

สรุปได้ว่า แบบฝึกทักษะที่ดีควรมีหลายรูปแบบ คำนึงถึงความเหมาะสมกับวัย ความสามารถและพัฒนาการของผู้เรียน โดยมีภาพประกอบ ใช้ภาษาที่ง่ายและชัดเจนที่นักเรียนเข้าใจ ฝึกตามลำดับขั้นเรียงจากง่ายไปหายาก และกำหนดเวลาที่เหมาะสม

หลักการสร้างแบบฝึกทักษะ

ฉวีวรรณ กีรติกร (2537) ได้กล่าวถึงหลักในการสร้างแบบฝึก ไว้ดังนี้

1. แบบฝึกที่สร้างขึ้นควรสอดคล้องกับจิตวิทยาพัฒนาการ และลำดับขั้นตอนการเรียนรู้ของผู้เรียน เด็กที่เริ่มเรียนมีประสบการณ์น้อยจะต้องสร้างแบบฝึกที่น่าสนใจและจูงใจผู้เรียนด้วยการเริ่มจากข้อที่ง่ายไปหายาก เพื่อให้ผู้เรียนมีกำลังใจในการฝึก
2. ให้แบบฝึกหัดที่ตรงกับจุดประสงค์ที่ต้องการฝึก และต้องมีเวลาเตรียมการไว้ล่วงหน้าอยู่เสมอ
3. แบบฝึกหัดควรมุ่งส่งเสริมนักเรียนแต่ละกลุ่มตามความสามารถที่แตกต่างกันของผู้เรียน
4. แบบฝึกหัดแต่ละชุดควรมีคำชี้แจงง่าย ๆ สั้น ๆ เพื่อให้นักเรียนเข้าใจ หรือมีตัวอย่างแสดงวิธีทำจะช่วยให้เข้าใจได้ดียิ่งขึ้น
5. แบบฝึกหัดจะต้องถูกต้อง ครูจะต้องพิจารณาให้ดีอย่ามีข้อผิดพลาดได้
6. แบบฝึกหัดควรมีหลาย ๆ แบบ เพื่อให้ผู้เรียนได้แนวคิดที่กว้างไกล

ขั้นตอนการสร้างแบบฝึกทักษะ

ดวงมณี กันทะยอม (2551) กล่าวถึง ขั้นตอนการสร้างแบบฝึกทักษะ ไว้ดังนี้

1. สำรวจสภาพปัญหา ความต้องการที่จะพัฒนาการเรียนการสอนแต่ละจุดประสงค์
2. กำหนดจุดประสงค์ในการสร้างแบบฝึกทักษะให้ชัดเจน คือ ต้องการให้นักเรียนเป็นอย่างไร
3. วิเคราะห์เนื้อหาที่เรียนในแต่ละจุดประสงค์ว่า ประกอบด้วยอะไร มีปัญหาอย่างไร และระบุปัญหารวบรวมไว้

4. ศึกษาจิตวิทยาการเรียนรู้ ประกอบด้วย การใช้สิ่งเร้าเพื่อตอบสนองความพอใจ การฝึกทำซ้ำ สร้างความรู้ความเข้าใจ ความแม่นยำ และการให้ผู้เรียนได้ทราบผลการทำงานของตนเอง ข้อดี ข้อบกพร่อง เพื่อปรับปรุงแก้ไข

5. กำหนดกรอบการสร้างแบบฝึกทักษะว่า ควรประกอบด้วยเรื่องอะไรบ้าง มีลักษณะอย่างไร กิจกรรมมีอะไรบ้าง นำเสนอในรูปแบบไหนระบุให้ชัดเจน

6. ลงมือเขียนและสร้างแบบชุดฝึกทักษะแต่ละชุด

7. นำแบบฝึกทักษะที่สร้างไปให้ผู้เชี่ยวชาญการตรวจความถูกความตรงต่อเนื้อหา เช่น ครู ผู้สอนที่มีประสบการณ์ศึกษานิเทศก์ เป็นต้น เพื่อนำมาปรับปรุงแก้ไขข้อบกพร่องก่อนนำไปทดลองกับนักเรียน

สรุปได้ว่า ขั้นตอนการสร้างแบบฝึกทักษะ ผู้สร้างต้องรู้ในเนื้อหาวิชาที่จะสร้างแบบฝึกนั้นอย่างถ่องแท้ กำหนดกรอบการสร้างให้ชัดเจนมีส่วนประกอบที่ครบถ้วนสมบูรณ์ มีการเรียงลำดับความยากง่ายไว้ตามเหมาะสมในระยะเวลาที่เหมาะสมในการฝึกแต่ละครั้ง เพื่อที่จะได้กำหนดขั้นตอนในการสร้างได้อย่างมีประสิทธิภาพ

ผลสัมฤทธิ์ทางการเรียน

พัฒนพงษ สีกา (2551) ได้ให้ความหมายของผลสัมฤทธิ์ทางการเรียน หมายถึง ผลที่เกิดจากการกระทำของบุคคล ซึ่งเป็นการเปลี่ยนแปลงพฤติกรรมเนื่องจากการได้รับประสบการณ์โดยการเรียนรู้ด้วยตนเอง หรือจากการเรียนการสอนในชั้นเรียน และสามารถประเมินหรือวัดได้จากการทดสอบ จากที่กล่าวมาแล้วสรุปได้ว่า ผลสัมฤทธิ์ทางการเรียน หมายถึง พฤติกรรมที่แสดงออกถึงความรู้ทักษะที่เกิดจากการเรียนรู้หรือฝึกฝนทักษะที่ได้เรียนมาแล้ว ซึ่งสามารถวัดหรือประเมินได้โดยใช้เครื่องมือวัด

การวัดผลสัมฤทธิ์ทางการเรียน เป็นการวัดพฤติกรรม 3 กลุ่มพฤติกรรมด้วยกันคือ (พวงรัตน์ ทวีรัตน์, 2530)

1. พฤติกรรมการเรียนรู้ด้านพุทธิพิสัย เป็นพฤติกรรมที่แสดงออกถึงความสามารถและความคิดรวมทั้งการแก้ปัญหาเกี่ยวกับสิ่งต่าง ๆ อันเป็นผลจากการเรียนการสอน ซึ่งพฤติกรรมด้านความรู้และความคิดประกอบด้วยพฤติกรรมย่อย 6 ขั้นตอนดังต่อไปนี้

1) ความรู้ความจำ หมายถึง ความสามารถของบุคคลที่จะรักษาไว้ซึ่งเรื่องราวต่าง ๆ ที่ได้รับจากการเรียนการสอนและประสบการณ์ต่าง ๆ รวมทั้งสิ่งที่สัมผัสกับประสบการณ์นั้น ๆ และสามารถถ่ายทอดออกมาได้ถูกต้อง

2) ความเข้าใจ หมายถึง ความสามารถในการแปลความ ตีความ และสรุปความเกี่ยวกับสิ่งที่ได้พบ ซึ่งเป็นเรื่องราวและเหตุการณ์ต่าง ๆ ที่ได้รับรู้ และสามารถสื่อความเข้าใจที่ตนมีอยู่นั้นไปสู่ผู้อื่นได้อย่างถูกต้อง

3) การนำไปใช้ หมายถึง ความสามารถในการนำความรู้ทฤษฎี หลักการ กฎเกณฑ์ และวิธีการต่าง ๆ ซึ่งได้รับจากการเรียนรู้ไปใช้แก้ปัญหาในสถานการณ์จริงในชีวิตประจำวันหรือสถานการณ์ใหม่ที่คล้ายคลึงกันได้อย่างถูกต้องเหมาะสม

4) การวิเคราะห์ หมายถึง ความสามารถในการจำแนกเรื่องราวข้อเท็จจริงหรือเหตุการณ์ใด ๆ ออกเป็นส่วนย่อย ๆ และสามารถบอกได้ว่าส่วนย่อย ๆ นั้นแต่ละส่วนสำคัญอย่างไร ส่วนใดสำคัญที่สุด แต่ละส่วนมีความสัมพันธ์กันอย่างไร และมีหลักการใดร่วมกันอยู่

5) การสังเคราะห์ หมายถึง ความสามารถในการผสมผสานส่วนย่อย ๆ เข้าด้วยกันให้เป็นส่วนใหญ่ ทำให้ได้ผลผลิตที่แปลกใหม่และดีไปกว่าเดิม พฤติกรรมด้านนี้เน้นให้เกิดความคิดสร้างสรรค์สิ่งใหม่

6) การประเมินค่า หมายถึง ความสามารถในการวินิจฉัยตีราคาสิ่งต่าง ๆ หรือเรื่องต่าง ๆ ได้อย่างมีหลักเกณฑ์เป็นที่ยอมรับโดยทั่วไป

สรุป พฤติกรรมการเรียนรู้ด้านพุทธิพิสัย คือ พฤติกรรมย่อยด้านความรู้ความจำ เป็นพฤติกรรมที่มีระดับต่ำสุด ถือเป็นพฤติกรรมขั้นพื้นฐาน ส่วนพฤติกรรมย่อยด้านความเข้าใจ การนำไปใช้ การวิเคราะห์ การสังเคราะห์ และการประเมินค่าเป็นพฤติกรรมที่สูงขึ้นตามลำดับ ในการเรียนการสอนโดยหลักทั่วไปนั้นต้องการให้ผู้เรียนเกิดพฤติกรรมสูงกว่าความรู้ความจำ คือ เป็นการพัฒนาให้เกิดความคิด

2. พฤติกรรมการเรียนรู้ด้านจิตพิสัย เป็นพฤติกรรมที่แสดงออกถึงการเปลี่ยนแปลงทางด้านจิตใจ เจตคติ ค่านิยม ความสนใจ ความชื่นชมของบุคคลต่อสิ่งต่าง ๆ ประกอบด้วย พฤติกรรมย่อย 5 ขั้น ดังนี้

1) การรับรู้ เป็นความสามารถในการฉับไวต่อการรับรู้สิ่งเร้าต่าง ๆ ได้มากในเวลาจำกัด

2) การตอบสนอง เป็นพฤติกรรมที่แสดงออกในการตอบสนองต่อสิ่งเร้า ในลักษณะของความยินยอมเต็มใจและพอใจ

3) การสร้างคุณค่าหรือค่านิยม เป็นพฤติกรรมที่แสดงออกถึงความรู้สำนึกในคุณค่าของสิ่งต่าง ๆ จนเกิดการยอมรับและเชื่อถือในสิ่งนั้น

4) การจัดระบบคุณค่าหรือค่านิยม เป็นการนำค่านิยมมาจัดให้เป็นระบบโดยอาศัยกระบวนการจัดพวกหาความสัมพันธ์ และกำหนดค่านิยมที่เด่นและสำคัญแล้วนำกระบวนการนั้นมาสร้างระบบค่านิยมที่เหมาะสมกับเหตุการณ์ต่าง ๆ ต่อไป

5) การสร้างลักษณะนิสัย เป็นความสามารถในการจัดระบบค่านิยมที่บุคคลยึดถืออยู่จนสามารถควบคุมพฤติกรรมและทำให้เกิดบูรณาการทางความเชื่อ ความคิด เจตคติ และก่อให้เกิดพฤติกรรมที่เป็นลักษณะนิสัยประจำตัวของบุคคลแต่ละคน

3. พฤติกรรมการเรียนรู้ด้านทักษะพิสัย เป็นพฤติกรรมที่แสดงออกถึงความสามารถในการใช้กลไกทางกายและทางสมองได้สัมพันธ์กันจนสามารถใช้ส่วนต่าง ๆ ของร่างกายทำงานอย่างมีจุดหมาย ซึ่งแบ่งออกเป็นพฤติกรรมย่อย ๆ 7 ขั้น ดังนี้

1) การรับรู้เป็นการรับรู้โดยประสาทสัมผัสเกี่ยวกับรูปธรรม เช่น วัตถุสิ่งของและนามธรรม เช่น คุณสมบัติหรือความสัมพันธ์

2) การเตรียมพร้อม เป็นความพร้อมทั้งทางใจ ความพร้อมทางกาย และความพร้อมทางอารมณ์

3) การเลียนแบบ เป็นการทำตามหรือเลียนแบบ

4) การปฏิบัติได้ เป็นพฤติกรรมตอบสนองที่พัฒนาจนเป็นนิสัย

5) การตอบสนองที่ซับซ้อน เป็นการแสดงออกที่ซับซ้อนตามกระบวนการปฏิบัติอย่างไม่ลังเล และเป็นไปโดยอัตโนมัติ

6) การดัดแปลง เป็นขั้นที่ทดลองหาวิธีอื่นมาปฏิบัติหลังจากที่ได้ปฏิบัติวิธีเดิมจนชำนาญแล้ว เพื่อเพิ่มประสิทธิภาพให้มากขึ้น

7) การริเริ่ม เป็นการประยุกต์สิ่งที่ได้ดัดแปลงแล้วเพื่อให้เกิดสิ่งใหม่ขึ้น

วิภาพร มาพบสุข (2542) กล่าวว่า องค์ประกอบที่มีความสัมพันธ์กับความสามารถในการเรียนรู้ของมนุษย์ โดยมนุษย์มีความรู้ความสามารถในการเรียนรู้ที่แตกต่างกันเนื่องจากปัจจัยต่าง ๆ หลายประการ ปัจจัยที่มีอิทธิพลต่อการเรียนรู้ ประกอบด้วย

1. ตัวผู้เรียน ได้แก่ ระบบประสาท วุฒิภาวะทางร่างกาย ทางอารมณ์ และสังคม ความพร้อม ประสบการณ์เดิม แรงจูงใจ ความบกพร่องทางร่างกายบางประการ อายุ เพศ และสติปัญญา

2. บทเรียนหรือลักษณะของงาน ได้แก่ การวางลำดับเนื้อหาของบทเรียน การจัดความยากง่ายของบทเรียนที่เหมาะสมกับผู้เรียน บทเรียนมีความหมาย ความยาวของบทเรียน และสิ่งรบกวน

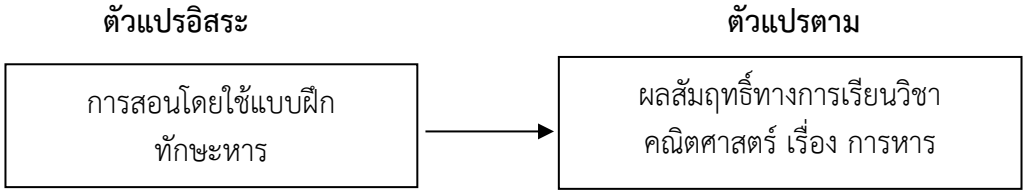
3. วิธีการเรียนการสอน ได้แก่ ผู้เรียนมีส่วนร่วมในการเรียนการสอน การให้คำแนะนำเกี่ยวกับแหล่งความรู้เพิ่มเติม ครูมีวิธีสอนที่สอดคล้องกับเนื้อหาในบทเรียนและการฝึกปฏิบัติภายหลังการสอน

4. ความสามารถในการถ่ายโยงการเรียนรู้

5. องค์ประกอบจากสิ่งแวดล้อมอื่น ๆ ได้แก่ สิ่งแวดล้อมทางกายภาพและจิตใจและวัฒนธรรมในสังคม

สรุปได้ว่า ปัจจัยที่มีความสัมพันธ์กับผลสัมฤทธิ์ทางการเรียน ประกอบด้วย 5 ด้าน ได้แก่ ด้านนักเรียน ครูผู้สอน โรงเรียน สภาพแวดล้อม และผู้ปกครอง

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากร

ประชากรที่ใช้ในการวิจัยนี้ คือ นักเรียนชั้นประถมศึกษาปีที่ 2 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา จำนวน 15 คน

กลุ่มตัวอย่าง

ใช้ประชากรเป็นกลุ่มตัวอย่าง คือ นักเรียนชั้นประถมศึกษาปีที่ 2 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา จำนวน 15 คน ได้มาโดยวิธีการเลือกแบบเจาะจง

เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการวิจัย ผู้วิจัยได้กำหนดเครื่องมือมีรายละเอียดดังนี้

1. แผนการจัดการเรียนรู้ เรื่อง การหาร จำนวน 9 แผน 10 ชั่วโมง

2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ก่อนเรียนและหลังเรียน แบบทดสอบปรนัยชนิดเลือกตอบ 4 ตัวเลือก 10 ข้อ

3. แบบฝึกทักษะการหาร

การสร้างเครื่องมือวิจัย

1. การสร้างแผนการจัดการเรียนรู้คณิตศาสตร์ เรื่อง การหาร สำหรับนักเรียนด้วยหลักการโดยแบบฝึกทักษะ

1.1 ศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 เนื้อหาวิชาคณิตศาสตร์ เรื่องการหารและคู่มือการจัดการเรียนรู้กลุ่มสาระการเรียนรู้คณิตศาสตร์ เรื่อง การหาร จัดทำโดยสถาบันเสริมการสอนวิทยาศาสตร์และเทคโนโลยี กระทรวงศึกษาธิการ

1.2 ศึกษาค้นคว้าตำรา เอกสาร ทฤษฎี หลักการ และแนวคิดที่สำคัญ งานวิจัยที่เกี่ยวข้องกับการเกี่ยวกับการจัดการเรียนการสอนคณิตศาสตร์ที่ใช้หลักการเรียนโดยใช้แบบฝึกทักษะ

1.3 กำหนดเนื้อหา ความคิดรวบยอด และจุดประสงค์การเรียนรู้ เรื่อง การหารสำหรับนักเรียน

1.4 สร้างแผนการจัดการเรียนรู้โดยใช้แบบฝึกทักษะ เรื่อง การหาร จำนวน 9 แผน ใช้เวลาในการสอน 10 ชั่วโมง ซึ่งผู้วิจัยกำหนดเวลาตามความเหมาะสมของเนื้อหาในแต่ละแผนการจัดการเรียนรู้ดังนี้

ตารางที่ 1 แผนการจัดการเรียนรู้

แผนที่	เรื่อง	ชั่วโมง
1	ความหมายของการหาร	1
2	การหารโดยใช้ตัวนับ	1
3	ความสัมพันธ์การคูณและการหาร	1
4	การหาค่าในประโยคสัญลักษณ์	1
5	การหาผลหารที่ลงตัว	1
6	การหาผลหารที่ไม่ลงตัว	1
7	โจทย์ปัญหาการหาร	1
8	การสร้างโจทย์ปัญหาจากภาพ	2
9	การสร้างโจทย์ปัญหาการหารจากประโยคสัญลักษณ์	1

1.5 เสนอแผนการจัดการเรียนรู้ที่สร้างเสร็จเรียบร้อยต่อผู้เชี่ยวชาญ เพื่อตรวจสอบความถูกต้องเหมาะสมเชิงเนื้อหา ซึ่งประกอบด้วยจุดประสงค์การเรียนรู้ กระบวนการจัดการเรียนรู้ สื่อและแหล่งการเรียนรู้ตลอดจนวิธีการและเครื่องมือวัดและประเมินผล เพื่อนำมาปรับปรุงแก้ไข จนได้แผนการเรียนรู้ตามความต้องการ

2. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง การหาร ชั้นประถมศึกษาปีที่ 2 ผู้วิจัยสร้างขึ้น มีลักษณะเป็นปรนัย 4 ตัวเลือก จำนวน 10 ข้อ โดยมีขั้นตอนการสร้างและหาประสิทธิภาพ ดังนี้

2.1 ศึกษาหลักสูตรสถานศึกษาของโรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา ปีการศึกษา 2566 กลุ่มสาระการเรียนรู้คณิตศาสตร์

2.2 ศึกษาแนวคิด ทฤษฎี และผลการวิจัยที่เกี่ยวข้องกับผลสัมฤทธิ์ทางการเรียน

2.3 ศึกษาหลักการและวิธีสร้างแบบทดสอบปรนัย

2.4 วิเคราะห์เนื้อหาแบบทดสอบจากตามจุดประสงค์การเรียนรู้ จากแผนการจัดการเรียนรู้ เรื่อง การหาร โดยใช้แบบฝึกทักษะ

2.5 สร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน แบบปรนัยชนิดเลือกตอบ 4 ตัวเลือก จำนวน 10 ข้อให้ครอบคลุมเนื้อหาและผลการเรียนรู้

2.6 นำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนเสนอต่อผู้เชี่ยวชาญ 3 ท่าน เพื่อพิจารณาข้อคำถามของข้อสอบแต่ละข้อว่า สอดคล้องกับจุดประสงค์การเรียนรู้ และเพื่อหาค่า (IOC) โดยใช้แบบประเมินความสอดคล้อง ผลการพิจารณาการลงความเห็นของผู้เชี่ยวชาญมีค่าอยู่ระหว่าง 0.67 - 1.0

2.7 นำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร ใช้แบบฝึกทักษะที่ได้รับการปรับปรุงแล้ว นำไปใช้เครื่องมือเก็บข้อมูลในการวิจัยกับกลุ่มเป้าหมาย

2.8 ทดลองใช้จากนั้นวิเคราะห์หาค่าความยาก (P) ได้ค่าระหว่าง 0.5 - 0.8 ค่าอำนาจจำแนก (r) ได้ค่าระหว่าง 0.3 - 0.8 และค่าความเชื่อมั่น (KR20) ของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง การหาร ของนักเรียนระดับชั้นประถมศึกษาปีที่ 2 ได้ค่า 0.68

3. การสร้างแบบฝึกทักษะวิชาคณิตศาสตร์ เรื่อง การหาร ชั้นประถมศึกษาปีที่ 2 ผู้วิจัยดำเนินการสร้างและหาคุณภาพตามลำดับขั้นตอน ดังนี้

3.1 ศึกษาหลักสูตรแกนกลางขั้นพื้นฐาน พุทธศักราช 2551 (ฉบับปรับปรุง 2560) กลุ่มสาระการเรียนรู้คณิตศาสตร์ หลักสูตรสถานศึกษาโรงเรียนบ้านหนองนายขุ้ย ปีการศึกษา 2566 งานวิจัยที่เกี่ยวข้องกับการสอน โดยใช้แบบฝึกหัดทักษะวิชาคณิตศาสตร์

3.2 สร้างแบบฝึกทักษะวิชาคณิตศาสตร์ เรื่อง การหาร ชั้นประถมศึกษาปีที่ 2 จำนวน 9 แบบฝึก

3.3 นำแบบฝึกทักษะที่ครูได้สร้างขึ้นเสนอต่อหัวหน้าวิชาการและปรับปรุงตามข้อเสนอแนะ

3.4 เสนอแบบฝึกทักษะที่ปรับปรุงแล้วเสนอต่อผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบความถูกต้องเหมาะสมเชิงเนื้อหา ซึ่งประกอบด้วย จุดประสงค์การเรียนรู้ กระบวนการจัดการเรียนรู้สื่อ และแหล่งการเรียนรู้ ตลอดจนวิธีการวัด และเครื่องมือวัดและประเมินผล โดยใช้แบบประเมินความเหมาะสมมีลักษณะเป็นมาตรประเมินค่า (Ratting Scale) แล้ววิเคราะห์หาค่าเฉลี่ย

3.5 นำแบบฝึกทักษะมาแก้ไขปรับปรุงตามข้อเสนอแนะของผู้เชี่ยวชาญ เพื่อให้เกิดความถูกต้องและสมบูรณ์มากขึ้น ให้มีความชัดเจน และมีความสอดคล้องกับจุดประสงค์การเรียนรู้ก่อนนำไปใช้จริงกับกลุ่มเป้าหมาย

3.6 นำแบบฝึกทักษะมาจัดพิมพ์เป็นแบบฝึกทักษะฉบับสมบูรณ์ จำนวน 9 แบบฝึก แล้วนำไปใช้จริงกับกลุ่มเป้าหมาย

แบบแผนที่ใช้ในการศึกษา

ผู้วิจัยได้ดำเนินการทดลองกับกลุ่มเป้าหมาย โดยทดสอบก่อนเรียนและหลังเรียน (One Group Pretest Posttest Design)

ตารางที่ 2 แบบแผนในการศึกษา

ทดสอบก่อนเรียน	ตัวแปรอิสระ	ทดสอบหลังเรียน
T1	X	T2

สัญลักษณ์ที่ใช้ในแบบแผนการวิจัย

E แทน กลุ่มทดลอง

T1 แทน การทดสอบก่อนเรียนของกลุ่มเป้าหมาย

T2 แทน การทดสอบหลังเรียนของกลุ่มเป้าหมาย

X แทน การสอนตามแผนการจัดการเรียนรู้ที่ผู้วิจัยสร้างขึ้น

การเก็บรวบรวมข้อมูล

1. ทำการทดสอบก่อนเรียน (Pre-test) เรื่อง การหาร ด้วยแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร ชั้นประถมศึกษาปีที่ 2 ที่ผู้วิจัยสร้างขึ้น
2. ผู้วิจัยดำเนินการสอนซ่อมเสริมวิชาคณิตศาสตร์ นักเรียนชั้นประถมศึกษาปีที่ 2 เรื่อง การหาร ตามแผนการจัดการเรียนรู้เรื่องการหาร โดยการใช้แบบฝึกทักษะใช้เวลาในการสอน 10 ชั่วโมง
3. ทำการทดสอบหลังเรียน (Post-test) ด้วยแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ ชั้นประถมศึกษาปีที่ 2 เรื่อง การหาร คะแนนที่ได้เป็นคะแนนการทดสอบหลังเรียน
4. นำผลสัมฤทธิ์ที่ได้จากการวัดโดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน เรื่อง การหาร ชั้นประถมศึกษาปีที่ 2 มาวิเคราะห์ทางสถิติ

การวิเคราะห์ข้อมูล

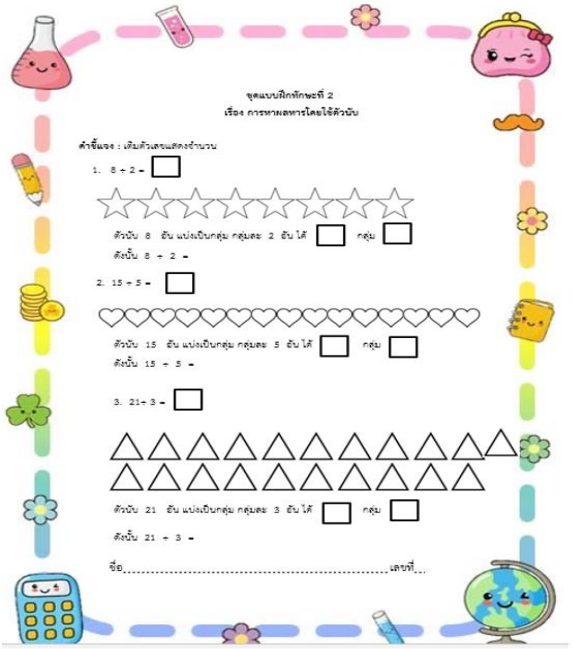
นำคะแนนที่ได้จากการทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนมาวิเคราะห์ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน (S.D.) และค่า t-test Dependent

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

1. สถิติพื้นฐาน ได้แก่ ค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐาน
2. สถิติทดสอบเครื่องมือวิจัย ได้แก่ IOC, ความเที่ยง ความยากและอำนาจจำแนก
3. สถิติทดสอบสมมติฐานการวิจัย ได้แก่ t-test Dependent

ผลการวิจัย

การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร โดยใช้แบบฝึกทักษะการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา



ภาพที่ 2 ตัวอย่างแบบฝึกทักษะการหารวิชาคณิตศาสตร์
ที่มา: แบบฝึกทักษะการหารวิชาคณิตศาสตร์ของนางสาวปิยดา บัวสม

ภาพที่ 3 การทดลองใช้แบบฝึกทักษะการหารวิชาคณิตศาสตร์
ที่มา: ภาพการนิเทศการสอน โดยอาจารย์สายสุดา สุขแสง

ตารางที่ 3 แสดงการเปรียบเทียบผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่องการหาร โดยใช้แบบฝึกทักษะการหารของนักเรียนชั้นประถมศึกษาปีที่ 2 โรงเรียนบ้านหนองนายขุ้ย อำเภอหาดใหญ่ จังหวัดสงขลา

คะแนนทดสอบ	n	$\overline{x}$	S.D.	df	t	P-value
ก่อนเรียน	15	3.80	1.57	14	7.95	.000*
หลังเรียน	15	6.53	2.03			

* อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

จากตารางที่ 3 พบว่า ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร โดยใช้แบบฝึกทักษะการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 ก่อนเรียนมีค่าเฉลี่ย 3.80 ส่วนหลังเรียนมีค่าคะแนนเฉลี่ย 6.53 เมื่อนำคะแนนเฉลี่ยมาเปรียบเทียบผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหารโดยใช้แบบฝึกทักษะการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 พบว่า หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05

สรุปและอภิปรายผล

ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร โดยใช้แบบฝึกทักษะการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 2 พบว่า หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 เป็นไปตามสมมติฐานที่ตั้งไว้

แบบฝึกทักษะเป็นเครื่องมือที่ช่วยพัฒนาทักษะ ในเรื่องที่เรียนรู้ให้มากขึ้น โดยอาศัยการฝึกฝนหรือปฏิบัติด้วยตนเองของผู้เรียน ลักษณะปัญหาในแบบฝึกทักษะจะเป็นปัญหาที่เสริมทักษะพื้นฐาน โดยกำหนดขึ้นให้ผู้เรียนตอบเรียงลำดับจากง่ายไปยาก พัฒนาทักษะกระบวนการคิดกระบวนการเรียนรู้ของผู้เรียนรวมทั้งในแบบฝึกทักษะจะทำให้ผู้เรียนสามารถตรวจสอบความเข้าใจบทเรียนด้วยตนเองได้ เพื่อให้เกิดทักษะเกิดความรู้ ความเข้าใจ ความชำนาญในเนื้อหาที่ผู้เรียนได้เรียนไปในเรื่องนั้น ๆ อย่างมีประสิทธิภาพ สอดคล้องกับ จักรพงษ์ ฤทธิพร (2562) ได้ศึกษาการพัฒนาแบบฝึกทักษะคณิตศาสตร์ เรื่อง การบวก การลบ การคูณ และการหารทศนิยม ชั้นประถมศึกษาปีที่ 6 พบว่า ผลสัมฤทธิ์ทางการเรียนหลังเรียนของนักเรียนที่เรียนด้วยแบบฝึกหัดเสริมทักษะคณิตศาสตร์ เรื่อง การบวก การลบ การคูณ และการหารทศนิยม ชั้นประถมศึกษาปีที่ 6 โดยเฉลี่ยคิดเป็นร้อยละ 85.52 สูงกว่าเกณฑ์ที่กำหนด และ จิราวรรณ จิตรบรรจง (2563) ได้ศึกษาการพัฒนาผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่อง การหาร ของนักเรียนชั้นประถมศึกษาปีที่ 6 โรงเรียนวัดเสาธงนอก โดยใช้แบบฝึกทักษะ ผลการวิจัยพบว่า ผลสัมฤทธิ์ทางการเรียนวิชาคณิตศาสตร์ เรื่องการหาร ของนักเรียนชั้นประถมศึกษาปีที่ 6 โดยใช้แบบฝึกทักษะหลังเรียนสูงกว่าก่อนเรียน

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1) ควรปรับปรุงแบบฝึกทักษะ โดยมีการเพิ่มเนื้อหาและจำนวนแบบฝึกทักษะ เรื่อง การหาร ให้มากขึ้นเพื่อให้นักเรียนได้ฝึกทักษะมากขึ้น

2) ควรเพิ่มเวลาที่ใช้ในการสอนซ่อมเสริมให้มากขึ้น เพื่อให้ผู้เรียนได้ฝึกและพัฒนาตนเองได้เต็มศักยภาพ เนื่องจากผู้เรียนบางคนอาจต้องใช้เวลาในการที่จะฝึกฝนและพัฒนาตนเอง

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1) ควรศึกษาวิจัยเกี่ยวกับการสร้างแบบฝึกทักษะอื่น ๆ และเพิ่มเทคนิคการสอนที่ซับซ้อนขึ้น เช่น การฟัง การคิดวิเคราะห์ และการเขียนเชิงสร้างสรรค์

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การประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอน ระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก

Assessment of The Project to Develop Active Learning Management Skills for Primary Level Teachers in Small Schools Network

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บทคัดย่อ

การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก ตามแนวคิดของเคิร์ก แพทริค โดยดำเนินการประเมิน 4 ด้าน คือ ด้านปฏิกิริยา ด้านการเรียนรู้ ด้านพฤติกรรม และด้านผลลัพธ์ กลุ่มตัวอย่างที่ใช้ในการวิจัย คือ ครูผู้สอนระดับชั้นประถมศึกษาของโรงเรียนขนาดเล็ก ในอำเภอเมืองนครนายก จังหวัดนครนายก ที่สมัครเข้าร่วมการอบรม จำนวน 69 คน เครื่องมือที่ใช้ในการวิจัย คือ แบบสอบถาม และแบบประเมินทักษะการจัดการเรียนรู้ วิเคราะห์ข้อมูลโดยหาค่าร้อยละ ค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์ข้อมูลเชิงเนื้อหา ผลการวิจัย พบว่า ผลการประเมินทั้ง 4 ด้านอยู่ในระดับมากที่สุดทุกด้าน โดยมีค่าเฉลี่ยเท่ากับ 4.72 4.64 4.81 และ 4.78 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.51 0.47 0.35 และ 0.38 ตามลำดับ

คำสำคัญ: การประเมินโครงการ , ทักษะการจัดการเรียนรู้เชิงรุก , โรงเรียนขนาดเล็ก

Abstract

The purpose of this research was to assess the project to develop active learning management skills for primary school teachers in a small school network. According to Kirk Patrick's concept, we evaluate 4 areas: reaction, learning, behavior, and results. The sample group used in this research were primary school teachers of small schools. In Mueang Nakhon Nayok District Nakhon Nayok Province There were 69 people who applied to participate in the training. The research instrument was a questionnaire. and learning management skills assessment form Data were analyzed by looking for percentages, means, and standard deviations and content analysis. The research results found that the evaluation results in all 4 areas were at the highest level in every aspect. with a mean

value of 4.72, 4.64, 4.81 and 4.78 and a standard deviation of 0.51, 0.47, 0.35 and 0.38 respectively.

Keywords: Project Assessment, Active Learning Management Skills, Small Schools

บทนำ

ตามที่มหาวิทยาลัยราชภัฏพระนครได้จัดทำโครงการยุทธศาสตร์มหาวิทยาลัยราชภัฏเพื่อการพัฒนาท้องถิ่น (ศาสตร์พระราชา) ประจำปีงบประมาณ 2565 โดยได้กำหนดจัดโครงการยกระดับคุณภาพการจัดการเรียนรู้เพื่อพัฒนาเครือข่ายการศึกษาตามอัธยาศัยหรือโรงเรียนขนาดเล็ก และมีโครงการพัฒนาโมเดลต้นแบบหลักสูตรบูรณาการฐานสมรรถนะเพื่อยกระดับคุณภาพผู้เรียนประถมศึกษา ในปีการศึกษา 2565 ของวิทยาลัยการฝึกหัดครูเป็นโครงการย่อยหนึ่งภายใต้โครงการดังกล่าว ในระหว่างและภายหลังการดำเนินโครงการผู้มีหน้าที่รับผิดชอบได้ประเมินโครงการ โดยการเก็บรวบรวมข้อมูลส่วนหนึ่งได้สอบถามความต้องการในการพัฒนาครูจากผู้บริหารและครูผู้สอนที่เข้าร่วมการอบรมด้วยกระบวนการสนทนากลุ่ม (Focus Group) พบว่า ผู้บริหารและครูผู้สอนมีความต้องการให้วิทยาลัยการฝึกหัดครูจัดโครงการพัฒนาครูในบริบทของโรงเรียนขนาดเล็กตามความต้องการของโรงเรียน โดยต้องการให้มีการประชาสัมพันธ์โครงการให้ทั้งผู้บริหารและครูผู้สอนในโรงเรียนขนาดเล็กทุกโรงเรียนได้รับทราบข้อมูลรายละเอียดของโครงการอย่างทั่วถึง นอกจากนี้ยังต้องการให้มีการกำกับ ติดตาม ให้ความช่วยเหลือครู ที่เข้าร่วมการอบรมให้สามารถนำความรู้และทักษะที่ได้รับการพัฒนาไปใช้ในโรงเรียนได้จริง โดยไม่ต้องการให้จัดการอบรมแล้วสิ้นสุดโครงการ การจัดการอบรมในลักษณะดังกล่าวทำให้ครูขาดที่ปรึกษาและไม่กล้านำสิ่งที่ได้เรียนรู้ไปปรับใช้เพื่อนำไปสู่การเปลี่ยนแปลงอย่างแท้จริง เนื่องจากครูยังขาดความมั่นใจ และต้องการให้มีผู้ที่มีความรู้ให้คำแนะนำเพิ่มเติม (ธัชทฤต เทียมธรรม, 2565)

จากความต้องการให้วิทยาลัยการฝึกหัดครูพัฒนาครูเฉพาะกลุ่ม โรงเรียนขนาดเล็กซึ่งมีปัญหาคล้ายคลึงกัน โดยประเด็นที่ผู้บริหารและครูผู้สอนยังขาดความกระจ่าง และต้องการได้รับการพัฒนาให้เกิดความชัดเจนทั้งในด้านความรู้และทักษะ คือ ประเด็นเกี่ยวกับการจัดการเรียนรู้เชิงรุก (Active Learning) เนื่องจากเป็นแนวทางการจัดการเรียนรู้ที่สำคัญในศตวรรษที่ 21 และต้องการให้มีการอบรมเกี่ยวกับการสร้างสื่อการจัดการเรียนรู้ที่สามารถนำมาใช้ได้จริงในการจัดการเรียนการเรียนรู้ (ธัชทฤต เทียมธรรม, 2565) ทั้งนี้ การจัดการเรียนรู้เชิงรุก เป็นกระบวนการเรียนการสอนที่ส่งเสริมให้ผู้เรียนมีส่วนร่วมในชั้นเรียน สร้างปฏิสัมพันธ์ระหว่างครูผู้สอนกับผู้เรียน มุ่งให้ผู้เรียนลงมือปฏิบัติโดยมีครูเป็นผู้อำนวยความสะดวก (Facilitator) สร้างแรงบันดาลใจให้คำปรึกษา ดูแล แนะนำ ทำหน้าที่เป็นโค้ชและพี่เลี้ยง (Coach & Mentor) แสวงหาเทคนิควิธีการจัดการเรียนรู้ และแหล่งเรียนรู้ที่หลากหลายให้ผู้เรียนได้เรียนรู้อย่างมีความหมาย (Meaningful Learning) ผู้เรียนสร้างองค์ความรู้ได้ มีความเข้าใจในตนเอง ใช้สติปัญญาคิดวิเคราะห์ สร้างสรรค์ผลงานนวัตกรรมที่บ่งบอกถึงการมีสมรรถนะสำคัญในศตวรรษที่ 21 มีทักษะทางวิชาการ ทักษะชีวิต และทักษะวิชาชีพ บรรลุเป้าหมายการเรียนรู้ตามระดับช่วงวัย เป็นการเรียนที่เน้นให้ผู้เรียนมีปฏิสัมพันธ์กับการเรียนการสอน กระตุ้นให้ผู้เรียนเกิดกระบวนการคิดขั้นสูง (Higher-order Thinking) ด้วยการวิเคราะห์ สังเคราะห์ และประเมินค่า ไม่เพียงแต่เป็นผู้ฟัง ผู้เรียนต้องอ่าน เขียน ตั้งคำถามและถาม อภิปรายร่วมกัน ผู้เรียนลงมือปฏิบัติจริงโดยต้องคำนึงถึงความรู้เดิมและความต้องการของผู้เรียนเป็นสำคัญ ทั้งนี้ ผู้เรียนจะถูกเปลี่ยนบทบาทจากผู้รับความรู้ไปสู่การมีส่วนร่วมในการสร้างความรู้ (สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน, 2562)

วิทยาลัยการฝึกหัดครู และโรงเรียนประถมสาธิต มหาวิทยาลัยราชภัฏพระนคร ตระหนักถึงความสำคัญของการจัดการเรียนรู้เชิงรุก ดังนั้นเพื่อให้เป็นไปตามความต้องการของผู้บริหารและครูผู้สอนในโรงเรียนขนาดเล็ก และเพื่อให้สอดคล้องกับยุทธศาสตร์มหาวิทยาลัยราชภัฏเพื่อพัฒนาท้องถิ่นระยะ 20 ปี (พ.ศ. 2560 - 2570) ยุทธศาสตร์ที่ 2 การผลิตและพัฒนาครู โครงการพัฒนาโรงเรียนสาธิตให้เป็นศูนย์ฝึกปฏิบัติการและการวิจัย เป็นต้นแบบให้กับโรงเรียนในท้องถิ่น จึงได้ดำเนินการจัดกิจกรรมหัวข้อ “การพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในเครือข่ายโรงเรียนขนาดเล็ก เพื่อพัฒนาสมรรถนะผู้เรียนระดับประถมศึกษา” เพื่อให้ครูผู้สอนในระดับประถมศึกษาของโรงเรียนในเครือข่ายโรงเรียนขนาดเล็กได้มีความรู้ และทักษะในการจัดการเรียนรู้เชิงรุก การผลิตสื่อสำหรับใช้ในการจัดการเรียนรู้เชิงรุก โดยมีการนิเทศ กำกับ ติดตาม ให้ความช่วยเหลือครูที่เข้าร่วมการอบรมทุกคนอย่างต่อเนื่อง ซึ่งเป็นการตอบสนองความต้องการของครูผู้สอน และเป็นการยกระดับการจัดการเรียนรู้ เพื่อพัฒนาเครือข่ายโรงเรียนขนาดเล็กต่อไป

อนึ่ง เพื่อเป็นการตรวจสอบและตัดสินคุณค่าของโครงการ คณะผู้รับผิดชอบโครงการจึงได้ดำเนินการวิจัยและประเมินโครงการดังกล่าว โดยมุ่งหมายที่จะให้ได้สารสนเทศเพื่อการปรับปรุงคุณภาพของโครงการให้ดีขึ้น นอกจากนี้ยังเป็นข้อมูลที่สำคัญในการตัดสินใจเกี่ยวกับโครงการว่าควรดำเนินการต่อหรือไม่ โดยการปรับปรุงให้มีคุณภาพดีขึ้น หรืออาจต้องพิจารณายกเลิกโครงการ ทั้งนี้การประเมินเป็นวิธีการศึกษาหรือกิจกรรมที่มุ่งค้นหาคุณค่าของความจริงในแง่มุมต่าง ๆ ภายใต้บริบททางสังคม การประเมินจึงมีความละเอียดอ่อนสลับซับซ้อน โดยมุ่งผลเพื่อเสนอสารสนเทศที่เป็นประโยชน์ต่อระบบการบริหาร การวางแผน การดำเนินโครงการ และการตัดสินใจในเชิงบริหาร ดังนั้นกระบวนการประเมินจึงควรเน้นการทำงานที่มีระบบ มีการวางแผน และเตรียมการประเมินอย่างชัดเจน ในการวางแผนการประเมินควรมุ่งถึงประโยชน์สูงสุด ทั้งนี้ต้องคำนึงถึงความพร้อมของทีมประเมิน ความต้องการใช้ข้อมูลประกอบการตัดสินใจของผู้เกี่ยวข้องกับเป้าหมาย หรือโครงการที่มุ่งประเมิน และความเป็นไปได้ในการประเมิน (กานดา นาคะเวช, 2554) โดยในการดำเนินการวิจัยและประเมินโครงการครั้งนี้ คณะผู้วิจัยได้ใช้รูปแบบการประเมินของเคิร์ก แพทริค (ศักดิ์ศรี ปาณะกุล, 2556; สิทธิพล อาจอินทร์, 2563) ซึ่งมีลักษณะการประเมินที่ตรงกับวัตถุประสงค์ของการฝึกอบรม เป็นรูปแบบการประเมินที่พัฒนาขึ้นเพื่อใช้กับการประเมินการฝึกอบรมโดยเฉพาะ และมุ่งเน้นผลการประเมินในทางลึกมากกว่าทางกว้าง คือ มุ่งเน้นไปที่ผลสัมฤทธิ์ของการฝึกอบรมเป็นหลัก มิได้มุ่งเน้นไปที่ตัวโครงการมากนัก

วัตถุประสงค์ของการวิจัย

เพื่อประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอนระดับประถมศึกษา ในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก

แนวคิด ทฤษฎี กรอบแนวคิด

ผู้วิจัยได้ทำการศึกษาแนวคิดการประเมินโครงการโดยใช้แนวทางการประเมินของเคิร์ก แพทริค (The Kirkpatric Approach) ในการประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก โดยมุ่งประเมินใน 4 ด้าน ได้แก่ ด้านปฏิกิริยา (Reaction) ด้านการเรียนรู้ (Learning) ด้านพฤติกรรม (Behavior) และด้านผลลัพธ์ (Results) การประเมินโครงการตามแนวทางการประเมินของเคิร์ก แพทริคใน 4 ด้าน (ศักดิ์ศรี ปาณะกุล, 2556; สิทธิพล

อาจอินทร์, 2563) ดังนี้

1. ด้านปฏิกิริยา มีจุดมุ่งหมายเพื่อตรวจสอบว่า ผู้เข้ารับการอบรมมีการตอบสนองต่อกระบวนการ และมีความรู้สึกนึกคิดความพึงพอใจต่อกิจกรรมการอบรมเป็นอย่างไร เนื้อหาสาระตรงกับความต้องการหรือไม่ ความคิดเห็นต่อเอกสาร สถานที่โสตทัศนูปกรณ์ ระยะเวลาการอบรมเหมาะสมเพียงไร วิทยากรเหมาะสมเพียงไร ได้รับความรู้ ทักษะในระดับใด มีความคาดหวังอย่างไร วิทยากรเหมาะสมเพียงไร ได้รับความรู้ทักษะในระดับใด มีความคาดหวังอย่างไรต่อการนำความรู้และทักษะที่ได้รับไปใช้งาน

2. ด้านการเรียนรู้ มีจุดมุ่งหมายเพื่อตรวจสอบว่า ผู้เข้าอบรมได้รับความรู้ ทักษะ และเจตคติ จากการเข้าอบรมเป็นอย่างไร เป็นการประเมินผลการเรียนรู้ที่เกิดขึ้นกับผู้เข้ารับการอบรม เช่น การเปลี่ยนแปลงการเรียนรู้ก่อนหลังการอบรม เกี่ยวกับความรู้ ความคิด ทัศนคติ ค่านิยม และทักษะการปฏิบัติ

3. ด้านพฤติกรรม มีจุดมุ่งหมายเพื่อต้องการตรวจสอบว่า ผู้เข้าอบรมมีการเปลี่ยนแปลงพฤติกรรมการทำงานอันสืบเนื่องมาจากการเข้ารับการฝึกอบรมหรือไม่ อย่างไร มุ่งเน้นการนำความรู้ ทักษะไปประยุกต์ใช้ในการปฏิบัติงาน และเจตคติที่มีต่อการทำงาน มีลักษณะเป็นการประเมินติดตามในสถานที่จริงประมาณ 3 – 6 เดือน การประเมินพฤติกรรมเมื่อกลับไปปฏิบัติงานว่าเปลี่ยนแปลงไปในทิศทางที่พึงประสงค์หรือไม่ มีการนำความรู้และทักษะที่ได้ไปประยุกต์ใช้ในการปฏิบัติงานได้มากน้อยเพียงใด

4. ด้านผลลัพธ์ มีจุดมุ่งหมายเพื่อตรวจสอบว่า องค์กรได้รับประโยชน์อย่างไรจากการอบรมที่เกิดต่อองค์กร การประเมินผลลัพธ์หรือผลกระทบต่อองค์กรอันเนื่องมาจากเปลี่ยนแปลงพฤติกรรมของผู้เข้ารับการอบรม การเพิ่มของประสิทธิภาพการทำงานของหน่วยงาน ประโยชน์ต่อเพื่อนร่วมงาน หรือผู้เกี่ยวข้อง หน่วยงาน องค์กร สถาบัน

วิธีดำเนินการวิจัย

การวิจัยครั้งนี้ใช้วิธีการวิจัยเชิงประเมิน ผู้วิจัยดำเนินการประชาสัมพันธ์โครงการและกิจกรรม “การพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในโรงเรียนเครือข่ายโรงเรียนขนาดเล็กเพื่อพัฒนาสมรรถนะผู้เรียนระดับประถมศึกษา” โดยเดินทางทำความเข้าใจครูในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก จำนวน 30 โรงเรียน ในเขตอำเภอเมืองนครนายก จังหวัดนครนายก เป็นเวลา 2 วัน ระหว่างวันที่ 14 – 15 ธันวาคม พ.ศ. 2565 มีครูผู้สอนแจ้งความประสงค์เข้าร่วมโครงการ จำนวน 69 คน จาก 15 โรงเรียน จากนั้นดำเนินการจัดการอบรมครั้งที่ 1 เป็นการอบรมเชิงปฏิบัติการ หัวข้อ “การพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้สำหรับครูผู้สอนในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก เพื่อพัฒนาสมรรถนะผู้เรียนระดับประถมศึกษา” เป็นเวลา 2 วัน ระหว่างวันที่ 18 – 19 กุมภาพันธ์ พ.ศ. 2566 หลังจากนั้นจัดการอบรมครั้งที่ 2 เป็นการอบรมเชิงปฏิบัติการ หัวข้อ “การนำเสนอแผนการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้ของครูผู้สอนระดับประถมศึกษาในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก” เป็นเวลา 1 วัน ในวันที่ 1 พฤษภาคม พ.ศ. 2566 และจัดกิจกรรม “การนิเทศ กำกับ ติดตาม ให้ความช่วยเหลือและประเมินผลการพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก” เป็นเวลา 4 วัน ระหว่างวันที่ 5 – 6 และ 12 – 13 กรกฎาคม พ.ศ. 2566 โดยผู้วิจัยได้ดำเนินการเก็บรวบรวมข้อมูลการประเมินโครงการตามแนวทางการประเมินของเคิร์กแพทริคใน 4 ด้าน

ประชากรและกลุ่มตัวอย่าง

ประชากร คือ ครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็กในเขตอำเภอเมืองนครนายก จังหวัดนครนายก ที่มีจำนวนนักเรียนไม่เกิน 120 คน จำนวน 30 โรงเรียน มีครูผู้สอนจำนวนทั้งสิ้น 239 คน

กลุ่มตัวอย่าง คือ ครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็กในอำเภอเมืองนครนายก จังหวัดนครนายก ได้มาโดยความสมัครใจในการสมัครเข้าร่วมการอบรม จำนวน 69 คน จาก 15 โรงเรียน

การสร้างและหาคุณภาพเครื่องมือวิจัย

เครื่องมือที่ใช้ในการวิจัยครั้งนี้ประกอบด้วย (1) แบบสอบถามความคิดเห็นและความพึงพอใจต่อการเข้าร่วมการอบรม และ (2) แบบประเมินทักษะการจัดการเรียนรู้ โดยมีกระบวนการในการสร้างและหาคุณภาพ ดังนี้

1. แบบสอบถามความคิดเห็นและความพึงพอใจต่อการเข้าร่วมการอบรม จำนวน 3 ฉบับ สร้างตามแนวคิดการประเมินของเคิร์ก แพทริค เป็นแบบสอบถามแบบมาตราส่วนประมาณค่า 5 ระดับ (Rating Scale) และแบบสอบถามปลายเปิดใช้ในการสอบถามความคิดเห็นเพิ่มเติม โดยแบบสอบถามฉบับที่ 1 ใช้ในการประเมินการอบรมครั้งที่ 1 ประเมินด้านปฏิกิริยาและด้านการเรียนรู้ของผู้เข้าอบรม แบบสอบถามฉบับที่ 2 ใช้ในการประเมินด้านพฤติกรรม และแบบสอบถามฉบับที่ 3 ใช้ในการประเมินด้านผลลัพธ์ หาคุณภาพของแบบสอบถามทั้ง 3 ฉบับ โดยการตรวจสอบความตรงเชิงเนื้อหา (Content Validity) โดยผู้เชี่ยวชาญ จำนวน 3 ท่าน พบว่า ข้อคำถามทุกข้อมีค่า IOC เท่ากับ 1.00 โดยผู้วิจัยได้ปรับแก้ไขข้อคำถามตามคำแนะนำของผู้เชี่ยวชาญเพื่อให้เป็นข้อคำถามที่สมบูรณ์ยิ่งขึ้น

2. แบบประเมินทักษะการจัดการเรียนรู้ เป็นแบบประเมินที่ใช้ในการประเมินด้านผลลัพธ์ โดยใช้ในการประเมินแผนการจัดการเรียนรู้และทักษะการจัดการเรียนรู้ของครูผู้สอน หาคุณภาพของแบบประเมินโดยตรวจสอบความตรงเชิงเนื้อหา และความเหมาะสมของเกณฑ์ที่ใช้ในการประเมิน โดยผู้เชี่ยวชาญ จำนวน 3 ท่าน พบว่า ประเด็นการประเมินทุกประเด็นมีค่า IOC เท่ากับ 1.00 และเกณฑ์ที่ใช้ในการประเมินมีความเหมาะสม

การเก็บรวบรวมข้อมูล

การวิจัยครั้งนี้ผู้วิจัยดำเนินการเก็บรวบรวมข้อมูล ดังนี้

1. เก็บรวบรวมข้อมูลการประเมินด้านปฏิกิริยาและด้านการเรียนรู้ ภายหลังจากการอบรมเชิงปฏิบัติการ หัวข้อ “การพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้สำหรับครูผู้สอนในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก เพื่อพัฒนาสมรรถนะผู้เรียนระดับประถมศึกษา” เสร็จสิ้น โดยให้ผู้เข้าร่วมการอบรมทุกคนตอบแบบสอบถามออนไลน์ฉบับที่ 1 ผ่านทาง Google Form

2. เก็บรวบรวมข้อมูลการประเมินด้านพฤติกรรม ภายหลังจากการอบรมเชิงปฏิบัติการ หัวข้อ “การนำเสนอแผนการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้ของครูผู้สอนระดับประถมศึกษาในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก” เสร็จสิ้น โดยให้ผู้เข้าร่วมการอบรมทุกคนตอบแบบสอบถามออนไลน์ฉบับที่ 2 ผ่านทาง Google Form

3. เก็บรวบรวมข้อมูลผลการประเมินทักษะการจัดการเรียนรู้ของครูผู้สอนโดยผู้เชี่ยวชาญ 3 ท่าน เป็นผู้ประเมินแผนการจัดการเรียนรู้และประเมินทักษะการจัดการเรียนรู้ของครูผู้สอน จำนวน 21

คน และเก็บรวบรวมข้อมูลการประเมินด้านผลลัพธ์ ภายหลังกิจกรรม “การนิเทศ กำกับ ติดตาม ให้ความช่วยเหลือ และประเมินผลการพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก” เสร็จสิ้น โดยให้ผู้เข้าร่วมการอบรมทุกคนตอบแบบสอบถามออนไลน์ฉบับที่ 3 ผ่านทาง Google Form

การวิเคราะห์ข้อมูล

การวิจัยครั้งนี้ดำเนินการวิเคราะห์ข้อมูล ดังนี้

1. วิเคราะห์ข้อมูลจากแบบสอบถามฉบับที่ 1, 2 และ 3 โดยการวิเคราะห์ค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐานของคะแนนความคิดเห็น และวิเคราะห์ความคิดเห็นเพิ่มเติมโดยการวิเคราะห์เชิงเนื้อหา (Content Analysis) โดยเกณฑ์การแปลผล เป็นดังนี้

เกณฑ์การแปลผล

4.51 - 5.00 หมายถึง ผู้ประเมินเห็นด้วยกับข้อความที่ถามหรือมีความพึงพอใจระดับมากที่สุด
3.51 - 4.50 หมายถึง ผู้ประเมินเห็นด้วยกับข้อความที่ถามหรือมีความพึงพอใจในระดับมาก
2.51 - 3.50 หมายถึง ผู้ประเมินเห็นด้วยกับข้อความที่ถามหรือมีความพึงพอใจระดับปานกลาง
1.51 - 2.50 หมายถึง ผู้ประเมินเห็นด้วยกับข้อความที่ถามหรือมีความพึงพอใจในระดับน้อย
1.00 - 1.50 หมายถึง ผู้ประเมินเห็นด้วยกับข้อความที่ถามหรือมีความพึงพอใจในระดับน้อยที่สุด

2. วิเคราะห์ข้อมูลผลการประเมินทักษะการจัดการเรียนรู้โดยการวิเคราะห์ค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน และวิเคราะห์ความคิดเห็นเพิ่มเติมโดยการวิเคราะห์เชิงเนื้อหา

ผลการวิจัย

การรายงานผลการวิจัย แบ่งเป็น 3 ตอน โดยรายงานผลการวิจัยตามแนวทางการประเมินของเคิร์ก แพทริค ดังนี้

ตอนที่ 1 ผลการประเมินด้านปฏิกิริยาและด้านการเรียนรู้ จากการเข้าร่วมการอบรมเชิงปฏิบัติการหัวข้อ “การพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้สำหรับครูผู้สอนในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก เพื่อพัฒนาสมรรถนะผู้เรียนระดับประถมศึกษา”

ในการจัดการอบรมกิจกรรมการอบรมเชิงปฏิบัติการหัวข้อ “การพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้สำหรับครูผู้สอนในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก เพื่อพัฒนาสมรรถนะผู้เรียนระดับประถมศึกษา” ในระหว่างวันที่ 18 - 19 กุมภาพันธ์ พ.ศ. 2566 ณ สำนักงานเขตพื้นที่การศึกษาประถมศึกษานครนายก มีครูผู้แจ้งความประสงค์เข้าร่วมการอบรม จำนวน 69 คน มีผู้เข้าร่วมการอบรม จำนวน 54 คน คิดเป็นร้อยละ 78.26 ของจำนวนผู้แจ้งความจำนงเข้าร่วมการอบรม โดยมีผู้ตอบแบบสอบถามความคิดเห็นและการประเมินความพึงพอใจเพื่อประเมินด้านปฏิกิริยา และด้านการเรียนรู้ จำนวน 43 คน คิดเป็นร้อยละ 79.62 ของจำนวนผู้เข้าร่วมการอบรม ผลการวิเคราะห์ข้อมูลเป็นดังตารางต่อไปนี้

ตารางที่ 1 แสดงผลการประเมินด้านปฏิกิริยาจากการเข้าร่วมการอบรม

ข้อความ	ผลการประเมิน		
	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน	แปลผล
1. ความเหมาะสมของระยะเวลา	4.51	0.62	มากที่สุด
2. ความเหมาะสมของสถานที่ในการจัดโครงการ	4.58	0.53	มากที่สุด
3. ความพึงพอใจต่อวิทยากร	4.79	0.40	มากที่สุด
4. ความเหมาะสมของเอกสารประกอบการอบรม	4.69	0.55	มากที่สุด
5. การอำนวยความสะดวกของเจ้าหน้าที่	4.83	0.36	มากที่สุด
6. ความเหมาะสมและเพียงพอของอาหารและเครื่องดื่ม	4.69	0.45	มากที่สุด
7. ความเหมาะสมของรูปแบบกิจกรรม	4.69	0.50	มากที่สุด
8. การให้คำแนะนำ ชี้แจง และการตอบข้อซักถามของวิทยากร	4.79	0.40	มากที่สุด
9. การเปิดโอกาสให้มีส่วนร่วมและแสดงความคิดเห็น	4.83	0.42	มากที่สุด
10. ความคุ้มค่าในการเข้าร่วมการอบรม	4.67	0.46	มากที่สุด
11. ความพึงพอใจในภาพรวมของการจัดการอบรม	4.72	0.44	มากที่สุด
รวม	**4.72**	**0.51**	**มากที่สุด**

จากตารางที่ 1 จะเห็นว่า ผลการประเมินด้านปฏิกิริยาในภาพรวมอยู่ในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.72 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.51 โดยผลการประเมินด้านปฏิกิริยาทุกประเด็นอยู่ในระดับมากที่สุด มีค่าเฉลี่ยอยู่ในช่วง 4.51 – 4.83 และค่าส่วนเบี่ยงเบนมาตรฐานอยู่ในช่วง 0.40 – 0.62 ผลการประเมินด้านปฏิกิริยาที่มีค่าเฉลี่ยสูงสุด 3 อันดับแรก คือ การเปิดโอกาสให้มีส่วนร่วมและแสดงความคิดเห็น การอำนวยความสะดวกของเจ้าหน้าที่ ความพึงพอใจต่อวิทยากร และการให้คำแนะนำ ชี้แจง และการตอบข้อซักถามของวิทยากร มีค่าเฉลี่ยเท่ากับ 4.83 4.83 4.79 และ 4.79 และมีค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.42 0.36 0.40 และ 0.40 ตามลำดับ และผลการประเมินด้านปฏิกิริยาที่มีค่าเฉลี่ยต่ำสุด 3 อันดับสุดท้าย คือ ความคุ้มค่าในการเข้าร่วมการอบรม ความเหมาะสมของสถานที่ในการจัดโครงการ และความเหมาะสมของระยะเวลา มีค่าเฉลี่ยเท่ากับ 4.67 4.58 และ 4.51 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.46 0.53 และ 0.62 ตามลำดับ

ตารางที่ 2 แสดงผลการประเมินด้านการเรียนรู้ของผู้เข้าร่วมการอบรม

ข้อความ	ผลการประเมิน		
	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน	แปลผล
1. ความรู้ และทักษะการจัดการเรียนรู้เชิงรุกก่อนการอบรม	3.62	0.50	มาก
2. ความรู้ และทักษะการจัดการเรียนรู้เชิงรุกหลังการอบรม	4.66	0.52	มากที่สุด

ตารางที่ 2 (ต่อ)

ข้อความ	ผลการประเมิน		
	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน	แปลผล
3. ความรู้ และทักษะในการสร้างสื่อการจัดการเรียนรู้ก่อนการอบรม	3.78	0.52	มาก
4. ความรู้ และทักษะในการสร้างสื่อการจัดการเรียนรู้หลังการอบรม	4.74	0.42	มากที่สุด
5. ความสามารถในการประยุกต์ใช้ความรู้ และทักษะที่ได้รับจากการอบรมในการพัฒนาการจัดการเรียนรู้ได้	4.62	0.48	มากที่สุด
6. สิ่งที่ท่านได้เรียนรู้จากโครงการเข้าร่วมการอบรมตรงตามความคาดหวังและความต้องการของท่าน	4.62	0.52	มากที่สุด
7. ทัศนคติที่ดีต่อการจัดการเรียนรู้เชิงรุกของท่าน	4.52	0.48	มากที่สุด
8. ประโยชน์ที่ท่านได้รับจากการอบรมครั้งนี้	4.72	0.44	มากที่สุด
รวม	**4.64**	**0.47**	**มากที่สุด**

จากตารางที่ 2 จะเห็นว่า ผลการประเมินการเรียนรู้ในภาพรวมอยู่ในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.64 และค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.47 และจะเห็นว่า ผู้เข้าร่วมการอบรมมีความรู้และทักษะการจัดการเรียนรู้เชิงรุกหลังการอบรมสูงขึ้น โดยก่อนจัดการอบรมมีความรู้และทักษะการจัดการเรียนรู้เชิงรุกในระดับมาก มีค่าเฉลี่ยเท่ากับ 3.62 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.50 หลังการอบรมมีความรู้และทักษะการจัดการเรียนรู้เชิงรุกในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.66 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.52 และจะเห็นว่า ผู้เข้าร่วมการอบรมมีความรู้และทักษะในการสร้างสื่อการจัดการเรียนรู้หลังการอบรมสูงขึ้น โดยก่อนจัดการอบรมมีความรู้และทักษะในการสร้างสื่อการจัดการเรียนรู้ในระดับมาก มีค่าเฉลี่ยเท่ากับ 3.78 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.52 หลังการอบรมมีความรู้และทักษะในการสร้างสื่อการจัดการเรียนรู้ในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.74 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.42 ส่วนผลการประเมินประเด็นอื่น ๆ อยู่ในระดับมากที่สุดทุกประเด็นเรียงตามลำดับจากมากที่สุดดังนี้ ประโยชน์ที่ท่านได้รับจากการอบรมครั้งนี้ ความสามารถในการประยุกต์ใช้ความรู้และทักษะที่ได้รับจากการอบรมในการพัฒนาการจัดการเรียนรู้ได้ สิ่งที่ได้เรียนรู้จากโครงการเข้าร่วมการอบรมครั้งนี้ตรงตามความคาดหวังและความต้องการ และการมีทัศนคติที่ดีต่อการจัดการเรียนรู้เชิงรุก มีค่าเฉลี่ยเท่ากับ 4.72, 4.62, 4.62 และ 4.52 และค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.44, 0.48, 0.52 และ 0.48 ตามลำดับ

ตอนที่ 2 ผลการประเมินด้านพฤติกรรมจากผลการจัดกิจกรรมการอบรมเชิงปฏิบัติการ “การนำเสนอแผนการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้ของครูผู้สอนระดับประถมศึกษาในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก”

ในการประเมินด้านพฤติกรรมจากผลการจัดกิจกรรมการอบรมเชิงปฏิบัติการ “การนำเสนอแผนการจัดการเรียนรู้เชิงรุก (Active Learning) และสื่อการจัดการเรียนรู้ของครูผู้สอนระดับประถมศึกษาในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก” มีผู้บริหารและครูผู้สอนเข้าอบรมทั้งสิ้น 47 คน จาก 11 โรงเรียน ซึ่งคิดเป็นร้อยละ 85.45 ของจำนวนผู้ที่แจ้งความประสงค์เข้าร่วมอบรม จำนวน 55 คน จาก 13 โรงเรียน โดยมีครูผู้สอนที่ส่งและนำแผนการจัดการเรียนรู้และสื่อการจัดการเรียนรู้ จำนวน 12 คน ผลการประเมินเป็นดังนี้

ตารางที่ 3 แสดงผลการประเมินด้านพฤติกรรมของผู้เข้าร่วมการอบรม

ข้อความ	ผลการประเมิน		
	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน	แปลผล
1. ด้านวิทยากร	**4.83**	**0.32**	**มากที่สุด**
1.1 การเตรียมตัวและความพร้อมของวิทยากร	4.81	0.39	มากที่สุด
1.2 การถ่ายทอดความรู้ของวิทยากร	4.78	0.41	มากที่สุด
1.3 ความชัดเจนในการอธิบายเกี่ยวกับประเด็นที่วิพากษ์	4.81	0.46	มากที่สุด
1.4 การตอบคำถามของวิทยากร	4.75	0.43	มากที่สุด
1.5 ความเป็นกัลยาณมิตรของวิทยากร	5.00	0.00	มากที่สุด
2. ด้านความเข้าใจและการนำความรู้ไปใช้	**4.78**	**0.43**	**มากที่สุด**
2.1 ความเข้าใจและทักษะการเขียนแผนการจัดการเรียนรู้เชิงรุก และการจัดทำสื่อการเรียนรู้ของข้าพเจ้าก่อนการอบรม	4.69	0.50	มากที่สุด
2.2 ความเข้าใจและทักษะการเขียนแผนการจัดการเรียนรู้เชิงรุก และการจัดทำสื่อการเรียนรู้ของข้าพเจ้าหลังการอบรม	4.79	0.40	มากที่สุด
2.3 ความสามารถในการนำความรู้และทักษะที่ได้รับ การพัฒนาไปประยุกต์ใช้ในการเขียนแผนการจัดการเรียนรู้เชิงรุก และการจัดทำสื่อการจัดการเรียนรู้เพื่อพัฒนาสมรรถนะผู้เรียน	4.79	0.40	มากที่สุด
2.4 ความสามารถในการนำความรู้และทักษะที่ได้รับการพัฒนาไปถ่ายทอด/เผยแพร่ให้กับผู้อื่นได้รับทราบ	4.83	0.42	มากที่สุด
3. การประเมินด้านผลลัพธ์	**4.83**	**0.32**	**มากที่สุด**
3.1 ได้รับความรู้ แนวคิด ทักษะและประสบการณ์ใหม่ ๆ จากโครงการ	4.67	0.46	มากที่สุด
3.2 สามารถนำสิ่งที่ได้รับจากโครงการ/กิจกรรมนี้ไปใช้ในการปฏิบัติงาน	4.62	0.48	มากที่สุด
ภาพรวม	**4.81**	**0.35**	**มากที่สุด**

จากตารางที่ 3 จะเห็นว่า ผลการประเมินพฤติกรรมอยู่ในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.81 ส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.35 เมื่อพิจารณาด้านย่อย ๆ พบว่า ด้านวิทยากร ด้านความเข้าใจและการนำความรู้ไปใช้ของผู้เข้าร่วมการอบรม และด้านผลลัพธ์ อยู่ในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.83 4.78 และ 4.83 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.32 0.43 และ 0.32 ตามลำดับ ด้านวิทยากร ประเด็นที่มีผลการประเมินสูงสุด คือ ความเป็นกัลยาณมิตรของวิทยากร โดยมีค่าเฉลี่ยเท่ากับ 5.00 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0 ด้านความเข้าใจและการนำความรู้ไปใช้ของผู้เข้าร่วมการอบรม ประเด็นที่มีผลการประเมินสูงสุดคือ ความสามารถในการนำความรู้และทักษะที่ได้รับการพัฒนาไปถ่ายทอด/เผยแพร่ให้กับผู้อื่นได้รับทราบ มีค่าเฉลี่ยเท่ากับ 4.83 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.42 และด้านการประเมินผลลัพธ์ ประเด็นที่มีผลการประเมินสูงสุด คือ ผู้เข้าอบรมได้รับความรู้ แนวคิด ทักษะและประสบการณ์ใหม่ ๆ จากโครงการ โดยมีค่าเฉลี่ยเท่ากับ 4.67 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.46

ความคิดเห็นในประเด็นอื่น ๆ

จากการสอบถามความคิดเห็นในประเด็นอื่น ๆ โดยใช้แบบสอบถามปลายเปิด จำนวน 2 ข้อ ข้อที่ 1) สอบถามแนวทางการนำความรู้และทักษะที่ได้รับการพัฒนาไปประยุกต์ใช้ และข้อที่ 2) สอบถามความคิดเห็นและข้อเสนอแนะเพิ่มเติม สรุปคำตอบแต่ละข้อได้ดังนี้

1. นำความรู้และทักษะที่ได้รับการพัฒนาจากการอบรมไปปรับใช้ในการจัดการเรียนการสอนตามแนวทางการจัดการเรียนรู้เชิงรุกเพื่อพัฒนาสมรรถนะของผู้เรียน โดยสามารถนำไปปรับใช้ในการพัฒนานักเรียนได้ทุกระดับชั้นตามความเหมาะสม ทั้งในด้านการพัฒนาแผนการจัดการเรียนรู้ให้เหมาะสมกับบริบทของโรงเรียน ออกแบบกิจกรรมการเรียนรู้ที่มีประสิทธิภาพตอบสนองตามความต้องการของนักเรียนโดยเน้นการมีส่วนร่วมของผู้เรียน สร้างและพัฒนาสื่อที่ส่งเสริมการเรียนรู้ให้นักเรียนได้สัมผัส ได้ปฏิบัติ ได้ลงมือทำ ปรับปรุงวิธีการจัดการเรียนรู้ให้สามารถพัฒนาทักษะการคิดขั้นสูงและสมรรถนะผู้เรียนได้อย่างแท้จริง ปรับปรุงและพัฒนาวิธีการประเมินการเรียนรู้ให้มีคุณภาพและมีประสิทธิภาพ

2. การอบรมครั้งนี้ ทำให้ผู้เข้าอบรมได้พัฒนาตนเองได้ทั้งในด้านความรู้ ทักษะการปฏิบัติทุกครั้งที่เข้ารับการอบรม สิ่งที่ได้เรียนรู้สามารถนำไปปฏิบัติ นำไปใช้ได้จริง และเกิดประโยชน์ต่อนักเรียน ต่อตัวครู และต่อโรงเรียน และทำให้ครูที่เข้าอบรมมีเจตคติที่ดีต่อการจัดการเรียนรู้เชิงรุก โดยต้องการให้มีการจัดอบรมในลักษณะเช่นนี้อีกในอนาคต ขอบคุณทีมงานและคณะวิทยากรที่มีความตั้งใจ ทุ่มเทและปรารถนาดีต่อคุณครูทุกคน โครงนี้เป็นโครงการที่ดีและมีประโยชน์ โดยมีข้อเสนอแนะให้เพิ่มจำนวนวันในการอบรม เพื่อให้มีเวลาในการเรียนรู้และฝึกปฏิบัติมากขึ้น และเพิ่มกาแฟในช่วงเบรกเพื่อเพิ่มความสดชื่นให้กับผู้เข้าอบรม

ตอนที่ 3 ผลการประเมินด้านผลลัพธ์จากการเข้าร่วมการอบรมจากผลการจัดกิจกรรม “การนิเทศ กำกับ ติดตามให้ความช่วยเหลือ และประเมินผลการพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก”

ในการประเมินด้านผลลัพธ์ประเมินจากผลการจัดกิจกรรม “การนิเทศ กำกับ ติดตาม ให้ความช่วยเหลือ และประเมินผลการพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก” โดยคัดเลือกโรงเรียนที่ครูผู้สอนเข้าอบรมทุกครั้ง และยินดีให้ทีมงานวิจัยเข้านิเทศ กำกับ ติดตามให้ความช่วยเหลือ จำนวนทั้งสิ้น 6 โรงเรียน ๆ ละ 2 คน ทั้งนี้มีจำนวน 1 โรงเรียนที่ขอให้นิเทศคุณครูทั้ง 6 คน มีจำนวนผู้เข้ารับการนิเทศทั้งสิ้น 21 คน โดยผู้นิเทศกำกับ ติดตาม และให้ความช่วยเหลือเป็นผู้เชี่ยวชาญด้านการจัดการเรียนรู้ และศึกษานิเทศก์ที่ดูแลเขต

พื้นที่เข้าร่วมการประเมิน โรงเรียนละ 3 ท่าน โดยใช้แบบประเมินทักษะจัดการเรียนรู้ รวมทั้งการตอบแบบสอบถามปลายเปิด ผลการนิเทศ พบว่า ครูผู้สอนได้รับผลการประเมินในระดับดีเยี่ยม จำนวน 11 คน คิดเป็น ร้อยละ 52.38 และระดับดี จำนวน 10 คน คิดเป็นร้อยละ 47.62 ในภาพรวมพบว่า ครูผู้สอนมีความตั้งใจในการพัฒนาแผนการจัดการเรียนรู้ กิจกรรมการเรียนรู้ สื่อการจัดการเรียนรู้ และมีความตั้งใจในการจัดการเรียนรู้เพื่อพัฒนานักเรียนในความรับผิดชอบเป็นอย่างดี โดยประเด็นที่ควรมีการพัฒนาเพิ่มเติม จากการตรวจสอบแผนการจัดการเรียนรู้คือ ความชัดเจนของจุดประสงค์การเรียนรู้ ความสอดคล้องของกิจกรรมการเรียนรู้ การประเมินการเรียนรู้กับจุดประสงค์การเรียนรู้ที่วางไว้ ผลการประเมินกิจกรรมการนิเทศ กำกับ ติดตาม ให้ความช่วยเหลือ และประเมินผลการพัฒนาทักษะการจัดการเรียนรู้เชิงรุก (Active Learning) ของครูผู้สอนในเครือข่ายโรงเรียนขนาดเล็ก จังหวัดนครนายก เป็นดังตารางต่อไปนี้

ตารางที่ 4 แสดงผลการประเมินด้านผลลัพธ์

ข้อความ	ผลการประเมิน		
	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน	แปลผล
1. ท่านนำความรู้และทักษะที่ได้รับการพัฒนาจากการเข้าร่วมการอบรมทั้ง 2 ครั้ง มาใช้ในการออกแบบการจัดการเรียนรู้	4.73	0.45	มากที่สุด
2. การติดตาม ให้ความช่วยเหลือเพื่อพัฒนาทักษะการจัดการเรียนรู้เชิงรุกครั้งนี้เป็นไปด้วยความเป็นกัลยาณมิตร	4.94	0.22	มากที่สุด
3. ท่านสามารถจัดการเรียนรู้ตามที่ได้วางแผนอย่างมีประสิทธิภาพ	4.47	0.61	มาก
4. ข้อเสนอแนะของผู้นิเทศการจัดการเรียนรู้เป็นประโยชน์สำหรับท่าน	4.89	0.31	มากที่สุด
5. ความพึงพอใจต่อภาพรวมของการจัดกิจกรรมการนิเทศ กำกับ ติดตาม และให้ความช่วยเหลือ	4.89	0.31	มากที่สุด
รวม	**4.78**	**0.38**	**มากที่สุด**

จากตารางที่ 4 จะเห็นว่า ผลการประเมินผลลัพธ์ในภาพรวมอยู่ในระดับมากที่สุด มีค่าเฉลี่ยเท่ากับ 4.78 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.38 โดยประเด็นที่มีผลการประเมินสูงสุด 3 อันดับแรก คือ การติดตามให้ความช่วยเหลือเพื่อพัฒนาทักษะการจัดการเรียนรู้เชิงรุกเป็นไปด้วยความเป็นกัลยาณมิตร ข้อเสนอแนะของผู้นิเทศการจัดการเรียนรู้เป็นประโยชน์สำหรับการนิเทศ และความพึงพอใจต่อภาพรวมของการจัดกิจกรรมการนิเทศ กำกับ ติดตาม และให้ความช่วยเหลือ มีค่าเฉลี่ยเท่ากับ 4.94, 4.89 และ 4.89 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.22 0.31 และ 0.31 ตามลำดับ

จากการสอบถามความคิดเห็นและข้อเสนอแนะเพิ่มเติม สรุปได้ว่า ครูสามารถสร้างแผนการเรียนรู้ตามแนวทางการจัดการเรียนรู้เชิงรุกได้ชัดเจนสอดคล้องตามความต้องการของนักเรียน เน้นการมี

ส่วนร่วมของนักเรียน ทำให้นักเรียนมีความสุข และกล้าแสดงออกมากขึ้น ใช้ความรู้ และทักษะในการจัดกิจกรรมที่ทำให้นักเรียนมีความสุขและเข้าร่วมอย่างกระตือรือร้น สามารถพัฒนาสื่อการเรียนรู้ที่สร้างสรรค์และตอบสนองความต้องการของผู้เรียน และสามารถนำความรู้ที่ได้ไปใช้ในการสร้างแผนการเรียนรู้ที่เหมาะสมกับเด็กปฐมวัยและสอดคล้องกับบริบทของโรงเรียน

สรุปและอภิปรายผล

สรุปผลการวิจัย

ผลการประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก ตามแนวคิดของเคิร์ก แพทริค โดยดำเนินการประเมิน 4 ด้าน คือ ด้านปฏิกิริยา ด้านการเรียนรู้ ด้านพฤติกรรม และด้านผลลัพธ์ ผลการวิจัยพบว่า ผลการประเมินทั้ง 4 ด้านอยู่ในระดับมากที่สุดทุกด้าน โดยมีค่าเฉลี่ยเท่ากับ 4.72, 4.64, 4.81 และ 4.78 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.51, 0.47, 0.35 และ 0.38 ตามลำดับ

การอภิปรายผล

จากผลการประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก ตามแนวคิดของเคิร์ก แพทริค ทั้ง 4 ด้าน อยู่ในระดับมากที่สุด โดยมีค่าเฉลี่ยเท่ากับ 4.72, 4.64, 4.81 และ 4.78 ค่าส่วนเบี่ยงเบนมาตรฐานเท่ากับ 0.51, 0.47, 0.35 และ 0.38 ตามลำดับ จะเห็นว่า ผลการประเมินอยู่ในระดับสูงทุกด้าน แสดงให้เห็นว่า การจัดโครงการดังกล่าวประสบผลสำเร็จไปด้วยดี ผู้เข้ารับการอบรมมีความพึงพอใจต่อรายละเอียดต่าง ๆ ของการจัดโครงการทั้งในด้านกระบวนการ วิทยากร และด้านอื่น ๆ โดยได้รับความรู้ และทักษะในการจัดการเรียนรู้ตามแนวทางการจัดการเรียนรู้เชิงรุก และการพัฒนาสื่อการจัดการเรียนรู้ อีกทั้งยังสามารถนำความรู้และทักษะที่ได้รับการพัฒนา ไปปรับใช้ในการออกแบบการจัดการเรียนรู้ สามารถเลือกวิธีการจัดการเรียนรู้ที่เน้นกระบวนการจัดการเรียนรู้เชิงรุก เลือกใช้สื่อการเรียนรู้ที่เหมาะสม และสามารถจัดการเรียนรู้ได้อย่างมีประสิทธิภาพ ส่งผลให้นักเรียนมีความสุขในการเรียนเพราะได้ลงมือปฏิบัติ ได้คิด ได้ทำ ได้แก้ปัญหาที่เกิดขึ้น ทั้งนี้ หากครูผู้สอนได้รับการพัฒนาเกี่ยวการวิเคราะห์ตัวชี้วัด เพื่อนำไปสู่การเขียนจุดประสงค์การเรียนรู้ที่มีประสิทธิภาพจะทำให้เกิดความชัดเจนในเป้าหมายที่ต้องการพัฒนานักเรียนมากยิ่งขึ้น อันจะนำไปสู่การวางแผนการจัดการเรียนรู้ การออกแบบกิจกรรมการเรียนรู้ การเลือกหรือพัฒนาสื่อการเรียนรู้ที่เหมาะสม และการออกแบบการประเมินการเรียนรู้ที่เน้นการประเมิน เพื่อพัฒนาที่ตรงตามจุดประสงค์การเรียนรู้ที่ตั้งไว้ ซึ่งจะทำให้นักเรียนบรรลุตามจุดประสงค์การเรียนรู้ที่ตั้งไว้ได้อย่างแท้จริง

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

การวิจัยครั้งนี้ พบว่า ผลการประเมินโครงการพัฒนาทักษะการจัดการเรียนรู้เชิงรุกของครูผู้สอนระดับประถมศึกษาในโรงเรียนเครือข่ายโรงเรียนขนาดเล็ก ในเขตอำเภอเมือง จังหวัดนครนายก อยู่ในระดับดีมาก แสดงให้เห็นว่า โครงการดังกล่าวประสบความสำเร็จ จึงควรจัดโครงการดังกล่าวในปีถัดไปโดยขยายพื้นที่ไปยังอำเภออื่น ๆ ของจังหวัดนครนายก และในจังหวัดอื่น ๆ โดยใช้ครูผู้สอนที่ได้รับผลการประเมินการสอนในระดับดีเยี่ยมร่วมเป็นวิทยากรในการถ่ายทอดองค์ความรู้ และทักษะการจัดการเรียนรู้ต่าง ๆ โดยคณะผู้วิจัยและผู้จัดโครงการควรนำข้อเสนอแนะต่าง ๆ ที่ได้รับจากการประเมินไปใช้

ในการปรับปรุงและพัฒนาโครงการให้มีคุณภาพยิ่งขึ้นต่อไป

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ในการวิจัยครั้งต่อไป คณะผู้วิจัยควรนำข้อบกพร่องในการวิจัยครั้งนี้ไปปรับใช้ในการวางแผนการวิจัยให้มีความรัดกุม และเก็บรวบรวมข้อมูลเชิงลึกโดยวิธีการที่หลากหลายจะได้สารสนเทศที่เป็นประโยชน์มากขึ้น

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การพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนพะตงประธานคีรีวัฒน์

Development of Reading Analytical Thinking Skills Training Using by Organizing KWL Plus Learning for Mathayomsuksa 5 Students at Patong Prathan Kiriwat School.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) พัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ให้มีประสิทธิภาพตามเกณฑ์ 80/80 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus 3) ประเมินความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus กลุ่มตัวอย่างที่ใช้ในการวิจัยคือ นักเรียนมัธยมศึกษาปีที่ 5/1 โรงเรียนพะตงประธานคีรีวัฒน์ ภาคเรียนที่ 2 ปีการศึกษา 2566 จำนวน 32 คน จากการสุ่มอย่างง่าย (Simple Random) ด้วยวิธีจับสลากโดยใช้ห้องเรียนเป็นหน่วยสุ่ม

เครื่องมือที่ใช้ในการวิจัยประกอบด้วย 1) แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน (ชุดเดียวกัน) ข้อสอบแบบปรนัย จำนวน 30 ข้อ คะแนนเต็ม 30 คะแนน 2) แบบฝึกทักษะการอ่านคิดวิเคราะห์โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 4 เล่ม 3) แผนการจัดการเรียนรู้ประกอบการใช้แบบฝึกทักษะ จำนวน 4 แผน รวม 8 ชั่วโมง (ไม่รวมทดสอบก่อนเรียนและหลังเรียน จำนวน 1 ชั่วโมง) 4) แบบประเมินความพึงพอใจ จำนวน 10 ข้อ สถิติที่ใช้วิเคราะห์ข้อมูลได้แก่ ค่าร้อยละ (P) ค่าเฉลี่ย ($\overline{X}$) ค่าส่วนเบี่ยงเบนมาตรฐาน (S.D.) ค่า E_1/E_2 และค่า t-test (Dependent samples) สรุปผลการวิจัยได้ ดังนี้

1. ประสิทธิภาพของแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 มีประสิทธิภาพ 80.94/81.04 เป็นไปตามเกณฑ์ที่กำหนด 80/80

2. ผลสัมฤทธิ์ทางการเรียนของนักเรียนก่อนและหลังเรียนด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

3. นักเรียนชั้นมัธยมศึกษาปีที่ 5 โรงเรียนพะตงประธานคีรีวัฒน์มีความพึงพอใจต่อการจัดการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus ในระดับมากที่สุด

คำสำคัญ: แบบฝึกทักษะ, การอ่านคิดวิเคราะห์, การจัดการเรียนรู้กลวิธี KWL Plus

Abstract

The objectives of this research are 1) to develop analytical reading skills training exercises; By organizing KWL Plus learning strategies for Mathayomsuksa 5 students to be effective according to the criteria of 80/80 2) To compare academic achievement before and after learning by using reading and analytical thinking skills exercises by organizing learning. KWL Plus strategies 3) To assess student satisfaction with the learning management using reading and analytical thinking skills training using the KWL Plus learning strategy. The sample group used in this study was Mathayomsuksa 5 students/ 1 Phatong Prathan Khiriwat School, Semester 2, Academic Year 2023, 1 room, totaling 32 students, using a simple random method (Simple Random) Lottery method using classrooms as random units.

The tools used include 1) a pre- and post-study achievement test. (The same set of exams) is a multiple-choice exam with 30 questions, a full score of 30 points. 2) Reading and analytical thinking skills practice by organizing the KWL Plus learning strategy for Mathayomsuksa 5 students, 4 volumes 3) 4 learning plans, 8 hours (not including pre-class and post-class tests) 4) Satisfaction assessment form Statistics used in data analysis include E1/E2, P (Percentage), $\overline{X}$ (Mean), S.D. and t-test (Dependent samples). The results of the research can be summarized as follows.

1. Efficiency of reading and analytical thinking skills training By organizing KWL Plus learning strategies for Mathayomsuksa 5 students at Phatong Prathan Khiriwat School. Efficiency is equal to 80.94/81.04, meeting the specified criteria 80/80.

2. Academic achievement of students before and after studying with reading and analytical thinking skills exercises. By organizing KWL Plus learning strategies for Mathayomsuksa 5 students at Phatong Prathan Khiriwat School. After studying was significantly higher than before studying at the .01 level.

3. Mathayomsuksa 5 students at Phatong Prathan Khiriwat School Satisfied with learning management with reading and analytical thinking skills exercises. By organizing KWL Plus learning strategies at the highest level.

Keywords: Skills Training, Analytical Reading, Learning Management Strategies KWL Plus

บทนำ

ภาษาไทยนับเป็นบทบาทสำคัญต่อคนไทยทุกคนเนื่องจากเป็นภาษาประจำชาติ อีกทั้งใช้ภาษาเป็นเครื่องมือในการติดต่อสื่อสาร ภาษาไทยจึงต้องฝึกฝนเรียนรู้ให้มีประสิทธิภาพเกิดความชำนาญในการใช้ภาษาเพื่อการสื่อสารและนำไปใช้ในชีวิตได้จริง ซึ่งทักษะที่สำคัญในการสื่อสาร ได้แก่ การอ่าน การฟัง การดู การพูด และการเขียน ดังนั้นภาษาไทยถือเป็นเอกลักษณ์ของชาติ และเป็นสมบัติทางวัฒนธรรมให้คนไทยได้เรียนรู้ อนุรักษ์ และสืบสานให้คงอยู่คู่ชาติไทยตลอดไป

ทักษะการสื่อสารที่สำคัญอย่างยิ่ง คือ การอ่าน เพราะเป็นทักษะการเรียนรู้ที่สำคัญต่อการพัฒนาคุณภาพชีวิต การอ่านช่วยสร้างองค์ความรู้และความสามารถ เป็นทักษะพื้นฐานที่จำเป็นโดยเฉพาะในยุคโลกไร้พรมแดนหรือยุคโลกาภิวัฒน์ (Globalization) ที่มีวิวัฒนาการอย่างรวดเร็วของเทคโนโลยีคอมพิวเตอร์และความเจริญก้าวหน้าของเทคโนโลยีการสื่อสาร คนส่วนใหญ่รับรู้ข้อมูลข่าวสารจากการอ่านไม่ว่าจะเป็นการอ่านจากสื่ออินเทอร์เน็ต หนังสืออิเล็กทรอนิกส์ บทความ วารสาร เป็นต้น ล้วนแล้วแต่ทำให้เกิดการเรียนรู้ทั้งสิ้น การศึกษาในปัจจุบันควรส่งเสริมให้บุคคลเกิดการเรียนรู้อย่างต่อเนื่อง เพื่อสามารถนำความรู้ที่ได้รับจากการอ่านมาพัฒนาสติปัญญาในการแก้ปัญหาและดำรงชีวิตอยู่ในสังคมได้ ดังที่ พิชญ์ชลิดา วงศ์สิริบวรกุล (2560) ได้กล่าวถึงความสำคัญของการอ่านไว้ว่า การอ่านมีความสำคัญต่อการใช้ชีวิตในยุคปัจจุบัน เพราะการอ่านช่วยให้ทันต่อการเปลี่ยนแปลงของโลก เป็นเครื่องมือสำคัญในการเรียนรู้และติดต่อสื่อสารกับผู้อื่น การอ่านจะเป็นประโยชน์อย่างยิ่ง ถ้าผู้อ่าน อ่านเป็น รู้จักใช้ความคิดวิเคราะห์ จนสามารถนำความรู้ประสบการณ์ต่าง ๆ จากเรื่องที่อ่านไปสร้างประโยชน์แก่ตนเองและสังคมได้

การจัดการเรียนการสอนภาษาไทย ชั้นมัธยมศึกษาปีที่ 5 ตามหลักสูตรการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 ได้กำหนดให้ผู้เรียนมีความรู้ ความสามารถ มีคุณธรรมจริยธรรม และมีค่านิยมในการใช้ภาษาในการสื่อสาร มีความสามารถในการอ่าน เขียน ฟัง และพูดได้อย่างมีประสิทธิภาพ มีความคิดสร้างสรรค์ คิดอย่างมีเหตุผล และคิดอย่างเป็นระบบ มีนิสัยรักการอ่าน การเขียน การแสวงหาความรู้ใช้ภาษาในการพัฒนาตนและสร้างสรรค์งานอาชีพ มีความตระหนักในวัฒนธรรมการใช้ภาษาและความเป็นไทย สามารถนำทักษะทางภาษามาประยุกต์ใช้ในชีวิตจริงได้อย่างมีประสิทธิภาพ ถูกต้องตามสถานการณ์และบุคคล มีมนุษยสัมพันธ์ที่ดี มีวิสัยทัศน์โลกทัศน์ที่กว้างไกล การที่จะให้นักเรียนเป็นผู้ที่มีความสามารถในการใช้ภาษาได้ดีต้องฝึกฝนทักษะต่าง ๆ ให้มีความสัมพันธ์กัน ครูจึงต้องสอนให้รู้จักอักษรที่ถูกต้อง ซึ่งการอ่านเป็นสิ่งสำคัญและจำเป็นต่อชีวิตของคนในยุคปัจจุบัน ให้ประโยชน์แก่มนุษย์ทุกด้านและทุกโอกาส ทั้งในด้านการศึกษา การประกอบอาชีพ และการพักผ่อนหย่อนใจ (ฉวีลักษณ์ บุณยะกาญจน์, 2557)

หลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 ได้มีการกำหนดเกณฑ์การประเมินผลการเรียนรู้ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 ดังนี้ ผู้เรียนทุกคนต้องผ่านเกณฑ์ในแต่ละระดับชั้น โดยเกณฑ์การประเมินการเรียนรู้เกณฑ์หนึ่งก็คือ ต้องผ่านการประเมินการอ่านคิดวิเคราะห์ และเขียนตามตัวชี้วัดความสามารถในการอ่านคิดวิเคราะห์ สำหรับนักเรียนระดับชั้นมัธยมศึกษาปีที่ 4 - 6 ดังนี้ สามารถอ่านเพื่อตีความ แปลความ และขยายความจากเรื่องที่อ่าน สามารถจับประเด็นสำคัญ เปรียบเทียบ เชื่อมโยงความเป็นเหตุเป็นผลจากเรื่องที่อ่าน สามารถเชื่อมโยงความสัมพันธ์ของเรื่องราวเหตุการณ์ของเรื่องที่อ่าน สามารถแสดงความคิดเห็นต่อเรื่องที่อ่าน โดยมีเหตุผลสนับสนุนและสามารถถ่ายทอด ความเข้าใจ ความคิดเห็น คุณค่าจากเรื่องที่อ่านโดยการเขียน

จากการประเมินผลสัมฤทธิ์ที่ได้จากการคัดกรองความสามารถในการอ่านและการเขียนของสำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน ภาคเรียนที่ 1 ปีการศึกษา 2566 เพื่อวัดความสามารถ

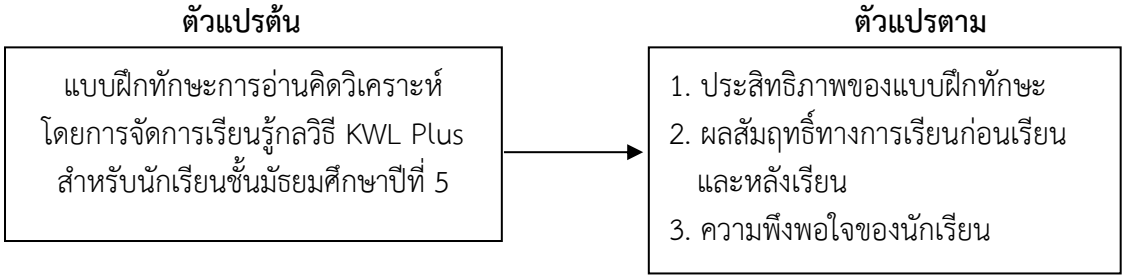
ในการจับใจความสำคัญ วิเคราะห์ วิจารณ์ แสดงความคิดเห็น และเสนอแนวคิดใหม่จากเรื่องที่อ่านได้อย่างมีเหตุผล และนำความรู้ความคิดจากเรื่องที่อ่านไปประยุกต์ใช้แก้ปัญหาในการดำเนินชีวิต ปรากฏว่านักเรียนส่วนใหญ่ในชั้นมัธยมศึกษาปีที่ 5 โรงเรียนพะตงประธานคีรีวัฒน์ นักเรียนขาดทักษะการอ่านการคิดวิเคราะห์ ซึ่งนับเป็นปัญหาที่ส่งผลกระทบต่อการเรียนรู้และการพัฒนาสู่ระดับการเรียนรู้ที่สูงขึ้น นักเรียนไม่สามารถจำแนกและจัดหมวดหมู่หรือประเภทสิ่งของต่าง ๆ อย่างมีหลักเกณฑ์ อีกทั้งมีความยากลำบาก ในการแก้ปัญหา การนำเสนอความคิด หรือทำการวิเคราะห์อย่างมีประสิทธิภาพ ซึ่งปัญหาเหล่านี้อาจเกิดจากสาเหตุหลายปัจจัย เช่น การสอนที่ไม่ได้รับการออกแบบอย่างเหมาะสม การให้ความสำคัญกับการจดจำข้อมูลมากเกินไป หรือขาดการประยุกต์ใช้ความรู้ในสถานการณ์จริง การเรียนรู้ที่เน้นการจดจำเพียงอย่างเดียว เป็นต้น ซึ่งอาจทำให้นักเรียนไม่สามารถนำความรู้ที่ได้รับมาประยุกต์ในบริบทต่าง ๆ ได้ ซึ่งเป็นทักษะสำคัญที่ต้องใช้ในชีวิตประจำวันและการทำงาน นอกจากนี้การพัฒนาทักษะการคิดวิเคราะห์อาจต้องให้ความสำคัญกับการสร้างสถานการณ์การเรียนรู้ที่กระตุ้นให้นักเรียนสามารถประยุกต์ความรู้ในสถานการณ์ที่แตกต่างกัน การให้โอกาสให้นักเรียนได้ปฏิบัติจริง หรือการทำกิจกรรมที่ต้องใช้การคิดวิเคราะห์จะช่วยส่งเสริมทักษะนี้ได้ การสร้างกิจกรรมที่ต้องการการคิดวิเคราะห์ เช่น การตั้งคำถามที่ต้องการการวิเคราะห์และการสรุป การแก้ปัญหาที่ไม่เคยพบมาก่อนจะช่วยให้นักเรียนได้ฝึกทักษะเหล่านี้ นอกจากนี้การให้คำปรึกษาที่สามารถแนะนำเทคนิคและกลยุทธ์ในการคิดวิเคราะห์อาจเป็นประโยชน์ เพราะการพัฒนาทักษะการคิดวิเคราะห์จะช่วยเตรียมนักเรียนให้มีผลสัมฤทธิ์ทางการเรียนที่ดีขึ้น มีความสามารถในการคิดวิเคราะห์ และประยุกต์ใช้ความรู้ในบริบทที่หลากหลาย

ผู้วิจัยได้ศึกษาเกี่ยวกับการจัดการเรียนการสอนโดยใช้กลวิธี KWL Plus ตามแนวคิดของ Carr, E., and Donna Ogle. (รินทร์ลภัส เฉลิมธรรมวงษ์, 2557) พบว่า กลวิธีนี้จะช่วยพัฒนาการคิดวิเคราะห์ผ่านการอ่านได้ดียิ่งขึ้น เน้นกระบวนการอ่านเพื่อความเข้าใจ เน้นกิจกรรมที่ให้นักเรียนใช้กระบวนการคิดในขณะที่อ่าน เพื่อพัฒนาความรู้ความเข้าใจในการอ่าน โดยการจัดการเรียนรู้เพื่อฝึกการอ่านคิดวิเคราะห์ผ่านการใช้กลวิธี KWL Plus มี 5 ขั้นตอน ได้แก่ 1. ขั้น K (What do I know) ในขั้นนี้ ก่อนที่นักเรียนจะอ่านเรื่อง ครูจะอธิบายความคิดรวบยอดของเรื่องและกำหนดคำถาม เพื่อกระตุ้นให้นักเรียนได้ระดมสมองและเขียนคำตอบของนักเรียนลงในแผนภูมิรูปภาพช่อง K หลังจากนั้นนักเรียนและครูร่วมกันจัดประเภทข้อมูลความรู้ที่คาดการณ์ไว้ที่อาจจะเกิดขึ้นในเรื่องที่จะอ่าน 2. ขั้น W (What Do I Want to Learn) ในขั้นนี้ ครูค้นหาความจริงจากคำถามของนักเรียนในสิ่งที่นักเรียนสนใจ อยากรู้ หรือคำถามที่ยังไม่มีคำตอบเกี่ยวกับความคิดรวบยอดของเรื่อง พร้อมทั้งให้นักเรียนเขียนรายการคำถามลงในช่อง W หลังจากนั้นนักเรียนทุกคนอ่านเรื่องและตอบคำถามที่ตั้งไว้ ระหว่างอ่านนักเรียนสามารถเพิ่มคำถามและคำตอบในกลุ่มของตัวเอง 3. ขั้น L1 (What I Learned) ในขั้นนี้ จะระบุความรู้ที่นักเรียนเกิดการเรียนรู้ทั้งระหว่างการอ่านและหลังการอ่าน นักเรียนบันทึกความรู้ที่ได้ลงในช่อง L พร้อมทั้งตรวจสอบคำถามที่ยังไม่ได้ตอบ 4. ขั้น L2 (Mapping) ให้นักเรียนนำหัวข้อความรู้ที่ได้จากขั้น 1 – 3 นำมาวิเคราะห์ตามองค์ประกอบหลักของแต่ละหัวข้อไว้ในแต่ละสาขา พร้อมทั้งเขียนอธิบายเพิ่มเติมแต่ละประเด็นเป็นแผนภาพความคิด 5. ขั้น L3 (Summarizing) ให้นักเรียนสรุปและเขียนสรุปความคิดรวบยอด ซึ่งการเขียนในขั้นนี้จะมีประโยชน์ต่อครูและนักเรียนในการประเมินความเข้าใจของนักเรียน

จากข้อมูลดังกล่าวข้างต้น ผู้วิจัยได้ตระหนักถึงความสำคัญของการอ่านคิดวิเคราะห์ เพื่อพัฒนาการจัดการเรียนรู้สู่การพัฒนาคุณภาพผู้เรียนให้สูงขึ้น จึงได้จัดทำวิจัยในชั้นเรียนโดยการสร้างและพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus ของนักเรียนชั้นมัธยมศึกษาปีที่ 5

โรงเรียนพะตงประธานคีรีวัฒน์ เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนวิชาภาษาไทยสู่การพัฒนาค่าเป้าหมายการประกันคุณภาพการศึกษามาตรฐานที่ 1 คุณภาพผู้เรียนของโรงเรียนพะตงประธานคีรีวัฒน์

กรอบแนวคิดในการวิจัย



วัตถุประสงค์ของการวิจัย

1. เพื่อพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ให้มีประสิทธิภาพตามเกณฑ์ 80/80
2. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5
3. เพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5

วิธีดำเนินการวิจัย

ผู้วิจัยได้พัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับชั้นมัธยมศึกษาปีที่ 5 โดยดำเนินการ ดังนี้

แบบแผนการวิจัย

การวิจัยครั้งนี้ เป็นการวิจัยเชิงทดลอง (Experimental Design) แบบทดลองกลุ่มเดียว วัดผลก่อนและหลังการทดลอง (One Group Pre-test–Post-test Design) (มาเรียม นิลพันธุ์, 2555) แสดงดังตารางที่ 1

ตารางที่ 1 แบบแผนการวิจัย

สอบก่อน	ทดลอง	สอบหลัง
T_1	X	T_2

หมายเหตุ X แทน การจัดการเรียนรู้
T_1 แทน การทดสอบก่อนการจัดการเรียนรู้ (Pre-test)
T_2 แทน การทดสอบหลังการจัดการเรียนรู้ (Post-test)

ประชากรและกลุ่มตัวอย่าง

ประชากรที่ใช้ในการวิจัย นักเรียนชั้นมัธยมศึกษาปีที่ 5 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนพะตงประธานคีรีวัฒน์ อำเภอหาดใหญ่ จังหวัดสงขลา จำนวน 4 ห้องเรียน รวม 132 คน

กลุ่มตัวอย่าง ผู้วิจัยเลือกกลุ่มตัวอย่างจากการสุ่มอย่างง่าย (Sample Random) ใช้วิธีจับสลาก โดยใช้ห้องเรียนเป็นหน่วยการสุ่ม เป็นนักเรียนชั้นมัธยมศึกษาปีที่ 5/1 ภาคเรียนที่ 2 ปีการศึกษา 2566 โรงเรียนพะตงประธานคีรีวัฒน์ อำเภอหาดใหญ่ จังหวัดสงขลา จำนวน 32 คน

เครื่องมือที่ใช้ในการวิจัย

1. แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน (ข้อสอบเป็นชุดเดียวกัน) เรื่อง การอ่านคิดวิเคราะห์ ของนักเรียนชั้นมัธยมศึกษาปีที่ 5 เป็นข้อสอบปรนัย จำนวน 30 ข้อ คะแนนเต็ม 30 คะแนน

2. แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 4 เล่ม ประกอบด้วย

แบบฝึกทักษะเล่มที่ 1 เรื่อง ความรู้เบื้องต้นเกี่ยวกับการอ่านคิดวิเคราะห์
แบบฝึกทักษะเล่มที่ 2 เรื่อง การอ่านคิดวิเคราะห์บทความ
แบบฝึกทักษะเล่มที่ 3 เรื่อง การอ่านคิดวิเคราะห์ข่าว
แบบฝึกทักษะเล่มที่ 4 เรื่อง การอ่านคิดวิเคราะห์บทร้อยกรองไทยในปัจจุบัน

3. แผนการจัดการเรียนรู้ประกอบการใช้แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 4 แผน รวม 8 ชั่วโมง (ไม่รวมทดสอบก่อนเรียนและหลังเรียน จำนวน 1 ชั่วโมง)

4. แบบสอบถามความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 10 ข้อ

การสร้างและหาคุณภาพเครื่องมือ

1. สร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ซึ่งเป็นข้อสอบแบบปรนัยเลือกตอบ จำนวน 40 ข้อ นำไปให้ผู้เชี่ยวชาญหาค่า IOC ปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ แล้วนำไป Try Out กับนักเรียนที่ไม่ใช่กลุ่มตัวอย่าง เพื่อหาค่าความยากง่าย ค่าอำนาจจำแนก และค่าความเชื่อมั่น จนได้ข้อสอบฉบับจริง จำนวน 30 ข้อ

2. สร้างแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 4 เล่ม นำไปให้ผู้เชี่ยวชาญหาค่า IOC หาค่าเฉลี่ยและค่าส่วนเบี่ยงเบนมาตรฐาน ปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ จนได้แบบฝึกทักษะการอ่านคิดวิเคราะห์ที่มีคุณภาพ

3. สร้างแผนการจัดการเรียนรู้ประกอบการใช้แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 4 แผน รวม 8 ชั่วโมง (ไม่รวมทดสอบก่อนเรียนและหลังเรียน จำนวน 1 ชั่วโมง) นำไปให้ผู้เชี่ยวชาญหาค่า IOC หาค่าเฉลี่ยและค่าส่วนเบี่ยงเบนมาตรฐาน ปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ จนได้แผนการจัดการเรียนรู้ฉบับสมบูรณ์

4. สร้างแบบสอบถามความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 10 ข้อ นำไปให้ผู้เชี่ยวชาญหาค่า IOC หาค่าเฉลี่ยและค่าส่วนเบี่ยงเบนมาตรฐาน ปรับปรุงแก้ไขตามคำแนะนำของผู้เชี่ยวชาญ แล้วนำไป Try Out กับนักเรียนที่ไม่ใช่กลุ่มตัวอย่าง เพื่อหาค่าความเชื่อมั่นทั้งฉบับตามวิธีของครอนบาค (Cronbach) จนได้แบบสอบถามความพึงพอใจที่มีคุณภาพ

การเก็บรวบรวมข้อมูล

ผู้วิจัยดำเนินการเก็บรวบรวมข้อมูล ดังนี้

1. ให้นักเรียนทดสอบก่อนเรียน (Pre-test) ด้วยแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน จำนวน 30 ข้อ ที่ผู้วิจัยสร้างขึ้น และบันทึกคะแนนไว้

2. หลังการทดสอบก่อนเรียน ให้นักเรียนเรียนรู้แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 จำนวน 4 เล่ม โดยสอนตามตารางสอน ใช้เวลารวม 8 ชั่วโมง (ไม่รวมทดสอบก่อนเรียนและหลังเรียน จำนวน 1 ชั่วโมง)

3. หลังสิ้นสุดการเรียนรู้แบบฝึกทักษะ ให้นักเรียนทดสอบหลังเรียน (Post-test) โดยใช้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ซึ่งเป็นฉบับเดียวกับแบบทดสอบก่อนเรียนและบันทึกคะแนนไว้

4. นำผลการทดสอบวัดผลสัมฤทธิ์ทางการเรียนระหว่างก่อนเรียนและหลังเรียนไปวิเคราะห์ทางสถิติ และหาค่าเฉลี่ยของคะแนนที่นักเรียนทำได้

5. ให้นักเรียนทำแบบสอบถามความพึงพอใจ ตรวจให้คะแนน เพื่อนำผลไปวิเคราะห์ข้อมูลโดยวิธีการทางสถิติต่อไป

การวิเคราะห์ข้อมูล

ผู้วิจัยได้วิเคราะห์ข้อมูล ดังนี้

1. หาประสิทธิภาพของแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ตามเกณฑ์ 80/80 หรือ E_1/E_2

2. เปรียบเทียบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5

3. หาความพึงพอใจของนักเรียนที่มีต่อการจัดการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5

สถิติที่ใช้ในการวิเคราะห์ข้อมูล

1. สถิติที่ใช้ในการตรวจสอบและหาคุณภาพเครื่องมือ

1.1 การหาค่าดัชนีความสอดคล้องระหว่างข้อคำถามของแบบทดสอบกับจุดประสงค์ของการวัดค่า IOC (ไพศาล วรคำ, 2559)

1.2 การหาค่าความยากง่ายของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน โดย ไพศาล วรคำ (2559) กำหนดเกณฑ์ความยากง่าย (P) = 0.20-0.80

1.3 การหาค่าอำนาจจำแนกของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ตามแนวทางของ บุญชัช เมฆแก้ว (2562)

1.4 การหาค่าความเชื่อมั่นของแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนตามวิธีของคูเดอร์ริชาร์ดสัน KR-20 (บุญชัช เมฆแก้ว, 2562) กำหนดค่าความเชื่อมั่น (r) = 0.75 ขึ้นไป

1.5 หาค่าความเชื่อมั่นของแบบสอบถามความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ตามวิธีของครอนบาค (Cronbach) สัมประสิทธิ์แอลฟา (α - Coefficient) (ธีระศักดิ์ อุ่นอารมณ์เลิศ, 2556)

2. สถิติที่ใช้ในการทดสอบสมมติฐาน

2.1 หาประสิทธิภาพของแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ให้มีประสิทธิภาพตามเกณฑ์ 80/80โดยการหา E_1/E_2 (กฤษมันต์ วัฒนาณรงค์, 2557) 80 ตัวแรก หมายถึง คะแนนเฉลี่ยที่วัดได้จากการทำแบบทดสอบระหว่างเรียนของนักเรียน

2.2 วิเคราะห์ค่าคะแนนเฉลี่ยของผลสัมฤทธิ์ทางการเรียนและความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยแบบฝึกทักษะ การอ่านคิดวิเคราะห์โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ใช้สูตรคำนวณ ดังนี้

2.2.1 ค่าเฉลี่ย (Arithmetic Mean) (ไพศาล วรคำ, 2559)

2.2.2 ส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation) (บุญชม ศรีสะอาด, 2553)

2.2.3 ร้อยละ (Percentage) (ไพศาล วรคำ, 2559)

2.3 เปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักเรียนจากการทำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนด้วยการทดสอบหาค่าที (t-test แบบ Dependent Sample) (ไพศาล วรคำ, 2559)

ผลการวิจัย

การสร้างและพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับชั้นมัธยมศึกษาปีที่ 5 ผู้วิจัยนำเสนอผลการวิเคราะห์ข้อมูลตามรายละเอียด ดังนี้

ผลการวิเคราะห์ข้อมูล

ตอนที่ 1 หาประสิทธิภาพของแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ตามเกณฑ์ 80/80 แสดงดังตารางที่ 2

ตารางที่ 2 ผลการหาค่าประสิทธิภาพของแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5

รายการ	จำนวนนักเรียน	คะแนนเต็ม	$\bar{X}$	p
แบบทดสอบท้ายแบบฝึกทักษะ (E_1)	32	40	32.38	80.94
แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนหลังเรียน (E_2)	32	30	24.31	81.04

จากตารางที่ 2 พบว่า ประสิทธิภาพของแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 หรือ E_1/ E_2 ผลที่ได้ เท่ากับ 80.94/81.04 สูงกว่าเกณฑ์ที่ตั้งไว้ แสดงว่า แบบฝึกทักษะที่ผู้วิจัยสร้างขึ้นมีประสิทธิภาพสามารถนำไปใช้ประกอบการเรียนการสอนได้

ตอนที่ 2 เปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักเรียนก่อนเรียนและหลังเรียนด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 แสดงดังตารางที่ 3

ตารางที่ 3 ผลการเปรียบเทียบคะแนนเฉลี่ยผลสัมฤทธิ์ทางการเรียนระหว่างก่อนเรียนและหลังเรียน

คะแนนสอบ	N	$\bar{X}$	S.D.	t-test
แบบทดสอบก่อนเรียน	32	13.91	2.70	19.96**
แบบทดสอบหลังเรียน	32	24.31	1.06	

** มีนัยสำคัญที่ระดับ .01 (α = .01, df = 31, t = 2.4528)

จากตารางที่ 3 พบว่า ผลสัมฤทธิ์ทางการเรียนของนักเรียนเปรียบเทียบคะแนนก่อนเรียนและหลังเรียน นักเรียนมีคะแนนเฉลี่ยก่อนเรียน เท่ากับ 13.91 คะแนนเฉลี่ยหลังเรียน เท่ากับ 24.31 และเมื่อนำมาหาค่าสถิติโดยใช้ค่า t-test ได้เท่ากับ 19.96 และเมื่อนำค่า t-test ที่คำนวณได้มาเปรียบเทียบกับค่า t-test ที่เปิดจากตาราง 2.4528 ผลการเปรียบเทียบค่า t ที่คำนวณได้มีค่ามากกว่าค่า t วิกฤติ ซึ่งแสดงว่า คะแนนก่อนเรียนและหลังเรียนแตกต่างกัน และเมื่อเปรียบเทียบคะแนนเฉลี่ยก่อนเรียนและหลังเรียน คะแนนเฉลี่ยหลังเรียนสูงกว่าคะแนนเฉลี่ยก่อนเรียน ดังนั้นสรุปได้ว่า ผลสัมฤทธิ์ทางการเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

ตอนที่ 3 สอบถามความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 แสดงดังตารางที่ 4

ตารางที่ 4 ความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5

ลำดับ	รายการประเมิน	$\bar{X}$	S.D.	แปลความ
1	เนื้อหาในแบบฝึกทักษะแต่ละตอนน่าสนใจตรงกับความต้องการของผู้เรียน	4.44	0.72	มาก
2	การเสนอเนื้อหาในแบบฝึกทักษะแต่ละตอนสอดคล้องกับจุดประสงค์ เรียงลำดับจากง่ายไปยากและมีความเหมาะสมกับระดับชั้นของผู้เรียน	4.63	0.49	มากที่สุด
3	การเสนอเนื้อหาในแบบฝึกทักษะแต่ละตอนสอดคล้องและต่อเนื่องกัน	4.47	0.76	มาก
4	เนื้อหาของแบบฝึกทักษะแต่ละตอนมีประโยชน์ที่ผู้เรียนสามารถนำไปใช้ในการศึกษาค้นคว้าด้วยตนเอง	4.66	0.65	มากที่สุด
5	ตัวอักษรอ่านง่ายชัดเจน รูปแบบน่าสนใจ	4.56	0.50	มากที่สุด
6	ลำดับขั้นตอนของแบบฝึกทักษะมีความเหมาะสม การนำเสนอครบถ้วนและครอบคลุมเนื้อหาที่เรียนรู้	4.41	0.76	มาก
7	มีการกำหนดจุดประสงค์ในการเรียนรู้ไว้ชัดเจน มีคำชี้แจงและคำอธิบายที่เข้าใจง่ายไม่ซับซ้อน พร้อมมีตัวอย่างประกอบ	4.50	0.72	มาก
8	จัดกิจกรรมที่เน้นผู้เรียนเป็นสำคัญ	4.50	0.67	มาก
9	กิจกรรมในแบบฝึกทักษะมีความหลากหลายและน่าสนใจ	4.50	0.72	มาก
10	กิจกรรมในแบบฝึกทักษะช่วยให้ผู้เรียนมีทัศนคติที่ดีต่อการเรียนรู้วิชาภาษาไทยมากขึ้น	4.60	0.61	มากที่สุด
	รวม	**4.53**	**0.66**	**มากที่สุด**

จากตารางที่ 4 พบว่า นักเรียนมีความพึงพอใจต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 โดยภาพรวมอยู่ในระดับมากที่สุด ($\overline{X}$= 4.53) เมื่อพิจารณาเป็นรายข้อ ข้อที่มีค่าเฉลี่ยสูงสุดคือ ข้อ 4 เนื้อหาของแบบฝึกทักษะแต่ละตอนมีประโยชน์ที่ผู้เรียนสามารถนำไปใช้ในการศึกษาค้นคว้าด้วยตนเอง ($\overline{X}$= 4.66) รองลงมาคือ ข้อ 2 การเสนอเนื้อหาในแบบฝึกทักษะแต่ละตอนสอดคล้องกับจุดประสงค์ เรียงลำดับจากง่ายไปยากและมีความเหมาะสมกับระดับชั้นของผู้เรียน ($\overline{X}$= 4.63) และข้อที่มีค่าเฉลี่ยต่ำสุดคือ ข้อ 6 ลำดับขั้นตอนของแบบฝึกทักษะมีความเหมาะสม การนำเสนอครบถ้วนและครอบคลุมเนื้อหาที่เรียนรู้ ($\overline{X}$= 4.41)

สรุปผลการวิจัย

การศึกษาค้นคว้าเพื่อพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 สรุปผลได้ดังนี้

1. แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 มีประสิทธิภาพ เท่ากับ 80.94/81.04 ซึ่งมีประสิทธิภาพสูงกว่าเกณฑ์ที่ตั้งไว้ 80/80 ทั้งด้านการเรียนและในภาพรวม

2. ผลสัมฤทธิ์ทางการเรียนของนักเรียนที่เรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

3. ความพึงพอใจของนักเรียนที่เรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 โดยภาพรวมอยู่ในระดับมากที่สุด (ค่าเฉลี่ย = 4.53)

การอภิปรายผล

การสร้างและพัฒนาแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ผู้วิจัยสามารถอภิปรายผลได้ ดังนี้

1. แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 ที่ผู้วิจัยสร้างขึ้น มีค่าเฉลี่ย เท่ากับ 80.94/81.04 หมายความว่า นักเรียนได้คะแนนเฉลี่ยจากการทำแบบทดสอบท้ายแบบฝึกทักษะทั้ง 4 เล่ม เฉลี่ยร้อยละ 80.94 และคะแนนเฉลี่ยจากการทำทดสอบวัดผลสัมฤทธิ์ทางการเรียนหลังเรียน เฉลี่ยร้อยละ 81.04 แสดงว่า แบบฝึกทักษะพัฒนาการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 มีประสิทธิภาพสูงกว่าเกณฑ์ที่ตั้งไว้คือ 80/80 ทั้งนี้ เนื่องจากผู้วิจัยได้พัฒนาทักษะการอ่าน จึงมีการเรียนรู้เรียงลำดับจากง่ายไปยาก ใช้แบบฝึกควบคู่กับครูผู้สอนอธิบาย แบบฝึกแต่ละเล่มจะมีแบบทดสอบก่อนเรียนและหลังเรียนเพื่อวัดความเข้าใจของนักเรียน รวมแบบฝึกในแต่ละเล่มเป็นไปตามจุดมุ่งหมายของการศึกษา สอดคล้องกับสกลรัตน์ นันอุดร (2565) ศึกษาวิจัยการพัฒนาชุดกิจกรรมเพื่อเสริมสร้างความสามารถการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 3 โดยใช้กระบวนการเรียนรู้แบบร่วมมือ CIRC ร่วมกับเทคนิคการสอนอ่าน KWL Plus มีความมุ่งหมายเพื่อ 1) พัฒนาและหาประสิทธิภาพของชุดกิจกรรมเพื่อเสริมสร้างความสามารถการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 3 โดยใช้กระบวนการเรียนรู้แบบร่วมมือ CIRC ร่วมกับเทคนิคการสอนอ่าน KWL Plus ตามเกณฑ์ 80/80 2) ตรวจสอบประสิทธิผลของชุด

กิจกรรมที่พัฒนาขึ้นตามเกณฑ์ร้อยละ 50 ขึ้นไป 3) เปรียบเทียบความสามารถการอ่านจับใจความของนักเรียนระหว่างก่อนเรียนกับหลังเรียน และ 4) ศึกษาความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้ กลุ่มตัวอย่างที่ใช้ในการวิจัยคือ นักเรียนชั้นมัธยมศึกษาปีที่ 3 โรงเรียนสกลนครพัฒนศึกษา อำเภอเมืองสกลนคร จังหวัดสกลนคร จำนวน 36 คน ที่กำลังศึกษาในภาคเรียนที่ 2 ปีการศึกษา 2564 ซึ่งได้จากการสุ่มแบบแบ่งกลุ่ม (Cluster Random Sampling) สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน ประสิทธิภาพ ดัชนีประสิทธิผล และการทดสอบค่าที (t-test for Dependent Samples) ผลการวิจัยพบว่า 1. ชุดกิจกรรมเพื่อเสริมสร้างความสามารถการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 3 โดยใช้กระบวนการเรียนรู้แบบร่วมมือ CIRC ร่วมกับเทคนิคการสอน อ่าน KWL Plus มีประสิทธิภาพ 81.98/82.13 ซึ่งสูงกว่าเกณฑ์ 80/80 ที่ตั้งไว้ 2. ชุดกิจกรรมที่พัฒนาขึ้นมีค่าดัชนีประสิทธิผลเท่ากับ 0.7025 คิดเป็นร้อยละ 70.25 ซึ่งสูงว่าเกณฑ์ร้อยละ 50 ที่กำหนดไว้

2. การเปรียบเทียบผลสัมฤทธิ์ทางการเรียนของนักเรียนพบว่า หลังเรียนรู้ นักเรียนมีคะแนนเพิ่มขึ้นมากกว่าก่อนเรียนอย่างมีนัยสำคัญที่ระดับ .01 ซึ่งแสดงให้เห็นว่า การจัดการเรียนการสอนด้วยกลวิธี KWL Plus ร่วมกับการใช้แบบฝึกทักษะจะเน้นให้นักเรียนได้ฝึกทักษะกระบวนการคิด ฝึกการวิเคราะห์กับเรื่องที่อ่าน เปิดโอกาสให้นักเรียนได้ใช้ความรู้ ความเข้าใจจากประสบการณ์เดิมของตนที่มีอยู่ให้เกิดประโยชน์ สามารถสร้างแรงจูงใจให้กับนักเรียน ทำให้นักเรียนกระตือรือร้น อยากเรียน สนุกสนานและตื่นเต้น สอดคล้องกับ สุชาวดี ไทยสุชาติ (2562) ศึกษาวิจัยการเปรียบเทียบความสามารถในการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โรงเรียนบางกะปิระหว่างวิธีสอนแบบร่วมมือโดยใช้เทคนิค KWL Plus กับวิธีสอนแบบปกติ มีวัตถุประสงค์ (1) เพื่อเปรียบเทียบความสามารถในการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 2 โรงเรียนบางกะปิ ระหว่างวิธีสอนแบบร่วมมือโดยใช้เทคนิค KWL Plus กับวิธีสอนแบบปกติ ผลการศึกษาพบว่า (1) ความสามารถในการอ่านจับใจความของนักเรียนชั้นมัธยมศึกษาปีที่ 2 ที่ได้รับการสอนด้วยวิธีสอนแบบร่วมมือโดยใช้เทคนิค KWL Plus สูงกว่านักเรียนที่ได้รับการสอนด้วยวิธีสอนแบบปกติอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 (2) ความสามารถในการอ่านจับใจความของนักเรียนที่ได้รับการสอนแบบร่วมมือโดยใช้เทคนิค KWL Plus หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 และ (3) ความสามารถในการอ่านจับใจความของนักเรียนที่ได้รับการสอนแบบปกติหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 แสดงว่า นักเรียนที่เรียนรู้โดยใช้แบบฝึกทักษะมีผลสัมฤทธิ์ทางการเรียนสูงขึ้น การพัฒนาการอ่านจับใจความให้มีประสิทธิภาพและได้ผลดีนั้น นักเรียนต้องได้รับการฝึกหลาย ๆ ครั้ง เพื่อให้เกิดทักษะที่คงทนและสามารถบูรณาการความรู้ไปใช้ในรายวิชาที่เกี่ยวข้องได้

3. ความพึงพอใจของนักเรียนมีต่อการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 5 พบว่า โดยภาพรวมอยู่ในระดับมากที่สุด มีค่าเฉลี่ย 4.53 แสดงว่า นักเรียนมีความพึงพอใจต่อการจัดการเรียนรู้ด้วยแบบฝึกทักษะอยู่ในระดับมากที่สุด สอดคล้องกับ ภัสราภรณ์ ธีระวงศานุรักษ์ (2562) ศึกษาวิจัยการใช้เทคนิค KWL-PLUS เพื่อพัฒนาทักษะการใช้ความคิดสร้างสรรค์และความสามารถด้านการอ่านภาษาอังกฤษ เพื่อความเข้าใจของนักเรียนชั้นมัธยมศึกษาปีที่ 4 โรงเรียนแม่สายประสิทธิ์ศาสตร์ อำเภอแม่สาย จังหวัดเชียงราย การวิจัยนี้มีวัตถุประสงค์ 1) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนที่เรียนด้วยวิธีการจัดการเรียนรู้ด้วยเทคนิค KWL ของนักเรียนชั้น ปวช.2 ก่อนเรียนและหลังเรียน 2) เพื่อศึกษาความพึงพอใจของนักเรียนที่มีต่อการเรียนด้วยวิธีการจัดการเรียนรู้ด้วยเทคนิค KWL ของนักเรียนชั้น ปวช.2 ประชากรที่ใช้ในการวิจัยครั้งนี้ ได้แก่

นักเรียนชั้นประกาศนียบัตรวิชาชีพ ชั้นปีที่ 2 (ปวช.2) วิทยาลัยเทคนิคนครสวรรค์ สำนักงานคณะกรรมการการอาชีวศึกษาภาคเหนือ เขต 4 ปีการศึกษา 2565 อำเภอเมืองนครสวรรค์ จังหวัดนครสวรรค์ ที่เรียนในรายวิชาการอ่านสื่อสิ่งพิมพ์ ภาษาอังกฤษ 20000 -1203 กลุ่มตัวอย่างในการวิจัยครั้งนี้ ได้แก่ นักเรียนวิทยาลัยเทคนิคนครสวรรค์ ชั้นประกาศนียบัตรวิชาชีพ ชั้นปีที่ 2 (ปวช.2) แผนกช่างอิเล็คทรอนิกส์ ห้องที่ 1 และ 2 จำนวน 34 คน ปีการศึกษา 2565 จำนวน 34 คน ซึ่งได้มาโดยการสุ่มแบบเจาะจง เครื่องมือที่ใช้ในการทำวิจัยประกอบด้วยแผนการจัดการเรียนการสอนเพื่อพัฒนาความสามารถทักษะการอ่านภาษาอังกฤษเพื่อความเข้าใจ โดยใช้เทคนิค KWL แบบทดสอบวัดความสามารถทักษะการอ่าน ภาษาอังกฤษเพื่อความเข้าใจ โดยใช้เทคนิค KWL และแบบสอบถามความพึงพอใจของนักเรียนที่จัดการเรียนการสอนโดยใช้เทคนิค KWL สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าเฉลี่ย ส่วนเบี่ยงเบน มาตรฐาน และการทดสอบค่าที (t-test Dependent) ผลการวิจัยพบว่า 1) ผลสัมฤทธิ์ทางการเรียนที่เรียนด้วยวิธีการจัดการเรียนรู้ด้วยเทคนิค KWL ของนักเรียนชั้น ปวช.2 หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 2) ความพึงพอใจต่อการเรียนด้วยวิธีการจัดการเรียนรู้ด้วยเทคนิค KWL พบว่า อยู่ในระดับมากที่สุด (ค่าเฉลี่ย = 4.65)

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. ในการทำแบบฝึกทักษะไม่ควรกำหนดเวลาให้นานเกินไป ควรให้นักเรียนได้ฝึกทักษะหลังจากนักเรียนได้เรียนรู้วิชาการต่าง ๆ เสร็จแล้ว เพราะแบบฝึกทักษะจะช่วยให้นักเรียนได้ผ่อนคลายความตึงเครียดและใช้เวลาว่างให้เกิดประโยชน์

2. ห้องเรียนควรมีบรรยากาศที่น่าเรียนรู้ เอื้อต่อการเรียนการสอน เพื่อให้นักเรียนได้เรียนรู้อย่างมีความสุข

3. ผู้สอนควรมีการวางแผนการทำกิจกรรมในแต่ละขั้นตอนของการจัดการเรียนรู้โดยใช้ กลวิธี KWL Plus ให้เหมาะสมกับเวลา

4. การจัดกิจกรรมการเรียนรู้ในชั้นเรียนจะต้องเอื้อต่อการใช้ทักษะการคิดของนักเรียนเป็นสิ่งสำคัญ โดยต้องเปิดโอกาสให้นักเรียนแต่ละคนได้คิดอย่างอิสระ ให้นักเรียนได้ถกเถียงหรือโต้แย้งกันด้วยเหตุผล และได้แลกเปลี่ยนแนวคิดของกันและกันอย่างหลากหลาย

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ผู้สอนต้องเตรียมคำถามทีละขั้นเพื่อกระตุ้นให้นักเรียนสามารถค้นพบข้อสรุปการอ่านด้วยตนเอง ดังขั้นตอนการจัดการเรียนรู้กลวิธี KWL Plus ควรเป็นคำถามปลายเปิดเพื่อสร้างความสนใจให้กับนักเรียน

2. ควรนำวิธีการจัดกิจกรรมการเรียนรู้โดยใช้แบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus ไปเปรียบเทียบกับการจัดกิจกรรมการเรียนรู้ด้วยวิธีสอนแบบอื่น ๆ

3. ควรนำวิธีการจัดกิจกรรมการเรียนรู้ด้วยแบบฝึกทักษะการอ่านคิดวิเคราะห์ โดยการจัดการเรียนรู้กลวิธี KWL Plus ในระดับชั้นอื่น ๆ เช่น ใช้ในระดับมัธยมศึกษาตอนต้นหรือระดับมัธยมศึกษาตอนปลายเพื่อเปรียบเทียบผลการศึกษาว่าเหมือนหรือแตกต่างกันอย่างไร เป็นต้น

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การสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่องยำสายสหายสองเลสำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ จังหวัดพัทลุง

Creating Books to Promote Reading Comprehension on the Subject "Yum Sai Sahai Song Le" for Mathayom 1 Students at HanTao Rangsi Prachasan School Phatthalung Province

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1) สร้างและหาประสิทธิภาพหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ ให้มีประสิทธิภาพตามเกณฑ์ 80/80 2) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนด้านการอ่านจับใจความสำคัญก่อนและหลังการจัดการเรียนรู้โดยใช้หนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดเรื่อง ยำสายสหายสองเล และ 3) ศึกษาความพึงพอใจของนักเรียนของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่มีต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล กลุ่มตัวอย่างเป็นนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ จำนวน 30 คน เครื่องมือที่ใช้ในการวิจัย คือ หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่องยำสายสหายสองเล แผนการจัดการเรียนรู้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนและแบบสอบถามความพึงพอใจต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สถิติที่ใช้ คือ ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการทดสอบสมมติฐาน (t-test) ผลการวิจัยพบว่า หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล มีประสิทธิภาพเท่ากับ 88/87.44 สูงกว่าเกณฑ์มาตรฐานที่กำหนดไว้ ผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 นักเรียนมีความพึงพอใจต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญเรื่องยำสายสหายสองเล โดยภาพรวมอยู่ในระดับมากมีค่าเฉลี่ยเท่ากับ 4.42

คำสำคัญ: หนังสือส่งเสริมการอ่าน, การอ่านจับใจความสำคัญ

Abstract

The objectives of this research were to 1) create and find out the effectiveness of a book to promote reading comprehension of the main points of a series on the subject "Yum Sai Sahai Song Le" for Mathayom 1 students at Han Tao Rangsi Prachasan School to be effective according to the criteria of 80/80 2) Compare academic achievement in reading comprehension before and after organizing learning using books to promote reading comprehension on the subject "Yum Sai Sahai Song Le" 3) study student satisfaction of Mathayom 1 students with books promoting reading comprehension. on the subject "Yum Sai Sahai Song Le". The sample group consisted of 30 Mathayom 1 students at Han Tao Rangsi Prachasan School.The research instrument was a book promoting reading comprehension of the main points of a series on the subject "Yum Sai Sahai Song Le". Learning management plan Academic achievement test and a questionnaire on satisfaction with books promoting reading comprehension in the on the subject "Yum Sai Sahai Song Le". Statistics used are percentage, mean, standard deviation and hypothesis testing (t-test).

The research results found that the book promoting reading comprehension of the main points on the subject "Yum Sai Sahai Song Le" has an efficiency of 88/87.44, higher than the specified. The academic achievement of students after studying is higher than before studying significantly Statistically at the .01 level, students were satisfied with the book promoting reading comprehension of the main points on the subject "Yum Sai Sahai Song Le" Overall, it was at a high level with an average of 4.42

Keywords: Books Promoting Reading, Reading Comprehension

บทนำ

ด้วยความสำคัญของการอ่านหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาไทย จึงได้กำหนดสาระที่ 1 ให้เป็นสาระการอ่านมาตรฐาน ท 1.1 คือ ผู้เรียนสามารถใช้กระบวนการอ่านสร้างความรู้ และความคิด เพื่อนำไปใช้ตัดสินใจแก้ปัญหาในการดำเนินชีวิต และมีนิสัยรักการอ่าน โดยหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานได้กำหนดตัวชี้วัดชั้นมัธยมศึกษาปีที่ 1 ว่า นักเรียนสามารถแยกข้อเท็จจริงข้อคิดเห็นจากเรื่องที่อ่าน วิเคราะห์ และแสดงความคิดเห็นเกี่ยวกับเรื่องที่อ่านเพื่อนำไปใช้ในการดำเนินชีวิต อ่านจับใจความจากสื่อต่าง ๆ เช่น วรรณคดีในบทเรียน บทความ บทโฆษณา งานเขียนประเภทโน้มน้าวใจ ข่าว และเหตุการณ์ประจำวัน และอ่านหนังสือตามความสนใจ (กระทรวงศึกษาธิการ, 2551)

ดังนั้นการจัดการเรียนการสอนภาษาไทยจำเป็นต้องมุ่งเน้นให้ผู้เรียนมีทักษะทั้ง 4 ด้าน คือ การฟัง การพูด การอ่าน และการเขียนอย่างสัมพันธ์กัน เรียนรู้เรื่องต่าง ๆ อย่างมีประสิทธิภาพ สามารถอ่านออกเสียง และอ่านในใจ เรื่องราวต่าง ๆ ได้อย่างมีประสิทธิภาพเน้นการอ่านได้รวดเร็ว ตามเวลาที่กำหนด อธิบายซักถามรายละเอียด ความคิดเห็น ตลอดจนใจความสำคัญ นัยของข้อความและเรื่องที่อ่าน เพื่อให้มีความรู้เกี่ยวกับหลักเกณฑ์ในการอ่าน มีทักษะในการอ่านในใจ และอ่านออกเสียงได้ถูกต้องคล่องแคล่ว

รวดเร็ว สามารถถ่ายทอดอารมณ์ และความรู้สึกจากเรื่องราวที่อ่านได้ สามารถจับใจความสำคัญ คิดเชิงวิจารณ์ และวิเคราะห์ใจความสำคัญ ปฏิบัติตนจนเป็นนิสัยที่ดีในการอ่านหนังสือและรักการอ่าน

ถึงแม้การอ่านจะเป็นสาระสำคัญที่มีการกำหนดไว้ในทุกระดับชั้น แต่จากผลคะแนนการทดสอบแบบอ่านออกเขียนได้ ภาคเรียนที่ 1 ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ จังหวัดพัทลุง ประจำปีการศึกษา 2565 พบว่า ความสามารถในการอ่านของนักเรียนก็ยังไม่ถึงตามเกณฑ์ร้อยละ 70 ของคะแนนที่โรงเรียนหารเทารังสีประชาสรรค์ได้กำหนดไว้ จากผลการทดสอบอ่านออกเขียนได้ ภาคเรียนที่ 1 ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ปีการศึกษา 2565 พบว่า นักเรียนมีผลการสอบภาษาไทย เรื่องของการอ่านจับใจความ มีคะแนนวิชาภาษาไทยเฉลี่ยร้อยละ 65 ซึ่งต่ำกว่าค่ามาตรฐานที่สถานศึกษากำหนดไว้ร้อยละ 70 ของ คะแนนเต็ม 100 คะแนน และจากประสบการณ์การสอนของผู้วิจัยที่ผ่านมา พบว่า ผู้เรียนจำนวนมากยังขาดทักษะการอ่านจับใจความของเรื่อง ไม่สามารถจับประเด็นหรือลำดับเหตุการณ์ของเรื่องได้ถูกต้อง มีการคิดอย่างไม่เป็นระบบ ไม่สามารถถ่ายทอดใจความจากการอ่านของตนเองให้ผู้อื่นเข้าใจได้อย่างชัดเจน ไม่มีความมั่นใจในการตอบคำถามหรือแสดงความคิดเห็น ผลสัมฤทธิ์ทางการเรียนจึงไม่เป็นที่พึงพอใจต่อครูผู้สอน

ด้วยเหตุนี้ ผู้วิจัยจึงเลือกจัดทำหนังสืออ่านเสริมการจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้ ความเป็นเอกลักษณ์ ภาพประกอบเนื้อหาที่น่าดึงดูด ซึ่งสามารถดึงดูดความสนใจให้แก่ผู้เรียนที่มีความสนใจในการฝึกการอ่านจับใจความมากยิ่งขึ้น เพื่อเป็นแนวทางในการศึกษาเพิ่มสมรรถนะในการอ่านจับใจความสำคัญจากหนังสืออ่านเสริมเรื่องนี้ได้ รวมไปถึงการเห็นคุณค่าของนิทานพื้นบ้านภาคใต้ ควบคู่กับการพัฒนาทักษะการอ่านจับใจความ เนื่องจากการอ่านจับใจความเป็นทักษะที่ต้องอาศัยการฝึกฝนเพื่อให้นักเรียนมีผลสัมฤทธิ์ทางการเรียนที่สูงขึ้น โดยผู้วิจัยเชื่อมั่นว่า การใช้หนังสือเป็นเครื่องมือในการฝึกฝนจะเป็นวิธีที่ดีที่จะช่วยให้นักเรียนมีพัฒนาการด้านการอ่านจับใจความได้ดีมากยิ่งขึ้นได้ ทั้งนี้ จากการที่ผู้วิจัยได้ลงพื้นที่สังเกตการสอน ณ โรงเรียนหารเทารังสีประชาสรรค์ อำเภอปากพะยูน จังหวัดพัทลุง พบว่า นักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 มีปัญหาด้านการอ่านจับใจความสำคัญ คือ นักเรียนไม่สามารถจับใจความจากการอ่านได้ตามองค์ประกอบของการอ่านจับใจความสำคัญ รวมไปถึงการอ่านจับใจความที่สำคัญไม่ได้ ผู้วิจัยจึงได้สร้างหนังสืออ่านเสริมการจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้ขึ้น เพื่อแก้ไขปัญหาดังกล่าว

วัตถุประสงค์ของการวิจัย

1. เพื่อสร้างและหาประสิทธิภาพหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ ให้มีประสิทธิภาพตามเกณฑ์ 80/80
2. เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนด้านการอ่านจับใจความสำคัญของนักเรียน ชั้นมัธยมศึกษาปีที่ 1 ก่อนและหลังการจัดการเรียนรู้ โดยใช้หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล
3. เพื่อศึกษาความพึงพอใจของนักเรียนของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่มีต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล

แนวคิด ทฤษฎี กรอบแนวคิด

การอ่านมีความสำคัญและจำเป็นอย่างยิ่งต่อการดำเนินชีวิตของคนในยุคปัจจุบัน เพราะการอ่านช่วยพัฒนาความรู้และสติปัญญาของผู้อ่าน ช่วยให้ผู้อ่านเป็นผู้รอบรู้และทันต่อเหตุการณ์ การอ่านจึงเป็นเครื่องมือสำคัญที่สุดในการแสวงหาความรู้ เป็นสิ่งที่ส่งเสริมความคิดอ่านและความฉลาด รอบรู้ แก่ผู้รับการอ่าน ดังที่ อัมพร สุขเกษม (2546) ได้กล่าวถึงการอ่านหนังสือว่า มีความสำคัญต่อการพัฒนาคุณภาพชีวิตมนุษย์ และมีความสำคัญต่อการพัฒนาประเทศด้วย เพราะการอ่านหนังสือช่วยให้ผู้อ่านรู้จักวิธีบำรุงรักษาสุขภาพของตนรู้จักวิธีการใหม่ ๆ สำหรับใช้พัฒนาอาชีพช่วยผ่อนคลายความเครียดมีความเพลิดเพลินเกิดความคิดสร้างสรรค์ เข้าใจความเคลื่อนไหวทางการเมือง เศรษฐกิจ และสังคม สามารถรับรู้และปรับตัวให้เข้ากับความก้าวหน้าทางวิทยาศาสตร์และเทคโนโลยี ซึ่งล้วนแต่เป็นประโยชน์ทั้งสิ้น

การอ่านเป็นทักษะที่สามารถพัฒนาได้ สุจริต เพียรชอบ และ สายใจ อินทรัมพรรย์ (2556) กล่าวไว้ว่า ทักษะการอ่านเป็นทักษะที่สำคัญและใช้มากในชีวิตประจำวัน เพราะเป็นทักษะที่นักเรียนใช้แสวงหาความรู้ต่าง ๆ เพื่อความบันเทิงและการพักผ่อนหย่อนใจ ผู้ที่มีนิสัยรักการอ่านและมีทักษะในการอ่านมีอัตราเร็วในการอ่านสูงย่อมแสวงหาความรู้ และศึกษาเล่าเรียนได้อย่างมีประสิทธิภาพ สามารถนำความรู้ที่ได้จากการอ่านไปใช้ในการพูดและการเขียนได้เป็นอย่างดี โดยการอ่านให้ประสบความสำเร็จได้นั้นผู้อ่านจะต้องสามารถจับใจความสำคัญของเรื่องที่อ่าน และสามารถนำไปใช้ประโยชน์ได้

การอ่านจับใจความสำคัญมีความจำเป็นอย่างยิ่งสำหรับทุกวัย โดยเฉพาะวัยเรียน อภิรดี เสนาวิน (2555) กล่าวว่า การอ่านจับใจความ หมายถึง การทำความเข้าใจเนื้อเรื่องที่อ่านโดยการจับประเด็นสำคัญของเรื่องที่อ่านให้ได้ว่าใจความสำคัญของเรื่องคืออะไร ผู้เขียนต้องการเสนอเรื่องหรือแนวคิดใดมายังผู้อ่าน ทั้งนี้ ผู้อ่านต้องจับสาระสำคัญของเรื่องได้ว่าใคร ทำอะไร ที่ไหน อย่างไร เมื่อไร เพราะเหตุใดตลอดจนเรียงลำดับเหตุการณ์ของเรื่อง และสามารถสรุปเรื่องโดยการเชื่อมโยงใจความสำคัญของเรื่องใด

ปัจจุบันมีหนังสือส่งเสริมการอ่านหลายประเภทที่น่าสนใจทั้งบันเทิงคดีและสารคดีให้ผู้สนใจได้เลือกอ่านตามความเหมาะสมอย่างหลากหลาย ลักษณะของหนังสือส่งเสริมการอ่านที่ดีมีหลายประการดังที่ พรจันทร์ จันทวิมล (2529) ได้กล่าวถึงลักษณะของหนังสือส่งเสริมการอ่านที่ดี ไว้ดังนี้

1. ด้านเทคนิคการพิมพ์และการจัดรูปเล่ม การจัดพิมพ์ภาพและตัวอักษรนั้น ต้องชัดเจน หน้าปกต้องสวยงาม จึงดึงดูดความสนใจ ขนาดรูปเล่มเหมาะสมกับความต้องการของเด็ก คุณภาพของกระดาษต้องดี ขนาดตัวอักษรเหมาะสมกับวัยของเด็ก ชื่อเรื่องดึงดูดความสนใจ

2. ด้านเนื้อหาต้องน่าสนใจ มีความสนุกสนานชวนติดตาม ความยากง่ายเหมาะสมกับวัยเนื้อหาต้องถูกต้อง การดำเนินเรื่องเร้าใจ ชวนติดตาม การจัดหน้าหนังสือดูโปร่งตา

3. ด้านภาพประกอบ ปกติแล้วหนังสือสำหรับเด็กจะมีภาพประกอบทุกหน้า ไม่ว่าจะเป็นบันเทิงคดี สารคดี หรือร้อยกรอง ภาพประกอบนั้นจะต้องมีสีสันสวยงามสอดคล้องกับเนื้อหาของเรื่อง ขนาดภาพเหมาะสมกับรูปเล่ม และน่าสนใจในประเภทของหนังสือส่งเสริมการอ่าน เนื่องจากหนังสือส่งเสริมการอ่านเป็นหนังสือสำหรับเด็ก การมีภาพประกอบที่น่าสนใจนั้นส่งผลให้ผู้อ่านให้ความสนใจและเข้าใจเนื้อหาที่ผู้เขียนต้องการจะสื่อมากยิ่งขึ้น

ทั้งนี้ผู้วิจัยเห็นว่า การสร้างหนังสือส่งเสริมการอ่านยังมีความเหมาะสมและอยู่ในความสนใจของเด็กระดับมัธยมศึกษาปีที่ 1 ซึ่งเป็นวัยเปลี่ยนผ่านจากวัยเด็กสู่วัยรุ่นตอนต้น การนำเอาเรื่องเล่าเกี่ยวกับวิถีชีวิตชุมชนมาใช้ในการส่งเสริมทักษะการอ่านจะช่วยให้นักเรียนจับใจความสำคัญได้ง่ายขึ้น โดยเฉพาะเรื่องเล่าที่มีเนื้อหาเชื่อมโยงกับภูมิปัญญาท้องถิ่น โดยมีตัวละครเล่าเรื่อง วิถีชีวิตความเป็นอยู่ในชุมชน ซึ่งมี

ความแตกต่างกันไปตามภูมิภาค ผู้วิจัยจึงมีความสนใจที่จะสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ เพื่อนำไปใช้พัฒนาทักษะการอ่านจับใจความสำคัญของนักเรียน โดยนำเอาเรื่องเล่า วิถีชีวิตรอบตัวมาผูกเรื่องเป็นเรื่องเล่าสั้น ๆ ให้นักเรียนได้ฝึกอ่านเพื่อเพิ่มพูนทักษะการจับใจความสำคัญให้มีประสิทธิภาพมากขึ้น

กรอบแนวคิดในการวิจัย ศึกษาตัวแปรต้น ได้แก่ การจัดการเรียนรู้โดยใช้หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ และตัวแปรตาม ได้แก่ ผลสัมฤทธิ์ทางการเรียนและความพึงพอใจของนักเรียนต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้

วิธีดำเนินการวิจัย

การสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ อำเภอปากพะยูน จังหวัดพัทลุง ดำเนินการตามระเบียบวิธีวิจัย ดังนี้

1. ประชากรและกลุ่มตัวอย่าง

1.1 ประชากรที่ใช้ในการวิจัยครั้งนี้ ได้แก่ นักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ อำเภอปากพะยูน จังหวัดพัทลุง ภาคเรียนที่ 2 ปีการศึกษา 2565 จำนวน 2 ห้องเรียน รวม 65 คน

1.2 กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ ผู้วิจัยเลือกกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) เป็นนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1/1 โรงเรียนหารเทารังสีประชาสรรค์ อำเภอปากพะยูน จังหวัดพัทลุง ภาคเรียนที่ 2 ปีการศึกษา 2565 จำนวน 30 คน

2. เนื้อหาที่ใช้ในการวิจัย การอ่านจับใจความสำคัญบทความประเภทร้อยแก้ว จากหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สาระการเรียนรู้แกนกลางการศึกษา ขั้นพื้นฐานวิชาภาษาไทยชั้นมัธยมศึกษาปีที่ 1 ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน

3. ระยะเวลาที่ใช้ในการทดลอง ผู้วิจัยได้ดำเนินการทดลองในภาคเรียนที่ 2 ปีการศึกษา 2566 โดยทดลองสอนจำนวน 6 ชั่วโมง และทดสอบผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียน 2 ชั่วโมง รวมระยะเวลา 8 ชั่วโมง

4. เครื่องมือที่ใช้ในการวิจัย ได้แก่ หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล จำนวน 1 ชุด แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน จำนวน 20 ข้อ เป็นแบบปรนัยชนิดเลือกตอบ 4 ตัวเลือก และแบบสอบถามความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่มีต่อหนังสือส่งเสริมการอ่าน แบบมาตราส่วนประมาณค่า 5 ระดับ จำนวน 10 ข้อ

5. การสร้างเครื่องมือวิจัย ดำเนินการตามลำดับขั้นตอน ดังนี้

5.1 การสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล เริ่มจากศึกษาเอกสารและงานวิจัยที่เกี่ยวข้องกับหลักการสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญ รวมทั้งศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาไทย ระดับชั้นมัธยมศึกษาปีที่ 1 ศึกษาค้นคว้าเกี่ยวกับนิทาน ตำนานพื้นบ้านภาคใต้ เพื่อนำมาเป็นแนวทางในการเขียนเนื้อเรื่องของหนังสือ กำหนดแก่นของเรื่องหรือแนวคิดหลักของเรื่องให้มีความชัดเจน โดยเน้นเนื้อหาสาระที่พัฒนาด้านการคิดวิเคราะห์ เพื่อพัฒนาทักษะการอ่านจับใจความสำคัญของนักเรียนจาก

เรื่องที่อ่านได้วางโครงเรื่องเนื้อหาจัดเรียงเหตุการณ์ กำหนดความยากง่ายของภาษาที่ใช้ในหนังสือส่งเสริมการอ่านจับใจความสำคัญ ภาษาสำนวนที่ใช้ในการเขียนความยาวของเรื่องให้เหมาะสมกับวัยของผู้อ่าน คือ นักเรียนชั้นมัธยมศึกษาปีที่ 1 ออกแบบรูปเล่มของหนังสือส่งเสริมการอ่าน โดยกำหนดขนาดของหนังสือ หน้าปกหน้า หน้าปกหลัง ส่วนหน้าของหนังสือ ส่วนท้ายของหนังสือ ภาพประกอบเนื้อเรื่องและจำนวนหน้าของหนังสือ เริ่มปฏิบัติเขียนเรื่องตามแผนที่ได้กำหนดไว้โดยเริ่มจากแก่นเรื่อง โครงสร้างเนื้อหาตั้งแต่ต้นเรื่อง กลางเรื่อง และตอนจบของเรื่อง ให้มีความสัมพันธ์ต่อเนื่องสอดคล้องกัน เพื่อตรวจสอบสำนวนภาษาที่ใช้ในการเขียนความกลมกลืนของเรื่อง จัดทำรูปเล่มจำลองของหนังสือส่งเสริมการอ่านโดยพิจารณาความเหมาะสมของรูปเล่ม ขนาดตัวอักษร การจัดวางหน้า การวางตำแหน่งภาพและเนื้อหาจำนวนหน้า การออกแบบหน้าปก ทั้งปกหน้า ปกหลัง และดำเนินการจัดพิมพ์เป็นรูปเล่ม นำหนังสือส่งเสริมการอ่านเสนอต่ออาจารย์ที่ปรึกษาวิจัย เพื่อตรวจสอบความถูกต้องเหมาะสม แล้วนำไปปรับปรุงแก้ไขตามคำแนะนำของอาจารย์ที่ปรึกษา ก่อนนำไปเสนอผู้เชี่ยวชาญพิจารณาความสอดคล้อง IOC ได้ค่าดัชนีความสอดคล้อง เท่ากับ 1.00 และนำหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล ให้ผู้เชี่ยวชาญชุดเดิมประเมินคุณภาพ โดยพิจารณาความเหมาะสมของหนังสือส่งเสริมการอ่านเกี่ยวกับลักษณะของรูปเล่ม เนื้อหาสาระ ภาพประกอบการดำเนินเรื่อง และภาษาที่ใช้ ตลอดจนคุณค่าของหนังสือส่งเสริมการอ่าน โดยประเมินผลตามวิธีของลิเคอร์ท (Likert) เป็นแบบมาตราส่วนประมาณค่า 5 ระดับ (พวงรัตน์ ทวีรัตน์, 2543) ผลการประเมินอยู่ในระดับคุณภาพเหมาะสมมาก มีค่าเฉลี่ยเท่ากับ 4.04 ซึ่งเป็นไปตามเกณฑ์คุณภาพความเหมาะสมที่ยอมรับว่า หนังสือส่งเสริมการอ่านมีคุณภาพที่สามารถนำไปใช้ได้ เมื่อมีผลการประเมินคะแนนเฉลี่ย 3.51 ขึ้นไป ผู้วิจัยจึงนำหนังสือไปใช้กับกลุ่มตัวอย่าง

5.2 การสร้างแผนการจัดการเรียนรู้ ในการวิจัยครั้งนี้เริ่มจาก (1) ศึกษาเอกสารและงานวิจัยที่เกี่ยวข้องกับหลักการเขียนแผนการจัดการเรียนรู้ รวมทั้งศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานพุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาไทย ระดับชั้นมัธยมศึกษาปีที่ 1 (2) วิเคราะห์ความสัมพันธ์ระหว่างเนื้อหามาตรฐาน มาตรฐานการเรียนรู้ ตัวชี้วัด สาระการเรียนรู้ การจัดกิจกรรมการเรียนรู้ การวัดผลและประเมินผลการเรียนรู้ ตามหลักสูตรแกนกลางการศึกษาขั้นพื้นฐานของกลุ่มสาระการเรียนรู้ภาษาไทย (3) ศึกษาทฤษฎี แนวคิด ในการจัดกิจกรรมการเรียนรู้เพื่อพัฒนาความสามารถด้านการอ่านจับใจความ และเขียนแผนการจัดการเรียนรู้โดยใช้หนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้ จำนวน 3 แผน ใช้เวลา 6 ชั่วโมง (4) นำแผนการจัดการเรียนรู้เสนอต่ออาจารย์ที่ปรึกษาวิจัยเพื่อตรวจสอบความถูกต้องเหมาะสม และปรับปรุงแก้ไขตามคำแนะนำ (5) นำแผนการจัดการเรียนรู้ที่จัดทำขึ้นและแผนการจัดการเรียนรู้แบบปกติ เสนอผู้เชี่ยวชาญจำนวน 3 ท่าน เพื่อตรวจพิจารณาความเหมาะสมของแผนการจัดการเรียนรู้เกี่ยวกับสาระสำคัญ จุดประสงค์การเรียนรู้ เนื้อหา กิจกรรมการเรียนรู้ สื่อการเรียนรู้ การวัด และประเมินผลการเรียนรู้ โดยผู้เชี่ยวชาญประเมินผลตามวิธีของลิเคอร์ท (Likert) เป็นแบบมาตราส่วน ประมาณค่า 5 ระดับ (พวงรัตน์ ทวีรัตน์, 2543) ผลการประเมินอยู่ในระดับคุณภาพเหมาะสมมาก มีค่าเฉลี่ยเท่ากับ 4.19 ซึ่งเป็นไปตามเกณฑ์คุณภาพความเหมาะสมที่ยอมรับได้ว่าแผนการจัดการเรียนรู้มีคุณภาพที่สามารถนำไปใช้ได้เมื่อมีผลการประเมินคะแนนเฉลี่ย 3.51 ขึ้นไป ผู้วิจัยจึงนำไปใช้กับกลุ่มตัวอย่าง

5.3 การสร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน ในการวิจัยครั้งนี้เริ่มจาก (1) ศึกษาเอกสารและงานวิจัยที่เกี่ยวข้องกับแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน รวมทั้งศึกษาหลักสูตรแกนกลางการศึกษาขั้นพื้นฐาน พุทธศักราช 2551 กลุ่มสาระการเรียนรู้ภาษาไทย ระดับชั้นมัธยมศึกษาปี

ที่ 1 (2) สร้างตารางวิเคราะห์หลักสูตร โดยการวิเคราะห์มาตรฐานการเรียนรู้ตัวชี้วัดสาระการเรียนรู้แกนกลาง จุดประสงค์การเรียนรู้ และระดับพฤติกรรมในการวัดผลสัมฤทธิ์ทางการเรียนภาษาไทย ได้แก่ ด้านความรู้ ความจำ ความเข้าใจ การนำไปใช้ การวิเคราะห์ การสังเคราะห์ และการประเมินค่า (3) สร้างแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนให้สอดคล้องกับตารางวิเคราะห์หลักสูตร มีเกณฑ์การให้คะแนนคือ ตอบถูกให้ 1 คะแนน ตอบผิดหรือไม่ตอบให้ 0 คะแนน (4) นำแบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนเสนอต่ออาจารย์ที่ปรึกษาวิจัย ตรวจสอบ และให้ข้อเสนอแนะเพื่อนำไปปรับปรุงแก้ไข

ผลการวิจัย

การสร้างหนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้ สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ อำเภอปากพะยูน จังหวัดพัทลุง สรุปผลการวิจัยตามวัตถุประสงค์ ได้ดังนี้

1. หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล สำหรับนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ มีประสิทธิภาพเท่ากับ 88/87.44 สูงกว่าเกณฑ์มาตรฐาน 80/80 ที่กำหนดไว้

ตารางที่ 1 คะแนนจากการทำแบบฝึกหัดท้ายแผนการสอน โดยใช้หนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล ของนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 โรงเรียนหารเทารังสีประชาสรรค์ อำเภอปากพะยูน จังหวัดพัทลุง ที่ผู้วิจัยพัฒนาขึ้น เพื่อเสริมทักษะการอ่านจับใจความ

ชุดที่	n	แบบฝึกหัดท้ายแผนการสอนระหว่างเรียน			แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียน			ประสิทธิภาพ (E_1/E_2)
		คะแนนเต็ม	ค่าเฉลี่ย	ร้อยละ	คะแนนเต็ม	ค่าเฉลี่ย	ร้อยละ	
1	30	30	26.23	87.44	20	17.6	88	88/87.44

2. ผลสัมฤทธิ์ทางการเรียนด้านการอ่านจับใจความสำคัญก่อนเรียนกับหลังเรียนด้วยหนังสือส่งเสริมการอ่านจับใจความสำคัญ เรื่อง ยำสายสหายสองเล พบว่า นักเรียนมีผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียน โดยก่อนเรียนมีคะแนนเฉลี่ย 4.73 คะแนน มีส่วนเบี่ยงเบนมาตรฐานเท่ากับ 5.40 และหลังเรียนมีคะแนนเฉลี่ย 8.63 คะแนน มีส่วนเบี่ยงเบนมาตรฐานเท่ากับ 8.53 มีค่าการทดสอบที (t-test) เท่ากับ 4.19 ซึ่งมีนัยสำคัญทางสถิติที่ระดับ .01 ดังตารางที่ 2

ตารางที่ 2 เปรียบเทียบคะแนนวัดผลสัมฤทธิ์ทางการเรียนก่อนเรียนและหลังเรียนด้วยหนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้

ผลสัมฤทธิ์	คะแนนเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน (S.D.)	$\left(\sum D^2\right)$	$\left(\sum D^2\right)$	t-test
ก่อนเรียน	4.73	3.55	142	601	4.19**
หลังเรียน	8.63	1.31	259		

**มีนัยสำคัญทางสถิติที่ระดับ.01

3. ความพึงพอใจของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ที่มีต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้ พบว่า มีความพึงพอใจโดยภาพรวมอยู่ในระดับมาก มีค่าเฉลี่ยเท่ากับ 4.42 ดังตารางที่ 3

ตารางที่ 3 การวิเคราะห์ความพึงพอใจของนักเรียนที่มีต่อหนังสือส่งเสริมการอ่านจับใจความสำคัญ ชุดนิทานพื้นบ้านภาคใต้

ข้อที่	รายการ	$\overline{X}$	S.D.	ระดับความพึงพอใจ
ด้านรูปเล่ม				
1.	ขนาดของเล่มเหมาะสมกับวัยของผู้เรียน	4.17	.75	มาก
2.	ส่วนประกอบของหนังสือครบถ้วน	4.10	.76	มาก
ด้านการดำเนินเรื่อง				
3.	การดำเนินเรื่องมีความต่อเนื่องเหมาะสม ตัวละครมีความเหมาะสมกับเนื้อเรื่อง	4.10	.80	มาก
4.	การดำเนินเรื่องชวนติดตามโดยตลอด	4.00	.74	มาก
ด้านเนื้อหา				
5.	เนื้อหาเหมาะสมกับวัยของผู้เรียน	4.20	.76	มาก
6.	เนื้อหามีความสนุกสนาน เพลิดเพลิน	4.57	.63	มากที่สุด
7.	สาระของเรื่องมีประโยชน์ต่อผู้เรียน	4.60	.56	มากที่สุด
8.	ข้อคิดของเรื่องส่งเสริมคุณธรรมจริยธรรม	4.37	.72	มาก
ด้านภาษา				
9.	ความยาวของเนื้อเรื่องเหมาะสมกับวัยของผู้เรียน	4.40	.62	มาก
10.	ขนาดตัวอักษรเหมาะสมกับวัยผู้เรียน	4.33	.66	มาก
	เฉลี่ย	**4.42**	**.8**	**มาก**

สรุปและอภิปรายผล

1. ประสิทธิภาพของชุดส่งเสริมการอ่าน วัดผลสัมฤทธิ์ทางการเรียนการอ่านจับใจความสำคัญของนักเรียนชั้นมัธยมศึกษาชั้นปีที่ 1 ที่ผู้วิจัยสร้างหรือพัฒนาขึ้นมีประสิทธิภาพ 88/87.44 ซึ่งเป็นไปตามเกณฑ์ 80/80 และ ทั้งนี้อาจเป็นเพราะผู้วิจัยได้ทำการออกแบบให้แบบทดสอบวัดผลสัมฤทธิ์ทางการเรียนการอ่านจับใจความสำคัญ โดยผู้วิจัยได้ทำการเรียงลำดับจากข้อง่ายไปสู่ข้อยาก รวมไปถึงผู้วิจัยได้เล็งเห็นว่านักเรียนในระดับชั้นมัธยมศึกษาปีที่ 1 ในการเรียนรู้ผ่านหนังสือควรที่จะมีภาพประกอบเล็กน้อยเพื่อให้ผู้เรียนเห็นภาพถึงสิ่งที่ผู้วิจัยต้องการจะสื่อ รวมไปถึงการใส่เนื้อหาเสริมประกอบอีกด้วย ซึ่งสอดคล้องกับจินตนา ใบกาซูยี (2544) ที่ได้กล่าวถึงขั้นตอนการเขียนหนังสืออ่านเพิ่มเติมว่า ขั้นตอนในการสร้างหนังสืออ่านเพิ่มเติม มี 7 ขั้นตอน เริ่มจากการกำหนดจุดประสงค์ กำหนดระดับกลุ่มผู้อ่านกำหนดเนื้อหา กำหนดชื่อเรื่อง กำหนดโครงสร้างเนื้อหา กำหนดแนวการเขียน และทำรูปเล่ม

อีกหนึ่งปัจจัยที่มีผลต่อการสร้างหนังสือส่งเสริมการอ่านเสริม ชุดนิทานพื้นบ้านภาคใต้ เรื่อง ยำ

สายสหายสองเล คือ ผู้วิจัยได้คำนึงถึงความสำคัญของการนำเอาวรรณกรรมท้องถิ่นมาใช้ ซึ่งเป็นสถานที่และสิ่งแวดล้อมที่นักเรียนคุ้นเคย มีความสัมพันธ์กับนักเรียนมาเป็นข้อมูลในการสร้างหนังสือ ได้แก่ วิถีชีวิต นิทาน ประวัติ อาหารท้องถิ่น ความเป็นอยู่ของคนในท้องถิ่นใกล้เคียง ทำให้นักเรียนรู้สึกสนใจ และได้เห็นถึงคุณค่าของวรรณกรรมท้องถิ่นของตนเอง ดังที่ วัณจินต์ ทองเกลียวทวี (2556) ได้พัฒนาหนังสืออ่านเพิ่มเติมเรื่องของดีเมืองสวรรคบุรี เพื่อส่งเสริมความสามารถในการอ่านคิดวิเคราะห์ และเขียนสำหรับนักเรียนชั้นประถมศึกษาปีที่ 5 พบว่า การนำเอาเรื่องราวที่เกี่ยวข้องกับท้องถิ่นผู้เรียนมาเป็นเนื้อหาในการจัดทำหนังสืออ่านเพิ่มเติม นอกจากจะทำให้ผู้เรียนเกิดความรักหวงแหนในสิ่งมีค่าในท้องถิ่นของตนยังทำให้นักเรียนมีความสนใจในการอ่าน และเข้าใจเรื่องที่อ่านเป็นอย่างดี ส่งผลให้หนังสืออ่านเพิ่มเติมนั้นมีประสิทธิภาพตามเกณฑ์ 80/80 ซึ่งสอดคล้องกับ จินตนา ใบกาซูยี (2544) ได้กล่าวว่า สภาพท้องถิ่นหรือปัญหาในท้องถิ่นก็ควรนำมาเป็นหัวข้อในการเขียนหนังสือเสริมประสบการณ์ได้ โดยเฉพาะอย่างยิ่งสิ่งที่อยู่ในท้องถิ่นสามารถจะอวดคนต่างถิ่นให้รู้จักของดีในท้องถิ่นได้ เช่น อาชีพที่สำคัญ สถานที่ที่สำคัญ บุคคลที่สำคัญของท้องถิ่น เป็นต้น

2. ผลสัมฤทธิ์ทางการเรียนของนักเรียนหลังเรียน โดยใช้เครื่องมือหนังสือส่งเสริมการอ่านจับใจความ ชุดนิทานพื้นบ้านภาคใต้ เรื่อง ยำสายสหายสองเล สูงกว่าก่อนเรียนอย่างมีนัยสำคัญที่ระดับ .01 เป็นไปตามสมมติฐานข้อ 2 ทั้งนี้ อาจเป็นเพราะผู้วิจัยได้จัดทำการจัดทำเครื่องมือหนังสือส่งเสริมการอ่านจับใจความ ชุดนิทานพื้นบ้านภาคใต้ ซึ่งจะมีเนื้อหาที่มีความใกล้ชิดกับวิถีชีวิตของผู้เรียน ทำให้เกิดการกระตุ้นการเรียนรู้ เพราะด้วยเหตุผลที่ว่า เนื้อหานั้นมีความใกล้ชิดกับผู้เรียนอ่านแล้วเข้าใจง่ายไม่ซับซ้อน เป็นเรื่องที่ผู้เรียนมีความรู้เดิมอยู่บ้างแล้วนั้น ทำให้สรุปใจความสำคัญที่เป็นหัวใจหลักของสิ่งที่ผู้วิจัยต้องการทดสอบได้ง่ายมากขึ้น ส่งผลให้ผลสัมฤทธิ์ทางการเรียนของผู้เรียนดีขึ้นตามไปด้วย ซึ่งสอดคล้องกับ อุมาพร พันธะไชย (2553) ที่ได้พัฒนาหนังสืออ่านเพิ่มเติมวิชาภาษาไทย เรื่อง ข้าว สำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 2 โรงเรียนไทยนิยมสงเคราะห์ บางเขน กรุงเทพมหานคร พบว่า หนังสืออ่านเพิ่มเติม เรื่อง ข้าว มีประสิทธิภาพ 88.57/93.42 ผลสัมฤทธิ์ทางการเรียนของนักเรียนที่เรียนกับหนังสืออ่านเพิ่มเติม เรื่อง ข้าว หลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ .01 เช่นเดียวกับ วันเพ็ญ นามเมืองรักษ์ (2554) ที่ได้พัฒนาหนังสืออ่านเพิ่มเติม เรื่อง สกลนครบ้านเกิด ชั้นมัธยมศึกษาปีที่ 1 โรงเรียนบ้านหนองหอย สังกัดสำนักงานเขตพื้นที่การศึกษาสกลนคร เขต 3 สรุปได้ว่า หนังสืออ่านเพิ่มเติมที่นำข้อมูลท้องถิ่นมาเป็นส่วนประกอบในเนื้อหานั้น สถานที่สำคัญในท้องถิ่น การประกอบอาชีพในท้องถิ่นตลอดจนธรรมชาติในท้องถิ่น ทำให้ดึงดูดใจผู้เรียนทำให้เกิดการเรียนรู้ตนเอง เรียนรู้ชีวิต เรียนรู้ท้องถิ่น ส่งผลให้ผู้เรียนมีค่าเฉลี่ยคะแนนผลสัมฤทธิ์ทางการเรียนหลังเรียนสูงกว่าก่อนเรียนอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

3. ความพึงพอใจของนักเรียนที่มีต่อการเรียนรู้โดยใช้เครื่องมือแบบสำรวจความพึงพอใจที่มีต่อหนังสือส่งเสริมการอ่านจับใจความ ชุดนิทานพื้นบ้านภาคใต้ เรื่อง ยำสายสหายสองเล โดยภาพรวมอยู่ในระดับมากมีค่าเฉลี่ย 4.42 เป็นไปตามสมมติฐานข้อ 3 ทั้งนี้ อาจเป็นเพราะหนังสือส่งเสริมการอ่านที่ผู้วิจัยสร้างขึ้นที่คิดว่า เด็กมีความพึงพอใจในการเรียนเรื่องการอ่านจับใจความสำคัญ จากหนังสือส่งเสริมการอ่านจับใจความ ชุดนิทานพื้นบ้านภาคใต้ ซึ่งสรุปได้ว่า กลุ่มตัวอย่างหรือผู้เรียนมีความพึงพอใจต่อการจัดการเรียนรู้โดยใช้เครื่องมือหนังสืออ่านเสริมที่มีความเหมาะสมกับผู้เรียนสอดคล้องกับงานวิจัยของทิพย์วิมล เพ็ชรฉุย (2558) ที่ศึกษาความพึงพอใจของนักเรียนต่อการจัดการเรียนรู้โดยใช้หนังสือส่งเสริมการอ่านเพื่อพัฒนาทักษะการอ่านและการเขียน ชุด ใต้ฟ้าเมืองสยาม กลุ่มสาระการเรียนรู้ภาษาไทย ชั้น

ประถมศึกษาปีที่ 5 ที่มีความพึงพอใจต่อหนังสือโดยรวมอยู่ในระดับมาก มีคะแนนเฉลี่ยเท่ากับ 4.19 ทิพย์วิมล เพ็ชรฉุย (2558) การพัฒนาหนังสือส่งเสริมการอ่านเพื่อพัฒนาทักษะการอ่านและการเขียน ชุด ใต้ฟ้าเมืองสยาม กลุ่มสาระการเรียนรู้ภาษาไทย ชั้นประถมศึกษาปีที่ 5 รายงานการวิจัย โรงเรียนบ้านบางคู สำนักงานเขตพื้นที่การศึกษาประถมศึกษาภูเก็ต สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน กระทรวงศึกษาธิการ

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. การจัดทำหนังสือนั้น เนื่องจากเป็นหนังสือส่งเสริมการอ่านควรที่จะเพิ่มในส่วนของภาพที่จะสามารถสื่อให้นักเรียนหรือผู้อ่านแล้ว สามารถเข้าใจเรื่องราวและเล่าเรื่องจากภาพได้ก่อน อาจจะเป็นภาพเสมือนจริงหรือภาพที่สมมุติขึ้นเพื่อสื่อความหมายก็ได้ ทั้งนี้ เกิดจากการสังเกตพบว่า นักเรียนจะสนใจดูภาพก่อนอ่านเสมอ

2. การใช้หนังสือส่งเสริมการอ่านนั้น ควรเลือกเนื้อหาที่เป็นรูปธรรมสามารถสื่อด้วยภาพให้นักเรียนเข้าใจความหมายของคำ ของเรื่องราว โดยจะต้องเป็นคำที่เหมาะสมกับระดับความรู้ความสามารถของผู้เรียน

3. ผู้เรียนสามารถนำความรู้จากหนังสือส่งเสริมการอ่านไปบูรณาการกับรายวิชาอื่น ๆ ไม่เพียงแค่รายวิชาที่ส่งเสริมการอ่านเท่านั้น สามารถนำไปใช้เป็นสื่อการเรียนรู้ในรายวิชาอื่น เพื่อให้เกิดความหลากหลายในการเรียนการสอนเพิ่มมากขึ้น

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรสร้างและหาประสิทธิภาพหนังสือส่งเสริมทักษะในด้านต่าง ๆ ให้กับผู้เรียนแต่ละระดับชั้น โดยจะต้องมีความสอดคล้องกับสิ่งที่ผู้เรียนต้องการที่จะเรียนรู้ เพื่อให้นักเรียนมีความรู้ความสามารถเพิ่มขึ้น

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(ระดับชาติ)

กลุ่มบริหารธุรกิจและการท่องเที่ยว

ปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา
Factors Influencing the Decision to Opt for Homestay Accommodation Services in Songkhla Province.

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บทคัดย่อ

บทความวิจัยนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาระดับประชากรศาสตร์ที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา 2) ศึกษาระดับส่วนประสมทางการตลาดต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา 3) ศึกษาปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา กลุ่มตัวอย่างคือ นักท่องเที่ยวที่เดินทางมาท่องเที่ยวและพักแรมประเภทโฮมสเตย์ ในเขตพื้นที่จังหวัดสงขลา จำนวน 385 คน โดยใช้แบบสอบถามเป็นเครื่องมือในการเก็บรวบรวมข้อมูล สถิติที่ใช้วิเคราะห์ข้อมูล คือ ค่าร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน สถิติที่ทดสอบสมมติฐาน คือ การวิเคราะห์การถดถอยพหุคูณ (Multiple Regression Analysis- MRA) ผลการวิจัย พบว่า ผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง จำนวน 242 คน คิดเป็นร้อยละ 62.90 อายุ 21 - 29 ปี จำนวน 134 คน คิดเป็นร้อยละ 34.80 มีสถานภาพโสด จำนวน 210 คน คิดเป็นร้อยละ 54.50 ระดับการศึกษาปริญญาตรี จำนวน 221 คน คิดเป็นร้อยละ 57.40 อาชีพเป็นเจ้าของธุรกิจ/อาชีพอิสระ จำนวน 112 คน คิดเป็นร้อยละ 29.10 มีรายได้เฉลี่ยต่อเดือน 15,001 - 25,000 บาท จำนวน 136 คน คิดเป็นร้อยละ 35.30 และผู้ตอบแบบสอบถามมีความคิดเห็นโดยรวมต่อปัจจัยส่วนประสมทางการตลาดโดยภาพรวมในระดับเห็นด้วยมากที่ระดับค่าเฉลี่ย 4.29 และเมื่อพิจารณาปัจจัยส่วนประสมทางการตลาดเป็นรายด้าน พบว่า ผู้ตอบแบบสอบถามเห็นด้วยกับทุกด้านอยู่ในระดับมาก โดยเรียงลำดับค่าเฉลี่ยที่มากที่สุด คือ ด้านราคา รองลงมา คือ ด้านผลิตภัณฑ์ ด้านลักษณะทางกายภาพ ด้านบุคคล ด้านกระบวนการ ด้านการส่งเสริมการตลาด และ ด้านช่องทางการจัดจำหน่าย ตามลำดับ และพบว่า ปัจจัยส่วนประสมทางการตลาด 7P's ด้านผลิตภัณฑ์ ด้านการส่งเสริมการตลาด ด้านบุคคล ด้านลักษณะทางกายภาพ

ด้านกระบวนการส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ เขตพื้นที่จังหวัดสงขลา ร้อยละ 77 มีค่า R Square = 0.77 อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

คำสำคัญ: โฮมสเตย์, ที่พักแรม, การตัดสินใจ

Abstract

The objectives of this research article were to 1) The study the demographic levels that affect the decision to use homestay accommodation. 2) Study the decision to use the homestay accommodation service. 3) Study the factors that affect the decision to use homestay accommodation. The sample used is the population and tourists living in Songkhla province and Thai tourists visiting the Songkhla area. 385 people used the questionnaire as a data collection tool. The statistics used to analyze the data are percentages, averages, standard deviations. The statistics that test the hypothesis are multiple regression analysis. The study found that Most of the respondents are 242 women, representing 62.90 percent, aged 21 - 29 years. 34.80 percent have 210 single status, 54.50 percent, with 221 bachelor's degree levels. 57.40 percent There is a career as a business /independent business of 112 people, accounting for 29.10 percent, has an average monthly income. 15,001 - 25,000 baht, 136 people, representing 35.30 percent and the respondents have an overall opinion on the marketing factor. Overall, at a very agreement level at the average level of 4.29 and when considering the marketing factor in Found that the respondents agree with all aspects at a high level Which is in order of the highest average, the secondary price is the product, the physical characteristics, the person, the process, the marketing promotion and distribution channels respectively and found 7P's marketing mix factors. Product, marketing promotion, personality, physical appearance, process, affect the decision to use homestay accommodation in Songkhla Province 77 percent had R Square = 0.77 Statistically significant at 0.05.

Keywords: Homestay, accommodation, decision

บทนำ

การท่องเที่ยวเป็นอุตสาหกรรมภาคบริการที่มีบทบาทสำคัญในระบบเศรษฐกิจ เป็นอุตสาหกรรมที่นำรายได้เข้าประเทศมากที่สุด ปริญญาภรณ์ อินทร์กอง (2563) เพราะนอกจากจะสร้างรายได้โดยมีมูลค่าเป็นอันดับหนึ่งของการค้าบริการแล้วยังเป็นอุตสาหกรรมที่ก่อให้เกิดธุรกิจต่อเนื่อง อาทิ โรงแรมและที่พัก ภัตตาคารร้านอาหาร ร้านจำหน่ายของที่ระลึกและสินค้าพื้นเมือง ซึ่งก่อให้เกิดการลงทุน การจ้างงาน และการกระจายรายได้สู่ท้องถิ่น รวมทั้งสามารถสร้างรายได้เข้าสู่ประเทศในรูปเงินตราต่างประเทศปีละหลายแสนล้านบาท เนื่องจากมีบทบาทมากขึ้นในสังคมโลกและยิ่งมากขึ้นในชุมชนท้องถิ่น เมื่ออุตสาหกรรมท่องเที่ยวได้ขยายอาณาเขตของกิจกรรมทางเศรษฐกิจเข้าใกล้วิถีชีวิตของชุมชนมากขึ้น ในขณะที่แนวโน้มการท่องเที่ยวมีการเติบโตในทิศทางบวก นักท่องเที่ยวส่วนหนึ่งให้ความสนใจกับการ

เดินทางไปสัมผัสความจริงแท้ดั้งเดิมของพื้นที่ต่าง ๆ เพิ่มมากขึ้น การท่องเที่ยวไม่ได้กระจุกตัวอยู่ในเมืองใหญ่หากมีการกระจายตัวสู่ชุมชนส่งผลให้ท้องถิ่นหลายแห่งตั้งรับการมาถึงของนักท่องเที่ยว นำการท่องเที่ยวมาเป็นเครื่องมือในการพัฒนาเศรษฐกิจและคุณภาพชีวิต ขณะเดียวกันภาครัฐก็ให้ความสำคัญกับการท่องเที่ยวโดยชุมชนเพิ่มมากขึ้น จากการประกาศให้ท่องเที่ยววิถีไทยเป็นวาระแห่งชาติมีการจัดทำแผนยุทธศาสตร์การท่องเที่ยวโดยชุมชน เพื่อให้การพัฒนาการท่องเที่ยวโดยชุมชนไปในทิศทางที่ยั่งยืน อุตสาหกรรมท่องเที่ยวจึงถือเป็นอุตสาหกรรมแห่งความหวังที่สร้างรายได้เป็นอันดับต้น ๆ และมีความสำคัญโดยตรงต่อการพัฒนาเศรษฐกิจอันส่งผลให้ความเป็นอยู่ของประชาชนในประเทศดีขึ้น การเจริญเติบโตของอุตสาหกรรมท่องเที่ยวแม้ว่าจะก่อให้เกิดประโยชน์ทางเศรษฐกิจ มีการจ้างงานเพิ่มขึ้น การลงทุนและสร้างรายได้เข้าประเทศ แต่ก็ส่งผลกระทบต่อสภาพแวดล้อม วิถีชีวิตของสถานที่นั้น ๆ หากไม่มีการจัดการที่ดีพอ ดังนั้นเพื่อให้เกิดความสมดุลระหว่างการอนุรักษ์และการพัฒนาจึงได้เกิดแนวความคิดในการพัฒนาการท่องเที่ยวอย่างยั่งยืน เกิดเป็นการท่องเที่ยวทางเลือกที่หลากหลาย หนึ่งในนั้นคือ “การท่องเที่ยวโดยชุมชน”

จังหวัดสงขลาเป็นศูนย์กลางการท่องเที่ยวของภาคใต้ตอนล่าง เป็นจังหวัดที่มีแหล่งท่องเที่ยวที่หลากหลาย เป็นเมืองสองทะเลและมีประวัติศาสตร์ความเป็นมาที่ยาวนาน ทำให้มีแหล่งท่องเที่ยวทั้งแหล่งท่องเที่ยวทางธรรมชาติ และแหล่งท่องเที่ยวทางประวัติศาสตร์ โบราณสถาน โบราณวัตถุ และสินค้าพื้นเมืองเป็นที่สนใจของนักท่องเที่ยว อีกทั้งจังหวัดสงขลามีชายแดนติดต่อกับประเทศมาเลเซีย และมีเส้นทางการคมนาคมที่สะดวกทำให้นักท่องเที่ยวโดยเฉพาะชาวมาเลเซียและสิงคโปร์นิยมเดินทางมาท่องเที่ยวในจังหวัดสงขลา เป็นจำนวนมาก (องค์การบริหารส่วนจังหวัดสงขลา, 2567) สภาอุตสาหกรรมจึงได้เสนอการผลักดันให้จังหวัดสงขลาเป็นพื้นที่สีฟ้า เพื่อเป็นพื้นที่กระตุ้นเศรษฐกิจด้านการท่องเที่ยว ศูนย์บริหารสถานการณ์การแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (โควิด-19) หรือที่เรียกว่า ศบค. จึงมีมติเพิ่มจังหวัดสงขลาเป็นพื้นที่สีฟ้า (นำร่องการท่องเที่ยว) เนื่องจากในปี พ.ศ. 2564 จังหวัดสงขลา จะเป็นศูนย์กลางเศรษฐกิจของภาคใต้เป็นเมืองที่มีความพร้อมด้านโครงสร้างพื้นฐาน มีระบบคมนาคมขนส่งเชื่อมโยงทางบก (รถไฟ ถนน) ทางเรือ (ท่าเรือสงขลาแห่งที่ 1 และ 2) ทางอากาศ (สนามบินนาชาติหาดใหญ่) เป็นศูนย์กลางการค้า การลงทุนของภาคใต้ โดยใช้ศักยภาพของนิคมอุตสาหกรรมยางพารา และเขตเศรษฐกิจพิเศษสะเดา ปาดังเบซาร์ เชื่อมโยงเศรษฐกิจทางตอนบนของภาคกับตอนใต้ของประเทศไปยังประเทศเพื่อนบ้านและนานาชาติ เป็นศูนย์กลางการท่องเที่ยวของภาคใต้ โดยใช้ความโดดเด่นจากฐานเดิมที่เป็นเมืองท่องเที่ยวชายแดน ความสวยงามของทรัพยากร และความหลากหลายทางวัฒนธรรม รวมทั้งเป็นเส้นทางสำคัญ ในการเชื่อมโยงการท่องเที่ยวกับแหล่งท่องเที่ยวสำคัญของภูมิภาคทั้งฝั่งทะเล อันดามัน และอ่าวไทย

จากปัจจัยที่กล่าวมาข้างต้น ในช่วงหลังสถานการณ์ไวรัสโคโรนา 2019 (โควิด-19) ยังมีนักท่องเที่ยวจำนวนไม่มากเหมือนเมื่อก่อนสถานการณ์โควิด เพื่อเป็นการกระตุ้นการท่องเที่ยวเชิงชุมชนที่เข้าพักแรมประเภทโฮมสเตย์ในจังหวัดสงขลาให้กลับมาคึกคักเช่นเดิม จึงเป็นข้อสนับสนุนให้ผู้วิจัยเห็นถึงความสำคัญในการศึกษาถึงประเด็นปัจจัยที่ส่งผลการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ จังหวัดสงขลา เพื่อทราบถึงความต้องการของนักท่องเที่ยวที่เดินทางมาพักแรม ตลอดจนนำข้อมูลที่ได้ไปเป็นแนวทางในการปรับปรุงและวางแผนธุรกิจ รวมทั้งส่งเสริมการพัฒนาการตลาดภาคการท่องเที่ยวให้มีความก้าวหน้า และยังคงรักษาสิ่งแวดล้อมทางธรรมชาติให้สวยงามสืบต่อไป

วัตถุประสงค์การวิจัย

1. ศึกษาระดับประชากรศาสตร์ที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

2. ศึกษาระดับส่วนประสมทางการตลาดต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

3. ศึกษาปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

สมมติฐานของการวิจัย

ปัจจัยส่วนประสมทางการตลาดส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

แนวคิด ทฤษฎี กรอบแนวคิด

ความหมายของโฮมสเตย์

ในราชกิจจานุเบกษา ประกาศกรมการท่องเที่ยว เรื่องกำหนดมาตรฐานบริการท่องเที่ยวมาตรฐานโฮมสเตย์ไทย พ.ศ. 2554 ให้ความหมายโฮมสเตย์ไทยว่า เป็นการท่องเที่ยวรูปแบบหนึ่งที่นักท่องเที่ยวจะต้องพักรวมกับเจ้าของบ้านชายคาเดียวกัน โดยมีห้องพักหรือพื้นที่ใช้สอยภายในบ้านเหลือสามารถนำมาดัดแปลงให้นักท่องเที่ยวพักได้ชั่วคราว ซึ่งมีจำนวนไม่เกิน 4 ห้อง มีผู้พักรวมกันไม่เกิน 20 คน โดยมีค่าตอบแทนและจัดบริการสิ่งอำนวยความสะดวกตามสมควร อันมีลักษณะเป็นการประกอบกิจการเพื่อหารายได้เสริม ซึ่งเป็นไปตามบทนิยามคำว่า “โรงแรม” แห่งพระราชบัญญัติโรงแรม พ.ศ. 2547 และได้ขึ้นทะเบียนกับกรมการท่องเที่ยวตามหลักเกณฑ์ที่กรมการท่องเที่ยวกำหนด สอดคล้องกับสำนักพัฒนาบริการท่องเที่ยว (2562) ให้ความหมายของโฮมสเตย์ หมายถึง บ้านที่อยู่อาศัยในชุมชนชนบทที่มีประชาชนในชุมชนเป็นเจ้าของบ้าน และเจ้าของบ้านหรือสมาชิกในครอบครัวอาศัยอยู่ประจำหรือใช้ชีวิตประจำวันอยู่ในบ้านดังกล่าว นอกจากนี้บ้านดังกล่าวต้องมีความพร้อมในการเป็นโฮมสเตย์ ดังนี้ 1) เจ้าของบ้านหรือสมาชิกในครอบครัวต้องถือว่าการทำโฮมสเตย์เป็นเพียงรายได้เสริม นอกเหนือจากรายได้หลักจากอาชีพหลักของครอบครัวเท่านั้น 2) มีพื้นที่ใช้สอยในบ้านเหลือและไม่ได้ใช้ประโยชน์ สามารถนำมาดัดแปลงให้นักท่องเที่ยวเข้าพักได้ 3) นักท่องเที่ยวต้องเข้าพักค้างแรมในบ้านเดียวกันกับเจ้าของบ้านอาศัยอยู่ โดยมีโอกาสแลกเปลี่ยนเรียนรู้วัฒนธรรม และวิถีชีวิตระหว่างกัน 4) สมาชิกในครอบครัวต้องมีความยินดีและเต็มใจที่จะรับนักท่องเที่ยวให้เข้ามาพักค้างแรมในบ้าน พร้อมทั้งถ่ายทอดวัฒนธรรมอันดีงามของท้องถิ่นนั้นให้แก่นักท่องเที่ยว 5) เจ้าของบ้านและสมาชิกในครอบครัวให้ความร่วมมือกับชุมชนในการจัดการโฮมสเตย์เป็นอย่างดี 6) บ้านนั้นควรเป็นสมาชิกของกลุ่มชมรมที่ร่วมกันจัดการโฮมสเตย์ของชุมชนนั้น นอกจากนี้การท่องเที่ยวแห่งประเทศไทย (2560) ได้ให้ความหมายของโฮมสเตย์ว่าหมายถึง บ้านพักประเภทหนึ่งที่ผู้เข้าพักต้องพักร่วมกับเจ้าของบ้าน และมีวัตถุประสงค์ที่จะเรียนรู้วัฒนธรรมประเพณี และวิถีชีวิตของชาวบ้าน ซึ่งเจ้าของบ้านเต็มใจที่จะถ่ายทอดวัฒนธรรม การแลกเปลี่ยนความรู้ซึ่งกันและกัน พร้อมทั้งจัดที่พักและอาหารให้กับนักท่องเที่ยว โดยได้รับค่าตอบแทนตามความเหมาะสม สรุปได้ว่า โฮมสเตย์ หมายถึง ที่พักสัมผัสวัฒนธรรมชนบท ซึ่งนักท่องเที่ยวจะพักรวมกันกับเจ้าบ้าน และ

ศึกษาธรรมชาติ วิถีชีวิต วัฒนธรรมท้องถิ่น โดยมีการจัดบริการสิ่งอำนวยความสะดวกตามสมควรแก่นักท่องเที่ยว อันมีลักษณะเป็นการประกอบกิจกรรมเพื่อหารายได้เสริมของเจ้าของบ้าน

แนวคิดและทฤษฎีเกี่ยวกับปัจจัยด้านส่วนประสมการตลาด 7P's

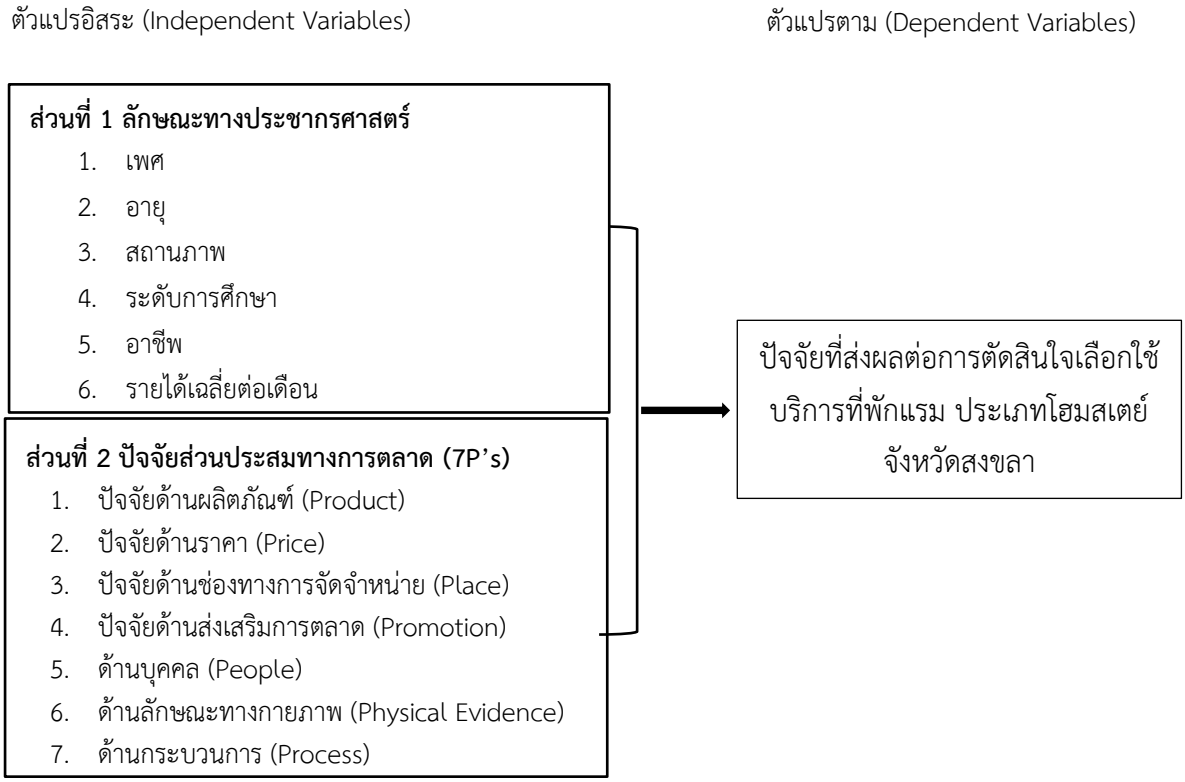
Kotler (2003) ได้กล่าวว่า ส่วนประสมทางการตลาดเป็นกลุ่มของเครื่องมือทางการตลาดที่นำมาใช้เพื่อตอบสนองความต้องการของตลาดและทำให้เกิดความพึงพอใจ คือ องค์ประกอบที่สำคัญในการดำเนินงานการตลาด ซึ่งเป็นปัจจัยที่กิจการสามารถควบคุมได้ กิจการธุรกิจจะต้องสร้างส่วนประสมการตลาดที่เหมาะสมในการวางกลยุทธ์ทางการตลาด เพื่อตอบสนองกลุ่มเป้าหมายให้เกิดความพึงพอใจมากที่สุด ซึ่งประกอบด้วย 7 ด้าน คือ ด้านสินค้า ด้านราคา ด้านช่องทางการจัดจำหน่าย ด้านการส่งเสริมการตลาด ด้านบุคคล ด้านกระบวนการ และด้านลักษณะทางกายภาพ เป็นต้น อีกทั้ง ผู้วิจัยได้นำส่วนประสมทางการตลาด 7P's เป็นตัวแปรต้นเป็นแนวคิดสำคัญสำหรับการวิเคราะห์ตลาด รวมถึงความสำเร็จต่อการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ เนื่องจากความสำเร็จของเจ้าของโฮมสเตย์ส่วนหนึ่งขึ้นอยู่กับการปรับปรุงปัจจัยที่ส่งผลต่อการตัดสินใจที่เหมาะสมของส่วนประสมทางการตลาดเหล่านี้เพื่อตอบสนองความต้องการของผู้บริโภคที่หลากหลาย และสร้างข้อได้เปรียบให้กับกิจการในสภาวะตลาดที่มีการแข่งขันที่รุนแรงในปัจจุบัน

แนวคิดและทฤษฎีพฤติกรรมการตัดสินใจซื้อ

การตัดสินใจ (Decision Making) หมายถึง กระบวนการคิดโดยใช้เหตุผลเลือกสิ่งหนึ่งสิ่งใดเพื่อให้ได้ทางเลือกตอบสนองต่อความต้องการของตนเองมากที่สุด กระบวนการตัดสินใจของผู้ซื้อของผู้บริโภคเริ่มต้นจากความต้องการค้นหาข้อมูลเปรียบเทียบราคาคุณภาพสินค้าที่ต้องการว่าสินค้าตัวไหนตรงกับความต้องการจึงตัดสินใจซื้อ (มานิต รัตนสุวรรณ และ สมฤดี ศรีจรรยา, 2561) กระบวนการหรือขั้นตอนพฤติกรรมการตัดสินใจซื้อ (Buyer's Decision Process) เป็นลำดับขั้นตอนในการตัดสินใจซื้อของผู้บริโภคประกอบไปด้วยการรับรู้ปัญหา การค้นหาข้อมูล การประเมินผลทางเลือก การตัดสินใจซื้อ และพฤติกรรมภายหลังการซื้อ กระบวนการพฤติกรรมตัดสินใจซื้อในการตัดสินใจซื้อของผู้บริโภคนั้นจะประกอบไปด้วยบุคคลที่เข้ามามีส่วนเกี่ยวข้องในพฤติกรรมการตัดสินใจซื้อแบ่งออกเป็น 5 ขั้นตอน ดังนี้

1. ผู้ริเริ่ม (Initiator) คือ บุคคลที่เสนอแนวความคิดในการซื้อสินค้าเป็นคนแรก
2. ผู้มีอิทธิพล (Influencer) คือ ผู้ที่ให้คำแนะนำข้อเสนอแนะในการตัดสินใจซื้อ
3. ผู้ที่ตัดสินใจซื้อ (Decider) คือ ผู้ที่ตัดสินใจซื้อสินค้าเป็นครั้งสุดท้ายในทุก ๆ เรื่อง
4. ผู้ซื้อ (Buyer) คือ ผู้ซื้อสินค้าในผลิตภัณฑ์ต่าง ๆ
5. ผู้ใช้ (User) คือ ผู้ใช้หรือบริโภคในสินค้าที่ต้องการ (ศิริวรรณ เสรีรัตน์ และคณะ, 2560)

กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากรที่ศึกษาวิจัยในครั้งนี้ คือ นักท่องเที่ยวโดยไม่ทราบจำนวนที่แน่นอน ในเขตพื้นที่จังหวัดสงขลาจากนักท่องเที่ยวชาวไทยที่เดินทางมาท่องเที่ยวพักแรมประเภทโฮมสเตย์ ในเขตพื้นที่จังหวัดสงขลา จึงใช้สูตรในการคำนวณขนาดของกลุ่มตัวอย่างแบบไม่ทราบจำนวนประชากรที่แน่นอน เก็บกลุ่มตัวอย่างแบบไม่อาศัยความน่าจะเป็น ผู้วิจัยจึงใช้วิธีการกำหนดขนาดกลุ่มตัวอย่างจากการประมาณค่าร้อยละกรณีไม่ทราบประชากร โดยใช้ สูตรของ W.G. Cochran (1977 อ้างถึงใน ยุทธ ไกยวรรณ์, 2561) ได้กลุ่มตัวอย่าง 385 ตัวอย่าง ผู้วิจัยจึงทำการเก็บตัวอย่างเพิ่มอีก 4% เท่ากับ 15 คน รวมทั้งสิ้น 400 คน โดยใช้วิธีการสุ่มตัวอย่างแบบสะดวก (Convenience Sampling) โดยแจกแบบสอบถามให้แก่กลุ่มตัวอย่างที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

เครื่องมือที่ใช้ในการวิจัย

สำหรับการวิจัยในครั้งนี้ เครื่องมือที่ใช้ คือ แบบสอบถาม (Questionnaire) ผู้วิจัยได้สร้างขึ้นเพื่อเป็นการศึกษาปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา โดยได้แบ่งแบบสอบถามออกเป็น 4 ส่วนดังนี้ ส่วนที่ 1. สอบถามเกี่ยวกับข้อมูลทั่วไปของผู้ตอบแบบสอบถาม ประกอบด้วย เพศ อายุ สถานภาพ ระดับการศึกษา อาชีพ และรายได้ต่อเดือน ลักษณะข้อคำถามเป็น

แบบเลือกตอบ ส่วนที่ 2. แบบสอบถามเกี่ยวกับปัจจัยส่วนประสมทางการตลาด (7P's) 1) ปัจจัยด้านผลิตภัณฑ์ 2) ปัจจัยด้านราคา 3) ปัจจัยด้านช่องทางการจัดจำหน่าย 4) ปัจจัยด้านส่งเสริมการตลาด 5) ด้านบุคคล 6) ด้านลักษณะทางกายภาพ 7) ด้านกระบวนการ ซึ่งมีลักษณะข้อคำถามเป็นแบบมาตราส่วนประมาณค่า 5 ระดับ ส่วนที่ 3. ปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ 1) ด้านที่พัก 2) ด้านอาหารและโภชนาการ 3) ด้านความปลอดภัย 4) ด้านอัธยาศัย 5) ด้านทรัพยากรธรรมชาติและสิ่งแวดล้อม 6) ด้านการบริการ 7) ด้านการประชาสัมพันธ์ ส่วนที่ 4. ข้อเสนอแนะเพิ่มเติม มีลักษณะคำถามแบบปลายเปิด

เครื่องมือที่ใช้ในการวิจัยได้รับการตรวจสอบความเที่ยงตรงเชิงเนื้อหาเพื่อพิจารณาคุณภาพของแบบสอบถามในด้านความเชื่อมั่น (Reliability) โดยวิธีการวิเคราะห์ค่าสัมประสิทธิ์ของครอนบาค (Cronbach's alpha) พบว่า ค่าความเชื่อมั่นของแบบสอบถามมีค่าเท่ากับ 0.89 ซึ่งถือว่ามีคุณภาพสามารถนำไปใช้ได้ ซึ่งเป็นไปตามเกณฑ์ของ Fraenkel & Wallen (2009) ซึ่งระบุว่าค่าความเชื่อมั่นไม่ควรต่ำกว่า 0.70

การเก็บรวบรวมข้อมูล

ผู้วิจัยได้ใช้แบบสอบถามในการเก็บรวบรวมข้อมูล ประเภทแบบสอบถามเพื่อเก็บรวบรวมข้อมูลกับกลุ่มตัวอย่างในเขตพื้นที่ในจังหวัดสงขลา

การวิเคราะห์ข้อมูล

1. ศึกษาระดับประชากรศาสตร์ที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา โดยใช้สถิติค่าความถี่ และร้อยละ

2. ศึกษาระดับส่วนประสมทางการตลาดต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา โดยใช้สถิติค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

3. ศึกษาปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา โดยใช้สถิติวิเคราะห์ถดถอยพหุคูณระหว่างส่วนประสมทางการตลาดกับการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ โดยวิเคราะห์การถดถอยพหุคูณ (Multiple Regression Analysis-MRA) เพื่อใช้ทดสอบสมมติฐาน เป็นการวิเคราะห์ข้อมูลเพื่อหาความสัมพันธ์ระหว่างตัวแปรตาม (Dependent Variable) จำนวนหนึ่งตัวแปรกับตัวแปรอิสระ (Independent Variable) ตั้งแต่ 2 ตัวแปรขึ้นไป

ผลการวิจัย

1. ลักษณะปัจจัยส่วนบุคคลของกลุ่มตัวอย่าง

จากการศึกษาพบว่า ผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง จำนวน 242 คน คิดเป็นร้อยละ 62.90 เพศชาย จำนวน 143 คน คิดเป็นร้อยละ 37.10 ส่วนใหญ่มีอายุระหว่าง 21 - 29 ปี จำนวน 134 คน คิดเป็นร้อยละ 34.80 สถานภาพโสด จำนวน 210 คน คิดเป็นร้อยละ 54.50 ระดับการศึกษาปริญญาตรี จำนวน 221 คน คิดเป็นร้อยละ 57.40 มีอาชีพเจ้าของธุรกิจ/อาชีพอิสระ จำนวน 112 คน คิดเป็นร้อยละ 29.10 รายได้ 15,001 - 25,000 บาท จำนวน 136 คน คิดเป็นร้อยละ 35.30

2. ระดับส่วนประสมทางการตลาดต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

ตารางที่ 1 แสดงค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานของปัจจัยส่วนประสมทางการตลาดในการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

ส่วนประสมทางการตลาด	$\bar{x}$	S.D.	ระดับความสำคัญ	ลำดับ
1) ปัจจัยด้านผลิตภัณฑ์	**4.39**	**0.90**	**มาก**	
1.1 ที่พักมีการแบ่งห้องนอนและห้องน้ำอย่างเป็นสัดส่วน	4.42	0.84	มาก	1
1.2 มีบริเวณมุมพักผ่อนสบายภายในบ้านหรือบริเวณ	4.40	0.92	มาก	2
1.3 ห้องอาบน้ำและห้องส้วมปลอดภัย สะอาด มีที่ล็อคประตูอยู่ในสภาพที่ใช้งานได้ดี และมีความมิดชิด	4.39	0.92	มาก	3
1.4 ที่นอนและเครื่องนอนมีความสะอาด ไม่มีกลิ่นอับ	4.38	0.92	มาก	4
1.5 มีราวตากผ้าและที่เก็บเสื้อผ้าที่เป็นส่วนตัว	4.38	0.93	มาก	5
1.6 ที่นอนอุปกรณ์เครื่องนอน ผ้าปู หมอน ปลอกหมอน ผ้าห่ม	4.34	0.89	มาก	6
2) ปัจจัยด้านราคา	**4.40**	**0.78**	**มาก**	**ลำดับ**
2.1 กำหนดราคาที่พักโฮมสเตย์และบริการต่าง ๆ อย่างชัดเจน	4.50	0.69	มาก	1
2.2 ราคาห้องพัก/ที่พักโฮมสเตย์เหมาะสมกับระยะเวลาเข้าพัก	4.39	0.79	มาก	2
2.3 ห้องพัก/ที่พักโฮมสเตย์มีความเหมาะสมกับราคา	4.39	0.81	มาก	3
2.4 ราคาห้องพัก/ที่พักโฮมสเตย์ถูกกว่าที่อื่น	4.38	0.80	มาก	4
2.5 ห้องพัก/ที่พักโฮมสเตย์มีราคาให้เลือกหลายระดับ	4.36	0.80	มาก	5
3) ปัจจัยด้านช่องทางการจัดจำหน่าย	**4.19**	**0.96**	**มาก**	**ลำดับ**
3.1 มีบริการสำรองที่พักโฮมสเตย์ผ่านอินเทอร์เน็ต	4.23	0.91	มาก	1
3.2 มีข้อมูลเกี่ยวกับที่พักให้นักท่องเที่ยวหลายช่องทาง	4.21	0.91	มาก	2
3.3 มีบริการสำรองที่พักผ่านบริษัทตัวแทนการท่องเที่ยว (บ.ทัวร์)	4.12	1.05	มาก	3
4) ปัจจัยด้านส่งเสริมการตลาด	**4.20**	**1.01**	**มาก**	**ลำดับ**
4.1 รับทราบข้อมูลโฆษณาจากสื่อสิ่งพิมพ์หรือป้ายต่าง ๆ	4.22	1.03	มาก	1
4.2 ประชาสัมพันธ์ผ่านช่องทางออนไลน์ (Facebook)	4.17	0.99	มาก	2
5) ปัจจัยด้านบุคคล	**4.30**	**0.94**	**มาก**	**ลำดับ**
5.1 ให้บริการลูกค้าอย่างเท่าเทียม	4.35	0.90	มาก	1
5.2 ให้บริการด้วยความยิ้มแย้มสุภาพเป็นมิตร	4.33	0.89	มาก	2
5.3 ให้บริการด้วยความรวดเร็ว	4.33	0.87	มาก	3
5.4 มีความสามารถในการแก้ไขปัญหาเฉพาะหน้า	4.30	0.95	มาก	4

5.5 มีความรู้ความเข้าใจในทักษะด้านการบริการ	4.28	0.97	มาก	5
5.6 มีความสามารถในการสื่อสารภาษาต่างประเทศ	4.22	1.06	มาก	6
6) ปัจจัยด้านลักษณะทางกายภาพ	**4.34**	**0.86**	**มาก**	**ลำดับ**
6.1 บรรยากาศในห้องพัก/ที่พัก	4.39	0.81	มาก	1
6.2 การจัดแบ่งสัดส่วนพื้นที่สำหรับลูกค้า อาทิ ที่จอดรถ มุมพักผ่อน	4.35	0.85	มาก	2
6.3 สัญญาณ Wi-Fi มีตลอดเวลา/ไม่ติดขัด	4.33	0.85	มาก	3
6.4 บรรยากาศโดยรอบบริเวณสถานที่พัก	4.32	0.85	มาก	4
6.5 ความแข็งแรงและระบบรักษาความปลอดภัยเชื่อถือได้	4.32	0.85	มาก	5
7) ปัจจัยด้านกระบวนการ	**4.29**	**0.84**	**มาก**	**ลำดับ**
7.1 มีบริการให้ข้อมูลที่ลูกค้าต้องการ	4.32	0.91	มาก	1
7.2 มีวิธีการสำรองที่พักและชำระเงินหลากหลายวิธี	4.32	0.94	มาก	2
7.3 มีจำนวนบุคคลากรเพียงพอต่อการบริการ	4.28	0.92	มาก	3
7.4 ให้บริการที่ถูกต้องตามความต้องการของลูกค้า	4.27	0.92	มาก	4
7.5 รวดเร็วทั้งการสำรองห้องพัก การจัดหา และเช็คเอ้าท์	4.24	1.03	มาก	5
รวม	**4.29**	**0.94**	**มาก**	

จากตารางที่ 1 พบว่า ผู้ตอบแบบสอบถามมีความคิดเห็นโดยรวมต่อปัจจัยส่วนประสมทางการตลาด โดยภาพรวมในระดับเห็นด้วยมากที่ระดับค่าเฉลี่ย 4.29 และเมื่อพิจารณาปัจจัยส่วนประสมทางการตลาดเป็นรายด้าน พบว่า ผู้ตอบแบบสอบถามเห็นด้วยกับทุกด้านอยู่ในระดับมาก โดยเรียงลำดับค่าเฉลี่ยที่มากที่สุด คือ ด้านราคา รองลงมาคือ ด้านผลิตภัณฑ์ ลักษณะทางกายภาพ ด้านบุคคล ด้านกระบวนการ ด้านการส่งเสริมการตลาด และด้านช่องทางการจัดจำหน่าย ตามลำดับ ซึ่งสามารถอธิบายแต่ละด้านได้ดังนี้

ด้านผลิตภัณฑ์ ผู้ตอบแบบสอบถามมีความพึงพอใจกับที่พักมีการแบ่งห้องนอนและห้องน้ำอย่างเป็นสัดส่วนในระดับเห็นด้วยมาก ค่าเฉลี่ย 4.42 รองลงมา คือ ที่พักโฮมสเตย์มีการดูแลบริเวณรอบที่พักมีมุมพักผ่อนที่สงบ สบายภายในบ้าน หรือบริเวณโดยรอบที่สามารถนั่ง นอน และมีบรรยากาศผ่อนคลาย เช่น ลานบ้าน ใต้ต้นไม้ ศาลาหน้าบ้าน ค่าเฉลี่ย 4.40 ห้องอาบน้ำและห้องส้วมมีความปลอดภัย สะอาด มีที่ล็อคประตูอยู่ในสภาพที่ใช้งานได้ดี และมีความมิดชิด ค่าเฉลี่ย 4.39 มีราวตากผ้าและที่เก็บเสื้อผ้าที่เป็นส่วนตัว และที่นอนและเครื่องนอน มีความสะอาด ไม่มีกลิ่นอับ ค่าเฉลี่ย 4.38 และที่พักมีที่นอน อุปกรณ์เครื่องนอน ผ้าปู หมอน ปลอกหมอน ผ้าห่ม ค่าเฉลี่ย 4.34 ตามลำดับ

ด้านราคา ผู้ตอบแบบสอบถามมีความพึงพอใจกับมีการกำหนดราคาที่พักโฮมสเตย์และบริการต่าง ๆ อย่างชัดเจนมากที่สุด ค่าเฉลี่ย 4.50 รองลงมาห้องพัก/ที่พักโฮมสเตย์ มีความเหมาะสมกับราคาและราคาห้องพัก/ที่พักโฮมสเตย์ เหมาะสมกับระยะเวลาเข้าพัก ค่าเฉลี่ย 4.39 ราคาห้องพัก/ที่พักโฮมสเตย์ ถูกกว่าที่อื่นที่ระดับ ค่าเฉลี่ย 4.38 และห้องพัก/ที่พักโฮมสเตย์ มีราคาให้เลือกหลายระดับ ค่าเฉลี่ย 4.36 ตามลำดับ

ด้านช่องทางการจัดจำหน่าย ผู้ตอบแบบสอบถามมีความพึงพอใจกับมีบริการสำรองที่พักโฮมสเตย์ผ่านอินเทอร์เน็ต ค่าเฉลี่ย 4.23 รองลงมาคือ มีข้อมูลเกี่ยวกับที่พักโฮมสเตย์ให้นักท่องเที่ยวหลากหลายช่องทาง ค่าเฉลี่ย 4.21 และมีบริการสำรองที่พักโฮมสเตย์ผ่านบริษัทตัวแทนการท่องเที่ยว (บริษัททัวร์) ระดับค่าเฉลี่ย 4.12 ตามลำดับ

ด้านการส่งเสริมการตลาด ผู้ตอบแบบสอบถามพึงพอใจกับการรับทราบข้อมูลโฆษณาจากสื่อสิ่งพิมพ์หรือป้ายต่าง ๆ ค่าเฉลี่ย 4.22 และประชาสัมพันธ์ผ่านช่องทางออนไลน์ (Facebook) ค่าเฉลี่ย 4.17 ตามลำดับ

ด้านบุคคล ผู้ตอบแบบสอบถามพึงพอใจกับการให้บริการลูกค้าอย่างเท่าเทียมมาก ที่ระดับค่าเฉลี่ย 4.35 รองลงมาคือ ให้บริการด้วยความยิ้มแย้มสุภาพเป็นมิตรและให้บริการด้วยความรวดเร็วที่ระดับค่าเฉลี่ย 4.33 มีความสามารถในการแก้ไขปัญหาเฉพาะหน้า ค่าเฉลี่ย 4.30 มีความรู้ความเข้าใจในทักษะด้านการบริการ ที่ระดับค่าเฉลี่ย 4.28 และมีความสามารถในการสื่อสารภาษาต่างประเทศ ที่ระดับค่าเฉลี่ย 4.22 ตามลำดับ

ด้านลักษณะทางกายภาพ ผู้ตอบแบบสอบถามพึงพอใจกับบรรยากาศในห้องพัก/ที่พักมากที่ระดับค่าเฉลี่ย 4.39 รองลงมาคือ การจัดแบ่งสัดส่วนพื้นที่สำหรับลูกค้า อาทิ ที่จอดรถ มุมพักผ่อน ค่าเฉลี่ย 4.35 สัญญาณ Wi-Fi มีตลอดเวลา/ไม่ติดขัด ค่าเฉลี่ย 4.33 ความแข็งแรงและระบบรักษาความปลอดภัยของที่พักสามารถเชื่อถือได้ และบรรยากาศโดยรอบบริเวณสถานที่พัก ค่าเฉลี่ย 4.32 ตามลำดับ

ด้านกระบวนการ ผู้ตอบแบบสอบถามพึงพอใจกับมีวิธีการสำรองที่พักและชำระเงินหลากหลายวิธี อาทิ เงินสด บัตรเครดิต โอนเงินผ่านธนาคาร โอนเงินผ่านอินเทอร์เน็ต และมีบริการให้ข้อมูลที่ลูกค้าต้องการ ค่าเฉลี่ย 4.32 มีจำนวนบุคลากรเพียงพอต่อการบริการ ค่าเฉลี่ย 4.28 มีการให้บริการที่ถูกต้องตามความต้องการของลูกค้า ค่าเฉลี่ย 4.27 และมีกระบวนการที่รวดเร็ว ทั้งการสำรองห้องพัก การจัดหาและเช็คเอ้าท์ ค่าเฉลี่ย 4.24 ตามลำดับ

3. ปัจจัยส่วนประสมทางการตลาดที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

ตารางที่ 2 แสดงผลการวิเคราะห์ถดถอยพหุคูณระหว่างส่วนประสมทางการตลาดที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา

ตัวแปร	B	S.E.	Beta	t	Sig
ค่าคงที่ (Constant)	0.08	0.42		9.67	0.00
ผลิตภัณฑ์ (X_1)	0.15	0.04	0.14	2.10	0.03*
ราคา (X_2)	0.01	0.65	-0.05	-0.11	0.91
ช่องทางการจัดจำหน่าย (X_3)	0.06	0.05	0.06	1.39	0.16
การส่งเสริมการตลาด (X_4)	0.10	0.10	0.09	2.04	0.04*
บุคคล (X_5)	0.13	0.86	0.12	2.45	0.01*
ลักษณะทางกายภาพ (X_6)	0.28	0.34	0.25	4.50	0.00*
กระบวนการ (X_7)	0.32	0.04	0.30	5.60	0.00*

R = 0.802 R Square = 0.77 Adj. R Square = 0.628 SEE = 4.389

* มีนัยสำคัญทางสถิติที่ระดับ 0.05

จากตารางที่ 2 ผลการศึกษา พบว่า ปัจจัยส่วนประสมทางการตลาด 7P's ด้านผลิตภัณฑ์ (sig = 0.03) ด้านการส่งเสริมการตลาด (sig = 0.04) ด้านบุคคล (sig = 0.01) ด้านลักษณะทางกายภาพ (sig = 0.00) ด้านกระบวนการ (sig = 0.00) ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ จังหวัดสงขลา อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05

โดยสามารถเขียนสมการถดถอยได้ดังนี้

$$y = 0.08 + (0.15)X_1 + (0.10)X_4 + (0.13)X_5 + (0.28)X_6 + (0.32)X_7$$

เมื่อพิจารณาน้ำหนักของผลการตัดสินใจเลือกใช้บริการ พบว่า ด้านกระบวนการ (Beta = 0.32) ส่งผลต่อการเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา มากที่สุด รองลงมาคือ ด้านลักษณะทางกายภาพ (Beta = 0.28) ด้านผลิตภัณฑ์ (Beta = 0.15) ด้านบุคคล (Beta = 0.13) และด้านการส่งเสริมการตลาด (Beta = 0.10) ตามลำดับ

เมื่อวิเคราะห์ค่าสัมประสิทธิ์การกำหนด (R Square = 0.77) พบว่า ปัจจัยส่วนประสมทางการตลาด 7P's ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา ร้อยละ 77 ส่วนที่เหลือร้อยละ 23 มาจากปัจจัยด้านอื่น ๆ ที่ไม่ได้นำมาพิจารณา

สรุปและอภิปรายผล

การวิจัยครั้งนี้เป็นการศึกษาเรื่อง ปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา สามารถสรุปและอภิปรายผลตรงตามวัตถุประสงค์การวิจัย ดังนี้

1. ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

ผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง จำนวน 242 คน คิดเป็นร้อยละ 62.90 เพศชาย จำนวน 143 คน คิดเป็นร้อยละ 37.10 ส่วนใหญ่มีอายุระหว่าง 21 - 29 ปี จำนวน 134 คน คิดเป็นร้อยละ 34.80 สถานภาพโสด จำนวน 210 คน คิดเป็นร้อยละ 54.50 ระดับการศึกษาปริญญาตรี จำนวน 221 คน คิดเป็นร้อยละ 57.40 มีอาชีพเจ้าของธุรกิจ/อาชีพอิสระ จำนวน 112 คน คิดเป็นร้อยละ 29.10 รายได้ 15,001 - 25,000 บาท จำนวน 136 คน คิดเป็นร้อยละ 35.30

2. ผู้ตอบแบบสอบถามมีความคิดเห็นโดยรวมต่อปัจจัยที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ จังหวัดสงขลา โดยภาพรวมในระดับเห็นด้วยมาก ที่ระดับค่าเฉลี่ย 4.29 และเมื่อพิจารณาปัจจัยส่วนประสมทางการตลาดเป็นรายด้าน พบว่า ผู้ตอบแบบสอบถามเห็นด้วยกับทุกด้านอยู่ในระดับมาก โดยเรียงลำดับค่าเฉลี่ยที่มากที่สุด คือ ด้านราคา รองลงมาคือ ด้านผลิตภัณฑ์ ลักษณะทางกายภาพ ด้านบุคคล ด้านกระบวนการ ด้านการส่งเสริมการตลาด และด้านช่องทางการจัดจำหน่าย ตามลำดับ สอดคล้องกับงานวิจัยของ นพดล ชูเศษ, วิวัฒน์ จันทร์กิ่งทอง, กอแก้ว จันทร์กิ่งทอง, และปัญจา ชูช่วย (2561) ได้ทำการศึกษาเรื่อง องค์ประกอบคุณภาพการบริการของโรงแรม ในอำเภอหาดใหญ่ จังหวัดสงขลา ที่มีอิทธิพลต่อความพึงพอใจของนักท่องเที่ยว พบว่า มีความพึงพอใจในด้านชื่อเสียงของโรงแรมมากที่สุด รองลงมาคือ ด้านราคา และด้านการให้บริการกับด้านบรรยากาศของโรงแรม ส่วนปัจจัย

ด้านคุณภาพการบริการที่มีอิทธิพลต่อความพึงพอใจของนักท่องเที่ยวมากที่สุดคือ ด้านสิ่งแวดล้อมที่พบเห็น ด้านการตอบสนองของพนักงาน ด้านการดูแลเอาใจใส่ ด้านความไว้วางใจ และด้านความน่าเชื่อถือ ตามลำดับ

3. ปัจจัยส่วนประสมทางการตลาดที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ คือ ด้านผลิตภัณฑ์ ด้านการส่งเสริมการตลาด ด้านบุคคล ด้านลักษณะทางกายภาพ ด้านกระบวนการ ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ ในเขตพื้นที่จังหวัดสงขลา เมื่อพิจารณาน้ำหนักของผลการตัดสินใจเลือกใช้บริการพบว่า ด้านกระบวนการส่งผลต่อการเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์มากที่สุด ด้านลักษณะทางกายภาพ ด้านผลิตภัณฑ์ ด้านบุคคล และด้านการส่งเสริมการตลาด ตามลำดับ วิเคราะห์ค่าสัมประสิทธิ์การกำหนด (R Square = 0.77) พบว่า ปัจจัยส่วนประสมทางการตลาด 7P’s ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรมประเภทโฮมสเตย์ในเขตพื้นที่จังหวัดสงขลา ร้อยละ 77 ส่วนที่เหลือร้อยละ 23 มาจากปัจจัยด้านอื่น ๆ ที่ไม่ได้นำมาพิจารณา ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ ในเขตพื้นที่จังหวัดสงขลา ร้อยละ 77 สอดคล้องกับงานวิจัยของ Aemstrong and Kotler (2009) การกำหนดกลยุทธ์ด้านผลิตภัณฑ์ควรจะต้องคำนึงและให้ความสำคัญเกี่ยวกับปัจจัยด้านต่าง ๆ ได้แก่ ความแตกต่างของผลิตภัณฑ์ คุณสมบัติ การพัฒนาผลิตภัณฑ์จะส่งผลต่อคุณค่าที่นำเสนอแก่ลูกค้า ซึ่งมีความสัมพันธ์กับตัวแปรด้านผลิตภัณฑ์ที่ส่งผลต่อการตัดสินใจเลือกใช้บริการที่พักแรม ประเภทโฮมสเตย์ ในจังหวัดสงขลา ที่มีการแบ่งห้องนอนและห้องน้ำอย่างเป็นสัดส่วน และที่พักโฮมสเตย์มีการดูแลบริเวณรอบที่พักทำให้ลูกค้าตัดสินใจที่จะใช้บริการที่พักแบบโฮมสเตย์มากถึงร้อยละ 62.20 และสอดคล้องกับ สุนทรีย์ ศิริจันทร์ (2561) ได้ทำการศึกษาเรื่องพฤติกรรมผู้บริโภคที่มีผลต่อการตัดสินใจใช้บริการที่พักแบบโฮสเทล ในเขตอำเภอเมือง จังหวัดเชียงใหม่ พบว่า นักท่องเที่ยวส่วนใหญ่มีจุดประสงค์ในการเข้าพัก คือ การได้พบปะกับเพื่อนใหม่ และการแลกเปลี่ยนประสบการณ์ในการท่องเที่ยว ระดับความสำคัญของส่วนประสมทางการตลาดที่มากที่สุดคือ ด้านราคา ด้านพนักงานให้บริการ และด้านสภาพแวดล้อมทางกายภาพ

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. การศึกษาครั้งต่อไปควรศึกษากลุ่มตัวอย่างนักท่องเที่ยวชาวต่างชาติเพื่อจะทำให้ทราบข้อมูลส่วนประสมทางการตลาดและพฤติกรรมของนักท่องเที่ยวชาวต่างชาติว่ามีความแตกต่างจากนักท่องเที่ยวชาวไทยอย่างไรเพื่อที่จะได้เอาข้อมูลดังกล่าวมาวางแผนพัฒนาการตลาดให้สอดคล้องกันทั้งนักท่องเที่ยวชาวไทยและต่างชาติ

2. การศึกษาครั้งต่อไปควรมีการเพิ่มขอบเขตในการศึกษา เช่น กระบวนการตัดสินใจและศึกษาการพยากรณ์ปัจจัยที่ก่อให้เกิดการตัดสินใจเลือกใช้บริการธุรกิจโฮมสเตย์ จังหวัดสงขลา หรือจังหวัดใกล้เคียง เพื่อให้ผลการศึกษาครอบคลุมมากยิ่งขึ้น

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การคัดเลือกพนักงานขับรถโดยใช้กระบวนการลำดับชั้นเชิงวิเคราะห์และวิธีประเมินระดับความสำคัญของปัจจัย กรณีศึกษาบริษัทให้บริการรถรับส่งพนักงาน จังหวัดพระนครศรีอยุธยา

Driver Selection Using Analytic Hierarchy Process and Factor Rating Method: A Case Study for a Company Providing Shuttle Service for Employees in Phra Nakhon Si Ayutthaya Province

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บทคัดย่อ

งานวิจัยเรื่องการคัดเลือกพนักงานขับรถโดยใช้กระบวนการลำดับชั้นเชิงวิเคราะห์และวิธีประเมินระดับความสำคัญของปัจจัย กรณีศึกษาบริษัทให้บริการรถรับส่งพนักงาน จังหวัดพระนครศรีอยุธยา มีวัตถุประสงค์เพื่อคัดเลือกพนักงานขับรถที่ตรงตามความต้องการอย่างมีระบบให้มีประสิทธิภาพ ซึ่งพิจารณาจากปัจจัยต่าง ๆ ที่มีผลต่อการคัดเลือกพนักงาน โดยใช้เทคนิคกระบวนการลำดับชั้นเชิงวิเคราะห์วิธีประเมินระดับความสำคัญของปัจจัย และ โปรแกรม Microsoft Excel มาเป็นเครื่องมือที่ช่วยในการวิเคราะห์ผลแบบสอบถามจากผู้เชี่ยวชาญ จำนวน 4 ท่าน โดยพนักงานที่มีอำนาจในการตัดสินใจรับพนักงานขับรถของบริษัทกรณีศึกษา มีเกณฑ์ประกอบในการพิจารณาทั้งหมด 5 ปัจจัย ได้แก่ ปัจจัยด้านทักษะการขับขี่ ปัจจัยด้านสภาพร่างกาย ปัจจัยด้านความสามารถในการซ่อมบำรุง ปัจจัยด้านความสามารถในการสื่อสาร และปัจจัยด้านความรู้รถยนต์ นอกจากนี้ยังได้พิจารณาทางเลือกสำหรับการคัดเลือกพนักงาน ทั้งหมด 5 ทางเลือก ได้แก่ นาย A นาย B นาย C นาย D และนาย E หลังจากการวิเคราะห์และทำการตรวจสอบความสอดคล้องกันของปัจจัย Consistency Ratio (C.R.) เท่ากับ 0.098 ซึ่งมีค่าน้อยกว่า 0.1 เป็นตัวบ่งชี้ว่า ข้อมูลจากแบบสอบถามที่นำมาวิเคราะห์มีความสอดคล้องกัน จึงสรุปผลการศึกษาว่า ค่าน้ำหนักแต่ละปัจจัยจากมากไปน้อย ได้แก่ ปัจจัยด้านความสามารถในการซ่อมบำรุง 39.2% ปัจจัยด้านความรู้รถยนต์ 37.4% ปัจจัยด้านทักษะการขับขี่ 10.1% ปัจจัยด้านสภาพร่างกาย 7.9% และปัจจัยด้านความสามารถในการสื่อสาร 5.4% ในส่วนผลการศึกษาด้านทางเลือกตัวพนักงานที่ได้การวิเคราะห์หาค่าน้ำหนักความสำคัญของแต่ละปัจจัย คำนวนค่าผลรวมตามวิธีประเมินระดับความสำคัญของปัจจัย จึงสรุปผลการศึกษาว่า ค่าน้ำหนักแต่ละปัจจัยจากมากไปน้อย ค่าน้ำหนักดังนี้ นาย B มีคะแนนรวม 8.726 นาย A มีคะแนนรวม 8.712 นาย C มีคะแนนรวม 8.396 นาย D มีคะแนนรวม 7.766 และ นาย E มีคะแนนรวม 7.561 ซึ่งสรุปได้ว่า นาย B เป็นบุคคลที่เหมาะสมที่สุดและได้รับคัดเลือกในการเป็นพนักงานขับรถ

คำสำคัญ: การคัดเลือกพนักงานขับรถ, กระบวนการลำดับชั้นเชิงวิเคราะห์, วิธีประเมินระดับความสำคัญของปัจจัย

Abstract

The purpose of this research is to find a driver who has the most appropriate qualification using Analytic Hierarchy Process (AHP) and Factor Rating Method. The research considers many factors that influence the selection of the driver. The data regarding the driver selection factors was collected by using questionnaires which were answered by four experts. Five factors were suggested by the expert. These factors are Driving skill, Health, Maintenance Ability, Communication skill, and Automobile knowledge. The factors were used in AHP to determine the most important ones. As a result, the importance of the factors are as follows: Maintenance Ability 39.2%, Automobile Knowledge 37.4%, Driving skill 10.1%, Health 7.9% and Communication skill 5.4%. This result is consistent according to the Consistency Ratio (C.R.) of 0.098. Consequently, five driver candidates namely A to E were verified based on the importance of the factor using Factor Rating method. The resultant rating of the 5 candidates are as follows: A: 8.2726, B: 8.712, C: 8.396, D: 7.766, and E:7.561. Therefore, B is the most appropriate driver.

Keywords: Driver Selection, Analytic Hierarchy Process, Factor Rating Method

บทนำ

จังหวัดพระนครศรีอยุธยา ถือว่ามีโรงงานอุตสาหกรรมเป็นอันดับต้น ๆ ของประเทศ (กรมอุตสาหกรรม, 2563) ซึ่งทำให้มีจำนวนพนักงานเยอะตามขนาดและจำนวนโรงงาน พนักงานบางคนพักอาศัยอยู่ในพื้นที่รอบนอกของจังหวัด ไม่มีรถยนต์ส่วนตัว ทางโรงงานจึงมีสวัสดิการที่เอื้ออำนวยความสะดวกให้แก่พนักงานของตนเอง คือ รถบัสรับส่งพนักงาน ซึ่งทางโรงงานเลือกใช้บริการผู้ประกอบการรถบัสรับส่งพนักงานแทน ซึ่งก็จะมีการกำหนดกฎ มาตรการความปลอดภัยของโรงงานเอาไว้ โดยทางผู้ประกอบการทุกบริษัทจะต้องมีความเข้มงวดและให้ความสำคัญกับพนักงานขับรถ เนื่องจากว่าพนักงานขับรถจะต้องเป็นผู้ขับรถส่งพนักงานโรงงานทุกวัน และต้องรับ - ส่งตามเวลาที่กำหนด ดังนั้นพนักงานขับรถจะต้องเป็นผู้ที่มีความเชี่ยวชาญในเส้นทาง ซึ่งการตัดสินใจคัดเลือกพนักงานขับรถเป็นปัจจัยสำคัญในการให้บริการรถรับส่งพนักงาน ซึ่งบริษัทกรณีศึกษาใช้การคัดเลือกแบบเดิม คือ การรับสมัครพนักงานที่ใช้ประสบการณ์ของผู้สัมภาษณ์เป็นตัวตัดสินใจอย่างเดียว ไม่ได้มีการนำหลักเกณฑ์ต่าง ๆ มาพิจารณาประกอบ ทำให้บริษัทอาจจะไม่ได้คนที่มีประสบการณ์ในทางด้านนี้ ผู้วิจัยจึงอยากจะปรับปรุงขั้นตอนการคัดเลือก เพื่อมุ่งเน้นในการปรับปรุงกระบวนการคัดเลือกพนักงานขับรถให้เป็นระบบ มีการนำปัจจัยต่าง ๆ เข้ามาพิจารณาด้วย และนำไปสู่การคัดเลือกพนักงานขับรถที่เหมาะสมกับความต้องการของบริษัท โดยมีการนำเทคนิคกระบวนการลำดับชั้นเชิงวิเคราะห์ (Analytic Hierarchy Process: AHP) และวิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) มาใช้ในงานวิจัยนี้ด้วย

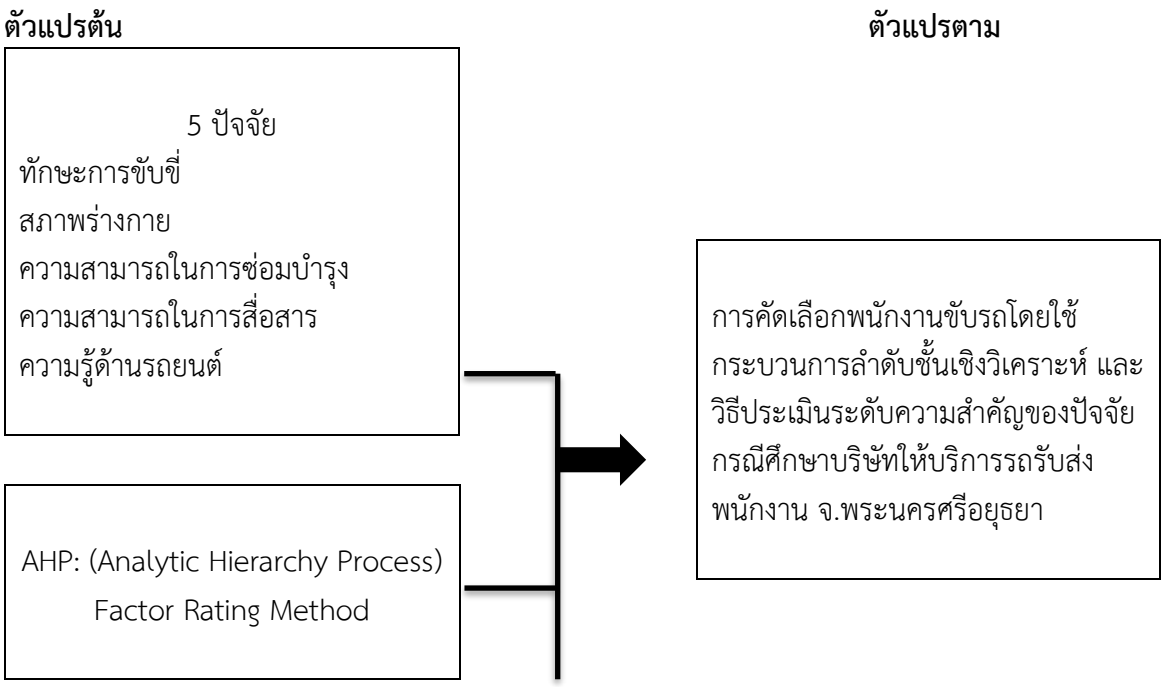
วัตถุประสงค์ของการวิจัย

1. เพื่อคัดเลือกพนักงานขับรถของบริษัทกรณีศึกษาให้มีระบบ และมีประสิทธิภาพเพิ่มขึ้น โดยใช้กระบวนการลำดับชั้นเชิงวิเคราะห์ (Analytic Hierarchy Process: AHP) และวิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method)
2. เพื่อเป็นแนวทางในการคัดเลือกพนักงานขับรถในกับบริษัทเดินรถต่าง ๆ

ขอบเขตการวิจัย

1. ขอบเขตด้านเนื้อหา งานวิจัยนี้นำกระบวนการลำดับชั้นเชิงวิเคราะห์ (Analytic Hierarchy Process: AHP) และ วิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) มาเป็นเครื่องมือในการคัดเลือกเพื่อประเมินพนักงานขับรถ กรณีศึกษาบริษัทให้บริการรถรับส่งพนักงาน จังหวัดพระนครศรีอยุธยา โดยมีการคัดเลือกพนักงานขับรถที่มาสมัครในช่วงเดือนกันยายน - ตุลาคม โดยมีเกณฑ์การตัดสินใจทั้งหมด 5 ปัจจัย คือ ปัจจัยด้านทักษะการขับขี่ สภาพร่างกาย ความสามารถในการซ่อมบำรุง ความสามารถในการสื่อสาร และความรู้เรื่องด้านรถยนต์
2. ขอบเขตด้านเวลา ระยะเวลาที่ใช้ในการศึกษาทั้งหมด 5 เดือน เริ่มที่เดือนสิงหาคม พ.ศ. 2566 สิ้นสุดที่เดือน ธันวาคม พ.ศ. 2566
3. ขอบเขตประชากร พนักงานที่มีอำนาจในการตัดสินใจรับพนักงานขับรถของบริษัทให้บริการรถรับส่งพนักงาน จังหวัดพระนครศรีอยุธยา

กรอบแนวคิดการวิจัย



ทบทวนวรรณกรรม

กระบวนการลำดับชั้นเชิงวิเคราะห์ (Analytic Hierarchy Process: AHP) ถูกพัฒนาโดย Saaty (1980) เพื่อใช้เป็นเครื่องมือในการแก้ปัญหาที่มีหลายเกณฑ์ เป็นเทคนิคที่ทั่วโลกยอมรับในระดับสากล มีการใช้เครื่องมือนี้กันอย่างแพร่หลาย ซึ่งเครื่องมือในการวิเคราะห์นี้มีโครงสร้างเลียนแบบกระบวนการความคิดของมนุษย์ ดังนั้นเทคนิคนี้จึงเหมาะสำหรับทั้งการตัดสินใจที่เป็นรายบุคคลและเป็นกลุ่ม (สถาบันเทคโนโลยีป้องกันประเทศ, 2555) โดยเป็นเทคนิคที่ใช้ในการแบ่งแยกปัญหาออกเป็นส่วน ๆ ให้ออกมาในรูปแบบของแผนภูมิตามลำดับชั้นเพื่อให้ทุกคนมองภาพออกและเข้าใจได้ง่าย มีการให้ค่าน้ำหนักของแต่จะปัจจัยที่เราเลือกนำมาคำนวณกับค่าน้ำหนัก เพื่อนำไปสู่การวิเคราะห์ลำดับความสำคัญของแต่ละปัจจัยว่าปัจจัยไหนมีความสำคัญมากที่สุด ทางเลือกไหนมีค่าสูงที่สุด แล้วนำมาประกอบในการตัดสินใจเลือก ดังตารางที่ 1

ตารางที่ 1 ความหมายของตัวเลขการเปรียบเทียบแบบคู่

ระดับความเข้มข้นของความสำคัญ	ความหมาย	คำอธิบาย
1	สำคัญเท่ากัน	ทั้ง 2 ปัจจัยส่งผลต่อวัตถุประสงค์เท่าเทียมกัน
3	สำคัญกว่าปานกลาง	ความพึงพอใจในปัจจัยหนึ่งมากกว่าอีกหนึ่งปัจจัยอย่างปานกลาง
4	สำคัญกว่ามาก	ความพึงพอใจในปัจจัยหนึ่งมากกว่าอีกหนึ่งปัจจัยอย่างมาก
7	สำคัญกว่ามากที่สุด	ปัจจัยที่พิจารณามีความพึงพอใจมากกว่าอีกหนึ่งปัจจัยอย่างมากที่สุด
9	สำคัญกว่าสูงสุด	ปัจจัยที่พิจารณามีความพึงพอใจในปัจจัยหนึ่งมากกว่าอีกปัจจัยหนึ่งในระดับที่สูงสุดเท่าที่จะเป็นไปได้
2,4,6,8	สำคัญที่อยู่ระหว่างแต่ละระดับ	ปัจจัยที่พิจารณามีความสำคัญที่อยู่ระหว่างก้ำกึ่งกันแต่ละระดับ

ที่มา: วิฑูรย์ ตันศิริคงคล (2542)

วิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) เป็นวิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) คือ วิธีการให้คะแนนปัจจัย เป็นเครื่องมือที่ใช้ในการตัดสินใจ และเป็นวิธีการประเมินโดยการจัดอันดับของปัจจัย โดยมักใช้ในการคัดเลือกซัพพลายเออร์หรือสถานที่ตั้งของโรงงาน มีการใช้ในงานวิจัยหลายฉบับที่เกี่ยวข้องกับการคัดเลือก (Sharma, Phanden & Baser, 2012) เป็นกระบวนการที่ใช้ในการประเมินค่าทางเลือกที่หลากหลาย ซึ่งประเด็นในการกำหนดทำเลที่ตั้งนั้นขึ้นอยู่กับจำนวนของปัจจัย

ตารางที่ 2 ตัวอย่างปัจจัยในการเลือกทำเลที่ตั้ง

ปัจจัยการเลือกทำเลที่ตั้ง	น้ำหนัก	ทำเลที่ 1	ทำเลที่ 2
แหล่งแรงงาน	0.30	85	130
แหล่งวัตถุดิบ	0.20	80	75
อัตราค่าจ้างแรงงาน	0.23	79	71
สภาพแวดล้อมทางสังคม	0.11	90	90
การอยู่ใกล้กับลูกค้า	0.19	136	126
ค่าใช้จ่ายในการขนส่ง	0.05	85	65
สนับสนุนด้านสาธารณูปโภค	0.10	125	156

การพิจารณาเลือกทำเลที่ตั้งที่เหมาะสมจะต้องพิจารณาจากแต่ละปัจจัยและค่าคะแนนที่สำคัญ โดยการคูณกับค่าคะแนนน้ำหนักของแต่ละปัจจัยกับค่าคะแนนในแถวของทำเลที่ 1 และทำการเปรียบเทียบกับค่าคะแนนคูณกับค่าคะแนนในแถวของทำเลที่ 2 หากค่าคะแนนทำเลใดมากกว่าให้ตัดสินใจเลือกใช้ทำเลนั้น ดังตารางที่ 2

ระเบียบวิธีวิจัย

ในการศึกษาครั้งที่ได้เริ่มจากการเก็บข้อมูลจากบริษัทกรณีศึกษา โดยสอบถามถึงปัจจัยที่มีผลต่อการตัดสินใจในการรับสมัครพนักงานขับรถ โดยให้ผู้บริหารและผู้ที่เกี่ยวข้องที่มีอำนาจในการพิจารณารับพนักงานขับรถมาให้คะแนนความสำคัญในแต่ละปัจจัย

หลังจากที่ได้รับข้อมูลในส่วนของการให้คะแนนปัจจัยที่มีความสำคัญ เมื่อได้ข้อมูลครบถ้วนจากผู้ตอบแบบสอบถามทุกคนที่เกี่ยวข้องกับการพิจารณารับพนักงานขับรถ ทั้งเจ้าของบริษัท ผู้จัดการ รองผู้จัดการ และหัวหน้าคนขับ ขั้นตอนต่อมาคือ จะนำข้อมูลที่ได้มาทำการวิเคราะห์ตามกระบวนการลำดับขั้นเชิงวิเคราะห์ ดังนี้

ขั้นตอนที่ 1 นำเอาค่าที่ได้จากการทำแบบสอบถามมาหาค่าเฉลี่ยและมาจัดลงในตารางเพื่อเปรียบเทียบความสำคัญของแต่ละปัจจัย ดังตารางที่ 3

ตารางที่ 3 เปรียบเทียบความสำคัญของแต่ละปัจจัย

ปัจจัย	ทักษะการขับขี่	สภาพร่างกาย	การซ่อมบำรุง	การสื่อสาร	ความรู้ด้านรถยนต์
ทักษะการขับขี่	1	2	1/6	3	1/8
สภาพร่างกาย	½	1	1/4	2	1/5
การซ่อมบำรุง	6	4	1	4	2
การสื่อสาร	1/3	1/2	1/4	1	1/8
ความรู้ด้านรถยนต์	8	5	1/2	8	1

จากตารางที่ 3 ในพื้นที่สีเหลืองนั้นเป็นค่าตัวเลขที่ได้มาจากการรวบรวมข้อมูล ในขณะที่สำหรับช่องสีขาวนั้นจะเป็นส่วนที่ผู้ทำวิจัยกำหนดค่าเอง โดยค่าที่ใส่นั้นจะเป็นการใส่ส่วนกลับของเกณฑ์ที่จับคู่เหมือนกัน และในแนวเส้นทแยงมุมจะเป็นตัวเลข 1 เท่านั้น เนื่องมาจากเป็นจุดที่ปัจจัยแต่ละปัจจัยเปรียบเทียบกับตัวเอง ซึ่งการเปรียบเทียบหลักเกณฑ์ที่จับคู่โดยสามารถอธิบายการเปรียบเทียบได้ดังนี้

คู่ที่ 1 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัยคือ ปัจจัยด้านทักษะการขับขี่และปัจจัยด้านสภาพร่างกาย พบว่า ปัจจัยด้านสภาพร่างกายมีความสำคัญมากกว่าปัจจัยด้านทักษะการขับขี่ ที่ค่าระดับ 2

คู่ที่ 2 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านทักษะการขับขี่และปัจจัยด้านความสามารถในการซ่อมบำรุง พบว่า ปัจจัยด้านความสามารถในการซ่อมบำรุงมีความสำคัญมากกว่าปัจจัยด้านทักษะการขับขี่ที่ค่าระดับ 6

คู่ที่ 3 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านทักษะการขับขี่และปัจจัยด้านความสามารถในการสื่อสาร พบว่า ปัจจัยด้านทักษะการขับขี่มีความสำคัญมากกว่าปัจจัยด้านความสามารถในการสื่อสารที่ค่าระดับ 3

คู่ที่ 4 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัยคือ ปัจจัยด้านทักษะการขับขี่และปัจจัยด้านความรู้ด้านรถยนต์ พบว่า ปัจจัยด้านความรู้ด้านรถยนต์มีความสำคัญมากกว่าปัจจัยด้านทักษะการขับขี่ ที่ค่าระดับ 8

คู่ที่ 5 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านสภาพร่างกายและปัจจัยด้านความสามารถในการซ่อมบำรุง พบว่า ปัจจัยด้านความสามารถในการซ่อมบำรุงมีความสำคัญมากกว่าปัจจัยด้านสภาพร่างกาย ที่ค่าระดับ 4

คู่ที่ 6 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านสภาพร่างกายและปัจจัยด้านความสามารถในการสื่อสาร พบว่า ปัจจัยด้านสภาพร่างกายความมีสำคัญมากกว่าปัจจัยด้านความสามารถในการสื่อสารที่ค่าระดับ 2

คู่ที่ 7 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านสภาพร่างกายและปัจจัยด้านความรู้ด้านรถยนต์ พบว่า ปัจจัยด้านความรู้ด้านรถยนต์มีความสำคัญมากกว่าปัจจัยด้านสภาพร่างกายที่ค่าระดับ 5

คู่ที่ 8 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านความสามารถในการซ่อมบำรุงและปัจจัยด้านความสามารถในการสื่อสาร พบว่า ปัจจัยด้านความสามารถในการซ่อมบำรุงมีความสำคัญมากกว่าปัจจัยด้านความสามารถในการสื่อสารที่ค่าระดับ 4

คู่ที่ 9 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านความสามารถในการซ่อมบำรุงและปัจจัยด้านความรู้ด้านรถยนต์ พบว่า ปัจจัยด้านความสามารถในการซ่อมบำรุงมีความสำคัญมากกว่าปัจจัยด้านความรู้ด้านรถยนต์ที่ค่าระดับ 2

คู่ที่ 10 จากการเก็บข้อมูลจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษา สามารถสรุปได้ว่า เมื่อเปรียบเทียบความสำคัญระหว่างสองปัจจัย คือ ปัจจัยด้านความสามารถในการสื่อสารและปัจจัยด้านความรู้ด้านรถยนต์ พบว่า ปัจจัยด้านความรู้ด้านรถยนต์มีความสำคัญมากกว่าปัจจัยด้านความสามารถในการสื่อสารที่ค่าระดับ 8

ขั้นตอนที่ 2 การคำนวณค่า (Eigenvector) โดยจะเริ่มจากการนำค่าผลรวมที่ได้ในแนวตั้งแต่ละแถวไปหารค่าในแต่ละตัวในแนวตั้งนั้น ๆ จากนั้นหาผลรวมในแนวนอน และตามด้วยหาค่าเฉลี่ยในแนวนอน โดยการหารด้วยจำนวนของปัจจัยที่พิจารณา คือ 5 ปัจจัย ค่าที่ได้จะคือค่า Eigenvector ซึ่งจะได้ค่าตามตารางที่ 4 ซึ่งค่าเฉลี่ยที่ได้จากตารางที่ 4 จะเป็นค่าน้ำหนักของแต่ละปัจจัยตามทฤษฎีกระบวนการลำดับชั้นเชิงวิเคราะห์

ตารางที่ 4 การคำนวณค่า (Eigenvector) ของแต่ละปัจจัย

ปัจจัย	ทักษะการขับขี่	สภาพร่างกาย	การซ่อมบำรุง	การสื่อสาร	ความรู้ด้านรถยนต์	ผลรวมแนวนอน	ค่าเฉลี่ย
ทักษะการขับขี่	0.06	0.16	0.08	0.17	0.04	0.50	0.101
สภาพร่างกาย	0.03	0.08	0.12	0.11	0.06	0.40	0.079
การซ่อมบำรุง	0.38	0.32	0.46	0.22	0.58	1.96	0.392
การสื่อสาร	0.02	0.04	0.12	0.06	0.04	0.27	0.054
ความรู้ด้านรถยนต์	0.51	0.40	0.23	0.44	0.29	1.87	0.374
ผลรวมแนวตั้ง	1.00	1.00	1.00	1.00	1.00	5.00	1.000

ขั้นตอนที่ 3 ก่อนที่จะนำน้ำหนักของปัจจัยต่าง ๆ ไปใช้ในกระบวนการต่อไป จะต้องมีการตรวจสอบความสอดคล้องกันของปัจจัย (Consistency Ratio: C.R.) โดยมีจุดประสงค์ในการตรวจสอบเพื่อที่จะดูว่าค่าเวกเตอร์ลักษณะเฉพาะ (Eigenvector) ที่ได้และที่จะนำไปใช้ในขั้นตอนต่อไปนั้นมีความสมเหตุสมผลหรือไม่ ตามเกณฑ์ของ AHP หากค่า C.R. มีค่าน้อยกว่าหรือเท่ากับ 0.1 แสดงว่า ค่าปัจจัยมีความสอดคล้องกันอย่างมีเหตุผล

1) นำค่าที่ได้จากตารางที่ 3 มาจัดในรูปเวคเตอร์ซึ่งลำดับค่าต่าง ๆ ตามตารางที่ 3 จะได้เป็นเมตริกซ์ [A] จากนั้นให้นำไปคูณด้วยค่า Eigenvector เป็น เวคเตอร์ [B] ซึ่งค่าดังกล่าวจะได้มาจากค่าเฉลี่ยในตารางที่ 4 โดยผลลัพธ์ที่ได้จะได้เป็นเป็นเวคเตอร์ผลลัพธ์เวคเตอร์ [C] ดังนี้

$$\begin{matrix} & [A] & & & & & & [B] & [C] \end{matrix}$$
$$\begin{bmatrix} 1.00 & 2.00 & 0.17 & 3.00 & 0.1 \\ 0.50 & 1.00 & 0.25 & 2.00 & 0.2 \\ 6.00 & 4.00 & 1.00 & 4.00 & 2.0 \\ 0.33 & 0.50 & 0.25 & 1.00 & 0.1 \\ 8.00 & 5.00 & 0.50 & 8.00 & 1.00 \end{bmatrix} \times \begin{bmatrix} 0.101 \\ 0.079 \\ 0.392 \\ 0.054 \\ 0.374 \end{bmatrix} = \begin{bmatrix} 0.532 \\ 0.410 \\ 2.276 \\ 0.272 \\ 2.200 \end{bmatrix}$$

2) ขั้นตอนต่อมา คือ การหาเวคเตอร์ [D] โดยจะนำตัวเลขในเวคเตอร์ผลลัพธ์ [C] จากขั้นตอนที่ 1 มาหารด้วยค่า Eigenvector [B] ผลลัพธ์ที่ได้จะได้ค่า เวคเตอร์ [D] ดังนี้

$$[D] = \left[\frac{0.532}{0.101} \; \frac{0.410}{0.079} \; \frac{2.276}{0.392} \; \frac{0.272}{0.054} \; \frac{2.200}{0.374}\right]$$
$$= [5.290 \; 5.173 \; 5.798 \; 5.064 \; 5.882]$$

3) จะทำการหาค่า λmax ซึ่งจะได้จากการหาค่าเฉลี่ยตัวเลขทั้งหมดในเวคเตอร์ [D] ที่ได้มาจากขั้นตอนที่ 2 ได้ดังนี้

$$\lambda max = \frac{5.290+5.173+5.798+5.064+5.882}{5}$$
$$= 5.44$$

4) ในขั้นตอนนี้จะทำการคำนวณหาค่า Consistency Index (C.I.) จากสูตร

$$\text{C.I.} = \frac{\lambda \text{max} - n}{n - 1}$$

โดยในการศึกษานี้พิจารณาทั้งหมด 5 ปัจจัย จึงแทน n = 5 แทนค่าลงในสูตรข้างต้นจะได้ค่าดังนี้

$$\text{C.I.} = \frac{5.44 - 5}{5 - 1}$$
$$= 0.11$$

5) ทำการหาค่า R.I. จากตารางที่ 5 ซึ่งตารางนี้มาจากทฤษฎีกระบวนการลำดับชั้นเชิงวิเคราะห์ ซึ่งเมื่อ n = 5 ดังนั้นจะได้ R.I. = 1.12จากนั้นจะนำค่า R.I. ไปคำนวณในขั้นตอนต่อไป

ตารางที่ 5 ค่าดัชนีการสุ่มตัวอย่าง n = 5

ขนาดตารางเมทริกซ์	1	2	3	4	5	6	7	8	9	10
ค่า R.I.	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.42	1.45	1.49

ที่มา: Saaty (1980)

6.) ทำการหาค่า Consistency Ratio (C.R.) จากสูตร

$$C.R. = \frac{C.I.}{R.I.}$$

เมื่อแทนค่า C.I. จากขั้นตอนที่ 4 และ R.I. จากขั้นตอนที่ 5 ลงในสูตรข้างต้น จะได้ค่าดังนี้

$$C.R. = \frac{0.11}{1.12}$$
$$= 0.098$$

โดยการคำนวนค่า C.R. ข้างต้น จะพบว่า C.R. = 0.098 ซึ่งมีค่าที่น้อยกว่า 0.1 และสรุปได้ว่าข้อมูลที่วิเคราะห์ในการศึกษาครั้งนี้มีความสอดคล้องกันในค่าที่ยอมรับได้ ดังนั้นจึงสามารถใช้เป็นน้ำหนักของแต่ละปัจจัยได้ โดยน้ำหนักความสำคัญของแต่ละปัจจัยสามารถสรุปได้ดังตารางที่ 6

ตารางที่ 6 การสรุปค่าน้ำหนักความสำคัญของแต่ละปัจจัย

ปัจจัย	ค่าน้ำหนัก	ร้อยละ %	ลำดับความสำคัญ
ทักษะการขับขี่	0.101	10.1	3
สภาพร่างกาย	0.079	7.9	4
การซ่อมบำรุง	0.392	39.2	1
การสื่อสาร	0.054	5.4	5
ความรู้ด้านรถยนต์	0.374	37.4	2

ค่าน้ำหนักได้มาจากกระบวนการลำดับชั้นเชิงวิเคราะห์ก่อนหน้านี้ ส่วนคะแนนมาจากผู้ที่มีอำนาจในการตัดสินใจคัดเลือกพนักงานขับรถ ในการคำนวนตามวิธี Factor Rating Method คือ เอาคะแนนของแต่ละคน แต่ละปัจจัย คูณกับค่าน้ำหนักของแต่ละปัจจัย โดยสเกลคะแนนมากสุดอยู่ที่ 10 ต่ำสุดอยู่ที่ 1 ตามตารางที่ 7

ตารางที่ 7 แสดงคะแนนของแต่ละปัจจัย

ปัจจัย	น้ำหนัก	นาย A	นาย B	นาย C	นาย D	นาย E
ทักษะการขับขี่	0.101	8	7	9	7	7
สภาพร่างกาย	0.079	8	9	7	7	8
การซ่อมบำรุง	0.392	9	8	8	8	7
การสื่อสาร	0.054	7	8	8	7	9
ความรู้ด้านรถยนต์	0.374	9	10	9	8	8

จากนั้นนำคะแนนที่ได้มาคำนวณหาค่าผลรวมตามวิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) ดังนี้

นาย A : (8x0.101)+(8X0.079)+(9x0.392)+(7x0.054)+(9x0.374) = 8.712

นาย B : (7x0.101)+(9X0.079)+(8x0.392)+(8x0.054)+(10x0.374) = 8.726

นาย C : (9x0.101)+(7X0.079)+(8x0.392)+(8x0.054)+(9x0.374) = 8.396

นาย D : (7x0.101)+(7X0.079)+(8x0.392)+(7x0.054)+(8x0.374) = 7.766

นาย E : (7x0.101)+(8X0.079)+(7x0.392)+(9x0.054)+(8x0.374) = 7.561

สรุปผลการวิจัย

การวิจัยนี้ได้กำหนดเกณฑ์ในการตัดสินใจโดยใช้ 5 ปัจจัย ได้แก่ ปัจจัยทักษะการขับขี่ สภาพร่างกาย ความสามารถในการซ่อมบำรุง ความสามารถในการสื่อสาร และความรู้ด้านรถยนต์ นอกจากนี้ยังมีปัจจัยจำนวนผู้สมัคร จำนวน 5 คน ชื่อ นาย A นาย B นาย C นาย D และ นาย E โดยผู้วิจัยได้รวบรวมข้อมูลผ่านแบบสอบถามจากผู้ที่มีส่วนเกี่ยวข้องในการตัดสินใจในการคัดเลือกพนักงานของบริษัทกรณีศึกษาจำนวนทั้งหมด 4 ท่าน หลังจากนั้นผู้วิจัยวิเคราะห์ข้อมูลด้วยเทคนิคกระบวนการลำดับชั้นเชิงวิเคราะห์ (AHP) วิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) และ โปรแกรมคอมพิวเตอร์ (Microsoft Excel) ตามผลการวิเคราะห์ค่าน้ำหนักความสำคัญของแต่ละปัจจัย สามารถจัดอันดับความสำคัญของแต่ละปัจจัยจากมากไปน้อย ได้ตามตารางที่ 8 ดังนี้

ตารางที่ 8 อันดับความสำคัญและน้ำหนักของแต่ละปัจจัย

อันดับที่	ปัจจัย	ค่าน้ำหนัก
1	ปัจจัยความสามารถในการซ่อมบำรุง	0.392
2	ปัจจัยความรู้ด้านรถยนต์	0.374
3	ปัจจัยทักษะการขับขี่	0.101
4	ปัจจัยสภาพร่างกาย	0.079
5	ปัจจัยความสามารถในการสื่อสาร	0.054

จากการวิเคราะห์ปัจจัยโดยการใช้เทคนิคกระบวนการลำดับชั้นเชิงวิเคราะห์ (AHP) สรุปผลตามหลักทฤษฎีและเรียงลำดับค่าน้ำหนักได้ดังนี้ ปัจจัยที่ได้อันดับ 1 คือ ปัจจัยความสามารถในการซ่อมบำรุง ซึ่งมีค่าน้ำหนักอยู่ที่ 0.392 รองลงมาคือ ปัจจัยความรู้ด้านรถยนต์ มีค่าน้ำหนักอยู่ที่ 0.374 และลำดับต่อมาคือ ปัจจัยทักษะการขับขี่ ปัจจัยสภาพร่างกาย และปัจจัยความสามารถในการสื่อสาร ตามลำดับ จากผลข้างต้น พบว่า การคัดเลือกพนักงานขับรถนั้น ปัจจัยที่ทางบริษัทกรณีศึกษาให้ความสำคัญมาก ๆ จะเป็นในส่วนทักษะที่เกี่ยวกับรถยนต์ไม่ว่าจะเป็นการซ่อม ความรู้ทั่วไปทางด้านรถยนต์ รวมถึงทักษะการขับขี่ ซึ่งอาจจะมาจากที่ใช้การขับรถรับ - ส่งพนักงานจะเป็นรถที่มีขนาดใหญ่ จึงจำเป็นต้องมีทักษะเฉพาะรวมทั้งต้องวิ่งรับ - ส่งเป็นประจำ ทำให้มีความต้องการผู้สมัครที่มีทักษะการซ่อมบำรุงเพื่อที่จะสามารถแก้ปัญหาเฉพาะหน้าเกี่ยวกับเครื่องยนต์ได้

ส่วนผลการวิจัยการคัดเลือกพนักงานขับรถนั้น จะใช้วิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) โดยนำค่าน้ำหนักความสำคัญของทุก ๆ ปัจจัย และค่าคะแนนของแต่ละ

ผู้สมัคร มาคำนวณตามหลักการของวิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) จากผลการวิเคราะห์คะแนนของแต่ละทางเลือกที่ได้จำแนกตามแต่ละปัจจัย สามารถจัดลำดับความสำคัญแต่ละทางเลือกจากมากไปน้อยได้ ดังนี้

ตารางที่ 9 จัดลำดับความสำคัญของแต่ละทางเลือก

อันดับที่	ทางเลือก	ค่าน้ำหนัก
1	นาย B	8.726
2	นาย A	8.712
3	นาย C	8.396
4	นาย D	7.766
5	นาย E	7.561

หลังจากการใช้วิธี (Factor Rating Method) จะได้อันดับของผู้สมัครตามตารางข้างต้น ซึ่งในที่นี้ถ้าทางบริษัทต้องการผู้สมัครเพียงคนเดียว นาย B จะเป็นผู้ถูกเลือก เนื่องจากมีคะแนนมากที่สุด แต่ถ้าในกรณีที่ทางบริษัทต้องการผู้สมัครที่มากกว่า 1 ท่านขึ้นไป ก็สามารถพิจารณาตามลำดับซึ่งจะตรงกับหลักการของทฤษฎีของวิธีประเมินระดับความสำคัญของปัจจัย (Factor Rating Method) ที่จะเลือกทางเลือกที่มีคะแนนมากที่สุด เพราะนั่นหมายถึงทางเลือกนั้น ๆ ตรงกับปัจจัยที่เกี่ยวข้องที่มีความสำคัญมากที่สุด

ข้อเสนอแนะ

ในการศึกษาเกี่ยวกับกระบวนการคัดเลือกพนักงานขับรถโดยใช้วิธีการลำดับชั้นเชิงวิเคราะห์ และวิธีประเมินระดับความสำคัญของปัจจัย ในกรณีศึกษาบริษัทให้บริการรถรับส่งพนักงาน จังหวัดพระนครศรีอยุธยา ผู้วิจัยขอเสนอแนะประเด็นจากการศึกษานี้ เพื่อเสริมสร้างความเหมาะสมในกระบวนการคัดเลือกพนักงานขับรถในอนาคต และเพื่อให้ผลการศึกษาในครั้งนี้สามารถขยายต่อไปได้กว้างมากขึ้นและเป็นประโยชน์ต่อไปในอนาคตผู้วิจัยขอเสนอแนะประเด็นสำหรับการทำวิจัยครั้งต่อไป ดังต่อไปนี้

1. จากการศึกษาครั้งนี้จะเป็นการพิจารณาเกณฑ์และเงื่อนไขการรับสมัครพนักงานขับรถของบริษัทกรณีศึกษาเท่านั้น และจำนวนและข้อมูลของทางเลือกหรือผู้สมัครนั้นจะเป็นข้อมูลตามที่มีการเก็บข้อมูลในช่วงหนึ่งเท่านั้นว่ามีผู้สมัครในตำแหน่งพนักงานขับรถจำนวนเท่าไร

2. ผู้วิจัยในการศึกษานี้ ได้พิจารณาเฉพาะการคัดเลือกพนักงานขับรถเท่านั้น แต่การวิจัยยังสามารถนำไปใช้ในการตัดสินใจการคัดเลือกในด้านอื่น ๆ เช่น การตัดสินใจคัดเลือกบริษัทรถรับส่งพนักงาน การคัดเลือกสถานที่ทำเลที่ตั้ง เป็นต้น

3. การวิจัยในครั้งถัดไป ควรพิจารณาปัจจัยด้านอื่น ๆ เพิ่มเติมด้วย ยกตัวอย่างเช่น ปัจจัยระยะทางที่พักอาศัย ปัจจัยด้านจิตสำนึกด้านขับขี่ ปัจจัยด้านบริการ เป็นต้น ปัจจัยเหล่านี้เป็นปัจจัยสำคัญที่ส่งผลต่อการคัดเลือกพนักงานขับรถ

4. การศึกษาครั้งนี้ เป็นเพียงการศึกษาของบริษัทกรณีตัวอย่างเท่านั้น หากจะนำไปประยุกต์ใช้กับบริษัทอื่น ๆ อาจต้องมีพิจารณาปัจจัยอีกครั้งเพื่อให้เหมาะสมกับบริษัทนั้น

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Waste Reduction in the Operations of the Purchase Planning Department: A Case Study of an Electronics Industry Company

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บทคัดย่อ

บริษัทกรณีศึกษาเป็นบริษัทในเครือของอุตสาหกรรมอิเล็กทรอนิกส์ ซึ่งมีขอบเขตปฏิบัติงานในการจัดหาชิ้นส่วนอิเล็กทรอนิกส์บนแผ่นวงจรอิเล็กทรอนิกส์ (Print Circuit Board) การดำเนินกิจกรรมระบบทันเวลาพอดี (Just in Time) การควบคุมบริหารสินค้าคงคลัง และการจัดมอบสินค้าตามแผนการผลิต (Production Plan) ของบริษัทภายในเครือ ซึ่งอยู่ทั้งในประเทศและต่างประเทศ จากการที่ผู้ศึกษาได้ปฏิบัติงานในแผนกวางแผนจัดซื้อพบถึงปัญหาทั้งภายในและภายนอกที่ส่งผลกระทบต่อระยะเวลาในการทำงาน ทั้งการทำงานที่มีขั้นตอนการทำงานหลายขั้นตอนและซ้ำซ้อน อันเป็นส่วนที่ทำให้การทำงานล่าช้า ซึ่งปัจจัยดังกล่าวส่งผลให้ระยะเวลาดำเนินการออกใบคำสั่งซื้อรวม (Total Time Spent on the PO Issuance) ใช้ระยะเวลานานถึง 6 ชั่วโมง 3 นาที และระยะเวลาในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้ารวม 6 ชั่วโมง 47 นาที ด้วยสาเหตุดังกล่าวผู้ศึกษามีแนวคิดที่จะหาแนวทางการลดระยะเวลาดำเนินการในงานวางแผนจัดซื้อโดยใช้การวิเคราะห์ข้อมูลจากจากเก็บรวบรวมข้อมูลก่อนหน้าปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 และหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 โดยใช้ผังงานสายธารคุณค่าในการวิเคราะห์หาความสูญเปล่า และนำมาวิเคราะห์ด้วยแผนผังสาเหตุและผลเพื่อหารากเหง้าของปัญหา อันจะทำให้ได้ผลลัพธ์คือ กระบวนการใหม่และเพิ่มประสิทธิภาพการจัดการโลจิสติกส์ด้านคุณภาพตามแนวคิดของ Bowersox ที่สอดคล้องตามวัตถุประสงค์ของการศึกษา ซึ่งมุ่งเสนอแนะกระบวนการทำงานของแผนกวางแผนจัดซื้อที่ได้ปรับปรุงใหม่ที่จะทำให้ความสูญเปล่าที่เกิดขึ้นจากการปฏิบัติงานนั้นลดลง อันนำไปสู่การลดต้นทุนทางด้านเวลา โดยหลังการปรับปรุงระยะเวลาในการดำเนินการออกใบคำสั่งซื้อรวม (Total Time Spent on the PO Issuance) เท่ากับ 2 ชั่วโมง 50 นาที และระยะเวลาในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้ารวมเท่ากับ 3 ชั่วโมง 39 นาที

คำสำคัญ: แผ่นวงจรอิเล็กทรอนิกส์, ระบบทันเวลาพอดี, แผนการผลิต

Abstract

Case Study Company, a subsidiary of the electronics industry, specializes in sourcing electronic components on printed circuit boards. Its operations encompass just-in-time systems, inventory management, and fulfilling production plans both domestically and internationally. Through work in the procurement planning department, it was identified that various internal and external factors contribute to delays, particularly in multi-step and repetitive processes, resulting in extended lead times for both purchase order issuance and goods receipt. To address this, the thesis proposes a method involving data analysis collected before and after improvements made between April B.E. 2566 and December B.E. 2566. Utilizing value stream mapping and cause-and-effect analysis, the root causes of inefficiencies were identified. The result is a new, more efficient procurement planning process aligned with the principles of Bowersox, aimed at reducing waste and improving logistics quality. Following the improvements, the total time spent on purchase order issuance decreased to 2 hours and 50 minutes, and the time for goods receipt decreased to 3 hours and 39 minutes. This leads to reduced time costs, enhancing overall operational efficiency.

Keywords: Printed Circuit Boards, Just-in-Time Systems, Production Plans

บทนำ

บริษัทกรณีศึกษาเป็นบริษัทในเครือของอุตสาหกรรมอิเล็กทรอนิกส์ ซึ่งมีขอบเขตปฏิบัติงานในการจัดหาชิ้นส่วนอิเล็กทรอนิกส์บนแผ่นวงจรอิเล็กทรอนิกส์ (Print Circuit Board) การดำเนินกิจกรรมระบบทันเวลาพอดี (Just in Time) การควบคุมบริหารสินค้าคงคลัง และการจัดมอบสินค้าตามแผนการผลิต (Production Plan) ของบริษัทภายในเครือ ซึ่งอยู่ทั้งในประเทศและต่างประเทศ จากการที่ผู้ศึกษาได้ปฏิบัติงานในแผนกวางแผนจัดซื้อพบถึงปัญหาทั้งภายในและภายนอกที่ส่งผลกระทบต่อระยะเวลาในการทำงานทั้งการทำงานที่มีขั้นตอนการทำงานหลายขั้นตอนและซ้ำซ้อน อันเป็นส่วนที่ทำให้การทำงานล่าช้า ซึ่งปัจจัยดังกล่าวส่งผลให้ระยะเวลาดำเนินการออกใบคำสั่งซื้อรวม (Total Time Spent on the PO Issuance) ใช้ระยะเวลานานถึง 6 ชั่วโมง 3 นาที และระยะเวลาในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้ารวม 6 ชั่วโมง 47 นาที ซึ่งส่งผลต่อเนื่องให้เกิดความล่าช้าในการส่งมอบสินค้าไปยังส่วนงานการผลิตซึ่งเป็นหน้าที่อีกประการหนึ่งของแผนกวางแผนจัดซื้อ ซึ่งรวมระยะเวลาทั้งสิ้น 12 ชั่วโมง 50 นาที ระยะเวลาปฏิบัติงานดังกล่าวสามารถปรับปรุงให้มีประสิทธิภาพได้ดียิ่งขึ้นได้ หากมีการปรับปรุงแก้ไขกระบวนการปฏิบัติงานที่สูญเปล่า

ด้วยสาเหตุดังกล่าว ผู้ศึกษาจึงมุ่งศึกษาและปรับปรุงกระบวนการวางแผนจัดซื้อของบริษัทกรณีศึกษาเพื่อเพิ่มประสิทธิภาพและขีดความสามารถขององค์กร โดยมุ่งเน้นจำกัดความสูญเปล่า (Waste) และการเพิ่มคุณค่าในกระบวนงานเป็นสำคัญ

วัตถุประสงค์ของการวิจัย

1. เพื่อวิเคราะห์กระบวนการทำงานในปัจจุบันของแผนกวางแผนจัดซื้อของบริษัทกรณีศึกษา เพื่อเสาะหาปัญหาด้านความสูญเปล่าจากกระบวนการทำงานและวิเคราะห์สาเหตุหรือรากเหง้าของปัญหา

2. เพื่อเสนอแนะกระบวนการทำงานของแผนกวางแผนจัดซื้อที่ได้ปรับปรุงใหม่ที่จะทำให้ความสูญเปล่าที่เกิดขึ้นจากการปฏิบัติงานนั้นลดลง อันนำไปสู่การลดต้นทุนทางด้านเวลาและลดการเสียโอกาสในการขายอันเนื่องจากส่งมอบสินค้าไม่ทันกับแผนการผลิต การเพิ่มประสิทธิภาพและประสิทธิผลก าร จัดการโลจิสติกส์ด้านคุณภาพ

วิธีดำเนินการวิจัย

การศึกษาผังงานผู้ศึกษาเริ่มจากเขียนผังงาน (Flow Chart) ขึ้นมา เพื่อศึกษาขั้นตอนการทำงานในแต่ละกระบวนการโดยเริ่มตั้งแต่ต้นทางยังปลายทางของหน้าที่ความรับผิดชอบแผนกวางแผนจัดซื้อ ทำให้ทราบถึงปัญหาหรืออุปสรรคในกระบวนการจัดซื้อจัดหาเป็นอย่างดี โดยมีรายละเอียดดังนี้

ก. ศึกษากระบวนการทำงานของแผนกวางแผนจัดซื้อและข้อมูลที่เกี่ยวข้องจากบริษัท กล่าวคือ การศึกษากระบวนการทำงานของแผนกวางแผนจัดซื้อแต่ละขั้นตอนโดยละเอียด โดยใช้ข้อมูลระยะเวลาการทำงานของแผนกวางแผนจัดซื้อ บริษัทกรณีศึกษาเป็นระยะเวลา 3 เดือน ตั้งแต่ เดือนเมษายน พ.ศ. 2566 - เดือนมิถุนายน พ.ศ. 2566 เพื่อเป็นข้อมูลนำมาจัดทำแผนผังธารคุณค่าเพื่อแสดงกระบวนการในปัจจุบันในขั้นตอนถัดไปรวมถึงข้อมูลที่เกี่ยวข้องจากบริษัทกรณีศึกษาที่จำเป็นต่อการศึกษาในครั้งนี้

ข. จัดทำแผนผังธารคุณค่าเพื่อแสดงกระบวนการในปัจจุบัน กล่าวคือ การนำข้อมูลกระบวนการทำงานของแผนกวางแผนจัดซื้อและข้อมูลที่เกี่ยวข้องจากบริษัทที่ได้เก็บรวบรวมมาสังเคราะห์ เพื่อจัดทำแผนผังธารคุณค่า เพื่อแสดงกระบวนการในปัจจุบัน

ค. วิเคราะห์หาความสูญเปล่าจากกระบวนการในปัจจุบัน โดยใช้ทฤษฎีลีน (Lean) (วิทยา สุหฤทดำรง, 2549) มากำหนดกิจกรรมที่มีคุณค่าในการดำเนินงานทำให้เกิดคุณค่าเพิ่มและลดต้นทุน (Value Added: VA) และการสูญเปล่าและกิจกรรมที่ไม่จำเป็นซึ่งควรถูกกำจัด (Non-Value Added: NVA) แล้วพิจารณาประกอบกับทฤษฎีว่าด้วยความสูญเสียทั้ง 7 ประการ (7 Wastes) (Brett, 2013). กล่าวอีกนัยหนึ่งคือ การหาความสูญเปล่าจากกระบวนการในปัจจุบันที่ได้จากการจัดทำแผนผังธารคุณค่ามาวิเคราะห์เพื่อกำหนด VA ,NVA และ NNVA ในแต่ละกระบวนการปฏิบัติงานโดยใช้หลักการตามทฤษฎีลีน (Lean) รวมถึงพิจารณาประกอบกับความสูญเสียทั้ง 7 ประการ

ง. นำเอาความสูญเปล่าที่ตรวจพบมาวิเคราะห์ด้วยแผนผังสาเหตุและผล เพื่อหารากเหง้าของปัญหา กล่าวคือ การนำเอาความสูญเปล่าที่ตรวจพบจากการวิเคราะห์หาความสูญเปล่าจากกระบวนการในปัจจุบันมาวิเคราะห์ด้วยแผนผังสาเหตุและผลเพื่อหารากเหง้าของปัญหา ซึ่งนำมาสู่การปรับปรุงขั้นตอนการปฏิบัติงาน

จ. จัดทำแผนผังแสดงกระบวนการทำงานของแผนกวางแผนจัดซื้อที่ได้หลังปรับปรุงขึ้นใหม่ กล่าวคือ การจัดทำแผนผังแสดงกระบวนการทำงานของแผนกวางแผนจัดซื้อที่ได้หลังปรับปรุงขึ้นใหม่ เพื่อแสดงกระบวนทำงานใหม่ที่จะนำมาทดลองปฏิบัติงาน

ฉ. ทดลองปฏิบัติงานตามกระบวนการใหม่และเก็บข้อมูล กล่าวคือ การทดลองปฏิบัติงานตามกระบวนการใหม่และเก็บข้อมูลที่ได้จากการทดลองปฏิบัติเป็นระยะเวลา 3 เดือน ตั้งแต่เดือนตุลาคม พ.ศ. 2566 - เดือนธันวาคม พ.ศ. 2566 เพื่อนำมาวิเคราะห์และสรุปผล

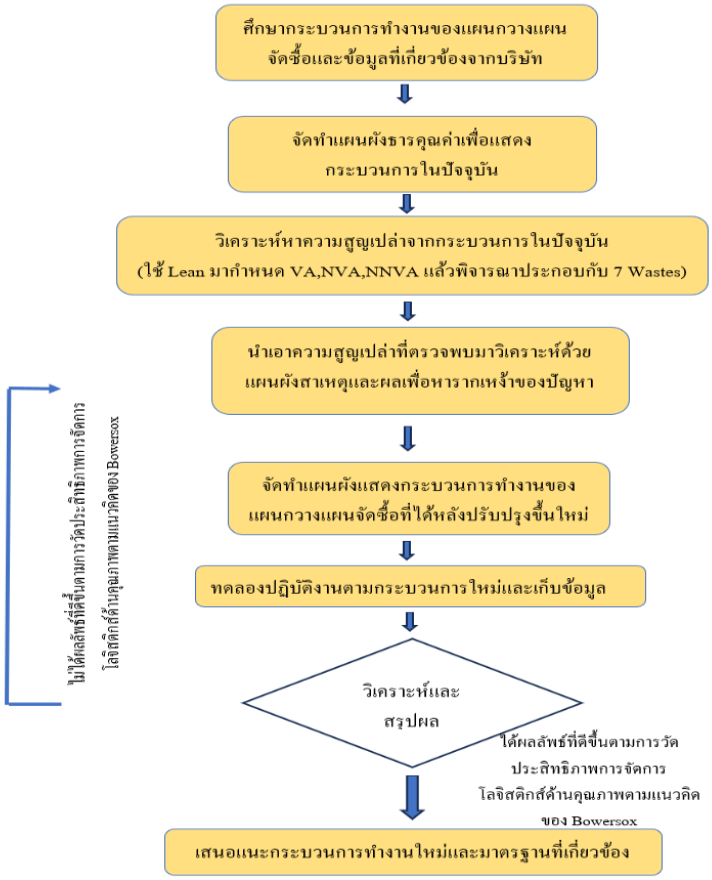
ช. วิเคราะห์และสรุปผล กล่าวคือ ถ้าได้ผลลัพธ์ที่ดีขึ้นตามการวัดประสิทธิภาพการจัดการโลจิสติกส์ด้านคุณภาพตามแนวคิดของ Bowersox (Bowersox, Closs, & Cooper, 2009) จะนำไปเสนอแนะกระบวนการทำงานใหม่และมาตรฐานที่เกี่ยวข้อง ถ้าไม่ได้ผลลัพธ์ที่ดีขึ้นตามการวัดประสิทธิภาพการจัดการโลจิสติกส์ด้านคุณภาพตามแนวคิดของ Bowersox จะนำเอาความสูญเปล่าที่ตรวจพบมาวิเคราะห์ด้วยแผนผังสาเหตุและผลเพื่อหารากเหง้าของปัญหา จัดทำแผนผังแสดงกระบวนการทำงานของแผนกวางแผนจัดซื้อที่ได้หลังปรับปรุงขึ้นใหม่ ทดลองปฏิบัติงานตามกระบวนการใหม่และเก็บข้อมูลและวิเคราะห์และสรุปผลอีกครั้งตามลำดับ

ซ. เสนอแนะกระบวนการทำงานใหม่และมาตรฐานที่เกี่ยวข้อง กล่าวคือ การเสนอแนะกระบวนการทำงานใหม่และมาตรฐานที่เกี่ยวข้องให้กับองค์กรรวมถึงภายในแผนกวางแผนจัดซื้อขององค์กรเพื่อนำไปสู่แนวทางการทำงานใหม่และมาตรฐานที่เกี่ยวข้องใหม่ขององค์กร

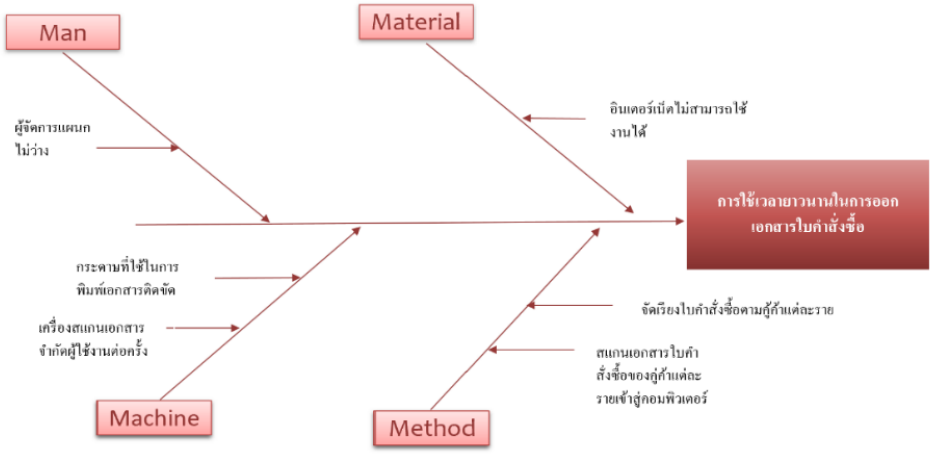
ทั้งนี้ ตามรายละเอียดของแต่ละกระบวนการดังที่กล่าวมาข้างต้นอาจแสดงในรูปแบบของแผนผังธารคุณค่า เพื่อแสดงกระบวนการในปัจจุบัน และวิเคราะห์หาความสูญเปล่า แผนผังงานแสดงขั้นตอนการศึกษาและแผนผังสาเหตุและผลตามที่แสดงในตารางที่ 1 และภาพที่ 1 ถึง 3 ได้ในลักษณะดังต่อไปนี้

ตารางที่ 1 แผนผังธารคุณค่าเพื่อแสดงกระบวนการในปัจจุบันและวิเคราะห์หาความสูญเปล่า

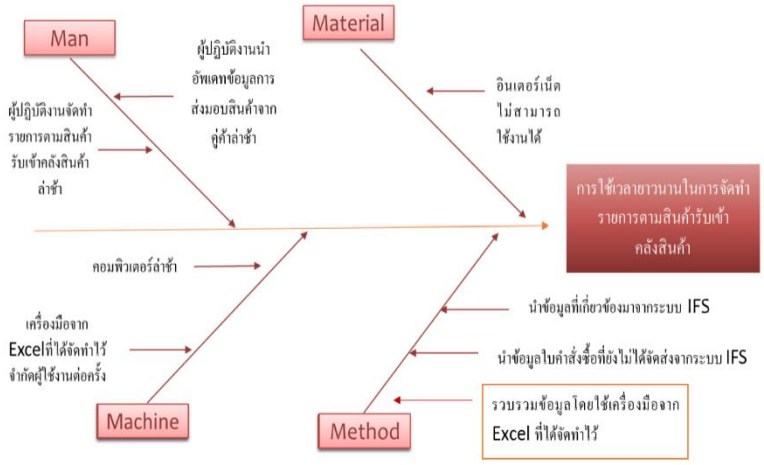
ลำดับ	กิจกรรม	ความสูญเปล่า (Waste)							คุณค่า		
		Rework	Overproduction	Waiting	Transportation	Inventory	Motion	Process	VA	NVA	NNVA
1	รับข้อมูลแผนการผลิตการลูกค้า							x	x		
2	นำข้อมูลแผนการผลิตของลูกค้าส่งให้สำนักงานใหญ่ที่ประเทศญี่ปุ่นดำเนินกระบวนการ MRP				x				x		
3	แผนกวางแผนจัดซื้อพิจารณาออกใบคำสั่งซื้อจากข้อมูลที่ได้หลักจากดำเนินจาก MRP							x	x		
4	เจ้าหน้าที่ปฏิบัติงานดำเนินการพิมพ์เอกสารใบคำสั่งซื้อ							x		x	
5	ตรวจสอบเอกสารใบคำสั่งซื้อ	x							x		
6	ผู้จัดการแผนกวางแผนจัดซื้อพิจารณาอนุมัติใบคำสั่งซื้อ							x		x	
7	จัดเรียงใบคำสั่งซื้อตามคู่ค้าแต่ละราย							x		x	
8	แสกนเอกสารใบคำสั่งซื้อของคู่ค้าแต่ละรายเข้าสู่คอมพิวเตอร์							x		x	
9	บันทึกและเปลี่ยนชื่อเอกสารอิเล็กทรอนิกส์ใบคำสั่งซื้อ	x								x	
10	ส่งใบคำสั่งซื้อในกับคู่ค้าทั้งในประเทศและต่างประเทศ							x			x
11	นำ DO จากลูกค้าเข้าสู่ระบบ IFS							x	x		
12	นำข้อมูลใบคำสั่งซื้อที่ยังไม่ได้จัดส่งจากระบบ IFS							x			x
13	จัดทำรายการตามสินค้ารับเข้าคลังสินค้า							x			x



ภาพที่ 1 แผนผังการดำเนินการวิจัย



ภาพที่ 2 แผนผังสาเหตุและผลการใช้เวลายาวนานในการออกเอกสารใบคำสั่งซื้อ



ภาพที่ 3 แผนผังสาเหตุและผลการใช้เวลายาวนานในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้า

ผลการวิจัย

ตามวัตถุประสงค์และวิธีดำเนินวิจัยดังที่ได้ระบุไปแล้วข้างต้น ผู้ศึกษาได้รวบรวมข้อมูลในส่วนของระยะเวลาการทำงานในแต่ละขั้นตอนเพื่อวิเคราะห์ระยะเวลาในการดำเนินการ และรวบรวมข้อมูลที่เกี่ยวข้องโดยนำมาจากระบบ IFS ซึ่งเป็นระบบ ERP ที่องค์กรใช้อยู่ในปัจจุบัน ซึ่งข้อมูลดังกล่าวถูกนำมาใช้ในการวิเคราะห์เพื่อหาวิธีการในการลดความสูญเปล่าที่เกิดจากกระบวนการต่าง ๆ และหาวิธีการปรับปรุงกระบวนการโดยใช้แนวคิด ทฤษฎี และงานวิจัยที่เกี่ยวข้องที่จะทำให้ได้มาซึ่งผลลัพธ์ตามวัตถุประสงค์ที่ได้ตั้งไว้ ทั้งนี้ สามารถวิเคราะห์และสรุปผลงานนิพนธ์โดยแบ่งตามหัวข้อการปรับปรุงขั้นตอนการปฏิบัติงานจากรากเหง้าของปัญหา ดังต่อไปนี้

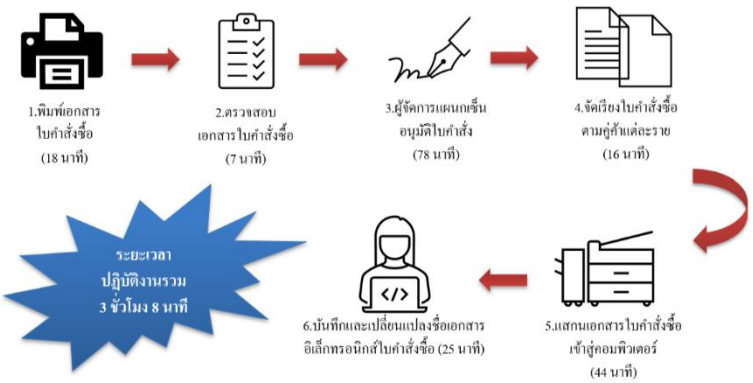
1. การใช้เวลายาวนานในการออกเอกสารใบคำสั่งซื้อ
2. ส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย
3. การใช้เวลายาวนานในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้า
4. การวัดประสิทธิภาพการจัดการโลจิสติกส์ด้านคุณภาพตามแนวคิดของ Bowersox (Bowersox et al., 2009)

1. การใช้เวลายาวนานในการออกเอกสารใบคำสั่งซื้อ

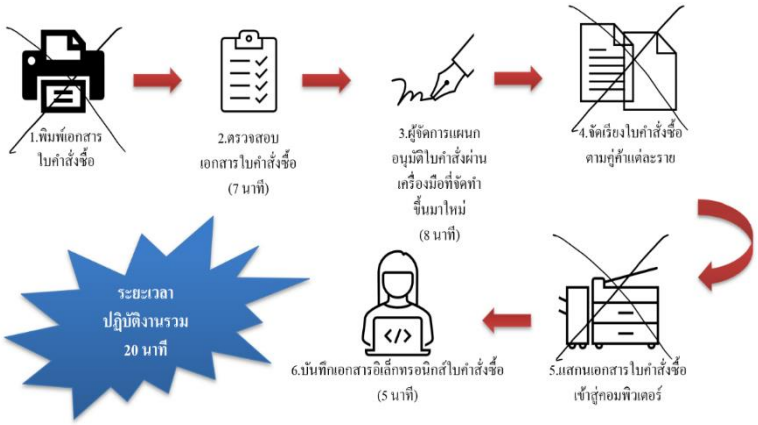
จากการหารากเหง้าของปัญหาด้วยแผนผังสาเหตุตามเกณฑ์การวิเคราะห์ความสูญเปล่าว่าด้วย “การใช้เวลายาวนานในการออกเอกสารใบคำสั่งซื้อ” และผลและรากเหง้าของปัญหาคือ “ผู้จัดการแผนกอนุมัติโดยการลงนามในเอกสารคำสั่งซื้อ” และ “ส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย” สำหรับรากเหง้าของปัญหา “ผู้จัดการแผนกอนุมัติโดยการลงนามในเอกสารคำสั่งซื้อ” ผู้จัดทำงานนิพนธ์ได้ดำเนินการผ่านหลักการ E C R S ของแนวคิดไคเซ็น (Kaizen) โดยการตัดขั้นตอนที่ไม่จำเป็นในการอนุมัติ โดยจากขั้นตอนเดิมให้ผู้จัดการแผนกอนุมัติโดยการลงนามในเอกสารคำสั่งซื้อเป็นการอนุมัติใบคำสั่งซื้อผ่านเครื่องมือสำเร็จรูป ทางผู้จัดทำงานนิพนธ์ได้ทดลองปฏิบัติงานตามกระบวนการใหม่ เพื่อเปรียบเทียบระหว่างช่วงก่อนปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 เปรียบเทียบกับหลัง

ปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 โดยระหว่างช่วงก่อนปรับปรุงเดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 มีระยะเวลาปฏิบัติงานเฉลี่ยอยู่ที่ 3 ชั่วโมง 8 นาที และช่วงหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 มีระยะเวลาปฏิบัติงานเฉลี่ยอยู่ที่ 20 นาที โดยลดระยะเวลาปฏิบัติงานเฉลี่ยรวมทั้งสิ้น 2 ชั่วโมง 48 นาที โดยกระบวนการปฏิบัติงานที่ได้ตัดทอนไปนั้น อันได้แก่ ขั้นตอนพิมพ์เอกสารใบคำสั่งซื้อ จัดเรียงใบคำสั่งซื้อตามคู่ค้าแต่ละราย สแกนเอกสารใบคำสั่งซื้อเข้าสู่ระบบคอมพิวเตอร์สามารถตัดทอนได้ เนื่องจากเมื่อนำเทคโนโลยีสารสนเทศเข้ามาประยุกต์ใช้แล้วนั้น ผู้จัดทำงานนิพนธ์ได้ปรึกษากับผู้มีส่วนเกี่ยวข้อง โดยได้การอนุมัติในการใช้เอกสารอิเล็กทรอนิกส์ได้โดยให้เก็บใบคำสั่งซื้ออิเล็กทรอนิกส์ที่มีลายเซ็นชื่อไว้ในข้อมูลส่วนกลางของแผนกเป็นระยะเวลา 10 ปี นับตั้งแต่วันที่ออกเอกสารใบคำสั่งซื้อ

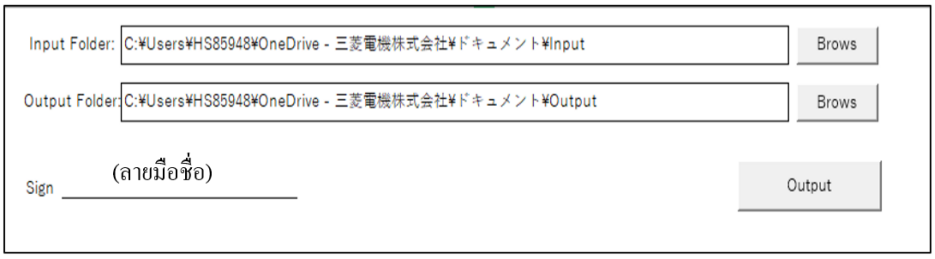
ทั้งนี้ ตามรายละเอียดของหัวข้อการปรับปรุงการใช้เวลายาวนานในการออกเอกสารใบคำสั่งซื้อดังที่กล่าวมาข้างต้นนำมาแสดงในรูปแบบของกระบวนการทำงานรูปแบบเดิมและรูปแบบใหม่ ตามที่แสดงในภาพที่ 4 และ 5 และแสดงภาพเครื่องมือการอนุมัติการใบคำสั่งซื้อตามที่แสดงในภาพที่ 6 และ 7



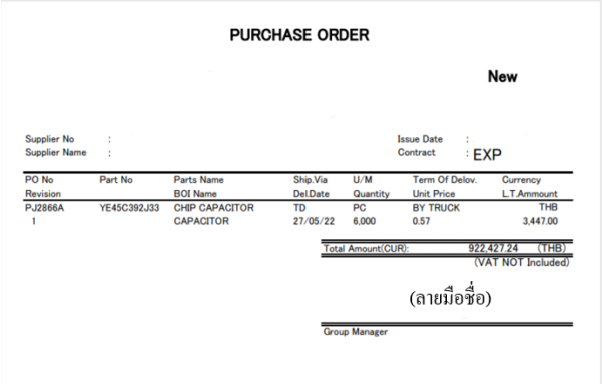
ภาพที่ 4 กระบวนการทำงานรูปแบบเดิมในการออกเอกสารใบคำสั่งซื้อ



ภาพที่ 5 กระบวนการทำงานรูปแบบใหม่ในการออกเอกสารใบคำสั่งซื้อ



ภาพที่ 6 เครื่องมือการอนุมัติการใบคำสั่งซื้อ



PURCHASE ORDER

New

Supplier No :
Supplier Name :
Issue Date :
Contract : EXP

PO No / Revision	Part No	Parts Name / BOI Name	Ship.Via / Del.Date	U/M / Quantity	Term Of Delov. / Unit Price	Currency / L.T.Ammount
PJ2866A / 1	YE45C392J33	CHIP CAPACITOR / CAPACITOR	TD / 27/05/22	PC / 6,000	BY TRUCK / 0.57	THB / 3,447.00

Total Amount(CUR): 922,427.24 (THB)
(VAT NOT Included)

(ลายมือชื่อ)

Group Manager

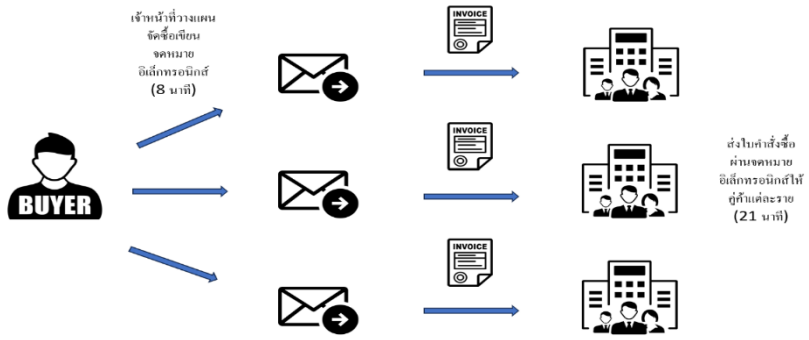
ภาพที่ 7 ใบคำสั่งซื้อที่ได้จากการอนุมัติใบคำสั่งซื้อผ่านเครื่องมือที่จัดทำขึ้นมาใหม่

2. ส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย

สำหรับรากเหง้าของปัญหาในขั้นตอนของการ “ส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย” ผู้จัดทำงานนิพนธ์ได้ดำเนินการผ่านหลักการ E C R S ของแนวคิดไคเซ็น (Kaizen) โดยการรวบรวมเอกสารใบคำสั่งซื้อให้กับคู่ค้าหลายรายพร้อมกันผ่านจดหมายอิเล็กทรอนิกส์ ทางผู้จัดทำงานนิพนธ์ได้ทดลองปฏิบัติงานตามกระบวนการใหม่ เพื่อเปรียบเทียบระหว่างช่วงก่อนปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 เปรียบเทียบกับหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 โดยระหว่างช่วงก่อนปรับปรุงเดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 มีระยะเวลาปฏิบัติงานเฉลี่ยอยู่ที่ 29 นาที และช่วงหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 มีระยะเวลาปฏิบัติงานเฉลี่ยอยู่ที่ 4 นาที โดยลดระยะเวลาปฏิบัติงานเฉลี่ยรวมทั้งสิ้น 25 นาที โดยกระบวนการปฏิบัติงานที่ได้เปลี่ยนแปลงไปนั้นอันได้แก่ ขั้นตอนเจ้าหน้าที่วางแผนจัดซื้อนำเอกสารใบสั่งซื้อเข้าสู่เครื่องมือที่จัดทำ กดส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละรายพร้อมกันผ่านเครื่องมือที่จัดทำสามารถเปลี่ยนแปลงได้ เนื่องจากเมื่อนำเทคโนโลยีสารสนเทศเข้ามาประยุกต์ใช้แล้วนั้นผู้จัดทำงานนิพนธ์ได้ปรึกษากับผู้มีส่วนเกี่ยวข้อง ไม่พบข้อผิดพลาดในการปฏิบัติงานโดยผู้มีส่วนเกี่ยวข้องนั้นได้รับใบคำสั่งซื้อและข้อมูลที่เกี่ยวข้องครบถ้วน

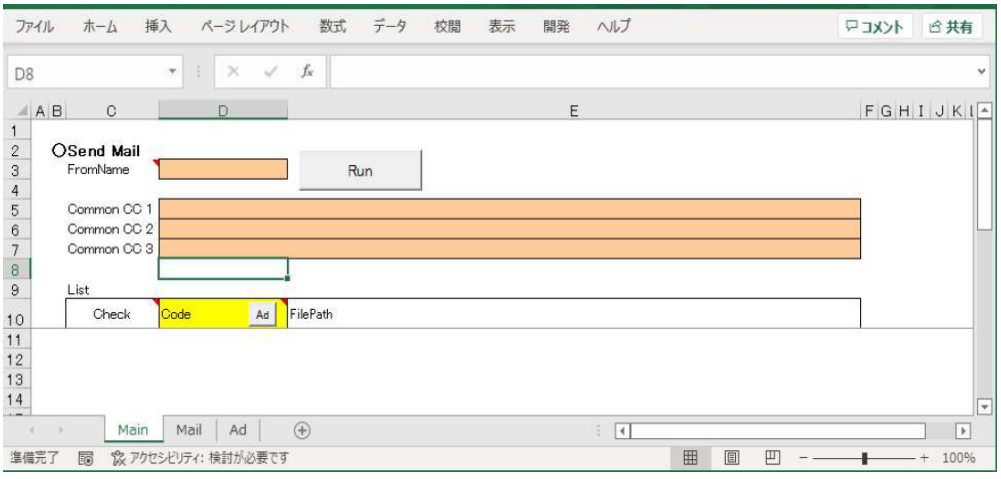
ทั้งนี้ ตามรายละเอียดของหัวข้อส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละรายดังที่กล่าวมาข้างต้นนำมาแสดงในรูปแบบของกระบวนการทำงานรูปแบบเดิมและรูปแบบใหม่ ตามที่แสดงในภาพที่ 8 และ 9 และแสดง

ภาพเครื่องมือในการส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละรายตามที่แสดงในภาพที่ 10 ถึง 12

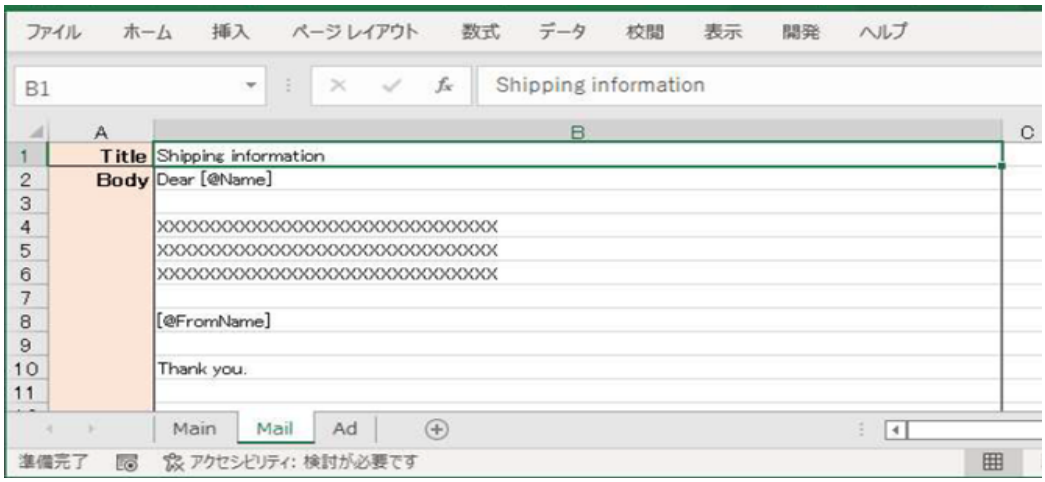


ภาพที่ 8 กระบวนการทำงานรูปแบบเดิมในการส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย

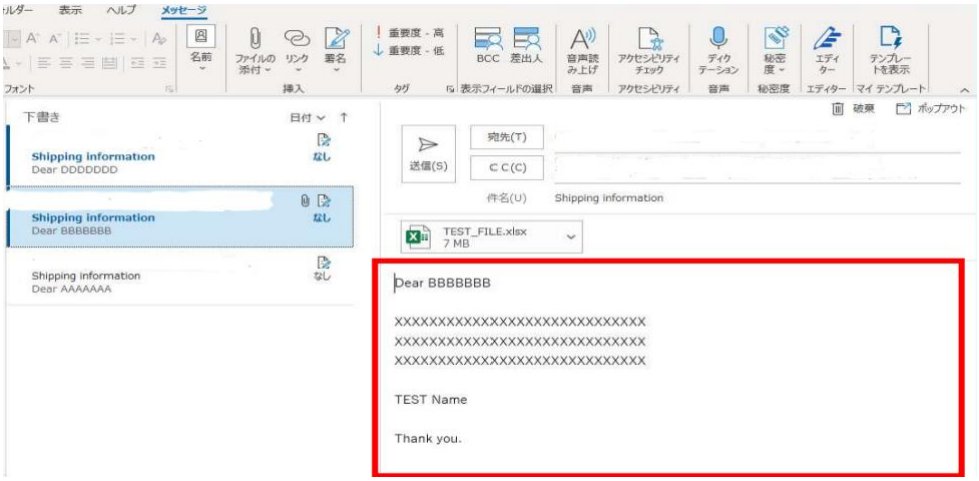
ภาพที่ 9 กระบวนการทำงานรูปแบบใหม่ในการส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย



ภาพที่ 10 เครื่องมือในการส่งใบคำสั่งซื้อให้กับคู่ค้าแต่ละราย



ภาพที่ 11 การตั้งรูปแบบข้อความที่ต้องการส่งให้กับคู่ค้า



ภาพที่ 12 ข้อมูลที่นำออกจากเครื่องมือซึ่งส่งใบคำสั่งซื้อผ่านจดหมายอิเล็กทรอนิกส์

3. การใช้เวลายาวนานในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้า

จากการศึกษาหารากเหง้าของปัญหาด้วยแผนผังสาเหตุในหัวข้อการวิเคราะห์ความสูญเปล่า “การใช้เวลายาวนานในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้า” และผลลัพธ์ของรากเหง้าของปัญหา คือ “รวบรวมข้อมูลโดยใช้เครื่องมือจากโปรแกรม Microsoft Excel ที่ได้จัดทำไว้” ผู้จัดทำงานนิพนธ์ได้ดำเนินการผ่านหลักการ E C R S ของแนวคิดไคเซ็น (Kaizen) โดยการรวบรวมขั้นตอน “นำข้อมูลใบคำสั่งซื้อที่ยังไม่ได้จัดส่งจากระบบ IFS” และ “จัดทำรายการตามสินค้ารับเข้าคลังสินค้าเข้าไว้ด้วยกัน” ทางผู้จัดทำงานนิพนธ์ได้ทดลองปฏิบัติงานตามกระบวนการใหม่ เพื่อเปรียบเทียบระหว่างช่วงก่อนปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 เปรียบเทียบกับหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 โดยระหว่างช่วงก่อนปรับปรุงเดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 มีระยะเวลาปฏิบัติงานเฉลี่ยอยู่ที่ 4 ชั่วโมง 47 นาที และช่วงหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 มีระยะเวลาปฏิบัติงานเฉลี่ยอยู่ที่ 1 ชั่วโมง 39 นาที โดยลดระยะเวลาปฏิบัติงานเฉลี่ยรวมทั้งสิ้น 3 ชั่วโมง 8 นาที โดยกระบวนการปฏิบัติงานที่ได้เปลี่ยนแปลงไป

นั้นอันได้แก่ ขั้นตอนเจ้าหน้าที่วางแผนจัดซื้อนำข้อมูลที่จำเป็นและใบคำสั่งซื้อที่ยังไม่ได้จัดส่งออกจากระบบ IFS เจ้าหน้าที่วางแผนจัดซื้อนำข้อมูลเข้าสู่เครื่องมือใน Excel รูปแบบใหม่ นำข้อมูลการจัดส่งจากคู่ค้ามาอัพเดทในเครื่องมือใน Excel รูปแบบใหม่ ส่งไฟล์เครื่องมือใน Excel รูปแบบใหม่ให้คลังสินค้ารับเข้าคลังผ่านจดหมายอิเล็กทรอนิกส์ สามารถเปลี่ยนแปลงได้เนื่องจากเมื่อนำเทคโนโลยีสารทศเทศเข้ามาประยุกต์ใช้แล้วนั้น ผู้จัดทำงานนิพนธ์ได้ปรึกษากับผู้มีส่วนเกี่ยวข้อง ไม่พบข้อผิดพลาดในการปฏิบัติงานโดยผู้มีส่วนเกี่ยวข้องนั้น ได้รับรายการตามสินค้ารับเข้าคลังสินค้าและข้อมูลที่เกี่ยวข้องครบถ้วน

ทั้งนี้ตามรายละเอียดของหัวข้อการใช้เวลายาวนานในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้าดังที่กล่าวมาข้างต้นนำมาแสดงในรูปแบบของกระบวนการทำงานรูปแบบเดิมและรูปแบบใหม่ตามที่แสดงในภาพที่ 15 และ 17 และแสดงภาพเครื่องมือรูปแบบเดิมที่ส่งให้คลังสินค้ารับเข้าคลังแสดงในภาพที่ 13 และ 14 แสดงภาพเครื่องมือรูปแบบใหม่ที่ส่งให้คลังสินค้ารับเข้าคลังแสดงในภาพที่ 16

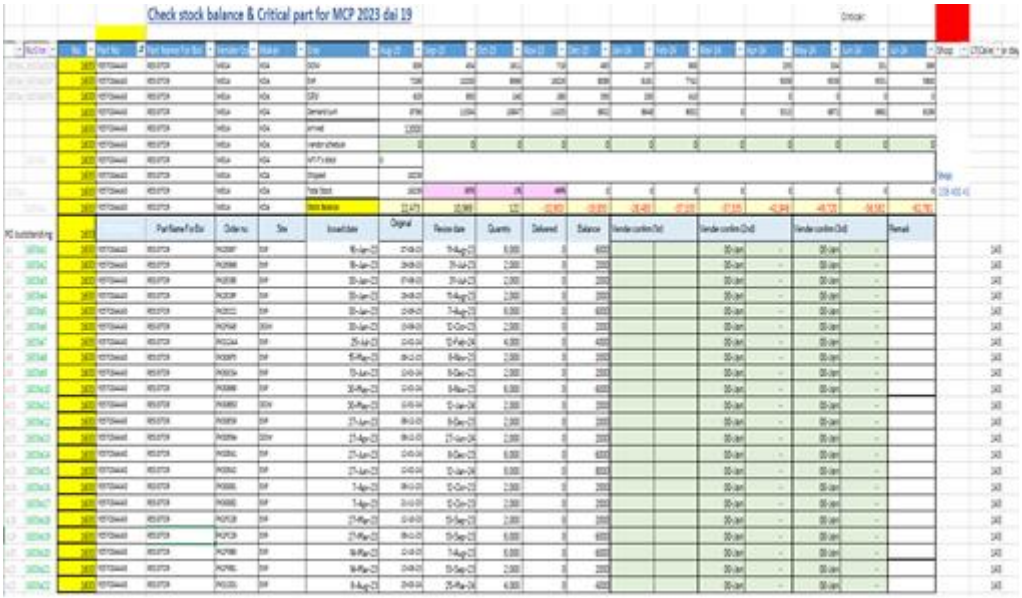
Use this ref.	Ref. no.	Run Or	Order	Si	Part No	Part Description	Maker Part Code	Issue da	Original da	Revise	Quanti	Deliver	Balan	Vendor confirmed IN	Date W/H (1)	Quantity
1633a1	1633a	1	PKI2E967	EXP	YE57044J43	FCF RESISTOR		16-01-23	07-08-23	11-08-23	6000	0	6,000			
1633a2	1633a	2	PKI2E968	EXP	YE57044J43	FCF RESISTOR		16-01-23	28-08-23	31-07-23	2000	0	2,000			
1633a3	1633a	3	PKI2ECBE	EXP	YE57044J43	FCF RESISTOR		30-01-23	07-08-23	31-07-23	2000	0	2,000			
1633a4	1633a	4	PKI2ECBF	EXP	YE57044J43	FCF RESISTOR		30-01-23	28-08-23	11-08-23	2000	0	2,000			
1633a5	1633a	5	PKI2ECC2	EXP	YE57044J43	FCF RESISTOR		30-01-23	13-09-23	07-08-23	6000	0	6,000			
1633a6	1633a	6	PKI2F045	DOM	YE57044J43	FCF RESISTOR		30-01-23	13-09-23	12-10-23	2000	0	2,000			
1633a7	1633a	7	PKI312AA	EXP	YE57044J43	FCF RESISTOR		25-07-23	12-02-24	12-02-24	4000	0	4,000			
1633a8	1633a	8	PKI306F5	EXP	YE57044J43	FCF RESISTOR		15-05-23	08-12-23	08-11-23	2000	0	2,000			
1633a9	1633a	9	PKI30C3A	EXP	YE57044J43	FCF RESISTOR		13-06-23	12-01-24	08-12-23	2000	0	2,000			
1633a10	1633a	10	PKI30969	EXP	YE57044J43	FCF RESISTOR		30-05-23	12-01-24	08-11-23	6000	0	6,000			
1633a11	1633a	11	PKI30B5D	DOM	YE57044J43	FCF RESISTOR		30-05-23	12-01-24	12-01-24	2000	0	2,000			
1633a12	1633a	12	PKI30E39	EXP	YE57044J43	FCF RESISTOR		27-06-23	08-12-23	08-12-23	2000	0	2,000			
1633a13	1633a	13	PKI3056A	DOM	YE57044J43	FCF RESISTOR		27-04-23	08-12-23	27-06-24	2000	0	2,000			
1633a14	1633a	14	PKI30E41	EXP	YE57044J43	FCF RESISTOR		27-06-23	12-01-24	08-12-23	6000	0	6,000			
1633a15	1633a	15	PKI30E42	EXP	YE57044J43	FCF RESISTOR		27-06-23	12-02-24	12-01-24	8000	0	8,000			
1633a16	1633a	16	PKI30081	EXP	YE57044J43	FCF RESISTOR		07-04-23	08-11-23	12-10-23	2000	0	2,000			
1633a17	1633a	17	PKI30082	EXP	YE57044J43	FCF RESISTOR		07-04-23	21-11-23	12-10-23	2000	0	2,000			
1633a18	1633a	18	PKI2FC28	EXP	YE57044J43	FCF RESISTOR		27-03-23	12-10-23	13-09-23	2000	0	2,000			
1633a19	1633a	19	PKI2FC29	EXP	YE57044J43	FCF RESISTOR		27-03-23	08-11-23	13-09-23	6000	0	6,000			
1633a20	1633a	20	PKI2F980	EXP	YE57044J43	FCF RESISTOR		14-03-23	12-10-23	07-08-23	6000	0	6,000			
1633a21	1633a	21	PKI2F981	EXP	YE57044J43	FCF RESISTOR		14-03-23	13-09-23	13-09-23	2000	0	2,000			
1633a22	1633a	22	PKI313D1	EXP	YE57044J43	FCF RESISTOR		08-08-23	25-03-24	25-03-24	4000	0	4,000			

ภาพที่ 13 ใบคำสั่งซื้อที่ยังไม่ได้จัดส่งจากระบบ IFS รูปแบบการทำงานเดิม

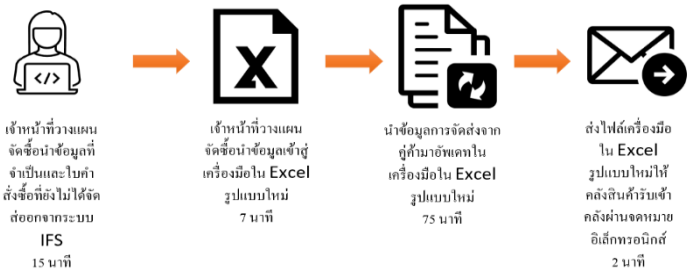
Site	Part No	Descriptio	P	Bc	Lead Time (	Base Date	Past Qty	Aug-23	Sep-23	Oct-23
DOM	YE56G228J20	CHIP RESISTO	RESI	No	Purchased	08-08-23	0	0	0	0
EXP	YE56G228J20	CHIP RESISTO	RESI	No	Purchased	08-08-23	0	712	271	158
SRV	YE56G228J20	CHIP RESISTO	RESI	No	Purchased	08-08-23	0	50	0	0
	YE56G228J20				Demand sum		0	762	271	158
	YE56G228J20	0	Arr.		Stock	5000	21,792	21,030	20,759	20,601
	YE56G228J20	238 515			Shipped	16791.97			7660%	13039%
	YE56G228J20				Schedule confirm		0			

ภาพที่ 14 รายการตามสินค้ารับเข้าคลังสินค้ารูปแบบเดิม

ภาพที่ 15 วิธีการปฏิบัติงานรูปแบบเดิมในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้า



ภาพที่ 16 เครื่องมือการทำงานรูปแบบใหม่ ซึ่งรวบรวมใบคำสั่งซื้อที่ยังไม่ได้จัดส่งจากระบบ IFS และรายการตามสินค้ารับเข้าคลังสินค้าเข้าด้วยกัน



ภาพที่ 17 วิธีการปฏิบัติงานรูปแบบใหม่ในการจัดทำรายการตามสินค้ารับเข้าคลังสินค้า

4. การวัดประสิทธิภาพการจัดการโลจิสติกส์ด้านคุณภาพตามแนวคิดของ Bowersox

ผู้จัดทำงานนิพนธ์ได้เก็บรวบรวมข้อมูลการส่งมอบสินค้าตามเอกสาร DO ของลูกค้า ซึ่งจำนวน DO ทั้งหมด ช่วงหลังปรับปรุงเป็นระยะเวลา 3 เดือน ตั้งแต่ เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 เป็นจำนวนทั้งสิ้น 692 รายการ โดยบริษัทกรณีศึกษาสามารถจัดส่งสินค้าได้ครบจำนวน (In full) 678 รายการ และสามารถจัดส่งสินค้าได้ตรงเวลา (On time) เป็นจำนวน 692 รายการ ซึ่งคิดร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot) ร้อยละ 98 ผู้จัดทำงานนิพนธ์ได้นำร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot) ระหว่างช่วงก่อนปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 มาเปรียบเทียบกับกรณีหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 ด้วยวิธีเก็บรวมรวมข้อมูลการส่งมอบสินค้าตามเอกสาร DO ของลูกค้า แสดงตารางเปรียบเทียบร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot) ในตารางที่ 2

ตารางที่ 2 ตารางเปรียบเทียบร้อยละการจัดส่งครบจำนวนเต็มเวลา (Difot)

หัวข้อ	ร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot) ช่วงก่อนปรับปรุง เดือนเมษายน ถึง เดือนมิถุนายน พ.ศ. 2566	ร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot) ช่วงหลังปรับปรุง เดือนตุลาคม ถึง เดือนธันวาคม พ.ศ. 2566
ร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot)	ร้อยละ 96	ร้อยละ 98

สรุปและอภิปรายผล

งานนิพนธ์นี้ ได้ทำการวิจัยเกี่ยวกับความเป็นไปได้ในการลดความสูญเปล่าด้านระยะเวลาการปฏิบัติงานแผนกวางแผนจัดซื้อ: กรณีศึกษาบริษัทผู้ประกอบกิจการอุตสาหกรรมอิเล็กทรอนิกส์ ซึ่งพบถึงปัญหาทั้งภายในและภายนอกที่ส่งผลกระทบต่อระยะเวลาในการทำงาน ทั้งการทำงานที่มีการทำงานหลายขั้นตอน ซ้ำซ้อน ซึ่งเป็นส่วนที่ทำให้การทำงานล่าช้า โดยปัจจัยดังกล่าวส่งผลให้ระยะเวลาดำเนินการออกใบคำสั่งซื้อรวม (Total Time Spent on the PO Issuance) นานมากขึ้นและส่งผลต่อเนื่องให้เกิดความล่าช้าในการส่งมอบสินค้าไปยังส่วนงานการผลิต ซึ่งเป็นอีกหนึ่งหน้าที่ของแผนกวางแผนจัดซื้อ ผู้จัดทำงานนิพนธ์แบ่งการสรุปผลเป็น 2 ส่วน ดังนี้

(1) ด้านระยะเวลาการปฏิบัติงาน

ผู้จัดทำงานนิพนธ์ได้เก็บรวมรวมข้อมูลระยะเวลาการทำงานเปรียบเทียบระยะเวลาปฏิบัติงานเฉลี่ยระหว่างช่วงก่อนปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 เปรียบเทียบกับหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 ด้วยวิธีจัดเก็บข้อมูลด้วยวิธีการจับเวลาแต่ละขั้นตอนการทำงานและรวบรวมข้อมูลที่เกี่ยวข้องโดยนำมาจากระบบ IFS ซึ่งเป็นระบบ ERP ที่องค์กรใช้อยู่ในปัจจุบัน โดยสามารถลดระยะเวลาการปฏิบัติงานเฉลี่ยได้ 381 นาที หรือ 6 ชั่วโมง 21 นาที

(2) การวัดประสิทธิภาพการจัดการโลจิสติกส์ด้านคุณภาพตามแนวคิดของ Bowersox

ผู้จัดทำงานนิพนธ์ได้เปรียบเทียบร้อยละการจัดส่งครบจำนวน เต็มเวลา (Difot) ระหว่างช่วงก่อนปรับปรุง เดือนเมษายน พ.ศ. 2566 – เดือนมิถุนายน พ.ศ. 2566 เปรียบเทียบกับหลังปรับปรุง เดือนตุลาคม พ.ศ. 2566 – เดือนธันวาคม พ.ศ. 2566 ด้วยวิธีเก็บรวมรวมข้อมูลการส่งมอบสินค้าตามเอกสาร

DO ของลูกค้า โดยสามารถเพิ่มอัตราการจัดส่งครบจำนวน เต็มเวลา (Difot) ได้ร้อยละ 2 กล่าวคือ จากเดิมที่อยู่ในอัตราร้อยละ 96 เป็นร้อยละ 98 และสามารถลดมูลค่าสูญเสียโอกาสในการขายอันเนื่องจากส่งมอบสินค้าไม่ทันได้ 1,053,366.55 บาท

ข้อเสนอแนะ

จากการศึกษาการลดความสูญเปล่าในการดำเนินงานของแผนกวางแผนจัดซื้อของบริษัทผู้ประกอบกิจการอุตสาหกรรมอิเล็กทรอนิกส์ตามกรณีศึกษาในครั้งนี้ ผู้ศึกษามีข้อเสนอแนะดังต่อไปนี้

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 ควรนำเอาเทคโนโลยีสารสนเทศมาช่วยในการปรับปรุงกระบวนการปฏิบัติงานเพื่อช่วยลดระยะเวลาในการปฏิบัติงานลงได้

1.2 ควรศึกษาผลกระทบในการเปลี่ยนแปลง ลด เพิ่มเติมกระบวนการปฏิบัติงานกับผู้มีส่วนเกี่ยวข้องอย่างรอบด้านเพื่อสร้างความเข้าใจร่วม รวมถึงข้อกำหนดรวมกันในการปฏิบัติงาน

1.3 ควรปรึกษาหารือกับฝ่ายบริหารและฝ่ายสารสนเทศของบริษัทกรณีศึกษา เพื่อขอความเห็นชอบก่อนการปรับปรุงกระบวนการปฏิบัติงาน

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ทำการศึกษาถึงการลดความสูญเปล่าในส่วนของต้นทุนของงานวางแผนจัดซื้อที่จะทำให้องค์กรได้ผลกำไรมากยิ่งขึ้น

2.2 ปรับปรุงกระบวนการปฏิบัติงานทุกส่วนงานโดยใช้เทคโนโลยีสารสนเทศ

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ความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ของกำไรต่อหุ้น มูลค่าตามบัญชีต่อหุ้น และค่าความนิยมต่อหุ้น หลักฐานจากตลาดหลักทรัพย์แห่งประเทศไทย

Value Relevance of Earnings per Share, Book Value per Share, and Goodwill per Share Evidence from the Stock Exchange of Thailand

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์ เพื่อศึกษาความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ของข้อมูลทางบัญชี 3 ตัว คือ กำไรต่อหุ้นมูลค่าตามบัญชีต่อหุ้นและค่าความนิยมต่อหุ้น ข้อมูลที่ใช้ในการวิจัยเป็นข้อมูลรายปีจากงบการเงินรวมของบริษัทจดทะเบียนที่มีข้อมูลครบถ้วน 5 ปีระหว่างปี พ.ศ. 2561 - 2565 จำนวน 89 บริษัท วิเคราะห์ข้อมูลด้วยสมการถดถอยพหุคูณจำแนกเป็น 2 สมการ คือ สมการที่มีตัวแปรอิสระ ประกอบด้วยกำไรต่อหุ้นและมูลค่าตามบัญชีต่อหุ้นตามตัวแบบ Ohlson (1995) และสมการที่เพิ่มค่าความนิยมต่อหุ้น ใช้ขนาดของกิจการเป็นตัวแปรควบคุมทั้งสองสมการ ผลการวิจัยพบว่า กำไรต่อหุ้นมีความเกี่ยวข้องเชิงบวกในการกำหนดมูลค่าหลักทรัพย์อย่างมีนัยสำคัญทางสถิติที่ 0.01 ส่วนมูลค่าตามบัญชีต่อหุ้นและค่าความนิยมต่อหุ้นไม่มีความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ สำหรับขนาดของกิจการมีอิทธิพลเชิงบวกต่อมูลค่าหลักทรัพย์อย่างมีนัยสำคัญทางสถิติที่ 0.10 ทั้งนี้ นักลงทุนสามารถนำผลการวิจัยไปใช้ประกอบการตัดสินใจได้

คำสำคัญ: ความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์, กำไรต่อหุ้น, มูลค่าตามบัญชีต่อหุ้น, ค่าความนิยมต่อหุ้น

Abstract

The objective of this research is to study the value relevance of accounting information comprise of earnings per share, book value per share, and goodwill per share. The data used in the study are annual consolidated financial statements of 89 listed companies in the Stock Exchange of Thailand for 5 years between 2018 - 2022. Multiple regression equations were used for data analysis. The independent variables used in the first equation were earnings per share and book value per share that followed Ohlson (1995) and goodwill per share was added in the second equation. Size

was used as control variable for both equations. The result showed that earnings per share was positively relevant with statistical significance at 0.01 level, however both of book value per share and goodwill per share were not relevant. Size had positive effect on stock price with statistical significance at 0.10 level. The result can be used by investors for decision making.

Keywords: Value Relevance, Earnings per Share, Book Value per Share, Goodwill per Share

บทนำ

หนึ่งในผู้ใช้ข้อมูลทางบัญชีหรืองบการเงินคือ นักลงทุน โดยกรอบแนวคิดสำหรับการรายงานทางการเงิน (สภาวิชาชีพบัญชี ในพระบรมราชูปถัมภ์, 2563) อธิบายว่า นักลงทุนจะใช้ข้อมูลทางบัญชีเพื่อประกอบการตัดสินใจที่จะซื้อ ถือ หรือขายเงินลงทุน โดยที่ข้อมูลทางบัญชีจะถือว่ามีความเกี่ยวข้องในการตัดสินใจ (Relevance) ก็ต่อเมื่อการตัดสินใจของผู้ใช้ข้อมูลกรณีที่มีข้อมูลทางบัญชีจะแตกต่างจากการไม่มีข้อมูลดังกล่าว หรืออาจกล่าวด้วยภาษาที่เข้าใจโดยง่าย คือ การมีข้อมูลจะช่วยทำให้ผู้ใช้ข้อมูลสามารถตัดสินใจได้ดียิ่งขึ้น ดังนั้นนิยามของความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ (Value Relevance) คือ ประโยชน์ของข้อมูลทางบัญชีและความสามารถของงบการเงินที่มีอิทธิพลต่อราคาหลักทรัพย์ (Francis & Schipper, 1999) และหากอาศัยตัวแบบ Ohlson (1995) ซึ่งแสดงฟังก์ชันของข้อมูลทางบัญชีที่ใช้อธิบายมูลค่าหลักทรัพย์ ประกอบด้วย กำไรต่อหุ้น (Earnings per Share: EPS) และมูลค่าส่วนของผู้ถือหุ้นต่อหุ้น ซึ่งต่อไปจะเรียกโดยย่อว่า มูลค่าตามบัญชีต่อหุ้น (Book Value per Share: BVS) โดยตัวแบบดังกล่าวถูกนำมาประยุกต์อย่างแพร่หลายในงานวิจัยที่ใช้อธิบายความสัมพันธ์ระหว่างตลาดทุน (Capital Market) และข้อมูลในงบการเงิน ที่เรียกว่า Capital Market-based Accounting Research: CMBAR (Beisland, 2009) และมีการเพิ่มตัวแปรที่ใช้อธิบายมูลค่าหลักทรัพย์เพื่อใช้ศึกษาว่าตัวแปรดังกล่าว มีอิทธิพลหรือมีความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์หรือไม่ โดยงานวิจัยนี้ได้นำข้อมูลทางบัญชีตัวหนึ่ง คือ ค่าความนิยม (Goodwill) มาทดสอบอิทธิพลหรือความเกี่ยวข้อง เนื่องจากในปัจจุบันการขยายธุรกิจจากภายนอก (External Expansion) ในลักษณะที่เรียกว่า การรวมธุรกิจแบบซื้อหุ้น (Stock Acquisition) เป็นหนึ่งในกลยุทธ์การเจริญเติบโตที่ผู้บริหารเลือกใช้ โดยมีมูลเหตุจูงใจประการสำคัญ คือ ทำให้เกิดการผนึกหรือผสานกำลัง (Synergy) จนทำให้เกิดมูลค่าเพิ่มขึ้นอย่างมาก เช่น การประหยัดด้านการเงิน การเพิ่มอำนาจทางการตลาด เป็นต้น (โยธิน ทวีกิติกุล, 2562) และผลของการที่ธุรกิจผู้ลงทุนหรือผู้ซื้อจ่ายซื้อธุรกิจด้วยมูลค่าที่สูงกว่าราคาตามบัญชีจะทำให้เกิดค่าความนิยม อันสะท้อนให้เห็นว่าธุรกิจผู้ซื้อเห็นศักยภาพของธุรกิจผู้ถูกซื้อที่จะก่อให้เกิดประโยชน์เชิงเศรษฐกิจแก่ธุรกิจในภาพรวม ดังนั้นผู้วิจัยจึงสนใจที่ประยุกต์ตัวแบบ Ohlson (1995) โดยอาศัยข้อมูลทางบัญชีตามตัวแบบดั้งเดิม คือ กำไรต่อหุ้นและมูลค่าตามบัญชีต่อหุ้น รวมทั้งการเพิ่มค่าความนิยมต่อหุ้นมาใช้อธิบายมูลค่าหลักทรัพย์ในบริบทของตลาดทุนไทยโดยเฉพาะตลาดหลักทรัพย์แห่งประเทศไทยระหว่างปี พ.ศ. 2561 - 2565

วัตถุประสงค์ของการวิจัย

งานวิจัยนี้มีวัตถุประสงค์ เพื่อศึกษาอิทธิพลหรือความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ของข้อมูลทางบัญชี โดยเฉพาะกำไรต่อหุ้น มูลค่าตามบัญชีต่อหุ้น และค่าความนิยมต่อหุ้น

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิด

1.1 ลักษณะเชิงคุณภาพ (Qualitative Characteristic) ของรายงานทางการเงินหรืองบการเงิน ตามกรอบแนวคิดสำหรับการรายงานทางการเงิน (สภาวิชาชีพบัญชี ในพระบรมราชูปถัมภ์, 2563) กำหนดลักษณะเชิงคุณภาพไว้ 2 ส่วน คือ (1) ลักษณะเชิงคุณภาพพื้นฐาน (Fundamental Qualitative Characteristic) และ (2) ลักษณะเชิงคุณภาพเสริม (Enhancing Qualitative Characteristic) โดยที่ลักษณะเชิงคุณภาพพื้นฐาน ประกอบด้วย ความเกี่ยวข้องกับการตัดสินใจ และการเป็นตัวแทนอันเที่ยงธรรม ส่วนลักษณะเชิงคุณภาพเสริม ประกอบด้วย ความสามารถเปรียบเทียบกันได้ การยืนยันความถูกต้องได้ ความทันเวลา และความเข้าใจได้ ในที่นี้จะกล่าวถึงเฉพาะความเกี่ยวข้องกับการตัดสินใจ (Relevance) คือ ข้อมูลในรายงานทางการเงินหรืองบการเงินจะเกี่ยวข้องกับการตัดสินใจเชิงเศรษฐกิจได้ก็ต่อเมื่อข้อมูลนั้นช่วยให้ผู้ใช้งบการเงินสามารถประเมินเหตุการณ์ในอดีต ปัจจุบัน และอนาคต รวมทั้งช่วยยืนยันหรือชี้ข้อผิดพลาดของผลการประเมินที่ผ่านมาของผู้ใช้งบการเงินได้

1.2 การรวมธุรกิจ (Business Combinations) ตามมาตรฐานการรายงานทางการเงินฉบับที่ 3 เรื่องการรวมธุรกิจ (สภาวิชาชีพบัญชี ในพระบรมราชูปถัมภ์, 2565) หมายถึง รายการหรือเหตุการณ์อื่นใดซึ่งทำให้ผู้ซื้อได้มีการควบคุมธุรกิจหรือกลุ่มธุรกิจ การรวมธุรกิจจึงเป็นการดำเนินการที่ทำให้กิจการหนึ่งเรียกว่า ผู้ซื้อ (Acquirer) ได้มาซึ่งสินทรัพย์สุทธิ หรือหุ้นของกิจการอื่นซึ่งเรียกว่า ผู้ถูกซื้อ (Acquiree) และผู้ซื้อมีอำนาจใจการควบคุมหรือครอบครองกิจการและประโยชน์จากกิจกรรมเชิงเศรษฐกิจของกิจการผู้ถูกซื้อ สำหรับอำนาจการควบคุมที่ผู้ซื้อมีนั้น อาจอยู่ในลักษณะ (1) สิทธิในการสั่งการในกิจกรรมที่เกี่ยวข้องในกิจการผู้ซื้อ (2) สิทธิในผลตอบแทนผันแปรจากการเข้าไปเกี่ยวข้องกับผู้ถูกซื้อ หรือ (3) ผู้ซื้อต้องมีความสามารถในการใช้อำนาจทำให้เกิดผลกระทบต่อผลตอบแทนจากการเข้าไปเกี่ยวข้องได้ หนึ่งในรูปแบบของการรวมธุรกิจที่กิจการนำมาใช้ในการขยายกิจการเพื่อให้เป็นไปตามกลยุทธ์การเจริญเติบโต คือ การเข้าซื้อหุ้น (Stock Acquisition) ที่ทั้งกิจการผู้ซื้อและกิจการผู้ถูกซื้อยังคงดำเนินกิจการต่อไป และทำให้เกิดความสัมพันธ์แบบบริษัทใหญ่ (Parent Company) และบริษัทย่อย (Subsidiary Company) โดยบริษัทใหญ่จะต้องนำงบการเงินของบริษัทย่อยทุกแห่งมาจัดทำงบการเงินรวม (Consolidated Financial Statements) ควบคู่กับงบการเงินเฉพาะกิจการ (Separate Financial Statements) เพื่อให้ข้อมูลภาพรวมในการดำเนินธุรกิจแก่นักลงทุนและผู้สนใจทั่วไป

1.3 ค่าความนิยม (Goodwill) หมายถึง สินทรัพย์ที่แสดงถึงประโยชน์เชิงเศรษฐกิจในอนาคตที่จะได้รับจากสินทรัพย์อื่นที่ได้มาจากการรวมธุรกิจ ซึ่งไม่สามารถระบุและรับรู้เป็นรายการแยกออกมาให้ชัดเจนได้ ตามมาตรฐานการรายงานทางการเงินฉบับที่ 3 เรื่องการรวมธุรกิจ (สภาวิชาชีพบัญชี ในพระบรมราชูปถัมภ์, 2565) กำหนดให้กิจการผู้ซื้อต้องรับรู้ค่าความนิยม โดยเป็นผลจากการเปรียบเทียบระหว่างมูลค่ายุติธรรมของสิ่งตอบแทนที่กิจการผู้ซื้อโอนให้กับมูลค่ายุติธรรมของสินทรัพย์สุทธิที่ระบุได้ที่ได้รับมา (สิ่งที่ให้มากกว่าสิ่งที่ได้มา หรือกล่าวด้วยภาษาที่เข้าใจโดยง่ายคือ ซื้อของแพง) ดังนั้นการที่กิจการผู้ซื้อยอมจ่ายสิ่งตอบแทนในจำนวนที่สูงนั้น อาจเล็งเห็นประโยชน์ที่จะเกิดในอนาคตจากการรวมธุรกิจ ซึ่งอาจอยู่ในลักษณะของการลดความเสี่ยง การลดต้นทุน การดำเนินงานต่อเนื่องไม่หยุดชะงัก การได้มาซึ่งสินทรัพย์ไม่มีตัวตน เป็นต้น (นิ่มนวล วิเศษสรรพ์ และ ธัญญรัศม์ วศวรรณวัฒน์, 2563) สำหรับการคำนวณค่าความนิยมจากการรวมธุรกิจคำนวณได้โดย

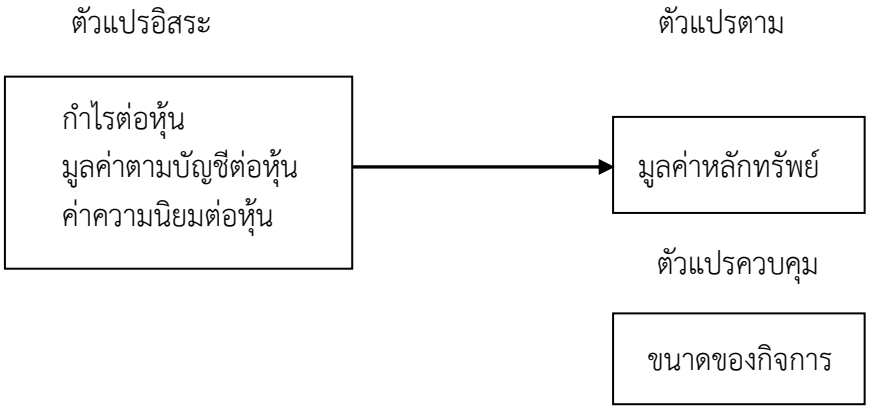
ค่าความนิยม = [มูลค่ายุติธรรมของสิ่งตอบแทนที่โอนให้ + ส่วนได้เสียที่ไม่มีอำนาจควบคุม (Non-controlling Interest: NCI) + มูลค่ายุติธรรมของส่วนได้เสียในส่วนของเจ้าของก่อนการรวมธุรกิจสำเร็จจากการทยอยซื้อ] – มูลค่ายุติธรรมของของสินทรัพย์สุทธิที่ระบุได้ที่ได้รับมา

2. ทฤษฎี

ทฤษฎีการประเมินมูลค่าทางตรง (Direct Valuation Theory) พัฒนาขึ้นโดย Holthausen และ Watts (2001) (อ้างถึงใน Permatasari and Narsa, 2022) ทฤษฎีนี้อธิบายว่า การเปลี่ยนแปลงมูลค่าตลาดส่วนของผู้ถือหุ้น เกิดจากการที่นักลงทุนได้รับข้อมูลหรือความรู้ที่เพิ่มขึ้นเกี่ยวกับกำไรต่อหุ้นและมูลค่าตามบัญชีส่วนของผู้ถือหุ้นของธุรกิจ ทฤษฎีนี้ยังยืนยันว่า ข้อมูลที่เกี่ยวข้องกับการตัดสินใจไม่เพียงแต่ได้มาจากงบการเงินหรือรายงานทางการเงิน แต่ยังรวมถึงข้อมูลจากแหล่งอื่น ๆ ด้วย ดังนั้นมูลค่าของกิจการในปัจจุบันหรือการคาดการณ์มูลค่าของกิจการในอนาคต สามารถอธิบายได้ด้วยตัวแปรต่าง ๆ มากมาย ทั้งที่ปรากฏและไม่ปรากฏอยู่ในงบการเงินหรือรายงานทางการเงิน

3. กรอบแนวคิด

งานวิจัยนี้กำหนดให้ข้อมูลทางบัญชีเป็นตัวแปรอิสระ ประกอบด้วย กำไรต่อหุ้น มูลค่าตามบัญชีต่อหุ้น และค่าความนิยมต่อหุ้น ส่วนตัวแปรตาม คือ มูลค่าหรือราคาหลักทรัพย์ และใช้ขนาดของกิจการเป็นตัวแปรควบคุม แสดงกรอบแนวคิดได้ดังภาพที่ 1



ภาพที่ 1 กรอบแนวคิด

วิธีดำเนินการวิจัย

1. ประชากร คือ บริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย จำนวน 89 บริษัท ที่มีข้อมูลครบถ้วนระหว่างปี พ.ศ. 2561 - 2565 โดยมีรอบระยะเวลาบัญชีสิ้นสุดวันที่ 31 ธันวาคม และส่วนของผู้ถือหุ้นไม่ติดลบ ทั้งนี้ ไม่รวมบริษัทจดทะเบียนในอุตสาหกรรมธุรกิจการเงิน เนื่องจากมีลักษณะการดำเนินงานแตกต่างจากอุตสาหกรรมอื่น โดยใช้ข้อมูลจากงบการเงินรวม (Consolidated Financial Statements) ดังนั้นจำนวนข้อมูลที่นำมาใช้ในการวิจัย คือ 445 รายปีรายบริษัท

2. สถิติที่ใช้ในการวิเคราะห์ข้อมูล

2.1 สถิติเชิงพรรณา (Descriptive Statistics) เพื่ออธิบายลักษณะทั่วไปของตัวแปร ประกอบด้วย ค่าสูงสุด ค่าต่ำสุด ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

2.2 สัมประสิทธิ์สหสัมพันธ์เพียร์สัน (Pearson Correlation) เพื่ออธิบายความสัมพันธ์ระหว่างตัวแปร

2.3 สมการถดถอยพหุคูณ (Multiple Regression) เพื่ออธิบายอิทธิพลของตัวแปรอิสระมากกว่า 1 ตัวแปรที่มีต่อตัวแปรตาม (ราคาหลักทรัพย์) สำหรับค่าสถิติที่ใช้ในการอธิบายอิทธิพลของข้อมูลทางบัญชีที่มีต่อราคาหลักทรัพย์ในสมการถดถอยพหุคูณนั้น จะพิจารณาจากค่าสัมประสิทธิ์การถดถอย (Coefficient) เพื่อใช้อธิบายผลว่าตัวแปรอิสระนั้น ๆ มีอิทธิพลต่อตัวแปรตามในทิศทางบวกหรือลบ และมีขนาดเท่าใด รวมทั้งพิจารณาค่าสัมประสิทธิ์การตัดสินใจ (Coefficient of Determination) หรือ adjusted R^2 ที่ใช้อธิบายว่า ตัวแปรอิสระที่อยู่ในสมการถดถอยพหุคูณสามารถอธิบายมูลค่าหลักทรัพย์ได้ร้อยละเท่าใด นอกจากนั้นมูลค่าหลักทรัพย์จะถูกอธิบายด้วยตัวแปรอื่น ๆ ที่ไม่อยู่ในสมการถดถอยพหุคูณ

สำหรับข้อมูลที่ใช้ในการวิจัยมีขนาดใหญ่ (n > 200) อาจไม่จำเป็นต้องพิจารณาการแจกแจงปกติ ซึ่งเป็นข้อตกลงเบื้องต้นของการวิเคราะห์ข้อมูลด้วยสมการถดถอย เพราะทฤษฎีแนวโน้มเข้าสู่ส่วนกลางเมื่อข้อมูลตัวอย่างเพิ่มขึ้น ค่าเฉลี่ยของตัวอย่างจะมีแนวโน้มเข้าใกล้การกระจายตัวแบบปกติตามแนวคิดของ Memon, et al. (2020) (อ้างถึงใน เกรียงไกร บุญเลิศอุทัย, ศิลปพร ศรีจั่นเพชร และ อนุวัฒน์ ภักดี, 2565)

3. ตัวแบบที่ใช้ งานวิจัยนี้ประยุกต์ตัวแบบ Ohlson (1995) ซึ่งมีความนิยมแพร่หลายในการนำมาใช้ในงานวิจัยความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ (พิเชษฐ์ สิทธิโชคสกุลชัย, สุวิทย์ ไวยทิพย์ และ พัทรียา เห็นกลาง, 2566) ตัวแบบ Ohlson (1995) แสดงความสัมพันธ์เชิงเส้นของมูลค่าหลักทรัพย์กับข้อมูลทางบัญชีคือ กำไรต่อหุ้น (Earnings per Share: EPS) และมูลค่าตามบัญชีต่อหุ้น (Book Value per Share: BVS) และใช้ขนาดของกิจการเป็นตัวแปรควบคุม ดังสมการถดถอย (1)

$$P_{it3m} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + Size_{it} + \boldsymbol{\varepsilon}_{it} \quad \text{..... (1)}$$

โดยที่ P_{it3m} = ราคาปิดของหลักทรัพย์เดือนมีนาคม[1]

EPS_{it} = กำไรต่อหุ้นของบริษัท i ในปีที่ t คำนวณโดยกำไรสำหรับปีหารด้วยจำนวนหุ้นสามัญถัวเฉลี่ยถ่วงน้ำหนัก

BVS_{it} = มูลค่าตามบัญชีต่อหุ้นของบริษัท i ในปีที่ t คำนวณโดยยอดส่วนของผู้ถือหุ้นหารด้วยจำนวนหุ้นสามัญถัวเฉลี่ยถ่วงน้ำหนัก

$Size_{it}$ = ขนาดของกิจการซึ่งวัดด้วยลอการิทึมของสินทรัพย์รวม

β = ค่าสัมประสิทธิ์การถดถอยของตัวแปรอิสระแต่ละตัว

$\boldsymbol{\varepsilon}_{it}$ = ค่าความคลาดเคลื่อน

และได้เพิ่มตัวแปรอิสระอีก 1 ตัวคือ ค่าความนิยมต่อหุ้น แสดงสมการถดถอย (2)

$$P_{it3m} = \beta_0 + \beta_1 EPS_{it} + \beta_2 BVS_{it} + \beta_3 GWS_{it} + Size_{it} + \boldsymbol{\varepsilon}_{it} \quad \text{..... (2)}$$

[1] สำนักงานคณะกรรมการกำกับหลักทรัพย์และตลาดหลักทรัพย์ (สำนักงาน ก.ล.ต.) กำหนดให้บริษัทจดทะเบียนต้องส่งงบการเงินที่ผ่านการตรวจสอบโดยผู้สอบบัญชีภายใน 3 เดือนนับแต่วันสิ้นสุดรอบระยะเวลาบัญชี

โดยที่ GWS_{it} = ค่าความนิยมต่อหุ้น คำนวณโดยค่าความนิยมหารด้วยจำนวนหุ้นสามัญถัวเฉลี่ยถ่วงน้ำหนัก

ทั้งนี้ จะเห็นว่าข้อมูลทางบัญชีที่ผู้วิจัยนำมาใช้นั้นจะเป็นมูลค่าต่อหุ้น เพื่อลดปัญหาที่อาจเกิดขึ้นจาก Scale Effect

ผลการวิจัย

1. ลักษณะทั่วไปของตัวแปร แสดงได้ดังตารางที่ 1

ตารางที่ 1 สถิติเชิงพรรณา (n = 445)

ตัวแปร	ค่าต่ำสุด	ค่าสูงสุด	ค่าเฉลี่ย	ส่วนเบี่ยงเบนมาตรฐาน
ราคาปิดเดือนมีนาคม (บาท)	0.05	1,142.00	28.1943	69.2502
กำไรต่อหุ้น (บาท)	-5.5000	40.0300	1.4795	3.3130
มูลค่าตามบัญชีต่อหุ้น (บาท)	0.2065	229.4478	16.2827	28.0179
ค่าความนิยมต่อหุ้น (บาท)	0.0002	40.7882	2.0748	6.0495
ขนาดของกิจการ (Log. สินทรัพย์รวม)	2.2480	6.5335	4.4493	0.6971

ลักษณะทั่วไปของตัวแปรซึ่งอธิบายด้วยสถิติเชิงพรรณาตามที่แสดงในตารางที่ 1 พบว่า ราคาปิดของหลักทรัพย์เดือนมีนาคมซึ่งใช้เป็นตัวแปรตามในงานวิจัยนี้มีค่าเฉลี่ยอยู่ที่ 28.1943 บาท ในขณะที่ราคาต่ำสุดและสูงสุดเท่ากับ 0.05 บาท และ 1,142 บาท ตามลำดับ สำหรับข้อมูลทางบัญชีที่ใช้เป็นตัวแปรอิสระประกอบด้วย กำไรต่อหุ้น มีค่าต่ำสุดที่แสดงเป็นผลขาดทุนต่อหุ้นคือ 5.5000 บาท ส่วนค่าสูงสุดคือ 40.0300 บาท และค่าเฉลี่ยเท่ากับ 1.4795 บาท ส่วนมูลค่าตามบัญชีต่อหุ้นมีค่าเฉลี่ยเท่ากับ 16.2827 บาท ค่าต่ำสุดและค่าสูงสุดเท่ากับ 0.2065 บาท และ 229.4478 บาท ตามลำดับ ค่าความนิยมต่อหุ้นนั้นมีค่าต่ำสุดเท่ากับ 0.0002 บาท ค่าสูงสุดเท่ากับ 40.7882 บาท และค่าเฉลี่ยเท่ากับ 2.0748 บาท สำหรับขนาดของกิจการที่ใช้เป็นตัวแปรควบคุมซึ่งวัดด้วยค่าลอการิทึมของสินทรัพย์รวมมีค่าเฉลี่ยเท่ากับ 4.4493 ค่าต่ำสุดและค่าสูงสุดเท่ากับ 2.2480 และ 6.5335 ตามลำดับ

2. ความสัมพันธ์ระหว่างตัวแปร แสดงได้ดังตารางที่ 2

ตารางที่ 2 สัมประสิทธิ์สหสัมพันธ์เพียร์สัน

ตัวแปร	ราคาปิดเดือนมีนาคม	กำไรต่อหุ้น	มูลค่าตามบัญชีต่อหุ้น	ค่าความนิยมต่อหุ้น	ขนาดของกิจการ
ราคาปิดเดือนมีนาคม	1.000	0.559***	0.423***	0.153***	0.282***
กำไรต่อหุ้น	0.559***	1.000	0.726***	0.237***	0.370***
มูลค่าตามบัญชีต่อหุ้น	0.423***	0.726***	1.000	0.391***	0.498***
ค่าความนิยมต่อหุ้น	0.153***	0.237***	0.391***	1.000	0.468***
ขนาดของกิจการ	0.282***	0.370***	0.498***	0.468***	1.000

หมายเหตุ *** มีนัยสำคัญทางสถิติที่ 0.01 (2-tailed)

ความสัมพันธ์ระหว่างตัวแปรซึ่งอธิบายด้วยค่าสัมประสิทธิ์สหสัมพันธ์เพียร์สันตามตารางที่ 2 พบว่า ตัวแปรที่ใช้ในงานวิจัยนี้ทุกตัวแปรมีความสัมพันธ์กันในทิศทางบวกอย่างมีนัยสำคัญทางสถิติที่ 0.01 และมีค่าสัมประสิทธิ์สหสัมพันธ์เพียร์สันไม่เกินกว่า 0.80 (Gujarati, 2003) รวมทั้งค่า Variance Inflation Factor (VIF) ไม่เกิน 10 (Hair et al., 1995) แสดงว่าชุดข้อมูลที่นำมาใช้ในงานวิจัยนี้ไม่พบปัญหา Multicollinearity สำหรับค่า VIF แสดงในตารางที่ 3

3. การทดสอบความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์แสดงได้ดังตารางที่ 3

ตารางที่ 3 สมการถดถอยพหุคูณ

ตัวแปรอิสระ	สมการถดถอย (1)		สมการถดถอย (2)	
	Coefficient	VIF	Coefficient	VIF
Constant	-27.325		-29.545	
	(-1.410)		(-1.440)	
EPS_{it}	11.099***	2.116	11.065***	2.131
	(9.286)		(9.216)	
BVS_{it}	-0.018	2.431	-0.007	2.541
	(-0.119)		(-0.047)	
GWS_{it}			-0.174	1.347
			(-0.333)	
$Size_{it}$	8.854*	1.330	9.406*	1.510
	(1.966)		(1.958)	
Adjusted R^2	31.4		31.3	
F-statistic	68.745***		51.483***	

หมายเหตุ. - ตัวเลขในวงเล็บคือ t-Statistic

*, **, *** มีนัยสำคัญทางสถิติที่ 0.01, 0.05 และ 0.10 ตามลำดับ

จากตารางที่ 3 ซึ่งแสดงผลการทดสอบความเกี่ยวข้องของข้อมูลทางบัญชีในการกำหนดมูลค่าหลักทรัพย์ โดยจำแนกเป็น 2 สมการคือ สมการถดถอย (1) ตามตัวแบบ Ohlson (1995) และสมการถดถอย (2) เพิ่มตัวแปรค่าความนิยมต่อหุ้น พบว่า สมการถดถอย (1) กำไรต่อหุ้นมีความเกี่ยวข้องเชิงบวกในการกำหนดมูลค่าหลักทรัพย์อย่างมีนัยสำคัญทางสถิติที่ 0.01 กล่าวคือ หากบริษัทจดทะเบียนมีกำไรต่อหุ้นเพิ่มขึ้นจะส่งผลให้ราคาหลักทรัพย์เพิ่มขึ้น สำหรับมูลค่าตามบัญชีต่อหุ้นมีความเกี่ยวข้องเชิงลบแต่ไม่มีนัยสำคัญทางสถิติ สำหรับขนาดของกิจการที่ใช้เป็นตัวแปรควบคุมก็มีอิทธิพลเชิงบวกต่อมูลค่าหลักทรัพย์อย่างมีนัยสำคัญทางสถิติที่ 0.10 ทั้งนี้ F-statistic แสดงให้เห็นว่า ชุดของตัวแปรอิสระสามารถร่วมกันอธิบายตัวแปรตามได้อย่างมีนัยสำคัญทางสถิติที่ 0.01 และมีความสามารถในการอธิบายมูลค่าหลักทรัพย์ได้ร้อยละ 31.4

สมการถดถอย (2) แสดงผลการทดสอบเช่นเดียวกับสมการถดถอย (1) คือ กำไรต่อหุ้นมีความเกี่ยวข้องเชิงบวกในการกำหนดมูลค่าหลักทรัพย์อย่างมีนัยสำคัญทางสถิติที่ 0.01 สำหรับข้อมูลทางบัญชีอีก 2 ตัว คือ มูลค่าตามบัญชีต่อหุ้นและค่าความนิยมต่อหุ้นมีความเกี่ยวข้องเชิงลบแต่ไม่นัยสำคัญทางสถิติ

ส่วนขนาดของกิจการก็มีอิทธิพลเชิงบวกต่อมูลค่าหลักทรัพย์อย่างมีนัยสำคัญทางสถิติที่ 0.10 ทั้งนี้ F-statistic แสดงให้เห็นว่า ชุดของตัวแปรอิสระสามารถร่วมกันอธิบายตัวแปรตามได้อย่างมีนัยสำคัญทางสถิติที่ 0.01 และมีความสามารถในการอธิบายมูลค่าหลักทรัพย์ได้ร้อยละ 31.3

สรุปและอภิปรายผล

ผลการดำเนินงานของบริษัทจดทะเบียนในรูปของกำไรทางบัญชีที่เรียกว่า กำไรต่อหุ้น ยังคงมีบทบาทสำคัญในการอธิบายมูลค่าหลักทรัพย์ ผลการวิจัยนี้สอดคล้องกับ กิตติมา อัครนุพงศ์ (2560); กิตติมา อัครนุพงศ์ (2565); Badu and Shamki (2013); Appiah (2018); Kwon (2018); Umar, Dikki and Yahaya (2018); Chukwu, Damieibi, and Okoye (2019); Mirza, Malek, and Abdul-Hamid (2019) แต่ขัดแย้งกับ Eugenio, Parel, Reyes, Yu, and Cudia (2019) ที่พบว่า ระหว่างเกิดวิฤตการณ์ทางการเงิน ค.ศ. 2008 - 2009 กำไรต่อหุ้นมีความเกี่ยวข้องเชิงลบกับมูลค่าหลักทรัพย์ หรือ Fiador (2013) ที่ไม่พบว่ากำไรต่อหุ้นมีความเกี่ยวข้องกับมูลค่าหลักทรัพย์ แต่ Fiador (2013) พบว่า มูลค่าตามบัญชีต่อหุ้นมีความเกี่ยวข้องกับมูลค่าหลักทรัพย์ ซึ่งขัดแย้งกับงานวิจัยนี้ที่พบว่า มูลค่าตามบัญชีต่อหุ้นไม่มีความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์

งานวิจัยนี้ยังพบว่า ค่าความนิยมต่อหุ้นไม่มีความเกี่ยวข้องกับมูลค่าหลักทรัพย์หรือไม่สามารถอธิบายมูลค่าหลักทรัพย์ได้ แม้ว่าตามหลักการแล้วค่าความนิยมจากการรวมธุรกิจในมุมมองของบริษัทผู้ซื้อนั้นคาดว่าจะก่อให้เกิดประโยชน์เศรษฐกิจในอนาคต แต่ไม่ได้มีความเกี่ยวข้องในการตัดสินใจในมุมมองของนักลงทุน ซึ่งขัดแย้งกับ Pechlivanidis, Ginoglou, and Barmpoutis (2022); Paolone, Tiscini, and Martiniello (2020) ที่พบว่า ค่าความนิยมมีความเกี่ยวข้องเชิงบวกกับมูลค่าหลักทรัพย์ โดย Pechlivanidis, et al. (2022) อธิบายว่า นักลงทุนให้ความสำคัญกับค่าความนิยมที่มีการรับรู้ระหว่างปีมากกว่าค่าความนิยมที่คงเหลือมาจากปีก่อน ๆ ซึ่งขัดแย้งกับ Bepari and Mollik (2017) ที่พบว่า ค่าความนิยมของปีก่อนมีความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ แต่ค่าความนิยมที่เกิดจากการรวมธุรกิจในปีปัจจุบันไม่มีความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ ส่วน Kimouche and Rouabhi (2016) พบว่า การด้อยค่าของค่าความนิยม (Goodwill Impairment) ไม่มีผลกระทบต่อมูลค่าตลาด

ดังนั้นหากจะกล่าวโดยสรุปสำหรับบริบทของตลาดทุนไทยโดยเฉพาะในช่วงเวลาที่ทำการวิจัย คือ ระหว่างปี พ.ศ. 2561 - 2565 นั้น ข้อมูลผลการดำเนินงานที่บริษัทจดทะเบียนเผยแพร่ต่อสาธารณชนในรูปของกำไรต่อหุ้นถือว่ามีบทบาทสำคัญในการใช้อธิบายมูลค่าหลักทรัพย์ ซึ่งก็เป็นไปตามทฤษฎีการประเมินมูลค่าทางตรง (Direct Valuation Theory) ที่อธิบายว่า การเปลี่ยนแปลงมูลค่าตลาดส่วนของผู้ถือหุ้นจะเกิดจากการที่นักลงทุนได้รับข้อมูลเกี่ยวกับผลการดำเนินงานของบริษัท รวมทั้งข้อมูลอื่น ๆ ที่ไม่ปรากฏในงบการเงิน สำหรับข้อมูลทางบัญชีอื่นที่ใช้ในงานวิจัยนี้ คือ มูลค่าตามบัญชีต่อหุ้นและความนิยมต่อหุ้น ไม่พบว่า มีนัยสำคัญทางสถิติที่นักลงทุนจะนำมาใช้ในการคาดการณ์มูลค่าหลักทรัพย์ได้ อย่างไรก็ตาม ข้อมูลที่นำมาใช้ในการวิจัยนี้ครอบคลุมระยะเวลาที่มีสถานการณ์แพร่ระบาดของโรคติดเชื้อไวรัสโคโรนาสายพันธุ์ใหม่ 2019 (COVID-19) คือ ระหว่างปี พ.ศ. 2563 - 2565 ซึ่งมูลค่าหลักทรัพย์มีความผันผวนมากกว่าสถานการณ์ทั่วไป รวมทั้งนักลงทุนอาจให้ความสำคัญกับกำไรต่อหุ้นมากกว่าข้อมูลทางบัญชีอื่น ๆ ที่ใช้สะท้อนความสามารถในการดำรงอยู่ของบริษัทจดทะเบียนในช่วงที่เกิดวิกฤตการณ์ดังกล่าว

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 นักลงทุนสามารถนำข้อมูลทางบัญชีโดยเฉพาะกำไรต่อหุ้นไปใช้ประกอบการตัดสินใจลงทุน

1.2 บริษัทจดทะเบียนควรเปิดเผยข้อมูลผลการดำเนินงานให้เป็นไปตามลักษณะเชิงคุณภาพของรายงานทางการเงินหรืองบการเงิน เนื่องจากเป็นข้อมูลที่นักลงทุนตลอดจนผู้สนใจทั่วไปให้ความสนใจเป็นพิเศษ

2. ข้อเสนอแนะสำหรับการวิจัยในครั้งต่อไป

2.1 ทดสอบความเกี่ยวข้องในการกำหนดมูลค่าหลักทรัพย์ด้วยตัวแบบอื่น เช่น ตัวแบบผลตอบแทน (Return Model) เป็นต้น หรือการใช้มูลค่าของบริษัทที่ประเมินด้วยวิธีการต่าง ๆ เป็นตัวแปรตามสำหรับการทดสอบ เช่น มูลค่าเพิ่มทางเศรษฐศาสตร์ (Economic Value Added: EVA) หรือ Tobin's Q เป็นต้น

2.2 เพิ่มตัวแปรข้อมูลที่ไม่ใช่ตัวเงินเข้าไปในตัวแบบ เพื่อพิจารณาอิทธิพลร่วมของทั้งข้อมูลที่เป็นตัวเงินและไม่ใช่ตัวเงินในการกำหนดมูลค่าหลักทรัพย์

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กรอบแนวคิดทฤษฎีสมการโครงสร้างปัจจัยเชิงสาเหตุของการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขัน และผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ

Proposed Theoretical Framework Causal Factors Structural Equation Modeling of Smart Supply Chain Management Affects to Innovation Capability, Competitive Advantage, and Innovation Performance Lead to Efficiency in Organizational Performance

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บทคัดย่อ

ปัจจุบันการแข่งขันเศรษฐกิจทางการค้ามีการแข่งขันที่รุนแรงจากสภาวะสงครามการค้า การแข่งขันธุรกิจที่รุนแรง ความไม่แน่นอน ความผันผวนเศรษฐกิจ การตอบสนองความต้องการของลูกค้าได้อย่างทันท่วงทีจึงกลายเป็นแรงผลักดันให้บริษัทหรือองค์กรต่างให้ความสำคัญในการพยายาม หาแนวทางสร้างความได้เปรียบสร้างเครือข่ายพันธมิตรห่วงโซ่อุปทานเพื่อลดต้นทุน เพื่อการแข่งขันให้เหนือกว่าคู่แข่งทางธุรกิจ โดยการปรับตัวนำนวัตกรรม เทคโนโลยี เข้ามาช่วยพัฒนาเพิ่มขีดความสามารถ และตอบสนองสร้างความพึงพอใจให้แก่ลูกค้า ส่งผลให้ธุรกิจสามารถอยู่รอดได้ในภาวะการแข่งขันที่รุนแรงในปัจจุบัน

การยกระดับความสามารถทางนวัตกรรมเพื่อรับมือกับความเปลี่ยนแปลงที่เกิดขึ้นอย่างต่อเนื่อง เพื่อเร่งการเติบโตในการลงทุนทางนวัตกรรมเชื่อมกับการใช้ประโยชน์จากงานวิจัย รวมทั้งการส่งเสริมให้เกิดความร่วมมือระหว่างภาคการศึกษาและภาคอุตสาหกรรม ช่วยเร่งการเติบโตการใช้ประโยชน์การลงทุน และการถ่ายทอดองค์ความรู้ด้านวิจัยและพัฒนาจากต่างประเทศ เพื่อสร้างผลผลิตทางนวัตกรรมที่ตอบโจทย์ความต้องการของตลาดโลก และสามารถใช้นวัตกรรมในการสร้างความได้เปรียบในการแข่งขันทางธุรกิจ

คำสำคัญ: การจัดการห่วงโซ่อุปทานอัจฉริยะ, ความสามารถทางนวัตกรรม, ความได้เปรียบทางการแข่งขัน, ผลดำเนินงานเชิงนวัตกรรม และประสิทธิภาพในการดำเนินธุรกิจ

Abstract

Today's economic and trade competition is intense due to the economic conditions. The economy is changing and fluctuating with uncertainty. Including under an environment of increasingly intense business competition in terms of introducing new products to the market. Responding to customer needs in a timely manner has become a driving force for companies or organizations to focus on trying to find ways to create a competitive advantage over business competitors.

By adapting and developing one's own abilities and respond and create satisfaction for customers, resulting in the business being able to survive in today's fierce competition. Improving innovation capabilities to cope with ongoing changes in order to accelerate the growth of investment in innovation, connecting with the utilization of research, especially in the Thai private sector, which has a higher proportion of investment. outstanding government agencies, including promoting cooperation between the education sector and the industrial sector will help accelerate the growth of investment utilization. and the transfer of research and development knowledge from abroad. To create innovative products that meet the needs of the global market and can use innovation to gain a competitive advantage in business.

Keywords: Smart Supply chain management, Innovation Capabilities, Competitive advantage, Innovation performance, Organizational performance

บทนำ

ผลกระทบต่อเศรษฐกิจทั่วโลกหลังการระบาดโรคโควิด-19 เกิดการชะลอตัวการหมุนเวียนระบบเศรษฐกิจในวงกว้าง มีผลต่อห่วงโซ่อุปทานโลกจากปัญหาการขาดแคลนแรงงานและวัตถุดิบ รัฐบาลไทยออกกฎหมายควบคุมเข้มงวด ทำให้ธุรกิจจำนวนมากได้รับผลกระทบจากมาตรการรัฐและเริ่มปิดกิจการลงไปตามลำดับ ซึ่งขนาดเศรษฐกิจประเทศไทยใหญ่เป็นอันดับสองของอาเซียน มีผลิตภัณฑ์มวลรวมในประเทศ (GDP) เฉลี่ยราว 15.45 ล้านล้านบาท (พัชรี สุวรรณศรี และ สุภัทณี เปี่ยมสุวรรณกิจ, 2562)

เนื่องด้วยปัญหาการระบาดของโรค รวมถึงความตึงเครียดของสงครามการค้า ส่งผลให้เกิดการหยุดชะงักของห่วงโซ่อุปทานของอุตสาหกรรมทำให้เกิดปัญหาการเชื่อมโยงห่วงโซ่การผลิต เกิดการสูญเสียโอกาสและต้นทุนสินค้าที่เพิ่มขึ้น สินค้าไม่พอเพียงต่อความต้องการในตลาด อุตสาหกรรมการผลิต (Manufacturing) กิจการค้าส่งและปลีก (Wholesale and Retail) และกิจการบริการ (Service) อีกทั้งมาตรการล็อกดาวน์มีผลทำให้การลงทุนโครงการต่าง ๆ ชะลอตัว มูลค่า FDI ในประเทศกำลังพัฒนาจะลดลงมากที่สุด เนื่องจากประเทศเหล่านี้มีการลงทุนในอุตสาหกรรมที่พึ่งพาห่วงโซ่การผลิตโลกสูง โดยในประเทศที่พัฒนาแล้ว FDI ในภูมิภาคยุโรปคาดว่าจะลดลง ร้อยละ 30-45 มากกว่าอเมริกาเหนือและประเทศที่พัฒนาแล้วที่จะลดลงร้อยละ 20-35 ในภูมิภาคแอฟริกา FDI คาดว่าจะลงลงร้อยละ 25 - 40 ส่วนประเทศกำลังพัฒนาในเอเชียจะรับผลกระทบรุนแรงสูงสุดคาดว่าจะลดลงร้อยละ 35 - 50 (United Nations Conference on Trade and Development: UNCTAD) ภาครัฐและภาคธุรกิจต่างเผชิญหน้า

กับการเปลี่ยนแปลงทางเศรษฐกิจที่เกิดขึ้นอย่างรวดเร็ว ความร่วมมือในห่วงโซ่การผลิตที่ขยายสู่ระดับโลก Global Supply Chains (GSC) มีผลอย่างยิ่งต่อการปรับโครงสร้างการค้าโลก การเชื่อมโยง Supply Chain ตั้งแต่ต้นน้ำถึงปลายน้ำการบริหารต้นทุนให้คุ้มค่าอาทิ อุตสาหกรรมอาหารแปรรูป เสื้อผ้า เครื่องใช้ไฟฟ้าอิเล็กทรอนิกส์ รถยนต์ หรือเครื่องบิน ซึ่งเป็นอุตสาหกรรมที่ล้วนมีเครือข่ายการผลิตกระจายอยู่ทั่วโลก โดยมีผู้ประกอบการไทยจำนวนไม่น้อยที่มีศักยภาพเข้าไปมีบทบาทในกระบวนการห่วงโซ่การผลิตระหว่างประเทศในหลาย ๆ ธุรกิจ (สำนักงานสภาพัฒนาการเศรษฐกิจและสังคมแห่งชาติ, 2563)

การปฏิรูปโครงสร้างทางธุรกิจไปสู่ประเทศที่แข่งขันด้วยเทคโนโลยีและองค์ความรู้ รวมถึงเกิดการสร้างธุรกิจใหม่ที่ตอบสนองความเปลี่ยนแปลงของห่วงโซ่มูลค่า และเป็นการสร้างตลาดแรงงานทักษะสูงที่ใช้ความรู้เข้มข้นเพื่อดึงดูดบุคลากรที่มีศักยภาพมาสร้างความสามารถในการแข่งขันให้กับธุรกิจอุตสาหกรรมและบริการแสดงให้เห็นว่าการจัดการห่วงโซ่อุปทานอัจฉริยะ ความสามารถทางนวัตกรรมและผลของความสามารถทางนวัตกรรมที่มีต่อความได้เปรียบทางการแข่งขันนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจที่มีต่อระบบเศรษฐกิจของประเทศไทย ดังนั้นผู้วิจัยมีความสนใจทำการศึกษาสมการโครงสร้างปัจจัยเชิงสาเหตุของการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขัน และผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ เพื่อผลการศึกษาจะเป็นประโยชน์ในการวางแผนและพัฒนากิจกรรมห่วงโซ่อุปทานในธุรกิจ และส่งเสริมความสามารถทางนวัตกรรมของธุรกิจให้มีประสิทธิผล และเพื่อสามารถนำไปใช้ดำเนินการจัดทำแผนพัฒนาบริหารการจัดการการวางแผนเชิงกลยุทธ์ในธุรกิจเพื่อสร้างความได้เปรียบในการแข่งขันต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาระดับความสัมพันธ์ของการจัดการห่วงโซ่อุปทานอัจฉริยะ ความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขัน ผลดำเนินงานเชิงนวัตกรรม และประสิทธิภาพในการดำเนินธุรกิจ
2. เพื่อวิเคราะห์สมการโครงสร้างปัจจัยเชิงสาเหตุของการจัดการห่วงโซ่อุปทานอัจฉริยะ ที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขัน และผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ

แนวคิด ทฤษฎี กรอบแนวคิด

การจัดการห่วงโซ่อุปทานเป็นการบริหารที่องค์กรสร้างความร่วมมือกับสมาชิกในห่วงโซ่อุปทานและมีการจัดการกระบวนการภายในองค์กร โดยมีเป้าหมายเพื่อให้การผลิตและบริการมีประสิทธิภาพ Gilbert (2001) โดยแนวทางที่ธุรกิจต่างให้ความสำคัญการจัดการห่วงโซ่อุปทาน (Supply Chain Management) ซึ่งเป็นการบริหารจัดการองค์กรทั้งระบบ เพื่อลดต้นทุนค่าใช้จ่ายและเพิ่มประสิทธิภาพการดำเนินงานขององค์กรอันจะส่งผลให้เพิ่มขีดความได้เปรียบในการแข่งขัน ทั้งในด้านราคาของสินค้าและความสามารถในการตอบสนองการดำเนินงานของกระบวนการทุกขั้นตอนในองค์กรอย่างชัดเจน (Langley, 2009) ผู้ประกอบการไทย เป็นกลไกหลักในการฟื้นฟูเศรษฐกิจและเสริมสร้างความก้าวหน้าทางเศรษฐกิจ จึงควรต้องนำดิจิทัลเทคโนโลยีมาปรับประยุกต์ใช้ให้เข้ากับห่วงโซ่การผลิตโลกในอนาคตให้เหมาะสมกับบริบทของธุรกิจของตัวเอง เพื่อปรับปรุงประสิทธิภาพการผลิต ต้นทุนที่ต่ำลง ซึ่งเป็นการเพิ่มศักยภาพการแข่งขันในตลาดโลก

ความสามารถทางนวัตกรรม (Innovation Capability) เป็นความสามารถในการเปลี่ยนแปลงแนวคิดและองค์ความรู้ไปสู่การสร้างผลิตภัณฑ์กระบวนการและระบบอันเป็นประโยชน์กับกิจการ ความสามารถออกแบบปรับเปลี่ยนแนวความคิดพัฒนาผลิตภัณฑ์ หรือบริการจากทรัพยากรที่มีอยู่ให้เป็นนวัตกรรม ผ่านกระบวนการทางการตลาดเพื่อสร้างความสำเร็จให้กับธุรกิจ โดยความสามารถเชิงนวัตกรรมผ่านทรัพยากรที่ได้มาจากการสร้างเครือข่ายจากภายนอก เพื่อเปิดโอกาสขยายฐานธุรกิจแลกเปลี่ยนทรัพยากรซึ่งกันและกันที่อยู่ภายใต้การมีผลประโยชน์ร่วมกัน (Walter, Auer, & Ritter, 2006) สำหรับนวัตกรรมผลิตภัณฑ์ (Product Innovation) พัฒนานำเสนอผลิตภัณฑ์หรือบริการใหม่ในรูปแบบเทคโนโลยีหรือวิธีการใช้ ปรับปรุงผลิตภัณฑ์เดิมที่มีอยู่ให้มีคุณภาพและประสิทธิภาพดียิ่งขึ้น (Schilling, 2008) ด้านนวัตกรรมกระบวนการ (Process Innovation) ประยุกต์ความสามารถเปลี่ยนแปลงกระบวนการผลิต ลดต้นทุนและเพิ่มผลผลิต ส่งผลโดยรวมมีประสิทธิภาพและประสิทธิผลสูงขึ้น (Lin & Cheng, 2007) โดยอาศัยเครื่องมือกรรมวิธีในการผลิตการจัดจำหน่ายหรือรูปแบบการจัดการองค์กร โดยมีเป้าหมายสู่การพัฒนานวัตกรรมผลิตภัณฑ์ (Gopalakrishnan & Damanpour, 1997) ด้านนวัตกรรมการตลาด (Market Innovation) ตอบสนองความต้องการของลูกค้าต่อผลิตภัณฑ์ใหม่และการหลีกหนีออกจากสมรภูมิการแข่งขันด้วยการหาช่องทางตลาดใหม่ที่มีความรุนแรงของการแข่งขันที่น้อยกว่า (Weiss, 2003) ซึ่งนำไปสู่ผลการดำเนินงานเชิงนวัตกรรมอันเป็นผลลัพธ์จากความสามารถเชิงนวัตกรรมที่เกี่ยวข้องกับการคิดค้นเปลี่ยนแปลงรูปแบบกระบวนการภายในและภายนอกองค์กร

การสร้างความได้เปรียบทางการแข่งขัน จึงเป็นสิ่งหนึ่งที่มีความจำเป็นในการดำเนินธุรกิจในยุคที่การแข่งขันมีความรุนแรง การกำหนดนโยบายกลยุทธ์และนโยบายการแข่งขันที่ชัดเจนจะช่วยสร้างขีดความสามารถและความได้เปรียบทางการแข่งขันของธุรกิจให้เหนือกว่าคู่แข่ง ทำให้ธุรกิจสามารถดำเนินการให้เป็นไปตามเป้าหมายและสามารถตอบสนองความต้องการของตลาดที่มีการเปลี่ยนแปลงอย่างต่อเนื่อง ซึ่งผลการดำเนินธุรกิจขององค์กร (Business Performance) เป็นตัวชี้วัดผลการดำเนินงานจากผลตอบแทนของสินทรัพย์การเติบโตของยอดขายความสำเร็จของผลิตภัณฑ์ใหม่ ส่วนแบ่งทางการตลาด (Moslem, Hamid, & Ali, 2015) ผลดำเนินงานธุรกิจทำให้ทราบถึงสถานะภาพดำเนินงานทั้งหมดของกิจการ ความสามารถการจัดการระบบบริหารคุณภาพขององค์กรที่จะทำให้กิจการเกิดการตอบสนองความต้องการของผู้มีส่วนได้ส่วนเสีย ยังช่วยเกิดการปรับปรุงผลการดำเนินงานทางธุรกิจ และเพิ่มความสามารถในการแข่งขันของธุรกิจ (Flynn, Huo & Zhao, 2010) ซึ่งผลการดำเนินธุรกิจขององค์กรจะส่งผลต่อการสร้างความได้เปรียบทางการแข่งขัน ช่วยให้ธุรกิจมีความสามารถที่แตกต่างจากคู่แข่งขันเพื่อหากลยุทธ์การแข่งขันที่เหมาะสมแก่ธุรกิจ และสนับสนุนให้มีผลการดำเนินงานที่เหนือกว่าคู่แข่ง เพื่อนำไปสู่การเป็นผู้นำการตลาดการใช้กลยุทธ์สร้างความพึงพอใจเหนือกว่าคู่แข่ง โดยสร้างความได้เปรียบทางการแข่งขัน (Healy, Serafeim,Srinivasan, Yu, 2014)

ข้อมูลจากสำนักงานนวัตกรรมแห่งชาติ (องค์กรมหาชน) หรือ NIA เผยผลการจัดอันดับดัชนีนวัตกรรมโลกประจำปี พ.ศ. 2565 (Global Innovation Index 2022: GII 2022) เพื่อวัดระดับความสามารถทางด้านนวัตกรรมที่เป็นเสมือนมาตรวัดเปรียบเทียบเชิงเวลาและการเปรียบเทียบเชิงแข่งขันทางด้านนวัตกรรมของแต่ละประเทศกว่า 130 ประเทศทั่วโลก ซึ่งในปี พ. ศ. 2565 ประเทศไทยยังครองอันดับที่ 43 ของโลก ซึ่งเป็นอันดับ 3 ในอาเซียนรองจากสิงคโปร์ อันดับ 7 ของโลก และมาเลเซีย อันดับ 36 ของโลก แสดงให้เห็นถึงการพัฒนาที่สอดรับและสนับสนุนให้ตรงกับปัจจัยและตัวชี้วัดที่เป็นข้อจำกัด

เชิงระบบจะช่วยให้ประเทศไทยสามารถก้าวกระโดดเป็นประเทศชั้นนำที่ขับเคลื่อนด้วยนวัตกรรม เพื่อรับมือกับความเปลี่ยนแปลงที่เกิดขึ้นอย่างต่อเนื่อง เพื่อเร่งการเติบโตในการลงทุนทางนวัตกรรมเชื่อมกับการใช้ประโยชน์จากงานวิจัยส่งเสริมให้เกิดความร่วมมือระหว่างภาคการศึกษาและภาคอุตสาหกรรมจะช่วยเร่งการเติบโตการใช้ประโยชน์การลงทุน และการถ่ายทอดองค์ความรู้ด้านวิจัยและพัฒนาจากต่างประเทศ เพื่อสร้างผลผลิตทางนวัตกรรมที่ตอบโจทย์ความต้องการของตลาดโลกและสามารถใช้นวัตกรรมสร้างความได้เปรียบในการแข่งขันทางธุรกิจ

สมมติฐานงานวิจัย

จากการพัฒนาแบบจำลองสมการโครงสร้างปัจจัยเชิงสาเหตุการจัดการห่วงโซ่อุปทานอัจฉริยะ ที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขันและผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจนำเสนอสมมติฐานงานวิจัยได้ดังนี้

สมมติฐานที่ 1 การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อความได้เปรียบในการแข่งขัน

สมมติฐานที่ 2 การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อความสามารถด้านนวัตกรรม

สมมติฐานที่ 3 การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อผลดำเนินงานเชิงนวัตกรรม

สมมติฐานที่ 4 การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อประสิทธิภาพดำเนินธุรกิจ

สมมติฐานที่ 5 ความสามารถด้านนวัตกรรมมีอิทธิพลต่อความได้เปรียบในการแข่งขัน

สมมติฐานที่ 6 ความสามารถด้านนวัตกรรมมีอิทธิพลต่อผลดำเนินงานเชิงนวัตกรรม

สมมติฐานที่ 7 ความสามารถด้านนวัตกรรมมีอิทธิพลต่อประสิทธิภาพดำเนินธุรกิจ

สมมติฐานที่ 8 ความได้เปรียบในการแข่งขันมีอิทธิพลต่อผลดำเนินงานเชิงนวัตกรรม

สมมติฐานที่ 9 ความได้เปรียบในการแข่งขันมีอิทธิพลต่อประสิทธิภาพดำเนินธุรกิจ

สมมติฐานที่ 11a การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อผลดำเนินงานเชิงนวัตกรรม โดยมีความสามารถด้านนวัตกรรมเป็นตัวแปรส่งผ่าน

สมมติฐานที่ 11b การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อความได้เปรียบในการแข่งขันโดยมีความสามารถด้านนวัตกรรมเป็นตัวแปรส่งผ่าน

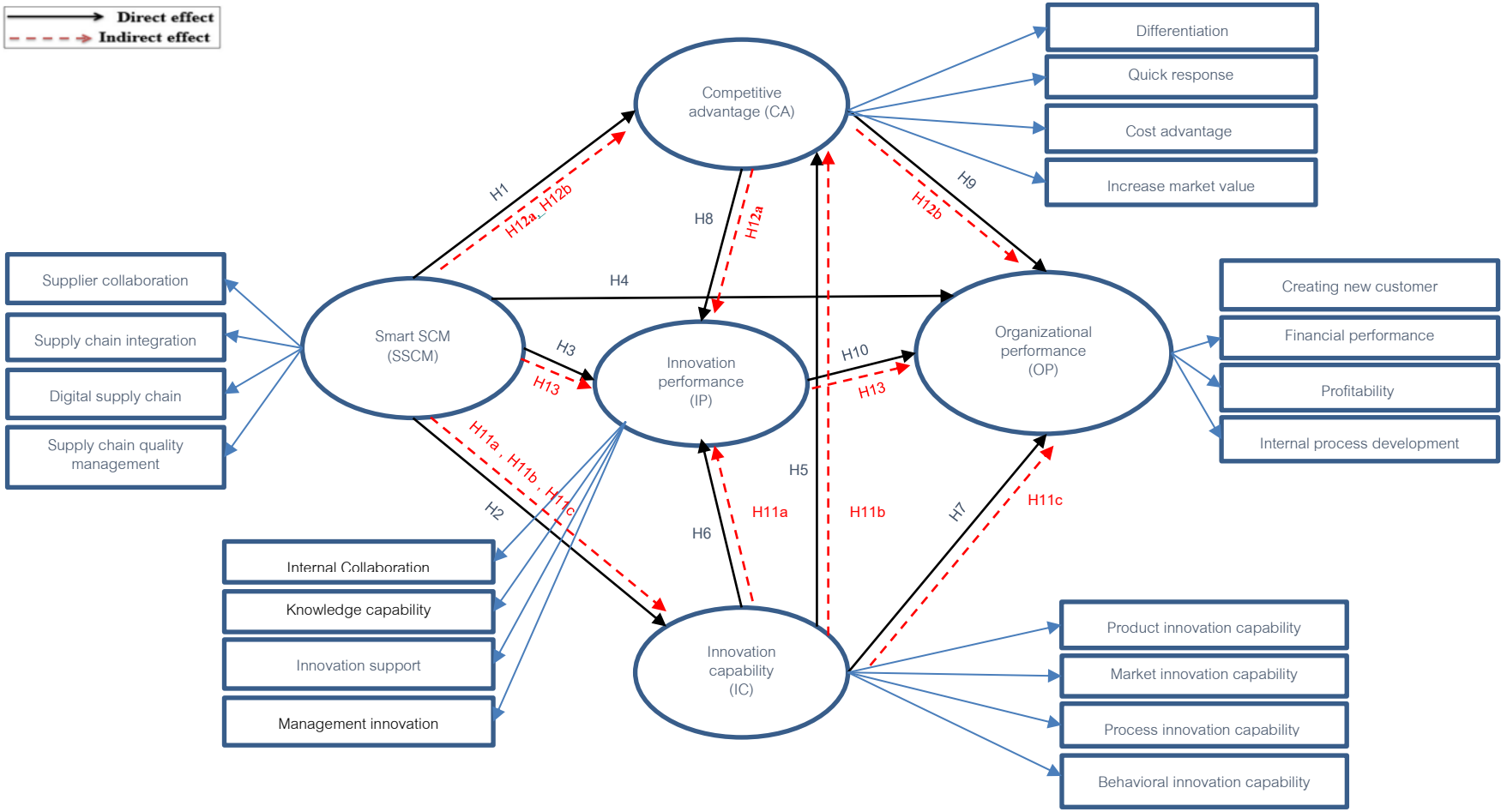
สมมติฐานที่ 11c การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อประสิทธิภาพดำเนินธุรกิจ โดยมีความสามารถด้านนวัตกรรมเป็นตัวแปรส่งผ่าน

สมมติฐานที่ 12a การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อผลดำเนินงานเชิงนวัตกรรม โดยมีความได้เปรียบในการแข่งขันเป็นตัวแปรส่งผ่าน

สมมติฐานที่ 12b การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อประสิทธิภาพดำเนินธุรกิจ โดยมีความได้เปรียบในการแข่งขันเป็นตัวแปรส่งผ่าน

สมมติฐานที่ 13 การจัดการห่วงโซ่อุปทานอัจฉริยะมีอิทธิพลต่อประสิทธิภาพดำเนินธุรกิจ โดยมีผลดำเนินงานเชิงนวัตกรรมเป็นตัวแปรส่งผ่าน

กรอบแนวคิดแบบจำลองสมการโครงสร้าง



ประโยชน์ที่คาดว่าจะได้รับ

1. ผลวิจัยจะทำให้ทราบสมการโครงสร้างปัจจัยเชิงสาเหตุการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขันและผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ เพื่อเป็นประโยชน์ในการบริหารจัดการใช้เป็นแนวทางในการวางแผนพัฒนากิจกรรมในธุรกิจของบริษัทให้มีประสิทธิภาพมากยิ่งขึ้น

2. ผลวิจัยจะทำให้ทราบแบบจำลองสมการโครงสร้างปัจจัยเชิงสาเหตุการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขันและผลดำเนินงานเชิงนวัตกรรมเพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ เพื่อสามารถนำไปใช้ในการวิเคราะห์ปัจจัยสำคัญที่มีอิทธิพลและจัดทำแผนเชิงกลยุทธ์ในการพัฒนาบริหารจัดการธุรกิจต่อไป

วิธีดำเนินการวิจัย

งานวิจัยเรื่อง สมการโครงสร้างปัจจัยเชิงสาเหตุการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขันและผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ ใช้วิธีดำเนินการวิจัย 2 แนวทางร่วมกัน สนับสนุนซึ่งกันและกัน คือ การวิจัยเชิงปริมาณ (Quantitative Research) เพื่อหาค่าและวิเคราะห์ความสัมพันธ์เป็นตัวเลขที่ชัดเจนในการสร้างแบบจำลองทางสถิติเพื่อการอธิบาย ข้อสังเกต ทดสอบสมมติฐาน วิเคราะห์ความสัมพันธ์เชิงสาเหตุระหว่างตัวแปรตามวัตถุประสงค์หลักเพื่อให้ได้ข้อค้นพบที่มีประสิทธิภาพสูงสุด และการวิจัยเชิงคุณภาพ (Qualitative Research) เพื่อให้ได้ข้อมูลในเชิงลึก และเป็นการศึกษาที่ช่วยเสริมและยืนยันผลให้การวิจัยเชิงปริมาณสมบูรณ์ยิ่งขึ้น ทั้งนี้ วัตถุประสงค์หลักของการกำหนดวิธีดำเนินการวิจัย คือ เพื่อให้ได้มาซึ่งข้อค้นพบที่มีประสิทธิภาพสูงสุดจากการวิจัย มีวิธีดำเนินการวิจัยตามวัตถุประสงค์ 5 หัวข้อดังต่อไปนี้

1. รูปแบบการวิจัย (Design Research)

ใช้วิธีการวิจัยแบบผสม (Mixed Methods) โดยทำการวิจัยเชิงปริมาณและเชิงคุณภาพใช้ 2 แนวทางร่วมกัน การวิจัยเชิงปริมาณ เสนอความเป็นรูปธรรมในทุกแนวคิดทุกประเด็นที่ศึกษาวัดค่าทุกแนวคิดหรือทุกตัวแปรออกมาเป็นตัวเลขได้ และวิเคราะห์ค่าอัตราความสัมพันธ์ออกมาเป็นตัวเลขชัดเจนเพื่อให้ได้มาซึ่งข้อค้นพบที่มีประสิทธิภาพสูงสุดจากการวิจัย และการวิจัยเชิงคุณภาพให้ได้ข้อมูลเชิงลึกให้ได้ความถูกต้อง ด้านรายละเอียดของการพรรณนาความ ผลจากการสัมภาษณ์เชิงลึกจะถูกเก็บรวบรวมเพื่อสังเคราะห์เนื้อหาในเรื่องที่ศึกษา เพื่อนำผลเป็นพื้นฐานในการนำไปใช้ยืนยันผล หรือหาข้อแนะนำผลเพิ่มเติมจากข้อค้นพบการวิจัยเชิงปริมาณต่อไป

2. การวิจัยเชิงปริมาณ (Quantitative Research)

ขั้นตอนการวิจัยเชิงปริมาณ (Quantitative Research) วัดค่าทุกแนวคิดหรือทุกตัวแปรออกมาเป็นตัวเลขได้ หาค่าอัตราความสัมพันธ์ออกมาเป็นตัวเลขชัดเจน สร้างแบบจำลองทางสถิติเพื่อการอธิบายข้อสังเกต ทดสอบสมมติฐานที่ตั้งไว้ และวิเคราะห์ความสัมพันธ์เชิงสาเหตุระหว่างตัวแปรได้ ในการศึกษาวิจัยในครั้งนี้ มีขั้นตอนดำเนินการวิจัยดังต่อไปนี้

ประชากรและกลุ่มตัวอย่าง

ประชากร (Population) คือ ผู้บริหารในเขตส่งเสริมอุตสาหกรรมในพื้นที่เขตนิคมอุตสาหกรรมภาคตะวันออกจำนวน 3,619 บริษัท (การนิคมแห่งประเทศไทย, 2564)

กลุ่มตัวอย่าง (Sampling) คือ กลุ่มตัวอย่างที่ศึกษา ได้แก่ ผู้บริหารในระดับผู้จัดการฝ่ายต่าง ๆ ในองค์กรขึ้นไป ในเขตส่งเสริมอุตสาหกรรมในพื้นที่เขตนิคมอุตสาหกรรมภาคตะวันออก จำนวน 400 คน โดยผู้วิจัยได้ทำการพิจารณาถึงขนาดของกลุ่มตัวอย่างที่มีความเหมาะสมกับการวิเคราะห์ข้อมูลโดยการใช้เครื่องมือทางสถิติ Structural Equation Modeling (SEM) ซึ่งผู้วิจัยใช้วิธีการกำหนดกลุ่มตัวอย่างตามกฎแห่งความชัดเจน (Rule of Thumb) ขนาดของตัวอย่างที่เหมาะสมในงานที่มีการวิเคราะห์องค์ประกอบการวิเคราะห์เส้นทาง และโมเดลสมการโครงสร้าง Comrey (1973) ได้ให้ข้อเสนอแนะขนาดตัวอย่างที่เหมาะสม โดยกำหนดขอบเขตของตัวอย่างควรมีหน่วยตัวอย่างที่ใช้ในการศึกษาไม่ต่ำกว่า 200 ตัวอย่าง (Kline, 2015) นอกจากนี้ยังมีนักสถิติและนักวิจัยที่มีชื่อเสียงอีกหลายท่าน เช่น Hair, Black, Babin, and Anderson (2010) ได้แนะนำถึงงานวิจัยประเภทนี้ว่า ควรใช้ขนาดตัวอย่างระหว่าง 15 - 20 ตัวอย่างต่อ 1 พารามิเตอร์ที่เป็นตัวแปรทำนาย (Shumacker & Lomax, 2010) ซึ่งสอดคล้องกับ Anderson and Gerbing (1988) 15 - 20 เท่าของจำนวนตัวแปร ดังนั้นขนาดตัวอย่างที่มีความเหมาะสมและเพียงพอจึงควรมีอย่างน้อย (20 x 20 = 400) ซึ่งผลจากการคำนวณดังกล่าวเป็นจำนวนของขนาดกลุ่มตัวอย่างขั้นต่ำ 400 ตัวอย่าง สามารถนำมาใช้ในการวิเคราะห์ข้อมูลด้วยเครื่องมือทางสถิติ Structural Equation Modeling (SEM) โดยในการศึกษาวิจัยในครั้งนี้ได้ทำการเก็บข้อมูลจากผู้บริหารในเขตส่งเสริมอุตสาหกรรมในพื้นที่เขตนิคมอุตสาหกรรมภาคตะวันออก ซึ่งเป็นกลุ่มตัวอย่างที่ให้ข้อมูลที่สามารถนำมาใช้งานได้ทั้งหมดและใช้วิธีการสุ่มตัวอย่างแบบชั้นภูมิ (Stratified Random Sampling)

ตารางที่ 3 ตารางแจกแจงกลุ่มตัวอย่างรายชื่อนิคมอุตสาหกรรมในพื้นที่เขตอุตสาหกรรมภาคตะวันออก

ลำดับ	รายชื่อนิคมอุตสาหกรรมในภาคตะวันออก EEC	จำนวน	กลุ่มตัวอย่าง	คิดเป็นร้อยละ
1	นิคมอุตสาหกรรมอีสเทิร์นซีบอร์ด ระยอง	421	45	12.92
2	นิคมอุตสาหกรรมดับบลิวเอชเอตะวันออกระยอง (มาบตาพุด)	144	15	4.38
3	นิคมอุตสาหกรรมดับบลิวเอชเอ อีสเทิร์นซีบอร์ด ระยอง	195	21	5.83
4	นิคมอุตสาหกรรมดับบลิวเอชเอชลบุรี	154	17	4.38
5	นิคมอุตสาหกรรมดับบลิวเอชเอชลบุรี 2	10	1	0.21
6	นิคมอุตสาหกรรมดับบลิวเอชเอ อีสเทิร์นซีบอร์ด 4	2	1	0.21
7	นิคมอุตสาหกรรมอมตะซิตี้ ชลบุรี	1180	130	36.04
8	นิคมอุตสาหกรรมอมตะซิตี้ ระยอง	529	58	16.04
9	นิคมอุตสาหกรรมปิ่นทอง ชลบุรี	197	20	6.04
10	นิคมอุตสาหกรรมปิ่นทอง แหลมฉบัง ชลบุรี	104	11	3.13
11	นิคมอุตสาหกรรมปิ่นทอง โครงการ 3	71	7	2.08
12	นิคมอุตสาหกรรมปิ่นทอง โครงการ 5	4	1	0.21
13	นิคมอุตสาหกรรมแหลมฉบัง ชลบุรี	140	15	3.13

ลำดับ	รายชื่อนิคมอุตสาหกรรมในภาคตะวันออก EEC	จำนวน	กลุ่มตัวอย่าง	คิดเป็นร้อยละ
14	นิคมอุตสาหกรรม 304 ฉะเชิงเทรา	252	25	2.71
15	นิคมอุตสาหกรรมเวลโกร์ว ฉะเชิงเทรา	153	17	1.67
16	นิคมอุตสาหกรรมเกตเวย์ซิตี้ ฉะเชิงเทรา	63	7	1.04
	รวมทั้งหมด	**3,619**	**400**	100.00

3. การวิจัยคุณภาพ (Qualitative Research)

ใช้แบบสัมภาษณ์เชิงลึก (In-depth Interview) เป็นเครื่องมือการวิจัยเชิงคุณภาพ อ้างอิงจากกรอบแนวคิดการวิจัย ซึ่งเป็นผลลัพธ์ที่ได้มาจากการทบทวนวรรณกรรมที่เกี่ยวข้อง 5 ด้าน ได้แก่ ด้านการจัดการห่วงโซ่อุปทานอัจฉริยะ ด้านความสามารถด้านนวัตกรรม ด้านความได้เปรียบในการแข่งขัน ด้านผลดำเนินงานเชิงนวัตกรรม ด้านประสิทธิภาพในการดำเนินธุรกิจ ซึ่งมีขั้นตอนการวิจัยดังต่อไปนี้

การเลือกผู้ให้ข้อมูลหลัก (Key Informant)

กำหนดผู้ให้ข้อมูลหลัก คือ ผู้บริหารที่มีประสบการณ์ในตำแหน่งผู้จัดการฝ่ายขึ้นไปมากกว่า 5 ปี ในพื้นที่ภาคตะวันออก ประกอบด้วย จังหวัดฉะเชิงเทรา ชลบุรี และ ระยอง และผู้แทนของหน่วยงานภาครัฐที่เกี่ยวข้องกับการสนับสนุน ส่งเสริม รวมจำนวน 9 ท่าน ที่ได้มาโดยการเลือกแบบเจาะจง (Purposive Sampling) ตามเกณฑ์ที่ได้กำหนดไว้เพื่อใช้ในการตรวจสอบความความเป็นประโยชน์ ความเป็นไปได้ ความเหมาะสม และความถูกต้อง

เครื่องมือในการเก็บรวบรวมข้อมูล

ผู้วิจัยใช้เทคนิคการสัมภาษณ์เชิงลึก (In-depth Interview) ด้วยแบบสัมภาษณ์เชิงลึก โดยการสัมภาษณ์ผู้ให้ข้อมูลหลักด้วยตนเองเพื่อให้สามารถเพิ่มเติมคำถามที่ควรถามหากมีประเด็นที่น่าสนใจเพิ่มเติมไปจากคำถามโครงสร้างที่วางไว้ และจดบันทึกคำให้สัมภาษณ์ของผู้ให้ข้อมูลเพื่อการวิเคราะห์เพิ่มเติมในภายหลัง หากมีความจำเป็นก็จะขอนัดหมายเพื่อดำเนินการสัมภาษณ์เพิ่มเติม สิ่งที่จะรวบรวมจากการสัมภาษณ์เชิงลึกนี้ ได้แก่ ตัวแปรต้นที่จำเป็นต้องมีและตัวแปรที่จะส่งผลต่อตัวแปรตาม ซึ่งอาจเป็นตัวแปรต้นตัวเดียวกับที่ได้จากการทบทวนวรรณกรรม หรือตัวแปรอื่น ๆ นอกเหนือจากนั้นเมื่อรวบรวมข้อมูลได้แล้วจะนำข้อมูลมาประมวลผลด้วยการทำดัชนีข้อมูลทำข้อสรุปชั่วคราว กำจัดข้อมูลแล้วสร้างบทสรุปและพิสูจน์บทสรุป

4. การพัฒนาเครื่องมือวิจัย

การสร้างเครื่องมือที่ใช้ในการวิจัย

1. การศึกษาวิจัยเชิงปริมาณ โดยเก็บรวบรวมข้อมูลโดยแบบสอบถาม เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลเชิงปริมาณในการวิจัยครั้งนี้ มีลักษณะเป็นคำถามที่ให้ตอบพฤติกรรมที่ดำเนินการจริง โดยการพัฒนาแบบสอบถามจากการศึกษาทฤษฎี แนวคิด เอกสาร และงานวิจัยที่เกี่ยวข้องกับการแบ่งปันความรู้ประกอบกับข้อมูลที่ได้จากการสัมภาษณ์มาเป็นกรอบในการกำหนดรายการหรือข้อความที่ถาม รวมทั้งตัวคำตอบที่ให้เลือกตอบ รายละเอียดแบบสอบถามโดยใช้คำถามปลายปิด (Close-end Question) และปลายเปิด (Open-end Question)

2. การศึกษาวิจัยเชิงคุณภาพ โดยการเก็บรวบรวมข้อมูลจากการสัมภาษณ์แบบกึ่งโครงสร้าง (Semi Structure Interview) กับผู้ประกอบการหรือผู้บริหารจำนวน 9 ตัวอย่าง ก่อนการวิเคราะห์ข้อมูล

เชิงปริมาณ ทั้งนี้ ผู้วิจัยได้กำหนดวัตถุประสงค์ และระบุประเด็นเนื้อหาที่จะสัมภาษณ์โดยใช้แนวคิด ทฤษฎีเกี่ยวกับการแบ่งปันความรู้เป็นกรอบการสัมภาษณ์ เพื่อค้นหาปัจจัยสำคัญที่ส่งผลต่อการแบ่งปันความรู้

ส่วนที่เป็นการวิจัยเชิงปริมาณนั้น ผู้วิจัยกำหนดให้ใช้แบบสอบถาม (Questionnaire) โดยเก็บข้อมูลจากผู้ให้ข้อมูลของกลุ่มตัวอย่าง ได้แก่ กลุ่มตัวอย่างที่ศึกษาสภาพความเป็นจริง และสภาพที่พึงประสงค์ที่เกี่ยวข้ององค์ประกอบ 5 ด้าน โดยการสอบถามความคิดเห็นของผู้บริหารหรือผู้ประกอบการเขตส่งเสริมนิคมอุตสาหกรรมในพื้นที่ภาคตะวันออก จำนวน 400 คน โดยการสำรวจในส่วนนี้จะเป็นการสำรวจเกี่ยวกับข้อมูลทั่วไปของผู้ตอบแบบสอบถาม โดยผู้วิจัยได้ใช้เป็นตัวแปรแฝง (Latent Variables) ในโมเดล และมีตัวบ่งชี้ที่เป็นตัวแปรสังเกตได้ (Observed Variables) จากการวิเคราะห์และสังเคราะห์เอกสารได้ตัวแปร จำนวน 20 ตัวแปร นำข้อมูลมาใช้ในการวิเคราะห์ และทดสอบสมมติฐานการวิจัยต่อไป โดยลักษณะของแบบสอบถามจะประกอบด้วย

1. การสำรวจข้อมูลทั่วไปของผู้ตอบแบบสอบถาม ประกอบด้วยข้อคำถามแบบให้เลือกตอบได้คำตอบเดียว ได้แก่ เพศ อายุ ระดับการศึกษา ประสบการณ์ในการทำงาน รายได้เฉลี่ยต่อเดือน เป็นต้น

2. การสำรวจความคิดเห็นของผู้ตอบแบบสอบถาม

การสำรวจประเด็นนี้จะใช้แบบสอบถาม ซึ่งแต่ละประเด็นจะมีระดับคะแนน (Rating Scale) 5 ระดับ ตามแบบวัดเจตคติด้วยเทคนิคของลิเคิร์ท (Likert Technique)

การตรวจสอบคุณภาพของแบบสอบถามนั้น จะใช้วิธีการหาค่าความสอดคล้องระหว่างข้อคำถามกับวัตถุประสงค์หรือเนื้อหาการวิจัย (Index of Item Objective Congruence หรือ IOC) ตามวิธีการของ Rovineli and Hambleton (1996) จากการให้ผู้เชี่ยวชาญตรวจสอบแบบสอบถามการวิจัยโดยจะให้ผู้เชี่ยวชาญตรวจสอบไม่น้อยกว่า 5 คน แล้วนำผลคะแนนที่ได้จากผู้เชี่ยวชาญมาคำนวณหาค่า IOC ตามสูตร เกณฑ์สำหรับความเที่ยงตรงมีดังนี้

ข้อคำถามที่มีค่า IOC	ตั้งแต่	0.50 - 1.00	มีค่าความเที่ยงตรง ใช้ได้
ข้อคำถามที่มีค่า IOC	ต่ำกว่า	0.50	ต้องปรับปรุง ยังใช้ไม่ได้

การทดสอบความเชื่อมั่น (Reliability) ของแบบสอบถามโดยจะนำแบบสอบถามที่สร้างขึ้นมาและปรับปรุงแก้ไขแล้วไปทำการทดสอบ (Pre-test) จำนวน 30 ชุด กับกลุ่มตัวอย่างที่คัดเลือกไว้เป็นกลุ่มตัวอย่างที่มีคุณสมบัติใกล้เคียงกับประชากรที่ต้องการศึกษาแล้วนำมาทดสอบความเชื่อมั่นของแบบสอบถามโดยใช้โปรแกรมสำเร็จรูปในการหาความน่าเชื่อถือตามเกณฑ์ โดยใช้ค่าสัมประสิทธิ์แอลฟ่า (Alpha Coefficient) ที่ Cornbach (1951) ได้นำเสนอไว้ว่า ค่าแอลฟ่าควรมากกว่าหรือเท่ากับ 0.7 สำหรับงานวิจัยเชิงสำรวจ (Exploratory Research)

การทดสอบเครื่องมือ

การทดสอบความตรง (Validity) นำแบบสอบถามที่สร้างขึ้นเสนอให้อาจารย์ที่ปรึกษาวิทยานิพนธ์ตรวจสอบความเหมาะสมของภาษา ความสอดคล้องและความครอบคลุมตามนิยามของตัวแปร แล้วนำมาปรับปรุงแก้ไขข้อคำถามตามคำแนะนำของอาจารย์ที่ปรึกษาวิทยานิพนธ์ หลังจากนั้นจะนำแบบสอบถามที่แก้ไขแล้วไปตรวจสอบคุณภาพเบื้องต้น โดยให้ผู้เชี่ยวชาญ จำนวน 3 ท่าน เป็นผู้ตรวจสอบความตรงเชิงเนื้อหา (Content Validity) โดยการหาดัชนีความสอดคล้องระหว่างคำถามและวัตถุประสงค์การวิจัย (Index of Item Objective Congruence: IOC) ตามวิธีการของ Rovineli and Hambleton (1996) รวมทั้งตรวจสอบความเหมาะสมของเนื้อหา ภาษาที่ใช้ ความสอดคล้องและครอบคลุมตามนิยามของ

ตัวแปร โดยใช้เกณฑ์ดัชนีความสอดคล้องระหว่างข้อคำถามและวัตถุประสงค์สามารถนำข้อคำถามไปใช้ได้ (พวงรัตน์ ทวีรัตน์, 2548)

การหาความเที่ยงตรง (Validity) ผู้วิจัยได้นำแบบสอบถามที่สร้างขึ้นให้อาจารย์ที่ปรึกษาตรวจสอบความสอดคล้อง ความครอบคลุมของนิยามตัวแปร แล้วนำไปแก้ไขปรับปรุงตามคำแนะนำของอาจารย์ที่ปรึกษาวิทยานิพนธ์ หลังจากนั้นนำแบบสอบถามที่ผ่านการแนะนำแล้วไป ตรวจสอบคุณภาพเบื้องต้นโดยผู้เชี่ยวชาญ 3 ท่าน เพื่อตรวจสอบความสอดคล้องของข้อความในเครื่องมือที่สร้างไว้ว่ามีความสอดคล้องกับการนิยามตัวแปรที่ต้องการวัดหรือไม่ ที่เรียกว่า การทดสอบความเที่ยงตรงเชิงเนื้อหา (Content Validity) โดยการหาค่า Index of item objective Congruence (IOC) ซึ่งผลตรวจสอบคุณภาพเบื้องต้นโดยผู้เชี่ยวชาญ 3 ท่านมีผลการทดสอบ ความเที่ยงตรงของเนื้อหามีผลของการทดสอบความเที่ยงตรงของเนื้อหาอยู่ระหว่าง 0.6 - 1.00 สอดคล้องกับ พิชิต ฤทธิ์จรูญ (2543) กล่าวว่า ค่า IOC ถ้ามีค่ามากกว่าหรือเท่ากับ 0.5 ขึ้นไปแสดงว่า ข้อคำถามนั้นสามารถใช้ได้ และสอดคล้องกับ พวงรัตน์ ทวีรัตน์ (2548) กล่าวว่า เกณฑ์วัดค่าดัชนีความสอดคล้องของข้อคำถามและวัตถุประสงค์ที่คำนวณได้มากกว่าหรือเท่ากับ 0.5 แสดงว่า ข้อคำถามนั้นมีความสอดคล้องกับวัตถุประสงค์ สามารถนำข้อคำถามไปใช้ในการเก็บข้อมูลได้โดยการใช้การวิเคราะห์ปัจจัย (Factor Analysis) หา EFA ใช้ ตรวจสอบ Construct Validity เพื่อตรวจสอบและยืนยันความถูกต้องของมาตรวัดของข้อคำถามที่ได้จากการทบทวนวรรณกรรมว่าตัวแปรมีความเหมาะสมและครอบคลุมเนื้อหาในเชิงทฤษฎี

การเก็บรวบรวมข้อมูล

การวิจัยในครั้งนี้ ผู้วิจัยได้ดำเนินการเก็บรวบรวมข้อมูล เป็นไปตามลำดับดังนี้

1. การวิจัยข้อมูลเชิงปริมาณ ผู้วิจัยใช้การวิจัยเชิงสำรวจโดยการแจกแบบสอบถามทางไปรษณีย์หรือใช้แบบสอบถามแบบอิเล็กทรอนิกส์ Google Form ผ่านช่องทางอีเมลให้กับผู้บริหารในเขตส่งเสริมอุตสาหกรรมในพื้นที่เขตนิคมอุตสาหกรรมภาคตะวันออกจำนวน 400 คน ระยะเวลาที่ได้รับแบบสอบถามกลับมาประมาณ 8 สัปดาห์ โดยนับจากวันที่ส่งแบบสอบถาม เมื่อครบกำหนดเวลาแล้วผู้วิจัยยังไม่ได้รับแบบสอบถามคืน ผู้วิจัยจะติดตามทวงถามข้อมูลทางโทรศัพท์ต่อไป เพื่อนำผลที่ได้มาวิเคราะห์ข้อมูลทางสถิติโดยใช้โปรแกรม SPSS ใช้โปรแกรม AMOS สำหรับการวิเคราะห์รูปแบบการวิเคราะห์โมเดลสมการโครงสร้าง (Structural Equation Model: SEM) ผู้วิจัยนำแบบสอบถามการวิจัยเชิงปริมาณที่ได้รับกลับคืนมาตรวจสอบความครบถ้วน สมบูรณ์ และความเรียบร้อยของแบบสอบถามทั้งหมด จำนวน 400 ตัวอย่าง คิดเป็นอัตราการตอบกลับร้อยละ 100 สอดคล้องกับแนวคิดของ Comery and Lee (1992)

2. การวิจัยเชิงคุณภาพ ในการเก็บรวบรวมข้อมูลเชิงคุณภาพผู้วิจัยได้สร้างเครื่องมือเป็นแบบการสัมภาษณ์แบบกึ่งโครงสร้าง (Semi-structured Interview) โดยวัตถุประสงค์ของการสัมภาษณ์เพื่อสร้างความคิดรวบยอดของโครงสร้างความสัมพันธ์สมการโครงสร้างปัจจัยเชิงสาเหตุการจัดการห่วงโซ่อุปทานอัจฉริยะที่ส่งผลต่อความสามารถทางนวัตกรรม ความได้เปรียบทางการแข่งขัน และผลดำเนินงานเชิงนวัตกรรม เพื่อนำไปสู่ประสิทธิภาพในการดำเนินธุรกิจ ผู้ให้ข้อมูลคือ เจ้าของกิจการ/ผู้บริหารในธุรกิจอุตสาหกรรมในเขตส่งเสริมอุตสาหกรรมในพื้นที่นิคมอุตสาหกรรมภาคตะวันออก จำนวน 9 ตัวอย่าง ในการสัมภาษณ์ผู้วิจัยแจ้งผู้ถูกสัมภาษณ์ทราบล่วงหน้าอย่างน้อย 3 - 7 วัน ใช้เวลาในการสัมภาษณ์ไม่น้อยกว่า 30 นาที พร้อมทั้งขอนัดเวลาและสถานที่ในการสัมภาษณ์เกี่ยวกับธุรกิจอุตสาหกรรมในเขตส่งเสริมอุตสาหกรรมในพื้นที่นิคมอุตสาหกรรมภาคตะวันออก ได้แก่ จังหวัดระยอง จังหวัดชลบุรี และจังหวัด

ฉะเชิงเทรา โดยนำเสนอข้อมูลที่เป็นประโยชน์เพื่อใช้ในการวิเคราะห์และยืนยันผลหรือหาข้อสรุปผลเพิ่มเติม

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สาเหตุของการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 ในปี 2021

Causes of Unemployment and Household Unemployed in Bangkok from the COVID-19 Situation in 2021

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บทคัดย่อ

งานวิจัยครั้งนี้มีจุดประสงค์ เพื่อศึกษาสาเหตุของการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 ในปี 2021 โดยใช้การวิเคราะห์การถดถอยโลจิสติกทวิภาค ข้อมูลที่นำมาศึกษาเป็นข้อมูลทุติยภูมิจากสำนักงานสถิติแห่งชาติ ในโครงการสำรวจภาวะการทำงานของประชากร ไตรมาสที่ 1 พ.ศ.2564 มีครัวเรือนตัวอย่างทั้งสิ้น 9,300 ครัวเรือน จากการวิเคราะห์พบว่าสาเหตุของการว่างงานและไม่ว่างงานของครัวเรือน ได้แก่ ตัวแปรอายุ ตัวแปรช่องทางการหางาน/สมัครงาน ตัวแปรเหตุผลที่ไม่หางานทำ ตัวแปรระยะเวลาที่หางาน/พร้อมทำงาน ตัวแปรสาเหตุที่ออกจากงานล่าสุด ตัวแปรระยะเวลาที่ออกจากงานล่าสุด และตัวแปรระยะเวลาที่หยุดงาน

คำสำคัญ: สถานการณ์ COVID-19 ในปี ค.ศ. 2021, การวิเคราะห์การถดถอยโลจิสติกทวิภาค

Abstract

The purpose of this research is to study the causes of unemployment and unemployment among households in Bangkok from the COVID-19 situation in 2021 using binary logistic regression analysis. The data used for the study is secondary data from the National Statistical Office. In the Labor Force Survey Project, Quarter 1 2021, there were a total of 9,300 sample households. From the analysis, it was found that The causes of unemployment and non- unemployment of households include age variables, job search/apply job channel variables. Variable reasons for not looking for work Variables on the period of time spent looking for work/ ready to work Variables of reasons for leaving the most recent job Variables for the period of time since last leave the job and the variable length of time off work.

Keywords: COVID-19 situation in 2021, Binary Logistic Regression

บทนำ

ในปี ค.ศ. 2021 การแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) ได้ส่งผลกระทบอย่างรุนแรงไปทั่วโลกรวมถึงประเทศไทย ซึ่งส่งผลให้มีผู้ติดเชื้อและผู้เสียชีวิตเป็นจำนวนมาก ข้อมูลสถานการณ์การแพร่ระบาด โดยข้อมูลจากกรมควบคุมโรค กระทรวงสาธารณสุข. ณ วันที่ 10 ตุลาคม พ.ศ. 2564 พบว่า มีผู้ติดเชื้อสะสมจำนวน 1,682,021ราย และผู้เสียชีวิตสะสมจำนวน 17,597 ราย (กรมควบคุมโรค, 2564) ซึ่งสถานการณ์ที่รุนแรงนี้ทำให้ทางภาครัฐต้องออกมาตรการต่าง ๆ เพื่อควบคุมการแพร่ระบาดของ COVID-19 ซึ่งได้ส่งผลกระทบอย่างรุนแรงต่อเศรษฐกิจไทย ส่งผลต่อการว่างงาน และการลดลงของรายได้ของผู้คนจำนวนมาก (กิริยา กุลกลการ, อนันต์ ภาวสุทธิไพศิฐ และ สุทธาภา นพวิญญูวงศ์, 2563)

ปัญหาสำคัญทางเศรษฐกิจและสังคม ปัญหาหนึ่งที่รัฐบาลเกือบทุกประเทศทั่วโลกกำลังเผชิญอยู่ในปัจจุบัน คือ ปัญหาการว่างงาน สำหรับในประเทศไทย การว่างงานเป็นปัญหาที่ส่อแววว่าจะขยายวงกว้าง และเพิ่มความรุนแรงขึ้นทุกขณะ โดยข้อมูลการสำรวจภาวะการว่างงานของประชากรโดยสำนักงานสถิติแห่งชาติ ในไตรมาสที่ 1 ปี 2021 พบว่า ผู้มีอายุ 15 ปีขึ้นไปของกรุงเทพมหานครมีทั้งสิ้น 7,657,600 คน เป็นผู้ว่างงานจำนวน 125,004 คน ซึ่งมีจำนวนเพิ่มขึ้น 77,131 คน เทียบกับในช่วงเวลาเดียวกันในปี ค.ศ. 2020 (สำนักงานสถิติแห่งชาติ, 2564) และจากการสำรวจอัตราค่าครองชีพของประชากรที่อาศัยอยู่ในกรุงเทพมหานคร พบว่า ประชากรมีรายได้เฉลี่ยอยู่ที่ 26,502 บาทต่อเดือน แต่กลับมีค่าครองชีพโดยเฉลี่ยสูงถึง 33,032 บาทต่อเดือน (ขนิษฐา สาสะกุล, 2564) ซึ่งเห็นได้ว่าระดับของรายได้นั้นสวนทางกับรายจ่าย โดยเฉพาะค่าครองชีพพื้นฐานที่กำลังปรับขึ้นหลายรายการ ในขณะที่รายได้ยังเท่าเดิมหรือลดลงจากสภาพเศรษฐกิจที่ยังไม่ฟื้นตัว ประกอบกับประชากรในกรุงเทพมหานครที่มีจำนวนหนาแน่น จึงส่งผลกระทบต่อการหางานทำของครัวเรือนในกรุงเทพมหานคร เนื่องจากครัวเรือนต้องดูแลตนเองและครอบครัว รวมถึงมีการกักตัวอยู่ที่บ้าน ทำให้ไม่สามารถทำงานหารายได้แบบปกติได้

ดังนั้นหากต้องมีการกำหนดและดำเนินนโยบายที่มีประสิทธิภาพเพื่อแก้ไขระดับการว่างงาน ควรศึกษาเพิ่มเติมเกี่ยวกับสาเหตุที่เกี่ยวข้องกับระดับการว่างงาน ซึ่งสาเหตุที่เกี่ยวข้องกับระดับการว่างงานมีหลายประการ เช่น ลักษณะส่วนบุคคล ปัจจัยด้านการทำงาน และปัจจัยด้านรายได้ ซึ่งส่งผลกระทบต่อการว่างงานโดยตรงโดยเฉพาะอย่างยิ่งปัญหาที่เกิดในช่วงของการแพร่ระบาดของ COVID-19 จากเหตุผลดังกล่าว ผู้วิจัยจึงมีความต้องการที่จะศึกษาถึงสาเหตุที่มีอิทธิพลต่อการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 เพื่อเป็นแนวทางให้กับหน่วยงานที่เกี่ยวข้องสามารถนำผลที่ศึกษาไปวางแผนและกำหนดนโยบายในการแก้ปัญหาการว่างงานได้ดีขึ้น

วัตถุประสงค์ของการวิจัย

1. ศึกษาและตรวจสอบสาเหตุที่เกี่ยวข้องกับการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 ในปี ค.ศ. 2021
2. วิเคราะห์ตัวแบบเพื่อทำนายการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 ในปี ค.ศ. 2021

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิดและทฤษฎีเกี่ยวกับปัจจัยส่วนบุคคล

ลักษณะทางด้านประชากรศาสตร์หรือลักษณะส่วนบุคคล เป็นความหลากหลายด้านภูมิหลังของบุคคล เช่น เพศ อายุ สถานภาพ อาวุโสในการทำงาน เป็นต้น (วชิรวัชร งามละม่อม, 2558)

2. แนวคิดและทฤษฎีเกี่ยวกับปัจจัยด้านการทำงาน

Albanese (1981) ได้ให้นิยามของการทำงานว่า คือ พฤติกรรมและการกระทำของคนงานที่จะส่งผลต่อความสำเร็จต่องานของเขาโดยตรงและพฤติกรรมนั้น ยังรวมไปถึงการแสดงออกของคนงานที่มีต่อสิ่งแวดล้อมในสังคมที่เขาปฏิบัติงานอยู่ เช่น ความสัมพันธ์กับเพื่อนร่วมงาน การเข้าร่วมการฝึกอบรม

3. แนวคิดและทฤษฎีเกี่ยวกับระดับการว่างงาน

ระดับการว่างงานแบ่งออกเป็น 2 ระดับ คือ การมีงานทำและการไม่มีงานทำ (การว่างงาน) ซึ่งผู้วิจัยได้ศึกษาแนวคิดและทฤษฎี ดังนี้

3.1 นิยามการว่างงาน

สำนักงานสถิติแห่งชาติ (2565) ได้ให้นิยามของผู้ว่างงานทำไว้ว่า ผู้ว่างงาน หมายถึง บุคคลที่มีอายุ 15 ปีขึ้นไป และมีลักษณะอย่างหนึ่งอย่างใด ดังต่อไปนี้

1) ไม่ได้ทำงานและไม่มีงานประจำ แต่ได้หางาน สมัครงาน หรือรอการบรรจุ

2) ไม่ได้ทำงานและไม่มีงานประจำ และไม่ได้หางานทำ แต่พร้อมที่จะทำงาน

3.2 ประเภทการว่างงาน

การว่างงานสามารถจำแนกได้เป็น 3 ประเภท คือ (อมรทิพย์ แท้เที่ยงธรรม, 2540)

1. การว่างงานชั่วคราว (Fiction Unemployment) หมายถึง การที่บุคคลไม่มีงานทำเพียงในช่วงระยะเวลาสั้น ๆ อาจเกิดขึ้นเนื่องจากแรงงานขาดข่าวสารข้อมูลเกี่ยวกับงาน จึงไม่ทราบว่าที่ใดมีงานทำหรือแรงงานอยู่ระหว่างการแสวงหางานที่ดีที่สุด (Best Job) สำหรับตนเอง

2. การว่างงานอันเนื่องมาจากโครงสร้างทางเศรษฐกิจ (Structural Unemployment) หมายถึง การว่างงานซึ่งเกิดขึ้นจากการที่แรงงาน ไม่สามารถปรับตัวได้ทันกับการเปลี่ยนแปลงของสภาพเศรษฐกิจ

3. การว่างงานอันเนื่องมาจากวัฏจักรทางเศรษฐกิจ (Cyclical Unemployment) หมายถึง การว่างงานซึ่งเกิดขึ้นจากภาวะเศรษฐกิจอยู่ในช่วงหดตัว (Recession Period)

4. แนวคิดและทฤษฎีเกี่ยวกับการวิเคราะห์การถดถอยโลจิสติก (Logistic Regression Analysis)

4.1 หลักการของการวิเคราะห์การถดถอยโลจิสติก

การถดถอยโลจิสติก เป็นวิธีการทางสถิติที่ใช้ในการศึกษาเพื่อการพยากรณ์ความน่าจะเป็นของการเกิดเหตุการณ์ที่สนใจต่อความน่าจะเป็นของการไม่เกิดเหตุการณ์ที่สนใจ ซึ่งการถดถอยแบบโลจิสติกนี้จะมีตัวแปรตามเป็นตัวแปรเชิงคุณภาพ แบ่งออกเป็น 2 ประเภท ได้แก่ (กัลยา วานิชย์บัญชา, 2555)

1. การถดถอยโลจิสติกทวิภาค (Binary Logistic Regression) คือ ตัวแปรตามมีค่าเพียง 2 ค่า

2. การถดถอยโลจิสติกพหุ (Multinomial Logistic Regression) คือ ตัวแปรตามมีค่ามากกว่า 2 ค่าขึ้นไป

4.2 ข้อตกลงเบื้องต้นของการวิเคราะห์การถดถอยโลจิสติกแบบทวิภาค

ในการวิเคราะห์การถดถอยโลจิสติกแบบทวิภาค จำเป็นต้องมีการพิจารณาข้อตกลงเบื้องต้นก่อนที่จะทำการวิเคราะห์ โดยมีข้อตกลงเบื้องต้น ดังนี้ (Burns & Grove, 1993; Kassambara, 2018)

1. ตัวแปรตามเป็นข้อมูลเชิงคุณภาพ มีเพียง 2 ค่า คือ 0 และ 1

2. ลอจิต (Logit) หรือ ลอการิทึมของอัตราส่วนระหว่างความน่าจะเป็นของการเกิดเหตุการณ์ที่สนใจกับความน่าจะเป็นของการไม่เกิดเหตุการณ์ที่สนใจของตัวแปรตาม มีความสัมพันธ์เชิงเส้นกับตัวแปรอิสระ

3. ตัวแปรอิสระไม่ควรมีค่าที่มีอิทธิพล (Influential Value) เช่น ค่านอกเกณฑ์ (Outlier)

4. ตัวแปรอิสระทุกตัวไม่ควรมีความสัมพันธ์เชิงเส้นพหุ หรือไม่เกิดความสัมพันธ์สูงมาก (Multicollinearity) โดยใช้เกณฑ์ของ Burns and Grove (1993) ที่ใช้ค่าความสัมพันธ์ไม่เกิน 0.65

4.3 ตัวแบบการถดถอยโลจิสติกทวิภาค

การถดถอยโลจิสติกทวิภาค เป็นการศึกษาเพื่อพยากรณ์โอกาสที่จะเกิดเหตุการณ์ที่สนใจ โดยใช้รูปแบบความสัมพันธ์ที่สร้างจากตัวแปรอิสระ โดยตัวแปรตามของเหตุการณ์ที่สนใจจะมีค่าเป็นไปได้เพียง 2 ค่า คือ 0 และ 1 โดยตัวแบบการถดถอยโลจิสติกจะมีรูปดังต่อไปนี้ (กัลยา วานิชย์บัญชา, 2551)

1. ความน่าจะเป็นของการเกิดเหตุการณ์ กรณีที่มีตัวแปรอิสระมากกว่า 1

$$P_y = \frac{e^{\beta_0+\beta_1x_1+\ldots+\beta_px_p}}{1+e^{\beta_0+\beta_1x_1+\ldots+\beta_px_p}} \quad \text{และ} \quad Q_y = \frac{1}{1+e^{\beta_0+\beta_1x_1+\ldots+\beta_px_p}}$$

โดย P_y = ความน่าจะเป็นของการเกิดเหตุการณ์ที่สนใจ $(y=1)$

Q_y = ความน่าจะเป็นของการไม่เกิดเหตุการณ์ที่สนใจ $(y=0)=1-P_y$

โดย $P_y \geq 0.5$ หมายถึง เกิดเหตุการณ์ที่สนใจ

$P_y < 0.5$ หมายถึง ไม่เกิดเหตุการณ์ที่สนใจ

2. Odds ของการเกิดเหตุการณ์

Odds หรือ odd ratio หมายถึง อัตราส่วนระหว่างโอกาสที่จะเกิดเหตุการณ์ที่สนใจ $(y=1)$ กับโอกาสที่จะไม่เกิดเหตุการณ์ที่สนใจ $(y=0)$ logit (กัลยา วานิชย์บัญชา, 2551)

$$\text{Odds} = \frac{P_y}{Q_y} = \frac{P(y=1)}{P(y=0)} = \frac{P}{1-P} = e^{\beta_0+\beta_1x_1+\ldots+\beta_px_p}$$

ดังนั้น $\text{Log}_e(\hat{OR}) = b_0 + b_1x_1 + \ldots + b_px_p$

4.4 วิธีการคัดเลือกตัวแปร

ในการเลือกตัวแปรอิสระมีวิธีเลือก 3 วิธี ดังนี้ (ธีระดา ภิญโญ, 2562)

1. Enter Method เป็นเทคนิคการเลือกตัวแปรอิสระทุกตัวเข้าสมการถดถอยโลจิสติกในขั้นตอนเดียว ผู้วิจัยต้องเป็นผู้ตัดสินใจเองว่า ตัวแปรอิสระตัวใดบ้างที่มีความสัมพันธ์กับตัวแปรตาม โดยพิจารณาจากค่าสถิติทดสอบ ถ้ามีนัยสำคัญทางสถิติก็ถือว่าตัวแปรอิสระนั้นควรจะอยู่ในสมการ

2. Forward Method เป็นเทคนิคการเลือกตัวแปรอิสระ ที่สามารถอธิบายความผันแปรของตัวแปรตามได้สูงสุดและมีนัยสำคัญทางสถิติเข้าสมการก่อน จากนั้นจึงเลือกตัวแปรอิสระอันดับรองเข้าสมการ ตามลำดับ ทำเช่นนั้นไปเรื่อย ๆ ไปจนกระทั่งไม่มีตัวแปรอิสระใดที่อธิบายความผันแปรของตัวแปรตามอย่างมีนัยสำคัญทางสถิติอีกแล้ว วิธีนี้มี 3 แบบย่อยโดยแตกต่างที่ค่าสถิติที่ใช้ในการพิจารณา ได้แก่ Forward: Conditional, Forward: LR (Likelihood Ratio), Forward: Wald

3. Backward Method เป็นเทคนิคการนำตัวแปรอิสระทุกตัวเข้าสมการพร้อมกัน จากนั้นจึงคัดตัวแปรอิสระออกมาทีละตัว โดยพิจารณาจากการที่ตัวแปรอิสระอธิบายความผันแปรของตัวแปรตามได้

น้อยที่สุดออกจากสมการ ทำเช่นนี้ไปเรื่อย ๆ จนกระทั่งเหลือตัวแปรอิสระที่อธิบายความผันแปรของตัวแปรตามได้อย่างมีนัยสำคัญทางสถิติ วิธีนี้มี 3 แบบย่อยโดยแตกต่างที่ค่าสถิติที่ใช้ในการพิจารณา ได้แก่ Backward: Conditional, Backward: LR (Likelihood Ratio), Backward: Wald

4.5 การตรวจสอบความเหมาะสมของตัวแบบการถดถอยโลจิสติกทวิภาค

1. Wald Statistic

สมมติฐานการทดสอบ

$H_0 : \beta_j = 0 \quad ; j = 1,2,...,p$

$H_1 : \beta_j \neq 0$

หากผลการทดสอบยอมรับ H_0 แสดงว่า ตัวแปรต้น i ไม่มีผลต่อการเปลี่ยนแปลงอัตราส่วน ดังนั้นจึงไม่มีผลต่อโอกาสการเกิดเหตุการณ์ที่สนใจ (ศิริชัย พงษ์วิชัย, 2549)

2. Likelihood Ratio Test (LR) พิจารณาค่าความเป็นไปได้ เพื่อวัดค่าความเหมาะสมของสมการโลจิสติกจะศึกษาจากค่า -2LL (-2 log Likelihood)

สมมติฐานการทดสอบ

$H_0 : \beta_1 = \beta_2 = ... = \beta_p = 0$

H_1 : มี $\beta_i \neq 0$ อย่างน้อย 1 ค่า; i = 1, 2,...,p

จะปฏิเสธ H_0 เมื่อพบว่า ค่า p-value < α ที่ระดับนัยสำคัญ 0.05 นั่นคือ Model ขึ้นอยู่กับตัวแปรอิสระอย่างน้อย 1 ตัว ที่ระดับนัยสำคัญ 0.05

3. Hosmer and Lemeshow จะใช้ทดสอบความเหมาะสม Model (ยุทธ ไกยวรรณ์, 2555)

สมมติฐานการทดสอบ

H_0 : model เหมาะสม

H_1 : model ไม่เหมาะสม

ในการทดสอบหาก χ^2 ไม่มีนัยสำคัญทางสถิติหรือยอมรับ H_0 แสดงว่า Model มีความเหมาะสม

4.6 การทดสอบสัมประสิทธิ์อธิบาย (Pseudo R^2) ของตัวแบบการถดถอยโลจิสติกทวิภาค

ในตัวแบบถดถอยโลจิสติกทวิภาค มีสถิติที่ทดสอบระดับความสัมพันธ์หลายค่า ได้แก่

1. สถิติทดสอบ Cox & Snell R Square หรือ R^2_{CS} เป็นการตรวจสอบความสอดคล้องของตัวแบบ ซึ่งปกติค่า Cox & Snell R square จะมีค่าน้อยกว่า 1 เสมอ

2. สถิติทดสอบ Nagelkerke R Square หรือ R^2_N สามารถคิดเป็นเปอร์เซ็นต์ได้จากการนำไปคูณด้วย 100 ที่สามารถอธิบายความผันแปรในการวิเคราะห์การถดถอยโลจิสติก

4.7 การแปลผลค่าสัมประสิทธิ์การถดถอย

1. การแปลผลจากค่า Coefficient (β) จะบอกทิศทางและขนาดความสัมพันธ์ (อุทัยทิพย์ เจี่ยวิวรรธน์กุล, 2553)

เครื่องหมาย + แสดงความสัมพันธ์เชิงบวก

เครื่องหมาย - แสดงความสัมพันธ์เชิงลบ(ผกผัน/ตรงข้าม)

2.การแปลผลจากค่า Odd Ratio (OR) โดย Odd Ratio (OR) คือ อัตราการเปลี่ยนแปลงของความน่าจะเป็นหรือโอกาสที่จะเกิดเหตุการณ์ที่สนใจ เมื่อตัวแปรอิสระเปลี่ยนไปหนึ่งหน่วย

ค่า Odds ของ y เมื่อ x มีค่า 1 หน่วย : $\text{Odds}_{y/x} = e^{\alpha+\beta}$

ค่า Odds ของ y เมื่อ x มีค่าเท่ากับ 0 หน่วย : $\text{Odds}_{y/x^-} = e^{\alpha}$

ดังนั้น ค่า Odd Ratio (OR) จะเท่ากับ $OR = \frac{e^{\alpha+\beta}}{e^{\alpha}} = e^{\beta}$ และ $\log(OR) = \beta$

1.กรณีที่ตัวแปรอิสระเป็นตัวแปรเชิงกลุ่ม

Odds Ratio > 1 หมายถึง ครัวเรือนไทยที่อยู่ในกลุ่มที่สนใจมีโอกาสที่จะว่างงานมากกว่ากลุ่มอ้างอิงเท่ากับ n เท่า หรือมากกว่า ร้อยละ (Odds Ratio - 1) *100

Odds Ratio < 1 หมายถึง ครัวเรือนไทยที่อยู่ในกลุ่มที่สนใจมีโอกาสที่จะว่างงานน้อยกว่ากลุ่มอ้างอิงเท่ากับ n เท่า หรือลดลง ร้อยละ (1 - Odds Ratio) *100

Odds Ratio = 1 หมายถึง ครัวเรือนไทยที่อยู่ในกลุ่มที่สนใจมีโอกาสที่จะว่างงานเท่ากับกลุ่มอ้างอิง หรือการเปลี่ยนแปลงของตัวแปรอิสระ ไม่มีผลต่อตัวแปรตาม

2.กรณีที่ตัวแปรอิสระเป็นตัวแปรเชิงปริมาณ

Odds Ratio > 1 หมายถึง เมื่อตัวแปรอิสระเพิ่มขึ้น 1 หน่วย ทำให้โอกาสที่ครัวเรือนไทยจะมีว่างงานเพิ่มขึ้น n เท่า เมื่อเทียบกับค่าเดิมของ X หรือเพิ่มขึ้นร้อยละ (Odds Ratio - 1) *100 โดยที่ค่าสัมประสิทธิ์ถดถอยโลจิสติก มีค่าเป็นบวก

Odds Ratio < 1 หมายถึง เมื่อตัวแปรอิสระเพิ่มขึ้น 1 หน่วย ทำให้โอกาสที่ครัวเรือนไทยจะมีว่างงานลดลง n เท่า เมื่อเทียบกับค่าเดิมของ X หรือลดลงร้อยละ (1 - Odds Ratio) *100 โดยที่ค่าสัมประสิทธิ์ถดถอยโลจิสติก มีค่าเป็นลบ

Odds Ratio = 1 หมายถึง เมื่อตัวแปรอิสระเพิ่มขึ้น (ลดลง) ทำให้โอกาสที่ครัวเรือนไทยจะว่างงานไม่เปลี่ยนแปลง หรือการเปลี่ยนแปลงของตัวแปรอิสระไม่มีผลต่อตัวแปรตาม นั่นคือ โอกาสที่จะเกิดเหตุการณ์ที่สนใจกับโอกาสที่จะไม่เกิดเหตุการณ์ที่สนใจเท่ากัน

5. แนวคิดและทฤษฎีเกี่ยวกับการวัดประสิทธิภาพของโมเดลแบบ Classification

Classification หรือ Target เป็นแบบ Categorical หรือถ้ามีสองค่าก็จะเรียกว่า ไบนารี เช่น การทายว่า เป็นมะเร็งหรือไม่เป็น กรณีนี้เราจะใช้ดังนี้ (Shavlik & Goadrich, 2007)

		Predicted Class	
Actual Class	Positive	True Positive (TP)	False Negative (FN)
	Negative	False Positive (FP)	True Negative (TN)

ภาพที่ 1 Confusion Matrix แบบ Actual-predict

5.1 การคำนวณหาค่าการวัดผล มีการคำนวณหาค่าการวัดผลได้หลายแบบ เช่น

1. Accuracy (ค่าความถูกต้อง)

Accuracy = (TP+TN)/(TP+TN+FP+FN) หรือ ค่าที่โมเดลทายถูกทั้งหมด/ค่าทั้งหมด

2. Precision หรือ Positive Predictive Value (ค่าความแม่นยำ)

Precision = TP/(TP+FP) หรือ ค่าที่โมเดลทายเป็นคลาสที่กำลังพิจารณาถูก/ค่าที่โมเดลทำนายว่าเป็นคลาสที่กำลังพิจารณาทั้งถูกและผิด

วิธีดำเนินการวิจัย

1. ประชากรและกลุ่มตัวอย่าง

ประชากรที่ใช้สำหรับการวิจัยในครั้งนี้ คือ ครัวเรือนส่วนบุคคลและครัวเรือนกลุ่มบุคคลที่อาศัยอยู่ในกรุงเทพมหานคร ณ เดือนมกราคม – มีนาคม พ.ศ. 2564 ซึ่งมีทั้งสิ้น 7,657,600 คน (สำนักงานสถิติแห่งชาติ, 2564) โดยในงานวิจัยครั้งนี้ใช้การสุ่มตัวอย่างแบบใช้ความน่าจะเป็น ด้วยวิธีการสุ่มตัวอย่างแบบ 2 ขั้นตอน (Two - stage Sampling) โดยในแต่ละขั้นตอนจะมีการสุ่มตัวอย่าง ดังนี้

(1) แผนการสุ่มตัวอย่างในขั้นที่หนึ่ง ใช้การสุ่มตัวอย่างแบบใช้ความน่าจะเป็น (Probability Sampling) ด้วยวิธีการสุ่มตัวอย่างแบบแบ่งชั้นภูมิ (Stratified Random Sampling) โดยมีกรุงเทพมหานครและจังหวัดเป็นสตราตัม เขตแจงนับ (Enumeration Area: EA) เป็นหน่วยตัวอย่าง และได้ทำการเลือก EA ตัวอย่างด้วยวิธีการสุ่มตัวอย่างอย่างง่าย (Simple Random Sampling)

(2) แผนการสุ่มตัวอย่างในขั้นที่สอง ใช้การสุ่มตัวอย่างแบบใช้ความน่าจะเป็น (Probability Sampling) ด้วยวิธีการสุ่มตัวอย่างแบบแบ่งชั้นภูมิ (Stratified Systematic Sampling) โดยมีการแบ่งชั้นภูมิตามเขตการปกครอง และจำนวนครัวเรือนของแต่ละ EA เป็นหน่วยตัวอย่าง โดยมีการเลือกครัวเรือนตัวอย่างจากครัวเรือนส่วนบุคคลทั้งสิ้นในบัญชีรายชื่อครัวเรือน แล้วจัดเรียงรายชื่อครัวเรือนส่วนบุคคลใหม่ตามขนาดของครัวเรือน (จำนวนสมาชิกในครัวเรือน) จึงทำการเลือกจำนวนครัวเรือนตัวอย่างด้วยการสุ่มตัวอย่างแบบมีระบบ (Systematic Sampling)

ในการวิจัยครั้งนี้ ผู้วิจัยจะเลือกศึกษาเฉพาะจังหวัดกรุงเทพมหานคร ซึ่งมีจำนวนประชากรเท่ากับ 7,657,600 คน และจากการสุ่มตัวอย่างและเลือกใช้ข้อมูลบางส่วน โดยตัดข้อมูลที่สูญหายและค่าผิดปกติออกโดยใช้โปรแกรมสำเร็จรูปทางสถิติ (IBM SPSS Statistics) จะได้จำนวนครัวเรือนตัวอย่างทั้งสิ้น 9,300 ครัวเรือน

2. เครื่องมือในการวิจัย

ผู้วิจัยนำเครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลครั้งนี้ ได้แก่ แบบสอบถาม โดยบุคคลที่เป็นหัวหน้าครัวเรือนจะเป็นผู้ตอบแบบสอบถาม

3. การจัดการข้อมูล

ข้อมูลทุติยภูมิได้จากโครงการสำรวจภาวะการทำงานของประชากรกรุงเทพมหานคร พ.ศ. 2564 ของสำนักงานสถิติแห่งชาติ โดยมีการดำเนินการจัดการชุดข้อมูลดังนี้

3.1 การกำจัดข้อมูลสูญหาย

การวิเคราะห์การถดถอยโลจิสติกในครั้งนี้จะเลือกใช้เฉพาะข้อมูลครัวเรือนที่มีข้อมูลครบถ้วนและกำจัดข้อมูลที่สูญหายของชุดข้อมูลนั้นก่อนจะนำไปใช้วิเคราะห์ จะได้จำนวนครัวเรือนตัวอย่างทั้งสิ้น 9,300 ครัวเรือน

3.2 แบ่งข้อมูลเป็นข้อมูลฝึกหัด (Training Data) และข้อมูลทดสอบ (Testing Data)

ในการวิจัยในครั้งนี้จะทำการแบ่งข้อมูลทั้งหมดออกเป็น 2 ส่วน คือ ส่วนที่ 1 ข้อมูลฝึกหัด จะใช้ในการสร้างสมการหรือตัวแบบพยากรณ์ ส่วนที่ 2 ข้อมูลทดสอบ จะนำมาใช้ทดสอบความถูกต้อง ซึ่งจะทำการแบ่งข้อมูลในอัตราส่วน 80:20 สำหรับข้อมูลฝึกหัด จะนำไปใช้เพื่อสร้างสมการหรือตัวแบบพยากรณ์ระดับการว่างงานของคนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 ในปี ค.ศ. 2021 และสำหรับข้อมูลทดสอบจะนำไปใช้เพื่อประเมินความถูกต้องของสมการหรือตัวแบบพยากรณ์ที่จะนำไปใช้จริง

4. วิธีการวิเคราะห์ข้อมูล

4.1 สถิติเชิงพรรณนา (Descriptive Statistic)

ใช้โปรแกรมสำเร็จรูปทางสถิติ (IBM SPSS Statistics) ในการวิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ในการศึกษาลักษณะทั่วไปของครัวเรือนกลุ่มตัวอย่าง

4.2 การวิเคราะห์การถดถอยโลจิสติก (Binary Logistic Regression)

ใช้โปรแกรมสำเร็จรูปทางสถิติ (IBM SPSS Statistics) ในการวิเคราะห์การถดถอยโลจิสติกทวิภาค (Binary Logistic Regression Analysis) โดยตรวจสอบความถูกต้องเหมาะสมของสมการของ Hosmer and Lemeshow จากการพิจารณาค่าสถิติ χ^2 ถ้าไม่มีนัยสำคัญทางสถิติหรือยอมรับ H_0 แสดงว่า Model มีความเหมาะสมดี หากตัวอย่างมีขนาดใหญ่ Hosmer and Lemeshow Test จะมีค่ามาก ทำให้สรุปผลได้ว่า ปฏิเสธสมมติฐานหลัก (H_0) ทั้งที่ Model มีความเหมาะสม (กัลยา วานิชย์บัญชา, 2548) นอกจากนี้ยังต้องพิจารณาจากค่า Pseudo R Square หรือ R Square เทียม ของ Cox & Snell และ Nagelkerke ของตัวแบบการถดถอยโลจิสติกทวิภาค ด้านปัจจัยด้านส่วนบุคคล การทำงาน และรายได้ของครัวเรือนที่มีอิทธิพลต่อระดับการว่างงานของคนในกรุงเทพมหานคร จากสถานการณ์ COVID-19 ในปี ค.ศ. 2021

5. สมมติฐานของการศึกษา

5.1 ปัจจัยส่วนบุคคล ได้แก่ เพศ อายุ สถานภาพสมรส ระดับการศึกษาสูงสุด และสายวิชาของการศึกษา ส่งผลต่อการว่างงาน

5.2 ปัจจัยด้านการทำงาน ได้แก่ ระยะเวลาที่หยุดงาน การหางาน/สมัครงาน ช่องทางการหางาน/สมัครงาน ความพร้อมในการทำงาน เหตุผลที่ไม่พร้อมทำงาน เหตุผลที่ไม่หางานทำ ระยะเวลาที่หางาน/พร้อมทำงาน เคยมีประสบการณ์ด้านการทำงาน สาเหตุที่ออกจากงานล่าสุด ระยะเวลาที่ออกจากงานล่าสุด อาชีพ กิจกรรมหลักของงาน สถานะอาชีพ และจำนวนชั่วโมงทำงาน ส่งผลต่อการว่างงาน

5.3 ปัจจัยด้านรายได้ ได้แก่ ประเภทของค่าจ้าง ค่าจ้าง ค่าโบนัสรายปี ค่าโอที และค่าอื่น ๆ ได้แก่ ค่าอาหาร ค่าเสื้อผ้า ค่าทิป ค่าที่อยู่ ค่าพาหนะ ส่งผลต่อการว่างงาน

ผลการวิจัย

1. ผลการวิเคราะห์สถิติเชิงพรรณนา

ตารางที่ 1 จำนวนและร้อยละลักษณะของกลุ่มตัวอย่าง

ลักษณะทั่วไปของกลุ่มตัวอย่าง	จำนวน	ร้อยละ
เพศ		
ชาย	4,265	45.86
หญิง	**5,035**	**54.14**
สถานภาพสมรส		

ลักษณะทั่วไปของกลุ่มตัวอย่าง	จำนวน	ร้อยละ
โสด	**3,283**	**35.30**
สมรส	2,728	29.33
ม่าย	2,175	23.39
หย่า	695	7.47
แยกกันอยู่	207	2.23
เคยสมรสแต่ไม่ทราบสถานภาพ	212	2.28
ระดับการศึกษาสูงสุด		
ไม่มีการศึกษา	297	3.19
ระดับต่ำกว่าประถมศึกษา	1,057	11.37
ระดับประถมศึกษา	1,569	16.87
ระดับมัธยมศึกษาตอนต้น	1,445	15.54
ระดับมัธยมศึกษาตอนปลาย	1,735	18.66
ระดับสูงกว่ามัธยมศึกษาตอนปลาย (อนุปริญญา)	470	5.05
ระดับปริญญาตรี	**2,201**	**23.67**
ระดับปริญญาโท	428	4.60
ระดับปริญญาเอก	33	0.35
การศึกษาอื่นๆ	5	0.05
ไม่ทราบระดับการศึกษา	60	0.65
สาขาวิชาของการศึกษา		
สายสามัญและอาชีวศึกษา	**3,410**	**93.68**
สายวิชาการ	230	6.32
อาชีพ		
ผู้จัดการ ข้าราชการระดับอาวุโสและผู้บัญญัติกฎหมาย	462	7.51
ผู้ประกอบวิชาชีพด้านต่างๆ เช่น วิศวกร สถาปนิก แพทย์	613	9.96
เจ้าหน้าที่เทคนิคต่างๆ	592	9.62
เสมียน	440	7.15
พนักงานบริการและผู้จัดจำหน่ายสินค้า	**1,814**	**29.47**
ผู้ปฏิบัติงานที่มีฝีมือด้านการเษตร ป่าไม้ และประมง	27	0.44
ช่างฝีมือและผู้ปฏิบัติงานที่เกี่ยวข้อง	713	11.58
ผู้ควบคุมและปฏิบัติงานด้านการประกอบเครื่องจักร	733	11.91
ผู้ประกอบอาชีพงานพื้นฐาน เช่น คนงานและผู้ช่วยทำความสะอาด	728	11.83
อาชีพมิได้ระบุไว้ชัดเจน/ไม่ทราบ/ไม่ระบุ	33	0.54

ลักษณะทั่วไปของกลุ่มตัวอย่าง	จำนวน	ร้อยละ
สถานภาพการทำงาน		
นายจ้าง	249	4.05
ประกอบธุรกิจส่วนตัวโดยไม่มีลูกจ้าง	1,420	23.07
ช่วยธุรกิจครัวเรือนโดยไม่ได้รับค่าจ้าง	465	7.55
ลูกจ้างรัฐบาล	375	6.09
ลูกจ้างรัฐวิสาหกิจ	128	2.08
ลูกจ้างเอกชน	**3,516**	**57.12**
ผู้รับจ้างทำงานหลายเจ้า	2	0.03

2. ผลการวิเคราะห์การถดถอยโลจิสติกทวิภาค (Binary Logistic Regression Analysis)

ในการวิเคราะห์การถดถอยโลจิสติกแบบทวิภาค จะวิเคราะห์ปัจจัยที่ส่งผลต่อระดับการว่างงานของคนในกรุงเทพมหานคร โดยผู้วิจัยได้แบ่งข้อมูลจากกลุ่มตัวอย่างทั้งสิ้น 9,300 ตัวอย่าง ออกเป็น 2 ชุด คือ ข้อมูลชุดการพยากรณ์ 80 เปอร์เซ็นต์ และข้อมูลชุดการทำนาย 20 เปอร์เซ็นต์ ดังนี้

ตารางที่ 2 จำนวนชุดข้อมูลการพยากรณ์ และชุดข้อมูลการทำนายของกลุ่มตัวอย่าง

	ชุดการพยากรณ์ 80 เปอร์เซ็นต์	**ชุดการทำนาย 20 เปอร์เซ็นต์**	**รวม**
คนที่มีงานทำ	4,836	1,209	6,045
คนที่ไม่มีงานทำ	2,604	651	3,255
รวม	7,440	1,860	9,300

ผลการสร้างและพัฒนาตัวแบบพยากรณ์

ผู้วิจัยได้สร้างตัวแบบพยากรณ์ ซึ่งใช้ข้อมูลที่นำมาวิเคราะห์ 80 เปอร์เซ็นต์ ข้อมูลที่นำมาทดสอบ 20 เปอร์เซ็นต์ และเลือกใช้วิธีการคัดเลือกตัวแปรอิสระ ด้วยวิธีการเลือกแบบพื้นฐาน (Enter Method) วิธีการเลือกแบบไปข้างหน้า (Forward Method) วิธีการกำจัดแบบถอยหลัง (Backward Method)

จากการวิเคราะห์ด้วยวิธีทั้งหมด ผู้วิจัยจึงเลือกวิธี Forward: Conditional แบบไม่มี Constant เนื่องจากมีค่า Negelkerke R Square สูงสุดเท่ากับ 0.977 และจะได้ตัวแบบที่ประกอบด้วย 7 ตัวแปร โดยแสดงดังตารางที่ 3

ตารางที่ 3 แสดงผลลัพธ์จากการพยากรณ์ด้วยเทคนิคการถดถอยโลจิสติกทวิภาควิธีการเลือกแบบไปข้างหน้า (Forward: Conditional) แบบไม่มี Constant

ตัวแปรอิสระ	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
อายุ (Age)	-0.113	0.031	13.017	1	0.000*	0.893
ช่องทางการหางาน/สมัครงาน (Method)			16.266	4	0.003*	

ตัวแปรอิสระ	B	S.E.	Wald	df	Sig.	Exp(B)
เพื่อน/ญาติหาให้ (Method1)	12.631	3.640	12.040	1	0.001	3.059E+5
หา/สมัครงานที่หน่วยจัดหางาน (Method2)	-6.080	2.694	5.092	1	0.024	0.002
หา/สมัครงานที่หน่วยงานโดยตรง (Method3)	31.600	8274.786	0.000	1	0.997	5.293E+13
ส่งจดหมายสมัครงานตามที่ต่าง ๆ (Method4)	0.353	1.983	0.032	1	0.859	1.424
ทาง Internet (ตัวแปรอ้างอิง)	=	=	=	=	=	=
เหตุผลที่ไม่หางานทำ (Re_No_Seeking)			23.924	6	0.001*	
เชื่อว่าหางานทำไม่ได้ (Re_No_Seeking1)	-45.081	18264719.335	0.000	1	1.000	0.000
หามาแล้วแต่หาไม่ได้ (Re_No_Seeking2)	-36.109	18264719.335	0.000	1	1.000	0.000
ไม่ทราบว่าจะไปหางานอย่างไร (Re_No_Seeking3)	-36.771	18264719.335	0.000	1	1.000	0.000
ไม่สามารถหางานที่เหมาะสมได้ (Re_No_Seeking4)	-43.338	18264719.335	0.000	1	1.000	0.000
ดินฟ้าอากาศไม่เอื้ออำนวย (Re_No_Seeking5)	-35.224	18264719.335	0.000	1	1.000	0.000
อื่นๆ (Re_No_Seeking6)	-13.201	18264732.986	0.000	1	1.000	0.000
ไม่ทราบ (ตัวแปรอ้างอิง)	=	=	=	=	=	=
ระยะเวลาที่หางาน/พร้อมทำงาน (Dr_Seek)			25.564	6	0.000*	
ต่ำกว่า 1 เดือน (Dr_Seek1)	11.677	12277.065	0.000	1	0.999	1.179E+5
1-2.9 เดือน (Dr_Seek2)	20.136	12277.065	0.000	1	0.999	5.559E+8
3-5.9 เดือน (Dr_Seek3)	18.793	12277.065	0.000	1	0.999	1.452E+8
6-8.9 เดือน (Dr_Seek4)	25.920	12277.066	0.000	1	0.998	1.806E+11
9-11.9 เดือน (Dr_Seek5)	41.923	19010.505	0.000	1	0.998	1.610E+18
ตั้งแต่ 12 เดือน (Dr_Seek6)	9.711	13189.603	0.000	1	0.999	1.650E+5
ไม่ทราบ (ตัวแปรอ้างอิง)	=	=	=	=	=	=
สาเหตุที่ออกจากงานล่าสุด (Re_Unem)			18.959	6	0.004*	

ตัวแปรอิสระ	B	S.E.	Wald	df	Sig.	Exp(B)
นายจ้างเลิก/หยุด/ปิดกิจการ (Re_Unem1)	14.131	10216.399	0.000	1	0.999	1.372E+6
หมดสัญญาจ้างแรงงาน (Re_Unem2)	21.388	10216.399	0.000	1	0.998	1.944E+9
ถูกให้ออก/ไล่ออก/ปลดออก (Re_Unem3)	9.619	10216.400	0.000	1	0.999	1.505E+4
ลาออก (Re_Unem4)	12.125	10216.399	0.000	1	0.999	1.844E+6
เลิก/หยุด/ปิดกิจการ (Re_Unem5)	6.640	10216.401	0.000	1	0.999	765.451
อื่นๆ (Re_Unem6)	12.408	10216.399	0.000	1	0.999	2.449E+5
ไม่ทราบ (ตัวแปรอ้างอิง)	=	=	=	=	=	=
ระยะเวลาที่ออกจากงานล่าสุด (Dr_Unem)			13.583	5	0.018*	
ต่ำกว่า 1 เดือน (Dr_Unem1)	-34.658	18264733.890	0.000	1	1.000	0.000
1-2.9 เดือน (Dr_Unem2)	-26.390	18264733.890	0.000	1	1.000	0.000
3-5.9 เดือน(Dr_Unem3)	-24.991	18264733.890	0.000	1	1.000	0.000
6-8.9 เดือน (Dr_Unem4)	-28.969	18264733.890	0.000	1	1.000	0.000
9-11.9 เดือน (Dr_Unem5)	-30.441	18264733.890	0.000	1	1.000	0.000
ไม่ทราบ (ตัวแปรอ้างอิง)	=	=	=	=	=	=
ระยะเวลาที่หยุดงาน (Absent)						
น้อยกว่าหรือเท่ากับ 2 เดือน (Absent1)	4.192	1.353	9.604	1	0.002*	66.179
มากกว่า 2 เดือน (ตัวแปรอ้างอิง)	=	=	=	=	=	=
Hosmer and Lemeshow Test χ^2 = 13.402 Sig.=0.099						
Cox & Snell R Square = 0.733, Negelkerke R Square = 0.977						

*มีนัยสำคัญทางสถิติ

โดยที่ $\log(\text{odds}) = \log\left[\frac{p}{1-p}\right]$ เมื่อ p คือ โอกาสในการว่างงาน และ 1-p คือ โอกาสในการไม่ว่างงาน

จากตารางที่ 3 พบว่า ผลลัพธ์จากการพยากรณ์ด้วยเทคนิคการถดถอยโลจิสติกทวิภาควิธี Forward: Conditional แบบไม่มี Constant ซึ่งทั้ง 7 ตัวแปรที่เข้ามาในสมการ ทำให้ได้ตัวแปรที่เป็นสาเหตุที่เกี่ยวข้องกับการว่างงานและไม่ว่างงานทั้งหมด 7 ตัวแปร ได้แก่ อายุ ช่องทางการหางาน/สมัครงาน เหตุผลที่ไม่หางานทำ ระยะเวลาที่หางาน/พร้อมทำงาน สาเหตุที่ออกจากงานล่าสุด ระยะเวลาที่ออกจากงานล่าสุด และระยะเวลาที่หยุดงาน

เมื่อพิจารณาปัจจัยหรือตัวแปรที่เป็นสาเหตุเกี่ยวกับการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร โดยพิจารณาจากค่า Exp(B) หรือ Odds Ratio ซึ่งจะยกตัวอย่างในบางปัจจัยมาอธิบาย เช่น

ตัวแปรอายุ มีค่า Exp(B) เท่ากับ 0.893 < 1 หมายความว่า อายุของครัวเรือนมีโอกาสน้อยที่จะเป็นสาเหตุในการว่างงาน เท่ากับ 0.893 เท่า หรือลดลงร้อยละ 10.7

ตัวแปรช่องทางการหางาน/สมัครงาน

เพื่อน/ญาติหาให้ มีค่า Exp(B) > 1 หมายความว่า ครัวเรือนที่มีเพื่อนหรือญาติหาช่องทางการหางานหรือสมัครงานให้ มีโอกาสน้อยมากที่จะว่างงานมากกว่าครัวเรือนที่หางานหรือสมัครงานผ่าน Internet (ตัวแปรอ้างอิง)

หา/สมัครงานที่หน่วยงานจัดหางาน มีค่า Exp(B) เท่ากับ 0.002 < 1 หมายความว่า ครัวเรือนที่หา/สมัครงานที่หน่วยงานจัดหางาน มีโอกาสที่จะว่างงานน้อยกว่าครัวเรือนที่หางานหรือสมัครงานผ่าน Internet (ตัวแปรอ้างอิง) เท่ากับ 0.002 เท่า หรือลดลงร้อยละ 99.8

ตัวแปรระยะเวลาที่หยุดงาน

หยุดงานน้อยกว่าหรือเท่ากับ 2 เดือน มีค่า Exp(B) > 1 หมายความว่า ครัวเรือนที่หยุดงานในระยะเวลาน้อยกว่าหรือเท่ากับ 2 เดือน โอกาสน้อยมากที่จะว่างงานมากกว่าครัวเรือนที่หยุดงานในระยะเวลามากกว่า 2 เดือน (ตัวแปรอ้างอิง)

การตรวจสอบความเหมาะสมของตัวแบบการถดถอยโลจิสติกทวิภาค

จากตารางที่ 3 พบว่า Hosmer and Lemeshow Test ได้ค่า χ^2 = 13.402 Sig. เท่ากับ 0.099 > 0.05 จึงยอมรับสมมติฐานหลัก (H_0) แสดงว่า Model มีความเหมาะสม

การทดสอบสัมประสิทธิ์อธิบาย (Pseudo R^2) ของตัวแบบการถดถอยโลจิสติกทวิภาค

จากตารางที่ 3 พบว่า ค่า Cox & Snell R Square = 0.733 และค่า Negelkerke R Square = 0.977 หมายความว่า ตัวแปรอิสระ 7 ตัว สามารถอธิบายโอกาสที่เกิดเหตุการณ์ที่สนใจได้ร้อยละ 99.9

การตรวจสอบความสัมพันธ์ระหว่างตัวแปรอิสระ

ตารางที่ 4 แสดงการตรวจสอบความสัมพันธ์ระหว่างตัวแปรอิสระ

	Age	Method	Re_No_ Seeking	Dr_Seek	Re_Unem	Dr_Unem	Absent
Age	1.000						
Method	0.282	1.000					
Re_No_Seeking	0.536	0.251	1.000				
Dr_Seek	0.647	0.268	0.473	1.000			
Re_Unem	0.631	0.150	0.315	0.350	1.000		
Dr_Unem	0.600	0.285	0.218	0.535	0.309	1.000	
Absent	0.250	0.083	0.169	0.260	0.064	0.212	1.000

จากตารางที่ 4 พบว่า ความสัมพันธ์ระหว่างตัวแปรอิสระที่ส่งผลต่อการว่างงาน มีระดับความสัมพันธ์ไม่เกิน .65 (Burns & Grove, 1993) งานวิจัยนี้จึงไม่เกิดปัญหาตัวแปรอิสระมีความสัมพันธ์กันสูงมาก (Multicollinearity)

ตารางที่ 5 Confusion Matrix การว่างงานจากเทคนิคการถดถอยโลจิสติกทวิภาควิธีวิธีการเลือกแบบไปข้างหน้า(Forward: Conditional) แบบไม่มี Constant ของข้อมูลชุด 20 เปอร์เซ็นต์

ค่าจริง		ค่าทำนาย	
		การว่างงาน	
		ไม่ว่างงาน	ว่างงาน
การว่างงาน	ไม่ว่างงาน	1012 (TN)	3 (FP)
	ว่างงาน	90 (FN)	153 (TP)

จากตารางที่ 5 แสดงเปอร์เซ็นต์ความถูกต้องของการพยากรณ์ ดังนี้

$$\text{Accuracy} = \frac{TP + TN}{TP + FP + TN + FN} = \frac{153 + 1012}{153 + 3 + 1012 + 90} = 0.92607$$

จากข้อมูลชุดการพยากรณ์ พบว่า ตัวแบบนี้มีค่าความถูกต้องเท่ากับ 92.607%

สรุปและอภิปรายผล

1. ข้อมูลลักษณะส่วนบุคคล

ผลการศึกษาพบว่า มีผู้ตอบแบบสอบถามเพศหญิงมากกว่าเพศชาย ส่วนใหญ่มีสถานภาพโสด และมีระดับการศึกษาสูงสุด คือ ปริญญาตรี โดยศึกษาในสายวิสามัญมากกว่าสายวิชาการ เมื่อพิจารณากลุ่มตัวอย่างที่ประกอบอาชีพ พบว่า ส่วนใหญ่มีอาชีพเป็นพนักงานบริการและผู้จัดจำหน่ายสินค้า และมีสถานภาพการทำงานเป็นลูกจ้างเอกชน

2. สาเหตุของการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร

จากการวิเคราะห์พบว่า ปัจจัยที่เป็นสาเหตุของการว่างงานและไม่ว่างงานของครัวเรือนในกรุงเทพมหานคร ด้วยเทคนิคการถดถอยโลจิสติกทวิภาคที่ระดับนัยสำคัญ 0.05 มีดังนี้

ปัจจัยด้านข้อมูลส่วนบุคคล ได้แก่ อายุ

ปัจจัยด้านการทำงาน ได้แก่ ช่องทางการหางาน/สมัครงาน เหตุผลที่ไม่หางานทำระยะเวลาที่หางาน/พร้อมทำงาน สาเหตุที่ออกจากงานล่าสุด ระยะเวลาที่ออกจากงานล่าสุด และระยะเวลาที่หยุดงาน

ข้อเสนอแนะ

งานวิจัยนี้เป็นงานวิจัยที่เริ่มจัดทำขึ้นตั้งแต่เมื่อปี พ.ศ. 2565 ซึ่งในอนาคตสถานการณ์ COVID-19 นั้น อาจจะไม่ได้ส่งผลกระทบกับการดำเนินชีวิต รวมถึงการมีงานทำของประชากรหรือครัวเรือนมากนัก

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แนวทางการเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต

Guidelines for Increasing the Number of Loan Applicants for GSB for BCG Economy Government Savings Bank, Phuket Zonel

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บทคัดย่อ

การศึกษามีวัตถุประสงค์เพื่อศึกษา 1) ปัจจัยส่วนประสมทางการตลาดบริการ ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม และกระบวนการตัดสินใจของผู้สมัครสินเชื่อ 2) ปัจจัยส่วนประสมทางการตลาดบริการและปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมที่มีผลต่อกระบวนการตัดสินใจ และ 3) หาสาเหตุปัญหาและนำเสนอทางเลือกแนวทางแก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต ให้เป็นไปตามเป้าหมายของธนาคารกำหนดไว้ เก็บข้อมูลแบบสอบถามประชากร 200 ราย และสัมภาษณ์ผู้ให้ข้อมูล 20 ราย วิเคราะห์ข้อมูลหาค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน การถดถอยพหุคูณแบบปกติ วิเคราะห์เชิงเนื้อหา แผนผังก้างปลา SWOT และตาราง TOWS Matrix ผลการศึกษาพบว่า 1) ปัจจัยส่วนประสมทางการตลาดบริการ ภาพรวมอยู่ในระดับเห็นด้วย ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมและกระบวนการตัดสินใจภาพรวมอยู่ในระดับมาก 2) ปัจจัยด้านผลิตภัณฑ์ ปัจจัยด้านพนักงาน ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม มีผลต่อกระบวนการตัดสินใจอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 3) สาเหตุปัญหามาจากด้านผลิตภัณฑ์ กระบวนการให้บริการ การส่งเสริมการตลาด พนักงาน ราคา และการรับรู้คุณค่าสิ่งแวดล้อม และได้แนวทางแก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อเลือกการส่งเสริมการตลาดด้วยวิธีทำการตลาดในการประชาสัมพันธ์ร่วมกับเครือข่ายภาคสังคม ปรับกลยุทธ์การตลาดให้พนักงานที่มีความเชี่ยวชาญเสนอขายผลิตภัณฑ์และเพิ่มสื่อประชาสัมพันธ์ตามสาขา

คำสำคัญ: สินเชื่อ GSB for BCG Economy, ปัจจัยส่วนประสมทางการตลาดบริการ, การตัดสินใจสมัครสินเชื่อ, ธนาคารออมสิน เขตภูเก็ต

Abstract

The objectives of this research were to study 1) marketing mix factors, environmental value perception factors, and decision-making process for loan applicants, 2) marketing mix factors, environmental value perception factors affecting the decision-making process, and 3) find the cause of the problem and presenting guidelines solutions for increasing the number of loan applicants for BCG Economy, Government Saving Bank Phuket Zonal the target of bank. Data was collected using a questionnaire of the population 200 case, and interviews 20 case. Data were analyzed for mean, standard deviation, Regression analysis by Enter method, Content analysis, fishbone diagram, SWOT, and TOWS Matrix Table. The results of research showed that 1) the marketing mix factors found that the overall average was at agreement high level, the factors environmental value perception and decision-making process the overall is at a high level, 2) product factors, employee factors, environmental perception factors that the decision-making process are statistically significant at the 0.05 level, 3) The cause of the problem from the product, process, marketing promotion service, employees, prices and perception of environmental value, and alternative approaches are guidelines solutions of increasing the number of loan applicants to marketing promotion, by means of marketing in public relations together with social sector networks. adjust marketing strategies for employees with expertise to sell products and increase public relations media according to branches.

Keywords: Loan GSB for BCG Economy, Marketing mix factors, Decision-making for loan applicants, Government Saving Bank Phuket Zonal

บทนำ

ธนาคารออมสินได้เปิดตัวโครงการสินเชื่อ “GSB for BCG Economy" ตอบโจทย์โมเดลเศรษฐกิจใหม่หรือ BCG (Bio-Circular-Green Economy) ตามนโยบายของรัฐบาลเพื่อการพัฒนาที่ยั่งยืน มีวัตถุประสงค์ให้ผู้กู้หรือผู้ประกอบการทุกพื้นที่ในการบริหารจัดการที่ดี สามารถนำเงินไปใช้หมุนเวียนในการดำเนินกิจการ ลงทุนในทรัพย์สินถาวร ลงทุนด้านพลังงานทดแทน และเพื่อไถ่ถอนจำนองจากสถาบันการเงินอื่น โดยเฉพาะในพื้นที่อุตสาหกรรมการท่องเที่ยวและบริการของจังหวัดภูเก็ต ซึ่งจากการดำเนินงานขับเคลื่อนของธนาคารออมสิน เขตภูเก็ต ในพื้นที่จังหวัดภูเก็ต นับตั้งแต่เปิดตัวโครงการถึงเดือนมิถุนายน พ.ศ. 2566 ต่ำกว่าเป้าหมายที่ธนาคารกำหนดไว้ โดยมีการกำหนดเป้าหมายแต่ละสาขาจำนวนผู้กู้ 30 ราย วงเงินสินเชื่อ 120 ล้านบาท และจากผลการดำเนินงานจาก 12 สาขา สาขาภูเก็ตทำยอดวงเงินสินเชื่อได้มากที่สุด คิดเป็นร้อยละ 60.27 รองลงมา สาขาป่าตอง ร้อยละ 42.49 สาขาถลาง ร้อยละ 38.40 สาขาห้าแยกฉลอง ร้อยละ 18.15 สาขาสามกอง ร้อยละ 9.00 สาขากะทู้ ร้อยละ 7.90 สาขาเชิงทะเล ร้อยละ 6.80 สาขาเซ็นทรัลภูเก็ต เฟสติวัล ร้อยละ 6.40 สาขาถนนพูนผล ร้อยละ 5.30 สาขากะรน ร้อยละ 4.00 สาขาถนนเทพกระษัตรี ร้อยละ 3.80 และสาขาสี่แยกท่าเรือ ร้อยละ 2.90 ที่ทำยอดวงเงินสินเชื่อได้น้อยที่สุด (ธนาคารออมสิน เขตภูเก็ต, 2566) ซึ่งธนาคารออมสิน เขตภูเก็ตและสาขา ต้องปฏิบัติตามธนาคารออมสิน การรับนโยบายผลิตภัณฑ์ หลักเกณฑ์ เงื่อนไข วงเงินสินเชื่อ และกระบวนการให้บริการสินเชื่อ

ที่ต้องขับเคลื่อนสนับสนุนกิจการที่มีโมเดลเศรษฐกิจ BCG และให้ความสำคัญการรับรู้คุณค่าสิ่งแวดล้อม ประกอบกับพนักงานสินเชื่อที่ให้บริการแต่ละสาขามีจำนวนน้อย สร้างแรงกดดันต้องปฏิบัติหน้าที่ในการขับเคลื่อนและประชาสัมพันธ์เพื่อให้ลูกค้าได้ตัดสินใจเลือกใช้บริการ นอกจากนั้นการแข่งขันเงื่อนไขและหลักเกณฑ์สินเชื่อเพื่อสิ่งแวดล้อม อัตราดอกเบี้ย หลักทรัพย์ค้ำประกัน และจำนวนวงเงินกู้ของสถาบันการเงินอื่นที่มีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ ซึ่งสินเชื่อนี้มีผู้ประกอบการในพื้นที่สนใจ และตระหนักถึงสิ่งแวดล้อม แต่ด้วยหลักเกณฑ์และคุณสมบัติมีผลต่อการไม่ผ่านเกณฑ์อนุมัติ อาจเป็นสาเหตุต่อส่งผลให้จำนวนรายและจำนวนเงินกู้สินเชื่อที่อนุมัติไม่เป็นไปตามเป้าหมายที่ธนาคารออมสินได้กำหนดไว้ จึงเป็นที่มาของการศึกษาแนวทางการเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต และผลการวิจัยคาดว่าจะเป็นประโยชน์ต่อการปรับปรุงและพัฒนากลยุทธ์ทางการตลาดตอบโจทย์ความต้องการของลูกค้าในพื้นที่ และเป็นประโยชน์ต่อภาพรวมธนาคารออมสินเพื่อแข่งขันและพัฒนาผลิตภัณฑ์เป็นไปตามนโยบายขับเคลื่อนสิ่งแวดล้อมของภาครัฐ

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาปัจจัยส่วนประสมทางการตลาดบริการ ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม และกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต
2. เพื่อศึกษาปัจจัยส่วนประสมทางการตลาดบริการ และปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมที่มีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต
3. เพื่อศึกษาหาสาเหตุปัญหาและนำเสนอทางเลือกแนวทางแก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต ให้เป็นไปตามเป้าหมายของธนาคารกำหนดไว้

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิดสินเชื่อ GSB for BCG Economy ธนาคารออมสิน สินเชื่อนี้แตกต่างจากสินเชื่อทั่วไปของธนาคาร เพราะสินเชื่อ GSB for BCG Economy นำทฤษฎีเศรษฐกิจใหม่ BCG (Bio-Circular-Green Economy) มาใช้กำหนดคุณสมบัติของผู้กู้ เปิดให้กู้เงินกู้ระยะสั้นและระยะยาวสามารถใช้หลักประกัน ได้แก่ สมุดฝากเงินออมสิน สลากออมสินพิเศษ พันธบัตรรัฐบาล พันธบัตรรัฐวิสาหกิจ ที่ดินและอาคาร ที่ดินเปล่าที่เป็นโฉนดที่ดินหรือ น.ส.3ก. ห้องชุด บรรษัทประกันสินเชื่ออุตสาหกรรมขนาดย่อม (บสย.) และหลักทรัพย์อื่นที่ธนาคารกำหนด และอัตราดอกเบี้ยและค่าธรรมเนียมเป็นไปตามธนาคารกำหนด (ธนาคารออมสิน, 2566)

2. แนวคิดกระบวนการตัดสินใจ การตัดสินใจเป็นกระบวนการเลือกแนวทางปฏิบัติอาศัยประสบการณ์ในการเลือกทางใดทางหนึ่งหรือหลายทาง เพื่อให้บรรลุเป้าหมายอาศัยกระบวนการตัดสินใจ 5 ขั้นตอน ได้แก่ การตระหนักและการรับรู้ถึงปัญหา การค้นหาข้อมูล การประเมินผลทางเลือก การตัดสินใจซื้อหรือใช้บริการ และพฤติกรรมภายหลังซื้อหรือใช้บริการ (ชูชัย สมิทธิไกร, 2563) สามารถนำไปใช้ศึกษากระบวนการตัดสินใจของผู้สมัครสินเชื่อ

3. แนวคิดการรับรู้คุณค่าและสิ่งแวดล้อม เป็นการรับรู้คุณค่าเกี่ยวกับสิ่งแวดล้อมขององค์กรที่ต้องคำนึงถึงหลักเกณฑ์การรับรองระบบการจัดการสิ่งแวดล้อม และเป็นสิ่งสำคัญที่โรงงานอุตสาหกรรมต้องวางแผนจัดการสิ่งแวดล้อม และต้องช่วยกันขับเคลื่อนให้เป็นไปตามยุทธศาสตร์การขับเคลื่อนการ

พัฒนาประเทศ (กรมโรงงานอุตสาหกรรม, 2560) สอดคล้องกับการขับเคลื่อนให้เป็นไปตามยุทธศาสตร์การขับเคลื่อนการพัฒนาประเทศด้วยเศรษฐกิจ BCG พ.ศ. 2564 – 2570 ที่เป็นการขับเคลื่อนโมเดลเศรษฐกิจใหม่ของประเทศ

4. แนวคิดการวิเคราะห์สภาพแวดล้อมภายในและภายนอก (SWOT Analysis) SWOT Analysis ด้วยการวิเคราะห์ถึงจุดแข็ง (Strength) จุดอ่อน (Weakness) สภาพแวดล้อมภายใน วิเคราะห์โอกาส (Opportunity) และอุปสรรค (Threat) จากสภาพแวดล้อมภายนอก (เอกชัย บุญยาทิษฐาน, 2556)

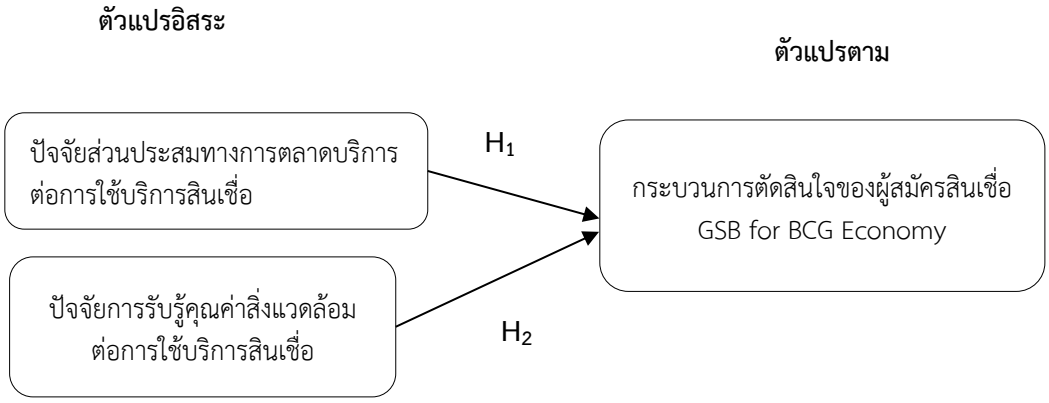
5. แนวคิดแผนผังก้างปลา เป็นเครื่องมือในการวิเคราะห์หาสาเหตุด้วยแผนภูมิวิเคราะห์หาสาเหตุและผลกระทบของปัญหา เขียนหัวปลาหันไปทางขวาแล้วตามด้วยเส้นแกนกลางและแตกกิ่งก้านออกไปในลักษณะของก้างปลาที่เป็นการหาสาเหตุ เป็นสาเหตุรองและสาเหตุย่อย (วันรัตน์ จันทกิจ, 2553)

6. แนวคิดการวิเคราะห์ TOWS Matrix เป็นการวิเคราะห์หาแนวทางเลือก โดยการนำการวิเคราะห์ SWOT มาจับคู่ระหว่างปัจจัยสภาพแวดล้อมภายในและปัจจัยสภาพแวดล้อมภายนอกออกมาเป็นกลยุทธ์ 4 รูปแบบ ได้แก่ กลยุทธ์เชิงรุก กลยุทธ์เชิงแก้ไข กลยุทธ์เชิงป้องกัน และกลยุทธ์เชิงรับ (Kulshrestha & Puri, 2017) ที่สามารถนำไปประยุกต์หาสาเหตุและแนวทางการเพิ่มยอดผู้สมัครสินเชื่อ

7. ทฤษฎีส่วนประสมทางการตลาดบริการ ใช้เป็นเครื่องมือทางการตลาดหรือตัวแปรทางการตลาดที่นำมาศึกษาเพื่อหากลยุทธ์ทางการตลาดสำหรับธุรกิจที่ให้บริการ ประกอบด้วยตัวแปร ได้แก่ ด้านผลิตภัณฑ์ เป็นสิ่งที่สัมผัสได้และสัมผัสไม่ได้ ทั้งในรูปของผลิตภัณฑ์เพื่อให้บริการหรือเป็นสินค้าบริการ ด้านราคา เป็นมูลค่าหรือคุณค่าของผลิตภัณฑ์ที่อยู่ในรูปของตัวเงิน ด้านช่องทางการจัดจำหน่าย เป็นช่องทางทำเลที่ตั้งหรือแหล่งจำหน่ายและการให้บริการ ด้านการส่งเสริมการตลาด เป็นการสื่อสารข้อมูลของการส่งเสริมการตลาดหรือการขาย ด้านพนักงาน เกี่ยวกับพนักงานบริการแก่ลูกค้าหรือผู้ใช้บริการ ด้านกระบวนการให้บริการ เกี่ยวข้องกับขั้นตอนและวิธีการปฏิบัติในการบริการ และด้านสิ่งแวดล้อมทางกายภาพ เกี่ยวกับภาพลักษณ์ของการนำเสนอสิ่งแวดล้อมลักษณะทางกายภาพให้กับลูกค้าหรือผู้ใช้บริการ (Kotler & Keller, 2016) ซึ่งนำไปประยุกต์ใช้ศึกษาสินเชื่อ

8. งานวิจัยที่เกี่ยวข้อง งานวิจัยที่ให้ความสำคัญเครื่องมือการตลาดปัจจัยส่วนประสมทางการตลาด อาทิ งานวิจัยของ อภิญญา ศรีสำราญ (2561) ที่ว่าปัจจัยส่วนประสมทางการตลาดโดยรวมอยู่ในระดับมาก และด้านช่องทางการจัดจำหน่าย ด้านการส่งเสริมการตลาดส่งผลให้ผู้ใช้บริการไม่ใช้บริการและหาแนวทางแก้ไขปัญหาโดยประชาสัมพันธ์การโฆษณาผ่านทางสื่อ งานวิจัยที่เกี่ยวข้องกับการรับรู้และสิ่งแวดล้อมมาจากงานวิจัยของ อาทิตยา คูอาริยะกุล (2561) ที่ว่า ธนาคารพาณิชย์ตระหนักถึงความรับผิดชอบต่อสังคมและสิ่งแวดล้อมและการปล่อยก๊าซเรือนกระจก สำหรับงานวิจัยที่เกี่ยวข้องกระบวนการตัดสินใจมาจากงานวิจัยของ สิริรัก บุญมี (2562) ที่ศึกษากระบวนการตัดสินใจเลือกใช้บริการสินเชื่อประเภทโครงการธนาคารประชาชนของธนาคารออมสินภาพรวมอยู่ในระดับมาก เป็นต้น

9. กรอบแนวคิด



ภาพที่ 1 กรอบแนวคิดในการวิจัย

วิธีดำเนินการวิจัย

การวิจัยใช้รูปแบบการวิจัยผสมผสานระหว่างการวิจัยเชิงคุณภาพและการวิจัยเชิงปริมาณนำเสนอวิธีดำเนินการวิจัย ดังนี้

1. ประชากร

1.1 การวิจัยเชิงคุณภาพ ประชากรเป็นผู้ให้ข้อมูลการสัมภาษณ์มาจากผู้บริหารหรือพนักงาน และลูกค้าของธนาคารออมสิน เขตภูเก็ต 20 ราย มาจากผู้บริหารและพนักงานที่เกี่ยวข้องการให้สินเชื่อระดับเขตภูเก็ต 2 ราย ผู้บริหารหรือพนักงานที่เกี่ยวข้องการให้สินเชื่อ GSB for BCG Economy จาก 12 สาขา 12 ราย และลูกค้าที่สนใจและไม่สนใจประสงค์กู้สินเชื่อในสาขาที่ยอดการกู้สินเชื่อน้อยที่สุด 6 ราย จาก 6 สาขา ได้แก่ สาขากะรน สาขาเซ็นทรัลภูเก็ต เฟสติวัล สาขาถนนเทพกระษัตรี สาขาถนนพูนผล สาขากะทู้ และสาขาเชิงทะเล (ข้อมูล ณ 14 กันยายน 2566)

1.2 การวิจัยเชิงปริมาณ ประชากรเป็นลูกค้าของธนาคารออมสิน เขตภูเก็ต 12 สาขา ได้แก่ สาขาภูเก็ต สาขาป่าตอง สาขาถลาง สาขาห้าแยกฉลอง สาขาเชิงทะเล สาขาสามกอง สาขาเซ็นทรัลภูเก็ต เฟสติวัล สาขาถนนเทพกระษัตรี สาขากะทู้ สาขาถนนพูนผล สาขาสี่แยกท่าเรือ สาขากะรน และทำการสุ่มแบบโควตาจากประชากร 2 กลุ่มคือ กลุ่มที่ 1 ลูกค้าที่ได้รับการอนุมัติสินเชื่อ GSB for BCG Economy 77 ราย และกลุ่มที่ 2 ลูกค้าที่ไม่รับการอนุมัติสินเชื่อ GSB for BCG Economy (ลูกค้าที่เคยสมัครสินเชื่อและไม่ได้รับการอนุมัติ และลูกค้าใหม่ที่อยู่ในขั้นตอนพิจารณาอนุมัติ) 123 ราย รวมทั้งสิ้น 200 ราย (ข้อมูลมาจาก Product Limit Report ธนาคารออมสิน เขตภูเก็ต ตั้งแต่เดือนพฤศจิกายน พ.ศ. 2565 – 14 กันยายน พ.ศ. 2566)

2. เครื่องมือที่ใช้ในการวิจัย

2.1 การวิจัยเชิงคุณภาพ เครื่องมือที่ใช้เป็นแบบสัมภาษณ์กึ่งโครงสร้างที่ได้จากการศึกษาแนวคิด ทฤษฎี และงานวิจัยที่เกี่ยวข้อง นำมาสร้างข้อคำถามการสัมภาษณ์ จำนวน 1 ชุด แบ่งออกเป็น 2 ส่วน คือ ส่วนที่ 1 สัมภาษณ์ผู้บริหารหรือพนักงานของธนาคารออมสิน เขตภูเก็ต ประเด็นข้อมูลส่วนตัวของผู้ให้สัมภาษณ์ สาเหตุของปัญหายอดผู้สมัครสินเชื่อ GSB for BCG Economy ไม่เป็นไปตามเป้าหมาย และจุดอ่อน จุดแข็ง อุปสรรค โอกาส ข้อเสนอแนะเพื่อแก้ไขปัญหาสินเชื่อ GSB for BCG Economy ส่วนที่ 2 สัมภาษณ์ลูกค้าของธนาคารออมสิน เขตภูเก็ต (เฉพาะลูกค้าที่สนใจและไม่สนใจ

กู้สินเชื่อ) ประเด็นข้อมูลส่วนตัวของผู้ให้สัมภาษณ์ เหตุผลที่สนใจและไม่สนใจประสงค์กู้สินเชื่อ ความต้องการและสาเหตุจะสมัคร และสิ่งที่ธนาคารระดับเขตภูเก็ต และระดับสาขาควรพัฒนาและปรับปรุงการให้สินเชื่อ GSB for BCG Economy และนำแบบสัมภาษณ์ที่สร้างนี้เสนออาจารย์ที่ปรึกษาและคณะกรรมการสอบป้องกันเพื่อขอคำแนะนำก่อนนำไปใช้

2.2 การวิจัยเชิงปริมาณ เครื่องมือที่ใช้เป็นแบบสอบถามที่ได้จากการศึกษาแนวคิด ทฤษฎี และงานวิจัยที่เกี่ยวข้อง นำมาสร้างข้อคำถามของแบบสอบถามเพื่อให้สามารถตอบตามวัตถุประสงค์ของการวิจัยและหาคุณภาพเครื่องมือแบบสอบถาม ซึ่งประเด็นแบบสอบถามมี 4 ส่วน ได้แก่ ส่วนที่ 1 ปัจจัยส่วนบุคคล ได้แก่ ตัวแปรสถานะของลูกค้าสินเชื่อ อาชีพ ตำแหน่งงาน ณ ปัจจุบัน ระดับการศึกษาสูงสุด ลักษณะของกิจการ ณ ปัจจุบัน สถาบันการเงินอื่นที่ต้องการขอสินเชื่อนอกเหนือจากธนาคารออมสิน คุณสมบัติที่เข้าเกณฑ์ขอสินเชื่อ การสนใจสมัครสินเชื่อ มีลักษณะเป็นคำถามปลายปิดจำนวน 8 ข้อ ส่วนที่ 2 ปัจจัยส่วนประสมทางการตลาดบริการ ได้แก่ ด้านผลิตภัณฑ์ ด้านราคา ด้านช่องทางการจัดจำหน่าย ด้านการส่งเสริมการตลาด ด้านพนักงาน ด้านกระบวนการให้บริการ ด้านสิ่งแวดล้อมทางกายภาพ มีลักษณะแบบสอบถามแบบมาตราส่วนประมาณค่า (Rating Scale) ตามวิธีของลิเคิร์ท (Likert's Scale) วัดความคิดเห็นข้อมูลประเภทอันตรภาคหรือมาตรวัดแบบช่วง (Interval Scale) 5 ตัวเลือก คือ เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่แน่ใจ ไม่เห็นด้วย และไม่เห็นด้วยอย่างยิ่ง ส่วนที่ 3 ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม และส่วนที่ 4 กระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต ได้แก่ ด้านตระหนักปัญหา ด้านการค้นหาข้อมูล ด้านการประเมินผลทางเลือก ด้านการเลือกใช้บริการ และด้านหลังการใช้บริการสินเชื่อ มีลักษณะแบบสอบถามเช่นเดียวกัน แต่ใช้ 5 ตัวเลือก คือ มากที่สุด มาก ปานกลาง น้อย และน้อยที่สุด และนำแบบสอบถามที่สร้างขึ้นนี้นำเสนออาจารย์ที่ปรึกษาและคณะกรรมการสอบป้องกันเพื่อตรวจสอบความถูกต้องของเนื้อหา ภาษาที่ใช้ และนำมาปรับปรุง หลังนั้นจึงนำไปทดลองใช้ (Try Out) กับกลุ่มตัวอย่างที่คล้ายคลึงกลุ่มประชากรที่ศึกษา คือ ธนาคารออมสิน เขตกระบี่ 30 ราย และนำมาวิเคราะห์ด้วยโปรแกรมสำเร็จรูปทางสถิติหาความเชื่อมั่นของเครื่องมือด้วยการหาค่าอัลฟ่าครอนบาค (Cronbach's alpha) ได้ค่าความเชื่อมั่นทั้งฉบับเท่ากับ 0.92

3. การเก็บรวบรวมข้อมูล

3.1 การวิจัยเชิงคุณภาพ เก็บข้อมูลจากแหล่งข้อมูลปฐมภูมิภาคสนามด้วยการสัมภาษณ์ผู้ให้ข้อมูลหลัก จำนวน 20 ราย และนำหนังสือที่ออกโดยมหาวิทยาลัยหอการค้าไทยเพื่อขอความอนุเคราะห์เข้าเก็บข้อมูลและเข้าสัมภาษณ์ถึงผู้อำนวยการธนาคารออมสิน เขตภูเก็ต เก็บด้วยตนเองโดยการสัมภาษณ์ตัวต่อตัวและทางโทรศัพท์ ใช้ระยะเวลาในการเก็บข้อมูลตั้งแต่วันที่ 25 กันยายน - 8 ตุลาคม พ.ศ. 2566

3.2 การวิจัยเชิงปริมาณ เก็บข้อมูลจากแหล่งข้อมูลปฐมภูมิภาคสนามด้วยการเก็บข้อมูลวิธีการสอบถามประชากรที่เป็นลูกค้าของธนาคารออมสิน เขตภูเก็ต จำนวน 200 ราย โดยการสร้างแบบสอบถามออนไลน์ ผ่านระบบ Google Form และนำหนังสือที่ออกโดยมหาวิทยาลัยหอการค้าไทยเพื่อขอความอนุเคราะห์เก็บข้อมูล โดยมีการประสานงานไปยังธนาคารสาขา 12 สาขา ส่งลิงก์ผ่านระบบไลน์กลุ่มของธนาคารออมสิน เขตภูเก็ต และขอความอนุเคราะห์ให้พนักงานสินเชื่อแต่ละสาขาช่วยเก็บข้อมูลแบบสะดวกส่งลิงก์ต่อให้ลูกค้าผ่านสื่อออนไลน์ ได้แก่ ช่องทาง Line ช่องทาง Facebook Messenger ทางอีเมล์ และรวบรวมข้อมูลนำมาตรวจสอบข้อมูลก่อนไปวิเคราะห์ โดยใช้ระยะเวลาเก็บข้อมูลวันที่ 22 กันยายน - 9 ตุลาคม พ.ศ. 2566

4. สถิติที่ใช้ในการวิเคราะห์ข้อมูล

4.1 การวิจัยเชิงคุณภาพ นำข้อมูลจากการสัมภาษณ์ตรวจสอบข้อมูลก่อนนำมาวิเคราะห์ด้วยการวิเคราะห์เชิงเนื้อหา (Content Analysis) โดยการจัดหมวดหมู่ของข้อมูลหรือจัดระเบียบของข้อมูลเพื่อให้ได้ประเด็นของการศึกษาตามวัตถุประสงค์ของการวิจัย

4.2 การวิจัยเชิงปริมาณ หลังจากเก็บรวบรวมและตรวจสอบ นำมาลงรหัส วิเคราะห์ด้วยโปรแกรมสำเร็จรูปทางสถิติ วิเคราะห์สถิติหาค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน เพื่อตอบตามวัตถุประสงค์ข้อที่ 1 และเพื่อตอบตามวัตถุประสงค์ข้อที่ 2 โดยทดสอบตามสมมติฐานการวิจัยที่ 1 ปัจจัยส่วนประสมทางการตลาดบริการมีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ และสมมติฐานการวิจัยที่ 2 ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมมีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy วิเคราะห์ด้วยสถิติการถดถอยพหุคูณแบบปกติ (Enter Regression Analysis) ที่ระดับนัยสำคัญทางสถิติ 0.05

4.3 การวิจัยผสมผสานระหว่างการวิจัยเชิงคุณภาพและปริมาณ เพื่อตอบตามวัตถุประสงค์ข้อที่ 3 วิเคราะห์หาสาเหตุของปัญหาใช้แผนผังก้างปลา กำหนดหัวปลาเป็นปัญหาใส่สาเหตุหลักสาเหตุรองที่ก้างปลาและสรุปสาเหตุที่ได้ หลังจากนั้นค้นหาแนวทางการแก้ไขปัญหาด้วยการวิเคราะห์ข้อมูล SWOT และนำข้อมูลผลการวิเคราะห์ SWOT มาวิเคราะห์ด้วยตาราง TOWS Matrix เพื่อหาทางเลือกของกลยุทธ์และประเมินทางเลือกที่ดีที่สุด เพื่อนำไปใช้เป็นแนวทางการตลาดแก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อ

ผลการวิจัย

ผลการวิจัยนำเสนอตามวัตถุประสงค์ของการวิจัย ดังนี้

วัตถุประสงค์ของการวิจัยที่ 1 ความคิดเห็นปัจจัยส่วนประสมทางการตลาดบริการ ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม และกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต ผลการวิเคราะห์ดังตารางที่ 1

ตารางที่ 1 ผลวิเคราะห์ปัจจัยส่วนประสมทางการตลาดบริการ ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมและกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต

รายการ	ค่าเฉลี่ย	ค่าเบี่ยงเบน	ระดับความคิดเห็น
1. ปัจจัยส่วนประสมทางการตลาดบริการ	3.57	0.94	เห็นด้วย
1.1 ด้านผลิตภัณฑ์	3.70	0.95	เห็นด้วย
1.2 ด้านราคา	3.66	0.93	เห็นด้วย
1.3 ด้านช่องทางการจัดจำหน่าย	3.55	0.91	เห็นด้วย
1.4 ด้านการส่งเสริมการตลาด	3.40	0.94	ไม่แน่ใจ
1.5 ด้านพนักงาน	3.54	0.92	เห็นด้วย
1.6 ด้านกระบวนการให้บริการ	3.60	0.95	เห็นด้วย
1.7 ด้านสิ่งแวดล้อมทางกายภาพ	3.51	0.96	เห็นด้วย
2. ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม	3.58	0.94	มาก

ตารางที่ 1 (ต่อ)

รายการ	ค่าเฉลี่ย	ค่าเบี่ยงเบน	ระดับความคิดเห็น
3. กระบวนการตัดสินใจของผู้สมัครสินเชื่อ	3.68	0.95	มาก
3.1 ด้านตระหนักปัญหา	3.78	0.95	มาก
3.2 ด้านการค้นหาข้อมูล	3.56	0.95	มาก
3.3 ด้านการประเมินผลทางเลือก	3.67	0.96	มาก
3.4 ด้านการเลือกใช้บริการ	3.75	0.96	มาก
3.5 ด้านหลังการใช้บริการสินเชื่อ	3.66	0.95	มาก

จากตารางที่ 1 พบว่า ปัจจัยส่วนประสมทางการตลาดบริการต่อการใช้บริการสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต ภาพรวมอยู่ในระดับเห็นด้วย เมื่อพิจารณารายด้านอยู่ในระดับเห็นด้วย เรียงลำดับคือ ด้านผลิตภัณฑ์ ด้านราคา ด้านกระบวนการให้บริการ ด้านช่องทางการจัดจำหน่าย ด้านพนักงาน ด้านสิ่งแวดล้อมทางกายภาพ และอยู่ในระดับไม่แน่ใจ คือ ด้านการส่งเสริมการตลาด ส่วนปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมต่อการใช้บริการสินเชื่อ GSB for BCG Economy ภาพรวมอยู่ในระดับมาก สำหรับความคิดเห็นกระบวนการตัดสินใจของผู้สมัครสินเชื่อภาพรวมอยู่ในระดับมาก เมื่อพิจารณารายด้าน เรียงลำดับคือ ด้านตระหนักปัญหา ด้านการเลือกใช้บริการ ด้านการประเมินผลทางเลือก ด้านหลังการใช้บริการสินเชื่อ และด้านการค้นหาข้อมูล

วัตถุประสงค์ของการวิจัยที่ 2 ปัจจัยส่วนประสมทางการตลาดบริการ และปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมที่มีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต ผลการวิเคราะห์ดังตารางที่ 2

ตารางที่ 2 ผลวิเคราะห์ปัจจัยส่วนประสมทางการตลาดบริการ ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมมีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต

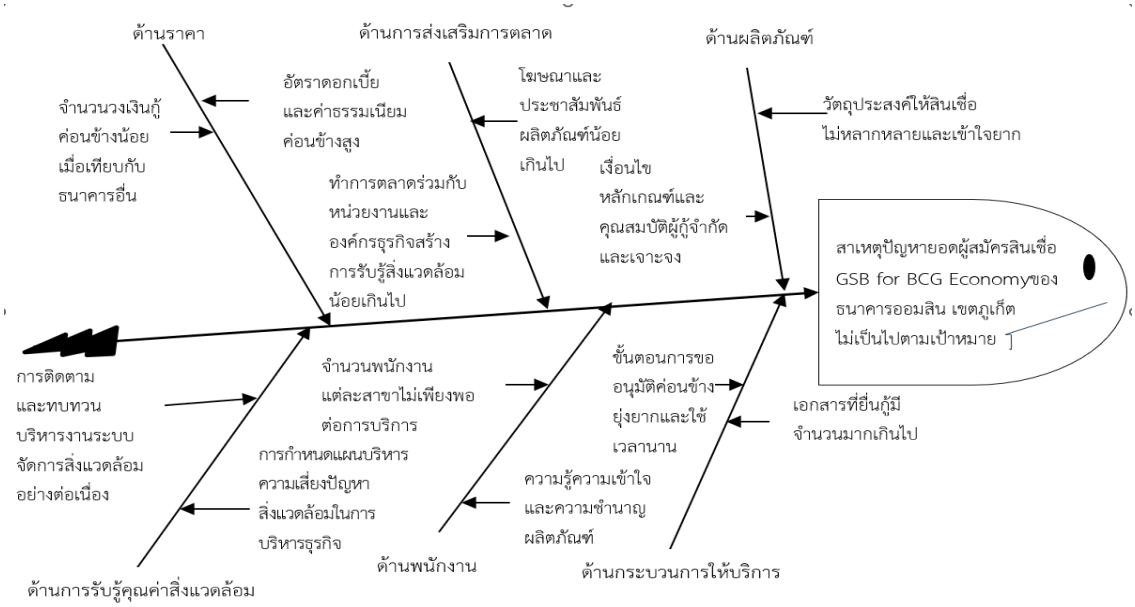
ตัวแปร	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
ค่าคงที่ (Constant)	2.04	0.24	-	8.42	0.00*
ปัจจัยด้านผลิตภัณฑ์ (Xp_1)	0.09	0.04	0.16	2.12	0.04*
ปัจจัยด้านราคา (Xp_2)	-0.01	0.04	-0.02	-0.28	0.78
ปัจจัยด้านช่องทางการจัดจำหน่าย (Xp_3)	0.06	0.05	0.09	1.16	0.25
ปัจจัยด้านการส่งเสริมการตลาด (Xp_4)	-0.08	0.04	-0.13	-1.85	0.07
ปัจจัยด้านพนักงาน (Xp_5)	0.10	0.05	0.16	1.99	0.05*
ปัจจัยด้านกระบวนการให้บริการ (Xp_6)	0.02	0.05	0.03	0.33	0.75
ปัจจัยด้านสิ่งแวดล้อมทางกายภาพ (Xp_7)	0.05	0.05	0.09	1.20	0.23
ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม (Xp_8)	0.23	0.06	0.27	3.78	0.00*

$R = 0.50$, $R^2 = 0.25$, $(R^2\ adj) = 0.22$, $SE_{est} = 0.34$, $F = 8.02$*, *มีนัยสำคัญทางสถิติที่ระดับ 0.05

จากตารางที่ 2 พบว่า ปัจจัยด้านผลิตภัณฑ์ ปัจจัยด้านพนักงาน ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมมีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 ซึ่งสามารถนำไปใช้เพื่อการวิเคราะห์หาสาเหตุของปัญหาด้วย

แผนผังก้างปลาต่อไป เมื่อพิจารณาค่าสัมประสิทธิ์สหสัมพันธ์พหุคูณ (R) มีค่าเท่ากับ 0.50 และกำลังสองของค่าสหสัมพันธ์พหุคูณ (R^2) มีค่าเท่ากับ 0.25 แสดงว่า ตัวแปรพยากรณ์ทั้งหมดร่วมกันพยากรณ์กระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต ได้ร้อยละ 25.0 ค่าความคลาดเคลื่อนมาตรฐานของการพยากรณ์ (SE_{est}) มีค่า 0.34

วัตถุประสงค์ของการวิจัยที่ 3 หาสาเหตุปัญหาและนำเสนอทางเลือกแนวทางแก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต ให้เป็นไปตามเป้าหมายของธนาคารกำหนดไว้ ซึ่งการหาสาเหตุปัญหาเพื่อนำไปใช้ในการวิเคราะห์แผนผังก้างปลาโดยพิจารณาจากตัวแปรอิสระหรือตัวแปรพยากรณ์ที่มีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 มีจำนวน 3 ตัวแปร คือ ปัจจัยด้านผลิตภัณฑ์ ปัจจัยด้านพนักงาน ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อม และพิจารณาจากค่าเฉลี่ยรายข้อที่ต่ำกว่าข้ออื่น ๆ และพิจารณาร่วมกับการวิจัยเชิงคุณภาพผลจากการสัมภาษณ์มีสาเหตุจากด้านผลิตภัณฑ์ ด้านราคา ด้านการส่งเสริมการตลาด ด้านพนักงาน ด้านกระบวนการให้บริการ นำมาเขียนแผนผังก้างปลาดังภาพที่ 2



ภาพที่ 2 ผลการวิเคราะห์หาสาเหตุของปัญหาด้วยแผนผังก้างปลา

จากภาพที่ 2 สาเหตุของปัญหา ได้สาเหตุหลัก 6 สาเหตุ ส่วนสาเหตุรองแต่ละก้างปลา คือ ด้านผลิตภัณฑ์ ได้แก่ เงื่อนไข หลักเกณฑ์และคุณสมบัติผู้กู้จำกัดและเจาะจง และวัตถุประสงค์ให้สินเชื่อไม่หลากหลายและเข้าใจยาก ด้านกระบวนการให้บริการ ได้แก่ ขั้นตอนการขออนุมัติค่อนข้างยุ่งยากและใช้เวลานาน และเอกสารที่ยื่นกู้มีจำนวนมากเกินไป ด้านการส่งเสริมการตลาด ได้แก่ โฆษณาและประชาสัมพันธ์ผลิตภัณฑ์น้อยเกินไป และทำการตลาดร่วมกับหน่วยงานและองค์กรธุรกิจสร้างการรับรู้สิ่งแวดล้อมน้อยเกินไป ด้านพนักงาน ได้แก่ ความรู้ความเข้าใจและความชำนาญผลิตภัณฑ์ และจำนวนพนักงานแต่ละสาขาไม่เพียงพอต่อการบริการ ด้านราคา ได้แก่ อัตราดอกเบี้ยและค่าธรรมเนียมค่อนข้างสูงและจำนวนวงเงินกู้ค่อนข้างน้อยเมื่อเทียบกับธนาคารอื่น และการรับรู้คุณค่าสิ่งแวดล้อม ได้แก่ การติดตาม

และทบทวนบริหารงานระบบจัดการสิ่งแวดล้อมอย่างต่อเนื่อง และการกำหนดแผนบริหารความเสี่ยงปัญหาสิ่งแวดล้อมในการบริหารธุรกิจอย่างยั่งยืน และนำเสนอแนวทางแก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต ให้เป็นไปตามเป้าหมายของธนาคารกำหนดไว้ จากสาเหตุของปัญหาดังภาพที่ 2 นำผลการวิเคราะห์ SWOT และนำไปวิเคราะห์ด้วยตาราง TOWS Matrix เพื่อหาทางเลือก ผลการวิเคราะห์ดังตารางที่ 3

ตารางที่ 3 การวิเคราะห์ด้วยตาราง TOWS Matrix

สภาพแวดล้อมภายใน (Internal) / สภาพแวดล้อมภายนอก (External)	จุดแข็ง (S : Strengths)	จุดอ่อน (W : Weaknesses)
	S1 สินเชื่อเน้นเพื่อสิ่งแวดล้อม S2 อัตราดอกเบี้ยถูก S3 ธนาคารเฉพาะกิจริเริ่มสนับสนุนกิจการส่งเสริมธุรกิจอนุรักษ์ สิ่งแวดล้อม	W1 มีข้อจำกัดหลักเกณฑ์ เงื่อนไข W2 คุณสมบัติผู้กู้จำกัดเฉพาะ W3 การประชาสัมพันธ์น้อย W4 ขั้นตอนสมัครและอนุมัติยุ่งยาก W5 เอกสารจำนวนมากและระยะเวลาอนุมัตินาน W6 ความรู้ความเชี่ยวชาญของพนักงาน W7 จำนวนพนักงานมีไม่เพียงพอแต่ละสาขา
โอกาส (O : Opportunity) O1 เจ้าของธุรกิจเริ่มเห็นความสำคัญ BCG สินเชื่อมีโอกาสที่จะเติบโต O2 สังคมสนับสนุนการอนุรักษ์สิ่งแวดล้อม O3 ภาครัฐให้การสนับสนุนโครงการ O4 ธุรกิจต่าง ๆ ตอบรับสนับสนุนนโยบายสิ่งแวดล้อมการเปลี่ยนแปลงเข้าสู่ BCG	SO Strategy กลยุทธ์เชิงรุก (ด้านการส่งเสริมตลาด) ธนาคารรุกสนับสนุนสินเชื่อเจ้าของธุรกิจหรือผู้ประกอบการนำแนวคิด BCG พัฒนาธุรกิจเพื่อสิ่งแวดล้อม (O1, W1) (ด้านการรับคุณค่าสิ่งแวดล้อม) ธนาคารร่วมกับเครือข่ายภาคสังคมสร้างการรับรู้คุณค่าและสนับสนุนกิจการส่งเสริมธุรกิจอนุรักษ์สิ่งแวดล้อม (S3, O2) (ด้านราคา) ขับเคลื่อนสินเชื่ออัตราดอกเบี้ยถูกให้กับธุรกิจต่าง ๆ สามารถตอบโจทย์ภาครัฐที่สนับสนุโครงการสินเชื่อเพื่อการเปลี่ยนธุรกิจเข้าสู่ BCG ได้มากขึ้น (S2-S3, O3-O4)	WO Strategy กลยุทธ์เชิงแก้ไข (ด้านผลิตภัณฑ์) ปรับหลักเกณฑ์และเงื่อนไขคุณสมบัติผู้กู้ทั้งเจ้าของธุรกิจหรือผู้ประกอบการให้หลากหลายเพื่อให้สินเชื่อได้เติบโตมากขึ้น (S1, S2, O1) (ด้านการส่งเสริมตลาด) ร่วมกับเครือข่ายภาคสังคมประชาสัมพันธ์และสนับสนุนกิจการส่งเสริมธุรกิจอนุรักษ์สิ่งแวดล้อม (W3, O2) (ด้านกระบวนการ) ปรับกระบวนการและขั้นตอนการสมัครและการอนุมัติ ลดจำนวนเอกสารยื่นกู้และอนุมัติให้รวดเร็วกว่านี้เพื่อทำให้เจ้าของธุรกิจหรือธุรกิจต่าง ๆ ได้มีโอกาสเข้าถึงแหล่งสินเชื่อมากขึ้น (W4- W5, O1, O4) (ด้านพนักงาน) พัฒนาและอบรมพนักงานให้มีความรู้ความเชี่ยวชาญในผลิตภัณฑ์ที่สามารถให้แนะนำเจ้าของธุรกิจหรือธุรกิจต่าง ๆ และภาคสังคม และเพิ่มพนักงานในแต่ละสาขารองรับให้บริการสินเชื่อเพื่อการเปลี่ยนแปลงเข้าสู่ BCG (W6-W7, O1, O2, O4)
อุปสรรค (T : Threat) T1 ธนาคารพาณิชย์หลายแห่งให้บริการสินเชื่อเพื่อสิ่งแวดล้อมมากขึ้น T2 คู่แข่งขันออกผลิตภัณฑ์มาแข่งขันจำนวนมากขึ้นชิงความได้เปรียบ	ST Strategy กลยุทธ์เชิงป้องกัน (ด้านราคา) สร้างความได้เปรียบอัตราดอกเบี้ยถูกจากคู่แข่งขันธนาคารพาณิชย์อื่นและมิใช่ธนาคารพาณิชย์ (S2, T1-T2) (ด้านการส่งเสริมตลาด) สร้างความได้เปรียบที่เป็นธนาคารเฉพาะกิจริเริ่มสนับสนุนสินเชื่อเพื่อสนับสนุนกิจการส่งเสริมธุรกิจอนุรักษ์สิ่งแวดล้อม (S1, S3, T2)	WT Strategy กลยุทธ์เชิงรับ (ด้านผลิตภัณฑ์) เตรียมพร้อมรับมือกับคู่แข่งขันที่มีหลักเกณฑ์เงื่อนไขไม่จำกัดคุณสมบัติและอนุมัติเร็วกว่า (W1- W2, W4, W5, T1, T2) (ด้านการส่งเสริมตลาด) ปรับกลยุทธ์การตลาดรองรับคู่แข่งขันพัฒนาพนักงานให้มีความรู้ความชำนาญในการนำเสนอขายผลิตภัณฑ์มากว่านี้ (W6, T2) (ด้านการส่งเสริมตลาด) ทำการตลาดในการประชาสัมพันธ์แข่งขันกับคู่แข่งขันธนาคารพาณิชย์หลายแห่งให้บริการสินเชื่อเพื่อสิ่งแวดล้อมที่มีมากขึ้น (W3, T1, T2)

จากตารางที่ 3 ได้แนวทางเลือก 6 แนวทาง คือ แนวทางที่ 1 แก้ไขปัญหาด้านผลิตภัณฑ์ใช้กลยุทธ์เชิงแก้ไขและกลยุทธ์เชิงรับ แนวทางที่ 2 แก้ไขปัญหาด้านกระบวนการให้บริการใช้กลยุทธ์เชิงแก้ไขแนวทางที่ 3 แก้ไขปัญหาด้านการส่งเสริมการตลาดใช้กลยุทธ์เชิงรุก กลยุทธ์เชิงแก้ไข กลยุทธ์เชิงป้องกัน และกลยุทธ์เชิงรับ แนวทางที่ 4 แก้ไขปัญหาด้านพนักงานใช้กลยุทธ์เชิงแก้ไข แนวทางที่ 5 แก้ไขปัญหาด้านราคาใช้กลยุทธ์เชิงรุกและใช้กลยุทธ์เชิงป้องกัน แนวทางที่ 6 แก้ไขปัญหาด้านการรับรู้คุณค่าสิ่งแวดล้อมใช้กลยุทธ์เชิงรุก และเมื่อประเมินแนวทางเลือกที่ดีที่สุดตามเกณฑ์ที่กำหนด ได้แนวทางเลือกด้านการส่งเสริมการตลาด เพื่อนำไปใช้แก้ไปสาเหตุของปัญหา ด้วยวิธีทำการตลาดในการประชาสัมพันธ์ร่วมกับเครือข่ายภาคสังคม ปรับกลยุทธ์การตลาดให้พนักงานที่มีความเชี่ยวชาญเสนอขายผลิตภัณฑ์และเพิ่มสื่อประชาสัมพันธ์ตามสาขาต่าง ๆ โดยผู้บริหารระดับเขตภูเก็ตและระดับสาขามีการมอบนโยบายเพื่อการปฏิบัติกับพนักงาน

สรุปและอภิปรายผล

ผลการวิจัยสามารถสรุปตามวัตถุประสงค์ข้อที่ 1 ปัจจัยส่วนประสมทางการตลาดบริการต่อการใช้บริการสินเชื่อภาพรวมอยู่ในระดับเห็นด้วย ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมต่อการใช้บริการสินเชื่อ และกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต ภาพรวมอยู่ในระดับมาก วัตถุประสงค์ข้อที่ 2 ปัจจัยด้านผลิตภัณฑ์ ปัจจัยด้านพนักงาน ปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมมีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 และวัตถุประสงค์ข้อที่ 3 สาเหตุของปัญหามาจากผลิตภัณฑ์ กระบวนการให้บริการ การส่งเสริมการตลาด พนักงาน ราคา และการรับรู้คุณค่าสิ่งแวดล้อม ได้แนวทางแก้ไขปัญหา โดยการส่งเสริมการตลาดด้วยวิธีทำการตลาดในการประชาสัมพันธ์ร่วมกับเครือข่ายภาคสังคม ปรับกลยุทธ์การตลาดให้พนักงานที่มีความเชี่ยวชาญเสนอขายผลิตภัณฑ์และเพิ่มสื่อประชาสัมพันธ์ตามสาขาต่าง ๆ ที่ผู้บริหารระดับเขตภูเก็ตและระดับสาขามีการมอบนโยบายเพื่อการปฏิบัติกับพนักงาน

ผลการวิจัยสามารถอธิบายผลตามวัตถุประสงค์ของการวิจัยดังนี้

วัตถุประสงค์ของการวิจัยที่ 1 ปัจจัยส่วนประสมทางการตลาดบริการต่อการใช้บริการสินเชื่อ GSB for BCG Economy ภาพรวมและรายด้านอยู่ในระดับเห็นด้วย เรียงลำดับคือ ด้านผลิตภัณฑ์ ด้านราคา ด้านกระบวนการให้บริการ ด้านช่องทางการจัดจำหน่าย ด้านพนักงาน ด้านสิ่งแวดล้อมทางกายภาพ และอยู่ในระดับไม่แน่ใจ คือ ด้านการส่งเสริมการตลาด แสดงให้เห็นว่า ส่วนประสมทางการตลาดสามารถนำมาใช้เป็นเครื่องมือธุรกิจให้บริการตามแนวคิดของ Kotler and Keller (2016) อธิบายว่า ส่วนประสมทางการตลาดบริการสามารถนำมาศึกษาหากลยุทธ์ทางการตลาดสำหรับธุรกิจที่ให้บริการให้สอดคล้องกับแนวคิดที่สำคัญทางการตลาดสมัยใหม่หรือผลิตภัณฑ์ทางการเงินต่าง ๆ และสอดคล้องกับงานวิจัยของ อภิญญา ศรีสำราญ (2561) ที่ว่า ปัจจัยส่วนประสมทางการตลาดต่อการใช้บริหารสินเชื่อภาพรวมอยู่ในระดับมาก และสอดคล้องกับงานวิจัยของ ครองพร เทพยสุวรรณ (2565) ที่ว่า ปัจจัยส่วนประสมทางการตลาดต่อการใช้บริการสินเชื่อภาพรวมและรายด้านอยู่ในระดับเห็นด้วย

ส่วนปัจจัยการรับรู้คุณค่าสิ่งแวดล้อมต่อการใช้บริการสินเชื่อ GSB for BCG Economy ภาพรวมอยู่ในระดับมากและมีการตระหนักคุณค่าทรัพยากรด้วยการลด การใช้ หมุนเวียนนำกลับมาใช้ เช่น ลดการปล่อยก๊าซเรือนกระจก เป็นต้น สอดคล้องกับแนวคิดของ กรมโรงงานอุตสาหกรรม (2560) ที่ชี้ให้เห็นว่าการรับรู้คุณค่าสิ่งแวดล้อมเป็นสิ่งสำคัญที่โรงงานอุตสาหกรรมต้องวางแผนจัดการสิ่งแวดล้อม และสอดคล้องกับงานวิจัยของ อาทิตยา คูอาริยะกุล (2561) ที่ว่า ธนาคารพาณิชย์ตระหนักถึงความรับผิดชอบต่อ

สังคมและสิ่งแวดล้อมและการปล่อยก๊าซเรือนกระจก และจัดทำรายงานความยั่งยืนให้พนักงานทุกคนต้องปฏิบัติ สำหรับกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ภาพรวมและรายด้านอยู่ในระดับมาก เรียงลำดับ คือ ด้านตระหนักปัญหา ด้านการเลือกใช้บริการ ด้านการประเมินผลทางเลือก ด้านหลังการใช้บริการสินเชื่อ และด้านการค้นหาข้อมูล สอดคล้องกับงานวิจัยของ สิริรัก บุญมี (2562) กระบวนการตัดสินใจเลือกใช้บริการสินเชื่อประเภทโครงการธนาคารประชาชน ของธนาคารออมสินอยู่ในระดับมาก และสอดคล้องกับแนวคิดของ Mothersbaugh, Hawkins, Kleiser and Linda (2020) ที่ชี้ให้เห็นว่า กระบวนการตัดสินใจเริ่มจากการตระหนักปัญหา การค้นหาข้อมูล การประเมินการเลือกซื้อหรือเลือกใช้บริการ และกระบวนการหลังการซื้อหรือบริการ และต้องให้ความสำคัญกับสถานการณ์และแหล่งที่มาของอิทธิพลภายในและปัจจัยภายนอกต่อกระบวนการตัดสินใจ

วัตถุประสงค์ของการวิจัยที่ 2 ปัจจัยผลิตภัณฑ์ พนักงาน การรับรู้คุณค่าสิ่งแวดล้อมที่มีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อ GSB for BCG Economy ธนาคารออมสิน เขตภูเก็ต สอดคล้องแนวคิดการรับรู้คุณค่าและสิ่งแวดล้อมของกรมโรงงานอุตสาหกรรม (2560) ที่ว่า การรับรู้คุณค่าเกี่ยวกับสิ่งแวดล้อมควรคำนึงถึงหลักเกณฑ์การรับรองระบบการจัดการสิ่งแวดล้อม ทั้งนี้ ต้องช่วยกันขับเคลื่อนให้เป็นไปตามยุทธศาสตร์การขับเคลื่อนการพัฒนาประเทศไทยด้วยเศรษฐกิจ BCG และสอดคล้องกับงานวิจัยของ อภิญญา ศรีสำราญ (2561) ที่อธิบายว่า ปัจจัยด้านการส่งเสริมการตลาดบริการส่งผลให้ผู้ใช้บริการไม่ใช้บริการสินเชื่อเงิน และยังสอดคล้องกับงานวิจัยของ สิริรัก บุญมี (2562) ที่ว่า ปัจจัยด้านผลิตภัณฑ์พนักงานมีผลกระทบต่อกระบวนการตัดสินใจเลือกใช้บริการสินเชื่ออย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 รวมถึงงานวิจัยของ ครองพร เทพยสุวรรณ (2565) ที่ว่า ปัจจัยผลิตภัณฑ์มีอิทธิพลต่อกระบวนการตัดสินใจเลือกใช้บริการขอกู้สินเชื่อเพื่อคุณ

วัตถุประสงค์ของการวิจัยที่ 3 สาเหตุปัญหายอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต ไม่เป็นไปตามเป้าหมายมาจากด้านผลิตภัณฑ์ ได้แก่ เงื่อนไข หลักเกณฑ์ คุณสมบัติผู้กู้ และวัตถุประสงค์ให้สินเชื่อ ด้านการส่งเสริมการตลาด ได้แก่ โฆษณาและประชาสัมพันธ์ผลิตภัณฑ์ และทำการตลาดร่วมกับหน่วยงานและองค์กรธุรกิจ ด้านกระบวนการให้บริการ ได้แก่ ขั้นตอนการขออนุมัติ และเอกสารที่ยื่นกู้ สอดคล้องกับงานวิจัยของ ครองพร เทพยสุวรรณ (2565) ผลการวิจัยชี้ให้เห็นว่า สาเหตุของปัญหามาจากด้านผลิตภัณฑ์ ได้แก่ คุณสมบัติของผู้ขอ หลักเกณฑ์ เงื่อนไขและวงเงินสินเชื่อ ด้านส่งเสริมการตลาด ได้แก่ ประชาสัมพันธ์และออกบูทกิจกรรมน้อย ด้านกระบวนการให้บริการ ได้แก่ ขั้นตอนการสมัครยุ่งยาก และงานวิจัยของ กานต์พิชชา กองคนขวา (2561) ที่ชี้ให้เห็นว่า สภาพปัญหาการปล่อยสินเชื่อมาจากกระบวนการพิจารณาสินเชื่อ สำหรับด้านราคามีสาเหตุอัตราดอกเบี้ยค่อนข้างสูงและจำนวนวงเงินกู้ค่อนข้างน้อยเมื่อเทียบกับธนาคารอื่น สอดคล้องกับงานวิจัยของ กษิดิศ การบรรจง (2561) ที่ว่า ปัจจัยด้านอัตราดอกเบี้ยและปัจจัยด้านวงเงินที่ขอของธนาคารพาณิชย์ที่เลือกใช้บริการมีอิทธิพลต่อการเลือกใช้บริการมากที่สุด รวมถึงด้านพนักงานที่เป็นสาเหตุ สอดคล้องกับงานวิจัย สิริรัก บุญมี (2562) ที่ว่า มีผลกระทบต่อกระบวนการตัดสินใจเลือกใช้บริการสินเชื่อ ส่วนการรับรู้คุณค่าสิ่งแวดล้อมที่มาจากขาดการติดตามและทบทวนบริหารงานระบบจัดการสิ่งแวดล้อมอย่างต่อเนื่อง และการกำหนดแผนบริหารความเสี่ยงปัญหาสิ่งแวดล้อมในการบริหารธุรกิจอย่างยั่งยืน สอดคล้องกับ กรมโรงงานอุตสาหกรรม (2560) สาเหตุการบริหารระบบการจัดการสิ่งแวดล้อมล้มเหลวเพราะขาดการทบทวนนโยบายสิ่งแวดล้อม พิจารณาความเสี่ยงและโอกาสที่เกี่ยวข้องกับลักษณะปัญหาสิ่งแวดล้อม ความต้องการและคาดหวังของผู้มีส่วนได้เสีย และพิจารณาผลกระทบที่เกิดขึ้น

ส่วนแนวทางแก้ไขปัญหาได้แนวทางเลือกด้านผลิตภัณฑ์ ด้านกระบวนการให้บริการ ด้านการส่งเสริมการตลาด ด้านพนักงาน ด้านราคา และด้านการรับรู้คุณค่าสิ่งแวดล้อม แก้ไขปัญหาเพิ่มยอดผู้สมัครสินเชื่อ GSB for BCG Economy ของธนาคารออมสิน เขตภูเก็ต และประเมินทางเลือกที่ดีที่สุด ได้การส่งเสริมการตลาดเพื่อนำไปใช้แก้ไปสาเหตุของปัญหาด้วยวิธีทำการตลาดในการประชาสัมพันธ์ร่วมกับเครือข่ายภาคสังคม ปรับกลยุทธ์การตลาดให้พนักงานที่มีความเชี่ยวชาญเสนอขายผลิตภัณฑ์และเพิ่มสื่อประชาสัมพันธ์ตามสาขาต่าง ๆ สอดคล้องกับงานวิจัยของ ครองพร เทพยสุวรรณ (2565) ที่ชี้ให้เห็นว่า แนวทางผลิตภัณฑ์ การส่งเสริมการตลาด กระบวนการให้บริการเป็นแนวทางเพิ่มยอดจำนวนผู้กู้สินเชื่อ และเห็นว่า แนวทางการส่งเสริมการตลาดสินเชื่อโดยการเพิ่มการประชาสัมพันธ์และออกบูธกิจกรรมให้เข้าถึงกลุ่มเป้าหมายเป็นแนวทางที่ดีที่สุด สอดคล้องกับงานวิจัยของ อภิญญา ศรีสำราญ (2561) ที่ชี้ให้เห็นว่า แนวทางการตลาดบริการเพื่อเพิ่มจำนวนผู้ใช้บริการสินเชื่อเน้นด้านการส่งเสริมการตลาดโดยการประชาสัมพันธ์ให้ลูกค้ารับข่าวสาร และยังสอดคล้องกับงานวิจัยของ ชลพินทุ์ สิงห์บูรณา (2563) ที่ว่า การส่งเสริมการตลาดบริการด้วยการโฆษณาประชาสัมพันธ์กระตุ้นให้เกิดการตัดสินใจเลือกใช้บริการ

ข้อเสนอแนะ

1. ข้อเสนอแนะต่อองค์กรธนาคารออมสิน ระดับเขตภูเก็ต และระดับสาขา ดังนี้

1.1 ผลการวิจัยตามวัตถุประสงค์ข้อที่ 1 ผู้บริหารธนาคารออมสิน ระดับเขตภูเก็ต ควรทบทวนด้านนโยบายและการปฏิบัติ เพื่อเป็นประโยชน์ต่อการบริหารงานสินเชื่อ ผู้บริหารควรมอบนโยบายปรับแผนงานและกลยุทธ์ทางการตลาดสู่ระดับสาขา เพื่อให้ผู้ที่ไม่สนใจเพราะธุรกิจไม่เข้าหลักเกณฑ์และเงื่อนไขการขอสินเชื่อ และมีสินเชื่ออื่น ๆ เป็นทางเลือกในการขอสินเชื่อหมุนเวียนจากสถาบันการเงินอื่นที่ต้องการขอสินเชื่อ และผู้ที่สนใจปรับแผนการส่งเสริมการตลาดมุ่งกลุ่มเป้าหมายผู้ที่ประกอบอาชีพเป็นผู้ประกอบการธุรกิจไบโอดีเซลและพลังงานทดแทนกับผู้ประกอบการธุรกิจยานยนต์และการขนส่งขับเคลื่อนเศรษฐกิจอุตสาหกรรมท่องเที่ยวในพื้นที่ให้มากขึ้น ด้วยวิธีทำการตลาด จัดกิจกรรมส่งเสริมการขายและออกบูทนอกสถานที่เข้าถึงผู้ประกอบการให้มากขึ้นกว่าเดิม และให้ผู้ประกอบการติดตามและทบทวนระบบการจัดการสิ่งแวดล้อมอย่างต่อเนื่อง เพื่อแข่งขันและประกอบการตัดสินใจเลือกใช้บริการสินเชื่อ GSB ของธนาคารออมสิน

1.2 ผลการวิจัยตามวัตถุประสงค์ข้อที่ 2 ผู้บริหารธนาคารออมสิน ระดับเขตภูเก็ต เสนอธนาคารออมสินสำนักงานใหญ่ เป็นประโยชน์ต่อเขตพื้นที่และสาขาอื่น ๆ นำไปประยุกต์ใช้และเป็นประโยชน์ต่อภาพรวมของธนาคารออมสินเพื่อการพัฒนาผลิตภัณฑ์ และปรับกลยุทธ์การตลาดให้พนักงานที่มีความเชี่ยวชาญเสนอขายผลิตภัณฑ์ สร้างเครือข่ายภาคสังคมและจัดฝึกอบรมร่วมกัน ด้วยการให้ความสำคัญต่อการสร้างเครือข่ายภาคสังคมกระตุ้นการรับรู้คุณค่าสิ่งแวดล้อม เช่น การมีส่วนร่วมในกิจกรรมที่เกี่ยวข้องกับภาคธุรกิจในพื้นที่ มีการอบรมและให้คำแนะนำปรึกษาประชาชนและผู้ประกอบการโดยเฉพาะผู้ประกอบการที่มีอาชีพธุรกิจอาหารและการแปรรูปที่มีผลต่อกระบวนการตัดสินใจของผู้สมัครสินเชื่อที่มีความตระหนักปัญหาและการรับรู้ถึงปัญหาสิ่งแวดล้อม

1.3 ผลการวิจัยตามวัตถุประสงค์ข้อที่ 3 ผู้บริหารธนาคารออมสิน ระดับเขตภูเก็ตเสนอธนาคารออมสินสำนักงานใหญ่เพื่อแก้ไขสาเหตุของปัญหาโดยการพัฒนาผลิตภัณฑ์ ปรับเงื่อนไขหลักเกณฑ์คุณสมบัติของผู้กู้ให้มีการยืดหยุ่นในพื้นที่จังหวัดภูเก็ต และลดหรือปรับกระบวนการการสมัครและอนุมัติ และลดจำนวนเอกสารประกอบการยื่นกู้ ปรับอัตราค่าธรรมเนียมสมเหตุสมผล และกระตุ้น

พนักงานตามสาขาต่าง ๆ ส่งเสริมการตลาดผ่านสื่อออนไลน์ ประชาสัมพันธ์ร่วมกับเครือข่ายภาคสังคม ให้พนักงานที่เชี่ยวชาญเสนอขายผลิตภัณฑ์ นอกจากนี้ธนาคารเสนอนโยบายต่อหน่วยงานภาครัฐต่าง ๆ ที่เกี่ยวข้องให้ห่วงโซ่คุณค่าเพื่อสร้างการรับรู้คุณค่าสิ่งแวดล้อมของภาคธุรกิจในการเพิ่มมาตรการแผนบริหารความเสี่ยง ปัญหาสิ่งแวดล้อมในการบริหารธุรกิจอย่างยั่งยืน และให้มีการติดตามและทบทวนระบบการจัดการสิ่งแวดล้อมอย่างต่อเนื่อง สอดคล้องกับยุทธศาสตร์ขับเคลื่อนการพัฒนาเศรษฐกิจด้วยโมเดลเศรษฐกิจของภาครัฐ เพื่อสนับสนุนผู้ประกอบการลงทุนด้านพลังงานทดแทนตอบโจทย์โมเดลเศรษฐกิจใหม่ อันจะเป็นประโยชน์ต่อประเทศชาติและสิ่งแวดล้อมในอนาคต

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ด้านขอบเขตพื้นที่ในการศึกษาข้อมูล ควรให้ความสำคัญต่อการศึกษาในพื้นที่อื่น ๆ อาทิ ในระดับภาคและภาพรวมของธนาคารออมสิน

2.2 ด้านกลุ่มตัวอย่าง ควรศึกษาเปรียบเทียบธนาคารออมสิน กับธนาคารพาณิชย์อื่นที่ให้สินเชื่อขับเคลื่อนการพัฒนาเศรษฐกิจด้วยโมเดลเศรษฐกิจ BCG เพื่อจะได้ข้อมูลในเชิงลึก

2.3 ด้านตัวแปรปัจจัยที่เกี่ยวข้องและกรอบแนวคิดในการศึกษา ควรศึกษาแนวโน้มการขับเคลื่อนการพัฒนาเศรษฐกิจด้วยโมเดลเศรษฐกิจ BCG ของภาครัฐ ภาคสังคม และภาคธุรกิจในพื้นที่จังหวัดภูเก็ต และควรเพิ่มตัวแปรปัจจัยทางวิทยาศาสตร์ เทคโนโลยี และนวัตกรรมต่อการปรับตัวในการพัฒนาธุรกิจเพื่อสิ่งแวดล้อมและสร้างสรรค์สังคมเพื่อการตัดสินใจเลือกใช้บริการสินเชื่อธนาคารออมสินเป็นเงินทุนหมุนเวียนและการลงทุน

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วิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

Canonical Correlation Analysis of the Relationship between Online Social Media Marketing and Intentions to Purchase Cosmetics through Electronic Commerce Platforms of Consumers in the Bangkok Metropolitan Area

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อวิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร โดยใช้แบบสอบถามเป็นเครื่องมือในการเก็บข้อมูล จำนวน 420 ตัวอย่าง จากผู้บริโภคกลุ่มเจเนอเรชั่นซีที่เคยซื้อหรือตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ในเขตกรุงเทพมหานคร โดยใช้วิธีการสุ่มตัวอย่างแบบหลายขั้นตอน จากนั้นทำการวิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา เพื่อหาร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน การวิเคราะห์สหสัมพันธ์เพียร์สัน และการวิเคราะห์สหสัมพันธ์คาโนนิคอล

ผลการวิจัย พบว่า ระหว่างชุดตัวแปรปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์กับชุดตัวแปรความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคกลุ่มเจเนอเรชั่นซีมีความสัมพันธ์กัน มีค่าสัมประสิทธิ์สหสัมพันธ์คาโนนิคอล เท่ากับ 0.839 โดยชุดตัวแปรปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์ มีค่าน้ำหนักความสำคัญคาโนนิคอล ระหว่าง |0.863| – |0.913| โดยกลุ่มตัวอย่างให้ความสำคัญกับความบันเทิงมากที่สุด ส่วนชุดตัวแปรความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางมีค่าน้ำหนักความสำคัญคาโนนิคอล ระหว่าง |0.858| – |0.938| ซึ่งกลุ่มตัวอย่างให้ความสำคัญกับความเชื่อของผู้บริโภคมากที่สุด สำหรับผลการวิจัยนี้ผู้ประกอบการสามารถนำไปใช้ในการพัฒนากลยุทธ์การดำเนินงานด้วยปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ให้สามารถทำงานได้อย่างมีประสิทธิภาพ เพื่อเป็นการเพิ่มโอกาสและกระตุ้นให้ผู้บริโภคเกิดความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ได้อย่างต่อเนื่อง

คำสำคัญ: การตลาดผ่านสื่อสังคมออนไลน์, ความตั้งใจซื้อ, ผลิตภัณฑ์เครื่องสำอาง, ระบบพาณิชย์อิเล็กทรอนิกส์

Abstract

This research analyzes the canonical correlation between online social media marketing and intentions to purchase cosmetics through electronic commerce platforms of consumers in the Bangkok metropolitan area. The study employed a questionnaire as a data collection tool with a sample size of 420 participants who have either purchased

or intended to purchase cosmetics through electronic commerce platforms within Bangkok's Generation Z consumer group. The researchers utilized a multi-stage sampling method and conducted statistical analysis, including percentage, mean, standard deviations, Pearson correlation analysis, and canonical correlation analysis.

The research findings reveal a significant relationship between the variables related to online social media marketing and the variables regarding consumer intentions to purchase cosmetics through electronic commerce platforms among Generation Z consumers. The canonical correlation coefficient was 0.839. Notably, online social media marketing variables showed canonical weights ranging from |0.863| to |0.913|, with the entertainment factor being the most influential within the sample group. In addition, variables related to consumer intentions to purchase cosmetics showed canonical weights ranging from |0.858| to |0.938|, with consumer beliefs being the most significant factor within the sample group. This research highlights the potential for entrepreneurs to utilize the findings in developing operational strategies through market factors via online social media. The objective is to enhance operational efficiency, increasing opportunities and stimulating consumer intent to purchase cosmetic products through electronic commerce systems.

Keywords: Social Media Marketing, Purchase Intentions, Cosmetic Products, Electronic Commerce System,

บทนำ

ภูมิทัศน์ด้านความงามและเครื่องสำอางของโลกมักมีการเปลี่ยนแปลงอยู่ตลอดเวลา รวมทั้งมีแนวโน้มเติบโตและขยายตัวของธุรกิจอย่างต่อเนื่อง จากการคาดการณ์ของ Precedence Research พบว่า ในปี พ.ศ. 2565 ขนาดตลาดของอุตสาหกรรมเครื่องสำอางทั่วโลก มีมูลค่าประมาณ 5.05 หมื่นล้านดอลลาร์สหรัฐ และคาดว่ามูลค่าตลาดจะเพิ่มขึ้นเป็น 9.03 หมื่นล้านดอลลาร์สหรัฐ ในปี พ.ศ. 2575 ซึ่งปัจจัยสำคัญที่ขับเคลื่อนการเติบโตของอุตสาหกรรมเครื่องสำอางมีหลายประการ ประกอบด้วย ความต้องการผลิตภัณฑ์ความงามที่เพิ่มขึ้นจากผู้บริโภคทั่วโลก เทรนด์ความงามที่เปลี่ยนแปลงไปอย่างรวดเร็ว และการเติบโตของช่องทางการจัดจำหน่ายทางออนไลน์ เป็นต้น สอดคล้องกับการคาดการณ์การเติบโตของตลาดเครื่องสำอางของประเทศไทย พบว่า ในปี พ.ศ. 2573 จะมีมูลค่ากว่า 3.23 แสนล้านบาท (อัตราการขยายตัวร้อยละ 5 ต่อปี) โดยผลิตภัณฑ์เครื่องสำอางที่มีมูลค่าการตลาดมากที่สุด คือ ผลิตภัณฑ์บำรุงผิว ผลิตภัณฑ์เกี่ยวกับเส้นผม และเครื่องสำอางสำหรับแต่งหน้า ตามลำดับ สำหรับการเติบโตของอุตสาหกรรมเครื่องสำอางในประเทศไทย มีสาเหตุสำคัญมาจากพฤติกรรมของผู้บริโภคที่ต้องการเสริมบุคลิกภาพของตนเองให้ดูดีจึงหันมาความสนใจดูแลสุขภาพร่างกาย ผิวพรรณ ผมและหนังศีรษะ รวมไปถึงกระแสการยอมรับในคุณค่าและความแตกต่างที่เปิดกว้างมากขึ้น ผ่านการสื่อสารที่ว่าทุกสีผิวบนโลกนั้นสื่อถึงเอกลักษณ์และไม่ว่าจะเป็นใครหรือสีผิวแบบไหนก็ต้องการดูแลตัวเองให้ดูดี เช่นเดียวกัน (ฐานเศรษฐกิจ, 2566; สำนักนวัตกรรมแห่งชาติ, 2566; Precedence Research, 2023; Quality Plus, 2024; Thailand Exhibition, 2024)

เช่นเดียวกับกลุ่มคนเจเนอเรชั่นซี (Generation Z: Gen Z) ที่แม้ว่าจะเป็นกลุ่มคนรุ่นใหม่ที่เกิดในช่วงปี พ.ศ. 2540 – 2549 ที่มีความภาคภูมิใจในรูปร่าง เพศสภาพ และตัวตนของตนเอง รวมไปถึงให้ความสำคัญกับความหลากหลาย แต่มีแนวโน้มว่าคนกลุ่มเจเนอเรชั่นซี ส่วนใหญ่ให้ความสำคัญกับความสวยความงามเช่นเดียวกับกลุ่มคนเจเนอเรชั่นอื่น ๆ โดยเฉพาะเรื่องรอยเหี่ยวย่นเร็วเกินวัย ทั้งที่คนกลุ่มนี้ยังเป็นวัยรุ่นและเพิ่งเข้าสู่โลกการทำงานได้เพียงไม่กี่ปีเท่านั้น หรืออาจเป็นเพราะคนกลุ่มนี้มีวิถีชีวิตและเติบโตมากับอุปกรณ์ดิจิทัลต่าง ๆ จึงให้ความสำคัญกับภาพลักษณ์ของตนเองที่อยู่บนแพลตฟอร์มออนไลน์และสื่อสังคมออนไลน์อยู่ตลอดเวลา ดังนั้นจึงค่อนข้างให้ความสำคัญกับความสวยความงาม ซึ่งจากผลสำรวจของ Piper (2022) พบว่า การใช้จ่ายด้านความงามของคนกลุ่มเจเนอเรชั่นซี ส่วนใหญ่ คือ การซื้อผลิตภัณฑ์เครื่องสำอางสำหรับแต่งหน้า รองลงมาคือ ผลิตภัณฑ์ดูแลผิว และผลิตภัณฑ์ที่เกี่ยวข้องกับเส้นผมและหนังศีรษะ ตามลำดับ นอกจากนี้ความสำคัญของกลุ่มเจเนอเรชั่นซี คือ การก้าวขึ้นเป็นประชากรกลุ่มขนาดใหญ่ของอาเซียน (24% ของประชากรทั้งหมด) ในอนาคตอันใกล้ ซึ่งแสดงให้เห็นถึงอิทธิพลของกลุ่มเจเนอเรชั่นซีที่จะเข้ามามีบทบาทต่อสังคมและเศรษฐกิจของประเทศ รวมถึงอิทธิพลที่มีต่อภาคธุรกิจ กล่าวคือ กลุ่มเจเนอเรชั่นซีจะเข้ามาเป็นผู้ขับเคลื่อนหลักในมุมของกำลังซื้อที่เพิ่มขึ้นในอนาคต (ภูริตา บุญล้อม, 2565; Hakuhodo, 2021; Thailand Creative & Design Center, 2021; Beauty Packaging, 2022; Siwaritemarketeer, 2023) จากข้อมูลที่ได้กล่าวมาข้างต้นเกี่ยวกับพฤติกรรมและวิถีชีวิตของกลุ่ม Gen Z ทำให้ผู้ประกอบการในอุตสาหกรรมเครื่องสำอางต่างก็ให้ความสนใจทำการตลาดผ่านสื่อสังคมออนไลน์มากขึ้น เพื่อปรับตัวให้เข้ากับกลุ่มผู้บริโภคและต้องการสื่อสารและให้ข้อมูลต่าง ๆ จากผู้ประกอบการ เช่น การนำเสนอผลิตภัณฑ์เครื่องสำอางใหม่ ๆ การประชาสัมพันธ์เกี่ยวกับโปรโมชั่นต่าง ๆ รวมไปถึงผลตอบรับ (Feedback) ความคิดเห็นและข้อเสนอแนะต่าง ๆ จากผู้บริโภค เพื่อนำข้อมูลกลับมาพัฒนาผลิตภัณฑ์และการบริการให้ดีและตอบโจทย์ผู้บริโภคมากยิ่งขึ้น (สุปรียา พัฒนพงศ์ธร และ ศรัณย์ธร ศศิธนากรแก้ว, 2563)

นอกจากนี้จากข้อมูลของสำนักงานสถิติแห่งชาติ พบว่า ประชาชนในกรุงเทพมหานครมีการใช้มือถือและอินเทอร์เน็ตสูงกว่าจังหวัดอื่น ๆ โดยเฉพาะประชาชนที่มีอายุระหว่าง 15 - 24 ปี พบว่า มีมือถือและใช้อินเทอร์เน็ตมากกว่าร้อยละ 98 ซึ่งสูงมากเมื่อเทียบกับประชากรวัยอื่น (สำนักงานสถิติแห่งชาติ, 2566) สอดคล้องกับผลการศึกษาของ Thailand Digital Outlook พบว่า กิจกรรมบนโลกอินเทอร์เน็ตที่คนไทยนิยมใช้งานมากที่สุด คือ ใช้งานสื่อสังคมออนไลน์ (สำนักงานคณะกรรมการดิจิทัลเพื่อเศรษฐกิจและสังคมแห่งชาติ, 2566) จากเหตุผลที่ได้กล่าวมาข้างต้นทำให้ผู้วิจัยสนใจที่จะหาค่าสัมประสิทธิ์สหสัมพันธ์ด้วยการวิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภค ในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี เพื่อให้สามารถระบุระดับความสัมพันธ์ของปัจจัยที่ศึกษาเพื่อนำมาเป็นแนวทางในการพัฒนาช่องทางและรูปแบบการตลาดผ่านสื่อสังคมออนไลน์ใหม่ที่สอดคล้องกับพฤติกรรมของผู้บริโภคได้อย่างตรงจุดมากที่สุด

วัตถุประสงค์ของการวิจัย

เพื่อวิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

แนวคิด ทฤษฎี กรอบแนวคิด

การวิจัยครั้งนี้ ผู้วิจัยได้ศึกษาและวิเคราะห์แนวคิด ทฤษฎี และทบทวนวรรณกรรมเพื่อนำไปสู่การสร้างกรอบแนวคิดและสมมติฐาน ดังนี้

1. เครื่องสำอาง (Cosmetics) หมายถึง วัตถุที่มุ่งหมายสำหรับใช้ทา ถู นวด โรย พ่น หยอด ใส่ อบ หรือกระทำด้วยวิธีอื่นใดกับส่วนภายนอกของร่างกายมนุษย์ และให้หมายความรวมถึงการใช้กับฟันและเยื่อบุในช่องปากโดยมีวัตถุประสงค์เพื่อความสะอาด ความสวยงาม หรือเปลี่ยนแปลงลักษณะที่ปรากฏ หรือระงับกลิ่นกาย หรือปกป้องดูแลส่วนต่าง ๆ นั้น ให้อยู่ในสภาพดี และรวมตลอดทั้งเครื่องประทิ่นต่าง ๆ สำหรับผิวด้วย แต่ไม่รวมถึงเครื่องประดับและเครื่องแต่งตัวซึ่งเป็นอุปกรณ์ภายนอกร่างกาย (ราชกิจจานุเบกษา, 2558)

2. พฤติกรรมผู้บริโภค (Customer Behavior) หมายถึง การแสงออกของผู้บริโภคในการเสาะแสวงหา การซื้อ การใช้ การประเมิน และการบริโภคสินค้าและบริการต่าง ๆ ที่ผู้บริโภคเห็นว่าสามารถสนองความต้องการของตนได้ (Schiffman & Kanuk, 2000)

3. ระบบพาณิชย์อิเล็กทรอนิกส์ (Electronic Commerce) หมายถึง ระบบการทำธุรกรรมซื้อขาย หรือแลกเปลี่ยนสินค้าและบริการบนอินเทอร์เน็ต โดยใช้เว็บไซต์หรือแอปพลิเคชันเป็นสื่อในการนำเสนอสินค้าและบริการต่าง ๆ รวมถึงการติดต่อกันระหว่างผู้ซื้อและผู้ขาย ทำให้ผู้เข้าใช้บริการจากทุกที่ทุกประเทศ หรือทุกมุมโลกสามารถเข้าถึงร้านค้าได้ง่ายและตลอด 24 ชั่วโมง (สำนักงานพัฒนาธุรกรรมทางอิเล็กทรอนิกส์, 2563)

4. การตลาดผ่านสื่อสังคมออนไลน์ (Social Media Marketing) หมายถึง รูปแบบเครื่องมือที่ใช้ในการสร้างเครื่องมือทางการตลาดบนอินเทอร์เน็ตผ่านการใช้สื่อสังคมออนไลน์ ในการกระจายข้อมูลเสริมภาพลักษณ์ และสร้างมูลค่าทางการตลาดของธุรกิจ ทั้งในรูปแบบของเนื้อหา รูปภาพ ภาพเคลื่อนไหวและเสียง เป็นต้น การตลาดผ่านสื่อสังคมออนไลน์ถือว่า เป็นเครื่องมือที่ได้รับความนิยมของนักการตลาดเนื่องจากทำให้เข้าถึงกลุ่มผู้บริโภคเป้าหมายได้อย่างรวดเร็ว หลากหลายกลุ่ม และสะดวกรวดเร็วด้วยเทคโนโลยีที่ทันสมัยส่งผลต่อความตั้งใจซื้อสินค้าผู้บริโภคในวงกว้าง (Tsai & Men 2013; Kaur, 2016; และ นฤมล สนหอม, 2564) สำหรับองค์ประกอบของการตลาดผ่านสื่อสังคมออนไลน์ แบ่งออกเป็น 5 องค์ประกอบ ได้แก่ ความบันเทิง การมีปฏิสัมพันธ์ ความนิยม ความเฉพาะเจาะจง และการตลาดแบบปากต่อปาก (ศศิวิมล ขำโอด, ธัมมะทินน ศรีสุพรรณ และ ประสิทธิชัย นรากรณ์, 2566; Wibowo, Chen, Wiangin, Ma, & Ruangkanjanases, 2021)

5. ความตั้งใจซื้อ (Purchase Intention) หมายถึง การกระทำและความพร้อมของทางเลือกแรกในความตั้งใจซื้อสินค้าและบริการที่ตนเองต้องการ และเป็นช่วงที่ผู้บริโภคควรเลือกสินค้าที่สุดเนื่องจากสามารถตอบสนองความต้องการได้อย่างหมาะสม เพราะผู้บริโภคสามารถรับรู้ประโยชน์ของสินค้านั้น ๆ ทั้งทางตรงและทางอ้อม รู้สึกถึงความคุ้มค่าและเกิดความพึงพอใจมากที่สุดในขณะนั้น (คุณากร จันทร์ไพศรี, 2565; Kim & Pysarchik, 2000) สำหรับองค์ประกอบของการตั้งใจซื้อสินค้าออนไลน์ แบ่งออกเป็น 3 องค์ประกอบ ได้แก่ ข้อมูลผลิตภัณฑ์ ความเพลิดเพลินและความสนุกสนาน และความเชื่อของผู้บริโภค (Bhat, Islam & Sheikh, 2021)

6. การตลาดผ่านสื่อสังคมออนไลน์มีความสัมพันธ์ต่อความตั้งใจซื้อสินค้าและบริการ

เนื่องจากปัจจุบันสื่อสังคมออนไลน์เข้ามามีบทความต่อการดำเนินชีวิตประจำวันของผู้คน และเป็นเครื่องมือการตลาดที่มีบทบาทสำคัญของธุรกิจ ช่วยธุรกิจให้สามารถวิเคราะห์ความต้องการและความสนใจของกลุ่มผู้บริโภคเป้าหมาย ส่งผลให้ธุรกิจสามารถสื่อสารทางการตลาดกับผู้บริโภคได้สะดวก รวดเร็ว และสามารถตอบสนองได้ตรงความต้องการของผู้บริโภค (Salhab, Al-Amarneh, Aljabaly, Al Zoubi, & Othman, 2023) ทั้งนี้ เมื่อผู้บริโภคตอบรับการสื่อสารทางการตลาดผ่านสื่อสังคมออนไลน์จะเกิดความสัมพันธ์และส่งผลในเชิงบวกต่อความตั้งใจซื้อสินค้าและบริการของผู้บริโภคอย่างมีนัยสำคัญ (Almohaimmeed, 2019; Moslehpour, Ismail, Purba, & Lin, 2020)

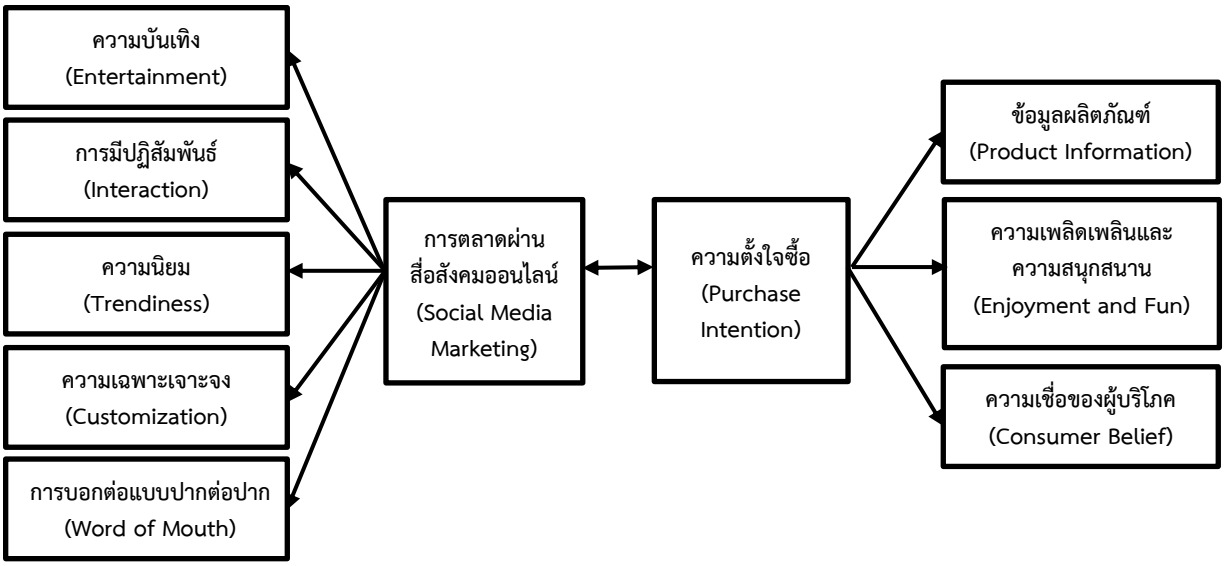
จากการทบทวนวรรณกรรมที่ได้กล่าวมาข้างต้น จึงนำไปสู่การตั้งสมมติฐานการวิจัยเพื่อทดสอบความสัมพันธ์ระหว่างสหสัมพันธ์คาโนนิคอล เพื่อค้นหารูปแบบความสัมพันธ์ระหว่างชุดตัวแปรสองชุดที่ทำให้ข้อมูลมีความสำคัญมากที่สุด คือ ปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์และความตั้งใจซื้อสินค้าและบริการ โดยการทดสอบสหสัมพันธ์คาโนนิคอล (R_{Cj}) ทุกค่าพร้อมกันว่า ค่าสหสัมพันธ์ทั้งหมดจะมีค่าเป็นศูนย์หรือไม่ จากการเปรียบเทียบค่า χ^2 ที่คำนวณได้กับค่า χ^2 จากตารางเพื่อทดสอบสมมติฐานการวิจัย (ณัฐพัชร์ อภิรุ่งเรืองสกุล และ ประสพชัย พสุนนท์, 2562) ดังนี้

สมมติฐาน H_0: $R_{C1} = R_{C2} = \ldots = R_{Cj} = 0$

H_1: R_{CJ} อย่างน้อย 1 ตัว ที่มีค่าไม่เท่ากับ 0

ทั้งนี้ หากผลการทดสอบสมมติฐานมีการปฏิเสธ H_0 แสดงว่า R_{Cj} อย่างน้อย 1 ตัว มีค่าไม่เท่ากับ 0 แสดงว่า ชุดตัวแปรทั้งสองชุดมีค่าสหสัมพันธ์คาโนนิคอลอย่างมีระดับนัยสำคัญ

จากการทบทวนวรรณกรรมที่เกี่ยวข้องกับการตลาดผ่านสื่อสังคมออนไลน์ ความตั้งใจซื้อ และงานวิจัยที่เกี่ยวข้องมาสร้างเป็นกรอบแนวคิดการวิจัยได้ดังภาพที่ 1



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

1. ขอบเขตในการวิจัย

1.1 ประชากรที่ใช้ในการศึกษาครั้งนี้ คือ ประชากร ในเขตกรุงเทพมหานครที่เคยซื้อผลิตภัณฑ์เครื่องสำอางช่องทางพาณิชย์อิเล็กทรอนิกส์ ซึ่งเป็นประชากรที่จัดอยู่ในกลุ่มเจเนอเรชั่นซี (Generation Z) หรือคนที่เกิดในช่วงปี พ.ศ. 2540 - 2549 เป็นกลุ่มคนที่เติบโตมาพร้อมกับเทคโนโลยี อินเทอร์เน็ต และสิ่งอำนวยความสะดวกมากมาย ทำให้มีลักษณะเป็นคนที่เรียนรู้ไว กล้าตัดสินใจ ทำอะไรที่รวดเร็วทันใจ ชอบการสื่อสารและค้นคว้าข้อมูลต่างๆ ผ่านระบบอินเทอร์เน็ต และมีพฤติกรรมที่นิยมซื้อสินค้าผ่านช่องทางออนไลน์ (Krungsri Guru, ม.ป.ป.; Brandage, 2564)

1.2 กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้ คือ ประชากรที่อาศัยในกรุงเทพมหานคร โดยเป็นข้อมูลที่ไม่ทราบจำนวนประชากรแน่ชัด ดังนั้นในการคำนวณหากลุ่มตัวอย่างที่เหมาะสมจึงเลือกใช้สูตรการคำนวณขนาดกลุ่มตัวอย่าง (Sample Size) กรณีที่ไม่ทราบจำนวนประชากรของ Cochran (1953) ณ ระดับค่าความเชื่อมั่นร้อยละ 95 ซึ่งผลการคำนวณพบว่า ขนาดของกลุ่มตัวอย่างที่ต้องใช้ในการศึกษาวิจัยฉบับนี้จะต้องไม่น้อยกว่า 385 ตัวอย่าง (จำนวนตัวอย่าง (n) = ((0.05)(1-0.5)(1.96)2)/(0.05)2) = 384.16) ทั้งนี้ เพื่อป้องกันกรณีผู้ตอบแบบสอบถามให้ข้อมูลไม่ครบถ้วนหรือมีข้อผิดพลาด ผู้วิจัยจึงทำการมีการเก็บแบบสอบถามเพิ่มเติม โดยใช้กลุ่มตัวอย่างในการตอบแบบสอบถาม ทั้งหมด 420 ตัวอย่าง

1.3 การสุ่มตัวอย่าง ผู้วิจัยได้ทำการสุ่มตัวอย่างแบบหลายขั้นตอน (Multi-stage Sampling) โดยขั้นตอนที่ 1 จากการสุ่มตัวอย่างแบบชั้นภูมิ ทั้งนี้ เพื่อป้องกันกรณีผู้ตอบแบบสอบถามให้ข้อมูลไม่ครบถ้วนหรือมีข้อผิดพลาด ผู้วิจัยจึงทำการเก็บแบบสอบถามเพิ่มเติมโดยใช้กลุ่มตัวอย่างในการตอบแบบสอบถามทั้งหมด 420 ตัวอย่าง (Stratified Sampling) เพื่อกำหนดพื้นที่ที่ต้องการศึกษา โดยแบ่งการปกครองออกเป็น 3 เขต ตามเกณฑ์การแบ่งเขตการปกครอง (สำนักยุทธศาสตร์และประเมินผล, 2556) ได้แก่ พื้นที่ชั้นใน พื้นที่ชั้นกลาง พื้นที่ชั้นนอก ขั้นตอนที่ 2 การสุ่มตัวอย่างแบบอย่างง่าย (Simple Random Sampling) ด้วยวิธีการจับฉลากเพื่อเลือกตัวแทนในแต่ละกลุ่มเขตตามสัดส่วน ซึ่งกลุ่มที่มีจำนวนเขตมากก็จะได้ตัวแทนเขตที่ได้จากการสุ่มมากตามไปด้วย ขั้นตอนที่ 3 การสุ่มตัวอย่างแบบโควตา (Quota Sampling) เป็นการกำหนดสัดส่วนของตัวอย่าง โดยเลือกสุ่มจำนวนตัวอย่างตามสัดส่วนจากตัวแทนเขตที่ได้จากการสุ่มทั้งหมด 14 เขต โดยเก็บข้อมูลให้ได้เขตละ 30 ตัวอย่างเท่า ๆ กัน (รวมทั้งหมด 420 ตัวอย่าง) และขั้นตอนที่ 4 การสุ่มตัวอย่างแบบตามสะดวก (Convenient Sampling) (ณัฐวุฒิ รุ่งเสถียรภูธร, 2558) โดยการกระจายแบบสอบถามไปยังกลุ่มตัวอย่างทั่วเขตกรุงเทพมหานครเพื่อเป็นการเพิ่มโอกาสในการเป็นตัวแทนของผู้บริโภค

1.4 การวิจัยครั้งนี้เป็นการใช้ระเบียบวิธีวิจัยเชิงปริมาณ โดยผู้วิจัยทำการเก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม ระยะเวลารวมทั้งหมด 3 เดือน ตั้งแต่เดือนธันวาคม พ.ศ. 2566 - กุมภาพันธ์ พ.ศ. 2567

2. เครื่องมือการวิจัย

การวิจัยครั้งนี้ใช้เครื่องมือการวิจัย คือ แบบสอบถามที่สร้างขึ้นจากหลักการ แนวคิด และทฤษฎีด้วยการทบทวนวรรณกรรมที่เกี่ยวข้อง จากนั้นสร้างข้อคำถามของปัจจัยการตลาดผ่านสื่อสังคมออนไลน์และความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ โดยแบบสอบถามแบ่งออกเป็น 4 ส่วน ประกอบด้วย ส่วนที่ 1 ข้อมูลด้านประชากรศาสตร์ ส่วนที่ 2 ข้อมูลพฤติกรรมการซื้อผลิตภัณฑ์เครื่องสำอางผ่านช่องทางพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร ส่วนที่ 3 ข้อมูลปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ ส่วนที่ 4 ข้อมูลความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบ

พาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร ซึ่งแบบสอบถามส่วนที่ 3 และ 4 ผู้วิจัยได้กำหนดระดับความคิดเห็นตามแบบมาตราส่วนประมาณค่าตามวิธีของลิเคิร์ท (Likert, 1961) แบ่งการวัดเป็น 5 ระดับ ได้แก่ มาก ที่สุด มาก ปานกลาง น้อย และน้อยที่สุด ตามลำดับ

3. การเก็บรวบรวมข้อมูล

การวิจัยเชิงปริมาณครั้งนี้เก็บข้อมูลมูลจากแหล่งปฐมภูมิ (Primary Data) รวบรวมข้อมูลจากการทำแบบสอบถามของตัวอย่าง โดยวิธีการสัมภาษณ์จากผู้ให้คำตอบและการตอบคำถามออนไลน์

1. แหล่งข้อมูลปฐมภูมิ (Primary Data) โดยเก็บข้อมูลจากการรวบรวมข้อมูลเบื้องต้นจากกลุ่มตัวอย่าง จำนวน 420 ตัวอย่าง โดยใช้วิธีการแจกแบบสอบถามในพื้นที่ต่าง ๆ ในกรุงเทพมหานคร ได้แก่ แหล่งชุมชน ห้างสรรพสินค้า สถานศึกษา และสถานีรถไฟฟ้า เป็นต้น

2. แหล่งข้อมูลทุติยภูมิ (Secondary Data) โดยการศึกษาค้นคว้าข้อมูลจากเอกสารวารสารวิชาการ งานวิจัย และเว็บไซต์ต่าง ๆ ที่เกี่ยวข้อง

4. การตรวจสอบความเที่ยงตรงของแบบสอบถาม

แบบสอบถามการวิจัยได้ผ่านการตรวจสอบความเที่ยงตรงเชิงเนื้อหา (Content Validity) จากผู้ทรงคุณวุฒิจำนวน 3 ท่าน จากนั้นคำนวณหาค่าดัชนีความสอดคล้องระหว่างข้อคำถามของผู้เชี่ยวชาญ (Index of Congruence: IOC) ที่มีค่าระหว่าง 0.67 - 1.00 พร้อมทั้งตรวจสอบความเชื่อมั่น (Reliability) โดยการตรวจสอบด้วยวิธีการหาความสอดคล้องภายในจากค่าสัมประสิทธิ์แอลฟาของ Cronbach's (Cronbach, 1960) พบว่า ตัวแปรแต่ละตัวมีค่าอยู่ระหว่าง 0.714 - 0.894 แสดงว่า เครื่องมือที่ใช้ในการเก็บข้อมูลสำหรับรายงานวิจัยมีความเชื่อมั่นเพียงพอในการนำผลที่ได้จากการเก็บข้อมูลด้วยเครื่องมือวิจัยนี้ไปทำการวิเคราะห์ผลการวิจัยได้

5. วิเคราะห์ข้อมูลที่ได้จากการตอบแบบสอบถาม

ผู้วิจัยใช้โปรแกรมสำเร็จรูปในการวิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ประกอบด้วย ค่าความถี่ ร้อยละ ค่าเฉลี่ย และค่าส่วนเบี่ยงเบนมาตรฐาน และวิเคราะห์รูปแบบความสัมพันธ์โดยใช้เทคนิคการวิเคราะห์สหสัมพันธ์คาโนนิคอลเพื่อพิจารณาความสัมพันธ์ระหว่างการตลาดผ่านสื่อสังคมออนไลน์และความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี เรียกว่า “ค่าสหสัมพันธ์คาโนนิคอล (Canonical Correlation: R_c)” ซึ่งการคัดเลือกค่าสัมประสิทธิ์สหสัมพันธ์คาโนนิคอลของตัวแปรจะใช้เกณฑ์การพิจารณาตัวแปรที่มีค่าสัมประสิทธิ์โครงสร้าง (Structure Coefficients) มากกว่าหรือเท่ากับ |4.5| (Sherry & Henson, 2005) หรือใช้เกณฑ์ค่าสัมบูรณ์ (Absolute Value) มากกว่าหรือเท่ากับ |0.30| ขึ้นไป (ชัยวิชิต เชียรชนะ, 2557) จึงจะถือว่ามีความสมเหตุสมผลในการแปลความหมายรูปแบบความสัมพันธ์ของฟังก์ชัน สำหรับการพิจารณาช่วงเกณฑ์เพื่อใช้ในการแปลความหมายความสัมพันธ์ตามฟังก์ชัน จำแนกออกเป็น 3 เกณฑ์ รายละเอียดดังนี้ 1) เกณฑ์ช่วง |0.30| – |0.50| แปลว่า มีขนาดความสัมพันธ์ระดับปานกลาง 2) เกณฑ์ช่วง |0.51| – |0.70| แปลว่า มีขนาดความสัมพันธ์ระดับสูง และ 3) เกณฑ์ช่วง |0.71| – |1.00| แปลว่า มีขนาดความสัมพันธ์ระดับสูงมาก (เมธาสิทธิ์ ธัญรัตนศรีสกุล, 2559; ณัฐพัชร์ อภิรุ่งเรืองสกุล และประสพชัย พสุนนท์, 2562)

ผลการวิจัย

1. ผลการศึกษาข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

การวิจัยครั้งนี้ มีตัวอย่างจำนวน 420 คน ที่ให้ความร่วมมือในการตอบแบบสอบถามด้วยความสมัครใจ ส่วนใหญ่เป็นเพศหญิง จำนวน 258 คน (ร้อยละ 61) อายุระหว่าง 19-23 ปี จำนวน 387 คน (ร้อยละ 93) มีการศึกษาระดับปริญญาตรี จำนวน 368 คน (ร้อยละ 88) อาชีพนักเรียน/นักศึกษา จำนวน 410 (ร้อยละ 98) และมีรายได้เฉลี่ยต่ำกว่า 15,000 บาท จำนวน 263 คน (ร้อยละ 63)

ส่วนผลการวิเคราะห์พฤติกรรมการซื้อผลิตภัณฑ์เครื่องสำอางผ่านช่องทางพาณิชย์อิเล็กทรอนิกส์ของกลุ่มตัวอย่าง พบว่า ส่วนใหญ่นิยมซื้อผลิตภัณฑ์เครื่องสำอางประเภทที่ใช้กับใบหน้า จำนวน 210 คน (ร้อยละ 50) จำนวนครั้งที่ซื้อน้อยกว่า 1 ครั้งต่อสัปดาห์ จำนวน 213 คน (ร้อยละ 51) มีค่าใช้จ่ายในการซื้อผลิตภัณฑ์เครื่องสำอาง (เฉลี่ยรายเดือน) ประมาณ 501 – 1,000 บาท จำนวน 122 คน (ร้อยละ 29) และซื้อผ่านระบบพาณิชย์อิเล็กทรอนิกส์จาก Shopee จำนวน 240 คน (ร้อยละ 57)

2. ผลการวิเคราะห์ข้อมูลการตลาดผ่านสื่อสังคมออนไลน์และความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

ผลการวิเคราะห์การตลาดผ่านสื่อสังคมออนไลน์ที่มีผลต่อความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี พบว่า กลุ่มตัวอย่างมีความคิดเห็นเกี่ยวกับการตลาดผ่านสื่อสังคมออนไลน์ภาพรวมอยู่ในระดับมาก ($\bar{X}$= 4.01, S.D. = 0.81) เมื่อพิจารณารายด้านนั้นปัจจัยแต่ละด้านมีค่าเฉลี่ยอยู่ในระดับมากเช่นกัน คือ ความนิยม ($\bar{X}$= 4.19, S.D. = 0.76) ความเฉพาะเจาะจง ($\bar{X}$= 4.02, S.D. = 0.84) ความบันเทิง ($\bar{X}$= 4.01, S.D. = 0.80) การบอกต่อแบบปากต่อปาก ($\bar{X}$= 4.00, S.D. = 0.81) และการมีปฏิสัมพันธ์ ($\bar{X}$= 3.85, S.D. = 0.82) ตามลำดับ (ตารางที่ 1)

ตารางที่ 1 ค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานของตัวแปรการตลาดผ่านสื่อสังคมออนไลน์

การตลาดผ่านสื่อสังคมออนไลน์	$\bar{x}$	S.D.	แปลผล
ความบันเทิง	4.01	0.80	มาก
การมีปฏิสัมพันธ์	3.85	0.82	มาก
ความนิยม	4.19	0.76	มาก
ความเฉพาะเจาะจง	4.02	0.84	มาก
การบอกต่อแบบปากต่อปาก	4.00	0.81	มาก
รวม	4.01	0.81	มาก

ผลการวิเคราะห์ความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี พบว่า กลุ่มตัวอย่างมีความคิดเห็นเกี่ยวกับความตั้งใจซื้อภาพรวมอยู่ในระดับมาก ($\bar{X}$= 3.99, S.D. = 0.78) เมื่อพิจารณารายด้านนั้นปัจจัยแต่ละด้านมีค่าเฉลี่ยอยู่ในระดับมากเช่นกัน คือ ความเชื่อของผู้บริโภค ($\bar{X}$= 4.05, S.D. = 0.75) ความเพลิดเพลินและความสนุกสนาน ($\bar{X}$= 4.04, S.D. = 0.88) และข้อมูลผลิตภัณฑ์ ($\bar{X}$= 3.88, S.D. = 0.70) ตามลำดับ (ตารางที่ 2)

ตารางที่ 2 ค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานของตัวแปรความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

ความตั้งใจซื้อสินค้า	$\overline{x}$	S.D.	แปลผล
ข้อมูลผลิตภัณฑ์	3.88	0.70	มาก
ความเพลิดเพลินและความสนุกสนาน	4.04	0.88	มาก
ความเชื่อของผู้บริโภค	4.05	0.75	มาก
รวม	3.99	0.78	มาก

จากการพิจารณาค่าสัมประสิทธิ์สหสัมพันธ์ระหว่างชุดตัวแปร ปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์กับชุดตัวแปรด้านความตั้งใจซื้อผลิตภัณฑ์ เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี มีค่าอยู่ระหว่าง 0.590 – 0.781 ซึ่งมีความสัมพันธ์กันในทิศทางบวกอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 ตัวแปรทั้งหมดมีค่าสัมประสิทธิ์สหสัมพันธ์ทั้งหมดมีค่าน้อยกว่า 0.8 (Cooper, Schindler & Sun, 2006) แสดงว่า ตัวแปรต่าง ๆ ไม่มีความสัมพันธ์กันเอง สามารถนำไปวิเคราะห์ในขั้นตอนต่อไปได้ (ตารางที่ 3)

ตารางที่ 3 ค่าสัมประสิทธิ์สหสัมพันธ์อย่างง่ายระหว่างชุดตัวแปรปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์กับชุดตัวแปรด้านความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

	X1	X2	X3	X4	X5	Y1	Y2	Y3
X1	1							
X2	.748**	1						
X3	.760**	.712**	1					
X4	.713**	.709**	.769**	1				
X5	.718**	.734**	.728**	.781**	1			
Y1	.661**	.653**	.673**	.675**	.684**	1		
Y2	.694**	.590**	.634**	.607**	.635**	.658**	1	
Y3	.713**	.696**	.719**	.682**	.683**	.741**	.740**	1

หมายเหตุ ** ระดับนัยสำคัญ 0.01

3. ผลการวิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

จากการวิเคราะห์ความสัมพันธ์คาโนนิคอล โดยมุ่งเน้นพิจารณาอิทธิพลของตัวแปรอิสระ คือ ปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ จำนวน 5 ตัวแปร ที่มีอิทธิพลต่อตัวแปรตาม คือ ความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอาง ผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี จำนวน 3 ตัวแปร ซึ่งในการวิเคราะห์สหสัมพันธ์คาโนนิคอลตัวแปรตามมีจำนวนน้อยกว่าตัวแปรอิสระ กล่าวคือ สหสัมพันธ์คาโนนิคอลจะมีทั้งหมด 3 ฟังก์ชัน โดยฟังก์ชันที่ 1 มีค่าสหสัมพันธ์คาโนนิคอล (R_c) สูงสุด เท่ากับ 0.839 เมื่อพิจารณาจากค่า p-value มีค่าเท่ากับ 0.00 (p-value = 0.00 < 0.05) เมื่อพิจารณาค่าสหสัมพันธ์คาโนนิคอลกำลังสอง R_c^2 มีค่าเท่ากับ 0.704 ซึ่งสูงกว่าค่าสหสัมพันธ์

คาโนนิคอลกำลังสอง (R_c^2) ของฟังก์ชันที่ 2 และฟังก์ชันที่ 3 ที่มีค่าเท่ากับ 0.047 และ 0.014 ตามลำดับ กล่าวคือ ฟังก์ชันที่ 1 สามารถอธิบายความความพันธ์ระหว่างตัวแปรทั้งสองชุดได้ถึงร้อยละ 70.4 ในขณะที่ฟังก์ชันที่ 2 และฟังก์ชันที่ 3 อธิบายความความสัมพันธ์ระหว่างตัวแปรทั้งสองชุดได้เพียงร้อยละ 4.7 และร้อยละ 1.4 ตามลำดับ

จากนั้นได้ทำการทดสอบสมมติฐานของสหสัมพันธ์คาโนนิคอล (R_{cj}) เพื่อหาแบบแผนความสัมพันธ์ระหว่างชุดตัวแปรสองชุด ผลการจากทดสอบค่า χ^2 ที่คำนวณได้ของฟังก์ชันที่ 1 มีค่าเท่ากับ 44.697 มีค่ามากกว่าค่า χ^2 จากตารางที่ระดับนัยสำคัญทางสถิติ 0.05 มีค่าวิกฤตเท่ากับ 27.488 แสดงว่าค่าที่คำนวณได้ตกอยู่บริเวณวิกฤต (Critical Region: CR) จึงปฏิเสธสมมติฐาน H_0 ยอมรับสมมติฐาน H_1 นั่นคือ ฟังก์ชันที่ 1 ของชุดตัวแปรทั้งสองชุดมีค่าสหสัมพันธ์คาโนนิคอล ณ ระดับนัยสำคัญ 0.05 แสดงว่ามีค่าสหสัมพันธ์คาโนนิคอลอย่างน้อยหนึ่งค่าที่มีค่าไม่เท่ากับศูนย์ กล่าวคือ มีตัวแปรอย่างน้อยหนึ่งตัวแปรในชุดตัวแปรอิสระมีความความสัมพันธ์กับตัวแปรตามอย่างน้อยหนึ่งตัวในชุดตัวแปรตาม

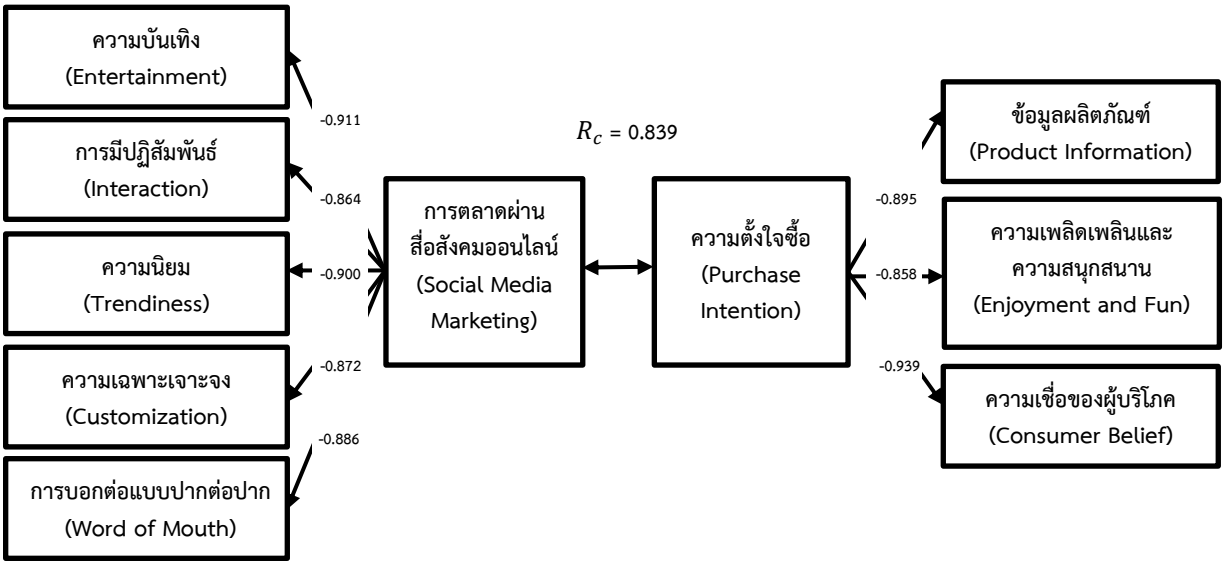
ในขณะที่การพิจารณาค่า χ^2 ที่คำนวณได้ของฟังก์ชันที่ 2 และฟังก์ชันที่ 3 มีค่าเท่ากับ 3.268 และ 2.016 ตามลำดับ ทั้งสองฟังก์ชันมีค่าน้อยกว่า χ^2 จากตารางที่ระดับนัยสำคัญทางสถิติ 0.05 มีค่าวิกฤตเท่ากับ 27.488 จึงยอมรับสมมติฐาน H_0 กล่าวคือ ตัวแปรทุกในชุดตัวแปรอิสระไม่มีความความสัมพันธ์กับชุดตัวแปรตาม จากเหตุผลข้างต้นจะเห็นได้ว่าฟังก์ชันที่ 2 และฟังก์ชันที่ 3 ไม่เหมาะสมที่จะนำไปอธิบายผลการศึกษา ดังนั้นจึงสรุปได้ว่าฟังก์ชันที่ 1 เป็นฟังก์ชันที่สามารถนำไปอธิบายผลการศึกษาได้สมเหตุสมผลมากที่สุด (ตารางที่ 4)

ตารางที่ 4 สัมประสิทธิ์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

Canonical Function	Canonical Correlation (R_c)	Canonical (R_c^2)	Eigenvalue ($\boldsymbol{\Lambda}$)	Wilk's Lambda (λ)	F-value (Chi-square) (χ^2)	df	p-value (sig.)
1	.839	0.704	2.376	.278	44.697	15	.000
2	.216	0.047	.049	.940	3.268	8	.001
3	.120	0.014	.015	.986	2.016	3	.111

หมายเหตุ * ระดับนัยสำคัญ 0.05

จากการพิจารณา ค่าสหสัมพันธ์คาโนนิคอลที่มีความหมายเชิงสถิติและขนาดความสัมพันธ์ที่อยู่ในระดับสูงมาก คือ ความสัมพันธ์ระหว่างตัวแปรคาโนนิคอลฟังก์ชันที่ 1 เมื่อพิจารณาสัมประสิทธิ์โครงสร้าง พบว่า ตัวแปรการตลาดผ่านสื่อสังคมออนไลน์ มีค่าน้ำหนักคาโนนิคอลของชุดตัวแปร 1 ระหว่าง |0.863| – |0.913| โดยค่าน้ำหนักคาโนนิคอลที่มีค่าน้ำหนักสูงที่สุด คือ |0.913| รองลงมาคือ |0.900| |0.887| |0.871| และ |0.863| ตามลำดับ ส่วนค่าตัวแปรความตั้งใจซื้อระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี มีค่าอยู่ระหว่าง |0.858| – |0.938| โดยค่าน้ำหนักคาโนนิคอลที่มีค่าน้ำหนักสูงที่สุด คือ |0.938| รองลงมาคือ |0.895|และ |0.858| ตามลำดับ ดังนั้นจึงสามารถสรุปได้ว่าความสัมพันธ์ระหว่างตัวแปรคาโนนิคอลฟังก์ชันที่ 1 จึงเป็นฟังก์ชันที่เหมาะสมที่สุด



ภาพที่ 2 รูปแบบความสัมพันธ์ของชุดตัวแปรการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร

สรุปและอภิปรายผล

จากการศึกษาสหสัมพันธ์คาโนนิคอลและค่าน้ำหนักความสำคัญคาโนนิคอลระหว่างปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี พบว่า ชุดตัวแปรทั้งสองมีความสัมพันธ์กันโดยมีค่าสหสัมพันธ์คาโนนิคอล (R_c = 0.839) ที่มีขนาดความสัมพันธ์ในระดับสูงมาก เมื่อพิจารณาชุดตัวแปรอิสระ คือ ปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์ในภาพรวม พบว่า ค่าสัมพันธ์คาโนนิคอลอยู่ระหว่างช่วง |0.864| - |0.911| คือ ระดับสูงมาก ในขณะที่ชุดตัวแปรตาม คือ ความตั้งใจซื้อสินค้าในภาพรวม พบว่า ค่าสัมพันธ์คาโนนิคอล อยู่ระหว่างช่วง |0.858| - |0.939| คือ ระดับสูงมาก (เมธาสิทธิ์ ธัญรัตนศรีสกุล, 2559; ณัฐพัชร์ อภิรุ่งเรืองสกุล และ ประสพชัย พสุนนท์, 2564) ทั้งนี้ หากพิจารณาค่าน้ำหนักความสำคัญคาโนนิคอลของปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์ โดยเรียงลำดับตัวแปรย่อยจากมากไปหาน้อยรายละเอียดดังนี้

- ผลจากการศึกษา พบว่า องค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่กลุ่มตัวอย่างให้ความสำคัญมากที่สุด คือ ความบันเทิง (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.939) เนื่องจากปัจจุบันพฤติกรรมของผู้บริโภคให้ความสำคัญกับประสบการณ์การซื้อสินค้าและบริการที่มีการเชื่อมโยงทางอารมณ์ด้วยความบันเทิง กล่าวคือ ผู้บริโภคไม่ได้ตั้งใจหรือตัดสินใจจะซื้อสินค้าเพียงอย่างเดียว แต่ซื้อจากเนื้อหาที่ผสานการสร้างความบันเทิงด้วยการสร้างแรงบันดาลใจ (Inspire) ตามใจ (Indulge) กระตุ้นอารมณ์ความรู้สึก (Emotional) และความรู้ (Education) ให้กับผู้บริโภค มาจากการผสานกันระหว่าง Shopping + Entertainment หมายถึง การสร้างความบันเทิงในการซื้อสินค้าและบริการ หรือเรียกว่า “Shoppertainment” ซึ่งเป็นรูปแบบการตลาดที่ต้องการสร้างการมีส่วนร่วมกับผู้บริโภคผ่านเนื้อหา (Content) ประเภทวีดีโอที่มีเสียงประกอบ เช่น Short Video และ Live Commerce พบได้มากบนแพลตฟอร์มออนไลน์ สอดคล้องกับการศึกษาของ วรการต์ เทพสมนึก และ ไพบูรณ์ อาชารุ่งโรจน์ (2564)

ที่พบว่า ตัวแปรย่อยความบันเทิงเป็นองค์ประกอบการของการตลาดผ่านสื่อสังคมออนไลน์ที่มีอิทธิพลทางตรงเชิงบวกต่อความตั้งใจซื้อสินค้าผ่านระบบสื่อสังคมออนไลน์ ขณะที่การศึกษาของ Wibowo, et al., (2021) พบว่า ตัวแปรย่อยความบันเทิงเป็นองค์ประกอบการของการตลาดผ่านสื่อสังคมออนไลน์ที่มีอิทธิพลทางตรงเชิงบวกต่อความตั้งใจซื้อสินค้าผ่านระบบสื่อสังคมออนไลน์ โดยมีคุณภาพความสัมพันธ์เป็นตัวแปรส่งผ่าน

- ความนิยมหรือกระแสนิยม (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.900) เป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่กลุ่มตัวอย่างให้ความสนใจรองมาจากความบันเทิง เนื่องจากจะเป็นการเพิ่มโอกาสในการขายแล้วยังสร้างความมั่นใจให้กับผู้ประกอบการว่าสามารถขายสินค้าได้อย่างแน่นอน ยิ่งสินค้าอยู่ในกระแสย่อมเป็นที่ต้องการของลูกค้า หรือสินค้าที่อยู่ในกระแสมาอย่างยาวนานย่อมขยายโอกาสในการขายได้อย่างยาวนานมากยิ่งขึ้น สอดคล้องกับการศึกษาของ Almohaimmeed (2019) และ Bushara et al. (2023) พบว่า ความนิยมหรือกระแสนิยมเป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่มีความสัมพันธ์กับความตั้งใจซื้อสินค้าและบริการอย่างมีนัยสำคัญ

- การบอกต่อแบบปากต่อปาก (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.886) เป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ ซึ่งการบอกต่อแบบปากต่อปากจะนำไปสู่การสร้างความรู้สึกร่วมให้ลูกค้าที่กำลังสนใจรู้ และประทับใจเกี่ยวกับสินค้า จนเกิดขึ้นผ่านการแสดงความคิดเห็นและการบอกต่อแก่ผู้อื่น สอดคล้องกับการศึกษาของ Almohaimmeed (2019); Moslehpour, et al. (2020) และ Bushara et al. (2023) พบว่า การบอกต่อแบบปากต่อปากเป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่มีความสัมพันธ์กับความตั้งใจซื้อสินค้าและบริการอย่างมีนัยสำคัญ

- ความเฉพาะเจาะจง (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.872) เป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่กลุ่มตัวอย่างให้ความสนใจ โดยการสร้างความเฉพาะเจาะจงให้กับลูกค้าบางกลุ่มหรือรายบุคคลที่สามารถสร้างให้เกิดความพึงพอใจส่วนตัวของลูกค้ากลุ่มนั้น ๆ ที่กำลังได้รับการดูแลและเอาใส่ใจ จนนำไปสู่ความพึงพอใจและเชื่อมโยงความสัมพันธ์ต่อไปถึงความตั้งใจซื้อสินค้าของลูกต้าต่อไป สอดคล้องกับการศึกษาของ Almohaimmeed (2019); Moslehpour, et al. (2020) และ Bushara et al. (2023) พบว่า ความเฉพาะเจาะจงเป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่มีความสัมพันธ์กับความตั้งใจซื้อสินค้าและบริการอย่างมีนัยสำคัญ

- การมีปฏิสัมพันธ์ (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.864) เป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่กลุ่มตัวอย่างให้ความสนใจ เนื่องจากการดำเนินธุรกิจการเข้าถึงลูกค้า การสร้างความคิด การพูดคุยกันถึงสินค้าและตราสินค้า ถือเป็นสิ่งจำเป็นในการสร้างการมีปฏิสัมพันธ์ให้เกิดขึ้นระหว่างผู้ประกอบการกับลูกค้าหรือลูกค้ากับลูกค้า สอดคล้องกับการศึกษาของ Almohaimmeed (2019); Moslehpour, et al. (2020) และ Bushara et al. (2023) พบว่า การมีปฏิสัมพันธ์เป็นองค์ประกอบย่อยของการตลาดผ่านสื่อสังคมออนไลน์ที่มีความสัมพันธ์กับความตั้งใจซื้อสินค้าและบริการอย่างมีนัยสำคัญ

สำหรับค่าน้ำหนักความสำคัญคาโนนิคอลของความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอาง ผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี โดยเรียงลำดับตัวแปรย่อยจากมากไปหาน้อย พบว่า ความเชื่อของผู้บริโภค (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.939) ข้อมูลผลิตภัณฑ์ (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.895) และน้อยที่สุดคือ ความเพลิดเพลินและความสนุกสนาน (มีค่าสัมพันธ์คาโนนิคอล เท่ากับ 0.858) ตามลำดับ ทั้งนี้ อาจเป็นเพราะว่าผู้บริโภคที่มี

ประสบการณ์โดยตรงจากสินค้าก่อให้เกิดเป็นความรู้ การรับรู้ และความเข้าใจ จึงนำไปสู่ความเชื่อที่มีต่อความตั้งใจซื้อสินค้าชนิดนั้น เช่น ผู้บริโภคเชื่อว่าการซื้อสินค้าผ่านแพลตฟอร์มพาณิชย์อิเล็กทรอนิกส์ช่วยประหยัดเวลา ประหยัดค่าใช้จ่าย เพราะมีหลายร้านให้เปรียบเทียบ สามารถชำระเงินได้หลากหลายช่องทางและยืดหยุ่นสูง (ผ่อนชำระเป็นงวด) รวมถึงสามารถค้นหาและซื้อสินค้าได้ตลอดเวลาตามที่ผู้บริโภคต้องการ สอดคล้องกับผลการวิจัยของ Schiffman and Kanuk (2000) ที่ว่า หากผู้บริโภคมีทัศนคติที่ดีต่อตราสินค้าใด นั่นหมายถึง ผู้บริโภคจะมีความเชื่อในตราสินค้านั้น ซึ่งนำไปสู่ความรู้สึกชื่นชอบในตราสินค้านั้นอันจะส่งผลต่อแนวโน้มที่ก่อให้เกิดความตั้งใจซื้อของผู้บริโภค (Intention to Buy)

- ข้อมูลผลิตภัณฑ์เป็นหนึ่งในองค์ประกอบย่อยของความตั้งใจซื้อ โดยเฉพาะสินค้าเครื่องสำอางที่มีส่วนผสมที่เข้มข้น หรืออยู่ในการควบคุมของแพทย์ หรือใช้เฉพาะจุด เช่น บริเวณรอบดวงตา ดังนั้นผู้บริโภคจึงค่อนข้างให้ความสำคัญต่อการเสาะแสวงหาข้อมูลเกี่ยวกับสินค้าจากแหล่งต่าง ๆ เพื่อประกอบการตัดสินใจ ดังนั้นการที่ผู้บริโภคได้รับข้อมูลข่าวสารต่าง ๆ ของผลิตภัณฑ์ได้อย่างสะดวก รวดเร็ว ถูกต้องและครบถ้วนจากผู้ประกอบการจะส่งผลต่อความตั้งใจซื้อสินค้าของผู้บริโภคอย่างมีนัยสำคัญ (Kotler, 2003; Mei-Hui, Weng-Wai & Sau-Mei, 2019)

- ความสนุกสนานและความเพลิดเพลินเป็นหนึ่งในองค์ประกอบย่อยของความตั้งใจซื้อ เมื่อผู้ที่ผู้บริโภคกำลังเพลินเพลินกับการซื้อสินค้าแล้วเกิดความตื่นเต้น การซื้อแล้วทำให้เกิดความรู้สึกการเป็นคนพิเศษ การซื้อสินค้าที่เกิดจากการตามกระแสหรือต้องการเป็นส่วนหนึ่งของสังคม ซึ่งสิ่งต่าง ๆ เหล่านี้ถือเป็นความสนุกสนานและความเพลิดเพลินที่มีผลต่อความตั้งใจซื้อสินค้าของผู้บริโภคอย่างมีนัยสำคัญ (Kotler, 2003; Mei-Hui, Weng-Wai & Sau-Mei, 2019)

จากผลการศึกษาวิจัยเรื่อง วิเคราะห์สหสัมพันธ์คาโนนิคอลระหว่างการตลาดผ่านสื่อสังคมออนไลน์กับความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มเจเนอเรชั่นซี พบว่า ตัวแปรทั้งสองตัวมีความสัมพันธ์กันโดยมีสัมประสิทธิ์สหสัมพันธ์คาโนนิคอลระดับสูงมาก (R_c = 0.839) แสดงให้เห็นว่า การตลาดผ่านสื่อสังคมออนไลน์ ประกอบด้วย ความบันเทิง ความนิยม การบอกต่อแบบปากต่อปาก ความเฉพาะเจาะจง และการมีปฏิสัมพันธ์ เป็นเครื่องมือทางการตลาดที่มีอิทธิพลเชิงบวกทั้งในทางตรงและทางอ้อมต่อความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ของผู้บริโภคเจเนอเรชั่นซีเป็นอย่างมาก ซึ่งการที่ธุรกิจสามารถใช้กลยุทธ์การตลาดผ่านสื่อสังคมออนไลน์ได้อย่างมีประสิทธิภาพนั้นถือเป็นการสร้างความแข็งแกร่งให้กับธุรกิจ เนื่องจากเป็นการเพิ่มประสิทธิภาพในสร้างความสัมพันธ์กับผู้บริโภค เช่น การตอบคำถามผู้บริโภค การให้ข้อมูลสินค้าและบริการ และการให้ผู้บริโภคแสดงความคิดเป็นที่มีต่อสินค้าผ่านทางสื่อสังคมออนไลน์ เนื่องจากช่วยให้ธุรกิจสามารถตอบสนองต่อความต้องการของผู้บริโภคจนก่อให้เกิดความพึงพอใจแล้วยังกระตุ้นให้เกิดความตั้งใจซื้อของผู้บริโภคได้อย่างมีนัยสำคัญ (Moslehpour, et al., 2020; Bushara et al., 2023)

ข้อเสนอแนะ

1. ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1.1 ผู้ประกอบการควรออกแบบและสร้างประสบการณ์ การซื้อที่ทำให้ผู้บริโภคโดยเฉพาะกลุ่มเจนเนอเรชั่นซีนั้นรู้สึกถึงความบันเทิงขณะกำลังเลือกซื้อสินค้า ซึ่งสอดคล้องกับแนวโน้มพฤติกรรมของผู้บริโภคยุคใหม่ที่ซื้อสินค้าจากการเชื่อมโยงอารมณ์ความรู้สึก (Emotional) ด้วยความบันเทิง แทนที่

ความตั้งใจซื้อสินค้าเพราะรูปแบบและประโยชน์การใช้งานเพียงอย่างเดียว ยกตัวอย่าง การสร้าง Video Content หรือการสร้าง Product Showcase ของสินค้าและบริการที่เพิ่มความเป็นระบบพาณิชย์อิเล็กทรอนิกส์เข้าไป เพื่อกระตุ้นความรู้สึกให้เกิดความพึงพอใจและคล้อยตามจนนำไปสู่ความตั้งใจซื้อสินค้าและบริการได้ทันที โดยไม่ต้องกดเชื่อมโยงต่อไปซื้อที่ E-Marketplace อื่น ๆ

1.2 ผู้ประกอบการควรให้ความสำคัญกับการพัฒนาสินค้าที่กำลังได้รับความนิยม หรือกระแสนิยมของผู้บริโภคกลุ่มเป้าหมาย เพื่อเป็นการเพิ่มโอกาสและความมั่นใจในการขายสินค้า เช่น ผลิตภัณฑ์ที่เป็นธรรมชาติและราคาเข้าถึงได้ กำลังเป็นที่นิยมของกลุ่มเป้าหมาย ดังนั้นผู้ประกอบจับกระแสความนิยมและพัฒนาสินค้าให้ตรงความต้องการของกลุ่มเป้าหมาย

1.3 ผู้ประกอบการควรใช้กลยุทธ์การบอกต่อแบบปากต่อปากผ่านทางสื่อสังคมออนไลน์ เนื่องจากเป็นการสื่อสารทางการตลาดที่ทรงพลัง สามารถกระจายข่าวสารออกเป็นวงกว้างในระยะเวลาเพียงไม่นานก็ทำให้สินค้าเป็นที่รู้จักและได้รับความนิยมอย่างแพร่หลาย เช่น การสื่อสารด้วยคุณภาพของสินค้านวัตกรรมใหม่ ๆ หรือการสร้างความสัมพันธ์ที่ดีระหว่างธุรกิจและผู้บริโภค

1.4 ผู้ประกอบการควรเพิ่มระดับความเฉพาะเจาะจงกับผู้บริโภคบางกลุ่ม เพื่อเป็นการสร้างความพึงพอใจให้เกิดขึ้นกับผู้บริโภค เช่น การส่งข้อความที่เฉพาะเจาะจง (อวยพรวันเกิด) ไปยังผู้บริโภคกลุ่มเป้าหมาย การส่งของขวัญหรือส่วนลดพิเศษในการซื้อสินค้าครั้งต่อไปให้กับผู้บริโภคที่มียอดการใช้จ่ายสูงสุดประจำเดือนหรือปี ซึ่งการเพิ่มระดับความเฉพาะเจาะจงต่อบุคคลเป็นการสร้างความพิเศษส่วนตัวต่อผู้บริโภคที่แสดงถึงความสนใจ ใส่ใจ และให้ความสำคัญ

1.5 ผู้ประกอบการควรมีปฏิสัมพันธ์ผ่านทางสื่อสังคมออนไลน์ เพื่อเป็นการสร้างตัวกระตุ้นสำคัญให้เกิดขึ้นกับผู้บริโภค เช่น การได้รับความเป็นกันเอง การดูแล หรือการแลกเปลี่ยนความคิดเห็นระหว่างผู้ประกอบการและกลุ่มผู้บริโภคด้วยกัน

1.6 ผู้ประกอบการควรสร้างความเชื่อมั่นให้ลูกค้ามีต่อสินค้า เช่น การตลาดที่ทำให้สร้างความประทับใจแรกแก่ผู้บริโภคด้วยสินค้าและบริการที่สอดคล้องกับความต้องการ จนนำไปสู่การยอมรับและความพึงพอใจ และความตั้งใจที่จะซื้อสินค้าของผู้บริโภคในที่สุด

1.7 ผู้ประกอบการควรให้ข้อมูลข่าวสารต่าง ๆ เกี่ยวกับสินค้าแก่ผู้บริโภคอย่างถูกต้องครบถ้วนและทำให้ผู้บริโภคสามารถเข้าถึงข้อมูลได้อย่างสะดวก รวดเร็ว และหลากหลายช่องทาง เพื่อให้ผู้บริโภคมีข้อมูลเพียงพอจนนำไปสู่ความตั้งใจในการซื้อสินค้าชนิดนั้น ๆ

1.8 ผู้ประกอบการควรพัฒนากิจกรรมหรือรูปแบบการตลาดผ่านช่องทางออนไลน์ที่ทำให้ผู้บริโภคเกิดความความสนุกสนานและความเพลิดเพลิน จนนำไปสู่ความตื่นเต้น ความรู้สึกถึงการเป็นคนพิเศษการได้เป็นส่วนหนึ่งของกระแสนิยม เพื่อให้ผู้บริโภคสนใจและพึงพอใจในสินค้าที่เสนอผ่านระบบพาณิชย์จนนำไปสู่ความตั้งใจในการซื้อสินค้าชนิดนั้น ๆ

2. ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

2.1 ควรศึกษาการวิจัยเชิงคุณภาพแบบการสัมภาษณ์ผู้บริโภคเชิงลึก เพื่อให้ได้ข้อมูลที่มีความละเอียดมากยิ่งขึ้น เพื่อนำข้อมูลที่ได้มาใช้ในการแก้ไขและพัฒนาการกลยุทธ์ทางการตลาดของผู้ประกอบการในกลุ่มอุตสาหกรรมเครื่องสำอางที่จำหน่ายสินค้าผ่านระบบพาณิชย์อิเล็กทรอนิกส์ให้สอดคล้องกับความต้องการของผู้บริโภคมากที่สุด

2.2 ควรพิจารณาปัจจัยที่ส่งผลต่อความตั้งใจซื้อผลิตภัณฑ์เครื่องสำอางผ่านระบบพาณิชย์อิเล็กทรอนิกส์ที่นอกเหนือจากปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ว่ามีปัจจัยใดบ้างที่เป็นปัญหาอุปสรรค

จุดแข็งหรือข้อได้เปรียบในการแข่งขันของผู้ประกอบการ เพื่อนำข้อมูลมาพัฒนาการดำเนินธุรกิจให้มีประสิทธิภาพและสร้างความพึงพอใจแก่ผู้บริโภคต่อไป

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ปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี

Factors Influencing the Decisions to Purchase Health and Medical Products in Convenience Stores among Generation Z Consumers

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาปัจจัยส่วนบุคคลและพฤติกรรมการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภค และ 2) ศึกษาปัจจัยที่มีผลต่อการตัดสินใจเลือกซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจนเนอเรชั่นซีในกรุงเทพมหานคร เก็บข้อมูลโดยใช้แบบสอบถาม จำนวน 405 ตัวอย่าง โดยใช้การสุ่มตัวอย่างแบบหลายขั้นตอน (Multi-stage Sampling) จากผู้ที่เคยซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อ ทำการวิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ได้แก่ ความถี่ ร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์ถดถอยเชิงเส้นพหุคูณ

ผลการวิจัยพบว่า ผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิงเจเนอเรชั่นซี ที่มีอายุระหว่าง 19 - 23 ปี มีการศึกษาอยู่ในระดับปริญญาตรี ประกอบอาชีพนักเรียนนักศึกษา และมีรายได้เฉลี่ยต่ำกว่า 15,000 บาทต่อเดือน ผลการศึกษาปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ประกอบด้วย สภาพแวดล้อมของร้านค้า ความรับผิดชอบต่อสังคมขององค์กร การส่งเสริมการขาย การตลาดผ่านสื่อสังคมออนไลน์ และคุณค่าที่ผู้บริโภครับรู้อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 ซึ่งสามารถอธิบายการพยากรณ์ความผันแปรของอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ได้ร้อยละ 59.30

คำสำคัญ: การตัดสินใจซื้อ, ผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์, ร้านสะดวกซื้อ, ผู้บริโภคเจเนอเรชั่นซี

Abstract

This research aims to 1) study the personal factors and purchasing behaviors of health and medical products in convenience stores among consumer groups, and 2) study the factors influencing the decision to purchase health and medical products in convenience stores among Generation Z consumers in Bangkok. Data was collected using a questionnaire with 405 samples, using a multi-stage sampling method from those who had purchased health and medical products in convenience stores. The data was analyzed

using descriptive statistics, including frequency, percentage, mean, and standard deviation, Pearson correlation analysis, and multiple linear regression analysis.

The results of the study showed that the majority of the respondents were female Generation Z, aged 19-23 years, with a bachelor's degree, working as students, and with an average income of less than 15,000 baht per month. The study of the factors influencing the decision to purchase health and medical products in convenience stores among Generation Z consumers found that the factors included store environment, corporate social responsibility, sales promotion, social media marketing, and perceived value, which were statistically significant at the 0.05 level. These factors can explain 59.30% of the variance in the influence on the decision to purchase health and medical products in convenience stores among Generation Z consumers.

Keywords: Purchase Decisions, Health and Medical Products, Convenience Stores, Generation Z Consumers.

บทนำ

ปัจจุบันร้านสะดวกซื้อไม่ได้เป็นเพียงสถานที่เพื่อใช้ซื้อสินค้าอุปโภคบริโภคที่สะดวกรวดเร็วเท่านั้น แต่กำลังเผชิญกับการเปลี่ยนแปลงและความท้าทายใหม่ ๆ อยู่หลายประการ ซึ่งนวัตกรรมและเทคโนโลยีดิจิทัลมีบทบาทสำคัญในการเปลี่ยนแปลงพฤติกรรมของผู้บริโภค ทำให้ร้านสะดวกซื้อจึงต้องปรับตัวให้เข้ากับยุคสมัย (Tunpaiboon, 2021) เช่น การนำเสนอบริการสั่งซื้อสินค้าออนไลน์ การจ่ายเงินแบบไร้เงินสด และการบริการตนเอง นอกจากนี้ในด้านของพฤติกรรมผู้บริโภคที่เปลี่ยนแปลงไปโดยให้ความสำคัญกับเรื่องของสุขภาพ ความยั่งยืน และความสะดวกสบาย ก็ส่งผลต่อสินค้าที่วางจำหน่าย กลยุทธ์ทางการตลาด และการออกแบบของร้านค้าสะดวกซื้อ รวมถึงบทบาทของร้านสะดวกซื้อในสมัยใหม่ไม่ได้จำกัดอยู่แค่การขายสินค้าแต่ต้องตอบสนองความต้องการที่หลากหลายของผู้บริโภค เช่น การมีพื้นที่บางส่วนสำหรับผู้บริโภคในการพบปะพูดคุย การให้บริการชำระค่าบริการต่าง ๆ และจุดรับ-ส่งพัสดุ เป็นต้น (Ming-Sung Cheng, Blankson, Sutikno, & Wang, 2009) อย่างไรก็ตาม ร้านสะดวกซื้อยังต้องเผชิญกับความท้าทายใหม่ ๆ เช่น การแข่งขันที่รุนแรงจากร้านค้าออนไลน์ ปัญหาแรงงาน และความรับผิดชอบต่อสังคมสิ่งแวดล้อม

สังคมในยุคสมัยใหม่ผู้บริโภคได้ให้ความสำคัญกับสุขภาพและการดูแลตนเองเพิ่มมากขึ้น ซึ่งมีสาเหตุจากปัญหาโรคระบาด สิ่งแวดล้อม และสังคมสูงวัย (Letunovska, Yashkina, Saher, Alkhashrami, & Nikitin, 2021) ส่งผลให้เกิดแนวโน้มเกี่ยวกับการดูแลสุขภาพทำให้ร้านสะดวกซื้อเห็นถึงโอกาสทางธุรกิจ ร้านสะดวกซื้อจึงมีการปรับตัวด้านสินค้าสุขภาพและทางการแพทย์เพื่อตอบสนองความต้องการของผู้บริโภคที่เปลี่ยนแปลงในหลากหลายรูปแบบ ได้แก่ การขยายหมวดหมู่สินค้าโดยนำเสนอสินค้าสุขภาพและทางการแพทย์ที่หลากหลายมากขึ้น เช่น อาหารเสริม เวชภัณฑ์ อุปกรณ์ปฐมพยาบาล และอุปกรณ์ตรวจวัดสุขภาพ การพัฒนาสินค้าสุขภาพและทางการแพทย์ภายใต้แบรนด์ของตัวเอง เพื่อตอบสนองความต้องการเฉพาะของผู้บริโภค และการให้บริการด้านสุขภาพภายในร้าน เช่น การตรวจวัดสุขภาพ การให้คำปรึกษาเกี่ยวกับสุขภาพ เป็นต้น ซึ่งการปรับตัวดังกล่าวส่งผลดีต่อผู้บริโภคช่วยให้เข้าถึงสินค้าและบริการด้านสุขภาพได้สะดวก รวดเร็ว และราคาที่สามารถเข้าถึงได้ (Sanders-Jackson, Parikh, Schleicher,

Fortmann, & Henriksen, 2015)

อย่างไรก็ตาม ร้านค้าสะดวกซื้อยังต้องเผชิญกับความท้าทายหลายประการในการปรับตัวเข้ากับแนวโน้มด้านสุขภาพ (Chang & Meyerhoefer, 2018) ได้แก่ ข้อจำกัดด้านสถานที่ซึ่งมีพื้นที่จำกัดที่ไม่อาจนำเสนอสินค้าสุขภาพและสินค้าทางการแพทย์ได้อย่างครบถ้วน รวมถึงข้อจำกัดทางกฎหมายที่สินค้าสุขภาพและทางการแพทย์ไม่สามารถจำหน่ายได้โดยตรง ต้องผ่านเภสัชกรหรือบุคลากรทางการแพทย์เท่านั้น และความรู้ความเข้าใจของพนักงานในด้านสุขภาพ ซึ่งอาจไม่เพียงพอต่อการให้คำปรึกษาให้กับผู้บริโภค ทั้งนี้ ในการซื้อสินค้าสุขภาพและทางการแพทย์ในร้านสะดวกซื้อของผู้บริโภค มีปัจจัยหลายประการเกี่ยวกับการยอมรับในตัวสินค้าและการตัดสินใจซื้อที่ผู้ประกอบการและเจ้าของธุรกิจร้านสะดวกซื้อควรสนใจและให้ความสำคัญ (Chahal & Kumari, 2011; Khedkar, Carraresi, & Bröring, 2017; Srivastava & Wagh, 2017) เช่น ปัจจัยด้านความสะดวกของร้านและความพร้อมของสินค้าที่มีจำหน่าย ราคาสินค้าที่สามารถเข้าถึงได้ ความหลากหลายของสินค้าสุขภาพและทางการแพทย์ที่มีจำหน่าย แบรนด์ของสินค้าสุขภาพและทางการแพทย์ที่มีจำหน่าย รวมทั้งความน่าเชื่อถือของสินค้าสุขภาพและทางการแพทย์โดยผ่านการแนะนำจากพนักงานหรือผู้เชี่ยวชาญเฉพาะทางด้านสุขภาพอีกด้วย เพื่อให้เกิดการรับรู้และเข้าใจด้านข้อมูลเกี่ยวกับผลิตภัณฑ์อย่างถูกต้องและเหมาะสมกับความต้องการด้านสุขภาพของแต่ละบุคคล

ในการตัดสินใจของผู้บริโภคในการเลือกซื้อสินค้าแต่ละประเภทก็มีความแตกต่างกัน ซึ่งมีปัจจัยหลักที่เกี่ยวข้อง ได้แก่ รายได้ของผู้บริโภคซึ่งส่งผลต่อกำลังซื้อและประเภทของสินค้าสินค้าที่เลือก ความต้องการและไลฟ์สไตล์ของผู้บริโภคที่แตกต่างกัน การรับรู้ด้านสินค้าและแบรนด์ เป็นต้น นอกจากช่วงวัยหรือเจนเนอเรชั่นที่แตกต่างกันก็ส่งผลต่อการตัดสินใจซื้อสินค้าได้เช่นกัน เช่น วัยเด็กมักตัดสินใจซื้อสินค้าจากอารมณ์ ความชอบ ความคิดเห็นจากคนใกล้ตัว วันรุ่นมักตัดสินใจจากความต้องการของตนเอง แฟชั่น แบรนด์ และกลุ่มเพื่อน วัยทำงานตัดสินใจจากความคุ้มค่า ประโยชน์ และความเหมาะสมในการดำเนินชีวิตของตนเอง วัยสูงอายุมักตัดสินใจจากความสะดวก ความปลอดภัย และความคุ้มค่า เป็นต้น ซึ่งปัจจัยต่าง ๆ เป็นเพียงภาพรวมของคนส่วนใหญ่ในกลุ่มช่วงวัยนั้น ๆ เพียงเท่านั้น ไม่สามารถอธิบายถึงทุกคนได้ เนื่องจากบุคคลมีความต้องการและพฤติกรรมที่แตกต่างกัน (Stankevich, 2017)

สำหรับกลุ่มผู้บริโภคเจนเนอเรชั่นซี เป็นกลุ่มคนรุ่นใหม่ที่เกิดตั้งแต่ปี พ.ศ. 2544 ซึ่งเป็นกลุ่มคนที่เติบโตมากับเทคโนโลยีดิจิทัล อินเทอร์เน็ต และสื่อสังคมออนไลน์ เป็นกลุ่มคนที่กำลังเติบโตขึ้นและกลายเป็นกลุ่มผู้บริโภคที่มีกำลังซื้อ รวมทั้งมีอิทธิพลต่อตลาดมากขึ้น ซึ่งพฤติกรรมของกลุ่มผู้บริโภคเจนเนอเรชั่นซีมีความหลากหลากและแตกต่างจากผู้บริโภคกลุ่มอื่น ๆ เนื่องจากมีปัจจัยหลายอย่างที่เกี่ยวข้อง เช่น รายได้ ครอบครัว สื่อออนไลน์ การค้นหาข้อมูลโดยใช้เทคโนโลยี ความตระหนักด้านสิ่งแวดล้อมและความรับผิดชอบต่อสังคม เป็นต้น ซึ่งหากธุรกิจสามารถพัฒนาสินค้าและบริการให้ตรงกับความต้องการของคนกลุ่มนี้ได้ก็ถือว่าเป็นโอกาสในการสร้างการเติบโตให้กับธุรกิจกับกลุ่มคนที่กำลังจะเป็นเป้าหมายหลักในอนาคต (Puiu, 2016; Thangavel, Pathak, & Chandra, 2019)

ดังนั้นการศึกษาปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีนี้ จะเป็นการศึกษาพฤติกรรมและความต้องการของผู้บริโภคเจนเนอเรชั่นซีซึ่งเป็นกลุ่มเป้าหมายที่มีศักยภาพในปัจจุบันต่อการพัฒนาและขยายตลาดของสินค้าด้านสุขภาพและทางการแพทย์ในร้านสะดวกซื้อ เพื่อปรับปรุงและพัฒนาร้านค้าในด้านต่าง ๆ ให้ตรงกับความต้องการเพื่อใช้เป็นข้อมูลในการพัฒนาร้านค้าสะดวกซื้อต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาปัจจัยส่วนบุคคลและพฤติกรรมการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจนเนอเรชั่นซี

2. เพื่อวิเคราะห์ปัจจัยที่มีผลต่อการตัดสินใจเลือกซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจนเนอเรชั่นซี

แนวคิด ทฤษฎี กรอบแนวคิด

ร้านสะดวกซื้อ (Convenience Store) หมายถึง กิจกรรมที่เพิ่มคุณค่าให้กับสินค้าและบริการที่ขายให้กับผู้บริโภค สำหรับใช้ส่วนตัว ภายในครัวเรือน หรือในอีกความหมายหนึ่ง คือ กิจกรรมที่นำเสนอสินค้าและบริการไปยังผู้บริโภคคนสุดท้ายเพื่อการใช้ในครัวเรือนหรือใช้ส่วนตัว โดยการจัดหาสินค้าในปริมาณมากและทยอยขายให้กับผู้บริโภคปริมาณน้อย (ศิริวรรณ เสรีรัตน์, 2546; Levy & Weitz, 2001; Newman & Cullen, 2002)

ความรับผิดชอบต่อสังคมขององค์กร (Corporate Social Responsibility) หมายถึง แนวทางปฏิบัติทางธุรกิจที่องค์กรปรับตัว โดยการดำเนินธุรกิจอย่างรอบคอบและช่วยเหลือสังคมเพื่อปรับปรุงความเป็นอยู่ของชุมชนและปกป้องสิ่งแวดล้อม กล่าวคือ เป็นการประกอบธุรกิจที่มุ่งเน้นการสร้างผลกำไรเพื่อรับผิดชอบในมิติต่าง ๆ ได้แก่ ความรับผิดชอบต่อผู้ก่อตั้งรวมถึงผู้มีส่วนได้เสียในองค์กร เช่น การกำกับดูแลกิจการที่ดี มุ่งเน้นสร้างผลกำไรแก่ผู้ถือหุ้น รักษาระดับความสามารถในการแข่งขันอย่างต่อเนื่อง ความรับผิดชอบทางกฎหมายและข้อบังคับของภาครัฐ เช่น ดำเนินกิจการภายใต้ข้อกฎหมายและข้อบังคับของภาครัฐ ผลิตสินค้าและบริการภายใต้ข้อกฎหมายขั้นต่ำ ความรับผิดชอบทางจริยธรรม คือ การดำเนินธุรกิจภายใต้ความคาดหวังของผู้มีส่วนได้เสียหรือผู้คนในสังคมอย่างเป็นธรรมและปกป้องสิทธิมนุษยธรรม และความรับผิดชอบด้านการกุศลเป็นการส่งเสริมทรัพยากรมนุษย์และกิจกรรมการกุศล เพื่อสร้างความเข้มแข็งให้กับประชาชน (Carroll, 1991; Kotler & Lee, 2005) ปัจจุบันความรับผิดชอบต่อสังคมเป็นแนวคิดที่เป็นกระแสไปทั่วโลกรวมถึงประเทศไทย ซึ่งนำไปสู่การเปลี่ยนแปลงการบริหารจัดการองค์การที่ส่งผลกระทบเชิงลึกต่อกลยุทธ์ทางธุรกิจ เนื่องจากปัจจุบันผู้บริโภคให้ความสำคัญต่อความรับผิดชอบต่อสังคมของธุรกิจทำให้ส่งผลต่อการตัดสินใจซื้อของผู้บริโภคในที่สุด (ชนมาศ ชัยศรี, ศิริรัตน์ โกศการิกา, และ ยุพาวรรณ วรรณวาณิชย์, 2565; Halme & Laurila, 2009)

การตลาดผ่านสื่อสังคมออนไลน์ (Social Media Marketing) หมายถึง รูปแบบการสร้างเครื่องมือทางการตลาดบนโลกอินเทอร์เน็ต เป็นการใช้สื่อออนไลน์ในการกระจายข้อมูลและสร้างมูลค่าทางการตลาดผ่านการสร้างช่องทางการติดต่อสื่อสารและสร้างตราสินค้าให้บรรลุความต้องการของผู้บริโภคด้วยการสร้างเนื้อหา รูปภาพ ภาพเคลื่อนไหว และ เสียง เป็นต้น ปัจจุบันการสื่อสารการตลาดผ่านสื่อสังคมออนไลน์ถือเป็นแนวทางใหม่และเป็นที่นิยมใช้ในการดำเนินธุรกิจเนื่องจากทำให้ธุรกิจเข้าถึงกลุ่มเป้าหมายได้ง่าย และสามารถสื่อสารการตลาดถึงผู้บริโภคได้หลากหลายรูปแบบและหลากหลายกิจกรรม (Kelly, Kerr, & Drennan, 2010; Kaur, 2016) ยิ่งไปกว่านั้น การตลาดผ่านสื่อสังคมออนไลน์ที่มีประสิทธิภาพยังส่งผลต่อการตัดสินใจซื้อสินค้าของผู้บริโภคอย่างมีนัยสำคัญ และยังสามารถเพิ่มรายได้ให้กับธุรกิจ (วรลักษณ์ ลลิตศศิวิมล, นุกูล ชิ้นฟัก, และ ธัญเทพ โต๊ะปลัด, 2562; Ansari, Ansari, Ghori & Kazi, 2019, Al-Azzam, & Al-Mizeed, 2021)

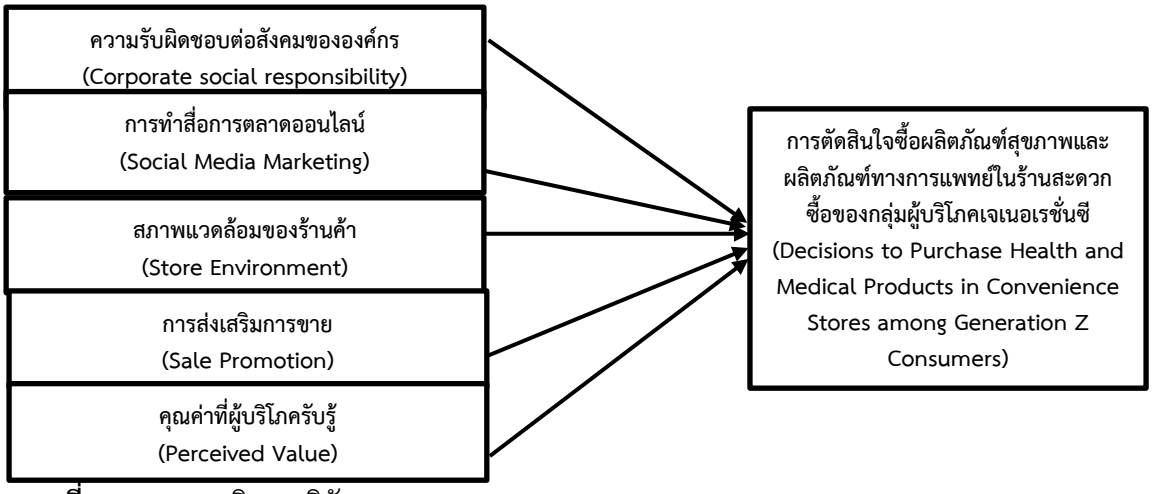
สภาพแวดล้อมของร้านค้า (Store Environment) หมายถึง ส่วนประกอบต่าง ๆ และลักษณะเฉพาะของร้านค้าที่ทำให้ลูกค้ารู้สึกต้องการซื้อสินค้าและบริการผ่านการสร้างบรรยากาศภายในร้าน ประกอบด้วย บรรยากาศในร้านค้า (Ambience) การออกแบบของร้านค้า (Design) และสภาพแวดล้อมทางสังคมของร้านค้า (Social Characteristic) ซึ่งส่วนประกอบเหล่านี้ล้วนส่งผลต่ออารมณ์ ความรู้สึก และแรงกระตุ้นของลูกค้าที่จะนำไปสู่แนวโน้มในการตัดสินใจซื้อสินค้าและบริการ (เลอเดช ทรัพย์กรานนท์, 2561; Kotler, 1973; Baker, Grewal & Parasuraman, 1994; Turley & Milliman, 2000)

การส่งเสริมการขาย (Sale Promotion) หมายถึง การโน้มน้าวจิตใจของผู้บริโภคด้วยวิธีการทางการตลาดที่มุ่งสร้างประโยชน์ให้กับลูกค้า เป็นการกระตุ้นให้ผู้บริโภคเกิดความต้องการต่อสินค้าและบริการมากอย่างยิ่ง รวมทั้งมีวัตถุประสงค์เพื่อการสร้างยอดขายในระยะเวลาอันสั้น นอกจากนี้การส่งเสริมการขายส่งผลต่อกระบวนการตัดสินใจของผู้บริโภคของอย่างมีนัยสำคัญ (บวรลักษณ์ พูลสวัสดิ์, 2561; เอริสา ยุติธรรมดำรง, สุริย์วิภา ไชยพันธุ์, และ เบ็ญจวรรณ ลี้เจริญ, 2567)

คุณค่าที่ผู้บริโภครับรู้ (Perceived Value) หมายถึง การประเมินอรรถประโยชน์ของสินค้าหรือบริการในภาพรวมของผู้บริโภค โดยการเปรียบเทียบคุณค่าที่ผู้บริโภครับรู้ เช่น เวลา ค่าใช้จ่ายที่เสียไป การให้บริการ คุณภาพของสินค้า และคุณประโยชน์ของสินค้า เป็นต้น ซึ่งเมื่อผู้บริโภคเห็นว่า สินค้าและบริการที่ได้รับนั้นมีอรรถประโยชน์ที่สูงกว่าสิ่งที่เสียไปจะนำมาซึ่งการตัดสินใจของผู้บริโภคต่อสินค้าและบริการนั้น ๆ (อัมพล ชูสนุก, มิลินลดา กุลนายุ, ฉวีวรรณ ชูสนุก, และ สุภาพร เพ่งพิศ, 2559; ภรภัทร จันกลิ่น, อัมพล ชูสนุก, กิตติ เจริญพรพานิชกุล, สิริบุปผา อุทารธาดา, และ วิทย์ เมฆวรากุล, 2565; Zeithaml, 1988; Oliver, 1997; Lewin, Biemans, & Ulaga, 2010)

การตัดสินใจซื้อ (Purchase Decision) หมายถึง การเลือกจะกระทำการอย่างใดอย่างหนึ่งในทางเลือกที่มีอยู่ตั้งแต่สองทางเลือกขึ้นไป ซึ่งเป็นขั้นตอนหนึ่งในกระบวนการเลือกของแต่ละบุคคลที่แตกต่างกันในการตัดสินใจเลือกซื้อสินค้าและบริการ (สดุดี บุนนาค, 2560; ธมลวรรณ สมพงศ์, 2564) นอกจากนี้การตัดสินใจซื้อสินค้าและบริการยังขึ้นอยู่กับหลายปัจจัยที่เกี่ยวข้อง ประกอบด้วย ความรับผิดชอบต่อสังคมขององค์กร การทำสื่อการตลาดออนไลน์ สภาพแวดล้อมของร้านค้า การส่งเสริมการขาย และคุณค่าที่ผู้บริโภครับรู้ เป็นต้น (Hanaysha, 2017)

จากการศึกษาแนวคิด ทฤษฎี และการทบทวนวรรณกรรมที่ได้กล่าวมาข้างต้น ผู้วิจัยจึงนำออกแบบกรอบแนวคิดการวิจัย โดยมีตัวแปรอิสระและตัวแปรตามดังภาพต่อไปนี้



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากร

การวิจัยครั้งนี้เป็นการวิจัยเชิงปริมาณ โดยใช้แบบสอบถามเป็นเครื่องมือในการวิจัย ประชากรที่ใช้ในการศึกษา คือ ผู้ซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มผู้บริโภคเจนเนอเรชั่นซี

กลุ่มตัวอย่าง

การวิจัยครั้งนี้เป็นการศึกษากลุ่มตัวอย่างที่เป็นผู้ซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มผู้บริโภคเจนเนอเรชั่นซี ซึ่งไม่ทราบจำนวนที่แน่นอนได้ ดังนั้นผู้วิจัยจึงใช้สูตรคำนวณขนาดตัวอย่างที่ไม่ทราบขนาดตัวอย่างของ Cochran (Cochran, 1953) โดยกำหนดระดับค่าความเชื่อมั่นร้อยละ 95 ณ ระดับค่าความคลาดเคลื่อนร้อยละ 5 กล่าวคือ ตัวอย่าง (n) = $((0.05)(1-0.5)(1.96)^2)/(0.05)^2$ = 384.16 ตัวอย่าง ดังนั้นเพื่อป้องกันข้อมูลไม่สมบูรณ์ผู้วิจัยเก็บแบบสอบถาม จำนวน 405 ชุด

การสุ่มตัวอย่าง

ผู้วิจัยได้ทำการสุ่มตัวอย่างแบบหลายขั้นตอน (Multi-stage Sampling) โดยขั้นตอนที่ 1 จากการสุ่มตัวอย่างแบบชั้นภูมิ (Stratified Sampling) เพื่อกำหนดพื้นที่ที่ต้องการศึกษา โดยแบ่งการปกครองออกเป็น 3 เขต ตามเกณฑ์การแบ่งเขตการปกครอง (สำนักยุทธศาสตร์และประเมินผล, 2556) ได้แก่ พื้นที่ชั้นใน พื้นที่ชั้นกลาง พื้นที่ชั้นนอก ขั้นตอนที่ 2 การสุ่มตัวอย่างแบบอย่างง่าย (Simple Random Sampling) ด้วยวิธีการจับฉลากเพื่อเลือกตัวแทนในแต่ละกลุ่มเขตตามสัดส่วน ซึ่งกลุ่มที่มีจำนวนเขตมากก็จะได้ตัวแทนเขตที่ได้จากการสุ่มมากตามไปด้วย ขั้นตอนที่ 3 การสุ่มตัวอย่างแบบโควตา (Quota Sampling) เป็นการกำหนดสัดส่วนของตัวอย่าง โดยเลือกสุ่มจำนวนตัวอย่างตามสัดส่วนจากตัวแทนเขตที่ได้จากการสุ่มทั้งหมด 14 เขต โดยเก็บข้อมูลให้ได้เขตละ 29 ตัวอย่างเท่าๆ กัน (รวมทั้งหมด 405 ตัวอย่าง) และขั้นตอนที่ 4 การสุ่มตัวอย่างแบบตัวอย่างตามสะดวก (Convenient Sampling) (ณัฐวุฒิ รุ่งเสถียรภูธร, 2558) โดยการกระจายแบบสอบถามไปยังกลุ่มตัวอย่างทั่วเขตกรุงเทพมหานครเพื่อเป็นการเพิ่มโอกาสในการเป็นตัวแทนของผู้บริโภค

เครื่องมือวิจัย

เครื่องมือในการวิจัย แบ่งออกเป็น 3 ส่วน คือ ส่วนที่ 1 ข้อมูลเกี่ยวกับปัจจัยส่วนบุคคล ได้แก่ อายุ ระดับการศึกษา อาชีพ รายได้เฉลี่ยต่อเดือน ส่วนที่ 2 ข้อมูลเกี่ยวกับพฤติกรรมการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อในเขตกรุงเทพมหานคร กรณีศึกษากลุ่มผู้บริโภคเจนเนอเรชั่นซี และส่วนที่ 3 แสดงความคิดเห็นของตัวแปรอิสระ ทั้ง 5 ด้าน ประกอบด้วย ความรับผิดชอบต่อสังคมขององค์กร การตลาดผ่านสื่อสังคมออนไลน์ สภาพแวดล้อมของร้านค้า การส่งเสริมการขาย และคุณค่าที่ผู้บริโภครับรู้ และตัวแปรตาม จำนวน 1 ตัว ประกอบด้วย การตัดสินใจซื้อ ซึ่งมีลักษณะคำถามเป็นแบบมาตราส่วนประมาณค่า (Rating Scale) ซึ่งกำหนดตามวิธีของลิเคิร์ท (Likert Scale) (Joshi, Kale, Chandel, & Pal, 2015) แบ่งระดับการวัดเป็น 5 ระดับ

การเก็บรวบรวมข้อมูล

การวิจัยเชิงปริมาณครั้งนี้มีการรวบรวมข้อมูลจากแหล่งปฐมภูมิ (Primary Data) รวบรวมข้อมูลจากการทำแบบสอบถามของกลุ่มตัวอย่าง โดยวิธีการสัมภาษณ์จากผู้ให้คำตอบและการตอบคำถามออนไลน์

1. แหล่งข้อมูลปฐมภูมิ โดยเก็บข้อมูลจากการรวบรวมข้อมูลเบื้องต้นจากกลุ่มตัวอย่าง จำนวน 405 ตัวอย่าง โดยใช้วิธีการแจกแบบสอบถามในพื้นที่ต่าง ๆ ในกรุงเทพมหานคร ได้แก่ พื้นที่ชุมชน ร้านสะดวกซื้อ ที่พักอาศัย ห้างสรรพสินค้า เป็นต้น

2. แหล่งข้อมูลทุติยภูมิ โดยการศึกษาค้นคว้าข้อมูลจากเอกสาร วารสารวิชาการ งานวิจัย และเว็บไซต์ต่าง ๆ ที่เกี่ยวข้อง

การตรวจสอบคุณภาพของเครื่องมือวิจัย

1. ตรวจสอบความเที่ยงตรงของเนื้อหา (Content Validity) โดยการวิเคราะห์ค่าดัชนีความสอดคล้องของข้อคำถามแต่ละข้อกับวัตถุประสงค์ (Item-Objective Congruence Index: IOC) ที่มีค่าตั้งแต่ 0.5 ขึ้นไป (Rovinelli & Hambleton, 1977) โดยข้อคำถามทุกข้อผ่านเกณฑ์ค่าดัชนีความสอดคล้อง โดยมีค่าระหว่าง 0.5 - 1.0

2. การหาความเชื่อมั่น (Reliability) โดยการนำแบบสอบถามที่ไปทดลองกับประชากรที่ไม่ใช่กลุ่มตัวอย่าง จำนวน 30 ตัวอย่าง แล้วนำมาวิเคราะห์ค่าความเชื่อมั่นของแบบสอบถาม โดยกำหนดให้มีค่าสัมประสิทธิ์แอลฟาของครอนบาค (Cronbach's Alpha Coefficient: α) มากกว่า 0.7 ตามวิธีการของครอนบาค (Cronbach, 1970) จากผลการทดสอบ พบว่า ค่าสัมประสิทธิ์แอลฟาของตัวแปรแต่ละตัวมีค่าอยู่ระหว่าง 0.799 - 0.959 และความเชื่อมั่นทั้งฉบับ มีค่าเท่ากับ 0.960 แสดงว่า เครื่องมือมีค่าความเชื่อมั่น

การวิเคราะห์ข้อมูล

การวิจัยครั้งนี้ ผู้วิจัยได้ทำการแบ่งกระบวนการวิเคราะห์ข้อมูลที่ได้จากการเก็บข้อมูลสำรวจออกเป็น 2 ส่วน ได้แก่

ส่วนที่ 1 วิเคราะห์ข้อมูลส่วนบุคคลและข้อมูลพฤติกรรมการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของผู้ตอบแบบสอบถาม โดยการใช้สถิติเชิงพรรณนา อาทิ ความถี่ (Frequency) ค่าร้อยละ (Percentage) ค่าเฉลี่ย (Mean) และส่วนเบี่ยงเบนมาตรฐาน (Standard Deviation) เพื่อตอบวัตถุประสงค์การศึกษาลักษณะทางด้านประชากรศาสตร์และพฤติกรรมการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อในเขตกรุงเทพมหานคร ซึ่งเป็นการสรุปข้อมูลในภาพรวมจากการสำรวจ

ส่วนที่ 2 การวิเคราะห์ถดถอยเชิงเส้นพหุคูณ (Multiple Regression Analysis) เพื่อตอบวัตถุประสงค์การวิเคราะห์ปัจจัยที่มีอิทธิพลของปัจจัยในการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี

ผลการวิจัย

การวิจัยครั้งนี้ผู้วิจัยได้แบ่งผลการวิจัย ออกเป็น 2 ส่วน ดังนี้

ส่วนที่ 1 ผลการวิเคราะห์ข้อมูลปัจจัยส่วนบุคคลและข้อมูลพฤติกรรมของผู้ตอบแบบสอบถาม

การวิจัยครั้งนี้ มีตัวอย่างจำนวน 405 คน ที่ให้ความร่วมมือในการตอบแบบสอบถามด้วยความสมัครใจ ส่วนใหญ่เป็นเพศหญิง จำนวน 243 คน (ร้อยละ 60.00) อายุระหว่าง 19-23 ปี จำนวน 378 คน (ร้อยละ 93.33) มีการศึกษาระดับปริญญาตรี จำนวน 346 คน (ร้อยละ 85.43) อาชีพนักเรียน/นักศึกษา จำนวน 397 (ร้อยละ 98.02) และมีรายได้เฉลี่ยต่ำกว่า 15,000 บาท จำนวน 263 คน (ร้อยละ 64.94)

ส่วนพฤติกรรมการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีของกลุ่มตัวอย่าง พบว่า ประเภทของผลิตภัณฑ์สุขภาพส่วนใหญ่ที่ซื้อ คือ เครื่องดื่มเพื่อสุขภาพ จำนวน 140 คน (ร้อยละ 34.57) รองลงมาคือ อาหารเพื่อสุขภาพ จำนวน 132 คน (ร้อยละ 32.59) ส่วนประเภทของผลิตภัณฑ์ทางการแพทย์ส่วนใหญ่ที่ซื้อ คือ ยาสามัญประจำบ้าน จำนวน 301 คน (ร้อยละ 74.32) รองลงมา คือ อุปกรณ์ปฐมพยาบาล จำนวน 59 คน (ร้อยละ 14.57) จำนวนครั้งที่ซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ ส่วนใหญ่ซื้อน้อยกว่า 1 ครั้งต่อสัปดาห์ จำนวน 285 คน (ร้อยละ 70.37) มีค่าใช้จ่ายในการซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ (เฉลี่ยรายเดือน) ประมาณ 100 - 500 บาท จำนวน 181 คน (ร้อยละ 44.69)

ส่วนที่ 2 ผลการวิเคราะห์เกี่ยวกับความคิดเห็นของปัจจัยที่ใช้ในการศึกษา

1) ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และระดับปัจจัยการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี (n = 405)

ผลการวิเคราะห์ระดับปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ดังต่อไปนี้

ตารางที่ 1 ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐานของตัวแปรที่ใช้ในการวิจัย

ปัจจัย		$\bar{X}$	S.D.	แปลผล	ลำดับ
ความรับผิดชอบต่อสังคมขององค์กร	X1	3.94	0.81	มาก	4
การตลาดผ่านสื่อสังคมออนไลน์	X2	3.76	0.84	มาก	6
สภาพแวดล้อมของร้านค้า	X3	4.05	0.80	มาก	2
การส่งเสริมการขาย	X4	4.00	0.78	มาก	3
คุณค่าที่ผู้บริโภครับรู้	X5	4.17	0.76	มาก	1
การตัดสินใจซื้อ	Y1	3.85	0.76	มาก	5
รวม		**3.98**	**0.81**	**มาก**	

จากตารางที่ 1 พบว่า ปัจจัยด้านคุณค่าที่ผู้บริโภครับรู้ โดยรวมอยู่ในระดับมากที่สุด มีค่าเฉลี่ยรวมเท่ากับ 4.17 (S.D. = 0.76) รองลงมา คือ ปัจจัยด้านสภาพแวดล้อมของร้านค้า มีค่าเฉลี่ยเท่ากับ 4.05 (S.D. = 0.80) ปัจจัยด้านการส่งเสริมการขาย มีค่าเฉลี่ยเท่ากับ 4.00 (S.D. = 0.78) ปัจจัยด้านความรับผิดชอบต่อสังคมขององค์กร มีค่าเฉลี่ยเท่ากับ 3.94 (S.D. = 0.81) และปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์ มีค่าเฉลี่ยเท่ากับ 3.76 (S.D. = 0.84) (ตารางที่ 1)

ตารางที่ 2 ค่าสัมประสิทธิ์สหสัมพันธ์อย่างง่ายของตัวแปรปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี

	X1	X2	X3	X4	X5	Y1
X1	1					
X2	.689**	1				
X3	.649**	.637**	1			
X4	.697**	.660**	.732**	1		
X5	.580**	.479**	.627**	.596**	1	
Y1	.675**	.640**	.682**	.681**	.561**	1

หมายเหตุ ** ระดับนัยสำคัญ 0.01

จากการพิจารณาค่าสัมประสิทธิ์สหสัมพันธ์ระหว่างชุดตัวแปรปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี พบว่ามีค่าอยู่ระหว่าง 0.479 – 0.732 ซึ่งมีความสัมพันธ์กันในทิศทางบวกอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 ตัวแปรทั้งหมดมีค่าสัมประสิทธิ์สหสัมพันธ์ทั้งหมดมีค่าน้อยกว่า 0.8 (Cooper & Schindler, 2006) แสดงว่า ตัวแปรต่าง ๆ ไม่มีความสัมพันธ์กันเอง

2) ผลการวิเคราะห์สมการถดถอยเชิงพหุคูณ

การหาความสัมพันธ์จากสมการถดถอยเชิงพหุคูณของปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ด้วยสมการเชิงเส้น ซึ่งมีตัวแปรต้น คือ ปัจจัยความรับผิดชอบต่อสังคมขององค์กร ปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ ปัจจัยสภาพแวดล้อมของร้านค้า ปัจจัยการส่งเสริมการขาย และปัจจัยคุณค่าที่ผู้บริโภครับรู้ ที่ส่งผลต่อตัวแปรตาม คือ การตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี (ตารางที่ 3)

ตารางที่ 3 ผลการวิเคราะห์สมการถดถอยเชิงพหุคูณ

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.773	0.598	0.593	0.484

จากตารางที่ 3 พบว่า ค่า R Square (R^2) ซึ่งแสดงอิทธิพลของตัวแปรอิสระที่มีต่อตัวแปรตามมีค่าเท่ากับ 0.598 หมายความว่า ปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ได้ร้อยละ 59.8 ส่วนที่เหลือเป็นอิทธิพลที่มาจากปัจจัยอื่น ๆ

ตารางที่ 4 ผลการวิเคราะห์สมการถดถอยเชิงพหุคูณของตัวแบบ (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	138.958	5	27.792	118.641	.000***
	Residual	93.466	394	0.234		
	Total	232.423	399			

** มีนัยสำคัญทางสถิติที่ระดับ 0.001

จากตารางที่ 4 พบว่า ผลการวิเคราะห์ทางสถิติได้ค่า Sig. เท่ากับ 0.000 ซึ่งน้อยกว่าระดับนัยสำคัญที่ 0.01 หมายความว่า มีอย่างน้อย 1 ด้าน ของปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01

ตารางที่ 5 ผลการวิเคราะห์สมการถดถอยเชิงพหุคูณ

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	0.457	0.149		3.078	0.002
ความรับผิดชอบต่อสังคมขององค์กร	0.208	0.048	0.222	4.377	0.000***
การตลาดผ่านสื่อสังคมออนไลน์	0.155	0.043	0.173	3.613	0.000***
สภาพแวดล้อมของร้านค้า	0.223	0.049	0.236	4.530	0.000***
การส่งเสริมการขาย	0.177	0.052	0.183	3.381	0.001**
คุณค่าที่ผู้บริโภครับรู้	0.091	0.043	0.091	2.108	0.036*

* มีนัยสำคัญทางสถิติที่ระดับ 0.05, ** มีนัยสำคัญทางสถิติที่ระดับ 0.01,
*** มีนัยสำคัญทางสถิติที่ระดับ 0.001

จากตารางที่ 5 เมื่อพิจารณาค่า Sig. สามารถสรุปได้ว่า ปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 และ 0.05 พบว่า มี 5 ด้าน ได้แก่ ปัจจัยด้านความรับผิดชอบต่อสังคมขององค์กร ด้านการตลาดผ่านสื่อสังคมออนไลน์ ด้านสภาพแวดล้อมของร้านค้า ด้านการส่งเสริมการขาย และด้านคุณค่าที่ผู้บริโภครับรู้ โดยผลที่ได้จากการวิเคราะห์สมการถดถอยเชิงพหุคูณ สามารถมาเขียนในรูปสมการถดถอยเชิงพหุคูณ ได้ดังนี้

$\hat{Y}$ = 0.457 + 0.208 (ความรับผิดชอบต่อสังคมขององค์กร) + 0.155 (การตลาดผ่านสื่อสังคมออนไลน์) + 0.223 (สภาพแวดล้อมของร้านค้า) + 0.177 (การส่งเสริมการขาย) + 0.091 (คุณค่าที่ผู้บริโภครับรู้)

สรุปและอภิปรายผล

1. จากผลการศึกษาวิจัย พบว่า ปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ได้แก่ คุณค่าที่ผู้บริโภครับรู้ (4.17) สภาพแวดล้อมของร้านค้า (4.05) การส่งเสริมการขาย (4.00) ความรับผิดชอบต่อสังคมขององค์กร (3.94) และการตลาดผ่านสื่อสังคมออนไลน์ (3.76) ตามลำดับ ซึ่งสอดคล้องกับทฤษฎีทางการตลาดในเรื่องของการรับรู้ของผู้บริโภค (Consumer Awareness) ซึ่งเป็นขั้นแรกที่จะนำสู่การตัดสินใจเลือกซื้อสินค้าและผลิตภัณฑ์ นอกจากนี้ในผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์เป็นกลุ่มผลิตภัณฑ์ที่มีความเฉพาะเจาะจงต่อการใช้ ดังนั้นการตัดสินใจเลือกซื้อจึงมีพื้นฐานมาจากการรับรู้คุณค่าที่ตรงกับความต้องการ ส่วนปัจจัยด้านอื่น ๆ เช่น สภาพแวดล้อม การส่งเสริมการขาย การรับผิดชอบต่อสังคมขององค์กร และการตลาดผ่านสื่อสังคมออนไลน์ก็มีส่วนต่อการตัดสินใจเช่นกัน แต่เป็นปัจจัยรองหรือปัจจัยเสริมในการตัดสินใจโดยรวมเพื่อซื้อสินค้าสุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจนเนอเรชั่นซี

หากวิเคราะห์ในมุมมองของปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีทั้ง 5 ข้อ สามารถแบ่งเป็นปัจจัยภายใน (Internal Factor) ประกอบด้วย คุณค่าที่ผู้บริโภครับรู้ และปัจจัยภายนอก (External Factors) ได้แก่ สภาพแวดล้อมของร้านค้า การส่งเสริมการขาย ความรับผิดชอบต่อสังคมขององค์กร และ การตลาดผ่านสื่อสังคมออนไลน์ จะสังเกตได้ว่าสิ่งที่มีความสำคัญในการตัดสินใจของผู้บริโภค Gen Z ในการเลือกซื้อผลิตภัณฑ์ทางการแพทย์มักเกิดจากปัจจัยภายในบุคคลซึ่งมีน้ำหนักมากกว่าปัจจัยภายนอก ดังนั้น การส่งเสริมให้ผู้บริโภคตระหนักรู้ถึงความสำคัญและคุณค่าของผลิตภัณฑ์จึงเป็นสิ่งสำคัญที่สามารถเพิ่มโอกาสในการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ได้เพิ่มขึ้น

2. จากการทดสอบการถดถอยเชิงพหุคูณ พบว่า 1) ปัจจัยความรับผิดชอบต่อสังคมขององค์กรมีความสัมพันธ์เชิงบวกต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ซึ่งสอดคล้องกับงานวิจัยของ ชนมาศ ชัยศรี และคณะ (2564) ที่ได้ทำการศึกษาความรับผิดชอบต่อสังคมขององค์กรที่มีอิทธิพลต่อคุณค่าตราสินค้า และกระบวนการตัดสินใจซื้อสินค้าของกลุ่มลูกค้าในองค์กรในประเทศไทย และจากผลการวิเคราะห์โดยรวม พบค่า Sig. เท่ากับ 0.000 แสดงให้เห็นว่า ปัจจัยความรับผิดชอบต่อสังคมขององค์กรส่งผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 2) ปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ มีความสัมพันธ์เชิงบวกต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ซึ่งสอดคล้องกับ Al-Azzam และ Al-Mizeed (2021) พบว่า ปัจจัยการตลาดดิจิทัลและสื่อสังคมออนไลน์มีอิทธิพลต่อการตัดสินใจของกลุ่มเป้าหมาย และจากผลการวิเคราะห์ยังพบว่า โดยรวมพบค่า Sig. เท่ากับ 0.000 แสดงให้เห็นว่า ปัจจัยการตลาดผ่านสื่อสังคมออนไลน์ส่งผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 3) ปัจจัยสภาพแวดล้อมของร้านค้ามีความสัมพันธ์เชิงบวกต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ซึ่งสอดคล้องกับ Turley และ Milliman (2000) พบว่า สภาพแวดล้อมและบรรยากาศของร้านที่ผลต่อการตัดสินใจและพฤติกรรมของผู้บริโภค และจากผลการวิเคราะห์ยังพบว่าโดยรวมพบค่า Sig. เท่ากับ 0.000 แสดงให้เห็น

ว่า ปัจจัยสภาพแวดล้อมของร้านค้าส่งผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 4) ปัจจัยการส่งเสริมการขายมีความสัมพันธ์เชิงบวกต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ซึ่งสอดคล้องกับงานศึกษาของ บวรลักษณ์ พูลสวัสดิ์ (2561) ที่พบว่า กลยุทธ์ส่งเสริมการขายมีความสัมพันธ์กับกระบวนการตัดสินใจของผู้บริโภค และจากผลการวิเคราะห์ยังพบว่า โดยรวมพบค่า Sig. เท่ากับ 0.001 แสดงให้เห็นว่า ปัจจัยการส่งเสริมการขายมีผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 และ 5) ปัจจัยคุณค่าที่ผู้บริโภครับรู้มีความสัมพันธ์เชิงบวกต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี ซึ่งสอดคล้องกับ Zeithaml (1988) พบว่า ปัจจัยด้านการรับรู้คุณค่ามีผลต่อการยอมรับและการตัดสินใจของผู้บริโภค และจากผลการวิเคราะห์ยังพบว่า โดยรวมพบค่า Sig. เท่ากับ 0.031 แสดงให้เห็นว่า ปัจจัยคุณค่าที่ผู้บริโภครับรู้ส่งผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซีอย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 จึงสามารถสรุปได้ว่า ปัจจัยด้านคุณค่าที่ผู้บริโภครับรู้ ปัจจัยด้านสภาพแวดล้อมของร้านค้า ปัจจัยด้านการส่งเสริมการขาย ปัจจัยด้านความรับผิดชอบต่อสังคมขององค์กร และปัจจัยด้านการตลาดผ่านสื่อสังคมออนไลน์ส่งผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อของกลุ่มผู้บริโภคเจเนอเรชั่นซี หากองค์กรธุรกิจมีการพัฒนาปัจจัยต่าง ๆ ดังกล่าวให้เพิ่มมากขึ้นอาจส่งผลต่อการตัดสินใจของผู้บริโภคเจนเนอเรชั่นซีต่อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อที่เพิ่มมากขึ้นด้วยเช่นกัน

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. ธุรกิจที่จำหน่ายผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อหรือค้าปลีกสามารถนำผลที่ได้ไปปรับใช้ โดยการพิจารณาองค์ประกอบของปัจจัยต่าง ๆ เช่น คุณค่าที่ผู้บริโภครับรู้ สภาพแวดล้อมของร้านค้า การส่งเสริมการขาย ความรับผิดชอบต่อสังคมขององค์กร และการตลาดผ่านสื่อสังคมออนไลน์ ให้เกิดความเหมาะสมกับบริบทของธุรกิจเนื่องจากปัจจัยต่าง ๆ เหล่านี้ส่งผลต่อการตัดสินของกลุ่มผู้บริโภคเจนเนอเรชั่นซีในการตัดสินใจซื้อสินค้า

2. สำหรับธุรกิจประเภทอื่นที่มีกลุ่มเป้าหมายเป็นกลุ่มผู้บริโภคเจนเนอเรชั่นซีสามารถนำผลที่ได้ไปปรับใช้โดยพิจารณาตามความเหมาะสม เนื่องจากในบางปัจจัยมีความเป็นสากลที่สามารถนำไปประยุกต์ให้ได้กับทุก ๆ ธุรกิจ

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรมีการศึกษาความสัมพันธ์เชิงสาเหตุเพื่อศึกษาความสัมพันธ์ระหว่างปัจจัยที่มีอิทธิพลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อ เพื่อให้ธุรกิจสามารถนำไปประยุกต์ใช้โดยเลือกเส้นทางที่มีปัจจัยที่มีอิทธิพลมากที่สุด เพื่อให้เกิดประสิทธิภาพในการบริหารจัดการสำหรับธุรกิจ

2. ในการวิจัยในอนาคตควรมีการศึกษาปัจจัยอื่นที่ส่งผลต่อการตัดสินใจซื้อผลิตภัณฑ์สุขภาพและผลิตภัณฑ์ทางการแพทย์ในร้านสะดวกซื้อ เช่น ตราสินค้า ประเทศผู้ผลิต การบริการ การรับประกัน ความ

หลากหลายของช่องทางในการซื้อและการชำระเงิน เป็นต้น

3. ควรมีการศึกษาวิจัยในกลุ่มเป้าหมายอื่นเพิ่มเติมเพื่อให้ได้ทราบข้อมูลที่มีความหลากหลายเพิ่มมากขึ้น เนื่องจากธุรกิจร้านสะดวกซื้อส่วนมากจะเหมาะกับผู้บริโภคในวงกว้างไม่ได้เฉพาะเจาะจงเพียงกลุ่มใดกลุ่มหนึ่งเท่านั้น

เอกสารอ้างอิง

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การสื่อสารวัฒนธรรมอาหารท้องถิ่นเพื่อส่งเสริมการท่องเที่ยว: กรณีศึกษาหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง

Communication of Local Food Culture to Promote Tourism: Case Study Lad Tainod, Donsai Subdistrict, Khuan Kanun District, Patthalung Province.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาการสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนด 2) ศึกษาวิธีการส่งเสริมการท่องเที่ยวเชิงอาหารโดยใช้หลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง เป็นพื้นที่ในการศึกษาใช้ระเบียบวิธีวิจัยเชิงคุณภาพ เก็บรวบรวมข้อมูลโดยใช้การสัมภาษณ์เชิงลึก การสังเกตแบบไม่มีส่วนร่วม การศึกษาข้อมูลจากเอกสารและสื่ออิเล็กทรอนิกส์ และการวิเคราะห์เชิงพรรณนา กลุ่มผู้ให้ข้อมูลสำคัญคือ กลุ่มตัวแทนผู้จัดการหลาดใต้โหนด 3 ราย กลุ่มตัวแทนผู้ประกอบการในหลาดใต้โหนด จำนวน 17 ราย โดยใช้การสุ่มตัวอย่างแบบเจาะจง และกลุ่มนักท่องเที่ยว จำนวน 80 ราย โดยใช้การสุ่มตัวอย่างแบบบังเอิญ รวมผู้ให้ข้อมูลจำนวน 100 ราย แนวคิดที่ใช้ในการศึกษา คือ แนวคิดการสื่อสาร แนวคิดอาหารท้องถิ่น และแนวคิดการท่องเที่ยวเชิงอาหาร

ผลการวิจัยพบว่า 1) ผู้ส่งสารคือ ผู้จัดการหลาดใต้โหนด ผู้ประกอบการในหลาดใต้โหนด ชาวบ้านในชุมชนดอนทรายและหน่วยงานภาครัฐและเอกชน สารคือ รูปภาพอาหารท้องถิ่นจังหวัดพัทลุง ข้อความที่สะท้อนวัฒนธรรมอาหารท้องถิ่น และป้ายโฆษณาที่เขียนด้วยมือ ช่องทางการสื่อสารวัฒนธรรมอาหารท้องถิ่น คือ สื่อสังคมออนไลน์และการบอกต่อปากต่อปากของนักท่องเที่ยว ผู้รับสารคือ ผู้ใช้สื่อสังคมออนไลน์และนักท่องเที่ยว 2) การส่งเสริมการท่องเที่ยวเชิงอาหารพบว่า มี 2 ลักษณะคือ การส่งเสริมภาคประชาชน และการส่งเสริมโดยภาครัฐและเอกชน

คำสำคัญ: การสื่อสาร, วัฒนธรรมอาหารท้องถิ่น, การท่องเที่ยวเชิงอาหาร, หลาดใต้โหนด

Abstract

This research aims to 1) Study the communication of local food culture of Lad Tainod 2) Study methods of promoting food tourism using Lad Tainod, Don Sai Subdistrict, Khuan Khanun District, Phatthalung Province as the study area. Use qualitative research methods. Data were collected using in-depth interviews. non-participant observation Studying information from documents and electronic media and descriptive analysis

The key information provider group is A group of 3 representatives of Lad Tainod managers, a group of 17 representative groups of entrepreneurs in Lad Tainod, using purposive sampling. and a group of 80 tourists using random sampling. A total of 100 informants were included. The concepts used in the study were communication concept local food concept and the concept of food tourism.

The results of the research found that 1) the messenger was the manager of the southern node market. Entrepreneurs in Lard Tainod Villagers in the Don Sai community and government and private agencies. The message is pictures of local food in Phatthalung Province. Messages that reflect local food culture and hand-painted billboards Channel for communicating local food culture namely social media and word of mouth among tourists. The recipients are social media users and tourists. 2) There are 2 types of food tourism promotion: promotion of the public sector and promotion by the public and private sectors.

Keywords: Communication, Local Food Culture, Gastronomy Tourism, Lad Tainod

บทนำ

อุตสาหกรรมการท่องเที่ยวเป็นการค้าและบริการที่มีบทบาทสำคัญต่อเศรษฐกิจของประเทศ ด้วยการผลักดันการท่องเที่ยวรูปแบบต่าง ๆ ที่แสดงความเป็นเอกลักษณ์ของประเทศ เพื่อสื่อการรับรู้ความเป็นท้องถิ่น รวมทั้งสร้างภาพจำและความสนใจต่อแหล่งท่องเที่ยวต่าง ๆ ได้เป็นอย่างดี อาหารท้องถิ่นเป็นปัจจัยหนึ่งที่แสดงถึงเอกลักษณ์และวัฒนธรรมประจำท้องถิ่นที่นักท่องเที่ยวให้ความสนใจ ดังนั้นอาหารท้องถิ่นจึงกลายเป็นส่วนหนึ่งที่มีความสำคัญต่อการท่องเที่ยวที่ต้องการสัมผัสความแปลกใหม่ที่เป็นลักษณะเฉพาะท้องถิ่น

การผลักดันนโยบายการท่องเที่ยวเชิงอาหารในประเทศไทย เกิดจากการกำหนดขึ้นตามแผนยุทธศาสตร์ชาติ 20 ปี (พ.ศ. 2561 - 2580) การท่องเที่ยวเชิงอาหารอยู่ในยุทธศาสตร์ที่ 2 ว่าด้วยการสร้างความสามารถในการแข่งขันเพื่อเพิ่มทักษะการแข่งขัน โดยให้มีความร่วมมือกันทุกภาคส่วนระหว่างภาครัฐ ภาคเอกชน และประชาชนผู้เป็นเจ้าของประเทศ เพื่อสร้างสรรค์และพัฒนาการท่องเที่ยวเชิงอาหารในระดับภูมิภาคให้ผู้ประกอบธุรกิจการค้าบริการและการท่องเที่ยวประสบความสำเร็จ สามารถแข่งขันเชิงธุรกิจให้เติบโตอย่างเต็มประสิทธิภาพ ส่งเสริมอำนวยความสะดวกให้นักลงทุนไทยและต่างชาติลงทุนในพื้นที่เขตเศรษฐกิจพิเศษชายแดน ได้แก่ การท่องเที่ยวและการค้าชายแดนใต้ การส่งเสริมวิถีความเป็นไทยจากความหลากหลายทางวัฒนธรรม สร้างความเชื่อมั่นให้นักท่องเที่ยวจากการนำต้นทุนทางวัฒนธรรมมาต่อยอดเพื่อสร้างผลิตภัณฑ์การท่องเที่ยวเพิ่มความได้เปรียบของแต่ละภูมิภาค และการใช้เทคโนโลยีนวัตกรรมการสื่อสารที่ทันสมัยมาใช้ประโยชน์สร้างการรับรู้ให้สามารถเข้าถึงกลุ่มนักท่องเที่ยวได้ตามเป้าหมาย (สำนักงานคณะกรรมการพัฒนาการเศรษฐกิจและสังคมแห่งชาติ, 2562)

จังหวัดพัทลุง มีแหล่งทรัพยากรธรรมชาติที่สมบูรณ์ ลักษณะทางภูมิศาสตร์เป็นภูเขา ป่า นา และที่ราบลุ่มทะเลสาบ ซึ่งส่งผลให้ทรัพยากรด้านอาหารมีความหลากหลายและโดดเด่นเป็นเอกลักษณ์ หนึ่งในแผนพัฒนาฟื้นฟูการท่องเที่ยวหลังเกิดสถานการณ์ COVID-19 ของจังหวัดพัทลุง (พ.ศ. 2566 - 2570) มีเป้าหมายเพื่อพัฒนาจังหวัดให้เป็น “เมืองแห่งความยั่งยืนทางเศรษฐกิจ สังคม ความมั่นคง ทรัพยากร

ธรรมชาติสิ่งแวดล้อม” จึงระบุแผนประเด็นการพัฒนาด้านการท่องเที่ยวไว้เป็นประเด็นหลักที่ 2 เรื่องการพัฒนาการท่องเที่ยวและกีฬาเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจ (สำนักงานจังหวัดพัทลุง, 2564) เมื่อมีการกำหนดแผนพัฒนาดังกล่าว จึงทำให้ผู้ประกอบการด้านการท่องเที่ยวมีแผนการดำเนินงานที่สอดรับกับนโยบายเพื่อร่วมกันส่งเสริมพัฒนาการท่องเที่ยว ร่วมกันให้พัฒนาจังหวัดพัทลุงเป็นแหล่งท่องเที่ยวที่สร้างรายได้ สร้างความยั่งยืนทางเศรษฐกิจของจังหวัดไปพร้อมกับหน่วยงานภาครัฐเช่นกัน

“หลาดใต้โหนด” เป็นชื่อเรียกตามสำเนียงภาษาถิ่นใต้ มาจากคำว่า “ตลาดใต้โหนด” ตั้งอยู่ในพื้นที่นาของครอบครัวสงสมพันธุ์ โดยครอบครัวตั้งใจจะให้พื้นที่บริเวณนี้เป็นแหล่งเรียนรู้การอ่านและศิลปะจากการตั้งเป็น “บ้านนักเขียนห้องเรียนสีสันศิลปะ” ตามความตั้งใจของนักเขียนรางวัลซีไรต์ ผู้ล่วงลับ เจ้าของผลงานที่ได้รับรางวัลซีไรต์ในปี พ.ศ. 2549 จากผลงานเรื่อง “แผ่นดินอื่น” ครอบครัวได้สานต่อเจตนารมณ์ที่ต้องการให้บริเวณดังกล่าว เป็นแหล่งเรียนรู้ของเด็กและเยาวชนในชุมชน ต่อมาเมื่อมีเด็กและเยาวชนมาใช้บริการบ้านนักเขียนห้องเรียนสีสันศิลปะ จึงได้มีร้านกาแฟ และการขายพืชผัก อาหาร และขนมท้องถิ่นตามมา เมื่อร้านค้ามีมากขึ้นจึงจัดตั้งเป็นหลาดใต้โหนดจนถึงปัจจุบัน

การเปิดทำการของหลาดใต้โหนดเริ่มต้นเมื่อ 18 มกราคม พ.ศ.2558 เปิดดำเนินการเฉพาะวันอาทิตย์ 8.00 - 15.00 น. คำว่า “โหนด” มาจากต้นตาลโตนดที่มีอยู่บนผืนนาเดิมของที่ดิน การดำเนินกิจการอยู่ภายใต้กรอบ กินดีมีสุข มีการเปิดตลาดมาต่อเนื่องยาวนาน 9 ปี อันเกิดจากความเข้มแข็งของผู้จัดการตลาดและการให้ความสำคัญกับอัตลักษณ์ของคนในชุมชน ดังนั้นคณะผู้วิจัยจึงมีความสนใจศึกษาว่า ช่องทางการสื่อสารวัฒนธรรมอาหารท้องถิ่นจังหวัดพัทลุงที่หลาดใต้โหนดมีรูปแบบวิธีการอย่างไร การส่งเสริมการท่องเที่ยวเชิงอาหารของหลาดใต้โหนดทำโดยวิธีใดบ้าง จึงทำให้หลาดใต้โหนดสามารถดำเนินกิจการมาได้อย่างต่อเนื่อง

วัตถุประสงค์ของการวิจัย

1). เพื่อศึกษาการสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนด

2) เพื่อศึกษาวิธีการส่งเสริมการท่องเที่ยวเชิงอาหารของหลาดใต้โหนด

แนวคิด ทฤษฎี กรอบแนวคิด

แนวคิดการสื่อสาร

การสื่อสาร (Communications) มีที่มาจากรากศัพท์ภาษาละตินว่า Communis หมายถึง ความเหมือนกันหรือร่วมกัน การสื่อสาร (Communications) หมายถึง กระบวนการถ่ายทอดข่าวสาร ข้อมูล ความรู้ ประสบการณ์ ความรู้สึก ความคิดเห็น ความต้องการจากผู้ส่งสารโดยผ่านสื่อต่าง ๆ เช่น การพูด การเขียน สัญลักษณ์อื่น ๆ หรือการแสดงออกไปยังผู้รับสาร กระบวนการสื่อสารมีลักษณะแตกต่างกันไปตามความเหมาะสม เพื่อเกิดการรับรู้ร่วมกันมีปฏิกิริยาตอบสนองต่อกันมีบริบทของการสื่อสาร ช่วยให้การสื่อสารสัมฤทธิ์ผล การจำลองรูปแบบการสื่อสาร S-M-C-R หรือ Communication Model กำหนดองค์ประกอบการสื่อสารหลัก 4 ด้าน (Berlo, 1997) ดังนี้

1. แหล่งที่มา คือ ต้นกำเนิดแหล่งที่มาหรือผู้คนที่ต้องการสื่อสารไปยังกลุ่มเป้าหมาย ผู้ส่งสารมีหน้าที่ในการสื่อสารผ่านการพูด การวาดภาพ การระบายสีเพื่อสื่อความหมาย อาศัยการมีประสบการณ์ร่วมเพื่อสร้างความเข้าใจในความคิดที่สื่อออกไป แหล่งที่มาของผู้ส่งสารต้องมีความน่าเชื่อถือและมีความเชี่ยวชาญมีเนื้อหาทันสมัยเหมาะสมกับผู้รับสาร

2. สาร หมายถึง สิ่งที่ผู้ส่งสารต้องการนำไปยังกลุ่มเป้าหมายปลายทาง ให้ผู้รับสารเข้าใจความหมายของสื่อที่ต้องการจะบอกโดยอาศัยภาษาเป็นสื่อกลาง สัญลักษณ์ ภาพ เสียง สารจะต้องมีเนื้อหาที่เป็นประโยชน์ต่อผู้รับสารสร้างความสนใจและทำให้ผู้รับสารมีปฏิกิริยาตอบสนองได้

3. ช่องทางการสื่อสาร หมายถึง การรับเนื้อหาในแบบต่างๆ ผ่านประสาทสัมผัสทั้ง 5 เช่น การได้ยิน การมอง การสัมผัส การได้กลิ่น และการรับรสชาติ จากนั้นผู้รับสารจะแปลความหมายจากประสบการณ์ที่เคยมีมาในอดีตออกมาเป็นข้อมูล

4. ผู้รับสาร คือ บุคคลหรือกลุ่มคนที่ผู้ส่งสารต้องการสื่อข้อมูลมาถึง การรับรู้ข้อมูลได้จากประสบการณ์ร่วมของแต่ละบุคคล มีทักษะการสื่อสาร ทัศนคติ ความรู้และกระบวนการคิดที่ดี แปลความหมายของเนื้อหาที่ได้รับ ความเข้าใจแตกต่างกันตามบริบทและประสบการณ์ของผู้รับสาร

แนวคิดวัฒนธรรมอาหาร

วัฒนธรรมอาหารเป็นเรื่ององค์ความรู้ ความเชื่อและวิถีการปฏิบัติที่เกี่ยวข้องกับอาหารโดยเป็นความสัมพันธ์ระหว่างกลุ่มคนกับอาหารที่สัมพันธ์กับปัจจัยต่าง ๆ แสดงให้เห็นว่า สังคมยังคงต้องใช้ประโยชน์จากอาหารนอกเหนือไปจากการกินเพื่ออิ่มท้องในแต่ละมื้อในชีวิตประจำวัน โดยวัฒนธรรมอาหารมีองค์ประกอบหลัก 5 องค์ประกอบ (ธนภัทร พิริย์โยธินกุล, 2561) ดังนี้

1. อาหารและประเภทของอาหาร เป็นการกำหนดและเลือกสรรว่าสิ่งใดในธรรมชาติเป็นองค์ความรู้ที่สังคมยอมรับกันว่าวัตถุดิบใดสามารถนำมากินหรือนำมาแปรรูป เพื่อให้เกิดเป็นอาหารที่มีคุณค่าต่อร่างกายและจิตใจได้

2. การแสวงหาและผลิตอาหาร เป็นกระบวนการได้มาซึ่งอาหารด้วยการเก็บหาอาหารและล่าสัตว์ในแหล่งธรรมชาติต่าง ๆ เช่น แหล่งน้ำ ป่า เป็นต้น

3. การแปรรูปอาหาร เป็นการนำวัตถุดิบมาปรุงเป็นอาหารชนิดต่าง ๆ หรือเพื่อให้สามารถเก็บรักษาไว้ได้นานยิ่งขึ้น โดยมีวิถีปฏิบัติที่สอดคล้องกับองค์ความรู้

4. การปรุงอาหารและการตกแต่งอาหาร เป็นการนำวัตถุดิบมาปรุงด้วยไฟเพื่อให้เกิดอาหารที่พร้อมรับประทานและมีการตกแต่งอาหารด้วยวิธีต่าง ๆ ทำให้อาหารมีรูปลักษณ์สวยงาม น่าลิ้มลองและเกิดความประทับใจ

5. การกินอาหาร เป็นองค์ประกอบที่สำคัญทำให้มนุษย์ได้ลิ้มลองรสชาติของอาหาร ซึ่งจะมีประโยชน์ต่อร่างกายและจิตใจ

สรุปได้ว่า แนวคิดวัฒนธรรมอาหารเป็นการแสวงหาวัตถุดิบมาผ่านการผลิตให้เป็นอาหารที่พร้อมรับประทานให้เหมาะสมกับวัตถุดิบและวิถีชีวิต ขนบธรรมเนียมประเพณี ภูมิปัญญาของแต่ละท้องถิ่นเพื่อแสดงความเป็นเอกลักษณ์ของวัฒนธรรมไทย

แนวคิดอาหารท้องถิ่น

อาหารท้องถิ่นเป็นการแสดงออกถึงเอกลักษณ์ประจำถิ่น ด้วยการนำวัตถุดิบที่มีอยู่ในธรรมชาติมาปรุงด้วยกรรมวิธีที่เรียบง่ายมีลักษณะเฉพาะของแต่ละถิ่น มีรสชาติเฉพาะตัว อาหารท้องถิ่นเป็นการผสมผสานระหว่างวัตถุดิบ เช่น เนื้อสัตว์ ผักพื้นถิ่น และเครื่องปรุง โดยอาหารไม่มีรสชาติตายตัว ซึ่งแต่ละท้องถิ่นจะได้รับการถ่ายทอดมาในช่วงวัยเด็ก (Sapcharoen, 1997) นอกจากนี้ยังได้รับอิทธิพลจากขนบธรรมเนียมประเพณี ความเชื่อ ประวัติศาสตร์ และสภาพภูมิศาสตร์ทำให้อาหารที่เป็นของแต่ละท้องถิ่นมีความแตกต่างหรือคล้ายคลึงกัน (พัชรี ตั้งตระกูล, โกศล แตงอุทัย, และ วารุณี วารัญญานนท์, 2561) กล่าวว่า อาหารท้องถิ่นคือ วัฒนธรรมอาหารที่แต่ละคนในท้องถิ่นนิยมรับประทานมาเป็นเวลานาน

ปรุงจากวัตถุดิบที่หาง่ายในบริเวณโดยรอบท้องถิ่น มีการสืบทอดกันมาจนเป็นเอกลักษณ์ ซึ่งอาจเหมือนหรือต่างกันหรือไม่ก็ได้ขึ้นกับลักษณะทางภูมิศาสตร์และสิ่งแวดล้อม

Mak, Lumbers, Eves, and Chang. (2012) ศึกษาอิทธิพลต่อการบริโภคอาหารในบริบทการท่องเที่ยว แบ่งได้ 3 มิติ คือ นักท่องเที่ยว อาหารในแหล่งท่องเที่ยว และสภาพแวดล้อมการบริโภคในแหล่งท่องเที่ยว

มิตินักท่องเที่ยวเป็นปัจจัยสำคัญของการบริโภคอาหารในแหล่งท่องเที่ยว ปัจจัยที่เป็นตัวกำหนดได้แก่ ด้านศาสนาและวัฒนธรรม การมีลักษณะเฉพาะด้านศาสนาเป็นตัวกำหนด เช่น ผู้นับถือศาสนาอิสลามไม่บริโภคอาหารบางชนิด ด้านปัจจัยทางสังคมและประชากรศาสตร์รวมไปถึงการบ่งชี้อายุและเพศจะเป็นตัวสะท้อนความแตกต่างในการบริโภค ด้านลักษณะกายภาพของอาหาร ด้านประสบการณ์ในการท่องเที่ยวที่ผ่านมาของนักท่องเที่ยว ก็มีผลในการเลือกบริโภคอาหาร โดยอาหารที่คุ้นเคยจะเป็นแรงกระตุ้นให้เกิดแรงจูงใจในการเดินทางไปยังจุดหมายปลายทาง

มิติอาหารในแหล่งท่องเที่ยวเป็นปัจจัยที่ส่งผลให้นักท่องเที่ยว มายังแหล่งท่องเที่ยวและเกิดการบริโภคอาหาร ปัจจัยจากส่วนผสมของอาหาร เครื่องปรุง เครื่องเทศ วัตถุดิบ หรือรสชาติของอาหารที่เป็นเอกลักษณ์ของพื้นที่ กระบวนการหรือกรรมวิธีการปรุงอาหาร การทำให้อาหารสะอาดไม่มีสิ่งปนเปื้อน กรรมวิธีถูกสุขลักษณะ ด้านความหลากหลายของอาหารเอกลักษณ์ของอาหารประจำท้องถิ่น หรืออาหารประจำชาติ รวมถึงราคา ปริมาณ และคุณภาพของอาหารในแหล่งท่องเที่ยว

มิติด้านสภาพแวดล้อมการบริโภคอาหารในแหล่งท่องเที่ยว โดยมีส่วนเกี่ยวข้องที่ส่งผลให้นักท่องเที่ยวเดินทางและบริโภคอาหารในพื้นที่ เช่น อัตลักษณ์ของอาหาร เช่น วัตถุดิบ เครื่องปรุง เครื่องเทศ วิธีการปรุง ให้มีอัตลักษณ์สร้างภาพลักษณ์ในการท่องเที่ยวในพื้นที่ เกิดความคิดเห็น มุมมอง ความเชื่อของนักท่องเที่ยว รวมถึงความมีชื่อเสียงของอาหารส่งผลต่อภาพลักษณ์ที่ดีต่อการท่องเที่ยวในท้องถิ่น

แนวคิดการท่องเที่ยวเชิงอาหาร

การท่องเที่ยวเชิงอาหาร คือ การเดินทางเพื่อสัมผัสประสบการณ์ทางด้านอาหาร มีวัตถุประสงค์ที่ต้องการให้ความรื่นรมย์ ได้รับประสบการณ์นอกเหนือจากการรับประทานอาหาร ประสบการณ์เหล่านั้น เช่น การเยี่ยมชมสถานที่ทำอาหาร เทศกาลอาหาร ตลาด งานแสดงงานสาธิตการทำอาหาร หรือการท่องเที่ยวในลักษณะที่มีกิจกรรมสัมพันธ์กับการทำอาหาร การท่องเที่ยวในลักษณะนี้กลุ่มนักท่องเที่ยว จะได้ลองประสบการณ์ใหม่ ๆ มีความรู้ความเข้าใจเกี่ยวกับอาหารในแต่ละท้องที่ เข้าใจเรื่องคุณภาพรูปลักษณ์ต่าง ๆ ที่เกี่ยวกับสินค้าด้านการท่องเที่ยว รวมถึงอาหารท้องถิ่นในแต่ละภูมิภาคผ่านการบริโภค ดังนั้นประสบการณ์ด้านการท่องเที่ยวเชิงอาหาร จึงเกิดขึ้นเฉพาะที่ใดที่หนึ่งหรือเกิดจากวัตถุประสงค์ใดก็ได้ (บัณฑิต อเนกพูนสุข, 2560)

หลักการของการท่องเที่ยวเชิงอาหาร มีความเกี่ยวข้องกับ 4 เสาหลัก ที่ทำให้องค์ประกอบของการท่องเที่ยวเชิงอาหารสมบูรณ์ (ณัฐณิชา ตันสกุล, 2566) ได้แก่

1. Farming Systems หมายถึง จุดเริ่มต้นของแหล่งกำเนิดอาหารที่แปลงผัก สวนผลไม้ บ้านไร่หรือท้องนาในแนวทางเกษตรปลอดภัย สร้างความตระหนักถึงความสำคัญของอาหารต่อสุขภาพและการกินดีมีสุข

2. Story of Food หมายถึง เรื่องราวเบื้องหลังที่ทำให้คุณค่าของอาหารที่รวบรวมมรดก ภูมิปัญญา ขนบธรรมเนียมประเพณีที่เพิ่มคุณค่าให้กับอาหารแต่ละจานโดดเด่นและเป็นที่จดจำ อาหารหนึ่งจานรวบรวมเรื่องราวภูมิปัญญาขนบธรรมเนียมประเพณีวัฒนธรรม การกิน วิธีการนำเสนออาหาร ซึ่งเรื่องราวจะเสริมสร้างให้อาหารมีคุณค่า

3. Creative Industries หมายถึง การนำเสนออาหารที่เป็นทั้งศาสตร์และศิลป์สะท้อนชีวิตรสนิยมและทิศทางของอาหารตามยุคสมัย ตั้งแต่ภาชนะที่ใส่อาหารไปจนถึงนวัตกรรมด้านอาหาร รางวัลด้านอาหาร ดนตรี การแสดง วรรณกรรม ที่ล้วนให้อรรถรสที่ครบทุกด้าน ตั้งแต่อิ่มท้อง อิ่มสมอง อิ่มตา ไปจนกระทั่งอิ่มใจ ยิ่งไปกว่านั้นยังช่วยผลักดันให้เกิดการพัฒนาท้องถิ่นบนฐานของการอนุรักษ์และส่งเสริมเรื่องราวท้องถิ่น และให้อาหารเป็นสัญลักษณ์ของพื้นที่เปิดประสบการณ์ท่องเที่ยวที่ลึกซึ้งและยั่งยืนให้กับนักท่องเที่ยว

4. Sustainable Tourism หมายถึง การพัฒนาอย่างยั่งยืนบนฐานของการท่องเที่ยว อนุรักษ์ และส่งเสริมเรื่องราวท้องถิ่นเพื่อสร้างโอกาสให้เกิดความคงอยู่ของความหลากหลายทางชีวภาพ การจัดการเศษอาหารเหลือทิ้ง คำนึงถึงสิ่งแวดล้อม การปกป้องมรดกทางอาหารท้องถิ่นให้เป็นอาหารสัญลักษณ์ของพื้นที่ เปิดประสบการณ์การท่องเที่ยวอย่างลึกซึ้งและยั่งยืนแก่ผู้มาเยือนและนักท่องเที่ยว

วิธีดำเนินการวิจัย

การวิจัยเรื่อง การสื่อสารวัฒนธรรมอาหารท้องถิ่นเพื่อส่งเสริมการท่องเที่ยว: กรณีหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง ผู้วิจัยได้ดำเนินการวิจัยดังนี้

1. กำหนดกลุ่มตัวอย่าง
2. จัดทำเครื่องมือการวิจัย
3. ทำการเก็บรวบรวมข้อมูล

กลุ่มตัวอย่าง

เก็บรวบรวมข้อมูลจำนวนกลุ่มตัวอย่าง จำนวน 100 คน ซึ่งประกอบด้วย กลุ่มตัวแทนผู้จัดการหลาดใต้โหนด จำนวน 3 ราย กลุ่มตัวแทนผู้ประกอบการในหลาดใต้โหนด จำนวน 17 ราย และกลุ่มนักท่องเที่ยว จำนวน 80 ราย

เครื่องมือการวิจัย

1. แบบสัมภาษณ์ เป็นแนวคำถามที่ผู้วิจัยกำหนดประเด็นด้านความเห็น เหตุผล และมุมมองตามวัตถุประสงค์ที่กำหนดไว้ เพื่อเก็บบันทึกข้อมูล รวบรวมข้อมูลได้ตรงประเด็นที่สุด โดยในแบบสัมภาษณ์มีหัวข้อในประเด็นการสื่อสารวัฒนธรรมอาหารท้องถิ่น และการท่องเที่ยวเชิงอาหารของหลาดใต้โหนด

2. การสังเกตแบบไม่มีส่วนร่วม เป็นการสังเกตที่ผู้วิจัยอยู่วงนอกไม่ได้เข้าไปร่วมในกิจกรรม เช่น สังเกตอาหารท้องถิ่นที่นำมาวางขายในหลาดใต้โหนด สังเกตพฤติกรรมของผู้จัดการ ผู้ประกอบการและนักท่องเที่ยว

3. เครื่องบันทึกภาพและสมุดจดบันทึกข้อมูล เพื่อเก็บข้อมูลประกอบการวิจัย

การเก็บรวบรวมข้อมูลดำเนินการ ดังนี้

1. สำรวจพื้นที่ในชุมชนเพื่อศึกษาข้อมูลเบื้องต้น สำรวจข้อมูลเชิงเอกสารและสื่อออนไลน์ และดำเนินการสำรวจพื้นที่หลาดใต้โหนด เพื่อเรียนรู้ข้อมูลอาหารท้องถิ่นและวิธีการส่งเสริมการท่องเที่ยวเชิงอาหาร

2. ประสานงานผู้จัดการตลาด ผู้ประกอบการหลาดใต้โหนด เพื่อนัดวัน เวลา สถานที่ และเก็บข้อมูลรายละเอียดต่าง ๆ ในมุมมองของผู้ดำเนินกิจการ เก็บภาพถ่าย

3. ลงพื้นที่วันเปิดหลาดใต้โหนดเพื่อสัมภาษณ์นักท่องเที่ยวโดยการสุ่มตัวอย่างแบบบังเอิญ จำนวน 80 ราย และเก็บภาพถ่าย

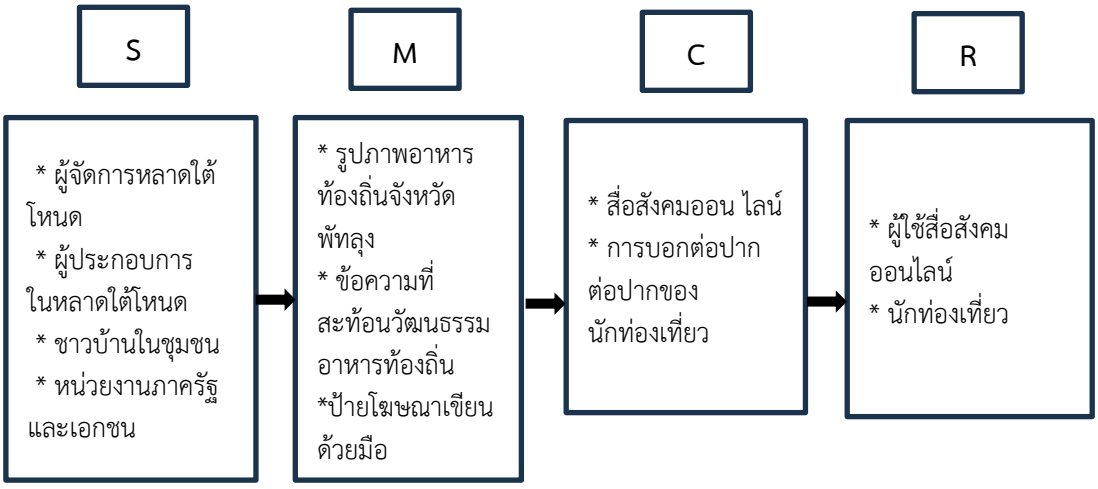
4. ศึกษาเอกสารงานวิจัยที่เกี่ยวข้องโดยผู้วิจัยศึกษาแนวคิดการสื่อสาร แนวคิดอาหารท้องถิ่นและแนวคิดการท่องเที่ยวเชิงอาหาร

5. นำข้อมูลที่ได้จากการเก็บรวบรวมทั้งหมด มาวิเคราะห์เพื่อนำไปสู่การตอบคำถามการวิจัยในประเด็นการสื่อสารวัฒนธรรมอาหารท้องถิ่นและการท่องเที่ยวเชิงอาหารของหลาดใต้โหนด สรุปข้อมูลผลการวิจัย นำเสนอข้อมูลในเชิงพรรณนา

ผลการวิจัย

จากการวิจัยเรื่องการสื่อสารวัฒนธรรมอาหารท้องถิ่นเพื่อส่งเสริมการท่องเที่ยว: กรณีศึกษาหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง ได้ผลการวิจัยตามวัตถุประสงค์การวิจัยดังนี้

1. ผลการศึกษาการสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนด ผู้วิจัยได้ผลการวิจัยดังภาพ



ภาพที่ 1 รูปแบบการสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนด

จากภาพที่ 1 แสดงรูปแบบของการสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนดจากแนวคิดการสื่อสารด้วยแบบจำลอง S-M-C-R

S (Sender) หมายถึง ผู้ส่งสาร ในงานวิจัยการสื่อสารวัฒนธรรมอาหารท้องถิ่นเพื่อส่งเสริมการท่องเที่ยว: กรณีศึกษาหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง พบผู้ส่งสารที่เป็นผู้ให้ข้อมูลหลักของหลาดใต้โหนด 4 กลุ่มด้วยกัน คือ

1) ผู้จัดการหลาดใต้โหนด เป็นสมาชิกในครอบครัวสงสมพันธุ์เจ้าของสถานที่ตั้งหลาดใต้โหนด คนกลุ่มนี้ ตั้งหลาดใต้โหนดขึ้นจากบริเวณที่คนในครอบครัวสงสมพันธุ์เล็งเห็นว่า มีพื้นที่ว่างใกล้บริเวณที่ได้จัดตั้งบ้านนักเขียนห้องเรียนสีสันศิลปะ จึงได้จัดพื้นที่ขึ้นเป็นสถานที่ขายของโดยให้ชาวบ้านในชุมชน

เป็นผู้ประกอบการและค่อย ๆ ขยายพื้นที่ขายของท้องถิ่นประเภท พืชผักท้องถิ่น และอาหารท้องถิ่นในจังหวัดพัทลุง กลุ่มนี้บริหารจัดการหลาดใต้โหนดกำหนดกฎกติกาในการประกอบการร้านค้าให้กับผู้ประกอบการ หาข้อตกลงในการจัดการตลาดร่วมกันกับผู้ประกอบการและคนในชุมชน จัดสร้างป้ายประชาสัมพันธ์ ทำหน้าที่ในการประกาศข่าวประชาสัมพันธ์ ถ่ายภาพ ประชาสัมพันธ์หลาดใต้โหนด สินค้าอาหารท้องถิ่นลงในช่องทางการสื่อสารต่าง ๆ

2) ผู้ประกอบการในหลาดใต้โหนด เป็นผู้ขายของท้องถิ่นผู้มีส่วนร่วมกับผู้จัดการหลาดใต้โหนดในการนำผลิตภัณฑ์ท้องถิ่นมาทำการซื้อขายแลกเปลี่ยน การซื้อขายอยู่ภายใต้กฎกติกาที่ตกลงร่วมกันระหว่างผู้จัดการหลาดใต้โหนดและผู้ประกอบการ ข้อตกลงดังกล่าวเช่น การเป็นตลาดสีเขียว ภายใต้สโลแกน “กินดี มีสุข” ดังคำให้สัมภาษณ์ของผู้ประกอบการ

> “พวกเราผู้ประกอบการทั้งหมดที่มาในหลาดใต้โหนด ความมุ่งหวังอย่างหนึ่ง คือ ทำให้อาหารท้องถิ่นของพัทลุงเป็นที่รู้จักของคนที่มาเที่ยว”
>
> (ผู้ให้สัมภาษณ์คนที่ 1, 21 มกราคม 2567)

> “ใครที่มาขายของอยู่ที่นี่ จะต้องใช้วัสดุจากธรรมชาติ พวกเราพยายามบอกกับคนที่มาเที่ยว เพื่อให้รู้ว่าพัทลุงบ้านเราอุดมสมบูรณ์ ของที่มาขาย คือ ของดีของจังหวัด ใครจะถ่ายรูปอาหารบ้านเราไปพวกเรายินดี”
>
> (ผู้ให้สัมภาษณ์คนที่ 2, 21 มกราคม 2567)

จากตัวอย่างการให้สัมภาษณ์ของผู้ประกอบการในหลาดใต้โหนดแสดงให้เห็นว่า เป็นกลุ่มผู้มีส่วนร่วมในการเป็นผู้ส่งสารไปยังบุคคลที่เป็นผู้รับสาร และยังแสดงให้เห็นถึงเอกลักษณ์ที่โดดเด่นของชุมชน แสดงให้เห็นความอุดมสมบูรณ์ในพื้นที่ การร่วมสืบสานอนุรักษ์ภูมิปัญญาอาหารและการนำวัตถุดิบ ซึ่งเป็นของดีของชุมชนมานำเสนอต่อผู้คนที่เข้ามาท่องเที่ยว

3) ชาวบ้านในชุมชนบริเวณโดยรอบตำบลดอนทราย เป็นผู้ที่แสดงสำนึกรักบ้านเกิด ร่วมอนุรักษ์ส่งเสริมการท่องเที่ยวเชิงอาหารให้เป็นที่รู้จักของนักท่องเที่ยวและประชาชนทั่วไป ให้หลาดใต้โหนดและอาหารท้องถิ่นเป็นที่รู้จักในวงกว้าง

> “โหม่เราชาวบ้านดอนทรายอยากให้หลาดเราเป็นที่รู้จัก อาหารถิ่นพัทลุงมีมาก ถ้าใครอยากรู้พัทลุงมีอะไร มาหลาดใต้โหนดก็จะรู้”
>
> (ผู้ให้สัมภาษณ์คนที่ 3 , 11 กุมภาพันธ์ 2567)

จากตัวอย่างการให้สัมภาษณ์ของชาวบ้านในชุมชนบริเวณโดยรอบ ตำบลดอนทราย แสดงให้เห็นสารที่ต้องการนำเสนอ คือ อาหารท้องถิ่นของจังหวัดพัทลุง การทำให้อาหารท้องถิ่นจังหวัดพัทลุงเป็นที่รู้จักโดยการวางจำหน่าย เพื่อให้นักท่องเที่ยวทราบว่าอาหารที่เป็นเอกลักษณ์ของจังหวัดพัทลุง มารวมกันอยู่ที่หลาดใต้โหนด

4) หน่วยงานภาครัฐและเอกชน ทำหน้าที่ให้การสนับสนุนในการดำเนินกิจกรรมต่าง ๆ ของหลาดใต้โหนดตามสมควร ส่งเสริมด้านการประชาสัมพันธ์หลาดใต้โหนดให้เป็นที่รู้จักของนักท่องเที่ยว และประชาชนทั้งในพื้นที่จังหวัดพัทลุง พื้นที่จังหวัดภาคใต้ และทั่วประเทศ

M (Message) หมายถึง สาร ในงานวิจัยการสื่อสารวัฒนธรรมอาหารท้องถิ่น เพื่อส่งเสริมการท่องเที่ยว: กรณีศึกษาหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง พบสารที่ผู้ส่งสารต้องการสื่อไปยังผู้รับสาร 3 รูปแบบด้วยกัน คือ

1) อาหารท้องถิ่นในหลาดใต้โหนด นำเสนอความเป็นธรรมชาติมีการตกแต่งและนำภาชนะที่มีอยู่ในท้องถิ่นมาสร้างสรรค์ให้เป็นสินค้าที่มีอัตลักษณ์เฉพาะของหลาดใต้โหนด เสนอความเป็นท้องถิ่นผ่านรูปลักษณ์ของอาหาร นำเสนออาหารท้องถิ่นภายใต้คำขวัญ “กินดี มีสุข” สอดคล้องกับวิถีชีวิตภูมินิเวศน์ เขา ป่า นา เล ของชาวใต้ และคนในชุมชนหลาดใต้โหนด

ภาพที่ 2 อาหารท้องถิ่นจังหวัดพัทลุง (ของหลาดใต้โหนด)
ถ่ายเมื่อ 11 กุมภาพันธ์ พ.ศ. 2567

2) ภาษาที่สะท้อนวัฒนธรรมอาหารท้องถิ่น โดยภาษาในที่นี้ปรากฏการให้ความหมาย 2 นัย คือ 1.วัจนภาษา คือ ภาษาพูดและภาษาเขียน 2.อวัจนภาษา คือ สัญลักษณ์และท่าทางที่ใช้สื่อความหมาย

ภาพที่ 3 ภาษาสะท้อนวัฒนธรรมอาหารท้องถิ่นบนสื่อออนไลน์
ที่มา: เพจเฟสบุ๊คหลาดใต้โหนด สืบค้นเมื่อ 8 มีนาคม 2567

จากภาพผู้วิจัยนำภาพมาจากเพจเฟสบุ๊คของหลาดใต้โหนดออนไลน์ วัจนภาษาที่ปรากฏในภาพ คือ ภาษาเขียน คำว่าหลาดใต้โหนด มาจากคำท้องถิ่นใต้ คำว่า “หลาด” เป็นคำภาษาใต้มาจากคำว่า “ตลาด” ในภาษามาตรฐาน คำว่า “โหนด” เป็นคำภาษาใต้มาจากคำว่า “ตาลโตนด” อวัจนภาษา ที่

ปรากฏในภาพ คือ ภาพตัวหนังตะลุง ภาพมโนราห์ อาหารท้องถิ่นที่แสดงความเป็นปักษ์ใต้ เช่น สะตอ ข้าวยำ หัวครก กล้วยพันธุ์พื้นเมือง ข้าวพัทลุง ภาพผลิตภัณฑ์ท้องถิ่นจังหวัดพัทลุง กระเป๋ากระจูด และผลิตภัณฑ์กระจูด

3) ป้ายโฆษณาเขียนด้วยมือ ป้ายประชาสัมพันธ์ที่ตั้งอยู่หน้าบริเวณหลาดใต้โหนด เป็นสารที่ต้องการสื่อไปยังผู้รับสารเกี่ยวกับลักษณะเด่นของหลาดใต้โหนด เช่น การจำหน่ายสินค้าที่ผลิตโดยตรงจากชุมชน การส่งเสริมวิถีวรรณกรรมศิลปวัฒนธรรมท้องถิ่น พื้นที่สร้างสรรค์หอศิลป์เรือนมโนราห์ สารเหล่านี้ สะท้อนให้เห็นความเป็นท้องถิ่นปักษ์ใต้ ซึ่งเป็นลักษณะเด่นของหลาดใต้โหนด

ภาพที่ 4 ป้ายโฆษณาเขียนด้วยมือเพื่อประชาสัมพันธ์หลาดใต้โหนด
ถ่ายเมื่อ 11 กุมภาพันธ์ พ.ศ. 2567

C (Channel) หมายถึง ช่องทางการสื่อสาร ในงานวิจัยเรื่อง การสื่อสารวัฒนธรรมอาหารท้องถิ่นเพื่อส่งเสริมการท่องเที่ยว: กรณีศึกษาหลาดใต้โหนด ตำบลดอนทราย อำเภอควนขนุน จังหวัดพัทลุง พบช่องทางการสื่อสารที่เป็นผู้ให้ข้อมูลหลักของหลาดใต้โหนด 2 ช่องทาง คือ

1) สื่อสังคมออนไลน์ คือ สื่อดิจิทัลที่เป็นเครื่องมือในการปฏิบัติการทางสังคมและสื่อสารข้อมูลระหว่างบุคคลในเครือข่ายทางสังคมผ่านสื่อออนไลน์ เช่น เฟสบุ๊ค อินสตราแกรม ติ๊กต๊อก ยูทูป เป็นต้น โดยต้องการให้เกิดการทำงานร่วมกันระหว่างผู้ส่งสารและผู้รับสารอย่างสร้างสรรค์เพื่อสร้างข้อมูล ภาพและเสียง ซึ่งสื่อออนไลน์จะช่วยให้เข้าถึงกลุ่มผู้รับสารที่ต้องการสื่อสารได้ง่าย สะดวก รวดเร็ว และมีประสิทธิภาพ (นุชฤดี รุ่ยใหม่, 2565) โดยหลาดใต้โหนด มีช่องทางการสื่อสารผ่านเฟสบุ๊คในชื่อเพจ หลาดใต้โหนด พัทลุง Tainod phattalung มีจำนวนผู้ติดตามเพจจำนวน 25,000 คน

2) การบอกต่อของนักท่องเที่ยว คือ เป็นการสื่อสารข้อมูลข่าวสารโดยตรงแบบปากต่อปากหรือแบบตัวต่อตัว ไปยังเพื่อนหรือญาติที่สามารถเกิดขึ้นได้หลังจากได้รับประสบการณ์จากการไปท่องเที่ยว ซึ่งมีทั้งการบอกต่อในทิศทางบวกและการบอกต่อในทิศทางลบ

R (Receiver) หมายถึง ผู้รับสาร พบผู้รับสาร 2 กลุ่ม คือ

1. ผู้ใช้สื่อสังคมออนไลน์ คือ บุคคลที่ใช้สื่อดิจิทัลเป็นเครื่องมือในการสื่อสารระหว่างกันและกันในสังคมโดยผ่านช่องทางออนไลน์ ทำให้ได้รับรู้ข่าวสารอย่างรวดเร็วเพื่อจะได้วางแผนการเดินทางมาเที่ยวหลาดใต้โหนดในทุกวันอาทิตย์

2. นักท่องเที่ยว คือ บุคคลที่เดินทางจากถิ่นที่อยู่ของตนไปยังถิ่นที่อยู่อื่นเป็นการชั่วคราวด้วยความสมัครใจและด้วยวัตถุประสงค์มิใช่เพื่อไปประกอบอาชีพหรือหารายได้ และเพื่อความเพลิดเพลินทางร่างกายและจิตใจส่งผลต่อความสุข โดยนักท่องเที่ยวจะได้รับรู้ถึงอัตลักษณ์ของตลาดชุมชนของหลาดใต้โหนดในตัวสินค้าที่มาจำหน่ายทั้งสินค้าอุปโภคและบริโภค

2. ผลศึกษาวิธีการส่งเสริมการท่องเที่ยวเชิงอาหารของหลาดใต้โหนด พบมีการส่งเสริม 2 ลักษณะ คือ

1) การส่งเสริมภาคประชาชน โดยประชาชนในพื้นที่จะร่วมมือกันผลิตสินค้าประเภทอาหารที่มีคุณภาพเพื่อมาจำหน่ายที่หลาดใต้โหนด โดยมีการใช้วัสดุบรรจุภัณฑ์ในท้องถิ่น มีการช่วยเหลือซึ่งกันและกันในการอนุรักษ์สิ่งแวดล้อมของแหล่งท่องเที่ยว ส่งเสริมความยั่งยืนของวัฒนธรรม โดยร่วมกันเชิดชูและรักษาไว้ซึ่งเอกลักษณ์ความเป็นไทย คุณค่าดั้งเดิมและภูมิปัญญาท้องถิ่น

2) การส่งเสริมโดยภาครัฐและเอกชน โดยกระทรวงการท่องเที่ยวและกีฬาจะมีการขับเคลื่อนการท่องเที่ยว โดยการส่งเสริมควรมีนโยบายที่สนับสนุนตั้งแต่ต้นน้ำการผลิตวัตถุดิบ ซึ่งถือเป็นหัวใจสำคัญเป็นการเพิ่มคุณค่าและมูลค่าของต้นทุนทรัพยากรชุมชนสู่การผลิตสินค้าหรือบริการ บนฐานอัตลักษณ์เอกลักษณ์ของแต่ละชุมชน และมีการพัฒนาส่งเสริมบริหารจัดการด้านการตลาด การขนส่งสินค้าและให้ชุมชนมุ่งเน้นการสมดุลของความสุขระหว่างชุมชนและนักท่องเที่ยว ตลอดจนพัฒนาไปสู่แหล่งการเรียนรู้ในหลาดใต้โหนด และหน่วยงานภาครัฐยังสามารถช่วยในการประชาสัมพันธ์แหล่งท่องเที่ยวหลาดใต้โหนดผ่านช่องทางออนไลน์ของหน่วยงานภาครัฐและช่องทางเพจของหลาดใต้โหนด

สรุปและอภิปรายผล

การสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนด โดยใช้แนวคิดการสื่อสารด้วยแบบจำลอง S-M-C-R มีข้อค้นพบว่า บริบทของสังคมที่มีความก้าวหน้าทางเทคโนโลยี สื่อออนไลน์มีบทบาทสำคัญในระบบการสื่อสารข้อมูลถึงผู้รับสาร ซึ่งสอดคล้องกับงานวิจัยของ เสาวนีย์ วรรณประภา, สราวุธ อนันตชาติ, และ กัญญารัตน์ หงส์วรนันท์. (2565) ในงานวิจัยเรื่องการพัฒนาแนวทางสื่อสารแบรนด์เชิงวัฒนธรรมเพื่อการท่องเที่ยว เชิงมรดกวัฒนธรรมในจังหวัดจันทบุรี ซึ่งกล่าวไว้ว่า รูปแบบและการพัฒนาการของการสื่อสารแบรนด์ มี 4 มิติ คือ มิติผู้ส่งสาร มิติเนื้อหาสาร มิติช่องทางสาร และมิติผู้รับสาร โดยทั้ง 4 มิติ มีความสัมพันธ์เชื่อมโยงที่จะช่วยให้สินค้าและบริการเป็นที่รู้จัก จำเป็นต้องอาศัยช่องทางการสื่อสารที่ดีเพื่อมาช่วยให้องค์กรเป็นที่รู้จักในวงกว้างของนักท่องเที่ยว และการสร้างเอกลักษณ์ของอาหารท้องถิ่นจำเป็นต้องอาศัยความร่วมมือกันจากหลายภาคส่วนเพื่อสร้างคุณค่าให้เป็นที่ประจักษ์ สอดคล้องกับงานวิจัยของ ปาริฉัตร ศรีหะรัญ (2561) ในงานวิจัยเรื่องกระบวนการสร้างความหมายวัฒนธรรมการบริโภคอาหารท้องถิ่น จังหวัดนครศรีธรรมราช ภายใต้แนวคิดการสร้างคุณค่าร่วมกันที่กล่าวว่า การสื่อสารทางการตลาดเพื่อการท่องเที่ยวจำเป็นต้องมีการสร้างความหมายของอาหารท้องถิ่นจนกลายเป็นภาพจำของนักท่องเที่ยว สามารถทำได้โดยการสร้างพื้นที่ทางสังคม การกระตุ้นความทรงจำ การกระตุ้นการตีความ การสร้างตำนาน การใช้วัตถุดิบในท้องถิ่น และการบริโภควิถีท้องถิ่น

วิธีการส่งเสริมการท่องเที่ยวเชิงอาหาร เป็นการท่องเที่ยวที่ได้รับความนิยมจากกลุ่มนักท่องเที่ยว โดยจะเห็นได้จากปริมาณการใช้จ่ายเพื่อการรับประทานอาหารที่เกิดจากการท่องเที่ยวเชิงอาหาร จะเป็นการท่องเที่ยวที่ผสมผสานธรรมชาติของพื้นที่ วัฒนธรรม การเป็นเจ้าบ้านที่ดี โดยจะมีการพัฒนาผู้ประกอบการที่จำหน่ายสินค้าในหลาดใต้โหนดให้มีองค์ความรู้ของการเป็นผู้ประกอบการ และมีการใช้ช่องทางออนไลน์ในการสื่อสาร ประชาสัมพันธ์ไปยังนักท่องเที่ยว รวมถึงการกำหนดนโยบายให้ผู้ประกอบการมุ่งเน้นนำสินค้าในท้องถิ่น ผลิตสินค้าที่มีคุณภาพและได้มาตรฐาน เพื่อส่งให้กลุ่มลูกค้าและนักท่องเที่ยวได้ลิ้มลองรสชาติอาหารอย่างประทับใจ และกลับมาซื้อซ้ำ และนำไปสู่การจัดการท่องเที่ยวอย่างยั่งยืนของหลาดใต้โหนด ซึ่งสอดคล้องกับงานวิจัยของ วันเพ็ญ ควรสมาน, ประภัสสร วิเศษประภา, และ ภูชิตต์ ภูริปาณิก. ((2565) เรื่องศักยภาพของอาหารพื้นถิ่นภาคใต้ ในการพัฒนาการท่องเที่ยวเชิงอาหารพื้นถิ่นภาคใต้ ซึ่งกล่าวไว้ว่า ศักยภาพของอาหารพื้นถิ่นภาคใต้ที่ผู้ประกอบการร้านอาหารในท้องที่ได้มีการเตรียมอาหารมาจำหน่ายเพื่อให้นักท่องเที่ยวได้ลิ้มลองรสชาติอาหารถิ่นแบบดั้งเดิมได้อย่างง่ายดาย จนอาจทำให้เกิดการบอกต่อหรือแบ่งปันประสบการณ์การท่องเที่ยวผ่านสื่อสังคมออนไลน์และดึงดูดให้ผู้คนหลั่งไหลเข้ามาเปิดรับประสบการณ์ใหม่ ๆ ที่อาจไม่เคยได้สัมผัสมาก่อน ทั้งนี้ ยังมีความสอดคล้องกับงานของ เบญจมาศ ณ ทองแก้ว, อาทิตย์ แพชนะ, ดรัลรัตน์ ขุนนุ้ย, และ อำนาจ รักษาพล. (2560) ในงานการท่องเที่ยวเชิงอาหารตลาดใต้เคี่ยม จังหวัดชุมพร ที่ศึกษาอาหารท้องถิ่นจังหวัดชุมพร ควบคู่กับปัจจัยชี้วัดความสำเร็จต่อการพัฒนาตลาดใต้เคี่ยม จากการมีส่วนร่วมของชุมชนในระดับหมู่บ้าน ทำให้ได้รับการส่งเสริมเป็นตลาดต้องชม โดยกระทรวงพาณิชย์

องค์ความรู้ใหม่ในงานวิจัยนี้ คือ การส่งเสริมการท่องเที่ยวในตลาดท้องถิ่น ต้องมี 2 ส่วนที่สำคัญมากคือ การส่งเสริมจากคนใน และการส่งเสริมจากคนนอกที่เป็นภาครัฐ การมีส่วนร่วมจากคนในทำให้อัตลักษณ์เข้มแข็งส่งต่อไปสู่นักท่องเที่ยว การสื่อสารอัตลักษณ์แบบคนในไปสู่คนนอก ศักยภาพของคนในเพียงลำพังอาจจะไม่สามารถทำให้ตลาดยั่งยืนได้ การได้รับการสนับสนุนจากภาครัฐก็จะรับประกันความยั่งยืน

ข้อเสนอแนะ

จากการวิจัยพบว่า การสื่อสารวัฒนธรรมอาหารท้องถิ่นของหลาดใต้โหนดมีจุดเริ่มต้นจากคนในชุมชนเป็นหลัก ได้แก่ ผู้จัดการหลาดใต้โหนด ผู้ประกอบการในหลาดใต้โหนด และคนในชุมชน โดยคนกลุ่มนี้ เป็นทั้งผู้ส่งสารและผู้รับสารที่ดี โดยอาศัยการใช้สื่อและช่องทางการสื่อสารที่หลากหลายตามความเชี่ยวชาญในการใช้ภาษาในการสื่อสาร โดยกระบวนการสื่อสารวัฒนธรรมอาหารดังกล่าวจากภาคประชาชนและภาครัฐให้มีประสิทธิภาพดียิ่งขึ้น ควรให้ความรู้ในด้านเทคโนโลยีการสื่อสารเพื่อให้เกิดความชำนาญ มีการโฆษณาประชาสัมพันธ์อย่างต่อเนื่องและทั่วถึง

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การปรับปรุงประสิทธิภาพโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์โคนม: กรณีศึกษา
Logistics Efficiency Improvement in Pasteurized Milk Production of Dairy Cooperative: A Case Study

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาและวิเคราะห์ปัญหาด้านโลจิสติกส์ รวมทั้งหาแนวทางในการปรับปรุงประสิทธิภาพโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์กรณีศึกษา คณะผู้วิจัยทำการศึกษาปัญหาด้านโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ โดยแบ่งเป็น 2 ส่วน คือ 1. ข้อมูลสภาพทั่วไปในการผลิตนมพลาสเจอร์ไรส์ ปัญหาอุปสรรค และ 2. ประเมินความสูญเปล่าในการผลิตนมพลาสเจอร์ไรส์นำข้อมูลมาวิเคราะห์ เพื่อหาแนวทางการแก้ปัญหาเพื่อเพิ่มประสิทธิภาพด้านโลจิสติกส์ในกระบวนการผลิต ผลปรากฏว่า 1) การรับวัตถุดิบ ที่ทำข้อตกลงกับผู้จัดส่ง และตรวจสอบขั้นตอน การจัดส่งเพื่อให้ได้มาตรฐาน 2) การขนย้ายในกระบวนการผลิต นำสายพานลำเลียง (Conveyor) มาใช้ในกระบวนการผลิต พนักงานมีอาการเมื่อยล้าลดลงโดยใช้พนักงานเพียง 2 คน จากเดิมใช้พนักงาน 6 คน คิดเป็นลดลง 4 คน หรือคิดเป็นลดลงร้อยละ 67 สามารถลดต้นทุนแรงงานได้ประมาณ 374,400 บาทต่อปี 3) การขนส่งสินค้า ทำการติดตั้งอุปกรณ์ Data Logger ในรถขนส่งเพื่อช่วยตรวจสอบอุณหภูมิของสินค้า และเมื่อติดตั้งอุปกรณ์ดังกล่าวสามารถลดความสูญเสียได้ร้อยละ 1.5 จากเดิมมีความสูญเสียร้อยละ 3 หรือคิดเป็นลดลงร้อยละ 50 และสามารถคิดเป็นมูลค่าที่ลดความสูญเสียจากกระบวนการนี้ได้ประมาณ 2,730,000 บาทต่อปี 4) การวางจำหน่ายสินค้า นำเสนอให้ร้านจำหน่ายวางสินค้าในตู้แช่เย็น เพื่อให้สินค้ามีอายุในการวางจำหน่ายได้เป็นระยะเวลานานขึ้นรวมถึงสามารถควบคุมคุณภาพได้ตามมาตรฐาน จากกระบวนการทั้งหมดสามารถปรับปรุงประสิทธิภาพโลจิสติกสของสหกรณ์ตัวอย่างให้ดีขึ้นทั้งในมิติของเวลาและต้นทุนตามลำดับ

คำสำคัญ: ประสิทธิภาพโลจิสติกส, นมพลาสเจอร์ไรส์, อุตสาหกรรมนม, ต้นทุนที่ลดลง, การจัดการ

Abstract

This research aims to study and analysis of logistics problems, also including the logistics efficiency improvement method in the pasteurized milk production of a cooperative. This study was divided into 2 parts: problem identification and observations,

and waste analysis in production and distribution. Our improvement results can be demonstrated in four topics. First, the producer and vendors established the standard of delivery and receiving raw materials. Second, the conveyor's use could increase the productivity in the production process and reduce the exhaustion of employees. The use of conveyors could reduce labor by up to 67% (2 employees from 6 employees). Reduction of labor can reduce labor costs to approximately 374,400 THB/year. Third, quality improvement in product transportation can be done by the data logger installation to vehicles for monitoring the temperature of products. It can reduce the loss of product in half compared to non-data logger vehicles (from 3% to 1.5%) which was calculated to be approximately 2,730,000 THB/year. Lastly, temperature-controlled shelves such as refrigerators can increase product shelf life. In conclusion, these are the efficiency improvements of the logistics processes of the case study cooperative in terms of time and cost, respectively.

Keywords: Logistics Efficiency, Pasteurized Milk, Dairy Industry, Reduced Cost, Management

บทนำ

นมโคเป็นอุตสาหกรรมที่มีการขยายตัวอย่างมาก และเป็นแหล่งของสารอาหารที่สำคัญ ได้แก่ โปรตีน ไขมัน น้ำตาล แลคโตส วิตามิน และเกลือแร่ โดยนมโคที่แปรรูปมาเป็นนมพลาสเจอร์ไรส์เป็นผลิตภัณฑ์ที่มีความนิยมจากผู้บริโภค ซึ่งประเทศไทยมีโครงการอาหารเสริม (นม) โรงเรียน เป็นโครงการที่มีความสำคัญต่อสุขภาพร่างกายของเด็กไทยทั่วประเทศ แม้ในสถานศึกษามีส่งเสริมและดำเนินการให้เด็กทุกคนได้เข้าถึงบริโภคนม แต่ประโยชน์จากนมสามารถเป็นโทษหรือไม่มีคุณค่าทางโภชนาการได้ หากพบว่า “ผลิตภัณฑ์นมโรงเรียนไม่มีคุณภาพ” หน่วยงานที่เกี่ยวข้องในทุกพื้นที่ควรใส่ใจดูแลระบบการจัดการนมโรงเรียนครอบคลุม โดยเฉพาะนมโรงเรียนเป็นโครงการที่ดำเนินมาเป็นระยะเวลาที่ยาวนาน ควรอย่างยิ่งต่อการเข้าใจสถานการณ์ปัจจุบันและมีแนวทางแก้ไขพัฒนาอย่างต่อเนื่อง ด้วยการศึกษาที่สามารถเข้าถึงรายละเอียดข้อมูลระบบคุณภาพของนมโรงเรียนในทุกขั้นตอน เพื่อวิเคราะห์ปัญหาและหาแนวทางพัฒนาที่แท้จริง (สุภพร งามโสภาสิริสกุล, อนันตญา ศักดิสอาด, และ นิลวรรณ ชุ่มฤทธิ์, 2565) ส่วนการศึกษาเกี่ยวกับการใช้น้ำมันเชื้อเพลิงของรถกระบะบรรทุกห้องเย็นที่มีการใช้เชื้อเพลิงสูงกว่ารถกระบะบรรทุกทั่วไป เพื่อช่วยเหลือสถานประกอบการในการบริหารจัดการขนส่งสินค้าแบบควบคุมความเย็นได้อย่างเต็มประสิทธิภาพมากขึ้น และเพิ่มศักยภาพในการแข่งขันของตลาดโลจิสติกส์โซ่ความเย็น (Cold chain logistics) ให้มีความได้เปรียบทางต้นทุน พร้อมสร้างความเชื่อมั่นให้แก่ลูกค้าและพัฒนาขีดความสามารถของสถานประกอบการ (ศุจินธร ทรงสิทธิเดช และ สุนทรี จันทรศรี, 2563)

คณะผู้วิจัยนำเทคนิคในการวิเคราะห์ความสูญเปล่าที่ส่งผลต่อการเกิดต้นทุนโลจิสติกส์เข้ามาช่วย ซึ่งแนวคิดการกำจัดความสูญเปล่าประยุกต์มาจากแนวความคิดของความสูญเปล่า 7 ประการ (7 Waste) นั่นคือ ความสูญเปล่าหรือของเสียที่เกิดขึ้นในกระบวนการดำเนินงาน โดยแบ่งเป็น 7 ประการ ดังนี้ 1) ความสูญเปล่าเนื่องมาจากการเคลื่อนไหว (Motion) 2) ความสูญเปล่าเนื่องมาจากงานเสีย (Defect) 3) ความสูญเปล่าเนื่องมาจากการรอคอย (Waiting) 4) ความสูญเปล่าเนื่องมาจากพัสดุคงคลัง (Inventory)

5) ความสูญเปล่าเนื่องมาจากการขนส่ง (Transportation) 6) ความสูญเปล่าเนื่องมาจากการผลิตเกินพอดี (Over Production) 7) ความสูญเปล่าเนื่องมาจากกระบวนการทำงานที่ไม่มีประสิทธิภาพ (Process Itself) (รื่นฤดี โยธาคุณ, วรรณกร นามนู, และ สุพรรณี อึ้งปัญสัตวงศ์, 2563) อีกทั้งมีการนำเทคนิค ECRS คือ หลักการการปรับปรุงกระบวนการทำงานเพื่อลดต้นทุนในกระบวนการที่เกิดความสูญเปล่า โดยมีหลักการ คือ 1) การกำจัด (E: Eliminate) ทำได้โดยการบ่งชี้ขั้นตอนที่ไม่จำเป็นและไม่เพิ่มมูลค่าให้กับผลิตภัณฑ์ ซึ่งจะทำให้สามารถกำจัดขั้นตอนที่ไม่จำเป็นออกได้ 2) การผสมผสาน (C: Combine) ทำได้โดยการผสมผสานองค์ประกอบของงานหลายประการเข้าด้วยกัน 3) การจัดลำดับใหม่ (R: Rearrange) การโยกย้ายสับเปลี่ยนลำดับขององค์ประกอบของงานอาจสร้างโอกาสกำจัดงานบางส่วนหรือโอกาสการผสมผสานใหม่ได้ 4) การทำให้ง่ายขึ้น (S: Simplify) เมื่อพิจารณาถึงการกำจัด การผสมผสาน และการจัดลำดับใหม่อย่างรอบคอบแล้ว ควรพยายามจัดการองค์ประกอบของงานส่วนที่เหลืออยู่ให้เป็นงานที่ง่ายที่สุดเท่าที่จะทำได้ (สุทธิสา วัดสิงห์ และ สายชล ปิ่นมณี, 2565) จากเครื่องมือในการวิเคราะห์และแก้ปัญหาดังกล่าวจะสามารถสร้างแนวทางในการลดต้นทุนโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์กรณีศึกษาสหกรณ์ตัวอย่างให้สามารถแข่งขันกับผู้ผลิตนมพลาสเจอร์ไรส์กลุ่มอื่น ๆ ได้

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาและวิเคราะห์ปัญหาด้านโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง
2. เพื่อหาแนวทางในการเพิ่มประสิทธิภาพโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง

แนวคิด ทฤษฎี กรอบแนวคิด

กระบวนการโลจิสติกส์โซ่ความเย็น (Cold Chain Logistics) (The Thirteenth National Economy and Social Development Plan, 2564) ประกอบด้วย 5 กิจกรรมหลัก ได้แก่

(1) กระบวนการผลิต สำหรับสินค้ากลุ่มอาหาร ยา และเวชภัณฑ์ จะมีการควบคุมอุณหภูมิตั้งแต่กระบวนการผลิตทั้งในการจัดเก็บวัตถุดิบ การผลิต และการเตรียมการจัดส่งหรือจัดเก็บ ส่วนสินค้าเกษตรกรรม การควบคุมอุณหภูมิจะเริ่มขึ้นภายหลังการเก็บเกี่ยวเพื่อลดการสูญเสียทางกายภาพและชีวภาพ ช่วยยืดอายุการเก็บรักษาและลดการปนเปื้อน

(2) การจัดเก็บ เป็นการจัดเก็บด้วยคลังสินค้าควบคุมอุณหภูมิหรือห้องเย็นเพื่อรอการแปรรูป รอบรรจุหรือรอการกระจายสินค้า เช่น การจัดการคลังสินค้าควบคุมอุณหภูมิแบบส่งผ่าน (Cross Docking) เป็นต้น

(3) การบรรจุและการดำเนินการในห้องเย็น เป็นกิจกรรมหนึ่งที่เกิดขึ้นในระหว่างการจัดเก็บดำเนินภายใต้การควบคุมอุณหภูมิที่เหมาะสมในห้องเย็น และบรรจุภัณฑ์ที่เอื้อต่ออายุการเก็บรักษาของสินค้า

(4) การกระจาย เป็นการควบคุมอุณหภูมิในทุกรูปแบบการขนส่งเพื่อกระจายสินค้าจนถึงผู้บริโภค การจัดเตรียมและการปรับเปลี่ยนสภาพสินค้าที่เหมาะสมเป็นปัจจัยสำคัญหนึ่งที่มีผลต่อประสิทธิภาพการกระจายสินค้าแบบควบคุมอุณหภูมิ

(5) การตลาด (การจำหน่ายถึงผู้บริโภค) เป็นจุดปลายของโซ่ความเย็นซึ่งมีการควบคุมอุณหภูมิ ณ ที่จัดวางหรือจัดเก็บตลอดจนสภาพแวดล้อมภายนอกที่อาจมีผลต่อตู้เย็น ตู้แช่แข็ง หรือสถานที่จัดเก็บ

ความสูญเสีย 7 ประการ

ความสูญเสีย (Wastes) คือ การสูญเสียทรัพยากรการผลิตที่ส่งผลกระทบโดยตรงต่อต้นทุน คุณภาพ และการส่งมอบ ซึ่งเป็นแนวคิดที่คิดค้นโดย Mr.Shigeo Shing และ Mr.Taiichi Ohno คือ ระบบการผลิตแบบโตโยต้า (Toyota Production System) ความสูญเปล่าทั้ง 7 ประการ แม้ว่าแนวคิดนี้จะเกิดจากแวดวงอุตสาหกรรมการผลิตแต่ในภาคบริการหรืองานสนับสนุนก็สามารถนำหลักการดังกล่าวไปพัฒนาประยุกต์ใช้ได้ โดยมีวัตถุประสงค์เพื่อขจัดความสูญเสีย 7 ประการ (รื่นฤดี โยธาคุณ และคณะ, 2563)

1. ความสูญเสียเนื่องจากการผลิตมากเกินไป (Overproduction)
2. ความสูญเสียเนื่องจากการเก็บวัสดุคงคลัง (Inventory)
3. ความสูญเสียเนื่องจากการขนส่ง (Transportation)
4. ความสูญเสียเนื่องจากการเคลื่อนไหว (Motion)
5. ความสูญเสียเนื่องจากกระบวนการผลิต (Processing)
6. ความสูญเสียเนื่องจากการรอคอย (Delay)
7. ความสูญเสียเนื่องจากงานเสีย (Defect)

หลักการ ECRS ซึ่งประกอบไปด้วย (มงคล กิตติญาณขจร, 2565)

1) การกำจัด (Eliminate) หมายถึง การพิจารณาการทำงานและพยายามกำจัดความสูญเปล า ที่พบออกไป

2) การรวมกัน (Combine) คือ การพิจารณาวาสามารถรวมขั้นตอนการทำงานใหลดลงได้หรือไม่

3) การจัดเรียงใหม่ (Rearrange) คือ การจัดเรียงขั้นตอนการผลิตใหม่หรือสลับลำดับในการทำงานเพื่อลดการเคลื่อนที่หรือการรอคอย

4) การทำให้ง่าย (Simplify) หมายถึง การปรับปรุงการทำงานให้ง่ายและสะดวกขึ้น โดยอาจจะออกแบบ Jig หรือ Fixture เข้าช่วย

วิธีดำเนินการวิจัย

1. ศึกษาสภาพทั่วไปและปัญหาที่เกิดขึ้นในด้านโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง

1.1 ศึกษาข้อมูลทุติยภูมิ ทฤษฎีและงานวิจัยที่เกี่ยวข้อง

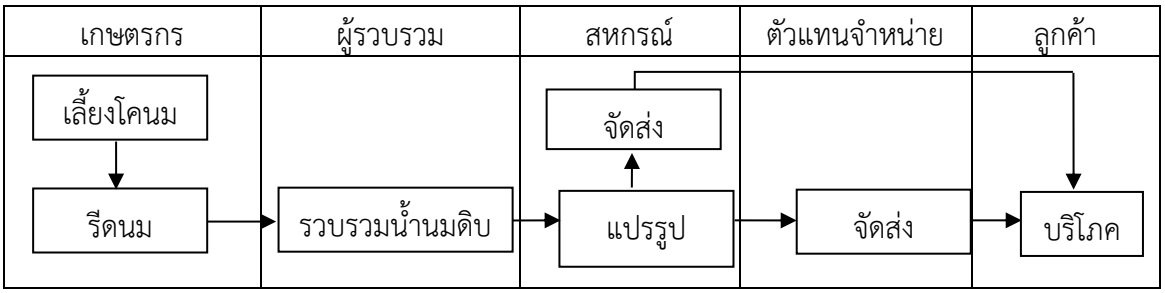
ศึกษาข้อมูลทุติยภูมิ ทฤษฎี และงานวิจัยที่เกี่ยวข้องจากหน่วยงานต่าง ๆ ที่เกี่ยวข้อง ได้แก่ กรมวิชาการเกษตร สำนักงานพาณิชย์จังหวัด สำนักงานเศรษฐกิจการเกษตร เพื่อให้ทราบข้อมูลพื้นฐานของการผลิตนมพลาสเจอร์ไรส์ทั่วไป

1.2 ศึกษาสภาพทั่วไป ปัญหาอุปสรรค และประเมินความสูญเปล่าที่เกิดขึ้นในด้านโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์

2. นำเสนอแนวทางในการปรับปรุงโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง โดยคณะผู้วิจัยได้ประยุกต์ใช้แนวคิดจากเทคนิค ECRS แก้ปัญหาความสูญเปล่าที่เกิดขึ้นด้วยหลักการการปรับปรุงกระบวนการทำงานด้วยวิธี 1. การกำจัด 2. การรวมกัน 3. การเรียงใหม่ 4. การทำให้ง่ายขึ้น

ผลการวิจัย

1. ศึกษาสภาพทั่วไป โดยเริ่มจากเกษตรกรกลุ่มเลี้ยงโคนมผู้รวบรวมน้ำนมดิบ เพื่อขนส่งน้ำนมดิบเข้าโรงงานแปรรูปเป็นนมพลาสเจอร์ไรส์ จากนั้นขนส่งไปยังลูกค้าโดยสหกรณ์เป็นผู้ขนส่งลูกค้าโดยตรงและบางส่วนขนส่งผ่านตัวแทนจำหน่าย แสดงโซ่อุปทานนมโคดังภาพที่ 1 โดยมีรายละเอียดของผู้ที่เกี่ยวข้องภายในโซ่อุปทาน ดังต่อไปนี้



ภาพที่ 1 แผนภาพโซ่อุปทานโดยรวมตั้งแต่ต้นน้ำจนถึงปลายน้ำของนมพลาสเจอร์ไรส์

1) เกษตรกร

ฟาร์มโคนมที่กระจายอยู่บริเวณสหกรณ์ตัวอย่างโดยมีจำนวนฟาร์มประมาณ 125 ราย เกษตรกรจะทำการรีดน้ำนมโคจำนวน 2 ครั้งต่อวัน คือ รอบเช้า เวลาประมาณ 3.00 - 4.00 น. เพื่อส่งให้สหกรณ์เวลาประมาณ 6.00 - 8.00 น. และรอบเย็นเวลาประมาณ 15.00 น. เพื่อส่งให้สหกรณ์ เวลา 14.00 - 20.00 น.

2) ผู้รวบรวม

ฟาร์มแต่ละฟาร์มเมื่อเกษตรกรรีดน้ำนมดิบเสร็จจะทำการรวบรวมน้ำนมดิบแต่ละฟาร์มในบริเวณใกล้เคียงกัน ส่งในลักษณะรวมกลุ่มโดยรถยนต์ โดยน้ำนมดิบจะถูกบรรจุใส่ถังขณะขนส่ง

3) การดำเนินงานของสหกรณ์ตัวอย่าง สามารถแบ่งเป็นกิจกรรมย่อยได้ดังนี้

(1) การรับน้ำนมดิบ เมื่อรถจากฟาร์มของเกษตรกรขนส่งน้ำนมดิบมาถึงสหกรณ์ เจ้าหน้าที่จะทำการเคลื่อนย้ายถังบรรจุน้ำนมดิบลงจากรถ โดยถังที่บรรจุน้ำนมดิบแต่ละถังจะถูกระบุตัวเลขของสมาชิกเกษตรกรแต่ละราย ดังภาพที่ 2

ภาพที่ 2 การมาส่งน้ำนมดิบของผู้รวบรวม

(2) การตรวจคุณภาพ ถังบรรจุแต่ละถังจะถูกตรวจคุณภาพโดยการตรวจสอบคุณภาพ ได้แก่ การตรวจสอบโปรตีน ซึ่งจะเป็นการตรวจสอบร้อยละ 100 และการตรวจสอบเชื้อของแม่วัวโดยตรวจสอบจากเชื้อที่อยู่ในน้ำนมดิบเพื่อดูว่ามีการอักเสบของเต้านมหรือไม่ ซึ่งจะเป็นการสุ่มตรวจจากตัวอย่างน้ำนมดิบที่รับซื้อจากฟาร์มของเกษตรกร โดยน้ำนมดิบจะมีอุณหภูมิประมาณ 25 - 30 องศาเซลเซียส

(3) การชั่งน้ำหนัก หลังจากนั้นก็จะทำการเคลื่อนถังน้ำนมดิบที่ผ่านการตรวจคุณภาพแล้ววางบนรางลำเลียงแบบลูกกลิ้ง เพื่อเทลงถังกรองเบื้องต้น และชั่งน้ำหนักเพื่อประเมินราคาซื้อ-ขาย ดังภาพที่ 3

ภาพที่ 3 การชั่งน้ำนมดิบ

(4) ถังเก็บน้ำนมดิบ น้ำนมดิบจะถูกลำเลียงโดยการสูบผ่านท่อไปยังถังเก็บน้ำนมดิบเพื่อแลกเปลี่ยนความความเย็นจาก 25 - 30 องศาเซลเซียส ให้ลดลงประมาณ 4 องศาเซลเซียส มีจำนวน 2 ถัง มีความสามารถในการบรรจุรวมประมาณ 30 ตัน จากนั้นน้ำนมดิบจะถูกเก็บไว้ในถังนี้ไม่เกิน 48 ชั่วโมง

(5) กระบวนการผสม เมื่อลูกค้าทำการสั่งสินค้ามายังสหกรณ์ตัวอย่าง ฝ่ายผลิตจะสั่งผลิตนมรสชนิดต่าง ๆ ตามแผนการผลิต เช่น รสจืด รสหวาน รสเปรี้ยว รสช็อคโกแลต เป็นต้น และจากนั้นนำน้ำนมดิบที่ถูกเก็บไว้เข้าเครื่องผสมตามรสชาติต่าง ๆ โดยรักษาอุณหภูมิประมาณ 1 องศาเซลเซียส ดังภาพที่ 4

ภาพที่ 4 กระบวนการผสม

(6) กระบวนการพลาสเจอร์ไรส์ หรือกระบวนการฆ่าเชื้อและลดอุณภูมิ จากกระบวนการผสมน้ำนมจะมีอุณภูมิประมาณ 1 องศาเซลเซียส เมื่อเข้าขั้นตอนการฆ่าเชื้อเพื่อแลกเปลี่ยนความร้อน สำหรับนมพลาสเจอร์ไรส์อุณหภูมิในการฆ่าเชื้อต้องไม่ต่ำกว่า 72 องศาเซลเซียส เมื่อน้ำนมผ่านการฆ่าเชื้อแล้วน้ำนมที่มีอุณภูมิร้อนจะถูกลดอุณหภูมิลงจนเหลือประมาณ 6 องศาเซลเซียส กลายเป็นน้ำนมเย็น ดังภาพที่ 5

ภาพที่ 5 กระบวนการพลาสเจอร์ไรส์

(7) การจัดเก็บน้ำนมในถังบรรจุ น้ำนมเย็นที่ผลิตเสร็จแล้วจะถูกเก็บไว้ภายในถังบรรจุ และรักษาอุณหภูมิไว้ไม่ให้เกิน 6 องศาเซลเซียส เพื่อรอการบรรจุใส่ถุงบรรจุภัณฑ์ต่อไป ดังภาพที่ 6

ภาพที่ 6 การจัดเก็บนม

(8) การบรรจุ น้ำนมที่ผลิตเสร็จจะถูกบรรจุลงถุงบรรจุภัณฑ์ตามรสชาติต่าง ๆ โดยความสามารถของเครื่องบรรจุสามารถผลิตได้ประมาณ 5 - 6 ตันต่อชั่วโมง โดยมีจำนวนทั้งหมด 17 เครื่อง นม 1 ถุงมีปริมาตรเท่ากับ 200 มิลลิลิตร จากนั้นจะรวบรวมบรรจุลงในถุงใหญ่ โดยในหนึ่งถุงใหญ่จะสามารถบรรจุนมถุงเล็กได้ประมาณ 50 ถุง ดังภาพที่ 7

ภาพที่ 7 การบรรจุนมลงถุง

(9) การจัดเก็บในห้องเย็น เพื่อรอส่งให้กับลูกค้า โดยจะรักษาอุณหภูมิไว้ไม่เกิน 6 องศาเซลเซียส โดยห้องเย็นจะเปิดความเย็นไว้ที่อุณหภูมิไว้ประมาณ -6 องศาเซลเซียส เนื่องจากการวางถุงบรรจุนมจะมีลักษณะการวางซ้อนทับกัน ดังนั้น จำเป็นต้องควบคุมความเย็นให้นมแต่ละถุงได้รับความเย็นได้ในปริมาณที่เท่า ๆ กัน ก่อนทำการจัดส่งให้ลูกค้าในขั้นตอนถัดไป ดังภาพที่ 8

ภาพที่ 8 การจัดเก็บนมพลาสเจอร์ไรส์ในห้องเย็น

(10) การจัดส่ง เมื่อฝ่ายจัดส่งได้รับทราบคำสั่งการผลิตจากฝ่ายการผลิต จึงทำการทำแผนการจัดส่งโดยเจ้าหน้าที่จะนำผลิตภัณฑ์ที่อยู่ในห้องจัดเก็บไปยังรถบรรทุกห้องเย็นโดยจัดเก็บไว้ล่วงหน้าประมาณ 1 คืน หรือประมาณ 15 ชั่วโมง จากนั้นเจ้าหน้าที่ทำการจัดส่งในเช้าวันต่อไป แสดงดังภาพที่ 9

ภาพที่ 9 รถห้องเย็นที่เข้ามารับนมในสหกรณ์เพื่อจัดส่งให้ลูกค้า

ลักษณะการจัดส่งนมไปยังลูกค้าจะถูกแบ่งออกเป็น 2 ส่วน ได้แก่ สหกรณ์จะจัดส่งให้กับลูกค้าโดยตรง และการจัดส่งโดยจ้างตัวแทนจำหน่ายขนส่งให้กับลูกค้า มีรายละเอียดดังนี้

(1) สหกรณ์จะจัดส่งให้กับลูกค้าโดยตรง มีรถขนส่งขนาดเล็ก ได้แก่ รถกระบะ และรถขนาดใหญ่ ได้แก่ รถหกล้อ และรถสิบล้อ ในอัตราส่วนประมาณร้อยละ 70

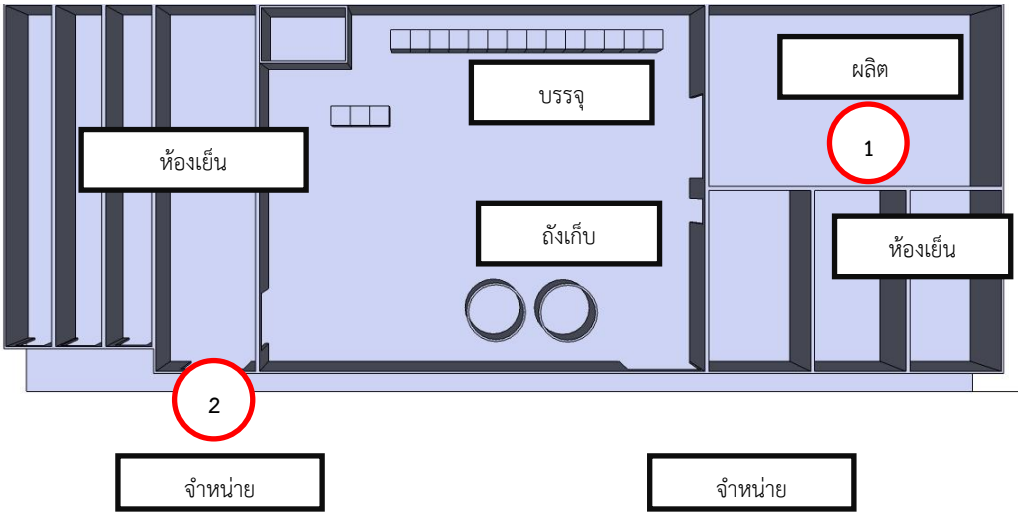
(2) การจัดส่งโดยจ้างตัวแทนจำหน่าย โดยตัวแทนจำหน่ายจะนำรถห้องเย็นเข้ามารับนมภายในสหกรณ์เพื่อจัดส่งให้กับลูกค้า ในอัตราส่วนประมาณร้อยละ 30 ซึ่งจะกระจายให้กับลูกค้าบริเวณสามจังหวัดชายแดนใต้

(11) ลูกค้าของสหกรณ์ตัวอย่าง จะเป็นแบ่งเป็น 2 ประเภท ได้แก่ โครงการอาหารเสริมนม คือ โรงเรียนต่าง ๆ ในจังหวัดของสหกรณ์ตัวอย่างและจังหวัดใกล้เคียง คิดเป็นสัดส่วนประมาณร้อยละ 90 และผู้บริโภคทั่วไป เช่น ตู้แช่ร้านจำหน่าย ลูกค้าขายปลีก เป็นต้น คิดเป็นสัดส่วนประมาณร้อยละ 10

2. ศึกษาปัญหาอุปสรรค ประเมินความสูญเปล่าที่เกิดขึ้นในด้านโลจิสติกส์ในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง พร้อมทั้งวิเคราะห์หาแนวทางการแก้ปัญหาอุปสรรคที่เกิดขึ้น

2.1 การขนย้ายในกระบวนการผลิต พบการเคลื่อนย้ายมากเกินความจำเป็นใน 2 ขั้นตอน ได้แก่ ขั้นตอนที่ 1 การยกกระสอบน้ำตาลทรายไปยังถังผสม โดยการทำงานในปัจจุบันมีการเคลื่อนย้ายกระสอบน้ำตาลด้วยแฮนด์ลิฟท์ การเคลื่อนย้ายแต่ละรอบจะบรรทุกน้ำตาลทรายประมาณ 25 - 30 กระสอบ และมีการยกกระสอบน้ำตาลทรายโดยใช้แรงงานในบางขั้นตอน ทำให้คนงานเกิดอาการเมื่อยล้า ในปัจจุบันสหกรณ์ผลิตโยเกิร์ตพร้อมดื่ม 16 ตันต่อวัน จำเป็นต้องใช้น้ำตาลทรายถึง 48 กระสอบ (โยเกิร์ตพร้อมดื่ม 1 ตัน ต่อน้ำตาลทราย 3 กระสอบ) และขั้นตอนที่ 2 การเคลื่อนย้ายสินค้าออกจากห้องเย็นเพื่อเตรียมจัดส่งให้ลูกค้าหลังจากโยเกิร์ตพร้อมดื่มถูกบรรจุเสร็จเรียบร้อยแล้วจะถูกเคลื่อนย้ายไปยังห้องจัดเก็บโดยใช้รถเข็น ซึ่งในขั้นตอนนี้จะใช้คนงานจำนวน 6 คน โดยเฉลี่ยคนงานจะต้องเข็นรถเข็น จำนวน 28 เที่ยวต่อคน และเมื่อลูกค้าสั่งสินค้าก็จะมีการเคลื่อนย้ายถุงนมออกจากห้องจัดเก็บ ทำให้เกิดการเคลื่อนย้ายอีกครั้ง โดยเฉลี่ยคนงานจะต้องเข็นรถเข็นอีกประมาณ 11 เที่ยวต่อคนต่อรอบการผลิต ทำให้คนงานเกิดอาการเมื่อยล้าและเสียเวลาในการเคลื่อนย้ายสูง

แนวทางในการแก้ปัญหา: ออกแบบ Conveyor ที่ช่วยในการเคลื่อนย้าย โดยคณะผู้วิจัยได้สร้างและติดตั้ง Conveyor ที่สามารถเคลื่อนย้ายได้ที่ช่วยในการทำงานทั้ง 2 ส่วน ได้แก่ การเคลื่อนย้ายกระสอบน้ำตาลทราย (ตำแหน่งที่ 1) และการเคลื่อนย้ายสินค้าออกจากห้องเย็น (ตำแหน่งที่ 2) แสดงดังภาพที่ 10 และภาพที่ 11



ภาพที่ 10 แผนผังโรงงานแสดงการติดตั้ง Conveyor ที่ใช้ในกระบวนการผลิต

ภาพที่ 11 การติดตั้งและการทดลองใช้ Conveyor ในตำแหน่งที่ 2 การเคลื่อนย้ายสินค้าออกจากห้องเย็น

2.2 ในกระบวนการผลิตมีการเคลื่อนย้ายผลิตภัณฑ์ที่ผลิตเสร็จแล้วเข้าสู่ห้องจัดเก็บสูง คนงานเกิดการเมื่อยล้า โดยน้ำหนักในการเข็นรถบรรจุถุงนมไปจัดเก็บในห้องเย็นประมาณ 300 กิโลกรัมต่อเที่ยวต่อคน

แนวทางในการแก้ปัญหา: นำเสนอการใช้ Conveyor ที่ช่วยในการลำเลียงแทนการใช้คนงานเข็นรถบรรทุกถุงนมโดยคณะผู้วิจัยได้นำเสนอแนวคิดดังกล่าวแก่ผู้บริหารของสหกรณ์ตัวอย่าง แต่ยังไม่ดำเนินการสร้างเนื่องจากมีราคาค่อนข้างสูง (มูลค่าประมาณ 300,000 บาท ระยะทาง 30 เมตร) จึงนำเสนอเป็นแนวทางในการแก้ปัญหาต่อไปในอนาคตดังภาพที่ 12

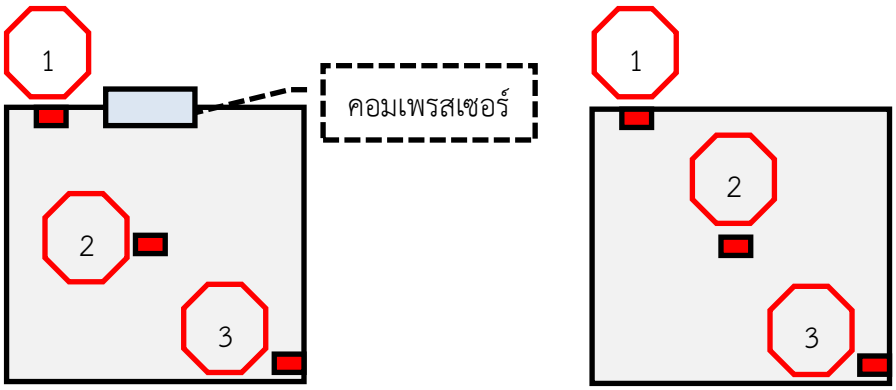
ภาพที่ 12 แสดงการลำเลียงถุงบรรจุนมโดยขณะใช้รถเข็น (ซ้าย) และตัวอย่าง Conveyor ที่นำเสนอกับผู้บริการของสหกรณ์ตัวอย่าง (ขวา)

2.3 การขนส่งไปยังลูกค้า

จากข้อร้องเรียนของผู้บริโภคพบว่า เกิดปัญหาเรื่องอุณหภูมิเนื่องจากขณะขนส่งไม่ได้รักษาความเย็นของนมไว้ได้ตามที่กำหนด ซึ่งส่วนใหญ่เกิดขึ้นในกรณีที่สหกรณ์จ้างตัวแทนจำหน่ายในการขนส่งนมให้กับลูกค้า โดยผลิตภัณฑ์นมเมื่อถึงมือผู้บริโภคจะต้องมีอุณหภูมิไม่เกิน 8 องศาเซลเซียส

แนวทางการแก้ปัญหา: ติดตั้งเครื่องวัดและบันทึกค่าอุณหภูมิ (Data logger) ไว้ในรถขนส่งขณะขนส่งนมไปยังลูกค้า เพื่อสามารถควบคุมอุณหภูมิตามที่ลูกค้าต้องการ และตรวจสอบย้อนกลับได้โดยทำการคัดเลือกรถขนส่งต้นแบบจำนวน 2 คัน (รถ 6 ล้อ) เป็นรถแบบที่มีคอมเพรสเซอร์และแบบไม่มีคอมเพรสเซอร์ ทำการติดตั้ง Data Logger คันละ 3 ตำแหน่ง ผลการทดลองเบื้องต้นพบว่า มีอุณหภูมิบางช่วงที่เกินค่ามาตรฐาน (8 องศาเซลเซียส) ทางคณะผู้วิจัยจึงเสนอแนะให้นำ Data Logger ไปใช้กับรถ

ขนส่งที่เหลือเพื่อแก้ปัญหาการควบคุมอุณหภูมิของรถขนส่งต่อไป ซึ่งการใช้ Data Logger ในรถขนส่งจะช่วยตรวจสอบอุณหภูมิของสินค้าได้และคาดว่าจะมีความสูญเสียเพียง 1.5% จากเดิมก่อนการปรับปรุงสูญเสีย 3% ทั้งนี้สามารถตรวจสอบข้อมูลด้านคุณภาพย้อนกลับได้จากข้อมูลจากการใช้ Data Logger เพื่อการควบคุมคุณภาพของผลิตภัณฑ์และส่งผลให้ความน่าเชื่อถือของผลิตภัณฑ์เพิ่มมากขึ้นดังภาพที่ 13 และภาพที่ 14



ภาพที่ 13 ตำแหน่งการติดตั้ง Data Logger รถที่มีคอมเพรสเซอร์ (ซ้าย) และรถที่ไม่มีคอมเพรสเซอร์ (ขวา)
หมายเหตุ: หมายเลข 1 ตำแหน่งผนังรถด้านหน้า
หมายเลข 2 ตำแหน่งตรงกลางรถ
หมายเลข 3 ตำแหน่งประตูรถด้านหลัง

ภาพที่ 14 การติดตั้งอุปกรณ์ Data Logger ในรถขนส่งผลิตภัณฑ์นมพาสเจอร์ไรส์

2.4 การวางจำหน่ายสินค้า

เมื่อทางสหกรณ์ได้จัดส่งสินค้าให้กับลูกค้าพบว่า ร้านค้าปลีกบางร้านไม่วางสินค้าในตู้เย็นที่ควบคุมอุณหภูมิได้ จึงส่งผลต่ออายุการวางจำหน่าย และทำให้คุณภาพของผลิตภัณฑ์ลดลงด้วย โดยมีข้อร้องเรียนจากลูกค้าทำให้ทางสหกรณ์ต้องรับผิดชอบและชดเชยสินค้าประมาณปีละ 170,000 บาท ซึ่งตามมาตรฐานในการวางจำหน่ายจะต้องควบคุมอุณหภูมิประมาณ 8 องศาเซลเซียสก่อนถึงมือผู้บริโภค

แนวทางการแก้ปัญหา: ทางคณะผู้วิจัยได้นำเสนอให้ร้านค้าปลีกวางสินค้าในตู้แช่เย็นที่มีการควบคุมอุณภูมิเพื่อให้สินค้ามีอายุการวางจำหน่ายที่นานขึ้น

จากปัญหาต่าง ๆ ที่กล่าวมานั้น สามารถสรุปประเด็นปัญหา แนวทางการแก้ไข และผลเปรียบเทียบเชิงปริมาณก่อนและหลังการแก้ไขปัญหา ได้ดังแสดงในตารางที่ 1

ตารางที่ 1 ปัญหา แนวทางการแก้ไข และผลตอบแทนหรือประโยชน์ที่ได้รับของนมพาสเจอร์ไรส์

ผู้เกี่ยวข้อง	กิจกรรมโลจิสติกส์	ปัญหาที่เกิดขึ้น	แนวทางการแก้ไขและการเปรียบเทียบก่อนและหลังการปรับปรุง	
			ก่อน	หลัง
ผู้จัดส่งวัตถุดิบ	การรับวัตถุดิบ	คุณภาพของน้ำนมดิบทั้งทางกายภาพและทางเคมี (ความน่าเชื่อถือ)	ทำการส่งวัตถุดิบกลับไปยังผู้จัดส่งและทวนสอบ	ทำข้อตกลงกับผู้จัดส่งและตรวจสอบขั้นตอนการจัดส่งเพื่อให้ได้มาตรฐาน
สหกรณ์ตัวอย่าง	การเคลื่อนไหลในกระบวนการผลิต	การเคลื่อนย้ายในการผลิตมากเกินความจำเป็น พนักงานมีความเมื่อยล้าจากการเคลื่อนย้าย (เวลา)	สูญเสียเวลา 10% พนักงานมีอาการเมื่อยล้า ใช้พนักงาน 6 คน	เมื่อใช้ Conveyor คาดว่าจะไม่พบการสูญเสียเวลาและพนักงานมีอาการเมื่อยล้าลดลง ใช้พนักงานเพียง 2 คน สามารถลดต้นทุนแรงงานได้ประมาณ 374,400 บาทต่อปี (คืนทุนใน 0.4 เดือน)
	การขนส่งสินค้า	การขนส่งไม่ได้รักษาอุณหภูมิของนมไว้ได้ตามที่ลูกค้าปลายทางต้องการ (อุณหภูมิและความน่าเชื่อถือ)	สูญเสีย 3%	ติดตั้ง Data logger ในรถขนส่งเพื่อช่วยตรวจสอบอุณหภูมิของสินค้าได้ และคาดว่าจะลดความสูญเสียได้ 1.5% คิดเป็น 2,730,000 บาทต่อปี
ร้านค้าปลีก	การวางจำหน่ายสินค้า	สินค้ามีอายุการวางจำหน่ายสั้นลง (อุณหภูมิ และการสูญเสีย)	ร้านค้าปลีกไม่วางสินค้าในตู้ควบคุมอุณหภูมิ	นำเสนอให้วางสินค้าในตู้แช่เย็น เพื่อให้สินค้ามีอายุการวางจำหน่ายนานขึ้น

สรุปและอภิปรายผล

การปรับปรุงประสิทธิภาพโลจิสติกสในการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง โดยใช้เครื่องมือทางวิศวกรรมอุตสาหการและโลจิสติกสช่วยแก้ปัญหาอุปสรรคที่เกิดขึ้นในโซ่อุปทาน ดังนี้ 1) การรับวัตถุดิบ ทำข้อตกลงกับผู้จัดส่งและตรวจสอบขั้นตอนการจัดส่งเพื่อให้ได้มาตรฐาน 2) การเคลื่อนไหลในกระบวนการผลิต นำ Conveyor มาใช้ในกระบวนการผลิตข้างต้น พบว่า ใช้พนักงานเพียง 2 คน จากเดิมใช้พนักงาน 6 คน คิดเป็นลดลง 4 คน หรือคิดเป็นลดลงร้อยละ 67 สามารถลดต้นทุนแรงงานได้ประมาณ 374,400 บาทต่อปี (คืนทุนใน 0.4 เดือน) ซึ่งสอดคล้องกับ สุภพร งามโสภาสิริสกุล และคณะ (2565) ซึ่งได้ศึกษาการพัฒนาระบบการตรวจสอบย้อนกลับนมพาสเจอไรส์ของสหกรณ์ตัวอย่าง พบว่าหลังการปรับปรุงขั้นตอนการตรวจสอบย้อนกลับนมพาสเจอไรส์จาก 15 ขั้นตอนลดเหลือ 10 ขั้นตอน อีกทั้งยังสอดคล้องกับ สุทธิสา วัดสิงห์ และ สายชล ปิ่นมณี (2565) ซึ่งได้ศึกษาการประยุกต์ใช้แนวความคิดลีนในการปรับปรุงกระบวนการผลิตในบริษัทผลิตเคมีภัณฑ์สำหรับอุตสาหกรรมอิเล็กทรอนิกส์พบว่า ช่วยเพิ่มประสิทธิภาพการผลิตและลดต้นทุนการผลิตได้โดยนำหลักการ ECRS มาใช้เพื่อลดความสูญเปล่าในการผลิต 3) การขนส่งสินค้า ทำการติดตั้งอุปกรณ์ Data logger ในรถขนส่งเพื่อช่วยตรวจสอบอุณหภูมิของสินค้าได้ และคาดว่าจะลดความสูญเสียได้ร้อยละ 1.5 จากเดิมมีความสูญเสียร้อยละ 3 หรือคิดเป็นลดลงร้อยละ 50 และสามารถคิดเป็นมูลค่าที่ลดความสูญเสียจากกระบวนการนี้ได้ประมาณ 2,730,000 บาทต่อปี ซึ่งสอดคล้องกับ ศุจินธร ทรงสิทธิเดช และ สุนทรี จันทร์ศรี (2563) ซึ่งได้ศึกษาการใช้น้ำมันเชื้อเพลิงของรถกระบะบรรทุกห้องเย็น กรณีศึกษา บริษัท ตาตง นครสวรรค์ จำกัด พบว่า ปัจจัยพฤติกรรมผู้ขับขี่ที่สงผลตอการสูญเสียน้ำมันในการขับรถกระบะบรรทุกห้องเย็น ได้แก่ ปัจจัยเกี่ยวกับตัวผู้ขับขี่ปัจจัยเกี่ยวกับยานพาหนะ และปัจจัยเกี่ยวกับสภาพแวดลอม 4) การวางจำหน่ายสินค้า นำเสนอให้ร้านจำหน่ายวางสินค้าในตู้แช่เย็น เพื่อให้สินค้ามีอายุในการวางจำหน่ายได้เป็นระยะเวลานานขึ้น รวมถึงสามารถควบคุมคุณภาพได้ตามมาตรฐาน จากกระบวนการทั้งหมดสามารถปรับปรุงประสิทธิภาพโลจิสติกสของสหกรณ์ตัวอย่างให้ดีขึ้นทั้งในมิติของเวลาและตนทุน ตามลำดับ

ข้อเสนอแนะ

ในสวนของการนำเสนอการใช้ Conveyor ที่ช่วยในการลำเลียงแทนการใช้คนงานเข็นรถบรรทุกถุงนม ซึ่งในทางปฏิบัติจริงการเขาไปโยกย้ายเปลี่ยนตำแหน่งของเครื่องจักรนั้นคอนข้างทำได้ยาก เนื่องจากการย้ายตำแหน่งเครื่องจักรมีคาใช้จ่ายคอนข้างสูงและกระทบกับการดำเนินการผลิตในช่วงเวลาปกติสงผลให้สายงานการผลิตหยุดชะงักได ดังนั้นคณะผู้วิจัยจึงนำเสนอแนวทางในการแก้ปัญหาข้างต้นตอผูมีสวนไดเสียเพื่อให้เกิดการเปลี่ยนแปลงและความคุมคาในการลงทุนในอนาคตต่อไป

และในการศึกษาวิจัยครั้งต่อไป ควรมีการศึกษาประสิทธิภาพโลจิสติกส์ของขั้นตอนการรับวัตถุดิบและขั้นตอนการวางจำหน่ายสินค้าซึ่งเป็นกระบวนการต้นน้ำและปลายน้ำของโซ่อุปทานการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ ตัวอย่างเพื่อหาแนวทางในการปรับปรุงประสิทธิภาพและลดต้นทุนในขั้นตอนดังกล่าวจึงจะเป็นการศึกษาที่ครอบคลุมและแก้ปัญหาตลอดทั้งโซ่อุปาน ซึ่งจะส่งผลทำให้เกิดประสิทธิภาพตลอดทั้งโซ่อุปทานของการผลิตนมพลาสเจอร์ไรส์ของสหกรณ์ตัวอย่าง ทำให้ผู้ที่มีส่วนเกี่ยวข้องทั้งหมดในโซ่อุปทานไม่ว่าจะเป็นเกษตรกร บริษัทขนส่ง สหกรณ์ตัวอย่าง ร้านจำหน่ายได้มีการปรับปรุงประสิทธิภาพโลจิสติกส์ไปพร้อมกัน

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ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา ในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

Administration Factors Affecting Effectiveness for Sport Excellence in Thailand National Sports University Northern Group.

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อวิเคราะห์ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ 2) เพื่อวิเคราะห์ความสัมพันธ์ระหว่างปัจจัยการบริหารกับความเป็นเลิศทางการกีฬา ในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ 3) เพื่อวิเคราะห์ตัวแปรพยากรณ์และสร้างสมการพยากรณ์การบริการสู่ความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ กลุ่มตัวอย่าง ได้แก่ ผู้บริหาร ผู้ฝึกสอนกีฬา หรือผู้ที่เกี่ยวข้องกับการบริหารทางการกีฬา ที่สังกัดในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ จำนวน 92 คน กำหนดกลุมตัวอยางด้วยตารางสำเร็จรูปของเครจซีและมอร์แกน โดยวิธีการสุมแบบเจาะจง เก็บรวบรวมข้อมูลด้วยแบบสอบถาม และวิเคราะห์ข้อมูลโดยการหาค่าเฉลี่ย และค่าส่วนเบี่ยงเบนแบบมาตรฐาน วิเคราะห์ความสัมพันธ์ของปัจจัยการบริหารที่ส่งผลต่อประสิทธิผล เพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ด้วยการวิเคราะห์สัมประสิทธิ์สหสัมพันธ์แบบเพียรสัน (Pearson's Correlation Coefficient) และการวิเคราะห์ถดถอยพหุคูณ (Multiple Regression Analysis) ผลการวิจัยพบว่า 1) ระดับปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในภาพรวมอยู่ในระดับมาก 2) การศึกษาความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในภาพรวมอยู่ในระดับมาก 3) ค่าสัมประสิทธิ์สหสัมพันธ์แบบเพียรสัน ระหว่างตัวแปรที่ส่งผลต่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ พบว่า มีค่าสัมประสิทธิ์สหสัมพันธ์ อยู่ระหว่าง 0.450 – 0.832 และปัจจัยการบริหารที่มีค่าสัมประสิทธิ์สหสัมพันธ์สูงสุด ได้แก่ ปัจจัยด้านคานิยมรวม และปัจจัยที่มีค่าสัมประสิทธิ์สหสัมพันธ์ต่ำสุด ได้แก่ ปัจจัยด้านกลยุทธ์ และ 4) ผลการวิเคราะห์ถดถอยพหุคูณ 4 ตัวแปร ได้แก่ ปัจจัยด้านกลยุทธ (X_1) ปัจจัยด้านระบบการปฏิบัติงาน (X_3) ปัจจัยด้านรูปแบบการบริหาร (X_4) และปัจจัยด้านคานิยมร่วม (X_7) อย่างมีนัยสำคัญทางสถิติระดับ 0.05 โดยมีค่าสัมประสิทธิ์สหสัมพันธ์พหูคูณ (R) เท่ากับ 0.864 และกำลังสองของค่าสัมประสิทธิ์สหสัมพันธ์พหูคูณ (R^2) ได้ร้อยละ 74.60 มีค่าความคลาดเคลื่อนมาตรฐานของการพยากรณ์เท่ากับ 0.380

คำสำคัญ: ปัจจัยการบริหาร, ประสิทธิผล, ความเป็นเลิศทางการกีฬา

Abstract

The objectives of this research are: 1) To analyze administrative factors that affect the effectiveness of sports for excellence at Thailand National Sports University; and 2) to identify 2) To analyze the relationship between administrative factors and sports excellence at Thailand National Sports University in the Northern Group 3) To analyze the predictive variables and create a prediction equation for services towards sports excellence at Thailand National Sports University in the Northern Group as a sample group, which includes executives, sports coaches, or people related to sports administration affiliated with Thailand National Sports University in the northern group consisting of 92 people. The sample was determined using Creasy and Morgan's ready-made tables by using the purposive random sampling method. Data were collected using a questionnaire on administrative factors affecting effectiveness for excellence in sports at Thailand National Sports University in the northern group. The data were analyzed using averages and standard deviations. Analyze the relationship between administrative factors that affect sports excellence at Thailand National Sports University in the northern group. The results of Pearson's correlation coefficient and normal multiple regression analysis (multiple regression analysis) revealed that 1) the level of administrative factors influencing the effectiveness of sports for excellence at Thailand National Sports University in the northern group is generally high. 2) studying sports excellence at the Thailand National Sports University in the northern group overall, it is at a high level. 3) Peirson's correlation coefficient between the variables that affect sports excellence at Thailand National Sports University in the northern group. The northern group found that the correlation coefficient was between 0.450 and 0.832, and the administrative factor with the highest correlation coefficient was the shared values factor, and the factors with the lowest correlation coefficients were strategic factors. 4) Results of a normal multiple regression analysis of factors affecting management and sports excellence at Thailand National Sports University in the northern group of Four variables in the Northern group have statistical significance at 0.05: Strategy (X_1), System (X_3), Style (X_4), and Shared values (X_7). The multiple correlation coefficient (R) is 0.864, and the square of the multiple correlation coefficient (R^2) is 74.60 %. The standard error of the forecast is equal to 0.380.

Keywords: Administration Factors, Effectiveness, Sport Excellence

บทนำ

การบริหารเป็นกระบวนการดำเนินกิจกรรมต่าง ๆ อย่างมีกลยุทธ์ โดยใช้ศาสตร์และศิลป์ในการนำทรัพยากรทางการบริหารที่มีอยู่นั้น รวมถึงปัจจัยแวดล้อมต่าง ๆ มาประกอบกันเพื่อแก้ปัญหาและดำเนินการให้บรรลุเป้าหมายที่กำหนดไว้อย่างมีประสิทธิภาพและประสิทธิผล องค์กรแต่ละองค์กรจึงควรมีการบริหารจัดการในองค์กรที่มีประสิทธิภาพเพื่อให้องค์กรสามารถขับเคลื่อนไปได้ตามเป้าหมายขององค์กรควบคู่กับการพัฒนาบุคลากรในองค์กร การส่งเสริมสนับสนุน และมีกระบวนการบริหารจัดการที่ดี เช่นเดียวกับการบริหารจัดการกีฬาอย่างมีประสิทธิภาพและเกิดประสิทธิผลสูงสุดในองค์กรกีฬา ต้องมาจากการบริหารจัดการในหลากหลายด้าน ซึ่งแต่ละด้านมีหน้าที่ที่แตกต่างกันออกไป จึงทำให้ผู้วิจัยสนใจว่าหน้าที่ทางการบริหารจัดการและทรัพยากรทางการบริหารจัดการนั้นส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศหรือไม่ และจะมีแนวทางในการพัฒนากีฬาเพื่อความเป็นเลิศอย่างไรให้เกิดประสิทธิภาพและประสิทธิผลสูงสุดต่อไป ซึ่งการพัฒนากีฬาเพื่อความเป็นเลิศจะพัฒนาไปได้อย่างมีประสิทธิภาพและยั่งยืนได้นั้น ตองมีกระบวนการบริหารจัดการและการเตรียมความพร้อมในหลายด้าน เชน ดานบุคลากรทางการกีฬา ทั้งผู้ฝึกสอน นักกีฬา นักวิทยาศาสตร์การกีฬา ด้านงบประมาณที่ได้รับการสนับสนุนจากภาครัฐและเอกชน ด้านสถานที่ อุปกรณ์ที่ใช้ในการฝึกซ้อม กระบวนการวางแผนการฝึกซ้อม ดังนั้นการบริหารจัดการจึงจำเป็นต่องมีปัจจัยด้านต่าง ๆ ผานกระบวนการวิธีปฏิบัติอย่างมีระบบแบบแผน มีการบริหารงานที่ชัดเจน (สุกาญจนา ศรีเขียวพงษ์ และ อัศวิน จันทรสระสม, 2564)

แผนพัฒนาการกีฬาแห่งชาติ ฉบับที่ 7 (พ.ศ. 2566 – 2570) ได้ให้ความสำคัญกับการส่งเสริมการกีฬาเพื่อพัฒนาสู่ระดับอาชีพ โดยกำหนดเป็นส่วนหนึ่งในยุทธศาสตร์ชาติ 20 ปี โดยมุ่งสร้างและพัฒนานักกีฬาของชาติ การเฟ้นหานักกีฬาที่มีความสามารถ สร้างพื้นที่และโอกาสในการแข่งขันแสดงศักยภาพด้านกีฬา นันทนาการ ซึ่งการพัฒนากีฬาเพื่อความเป็นเลิศและกีฬาอาชีพของประเทศไทยได้มีหน่วยงานหลัก ได้แก่ กระทรวงการท่องเที่ยวและกีฬา นอกจากนี้ยังมีหน่วยยงานร่วมดำเนินการที่สำคัญ ได้แก่ สมาคมกีฬา สถานศึกษา สื่อมวลชน และเอกชน เป็นต้น ซึ่งเราจะเห็นว่าในการพัฒนากีฬาเพื่อความเป็นเลิศของประเทศจำเป็นต้องวางแผนการในระยะยาวและสนับสนุนเงินงบประมาณอย่างต่อเนื่อง ซึ่งการดำเนินงานดังกล่าวมีข้อสังเกตว่า หลายโครงการและกิจกรรมที่สนับสนุนการพัฒนากีฬาเพื่อความเลิศมีผลการดำเนินงานล่าช้ากว่าแผนที่กำหนด ผลการเบิกจ่ายไม่เป็นไปตามเป้าหมาย และสถานที่ก่อสร้างสนามกีฬาบางแห่งไม่มีความเหมาะสมกับประเภทกีฬาเพื่อความเป็นเลิศ แสดงให้เห็นว่า ยังมีปัญหาบางประการที่อาจทำให้การดำเนินงานในการพัฒนากีฬาเพื่อความเป็นเลิศไม่บรรลุวัตถุประสงค์ดังที่คาดหวังไว้ (สำนักงบประมาณของรัฐสภา, 2562) ซึ่งผลการดำเนินงานการกีฬาของประเทศที่ผ่านมายังประสบปัญหาและอุปสรรคสำคัญหลายประการ อาทิ ขาดบุคลากรด้านการพลศึกษา ขาดการส่งเสริมและโครงสร้างพื้นฐานสำหรับการออกกำลังกายและการเล่นกีฬาในระดับท้องถิ่น ขาดระบบพัฒนานักกีฬาและบุคลากรกีฬาในระยะยาว บุคลากรการกีฬายังขาดความเป็นมาตรฐาน ขาดการจัดเก็บข้อมูลติดตาม และประเมินผลอย่างเป็นระบบ ขาดการดำเนินการนำแนวทางของแผนพัฒนาฯ ไปสู่การปฏิบัติอย่างเป็นรูปธรรม ตลอดจนขาดการบูรณาการทำงานของกลไกการบริหารจัดการกีฬา ซึ่งประเด็นเหล่านี้ล้วนมีความจำเป็นต้องได้รับการแก้ไขและพัฒนา (บุญเรือน ทองทิพย์, 2563) ดังนั้นการขับเคลื่อนองค์การทางการกีฬาให้บรรลุเป้าหมายหรือประสบความสำเร็จตามที่กำหนดไว้นั้นเป็นสิ่งสำคัญอย่างยิ่ง เพราะการขับเคลื่อนองค์กรจำเป็นต้องอาศัยบุคลากรที่มีคุณภาพ การพัฒนาทรัพยากรมนุษย์จึงเป็นสิ่งสำคัญลำดับต้น ๆ ขององค์กร และเพื่อให้สอดคล้องกับแนวทางการดำเนินงานของมหาวิทยาลัยการกีฬา

แห่งชาติ การพัฒนาทรัพยากรมนุษย์จึงต้องควบคู่ไปกับการพัฒนาศาสตร์ด้านอื่น ๆ ผู้วิจัยจึงเห็นว่า มหาวิทยาลัยการกีฬาแห่งชาติ เป็นสถาบันการศึกษาที่สังกัดในกระทรวงการท่องเที่ยวและกีฬา มีการจัดการเรียนการสอน การวิจัย การบริการวิชาการแก่สังคม และการทำนุบำรุงศิลปะและวัฒนธรรม แต่มีพันธกิจที่แตกต่างจากมหาวิทยาลัยอื่น คือ ส่งเสริมและพัฒนานักศึกษาให้มีศักยภาพด้านกีฬาสูงสุดของแต่ละบุคคล มุ่งเน้นให้มีการพัฒนาด้านการกีฬาควบคู่กับการศึกษา และทางมหาวิทยาลัยการกีฬาแห่งชาติมีประสิทธิภาพในการผลิตนักกีฬาไปสู่ความเป็นเลิศในด้านต่าง ๆ มากมาย จะมีการบริหารจัดการอย่างไรบ้างที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศทางการกีฬา ผู้วิจัยจึงสนใจศึกษาเกี่ยวกับปัจจัยด้านการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ซึ่งผลการศึกษาที่ได้นำมาเป็นแนวทางในการพัฒนากีฬาเพื่อความเป็นเลิศของมหาวิทยาลัยฯ อย่างมีประสิทธิภาพอันจะนำไปสู่ความสำเร็จของทางการกีฬาต่อไป

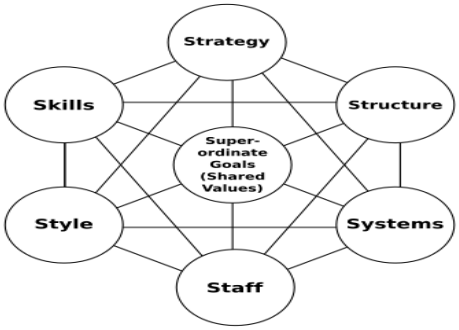
วัตถุประสงค์ของการวิจัย

1. เพื่อวิเคราะห์ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ
2. เพื่อวิเคราะห์ความสัมพันธ์ระหว่างปัจจัยการบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ
3. เพื่อวิเคราะห์ตัวแปรพยากรณ์และสร้างสมการพยากรณ์การบริการสู่ความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิดและทฤษฎีเกี่ยวกับ 7s ของแมคคินซีย (McKinsey)

แนวคิดปัจจัย 7s ของแมคคินซีย (McKinsey) เป็นกรอบแนวคิดที่ได้รับการยอมรับและนำไปใช้อย่างกว้างขวาง ซึ่งการวิเคราะห์ปัจจัย 7s ตามหลักการของแมคคินซีย (McKinsey) เป็นแนวทางในการวิเคราะห์ปัจจัยภายในองค์กร ซึ่งเป็นเครื่องมืออย่างหนึ่งที่ถูกนำมาใช้ในการวิเคราะห์การบริหารองคกรที่จะช่วยให้การบริหารองคกรมีประสิทธิผลยิ่งขึ้น ซึ่งจากการศึกษาพบว่า ความสำเร็จในการบริหารงานให้เกิดผลสัมฤทธิ์ผลนั้นขึ้นอยู่กับปัจจัยตัวแปร 7 ปัจจัย ประกอบด้วย 1) กลยุทธ (Strategy) 2) โครงสร้าง (Structure) 3) ระบบ (System) 4) รูปแบบ (Style) 5) บุคลากร (Staff) 6) ทักษะความสามารถ (Skill) 7) คานิยมรวม (Shared Values) ซึ่งปัจจัยทั้ง 7 มีความสัมพันธ์เชื่อมโยง (กฤษติญา มูลศรี, 2562) ดังภาพที่ 1



ภาพที่ 1 7S ของแมคคินซีย (McKinsey)
ที่มา: https://hmong.in.th/wiki/McKinsey_7S_Framework

ดังนั้นผู้วิจัยจึงได้นำปัจจัยการบริหารของแมคคินซียมาใช้ในการศึกษา ซึ่งมีรายละเอียดดังนี้

1. กลยุทธ (Strategy) หมายถึง กระบวนการอย่างหนึ่งที่ช่วยให้ผู้บริหารตอบคำถามที่สำคัญขององค์กรว่า ในปัจจุบันองค์กรอยู่ที่ไหนและควรเป็นอย่างไร กลยุทธ์จึงมีความสำคัญเป็นอย่างยิ่งที่ช่วยให้องค์กรกำหนดและพัฒนาข้อได้เปรียบทางการแข่งขัน สอดคล้องกับ ณัฐยา สินตระการผล (2556) กล่าวว่า กลยุทธ์ หมายถึง การสร้างและกำหนดตำแหน่งที่ชัดเจน เจาะจง และมีคุณค่าซึ่งเกี่ยวข้องกับกลุ่มของกิจกรรมหลาย ๆ กลุ่มที่แตกต่างกันไป สรุปได้ว่า กลยุทธ์ (Strategy) หมายถึง การกำหนดตำแหน่งที่ชัดเจน เป็นแนวทางให้บุคลากรภายในองค์กรรู้ถึงทิศทางในองค์กรเพื่อนำไปสู่ผลสำเร็จและวัตถุประสงค์ที่ตั้งไว้ขององค์กร

2. โครงสร้างองคกร (Structure) หมายถึง โครงสร้างที่ผู้บริหารจัดตั้งขึ้นตามกระบวนการหรือหน้าที่งานในองค์กร โดยเริ่มตั้งแต่การรับบุคลากรให้เข้ามาทำงานร่วมกันกับฝ่ายต่าง ๆ ตามหน้าที่ของงานในองค์กรที่ผู้บริหารได้วางไว้ สอดคล้องกับ Koyalkar and Gankar (2018) กล่าวว่า โครงสร้าง (Structure) คือ การจัดโครงสร้างองค์กรว่าใครรายงานต่อใคร สรุปได้ว่า โครงสร้าง หมายถึง โครงสร้างที่จัดตั้งขึ้นเพื่อกำหนดหน้าที่ความรับผิดชอบของงาน โดยมีการรับบุคลากรให้เข้ามาทำงานร่วมกันกับฝ่ายต่าง ๆ เพื่อบรรลุตามเป้าหมายของวัตถุประสงค์ที่ตั้งไว้ โครงสร้างที่ดีจะช่วยให้เกิดความคล่องตัวในการปฏิบัติงาน ลดความซ้ำซ้อน ช่วยให้บุคลากรทราบถึงขอบเขตในความรับผิดชอบและมีความสะดวกในการติดต่อประสานงาน

3. ระบบ (System) ในการปฏิบัติงานเพื่อให้บรรลุเป้าหมายตามวัตถุประสงค์ที่กำหนดไว้นอกจากการจัดโครงสร้างที่เหมาะสม และมีกลยุทธ์ที่ดีแล้วการจัดระบบการทำงานก็มีความสำคัญอย่างยิ่ง ซึ่งในทุกองค์การก็จะมีระบบงานต่าง ๆ เช่น ระบบสารสนเทศ ระบบการวางแผน ระบบงบประมาณ ระบบการจัดซื้อ สอดคลองกับ สถิตย์ กุลสอน, ยืนยง ไทยใจดี, และ ชานนท์ เศรษฐแสงศรี (2563) กล่าวว่า ระบบ คือ การนำเทคโนโลยีมาประยุกต์ใช้ในองค์การช่วยเพิ่มประสิทธิภาพในการรวบรวมข้อมูล นันทวัฒน์ พรเลิศกชกร, กานต์จิรา ลิมศิริธง, และ บุรินทร์ สันติสาส์น (2565) กล่าวว่า องค์การนำเทคโนโลยีที่ทันสมัยเข้ามาใช้ในการปฏิบัติงานช่วยสนับสนุนให้พนักงานสามารถรวบรวม ประมวลผล จัดเก็บความรู้ และแลกเปลี่ยนข้อมูลต่าง ๆ ได้อย่างสะดวกรวดเร็วมากยิ่งขึ้น สรุปได้ว่า ระบบ (System) หมายถึง กระบวนการและลำดับขั้นการปฏิบัติงานทุกอย่างที่เป็นระบบที่ต่อเนื่องสอดคล้องประสานกันทุกระดับในการปฏิบัติงาน กระบวนการขั้นตอน องคประกอบตาง ๆ ที่มีความสัมพันธกันที่แสดงให้เห็นว่าการดำเนินงานขององค์กรดำเนินเป็นไปอย่างมีคุณภาพและประสิทธิภาพ

4. รูปแบบการบริหารงาน (Style) หมายถึง แบบแผนพฤติกรรมในการปฏิบัติงานของผู้บริหารเป็นองค์ประกอบที่สำคัญอย่างหนึ่งของสภาพแวดล้อมภายในองค์กร ความเป็นผู้นำขององค์กรจะมีบทบาทที่สำคัญต่อความสำเร็จหรือล้มเหลวขององค์กร ผู้นำที่ประสบความสำเร็จต้องวางโครงสร้างองค์กรด้วยความเชื่อมโยงระหว่างความเป็นเลิศและพฤติกรรมทางจรรยาบรรณให้เกิดขึ้น สอดคล้องกับกฤษติญา มูลศรี (2562) กล่าวถึงรูปแบบพฤติกรรมการบริหารงานของผู้บริหาร นันทวัฒน์ พรเลิศกชกร และคณะ (2565) กล่าวว่า องค์การนำเทคโนโลยีที่ทันสมัยเข้ามาใช้ในการปฏิบัติงานช่วยสนับสนุนให้พนักงานสามารถรวบรวม ประมวลผล จัดเก็บความรู้ และแลกเปลี่ยนข้อมูลต่าง ๆ ได้อย่างสะดวกรวดเร็วมากยิ่งขึ้น สรุปได้ว่า รูปแบบ หมายถึง วิธี แบบแผนพฤติกรรมในการปฏิบัติงาน หรือการบริหารงานที่เหมาะสมกับลักษณะขององค์กร

5. บุคลากร (Staff) ทรัพยากรมนุษย์นับเป็นปัจจัยหนึ่งที่มีความสำคัญต่อการดำเนินงานขององค์กร องค์กรจะประสบความสำเร็จได้นั้นขึ้นอยู่กับการบริหารจัดการทรัพยากรมนุษย์ ดังนั้นองค์กรต้องสรรหาพนักงานเพื่อเข้ามาปฏิบัติหน้าที่ และต้องมีความรู้ความสามารถ มีทัศนคติที่ถูกต้องเหมาะสม สอดคล้องกับ เสาวนารถ เล็กเลอสินธุ์ (2560) กล่าวว่า บุคลากร หมายถึง ทรัพยากรมนุษย์ที่นับเป็นปัจจัยที่มีความสำคัญต่อการดำเนินงานขององค์กร การคัดเลือกบุคลากรที่มีความสามารถ การพัฒนาบุคลากรอย่างต่อเนื่อง สรุปได้ว่า บุคลากร หมายถึง บุคลากรในองค์กรที่มีความสำคัญต่อการดำเนินงานขององค์กรโดยมีทักษะความสามารถที่จะนำพาองค์กรให้ดำเนินไปอย่างมีประสิทธิภาพ

6. ทักษะความสามารถ (Skill) หมายถึง ศักยภาพขององคกรในการใชทักษะความสามารถความโดดเดน ความเชี่ยวชาญในการผลิต/ขาย/ใหบริการ สอดคล้องกับ กฤษติญา มูลศรี (2562) กล่าวว่า ทักษะฝีมือ หมายถึง ความรู้ความสามารถหรือความเชี่ยวชาญของพนักงานที่สะท้อนรวมถึงความเชี่ยวชาญขององค์กรโดยรวม นันทวัฒน์ พรเลิศกชกร และคณะ (2565) องค์การมีแผนการพัฒนาทักษะความรู้และความสามารถให้แก่พนักงานเป็นประจำ และมีกระบวนการพัฒนาที่หลากหลายส่งผลให้พนักงานนำทักษะมาใช้ในการปฏิบัติงานได้อย่างมีประสิทธิภาพ สรุปได้ว่า ทักษะความสามารถ หมายถึง ความรู้ความสมารถหรือความเชี่ยวชาญของพนักงานที่สะท้อนรวมถึงความเชี่ยวชาญขององค์กรโดยรวมและความสามารถขององค์กรในการพัฒนาทักษะพนักงาน ซึ่งพนักงานจะนำทักษะมาใช้ในการปฏิบัติงานได้อย่างมีประสิทธิภาพ

7. คานิยมรวม (Shared Value) หมายถึง คานิยมรวมในองคการ วัฒนธรรมองคกรที่องคกรจะสามารถสื่อสารคานิยมใหพนักงานใหมีความเชื่ออยางไร สอดคล้องกับ สุตาภัทร แก้วคัลณา และวิไลลักษณ์ อยู่สำราญ (2564) กล่าวว่า ค่านิยมร่วมช่วยส่งเสริมให้พนักงานร่วมกันปฏิบัติงานเพื่อผลักดันให้องค์การประสบความสำเร็จตามเป้าหมาย นันทวัฒน์ พรเลิศกชกร และคณะ (2565) องค์การปลูกฝังค่านิยมร่วมแก่พนักงานทุกคนให้มีเป้าหมายเดียวกันกับเป้าหมายขององค์การจึงส่งผลให้พนักงานสามารถปฏิบัติงานร่วมกันได้อย่างมีประสิทธิภาพ สรุปได้ว่า คานิยมรวม หมายถึง คานิยมรวมในองคการ เพื่อให้พนักงานร่วมกันปฏิบัติงานเพื่อผลักดันให้องค์การประสบความสำเร็จตามเป้าหมายที่กำหนดไว้เปนคานิยมและบรรทัดฐานที่ยึดถือรวมกัน

2. ประสิทธิผลของการบริหารกีฬาเพื่อความเป็นเลิศ

ประสิทธิผลเป็นสิ่งสำคัญสำหรับองค์การ มีความเกี่ยวพันกับผลงานหรือความสำเร็จของผลการปฏิบัติงานให้บรรลุตามเป้าหมายและวัตถุประสงค์ องค์การจะอยู่รอดและมีความมั่นคงขึ้นอยู่กับประสิทธิผลขององค์การ หากองค์การไม่สามารถดำเนินงานให้บรรลุตามเป้าหมายและวัตถุประสงค์องค์การนั้นก็จะล่มสลายไป จากแนวคิดในการประเมินประสิทธิผลของ Gibson, Ivancevich, and Donnelly. (1991) เป็นการประเมินประสิทธิผลองค์กรตามแนวทางบูรณาการ ซึ่งเป็นรูปแบบการประเมินที่ครอบคลุมและเหมาะสมสำหรับการประเมินองค์กรที่ไม่ใช่ธุรกิจ เช่น สถาบันการศึกษา ซึ่งเป็นองค์กรที่เป้าหมายที่หลากหลาย ซึ่งได้กำหนดไว้ 5 ด้าน ได้แก่ ด้านผลงาน (Production) ด้านประสิทธิภาพ (Efficiency) ด้านความพึงพอใจ (Satisfaction) ด้านความสามารถในการปรับตัว (Adaptiveness) และด้านการพัฒนา (Development) (อัษ แสนภักดี, 2558) ซึ่งการวิจัยในครั้งนี้ผู้วิจัยได้นำตัวแปรทั้ง 6 ด้าน มาประยุกต์ใช้เป็นแนวทางการประเมินผลประสิทธิผลเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ดังรายละเอียดดังต่อไปนี้

1. ด้านผลงาน (Production) เป็นความสามารถในการดำเนินงานของการบริหารกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ เช่น การจัดกิจกรรมการแข่งขันกีฬาในระดับต่าง ๆ ในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ การจัดประชุม อบรมเพื่อพัฒนาบุคลากรกีฬาภายใน การส่งนักกีฬาเข้าร่วมการแข่งขันกีฬารายการต่าง ๆ รวมทั้งการได้รับเหรียญรางวัล และการพัฒนาสถิติหรือลำดับที่ในการแข่งขันกีฬาของนักกีฬา

2. ด้านประสิทธิภาพ (Efficiency) เป็นความสามารถในการดำเนินงานของการบริหารกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ เกี่ยวกับการบริหารจัดการด้านต่าง ๆ เช่น การจัดหาและวางแผนการใช้งบประมาณ การจัดให้มีสถานที่ทำการสมาคม วัสดุและครุภัณฑ์สำนักงาน การจัดให้มีสนามกีฬา สถานที่ฝึกซ้อมและสิ่งอำนวยความสะดวกด้านกีฬาให้กับนักกีฬาอย่างเพียงพอ เหมาะสม และเกิดประโยชน์สูงสุดในการทำงาน

3. ด้านความพึงพอใจ (Satisfaction) เป็นความสามารถในการดำเนินงานของการบริหารกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ส่งผลให้บุคลากรมีความพึงพอใจ มีความสุขในการทำงานและเต็มใจที่จะทำงานให้กับสถาบัน ทำให้ความสัมพันธ์ระหว่างบุคลากรของสถาบันเป็นไปด้วยดี โดยการเปิดโอกาสให้บุคลากรมีส่วนร่วมในกิจกรรมต่าง ๆ ของสถาบัน เช่น การวางแผนการดำเนินงาน การสรรหานักกีฬา การพัฒนานักกีฬาและบุคลากรกีฬา การจัดกิจกรรมเพื่อส่งเสริมและพัฒนาการกีฬาเพื่อความเป็นเลิศในสถาบัน

4. ด้านความสามารถในการปรับตัว (Adaptiveness) เป็นความสามารถของการบริหารกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในการปรับตัวต่อการเปลี่ยนแปลงโดยปรับบทบาท วิธีการดำเนินงานให้สอดคล้องยุทธศาสตร์การพัฒนาการกีฬาของประเทศ ตามแผนพัฒนาการกีฬาแห่งชาติ นโยบายการดำเนินงานของแต่ละสถาบัน การเปลี่ยนแปลงทางเทคโนโลยีทางการกีฬา การเปลี่ยนแปลงทางเศรษฐกิจ รวมทั้งสามารถเตรียมรับปัญหาที่อาจเกิดขึ้นได้ทั้งในปัจจุบันและอนาคต (กระทรวงการท่องเที่ยวและกีฬา, 2566).

5. ด้านการพัฒนา (Development) เป็นความสามารถของการบริหารกีฬาเพื่อความเป็นเลิศในการดำเนินงานเกี่ยวกับการพัฒนาผู้บริหาร บุคลากร ผู้ฝึกสอน และนักกีฬาของมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ให้มีทักษะ ความรู้ ความสามารถ และประสบการณ์ด้านกีฬาเพิ่มมากขึ้น

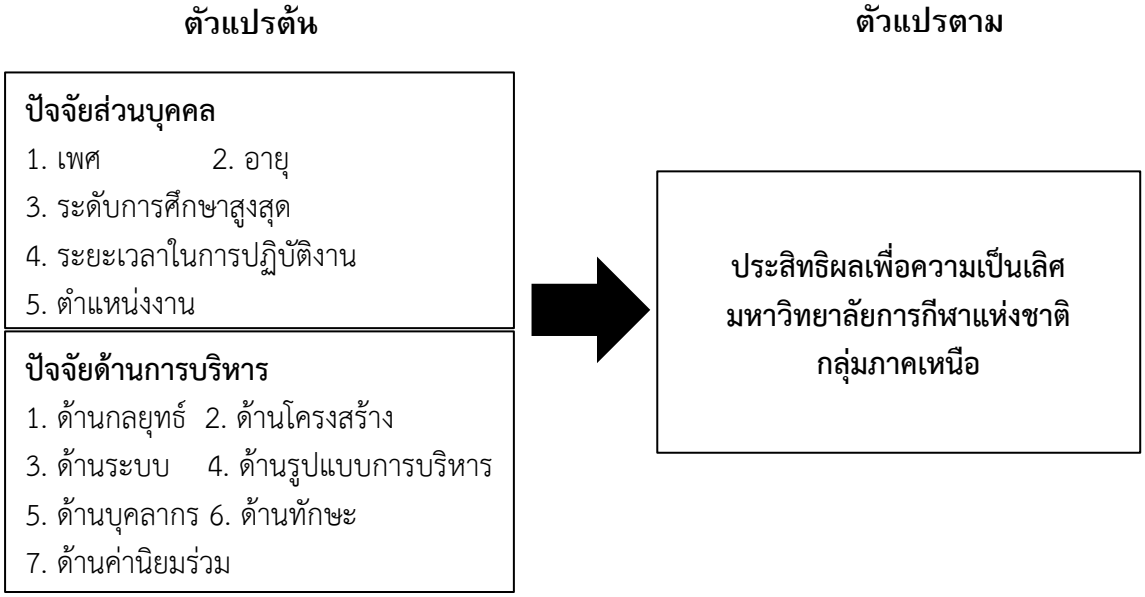
6. ด้านการอยู่รอดขององค์กร (Survival) ความสามัคคีของบุคลากรในมหาวิทยาลัยในการทำงานร่วมกัน เช่น การออกประชาสัมพันธ์กิจกรรมต่าง ๆ ในมหาวิทยาลัย ผลงานของนักกีฬาในการเข้าร่วมรายการต่าง ๆ

3. แนวคิดเกี่ยวกับกีฬาเพื่อความเป็นเลิศ

กีฬาเพื่อความเป็นเลิศ หมายถึง กีฬาสมัครเล่นที่ทำการแข่งขันทุกระดับ ได้แก่ นักเรียนระดับเยาวชน ระดับนิสิตนักศึกษา ระดับชาติ และระดับนานาชาติ (แผนพัฒนาการกีฬาแห่งชาติ ฉบับที่ 5) ในประเด็นการพัฒนาการกีฬาสู่ความเป็นเลิศนั้นอยู่ในแผนยุทธศาสตร์การพัฒนากีฬาเพื่อความเป็นเลิศและต่อยอดเพื่อความสำเร็จในระดับอาชีพ มุ่งเน้นด้านการสร้างและการพัฒนานักกีฬาของชาติให้ประสบความสำเร็จในการแข่งขันในระดับต่าง ๆ เพื่อสร้างชื่อเสียง เกียรติยศ และเกียรติภูมิของประเทศชาติให้ทัดเทียมกับนานาชาติ สามารถสร้างความภาคภูมิใจและเป็นเครื่องมือในการรวมจิตใจซึ่งจะเป็นการสร้างความรักความสามัคคีของคนในชาติ อีกทั้งยังส่งเสริมการพัฒนาต่อยอดนักกีฬาที่มีความเป็นเลิศไปสู่การกีฬาเพื่อการอาชีพอย่างเต็มตัว สามารถสร้างรายได้จากความรู้ ความสามารถ

ทักษะ และประสบการณ์ โดยจัดให้มีโครงสร้างพื้นฐานที่พร้อมรองรับการพัฒนา ประกอบกับการจัดให้มีระบบสวัสดิการช่วยเหลือ และส่งเสริมการสร้างความร่วมมือระหว่างภาครัฐและเอกชนในการร่วมพัฒนาตลอดเส้นทางอาชีพนักกีฬา โดยมีแนวทางที่สำคัญ ได้แก่ (1) การเฟ้นหาและพัฒนานักกีฬาที่มีความสามารถทางการกีฬาเพื่อความเป็นเลิศ (2) การพัฒนาบุคลากรการกีฬาอย่างเป็นระบบและมีมาตรฐานสากลเพื่อการพัฒนากีฬาเพื่อความเป็นเลิศและการอาชีพอย่างยั่งยืน (3) การสร้างและพัฒนาศูนย์บริการการกีฬาและศูนย์ฝึกกีฬาแห่งชาติที่เป็นมาตรฐาน (4) การส่งเสริมและจัดเตรียมการดูแลสวัสดิการและสวัสดิภาพของนักกีฬาและบุคลากรการกีฬา (5) การส่งเสริมและพัฒนากีฬาเพื่อการอาชีพอย่างเป็นระบบ

กรอบแนวคิดที่ใช้ในการวิจัย



ภาพที่ 2 กรอบแนวคิดที่ใช้ในการวิจัย

วิธีดำเนินการวิจัย

ประชากรและกลุ่มตัวอย่าง

ประชากร ได้แก่ ผู้บริหาร จำนวน 40 คน ผู้ฝึกสอนกีฬา หรือผู้ที่เกี่ยวข้องกับการบริหารทางการกีฬา 80 คน รวมทั้งสิ้น 120 คน ที่สังกัดในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

กำหนดกลุ่มตัวอย่างด้วยตารางสำเร็จรูปของเครจซีและมอร์แกน (Krejcie & Morgan, 1970) ที่ระดับความคลาดเคลื่อนที่ยอมรับได้ 5% และระดับความเชื่อมั่น 95% ขนาดกลุ่มตัวอย่าง จำนวน 92 คน โดยวิธีการสุ่มแบบเจาะจง (Purposive Sampling)

เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล

ผู้วิจัยใช้แบบสอบถามในการเก็บรวบรวมข้อมูลเพื่อสอบถามความคิดเห็นของผู้บริหารและฝึกสอนกีฬาหรือผู้ที่เกี่ยวข้องกับการบริหารทางการกีฬาที่มีต่อปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา แบ่งออกเป็น 3 ตอน ดังนี้

ตอนที่ 1 ข้อมูลเกี่ยวกับสภาพทั่วไปของผู้ตอบแบบสอบถาม ประกอบด้วย เพศ อายุ ตำแหน่งประสบการณ์ทำงาน และวุฒิการศึกษา โดยมีลักษณะเป็นแบบตรวจรายการ (Check List)

ตอนที่ 2 ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ แบ่งออกเป็น 7 ปัจจัย มีลักษณะเป็นมาตราส่วนประมาณค่า (Rating Scale) โดยมีเกณฑ์ในการเลือกตอบในส่วนของปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ใช้วิธีการให้คะแนนตามน้ำหนักของตัวเลือก ดังนี้

5 หมายถึง ระดับการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา อยู่ในระดับมากที่สุด
4 หมายถึง ระดับการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา อยู่ในระดับมาก
3 หมายถึง ระดับการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา อยู่ในระดับปานกลาง
2 หมายถึง ระดับการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา อยู่ในระดับน้อย
1 หมายถึง ระดับการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา อยู่ในระดับน้อยที่สุด

การเก็บรวบรวมข้อมูล

ผู้วิจัยดำเนินการเก็บรวบรวมข้อมูลโดยใช้แบบสอบถามที่สร้างขึ้นเพื่อสอบถามกลุ่มตัวอย่าง โดยจัดทำแบบสอบถามให้สอดคล้องกับกรอบแนวคิดในการวิจัย และนำไปหาคุณภาพเครื่องมือก่อนนำไปเก็บรวบรวมข้อมูลจากผู้บริหารและฝึกสอนกีฬาหรือผู้ที่เกี่ยวข้องกับการบริหารทางการกีฬามหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

การวิเคราะห์ข้อมูล

ผู้วิจัยตรวจสอบความสมบูรณ์และนำแบบสอบถามฉบับสมบูรณ์มาวิเคราะห์ข้อมูลด้วยโปรแกรมสำเร็จรูปทางสถิติโดยการดำเนินการ ดังนี้

1. ข้อมูลเกี่ยวกับสภาพทั่วไปของผู้ตอบแบบสอบถาม ประกอบด้วย เพศ อายุ ตำแหน่งประสบการณ์ทำงาน และวุฒิการศึกษา วิเคราะห์โดยใช้ค่าสถิติ ความถี่ และร้อยละ

2. วิเคราะห์ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ด้วยค่าเฉลี่ย ($\bar{X}$) และค่าส่วนเบี่ยงเบนแบบมาตรฐาน (S.D.)

3. วิเคราะห์ความสัมพันธ์ของปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ด้วยการวิเคราะห์สัมประสิทธิ์สหสัมพันธ์แบบเพียรสัน (Pearson's Correlation Coefficient) (พวงรัตน์ ทวีรัตน์, 2550) และการทดสอบภาวะร่วมเส้นตรงเชิงพหุ (Multicollinearity) ของตัวแปรพยากรณ์ ด้วยการวิเคราะห์ค่า Tolerance และ Varian Inflation Factor (VIF) ซึ่งกำหนดเกณฑ์การแปลความหมายตามเกณฑ์ของ ดังนี้ ค่า Tolerance มีค่ามากกว่า 0.1 แสดงว่า ตัวแปรพยากรณ์มีความเป็นอิสระต่อกัน และค่า Varian Inflation Factor (VIF) มีค่าน้อยกว่า 10 แสดงว่า ตัวแปรพยากรณ์มีความเป็นอิสระต่อกัน และวิเคราะห์ตัวแปรพยากรณ์ของการบริหารต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ด้วยการวิเคราะห์ถดถอยพหุคูณ (Multiple Regression Analysis)

ผลการวิจัย

1. ข้อมูลเกี่ยวกับสภาพทั่วไปของผู้ตอบแบบสอบถาม ผู้ตอบแบบสอบถามเป็นเพศชาย จำนวน 49 คน คิดเป็นร้อยละ 53.26 เพศหญิง จำนวน 43 คน คิดเป็นร้อยละ 43.74 อายุอยู่ในช่วงอายุ 25 – 35 ปี จำนวน 31 คน คิดเป็นร้อยละ 33.70 ระดับการศึกษาสูงสุด จบการศึกษาในระดับการศึกษาปริญญาโท จำนวน 51 คน คิดเป็นร้อยละ 55.43 ระยะเวลาการปฏิบัติงานในมหาวิทยาลัยการกีฬาแห่งชาติของ

ผู้ตอบแบบสอบถาม ส่วนใหญ่อยู่ที่ช่วงระยะเวลา 5 – 10 ปี จำนวน 35 คน คิดเป็นร้อยละ 38.04 และประเภทตำแหน่งงานส่วนใหญ่ คือ อาจารย์ จำนวน 45 คน คิดเป็นร้อยละ 48.91

2. ผลการศึกษาปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

ตารางที่ 1 แสดงค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐานของประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในภาพรวม

ปัจจัยด้านที่	ด้าน	n = 92		แปลผล
		$\bar{x}$	S.D.	
1	ด้านกลยุทธ (Strategy)	3.87	0.81	มาก
2	ด้านโครงสรางองคกร (Structure)	3.70	0.89	มาก
3	ด้านระบบ (System)	3.63	0.94	มาก
4	ด้านรูปแบบการบริหาร (Style)	3.71	0.95	มาก
5	ด้านบุคลากร (Staff)	3.86	0.93	มาก
6	ด้านทักษะความสามารถ (Skill)	4.07	0.62	มาก
7	ด้านคานิยมรวม (Shared Value)	3.98	0.77	มาก
รวม		**3.81**	**0.86**	**มาก**

จากตารางที่ 1 พบว่า ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในภาพรวมอยู่ในระดับมาก ($\bar{x}$ = 3.81) เมื่อพิจารณาเป็นปัจจัยรายด้าน พบว่า ปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ที่มีค่าเฉลี่ยสูงสุด คือ ปัจจัยด้านทักษะความสามารถ (Skill) อยู่ในระดับมาก ($\bar{x}$ = 4.07) รองลงมา คือ ปัจจัยด้านคานิยมรวม (Shared Value) อยู่ในระดับมาก ($\bar{x}$ = 3.98) และด้านที่มีค่าเฉลี่ยต่ำสุด ได้แก่ ปัจจัยด้านระบบ (System) ในภาพรวมอยู่ในระดับมาก ($\bar{x}$ = 3.63)

3. ผลการศึกษาความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

ตารางที่ 2 แสดงค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน ของประสิทธิผลด้านความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในภาพรวม

ด้านที่	รายการ	n = 92		แปลผล
		$\bar{x}$	S.D.	
1	ด้านผลงาน (Production)	3.45	1.10	ปานกลาง
2	ด้านประสิทธิภาพ (Efficiency)	3.44	1.01	ปานกลาง
3	ด้านความพึงพอใจ (Satisfaction)	3.51	0.98	มาก
4	ด้านความสามารถในการปรับตัว (Adaptiveness)	3.42	1.00	ปานกลาง

ด้านที่	รายการ	n = 92		แปลผล
		$\bar{x}$	S.D.	
5	ด้านการพัฒนา (Development)	3.62	0.92	มาก
6	ด้านความอยู่รอดขององค์การ (Survival)	3.63	0.90	มาก
รวม		**3.50**	**1.00**	**ปานกลาง**

จากตารางที่ 2 พบว่า ความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ในภาพรวมอยู่ในระดับมาก ($\bar{x}$ = 3.50) เมื่อพิจารณาเป็นรายด้าน พบว่า ด้านที่มีค่าเฉลี่ยสูงสุด คือ ด้านความอยู่รอดขององค์การ อยู่ในระดับมาก ($\bar{x}$ = 3.63) รองลงมา ได้แก่ ด้านการพัฒนา อยู่ในระดับมาก ($\bar{x}$ = 3.62) และด้านที่มีค่าเฉลี่ยต่ำสุด ได้แก่ ด้านความสามารถในการปรับตัว อยู่ในระดับปานกลาง ($\bar{x}$ = 3.42)

4. ผลการศึกษาความสัมพันธ์ระหว่างปัจจัยการบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

ตารางที่ 3 แสดงค่าสัมประสิทธิ์สหสัมพันธ์ระหว่างปัจจัยที่มีผลต่อการบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

ตัวแปร	X_1	X_2	X_3	X_4	X_5	X_6	X_7	Y
X_1	1							
X_2	0.832**	1						
X_3	0.738**	0.726**	1					
X_4	0.657**	0.776**	0.616**	1				
X_5	0.587**	0.562**	0.785**	0.493**	1			
X_6	0.435**	0.393**	0.522**	0.592**	0.592**	1		
X_7	0.666**	0.738**	0.780**	0.724**	0.767**	0.770**	1	
Y	0.450**	0.611**	0.713**	0.689**	0.655**	0.616**	0.793**	1

** มีนัยสำคัญทางสถิติที่ระดับ 0.01

จากตารางที่ 3 พบว่า ค่าสัมประสิทธิ์สหสัมพันธ์ของตัวแปรที่ปัจจัยการบริหารที่ส่งผลต่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ อยู่ระหว่าง 0.450 – 0.832 ตัวแปรที่มีค่าสัมประสิทธิ์สหสัมพันธ์สูงสุด ได้แก่ ปัจจัยด้านคานิยมรวม (Shared Values) (X_7) มีค่าสัมประสิทธิ์สหสัมพันธ์ เท่ากับ 0.793 อยู่ในค่อนข้างสูง มีทิศทางบวกอย่างมีนัยสำคัญทางสถิติระดับ 0.01 รองลงมา ได้แก่ ปัจจัยด้านระบบการปฏิบัติงาน (System) (X_3) มีค่าสัมประสิทธิ์สหสัมพันธ์ เท่ากับ 0.713 อยู่ในระดับค่อนข้างสูง มีทิศทางบวกอย่างมีนัยสำคัญทางสถิติระดับ 0.01 และปัจจัยด้านรูปแบบการบริหาร (Style) (X_4) มีค่าสัมประสิทธิ์สหสัมพันธ์ เท่ากับ 0.689 อยู่ในระดับค่อนข้างสูง มีทิศทางบวกอย่างมีนัยสำคัญทางสถิติระดับ 0.01 ส่วนตัวแปรที่มีค่าสัมประสิทธิ์สหสัมพันธ์ต่ำสุด ได้แก่ ปัจจัยด้านกลยุทธ (Strategy) (X_1) มีค่าสัมประสิทธิ์สหสัมพันธ์ เท่ากับ 0.450 อยู่ในระดับปานกลาง มีทิศทางบวกอย่างมี

นัยสำคัญทางสถิติระดับ 0.01 ซึ่งจะเห็นว่า ผลการศึกษาความสัมพันธ์ระหว่างปัจจัยการบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ มีความสัมพันธ์กันตามนัยสำคัญทางสถิติระดับ 0.01

5. ผลการค้นหาตัวแปรพยากรณ์และสร้างสมการพยากรณ์การบริการสู่ความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

ตารางที่ 4 แสดงผลการวิเคราะห์ความเป็นอิสระของตัวแปรพยากรณ์ ค่าสถิติ Tolerance และ Variance Inflation (VIF)

ที่	ตัวแปรพยากรณ์	Collinearity Statistics	
		Tolerance	VIF
1	ปัจจัยด้านกลยุทธ (Strategy)	0.256	3.910
2	ปัจจัยด้านโครงสรางองคกร (Structure)	0.145	6.875
3	ปัจจัยด้านระบบ (System)	0.236	4.244
4	ปัจจัยด้านรูปแบบการบริหาร (Style)	0.286	3.496
5	ปัจจัยด้านบุคลากร (Staff)	0.299	3.341
6	ปัจจัยด้านทักษะความสามารถ (Skill)	0.274	3.650
7	ปัจจัยด้านคานิยมรวม (Shared Value)	0.134	7.470

จากตารางที่ 4 พบว่า ตัวแปรพยากรณ์ทั้ง 7 ตัว มีค่า Tolerance ต่ำสุด 0.134 ซึ่งสูงกว่าเกณฑ์ขั้นต่ำที่ต้องมากกว่า 0.1 และค่า VIF มีค่าระหว่าง 3.341 - 7.470 ซึ่งมีค่าไม่เกิน 10 แสดงว่า ตัวแปรพยากรณ์แต่ละตัวมีความเป็นอิสระต่อกันจึงไม่เกิดภาวะร่วมเส้นตรงเชิงพหุ (Multicollinearity ดังนั้นข้อมูลดังกล่าวสามารถนำไปวิเคราะห์ถดถอยพหุคูณได้

ตารางที่ 5 แสดงผลการวิเคราะห์ถดถอยพหุคูณของปัจจัยที่มีผลต่อการบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ

ตัวแปรพยากรณ์	B	SE_b	β	t	Sig.
X_1 ปัจจัยด้านกลยุทธ (Strategy)	-0.495	0.114	-0.472	-4.346	0.000**
X_2 ปัจจัยด้านโครงสร้าง (Structure)	0.109	0.136	0.115	0.801	0.426
X_3 ปัจจัยด้านระบบการปฏิบัติงาน (System)	0.330	0.098	0.382	3.377	0.001**
X_4 ปัจจัยด้านรูปแบบการบริหาร (Style)	0.278	0.088	0.324	3.156	0.002**
X_5 ปัจจัยด้านบุคลากร (Staff)	0.089	0.116	0.077	0.771	0.443
X_6 ปัจจัยด้านทักษะความสามารถ (Skill)	0.020	0.154	0.014	0.132	0.895
X_7 ปัจจัยด้านคานิยมร่วม (Shared values)	0.477	0.171	0.420	2.796	0.006**
R = 0.864 R^2 = 0.746 R^2adj = 0.725 SE_{est} = 0.38063 F = 35.320					

**มีนัยสำคัญทางสถิติที่ระดับ 0.01

จากตารางที่ 5 พบว่า ปัจจัยการบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 มีจำนวน 4 ตัวแปร คือ X_1 ปัจจัยด้านกลยุทธ X_3 ปัจจัยด้านระบบการปฏิบัติงาน X_4 ปัจจัยด้านรูปแบบการบริหาร และ X_7 ปัจจัยด้านคานิยมร่วม ส่งผลต่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ โดยมีค่าสัมประสิทธิ์สหสัมพันธ์พหูคุณ (R) เท่ากับ 0.864 และกำลังสองของค่าสัมประสิทธิ์สหสัมพันธ์พหูคุณ (R^2) เท่ากับ 0.746 แสดงว่า ปัจจัยที่ส่งผลต่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ทั้ง 4 ตัว ร่วมกันพยากรณ์การบริหารกับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ได้ร้อยละ 74.60 มีค่าความคลาดเคลื่อนมาตรฐานของการพยากรณ์เท่ากับ 0.380 ซึ่งสามารถเขียนสมการพยากรณ์ในรูปคะแนนดิบ และคะแนนมาตรฐานตามลำดับ ดังนี้

$$\hat{y} = 0.432 + -0.495X_1 + 0.330X_3 + 0.278X_4 + 0.477X_7$$

$$\hat{z}_y = -0.472X_1 + 0.382X_3 + 0.324X_4 + 0.420X_7$$

อภิปรายผล

1. ผลการศึกษาระดับปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลของกีฬา เพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ พบว่า ปัจจัยการบริหารมีค่าเฉลี่ยสูงสุด คือ ปัจจัยด้านทักษะความสามารถ อยู่ในระดับมาก ทั้งนี้ มาจากการที่บุคลากรในมหาวิทยาลัยการกีฬาแห่งชาติ มีทักษะความรู้ความสามารถและความเชี่ยวชาญทางการกีฬา และมหาวิทยาลัยฯ ส่งเสริมให้บุคลากรเน้นทักษะความสามารถในเรื่องกีฬาที่แต่ละคนถนัดได้แสดงออกมาในตำแหน่งหน้าที่ที่ตนเองรับผิดชอบให้มีประสิทธิผลและเกิดประสิทธิภาพมากที่สุด สอดคล้องกับ อัษ แสนภักดี (2558) ได้ทำการศึกษารูปแบบของปัจจัยด้านการบริหารที่ส่งผลต่อประสิทธิผลของกีฬาเพื่อความเป็นเลิศในสถาบันอุดมศึกษาของรัฐ ซึ่งจากงานวิจัยพบว่า สถาบันอุดมศึกษาของรัฐที่ประสบความสำเร็จตามประสิทธิผลด้านบุคลากร ต้องประกอบไปด้วย ความเพียงพอของจำนวนเจ้าหน้าที่ผู้ปฏิบัติงานด้านกิจกรรมกีฬา บุคลากรที่มีความรู้และความชำนาญทางด้านกีฬา วิทยาศาสตร์และเทคโนโลยีทางการกีฬา มีความมุ่งมั่นกระตือรือร้นในการปฏิบัติงาน มีมนุษยสัมพันธ์ที่ดี มีการเข้าร่วมสัมมนาหรืออบรมเพื่อเพิ่มความรู้และประสบการณ์เกี่ยวกับกีฬาเพื่อความเป็นเลิศ ผู้ฝึกสอนกีฬาในแต่ละชนิดกีฬามีความรู้ความสามารถตรงตามชนิดกีฬา และมีความเป็นมืออาชีพ ผู้จัดการทีมกีฬาหรืออาจารย์ที่ปรึกษามีความรับผิดชอบ ดูแลเอาใจใส่ ติดตามช่วยเหลือนักกีฬาเป็นอย่างดี และจำนวนนักกีฬาที่พร้อมแสดงความสามารถ สอดคล้องกับ อัครกิตติ์ พัฒนสัมพันธ์ (2565) ศึกษาประสิทธิภาพตามแนวคิด 7s ของ Mckinsey กรณีศึกษาบริษัทเอกชนแห่งหนึ่งในนิคมอุตสาหกรรมเวลโกรว์ อำเภอบางประกง จังหวัดฉะเชิงเทรา พบว่า บริษัทเน้นทักษะในเรื่องการบริหารพนักงานให้สามารถปฏิบัติงานในตำแหน่งหน้าที่ของตนที่รับผิดชอบให้มีประสิทธิภาพมากที่สุด และปัจจัยทางการบริหารที่มีค่าเฉลี่ยต่ำสุด คือ ปัจจัยด้านระบบ ทั้งนี้อาจมาจากการวางระบบสารสนเทศ ระบบการวางแผน ระบบงบประมาณ ระบบการจัดซื้อ หากว่าองค์กรมีระบบงานที่ยังไม่ชัดเจนจะส่งผลต่อระบบการทำงานในหลายส่วน สอดคล้องกับ ศราวุฒิ อารีราษฎร (2561) กล่าวถึงการจัดทำระบบข้อมูลและสารสนเทศของชมรมกีฬาทางน้ำ เช่น การจัดทำเว็บไซต์ การจัดทำข้อมูลนักกีฬา การจัดทำสถิติต่าง ๆ ที่เกี่ยวข้องกับกีฬาทางน้ำประจำทุก ๆ ปี ในด้านบุคลากรควรมีการบูรณาการสร้างเครือข่ายความร่วมมือกับหน่วยงานที่เกี่ยวข้องด้านกีฬาในการสร้างและพัฒนาด้านบุคลากรกีฬาของจังหวัดอย่างต่อเนื่อง สอดคล้องกับ สุกาญจนา ศรีเขียวพงษ์ และ อัศวิน จันทรสระสม (2564) ที่ศึกษาแนวทางการบริหาร

จัดการด้านการพัฒนากีฬาเพื่อความเป็นเลิศของเมืองกีฬา จังหวัดชลบุรี โดยได้สำรวจความคิดเห็นของนักกีฬาและผู้ฝึกสอนกีฬาที่มีต่อสภาพปัญหาปัจจุบัน พบว่า ควรมีระบบและกลไกการจัดสวัสดิการอย่างเป็นระบบ รวมไปถึงระบบและกลไกการบริหารงบประมาณที่ชัดเจน และครอบคลุมปฏิทินการแข่งขันกีฬา

2. ผลการศึกษาด้านความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ พบว่า ด้านที่มีค่าเฉลี่ยสูงสุด คือ ด้านความอยู่รอดขององค์การ (Survival) อยู่ในระดับมาก ทั้งนี้ มาจากการที่มหาวิทยาลัยการกีฬาแห่งชาติ เป็นสถาบันการศึกษาที่ให้ความสำคัญกับกีฬา โดยมีวิสัยทัศน์ “สถาบันการศึกษาคุณภาพด้านศาสตร์การกีฬาในภูมิภาคอาเซียน” ซึ่งแสดงให้เห็นว่า บุคลากรและนักศึกษาในสถาบันมีผลงานที่ได้รับการยอมรับ และเป็นที่พึงพอใจให้กับสถาบัน รวมทั้งตัวนักศึกษาเอง สอดคล้องกับงานวิจัยของ อัษ แสนภักดี (2558) กล่าวว่า ระบบบริหารจัดการสถาบันมีมาตรฐานและความมั่นคง บุคลากรมีความสามัคคี ร่วมมือร่วมใจทำงาน กิจกรรมของสถาบัน ๆ มีการประชาสัมพันธ์ตามสื่อต่าง ๆ และได้รับความสนใจจากนิสิตนักศึกษาและบุคลากร ได้รับการสนับสนุนจากองค์กรหรือหน่วยงานต่าง ๆ ภายในมหาวิทยาลัย ในเรื่องผลงานพบว่า นักกีฬาได้รับรางวัลหรือได้รับการเชิดชูยกย่องจากสถาบันเป็นที่ยอมรับและเป็นที่พอใจของนิสิตนักศึกษาและบุคลากรในสถาบัน และสามารถสร้างชื่อเสียงให้สถาบันทำให้นิสิตนักศึกษาและบุคลากรสนใจกีฬามากขึ้นซึ่งมีผลต่อความผูกพันและความภูมิใจต่อสถาบันของนิสิตนักศึกษาและบุคลากร และสถาบันมีเครือข่ายองค์กรกีฬาเพื่อพัฒนากีฬาเพื่อความเป็นเลิศของสถาบันแบบเป็นทางการและไม่เป็นทางการ และด้านที่มีค่าเฉลี่ยต่ำสุด ได้แก่ ด้านความพึงพอใจเป็นความสามารถในการดำเนินงานของการบริหารกีฬาเพื่อความเป็นเลิศในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ ส่งผลให้บุคลากรมีความพึงพอใจ มีความสุขในการทำงาน และเต็มใจที่จะทำงานให้กับสถาบันทำให้ความสัมพันธ์ระหว่างบุคลากรของสถาบันเป็นไปด้วยดี โดยการเปิดโอกาสให้บุคลากรมีส่วนร่วมในกิจกรรมต่าง ๆ ของสถาบัน เช่น การวางแผนการดำเนินงาน การสรรหานักกีฬาการพัฒนานักกีฬาและบุคลากรกีฬา การจัดกิจกรรมเพื่อส่งเสริมและพัฒนาการกีฬาเพื่อความเป็นเลิศในสถาบัน ซึ่งอาจมาจากการที่มีการปรับเปลี่ยนผู้บริหารส่งผลให้การทำงานในด้านต่าง ๆ ไม่ต่อเนื่อง และไม่เป็นไปตามแผนที่วางไว้

3. ผลการศึกษาความสัมพันธ์ระหว่างปัจจัยการบริหารกับประสิทธิผลเพื่อความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ โดยใช้สถิติวิเคราะห์ถดถอยพหุคูณ (Multiple Regression Analysis) ผลการวิเคราะห์ข้อมูลจะเห็นว่า ปัจจัยการบริหารมีความสัมพันธ์กับความเป็นเลิศทางการกีฬาในมหาวิทยาลัยการกีฬาแห่งชาติ กลุ่มภาคเหนือ จำนวน 4 ปัจจัย ได้แก่ ปัจจัยด้านกลยุทธ (Strategy) ปัจจัยด้านระบบการปฏิบัติงาน (System) ปัจจัยด้านรูปแบบการบริหาร (Style) และปัจจัยด้านคานิยมร่วม (Shared values) อยู่ในระดับมาก โดยมีค่าสัมประสิทธิ์สหสัมพันธ์พหูคูณ (R) เท่ากับ 0.864 และสามารถร่วมกันพยากรณ์ได้ร้อยละ 74.60 (R^2 = 0.746) อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 ซึ่งสอดคล้องกับ นันทวัฒน์ พรเลิศกชกร และคณะ (2565) ได้ทำการศึกษาปัจจัยการบริหารจัดการตามแนวคิด 7S ของแมคคินซีย์ที่ส่งผลต่อการเป็นองค์การแห่งการเรียนรู้ของธุรกิจโรงแรมในประเทศไทย ผลการวิจัยพบว่า 1) กลยุทธ์องค์การต้องกำหนดยุทธศาสตร์ให้สอดคล้องกับโครงสร้างและด้านอื่น ๆ ในองค์การ โดยต้องวิเคราะห์สภาพแวดล้อมในปัจจุบันและวางแผนการปฏิบัติงานให้เหมาะสมกับสถานการณ์ที่เกิดขึ้น 2) ระบบองค์การต้องนำเทคโนโลยีที่ทันสมัยเข้ามาใช้ในการติดต่อสื่อสาร การเก็บรวบรวมความรู้ การประมวลผล การสืบค้น และแลกเปลี่ยนข้อมูลต่าง ๆ เพื่อเพิ่มประสิทธิภาพ

การปฏิบัติงานให้สูงยิ่งขึ้น 3) รูปแบบการบริหาร ผู้บริหารต้องสร้างแรงจูงใจให้พนักงานเกิดความกระตือรือร้นในการปฏิบัติงานอย่างสร้างสรรค์ และให้ความสำคัญกับการเรียนรู้ การแก้ไขปัญหาร่วมกัน รวมถึงการให้คำปรึกษาแก่พนักงานอย่างเป็นกันเอง 4) ค่านิยมร่วม องค์การต้องปลูกฝังค่านิยมขององค์การแก่พนักงานให้เป็นหนึ่งเดียวกัน ซึ่งจะทำให้พนักงานปฏิบัติงานร่วมกันได้อย่างมีประสิทธิภาพและมีความทุ่มเทในการปฏิบัติงานเพื่อความสำเร็จขององค์การ สอดคล้องกับ ปัณฑารีย์ ฟองแพร (2559) ศึกษาปัจจัยที่มีผลต่อการพัฒนาองค์กรให้มีศักยภาพการทำงานสูง กรณีศึกษาธนาคารยูโอบี ผลการวิจัยพบว่า ปัจจัยด้านค่านิยมร่วม ปัจจัยด้านกลยุทธ์และยุทธศาสตร์ ด้านทักษะความสามารถ ด้านระบบมีความสัมพันธ์กับการพัฒนาองค์กรให้มีศักยภาพการทำงานสูงของพนักงานที่ปฏิบัติงานในธนาคารยูโอบีตามลำดับ

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. งานวิจัยในครั้งนี้ใช้เป็นแนวทางในการบริหารจัดการองค์กรทางการกีฬาไม่ว่าจะเป็นในส่วนของภาครัฐและภาคเอกชน ซึ่งจะทำให้เห็นว่า การบริหารจัดการองค์กรที่ดีจะส่งผลความสำเร็จที่เป็นเลิศขององค์กร และจะเป็นประโยชน์ในการพัฒนาการบริหารจัดการกีฬาในประเทศ พัฒนาไปสู่การขับเคลื่อนอุตสาหกรรมทางการกีฬาของประเทศต่อไป

2. งานวิจัยในครั้งนี้ ผู้วิจัยเก็บรวมรวมข้อมูลในช่วงที่มีการเปลี่ยนแปลงการบริหารของมหาวิทยาลัยการกีฬาแห่งชาติ ทำให้ผลการศึกษาแต่ละวิทยาเขตมีผลที่แตกต่างกันในด้านการบริหาร ดังนั้นผู้ที่จะนำผลการวิจัยไปใช้ต้องคำนึงถึงข้อจำกัดที่เกี่ยวข้องกับข้อมูลดังกล่าว เพราะเป็นมุมมองของผู้บริหาร บุคลากรในมหาวิทยาลัยฯ ของตนเอง

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1. ควรมีการศึกษาปัจจัยการบริหารในด้านอื่น ๆ ที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา โดยอาจเปลี่ยนตัวแปรอื่น ๆ เพื่อนำมาพัฒนาปัจจัยด้านการบริหารจัดการกีฬาต่อไป

2. ควรศึกษาปัจจัยการบริหารที่ส่งผลต่อประสิทธิผลเพื่อความเป็นเลิศทางการกีฬา ในสถาบันอุดมศึกษาอื่น ๆ เช่น มหาวิทยาลัยในภาคเอกชน เป็นต้น เพื่อเป็นแนวทางในการพัฒนาปัจจัยการบริหารเพื่อความเป็นเลิศทางการกีฬาเกิดประสิทธิภาพและประสิทธิผลสูงสุดต่อไป

เอกสารอ้างอิง

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การจัดการท่องเที่ยวเชิงวัฒนธรรมอุทยานประวัติศาสตร์ จังหวัดสุโขทัยกับบูโรบูดูร์ (บุโรพุทโธ) จังหวัดชวากลางประเทศอินโดนีเซีย

Historical Tourism Management between Sukhothai Historical Park in Sukhothai, and Borobudur of in Java, Indonesia

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บทคัดย่อ

การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาแนวทางการบริหารจัดการการท่องเที่ยวเชิงวัฒนธรรมภายใต้บริบทการเป็นเมืองมรดกโลก จากแนวคิดของผู้มีส่วนเกี่ยวข้องในการจัดการท่องเที่ยวบูโรบูดูร์ (บุโรพุทโธ) และอุทยานประวัติศาสตร์สุโขทัย ในประเด็น 4 ด้าน คือ ด้านการบริหารจัดการพื้นที่ ด้านการจัดการสิ่งแวดล้อม ด้านสินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจ และด้านกิจกรรมส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรม

อีกทั้งเพื่อนำต้นทุนทางวัฒนธรรมที่มีอยู่ในชุมชนมาเพิ่มมูลค่าทางเศรษฐกิจให้แก่คนในชุมชนรอบอุทยานประวัติศาสตร์สุโขทัย โดยเป็นการวิจัยเชิงคุณภาพ ใช้แบบสัมภาษณ์ สัมภาษณ์ผู้มีส่วนเกี่ยวข้องกับการบริหารจัดการและนักท่องเที่ยวของเมืองมรดกโลกทั้งสองแห่ง รวมทั้งใช้การสนทนากลุ่มเพื่อหาแนวทางเชิงนโยบายในการบริหารจัดการการท่องเที่ยวเชิงวัฒนธรรม ภายใต้บริบทการเป็นเมืองมรดกโลกของอุทยานประวัติศาสตร์สุโขทัย

ผลการวิจัยพบว่า การเปรียบเทียบการบริหารจัดการระหว่างอุทยานประวัติศาสตร์สุโขทัยกับบุโรพุทโธนั้น แบ่งเป็น 4 ด้าน ได้แก่

ด้านที่ 1 ด้านการบริหารจัดการพื้นที่ต่างก็ได้รับการสนับสนุนจากรัฐบาลแต่แตกต่างกันในด้านการแบ่งรูปแบบการบริหารจัดการ การบริหารจัดการพื้นที่ของอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธมีความแตกต่างกันในด้านของการบริหารงานอุทยานประวัติศาสตร์สุโขทัยจะยังไม่เป็นเอกเทศ ทั้งนี้จังหวัดสุโขทัยเป็นจังหวัดเล็ก ๆ ขึ้นอยู่กับหน่วยงานในกำกับหลายส่วนตามลำดับชั้น ในขณะที่บุโรพุทโธมีการแบ่งส่วนในการบริหารจัดการพื้นที่แบบประสานความร่วมมือของ 3 ภาคส่วน

ด้านที่ 2 ด้านสินค้าที่ระลึกสร้างมูลค่าเพิ่มทางเศรษฐกิจ พบว่า ในส่วนของอุทยานประวัติศาสตร์สุโขทัยมีการจัดระเบียบการจำหน่ายสินค้าที่ระลึกได้ดี มีจุดจำหน่ายสินค้าที่ระลึกบริเวณพื้นที่ของตนเองและไม่มีพ่อค้าแม่ค้ามารุมแย่งเสนอขายสินค้าทั้งภายในและภายนอก อีกทั้งมีการพัฒนาสินค้าที่ระลึกตามอัตลักษณ์ของชุมชน ซึ่งได้รับการยอมรับในระดับประเทศ

ด้านที่ 3 ด้านการจัดการสิ่งแวดล้อมมีความเหมือนกันตรงที่มีการรณรงค์และรักษาสิ่งแวดล้อมและมีนโยบายในการดูแลรักษาบริเวณสถานที่ท่องเที่ยวหลายจุด แตกต่างกันตรงความร่มรื่นของต้นไม้ที่ปลูกบริเวณบุโรพุทโธจะมีน้อยกว่าอุทยานประวัติศาสตร์สุโขทัย

ด้านที่ 4 ด้านกิจกรรมส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรม เหมือนกันตรงที่เมืองมรดกโลกทั้งสองแห่งต่างก็ได้รับการส่งเสริมสนับสนุนในการจัดกิจกรรมจากทั้งหน่วยงานภาครัฐและเอกชนในการดำเนินกิจกรรมต่าง ๆ รวมถึงมีประเพณีทางวัฒนธรรมและศาสนาที่ได้รับความนิยมจากทั้งชาวไทยและต่างชาติ โดยมีความแตกต่างกันตรงบุโรพุทโธจะมีกิจกรรมส่งเสริมการท่องเที่ยวภาคกลางคืนที่มีความหลากหลายมากกว่าอุทยานประวัติศาสตร์สุโขทัย ทั้งนี้ จากผลจากศึกษาสามารถนำไปสร้างแนวทางการบริหารจัดการการท่องเที่ยวให้แก่อุทยานประวัติศาสตร์สุโขทัยที่ดีให้มีประสิทธิภาพต่อไป

คำสำคัญ: การจัดการท่องเที่ยวเชิงวัฒนธรรม, อุทยานประวัติศาสตร์สุโขทัย, บุโรพุทโธ

Abstract

The objective of this research was to study the policy guidelines for cultural tourism management under the context of a World Heritage city from the ideas of stakeholders in Borobudur Tourism (Borobudur) and Sukhothai Historical Park. In four issues: area management Environmental management Souvenir products to create added economic value and tourism promotion activities. tradition and culture

This also aimed to bring the cultural costs that exist in the community to add economic value to the people in the communities surrounding the Sukhothai Historical Park. This was qualitative research and use by interviewing form with management stakeholders and tourists of the two World Heritage cities Use focus groups to find policy guidelines for managing cultural tourism within the context. Being a World Heritage City of Sukhothai Historical Park.

The results were as follows. The comparison of the four parts of management between Sukhothai Historical Park and Borobudur was found as follows.

Firstly, So that the area can be acquired by many governments, but there is still a model that can be used in the area of historic archaeological sites Sukhothai and Borobudur first occurred together as possible. The management of Sukhothai history will not be independent, however, Sukhothai is a small province. and control over many areas in a hierarchical manner, while Borobudur still has parts of this area. Coordinate cooperation of 3 sectors

Thirdly, environmental management was similar in terms of a littering campaign by regular cutting tree branches and providing trash cans in the tourist spots. However, the difference was that the shade of trees planted in Borobudur area was less than the Sukhothai Historical Park.

Fourth, tourism promotion activities tradition and culture were similar. The two World Heritage cities was encouraged to organize activities from both the public and

private sectors to carry out various activities including the cultural and religious traditions that were popular with both Thai and foreigners. The difference was that Borobudur had more variety of night tourism promotion activities than Sukhothai Historical Park. Moreover, the results of this study can be applied to create better and more efficient tourism management guidelines for the Sukhothai Historical Park.

Keywords: Historical Tourism Management, Sukhothai Historical Park, Borobudur

บทนำ

ในปัจจุบันประเทศไทยมีแหล่งท่องเที่ยงเชิงวัฒนธรรมอยู่เป็นจำนวนมาก และกระจายอยู่ทั่วภูมิภาคของประเทศไทย ทั้งนี้ด้วยการที่ทั้งภาครัฐและเอกชนได้ส่งเสริมและให้ความสำคัญกับการท่องเที่ยวเชิงวัฒนธรรมในประเทศไทยมากขึ้น และได้มีการกำหนดแผนการพัฒนาไว้ในระดับนโยบายดังที่แผนแม่บทภายใต้ยุทธศาสตร์ชาติ 5 ประเด็นการท่องเที่ยว (พ.ศ. 2561 – 2581) (กระทรวงการท่องเที่ยวและกีฬา, 2561) กล่าวว่า การท่องเที่ยวเชิงสร้างสรรค์และวัฒนธรรม คือ การสร้างสรรค์คุณค่าสินค้าและบริการการท่องเที่ยว มุ่งเน้นการใช้องค์ความรู้และนวัตกรรมผนวกกับจุดแข็งในด้านความหลากหลายทางทรัพยากรธรรมชาติ วัฒนธรรม และวิถีชีวิต เพื่อสร้างคุณค่าให้กับสินค้าและบริการด้านการท่องเที่ยวที่ตอบสนองพฤติกรรมความต้องการนักท่องเที่ยว และสร้างทางเลือกของประสบการณ์ใหม่ ๆ ให้กับนักท่องเที่ยว

ซึ่งเห็นว่าการท่องเที่ยวเชิงวัฒนธรรมในประไทยนั้น กำลังได้รับการพัฒนาไปอีกขั้น อันเนื่องมาจากประเทศไทยเป็นที่ตั้งของสถานที่สำคัญทางวัฒนธรรมอันเป็นมรดกอันล้ำค่าของชาติที่สำคัญ ทั้งในระดับท้องถิ่นและในระดับประเทศนับเป็นต้นทุนให้เกิดคุณค่าทางสังคม อีกทั้งช่วยเพิ่มมูลค่าทางเศรษฐกิจให้แก่ประเทศนั้น ๆ ได้เป็นอย่างดีนั้นก็คือ การที่ยูเนสโก้ได้ขึ้นทะเบียนให้หลาย ๆ ประเทศในประชาคมอาเซียนเป็นเมืองมรดก สำหรับประเทศไทยนั้นในปัจจุบันมีมรดกโลกทางวัฒนธรรมจำนวน 4 แห่ง โดยจังหวัดสุโขทัยก็เป็นจังหวัดหนึ่งที่ได้รับการประกาศให้เป็นเมืองมกดกโลก ในการประชุม ณ กรุงคาร์เธจ ประเทศตูนีเซีย เมื่อวันที่ 12 ธันวาคม พ.ศ. 2534 ซึ่งคณะกรรมการมรดกโลกแห่งอนุสัญญาว่าด้วยการคุ้มครองมรดกโลกทางวัฒนธรรมและทางธรรมชาติได้ประกาศให้อุทยานประวัติศาสตร์สุโขทัย ศรีสัชนาลัยและกำแพงเพชรเป็นมรดกโลก (กรมประชาสัมพันธ์, 2566) จึงส่งให้จังหวัดสุโขทัยเป็นเมืองมรดกโลกอันทรงคุณค่านับแต่บัดนั้นมา โดยครอบคลุมพื้นที่ชุมชนบ้านเมืองเก่า อำเภอเมือง จังหวัดสุโขทัย ซึ่งเป็นชุมชนที่ตั้งอยู่ใกล้อุทยานประวัติศาสตร์สุโขทัยมากที่สุด และด้วยชุมชนดังกล่าวยังเป็นชุมชนที่มีวิถีชีวิตเรียบง่ายถึงแม้จะอยู่ในเขตอำเภอเมืองก็ตาม แต่ยังคงเอกลักษณ์แห่งสถาปัตยกรรม ประเพณี สังคม ตลอดจนศิลปะและวัฒนธรรมภายในพื้นที่ตั้งแต่อดีตปรากฏร่องรอยมาจวบจนปัจจุบัน ดังนั้นจึงนับได้ว่าพื้นที่ดังกล่าวควรค่าแก่การศึกษา สืบสาน และรักษา อีกทั้งเพื่อเป็นการต่อยอดในการนำมรดกทางวัฒนธรรมที่ทรงคุณค่ามาพัฒนาเป็นแหล่งท่องเที่ยวที่ยั่งยืน

ทั้งนี้ หากเปรียบเทียบกับเมืองมรดกโลกอีกแห่งในประเทศอาเซียนนั่นก็คือ บูโรบูดูร์หรือกลุ่มวัดบุโรพุทโธเมืองชวากลาง ประเทศอินโดนีเซีย ซึ่งเป็นเมืองมรดกโลกที่ได้รับการยอมรับจากหลาย ๆ ประเทศว่า มีการบริหารจัดการพื้นที่ได้เป็นอย่างดี โดยมีการแบ่งการดูแลเป็น 3 ภาคส่วน คือ จากรัฐบาล หน่วยงานเอกชน และหน่วยงานท้องถิ่นและชุมชน ดังที่ นิติบัญญัติ คณะกรรมาธิการการกีฬาวุฒิสภา (2557) กล่าวไว้ในรายงานการศึกษาดูงานประเทศสมาชิกอาเซียนของรัฐสภา ณ บุโรพุทโธ ว่า สถูปบุโร

พุทโธ เป็นโบราณสถานเกี่ยวกับพุทธศาสนา ซึ่งมีการจัดระเบียบพื้นที่แหล่งท่องเที่ยวอย่างมีประสิทธิภาพ โดยพบว่า ไม่อนุญาตให้ตั้งร้านค้าหรือร้านจำหน่ายของที่ระลึกในบริเวณโบราณสถานดังกล่าว เพื่อเป็นการสร้างความสวยงามและความเป็นระเบียบเรียบร้อยในแหล่งท่องเที่ยว ดังนั้นรัฐบาลไทย โดยกระทรวงวัฒนธรรมควรนำแนวทางการจัดระเบียบแหล่งท่องเที่ยวทางโบราณสถาน และวัฒนธรรมของรัฐบาลอินโดนีเซียมาเป็นต้นแบบการจัดการ ประกอบกับการที่บุโรพุทโธแม้จะเคยเผชิญกับเหตุการณ์น้ำท่วมและแผ่นดินไหวแต่ก็ได้รับการฟื้นฟูและแบ่งการบริหารจัดการที่ชัดเจน โดยมีการแบ่งพื้นที่การดูแลเป็น 3 ส่วน คือ การบริหารจัดการดูแลโบราณสถานอยู่ภายใต้กระทรวงศึกษาธิการและกระทรวงวัฒนธรรม การบริหารจัดการเชิงกายภาพ จำหน่ายตั๋ว ประชาสัมพันธ์ และรักษาความปลอดภัยภายใต้การดูแลของบริษัทเอกชน การบริหารจัดการบริเวณรอบนอกมีการบริหารจัดการภายใต้การดูแลของชุมชนและภาคท้องถิ่น โดยทั้งสามภาคส่วนมีการประสานงาน แบ่งหน้าที่กันชัดเจนในการดูแลพื้นที่บุโรพุทโธ ซึ่งจากที่กล่าวมาจึงเห็นได้ว่า บุโรพุทธโธมีแนวทางในการบริหารจัดการพื้นที่ได้ค่อนข้างดี

ดังนั้นผู้วิจัยจึงสนใจที่จะศึกษาการบริหารจัดการพื้นที่และบริเวณโดยรอบของบูโรบูดูร์ เพื่อนำแนวทางมาเป็นกรณีศึกษาในพัฒนาการบริหารจัดการอุทยานประวัติศาสตร์สุโขทัยอันเป็นมรดกทางวัฒนธรรม เพื่อสืบสาน คงอยู่ ต่อยอดโบราณสถานอันวิจิตรงดงามของประเทศไทยสืบไป

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาแนวทางการบริหารจัดการการท่องเที่ยวเชิงวัฒนธรรม ภายใต้บริบทการเป็นเมืองมรดกโลกในการจัดการท่องเที่ยวบูโรบูดูร์ (บุโรพุทโธ) และอุทยานประวัติศาสตร์สุโขทัย

แนวคิด ทฤษฎี กรอบแนวคิด

ผู้วิจัยได้ศึกษาค้นคว้าแนวคิด ทฤษฎี และงานวิจัยที่เกี่ยวข้องเพื่อเป็นกรอบในการวิจัยดังนี้

ทัศนีย์ ปิยะเจริญ (2564) กล่าวว่า การจัดการการท่องเที่ยว หมายถึง การวางแผนการท่องเที่ยวและดำเนินการให้เป็นไปตามแผนโดยมีการจัดการบริหารงานบุคคล การอำนวยการ และควบคุมอย่างเหมาะสมเพื่อให้เป็นไปตามแผนที่ได้วางไว้ การจัดการการท่องเที่ยวที่ควรจะดำเนินการในความรับผิดชอบของหน่วยงานที่ดูแลสถานที่ท่องเที่ยวนั้น มีอยู่ 5 ภารกิจหลัก ดังนี้

1. การโฆษณาและประชาสัมพันธ์ หน่วยงานที่รับผิดชอบในด้านการจัดการแหล่งท่องเที่ยว ควรมีบทบาทในการเผยแพร่ประชาสัมพันธ์แหล่งท่องเที่ยวให้สาธารณะชนได้รับรู้และทราบให้มากที่สุด
2. การสำรวจข้อมูลเกี่ยวกับทรัพยากรการท่องเที่ยว เป็นการสำรวจหาข้อมูลในแหล่งท่องเที่ยวที่มีอยู่ในพื้นที่เพื่อเป็นข้อมูลในการประชาสัมพันธ์แหล่งท่องเที่ยวในพื้นที่
3. การปรับปรุงและพัฒนาแหล่งท่องเที่ยว เป็นการจัดทำแผนงานโครงการ เพื่อปรับปรุงและพัฒนาแหล่งท่องเที่ยวให้เป็นที่ประทับใจของนักท่องเที่ยว
4. การบริหารแหล่งท่องเที่ยว เป็นการกำหนดแนวทางในการบริหารจัดการแหล่งท่องเที่ยวในพื้นที่อย่างเหมาะสมและเกิดประโยชน์สูงสุด
5. การรักษาความปลอดภัยในแหล่งท่องเที่ยว เป็นการวางระบบในการดูแลรักษาระบบความปลอดภัยให้แก่นักท่องเที่ยวที่เข้ามาในพื้นที่รับผิดชอบ

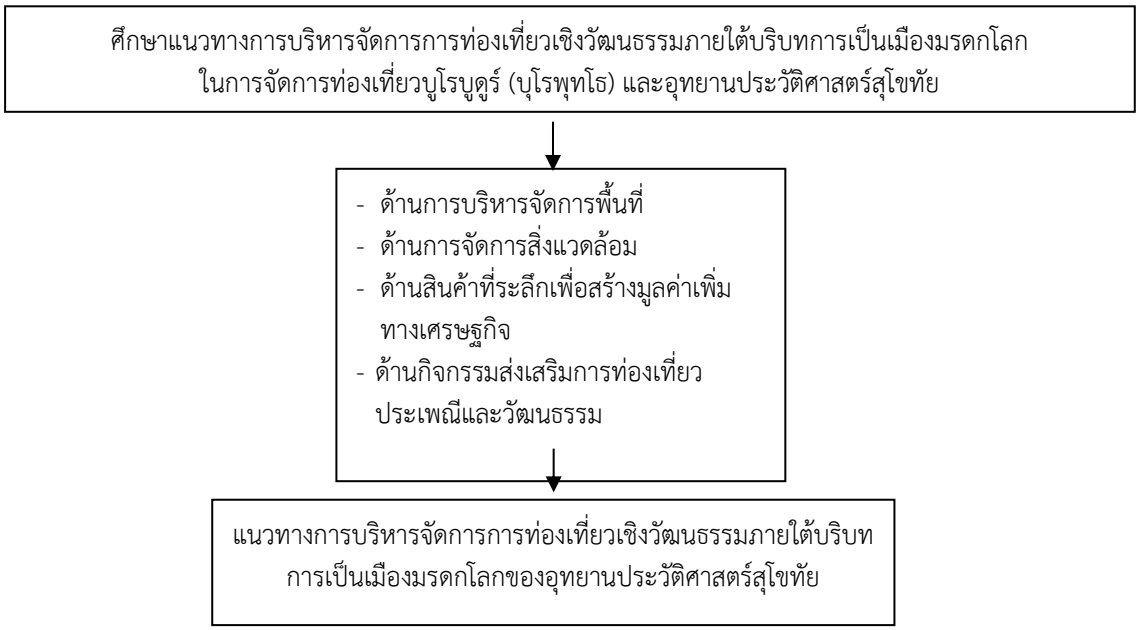
ภณสิทธ์ อ้นยะ (2561) กล่าวว่า การบริหารจัดการแหล่งท่องเที่ยวในประเทศไทยนั้น โดยทั่วไปแล้วมีรูปแบบการบริหารจัดการ 3 รูปแบบ คือ

1. แหล่งท่องเที่ยวที่บริหารจัดการโดยหน่วยงานภาครัฐ
2. แหล่งท่องเที่ยวที่บริหารจัดการโดยภาคเอกชน
3. แหล่งท่องเที่ยวที่บริหารจัดการโดยชุมชน

แหล่งท่องเที่ยวที่บริหารจัดการโดยชุมชนจะถูกเรียกว่า การท่องเที่ยวโดยชุมชน (Community Based Tourism) คือ การท่องเที่ยวที่คำนึงถึงความยั่งยืนของสิ่งแวดล้อม สังคม และวัฒนธรรม กำหนดทิศทางโดยชุมชน จัดการโดยชุมชน เพื่อชุมชน และชุมชนมีบทบาทเป็นเจ้าของมีสิทธิในการจัดการดูแลเพื่อให้เกิดการเรียนรู้แก่ผู้มาเยือน โดยมองว่าการท่องเที่ยวต้องทำงานครอบคลุม 5 ด้าน พร้อมกันทั้งการเมือง เศรษฐกิจ สังคม วัฒนธรรม และสิ่งแวดล้อม โดยมีชุมชนเป็นเจ้าของและมีส่วนในการจัดการ

กุลแก้ว คล้ายแก้ว และ คณิต เขียววิชัย (2566) กล่าวว่า พื้นที่สุโขทัยมรดกโลกเป็นพื้นที่แหล่งท่องเที่ยวทางมรดกวัฒนธรรมที่สำคัญในระดับประเทศ อัตลักษณ์ของพื้นที่ที่สามารถนำมาบูรณาการให้เป็นการท่องเที่ยวเชิงวัฒนธรรม เพื่อรองรับนักท่องเที่ยวทุกเพศทุกวัยได้ แต่สิ่งหนึ่งที่เป็นจุดอ่อนของพื้นที่ที่ควรได้รับการวางแผน ปรับปรุง และพัฒนา เพื่อสร้างมูลค่าทางเศรษฐกิจด้านการท่องเที่ยวในพื้นที่มรดกโลกจังหวัด คือ ทั้งที่แหล่งมรดกทางวัฒนธรรมของสุโขทัยยังอยู่ในพื้นที่ของชุมชนโบราณอีกมากมาย เพียงแต่ยังไม่มีการส่งเสริมการท่องเที่ยวเชิงวัฒนธรรมร่วมกับการจัดการการท่องเที่ยวกับชุมชน

จากแนวคิด ทฤษฎีที่ผู้วิจัยได้ศึกษาผู้วิจัยจึงนำมาจัดทำเป็นกรอบแนวคิดในการวิจัยประยุกต์ตามบริบทของพื้นที่เมืองมรดกโลกทั้ง 2 แห่ง แบ่งออกเป็น 4 ด้านในการศึกษาตามกรอบแนวคิด เพื่อใช้ในการศึกษาวิจัย ดังนี้



วิธีดำเนินการวิจัย

1. การค้นคว้าเอกสาร จากเอกสาร ตำรา หนังสือ บทความวิชาการ ตำรา สื่อทางอินเตอร์เน็ต และเอกสารงานวิจัยที่เกี่ยวข้อง โดยมีวัตถุประสงค์ค้นคว้าข้อมูลที่เกี่ยวข้องกับบริหารจัดการการท่องเที่ยวเชิงวัฒนธรรมภายใต้บริบทการเป็นเมืองมรดกโลก ในการจัดการท่องเที่ยวบูโรบูดูร์ (บุโรพุทโธ) และ

อุทยานประวัติศาสตร์สุโขทัย ทั้งเพื่อนำข้อมูลดังกล่าวมาเป็นแนวทางในการศึกษาและนำมาพัฒนาเป็นกรอบแนวคิดและประเด็นในการสัมภาษณ์อีกด้วย

2. การเก็บรวบรวมข้อมูล เป็นการเก็บข้อมูลเชิงคุณภาพ โดยการสัมภาษณ์เชิงลึก (In–depth Interviews) ตามแนวทางการสัมภาษณ์โดยใช้การสัมภาษณ์แบบไม่เป็นทางการ (Informal Interview) และการสัมภาษณ์แบบเป็นทางการ (Formal Interview) ที่กำหนดไว้โดยสัมภาษณ์นักท่องเที่ยว จำนวนแห่งละ 4 คน กลุ่มร้านขายของที่ระลึก จำนวนแห่งละ 4 คน กลุ่มคนในชุมชนจำนวนแห่งละ 4 คน และกลุ่มผู้บริหารหรือผู้ดูแลบริหารจัดการ จำนวนแห่งละ 2 คน ที่อยู่ในในพื้นที่บุโรพุทโธและอุทยานประวัติศาสตร์สุโขทัย จำนวน 28 คน เป็นการเลือกกลุ่มตัวอย่างแบบเจาะจง (Purposive Selection)

3. ผู้วิจัยลงพื้นที่วิจัยภาคสนามเพื่อสัมภาษณ์ ผู้วิจัยตรวจสอบความครบถ้วนสมบูรณ์ของแบบสัมภาษณ์ หลังจากนั้นนำผลการวิจัยมาวิเคราะห์ เรียบเรียง ถอดเทปการสัมภาษณ์ และทำการสนทนากลุ่มกับโดยใช้การเลือกแบบเจาะจง (Purposive Selection) จำนวน 8 คน คือ ตัวแทนนักท่องเที่ยว ตัวแทนร้านขายของที่ระลึก ตัวแทนคนในชุมชน และตัวแทนผู้บริหารหรือผู้ดูแลบริหารจัดการ

4. ผู้วิจัยตรวจสอบข้อมูลความถูกต้องครบถ้วนจากการสนทนากลุ่ม หลังจากนั้นนำไปวิเคราะห์ต่อไป

5. จัดสนทนากลุ่มย่อยเพื่อวิเคราะห์แนวทางเชิงนโยบายการบริหารจัดการการท่องเที่ยวเชิงวัฒนธรรมภายใต้บริบทการเป็นเมืองมรดกโลก วิเคราะห์จุดเด่น จุดด้อยในประเด็นด้านการบริหารจัดการพื้นที่ ด้านการจัดการสิ่งแวดล้อม ด้านสินค้าที่ระลึก เพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจ ด้านกิจกรรมส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรม

6. คณะผู้วิจัยดำเนินการวิเคราะห์ข้อมูล สรุปและอภิปรายผลการวิจัย และจัดทำรูปเล่มรายงานการวิจัยฉบับสมบูรณ์และคณะผู้วิจัยตีพิมพ์เผยแพร่ผลงานวิจัย

ขอบเขตการวิจัย

ขอบเขตด้านพื้นที่ บริเวณบูโรบูดูร์ (บุโรพุทโธ) จังหวัดชวากลาง ประเทศอินโดนีเซีย และพื้นที่บริเวณอุทยานประวัติศาสตร์สุโขทัย บ้านเมืองเก่า อำเภอเมือง จังหวัดสุโขทัย

ขอบเขตด้านประชากร ประชากร คือ นักท่องเที่ยวและบุคคลที่เกี่ยวข้อง ซึ่งได้แก่ นักท่องเที่ยว กลุ่มร้านค้าที่จำหน่ายสินค้า คนในชุมชนที่อยู่ในพื้นที่บุโรพุทโธและอุทยานประวัติศาสตร์สุโขทัย ผู้บริหารหรือเจ้าหน้าที่/พนักงานของบุโรพุทโธและอุทยานประวัติศาสตร์สุโขทัย

ขอบเขตด้านกลุ่มตัวอย่าง

จากการสัมภาษณ์ใช้การเลือกแบบเจาะจง (Purposive Selection) รวมทั้งสิ้น 28 คน จำนวน 4 กลุ่ม คือ กลุ่มนักท่องเที่ยว จำนวนแห่งละ 4 คน กลุ่มร้านขายของที่ระลึก จำนวนแห่งละ 4 คน กลุ่มคนในชุมชนจำนวนแห่งละ 4 คน และกลุ่มผู้บริหารหรือผู้ดูแลบริหารจัดการ จำนวนแห่งละ 2 คน ที่อยู่ในพื้นที่บุโรพุทโธและอุทยานประวัติศาสตร์สุโขทัย

การสนทนากลุ่ม ใช้การเลือกแบบเจาะจง (Purposive Selection) รวมทั้งสิ้น จำนวน 8 คน คือ ตัวแทนนักท่องเที่ยว แห่งละ 1 คน รวม 2 คน ตัวแทนร้านขายของที่ระลึก แห่งละ 1 คน รวม 2 คน ตัวแทนคนในชุมชน แห่งละ 1 คน รวม 2 คน และตัวแทนผู้บริหารหรือผู้ดูแลบริหารจัดการ แห่งละ 1 คน รวม 2 คน

ขอบเขตด้านเวลา

ตุลาคม พ.ศ. 2562- เมษายน พ.ศ. 2566 (เนื่องจากสถานการณ์การแพร่ระบาดของโรคไวรัสโคโรนา 2019 จึงใช้ระยะเวลาในการดำเนินการวิจัยเป็นเวลานาน)

ผลการวิจัย

ผู้วิจัยแบ่งการศึกษาเป็น 4 ด้าน ได้แก่ ด้านการบริหารจัดการพื้นที่ ด้านการจัดการสิ่งแวดล้อม ด้านสินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจ ด้านกิจกรรมส่งเสริมการท่องเที่ยว ประเพณีและวัฒนธรรม เนื่องจากทั้ง 4 ด้านนี้ เป็นส่วนสำคัญของการสะท้อนถึงทิศทางในขับเคลื่อนการบริหารจัดการเมืองมรดกโลกทั้ง 2 แห่ง สู่การเป็นพื้นที่แห่งการพัฒนาที่มีประสิทธิภาพสูงสุดในทางกายภาพ และเกิดประโยชน์สูงสุดต่อนักท่องเที่ยวที่มาเยือนอุทยานประวัติศาสตร์สุโขทัย ดังต่อไปนี้

1. ด้านการบริหารจัดการพื้นที่ มีผลการศึกษาดังนี้

ตารางที่ 1 แนวทางความคิดเห็นด้านการบริหารจัดการพื้นที่เมืองมรกดโลกทั้ง 2 แห่ง

แนวความคิดเห็นด้านการบริหารจัดการ พื้นที่อุทยานประวัติศาสตร์สุโขทัย	แนวความคิดเห็นด้านการบริหารจัดการ พื้นที่บุโรพุทโธ
1) อุทยานประวัติศาสตร์สุโขทัยมีกรมศิลปากร สำนักศิลปากรที่ 6 บริหารจัดการดูแลบูรณะปฏิสังขรณ์ตลอดจนมีบุคลากรของกรมศิลปากรดูแลรอบอุทยาน อันประกอบด้วยหลายภาคส่วนที่ช่วยดูแลส่งเสริมการท่องเที่ยว ได้แก่ ชุมชนเมืองเก่าสุโขทัย เทศบาล องค์การบริหารการพัฒนาพื้นที่พิเศษเพื่อการท่องเที่ยวอย่างยั่งยืน (อพท.) และการท่องเที่ยวแห่งประเทศไทย (ททท.) ทุกภาคส่วนมีการดำเนินงานร่วมกันและมีภาคเอกชนเข้ามามีบทบาทในการร่วมส่งเสริมการท่องเที่ยวในรูปแบบต่าง ๆ 2) มีการบริหารจัดการรถรางเพื่อส่งเสริมการท่องเที่ยวภายในอุทยาน และมีภาคเอกชนดำเนินธุรกิจรถสามล้อบริการนักท่องเที่ยวภายในอุทยานฯ ตลอดจนมีรถจักรยานยนต์ให้เช่า เพื่อขี่ชมรอบอุทยานประวัติ ศาสตร์สุโขทัย 3) ภาครัฐร่วมกับภาคชุมชนมีการจัดกิจกรรมส่งเสริมทักษะทางภาษาและจัดการฝึกอบรมปราชญ์ชุมชนตลอดจนมัคคุเทศน์น้อย เพื่อนำเที่ยวให้แก่นักท่องเที่ยว 4) มีการจัดระเบียบการห้ามนำรถยนต์เข้ามาในอุทยาน โดยมีการส่งเสริมการเดิน ปั่นจักรยาน รถไฟฟ้า ต่อมามีรถตุ๊ก ๆ ไฟฟ้าเข้ามารับส่งนักท่องเที่ยวทำให้เกิดปัญหาการนำรถสามล้อเล็กไฟฟ้าเข้ามามากขึ้น ส่งผลให้เกิดความวุ่นวายเช่นเดิม 5) มีภาคชุมชนดูแลด้านความปลอดภัยร่วมกับหน่วยงานภาคตำรวจ	1) บุโรพุทโธได้รับการสนับสนุนจากรัฐบาล โดยรัฐบาลอินโดนีเซียพยายามให้บุโรพุทโธ เป็นส่วนหนึ่งของเมืองย็อกยาการ์ตา แบ่งการบริหารจัดการเป็น 3 ส่วน ส่วนที่หนึ่ง ดูแลโบราณสถานในบุโรพุทโธทำหน้าที่บริหารจัดการอยู่ภายใต้กระทรวงศึกษาธิการและกระทรวงวัฒนธรรม ส่วนที่สองการบริหารจัดการทางกายภาพ ทัศนียภาพจำหน่วยตั๋ว ประชาสัมพันธ์และรักษาความปลอดภัยภายในบุโรพุทโธ อยู่ภายใต้การดูแลของบริษัทเอกชน บริษัท ชุมชน P.T. Taman Wisata Candi Borobudur, TWCB (Persero) ส่วนที่สาม บริเวณรอบนอกชุมชน บริหารจัดการโดยหน่วยงานท้องถิ่นและชุมชน โดยทั้งสามหน่วยงานมีการประสานงานให้ความรู้อบรมพัฒนาศักยภาพบุคลากรร่วมกัน 2) การบริหารงานรูปแบบองค์กรรัฐวิสาหกิจ มุ่งเน้นจำนวนนักท่องเที่ยว มุ่งจูงใจนักท่องเที่ยว ผู้มาจาริกแสวงบุญด้วยกิจกรรมทางการค้า 3) มีการส่งเสริมให้มีการบริหารจัดการกระจายให้แก่ประชาชนเข้ามาดำเนินการ เช่น ให้รถบัสเข้ามาส่งผู้โดยสารบริเวณใกล้ ๆ อุทยาน และมีรถรับจ้างรับขับเข้าไปใกล้ ๆ บุโรพุทโธ 4) มีการจัดกิจกรรมจากสำนักวัฒนธรรมและการท่องเที่ยวจะมีการอบรมภาษาอังกฤษ และการ

แนวความคิดเห็นด้านการบริหารจัดการ พื้นที่อุทยานประวัติศาสตร์สุโขทัย	แนวความคิดเห็นด้านการบริหารจัดการ พื้นที่บุโรพุทโธ
6) มีการติดป้ายข้อควรระวังในการเดินทางมาท่องเที่ยวอุทยานเมืองเก่าสุโขทัยรอบ ๆ ชุมชน 7) มีการจัดอบรมการบริหารจัดการท่องเที่ยวด้านความปลอดภัยให้แก่คนในชุมชน ได้แก่ การรักษาความปลอดภัย จำลองสถานการณ์โจรปล้นจริง วิธีใช้กระเป๋ายา เป็นต้น 8) ได้รับการประชาสัมพันธ์จากการท่องเที่ยวแห่งประเทศไทย สื่อสิ่งพิมพ์ท้องถิ่นมีส่วนสำคัญในการส่งเสริมการท่องเที่ยวภายในจังหวัด นอกจากนี้ภาคชุมชนยังร่วมกับการท่องเที่ยวแห่งประเทศไทย ส่งตัวแทนเดินทางไปโปรโมทอุทยานประวัติศาสตร์และกิจกรรมส่งเสริมการท่องเที่ยวในจังหวัดสุโขทัย ณ ต่างประเทศอีกด้วย 9) ภาครัฐตั้งสำนักงานพื้นที่พิเศษอุทยานประวัติสุโขทัย-ศรีสัชนาลัย-กำแพงเพชร (อพท.4) เพื่อส่งเสริมการท่องเที่ยวและการประชาสัมพันธ์ภายในจังหวัดพื้นที่เมืองมรดกโลกโดยเฉพาะ 10) ภาครัฐให้การส่งเสริมด้านการทำวิจัยด้านการท่องเที่ยวเพื่อพัฒนาองค์ความรู้ภายในอุทยานประวัติศาสตร์สุโขทัย 11) มีการพัฒนาสื่อดิจิทัลและแอปพลิเคชั่นเชื่อมโยงข้อมูลการท่องเที่ยวอุทยานประวัติศาสตร์สุโขทัย 12) การบริหารจัดการยังไม่เป็นเอกเทศขึ้นอยู่กับหน่วยงานในกำกับหลายส่วนตามลำดับชั้น 13) ราคาตั๋วค่าเข้าอุทยานประวัติศาสตร์สุโขทัยมีราคาถูก	ท่องเที่ยวให้กับชาวบ้าน สำหรับเตรียมความพร้อมในการนำเที่ยว 5) มีการประชาสัมพันธ์ค่อนข้างดี มีสื่อโฆษณาประชาสัมพันธ์จำนวนมากทั้งสนามบิน รถไฟ รถยนต์ ป้ายสื่อข้างทาง ทั้งภาพ ชื่อ คำขวัญ ฯลฯ 6) ภาครัฐให้บริษัทเอกชนมาบริหารจัดการบุโรพุทโธจนได้รับการชื่นชมจากนักท่องเที่ยวสามารถบริหารจัดการพื้นที่มรดกโลกได้อย่างดีเยี่ยม โดยแบ่งการบริหารจัดการเป็น 3 ส่วน 7) โทรทัศน์ สื่อสิ่งพิมพ์ สื่อออนไลน์ โบว์ชัวร์ แผ่นพับ หนังสือพิมพ์มีบทบาทในการประชาสัมพันธ์บุโรพุทโธ 8) มีการดำเนินการพัฒนาสื่อดิจิทัลแอพพลิเคชั่นเพื่อการส่งเสริมการท่องเที่ยวในประเทศอินโดนีเซีย และบุโรพุทโธหลายรูปแบบ 9) กระทรวงการท่องเที่ยวอินโดนีเซียร่วมกับประเทศต่าง ๆ ที่มีสถานทูตอินโดนีเซีย มีการจัดการส่งเสริมการท่องเที่ยวของประเทศอินโดนีเซียเชิงรุก 10) มีสุลต่านเป็นผู้ว่าราชการปกครองในเขตปกครองพิเศษเมืองย็อกยากาต้าทำให้การบริหารจัดการเป็นไปด้วยความลื่นไหลมากกว่าจังหวัดสุโขทัย 11) ราคาค่าเข้าชมบุโรพุทโธมีราคาค่อนข้างแพง

จากตารางพบว่า อุทยานประวัติศาสตร์สุโขทัยกับบุโรพุทโธมีการบริหารจัดการพื้นที่ที่แตกต่างกัน โดยอุทยานประวัติศาสตร์สุโขทัยการบริหารจัดการยังไม่เป็นเอกเทศ ขึ้นอยู่กับหน่วยงานในกำกับหลายส่วนตามลำดับชั้นจะมีหน่วยงานราชการคือ กรมศิลปากรช่วยดูแลพื้นที่ด้านในและบูรณะปฏิสังขรณ์รักษาคงสภาพเดิม ไม่ให้พังทลาย สูญหายตลอดจนส่งเสริมการจัดกิจกรรมต่าง ๆ ภายในอุทยานประวัติศาสตร์สุโขทัย นอกจากนี้ยังมีองค์การบริหารการพัฒนาพื้นที่พิเศษเพื่อการท่องเที่ยวอย่างยั่งยืน (อพท.) การท่องเที่ยวแห่งประเทศไทย (ททท.) และคนในชุมชนร่วมบริหารจัดการการท่องเที่ยวภายในพื้นที่มีเทศบาล คนในชุมชนร่วมกับตำรวจช่วยกันรักษาความปลอดภัยให้แก่นักท่องเที่ยวรอบอุทยานประวัติศาสตร์สุโขทัย

ในส่วนของเมืองย็อกยากาต้าที่ตั้งของบุโรพุทโธนั้น เป็นเขตปกครองพิเศษของประเทศอินโดนีเซียที่มีสุลต่านเป็นผู้ว่าราชการการดำเนินงานบางอย่างจึงมีความเป็นเอกเทศมากกว่าจังหวัดสุโขทัย จึงเป็นศักยภาพสำคัญที่อุทยานประวัติศาสตร์สุโขทัยควรนำไปพัฒนาในการบริหารจัดการ

2. ด้านสินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจ มีผลการศึกษาดังนี้

ตารางที่ 2 แนวทางความคิดเห็นด้านสินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจพื้นที่เมืองมรดกโลกทั้ง 2 แห่ง

แนวความคิดเห็นด้านที่สินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจอุทยานประวัติศาสตร์สุโขทัย	แนวความคิดเห็นด้านที่สินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจบุโรพุทโธ
1) มีสินค้าพื้นเมือง OTOP ที่ผลิตขึ้นจากภูมิปัญญาของคนในชุมชน เช่น สินค้า Handmade ถ้วยชาม สังคโลก งานไม้แกะสลัก ขนมของฝาก ผลิตภัณฑ์จากไม้ และผ้าทอพื้นเมือง เครื่องเงินโบราณ เป็นต้น 2) สินค้ามีที่มาจากชื่อวรรณกรรมพระร่วง เช่น ข้าวตอกพระร่วง ว่าวพระร่วง เป็นต้น 3) มีการพัฒนาบรรจุภัณฑ์สินค้าอย่างต่อเนื่องมีการให้สัญลักษณ์เพื่อยกระดับสินค้าอย่างต่อเนื่องเช่นกัน 4) สินค้าของจังหวัดสุโขทัยได้รับการยอมรับในระดับ ประเทศ และมีชื่อเสียง เช่น ทองสุโขทัย ผ้าทอบ้านนาต้นจั่น ผ้าหมักโคลน ผ้าทอสุโขทัย เป็นต้น 5) มีการจัดระเบียบการขายสินค้าที่ระลึกและสินค้าของฝากได้ค่อนข้างดี โดยให้แต่ละครัวเรือนดำเนินการขายในพื้นที่ของตน 6) มีขนมซึ่งเป็นขนมขึ้นชื่อของฝากของจังหวัดสุโขทัย จัดจำหน่ายเพื่อสร้างมูลค่าเพิ่มให้แก่ชุมชน เช่น ขนมผิง ขนมกลีบลำดวน ขนมทองม้วน เป็นต้น 7) ควรยกระดับสินค้าโอท็อปเพื่อให้สามารถนำไปจดสิทธิบัตรได้ทุกชิ้น 8) มีการพัฒนาผลิตภัณฑ์ นำไปจัดแสดงสินค้าในต่างประเทศ และให้ต่างชาติมีส่วนร่วมฝึกทำผลิตภัณฑ์	1) มีผ้าบาติก ภาพวาด และผ้าพันคอเป็นสินค้าที่ระลึกที่มีความโดดเด่นเป็นเอกลักษณ์ บ่งบอกถึงอัตลักษณ์ของชาวย็อกยากาต้า อีกทั้งยังมีการจัดกิจกรรมส่งเสริมการท่องเที่ยวให้แก่นักท่องเที่ยววาดลายลงบนเสื้อยืดหรือผ้าบาติกตลอดจนการโชว์วาดลายลงในผ้าบาติกให้แก่นักท่องเที่ยวได้ชม 2) ระบบการขายสินค้าบริเวณในบุโรพุทโธ ไม่มีระเบียบในการขายสินค้า สร้างความรบกวนให้แก่นักท่องเที่ยว 3) มีการขายสินค้าที่บ่งบอกถึงความเป็นอัตลักษณ์ของบุโรพุทโธเป็นของที่ระลึก เช่น บุโรพุทโธจำลอง หุ่นแกะสลัก รูปสัญลักษณ์การแสดงพื้นเมือง ตุ๊กตาไม้ ตัวหนังเชิดแบบหนังตะลุงตัวละครตามตำนานรามายนะ เป็นต้น 4) พ่อค้าแม่ค้าเข้ามารุมล้อมเสนอขายสินค้าแก่นักท่องเที่ยว 5) มีของเก่าเหมาะแก่นักท่องเที่ยวที่นิยมวัตถุโบราณ เช่น หินแกะสลัก เครื่องเซรามิก จาน ชาม เป็นต้น 6) มีเครื่องประดับที่มีการออกแบบที่สวยงามและมีเอกลักษณ์เฉพาะ เป็นการรวบรวมการฝีมือแบบดั้งเดิมผสมผสานเข้ากับความทันสมัย

จากตารางพบว่า ในส่วนของอุทยานประวัติศาสตร์สุโขทัยมีการจัดระเบียบการจำหน่ายสินค้าที่ระลึกได้ค่อนข้างดี โดยมีการขายของที่ระลึก ณ จุดจำหน่ายสินค้าที่ระลึกบริเวณในพื้นที่ของตนเอง ไม่มีพ่อค้าแม่ค้ามารุมเสนอขายสินค้าตลอดจนไม่มีการขายของภายในบริเวณด้านในอุทยานประวัติศาสตร์สุโขทัยรบกวนนักท่องเที่ยว

นอกจากนี้การส่งเสริมให้ผลิตภัณฑ์สินค้าที่ระลึกของจังหวัดสุโขทัยและชุมชนในอุทยานประวัติศาสตร์สุโขทัย ได้รับการยกระดับและสามารถเป็นที่ยอมรับสู่สากลจึงต้องมีการสร้างมาตรฐานให้ได้รับการรับรองและจดทะเบียนทรัพย์สินทางปัญญา อีกทั้งการพัฒนารูปแบบผลิตภัณฑ์และแพคเกจสินค้าให้มีความทันสมัยและสอดคล้องกับอัตลักษณ์ชุมชนเป็นอีกแนวทางหนึ่งที่จะช่วยส่งเสริมให้ผลิตภัณฑ์ของชุมชนได้รับความนิยมสูงขึ้น

ในส่วนของบุโรพุทโธนั้น ในบริเวณรอบบุโรพุทโธจะมีการขายสินค้าที่ระลึกบริเวณในบุโรพุทโธและรอบบุโรพุทโธมีการขายสินค้าที่บ่งบอกถึงความเป็นเอกลักษณ์ของบุโรพุทโธ อีกทั้งมีการพัฒนามาจากภูมิปัญญาท้องถิ่นผสมผสานกับอัตลักษณ์ในชุมชน เพื่อเป็นของที่ระลึกแก่นักท่องเที่ยวแต่ยังขาดการจัดระเบียบในการขายให้แก่พ่อค้าแม่ค้าบริเวณทางออก

3. ด้านการจัดการสิ่งแวดล้อม ผลการศึกษาดังนี้

ตารางที่ 3 แนวทางความคิดเห็นด้านการจัดการสิ่งแวดล้อม ในพื้นที่เมืองมรกดโลกทั้ง 2 แห่ง

แนวความคิดเห็นด้านการจัดการสิ่งแวดล้อม อุทยานประวัติศาสตร์สุโขทัย	แนวความคิดเห็นด้านการจัดการสิ่งแวดล้อม บุโรพุทโธ
1) มีการบริหารจัดการด้านสิ่งแวดล้อมในช่วงที่มีกิจกรรมต่าง ๆ หรือประเพณีลอยกระทง ซึ่งจัดขึ้นในพื้นที่อุทยานประวัติศาสตร์ได้ดี โดยจะต้องมีการจัดการเก็บภายในคืนนั้น ๆ เลย 2) กรมศิลปากรมีนโยบายด้านการจัดการขยะให้แก่อุทยานประวัติศาสตร์ทุกแห่ง 3) มีถังขยะที่ทำให้กลมกลืนกับอุทยานเป็นถังดำแต่มีไม้ แม้จะยังไม่ได้มีถังสำหรับคัดแยกขยะแต่ก็มีวางอยู่โดยรอบกระจายทั่ว ทั้งนี้มีเทศบาลตำบลเมืองเก่ารับขยะไปกำจัด 4) บริหารจัดการขยะได้ดีและรวดเร็ว ในช่วงเทศกาลลอยกระทงสามารถเก็บขยะได้ในตอนหลังเลิกงาน และมีการห้ามเผาขยะภายในพื้นที่ 5) ขยะบริเวณรอบชุมชนมีเยอะขึ้นมากจำเป็นต้องมีการคัดแยกขยะและสร้างจิตสำนึกให้แก่คนในชุมชน	1) มีการบริหารจัดการด้านสิ่งแวดล้อมได้ดีโดยเฉพาะสามารถจัดการขยะได้ค่อนข้างเร็วเมื่อมีการจัดกิจกรรมและประเพณีต่าง ๆ ในบริเวณบุโรพุทโธ 2) บุโรพุทโธมีการจัดการขยะที่ดีมากมีถังขยะตั้งประจำอยู่หลายจุดในบริเวณรอบบุโรพุทโธ 3) มีหน่วยงานที่ดูแลดด้านการจัดการขยะบริเวณบุโรพุทโธโดยเฉพาะ 4) มีถังขยะจำนวนมากเพื่ออำนวยความสะดวกแก่นักท่องเที่ยวและสร้างจิตสำนึกที่ดี 5) ควรจะสร้างแนวต้นไม้ระหว่างทางเดินจากจุดบริการไปยังตัวบุโรพุทโธ 6) บุโรพุทโธตั้งอยู่บนเนินธรรมชาติ สามารถมองลงไปเห็นวิวรอบข้างได้ชัดเจน 7) มีการขอความร่วมมือจากร้านค้าเรื่องการดูแลสิ่งแวดล้อมรอบ ๆ บุโรพุทโธและมีมาตรการดูแลด้านสิ่งแวดล้อมภายในพื้นที่บุโรพุทโธ

จากตารางพบว่า อุทยานประวัติศาสตร์สุโขทัยมีการบริหารจัดการขยะที่ดีเฉกเช่นเดียวกับบุโรพุทโธ แต่ก็มีข้อแตกต่างบางประการที่สามารถนำจุดเด่นจากบุโรพุทโธมาเพิ่มศักยภาพการบริหารจัดการสิ่งแวดล้อมได้ ทั้งนี้ในด้านการจัดการสิ่งแวดล้อมอุทยานประวัติศาสตร์สุโขทัยมีการออกกฎควบคุมและดูแลภายในพื้นที่ โดยกรมศิลปากรมีนโยบายมุ่งเน้นการบริหารจัดการพื้นที่สีเขียวด้านการจัดการขยะให้แก่อุทยานประวัติศาสตร์ทุกแห่ง โดยมุ่งเน้นลดพลาสติก รณรงค์ไม่ใช้โฟม อีกทั้งมีการรณรงค์ให้เก็บขยะและตั้งจุดทิ้งขยะ ทำถังขยะให้มีรูปแบบกลมกลืนกับอุทยานประวัติศาสตร์สุโขทัย และมีการนำต้นไม้หญ้า วัชพืช มาเก็บไว้เพื่อย่อยสลายนำมาเป็นปุ๋ยและนำมาดูแลต้นไม้ต่อ นอกจากนี้ยังมีการสร้างการมีส่วนร่วมกับคนในชุมชนด้วยการให้แต่ละบ้านดูแลทัศนียภาพภายในบ้านของตนเองให้มีความสวยงามและไม่สร้างสิ่งปลูกสร้างที่บดบังอุทยานประวัติศาสตร์สุโขทัย อย่างไรก็ตามเนื่องด้วยจำนวนขยะบริเวณรอบชุมชนและรอบอุทยานประวัติศาสตร์สุโขทัยมีจำนวนมากขึ้น การรณรงค์เรื่องการคัดแยกขยะและสร้างจิตสำนึกให้แก่คนในชุมชนจึงเป็นสิ่งสำคัญที่ภาครัฐต้องให้ความตระหนักและเร่งปลูกฝังโดยเร่งด่วน

ในส่วนของบุโรพุทโธมีการจัดการสิ่งแวดล้อมที่ดี นอกจากนี้ยังตั้งอยู่ในพื้นที่บนเนินสูงที่สามารถมองเห็นทัศนียภาพที่สวยงามของเมืองอันเป็นโอกาสที่ดีต่อการเพิ่มศักยภาพด้านสิ่งแวดล้อม โดยบุโรพุทโธมีการออกมาตรการสำหรับการบริหารจัดการสิ่งแวดล้อมภายในบุโรพุทโธและชุมชนรอบบุโรพุทโธ ทั้งนี้ภายในบุโรพุทโธมีถังขยะจำนวนมากรอบบริเวณพื้นที่บุโรพุทโธเพื่ออำนวยความสะดวกในการทิ้งขยะแก่นักท่องเที่ยว อีกทั้งมีเจ้าหน้าดูแลด้านการจัดการขยะโดยเฉพาะในขณะที่นักท่องเที่ยวเดินทางมาท่องเที่ยวตลอดจนสามารถจัดการกับขยะได้ค่อนข้างเร็วเมื่อมีการจัดกิจกรรมทางพุทธศาสนา ประเพณีต่าง ๆ ใน

บริเวณบุโรพุทโธ รวมถึงมีการขอความร่วมมือจากร้านค้าเรื่องการดูแลสิ่งแวดล้อมรอบ ๆ บุโรพุทโธ เพื่อปลูกฝังจิตสำนึกและสร้างค่านิยมที่ดีต่อการรักษาสิ่งแวดล้อมภายในพื้นที่

4. ด้านกิจกรรมส่งเสริมการท่องเที่ยว ประเพณีและวัฒนธรรม มีผลการศึกษาดังนี้

ตารางที่ 4 แนวความคิดเห็นด้านกิจกรรมส่งเสริมการท่องเที่ยว ประเพณีและวัฒนธรรมพื้นที่เมืองมรดกโลกทั้ง 2 แห่ง

แนวความคิดเห็นด้านกิจกรรมส่งเสริมการท่องเที่ยว ประเพณีและวัฒนธรรม อุทยานประวัติศาสตร์สุโขทัย	**แนวความคิดเห็นด้านกิจกรรมส่งเสริมการท่องเที่ยว ประเพณีและวัฒนธรรมบุโรพุทโธ**
1) มีหน่วยงานภาครัฐ เช่น การท่องเที่ยวแห่งประเทศไทย (ททท.) องค์การบริหารการพัฒนาพื้นที่พิเศษเพื่อการท่องเที่ยวอย่างยั่งยืน (อพท.) กรมศิลปากร เทศบาล เป็นต้น จัดสรรงบประมาณตลอดจนช่วยส่งเสริมการท่องเที่ยวร่วมกัน 2) มีการจัดส่งเสริมการท่องเที่ยวประเพณีลอยกระทงที่ยิ่งใหญ่สวยงามเผยแพร่ไปสู่นานาประเทศ 3) จัดการส่งเสริมการท่องเที่ยวปั่นจักรยานเที่ยวเมืองพระร่วง 4) การดำเนินการจัดกิจกรมต่าง ๆ บางกิจกรรมระหว่างอุทยานประวัติศาสตร์สุโขทัยร่วมกับภาคชุมชนเมื่อดำเนินการไปได้สักระยะแล้วเวลาต่อมาภาคเอกชนได้นำไปดำเนินการเองจึงส่งทำให้กิจกรรมต่างๆไม่ได้รับความนิยมต่อเนื่องเท่าที่ควร 5) มีการขายทัวร์ให้แก่นักท่องเที่ยวโดยมีการเชื่อมโยงการท่องเที่ยวอุทยานประวัติศาสตร์สุโขทัยกับการทำพระการอบรมวาดลายชามสังคโลก ชมทุ่งนา พร้อมทั้งให้นักท่องเที่ยวได้ฝึกปฏิบัติกิจกรรมจริง 6) ใช้เรื่องเล่าเป็นสื่อนำการท่องเที่ยว ดึงศักยภาพชุมชนอาหาร วรรณกรรมเพื่อสร้างความสนใจให้แก่นักท่องเที่ยวได้เดินทางท่องเที่ยวในสถานที่ท่องเที่ยวโดยรอบ 7) ภาคชุมชนจัดกิจกรรมท่องเที่ยวเชิงสร้างสรรค์ให้แก่นักท่องเที่ยวเพื่อเชื่อมโยงการท่องเที่ยวอุทยานประวัติศาสตร์สุโขทัยให้ได้รับการส่งเสริมให้มีจุดขายมากยิ่งขึ้นเช่น มีการนำขนมมงคลพื้นเมืองจังหวัดสุโขทัยมาจัดสำรับให้แก่นักท่องเที่ยว ได้แก่ ขนมสี่ถ้วย ข้าวเหนียวดงคลุกมะพร้าว ขนมแดกงา 8) มีการจัดเตรียมความพร้อมด้านอาหารให้แก่นักท่องเที่ยวมุสลิม ได้แก่ การจัดเตรียมอาหาร การขึ้นป้ายอาหารฮาลาล	1) มีการจัดกิจกรรมส่งเสริมการท่องเที่ยวในบริเวณรอบบุโรพุทโธเพื่อเชื่อมโยงการท่องเที่ยวบุโรพุทโธ เช่น กิจกรรมขี่ช้าง นั่งรถม้า เป็นต้น และมีการจัดกิจกรรมส่งเสริมการท่องเที่ยวในกลุ่มวัด พรัมบานันเชื่อมโยงการท่องเที่ยวบุโรพุทโธ 2) มีหมู่บ้านการท่องเที่ยวที่มีเอกลักษณ์ด้านวัฒนธรรมเฉพาะ เช่น หมู่บ้านบาติก หมู่บ้านเครื่องปั้นดินเผา หมู่บ้าน การเกษตร 3) มีการจัดงานพิธีบุญใหญ่วันวิสาขบูชาโลกจัดอย่างยิ่งใหญ่ 4) มีแหล่งการท่องเที่ยวที่กำลังพัฒนามีการจัดคอนเสิร์ตมีการแสดงเป็นพื้นที่สาธารณะของประชาชน 5) การประกอบพิธีของบุโรพุทโธในปัจจุบัน เป็นงานกึ่ง ๆ ประเพณีและวัฒนธรรมรื่นเริงต่าง ๆ ด้านกิจกรรมศาสนพิธีจึงอาจลดทอนความเชื่อถือและภาพความศักดิ์สิทธิ์ของบุโรพุทโธในฐานะวัดทางพระพุทธศาสนาไป 6) มีการจัดหลักสูตรบาติกและการวาดภาพให้กับนักท่องเที่ยวซึ่งเป็นที่ชื่นชอบของนักท่องเที่ยวชาวต่างชาติที่ต้องการท่องเที่ยวเชิงวัฒนธรรมประเพณีดั้งเดิม 7) มีการจัดกิจกรรมส่งเสริมการท่องเที่ยวภาคกลางคืน เช่น ขบวนช้าง แห่สิงโต ดนตรี ละคร ฟ้อนรำ แสงสีเสียงตามเทศกาล 8) มีกิจกรรมส่งเสริมการท่องเที่ยวทางศาสนาช่วงวันวิสาขบูชาซึ่งเป็นประเพณีสำคัญทางศาสนาที่ชาวพุทธทั่วโลกหลั่งไหลเดินทางเข้ามา 9) มีถนนมาลิโอโบโรซึ่งเป็นตลาดกลางคืนขนาดใหญ่ในตัวเมืองย็อกยาการ์ตาซึ่งจำหน่ายสินค้าพื้นเมืองและอาหารพื้นเมืองนับเป็นเอกลักษณ์สำคัญของการเดินทางมาเมืองนี้

จากตารางพบว่า อุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธต่างใช้ศักยภาพที่มีอยู่ภายในชุมชนมาสร้างอัตลักษณ์ และการส่งเสริมการท่องเที่ยวเชื่อมโยงในส่วนของอุทยานประวัติศาสตร์สุโขทัยนั้นได้รับการส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรมจากภาครัฐและเอกชน จัดสรรงบประมาณตลอดจนช่วยส่งเสริมการท่องเที่ยวร่วมกัน ทั้งนี้จังหวัดสุโขทัยยังมีการใช้ศักยภาพชุมชนเข้ามาบูรณาการกับการขับเคลื่อนส่งเสริมการท่องเที่ยว เช่น จัดกิจกรรมตักบาตรรับอรุณ กิจกรรมสวดมนต์คืนเพ็ญหน้ามณฑปวิหารหลวงพ่ออจนะ วัดศรีชุมที่อยู่ใกล้ ๆ อุทยานประวัติศาสตร์สุโขทัย จัดกิจกรรมตลาดท่าน้ำรับเสด็จ กิจกรรมปั่นจักรยานฯ อีกทั้งภาคชุมชนจัดกิจกรรมส่งเสริมให้มีจุดขายมากยิ่งขึ้น เช่น มีการนำขนมมงคลพื้นเมืองจังหวัดสุโขทัยมาจัดสำรับให้แก่นักท่องเที่ยว มีการจัดกิจกรรมส่งเสริมการท่องเที่ยวอบรมวาดลายชามสังคโลกลายก้างปลา ซึ่งเป็นเอกลักษณ์และของที่ระลึกที่มีชื่อเสียงของจังหวัดสุโขทัยให้แก่นักท่องเที่ยวเพื่อให้นักท่องเที่ยวพำนักค้างคืนเพิ่มมากขึ้น การจัดการส่งเสริมการท่องเที่ยวภาคกลางคืนจัดให้มีตลาดวิถีชุมชนจากการเปิดโชว์ไฟ Light Up และการประดับประทีป (ตะคันดินเผา) ตะคันไฟในบริเวณอุทยานประวัติศาสตร์สุโขทัยและถนนโดยรอบ อีกทั้งมีการโปรโมทการจัดเทศกาลลอยกระทงที่จัดขึ้น ณ อุทยานประวัติศาสตร์สุโขทัยเป็นประจำทุกปี รวมถึงมีการประชาสัมพันธ์จากสื่อหลากหลายช่องทางอันจะช่วยให้นักท่องเที่ยวทั้งไทยและต่างชาติได้ยลความงดงามของเมืองมรดกโลกและกลับมาเที่ยวซ้ำมากยิ่งขึ้น

ทั้งนี้ บุโรพุทโธจะมีทำเลที่ตั้งที่เป็นโอกาสทางการค้า เนื่องจากเป็นเมืองทางเศรษฐกิจมีถนนมาลิโอโบโร ซึ่งเป็นตลาดช็อปปิ้งกลางคืนในตัวเมืองย็อกยากาต้า ซึ่งจำหน่ายสินค้าพื้นเมืองและอาหารพื้นเมืองนับเป็นเอกลักษณ์สำคัญของการเดินทางมาเมืองนี้ พร้อมกันนี้ยังมีกิจกรรมให้นักท่องเที่ยวได้เพ้นส์ผ้าลายพื้นเมือง มีกิจกรรมส่งเสริมการท่องเที่ยวภาคกลางคืน จัดการแสดงพื้นเมืองและการแสดงสะท้อนวิถีอัตลักษณ์ของเมืองนี้ อีกทั้งในช่วงวันวิสาขบูชาซึ่งเป็นประเพณีสำคัญทางศาสนาที่ชาวพุทธทั่วโลกหลั่งไหลเดินทางเข้ามายังบุโรพุทโธ ยังสามารถทำให้เกิดการท่องเที่ยวเชื่อมโยงได้ยิ่งขึ้น

สรุปผลการวิจัย

ผลจากการศึกษาการเปรียบเทียบการบริหารจัดการอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธ พบว่า เมื่อพิจารณารายด้าน ได้แก่ ด้านการบริหารจัดการพื้นที่ ด้านการจัดการสิ่งแวดล้อม ด้านสินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจและด้านกิจกรรมส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรม พบว่า เมืองมรดกโลกทั้งสองแห่งมีเหมือนกันกันนั่นก็คือ มีเอกลักษณ์ทางวัฒนธรรมที่บ่งบอกถึงศิลปวัฒนธรรม ร่องรอยทางพระพุทธศาสนา ตลอดจนสะท้อนให้เห็นถึงวิถีชีวิตและความรุ่งเรืองในอดีตที่ทรงคุณค่ามากมายควรค่าแก่การรักษา ดังนี้

ผลการศึกษาเปรียบเทียบอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธ ในการบริหารจัดการพื้นที่ของอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธมีความแตกต่างกันในด้านของการบริหารงานอุทยานประวัติศาสตร์สุโขทัยจะยังไม่เป็นเอกเทศ ทั้งนี้จังหวัดสุโขทัยเป็นจังหวัดเล็ก ๆ ขึ้นอยู่กับหน่วยงานในกำกับหลายส่วนตามลำดับชั้น ส่วนบุโรพุทโธมีการบริหารจัดการพื้นที่แบ่งเป็น 3 หน่วยงานชัดเจนถึงแม้จะมีปัญหาในหลาย ๆ ประการ แต่อย่างไรก็ตามการที่มีการแบ่งส่วนการบริหารจัดการที่ชัดเจนจึงเป็นศักยภาพสำคัญที่อุทยานประวัติศาสตร์สุโขทัยสามารถดึงมาสร้างศักยภาพในการบริหารจัดการได้

ดังนั้นทั้งการบริหารจัดการพื้นที่ระหว่างอุทยานประวัติศาสตร์สุโขทัยกับบุโรพุทโธ จึงมีการบริหารจัดการพื้นที่รูปแบบเฉพาะของตนเอง นอกจากนี้ทั้งหน่วยงานภาครัฐของเมืองมรดกโลกทั้ง 2 แห่ง

ควรมุ่งส่งเสริมให้คนในชุมชนมีความรู้ความเข้าใจในเมืองมรดกโลกของตนเอง เพราะถือเป็นขุมคลังอันมีคุณค่าของท้องถิ่น และถือเป็นทรัพยากรในการขับเคลื่อนที่สำคัญที่สุด

ด้านสินค้าที่ระลึก เพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจระหว่างอุทยานประวัติศาสตร์สุโขทัย กับบุโรพุทโธนั้นพบว่า ในส่วนของอุทยานประวัติศาสตร์สุโขทัย มีการจัดระเบียบการจำหน่ายสินค้าที่ระลึกได้ดี มีจุดจำหน่ายสินค้าที่ระลึกบริเวณพื้นที่ร้านค้าของตนเอง ตลอดจนมีการพัฒนาสินค้าที่ระลึกตามอัตลักษณ์ของชุมชน ซึ่งได้รับการยอมรับในระดับประเทศ ในส่วนของบุโรพุทโธนั้นในบริเวณรอบบุโรพุทโธจะมีการขายสินค้าที่ระลึกบริเวณในพื้นที่และรอบบุโรพุทโธ เป็นสินค้าที่บ่งบอกถึงความเป็นบุโรพุทโธ อีกทั้งมีการพัฒนามาจากภูมิปัญญาท้องถิ่นผสมผสานกับอัตลักษณ์ในชุมชนเพื่อเป็นของที่ระลึกมีทั้งสินค้าอุปโภค เช่น เสื้อผ้าทั่วไปและสินค้าที่เป็นเอกลักษณ์ของสถานที่ แต่ขาดการจัดระเบียบ การขายสินค้าให้แก่พ่อค้าแม่ค้าบริเวณโซนร้านค้าภายนอกบุโรพุทโธ พ่อค้าแม่ค้ารุมแย่งขายสินค้าให้แก่นักท่องเที่ยว

ด้านการจัดการสิ่งแวดล้อม อุทยานประวัติศาสตร์สุโขทัยมีการจัดการที่ดี เช่น การจัดถังขยะให้มากยิ่งขึ้นในบริเวณพื้นที่ท่องเที่ยวภายในอุทยานประวัติศาสตร์ การส่งเสริมให้ความรู้เพื่อให้คนในชุมชนตระหนักถึงการจัดการสิ่งแวดล้อม มีนโยบายในการดูแลด้านสิ่งแวดล้อมจากกรมศิลปากร มีการวางมาตรการในการควบคุมการทิ้งขยะและน้ำเสียอย่างจริงจัง ตลอดจนมีการขอความร่วมมือจากชุมชนในการไม่สร้างอาคารบ้านเรื่องที่บดบังทัศนียภาพของอุทยานประวัติศาสตร์สุโขทัย มีป้ายแจ้งให้นักท่องเที่ยวช่วยกันรักษาความสะอาด และนำขยะที่ย่อยสลายได้ไปหมักทำปุ๋ยอินทรีย์ เป็นต้น ในส่วนของบุโรพุทโธจะมีการจัดการขยะที่ดี นอกจากนี้ยังตั้งอยู่ในพื้นที่บนเนินสูงที่สามารถมองเห็นทัศนียภาพที่สวยงามของเมืองอันเป็นโอกาสที่ดีต่อการเพิ่มศักยภาพด้านสิ่งแวดล้อม ทั้งนี้ บุโรพุทโธมีการออกมาตรการสำหรับการบริหารจัดการสิ่งแวดล้อมภายในบุโรพุทโธและชุมชนรอบบุโรพุทโธ รวมถึงมีการขอความร่วมมือจากร้านค้าเรื่องการดูแลสิ่งแวดล้อมรอบ ๆ บุโรพุทโธ เพื่อปลูกฝังจิตสำนึกและสร้างค่านิยมที่ดีต่อการรักษาสิ่งแวดล้อมภายในพื้นที่

ด้านการส่งเสริมการท่องเที่ยว ประเพณีและวัฒนธรรมอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธต่างใช้ศักยภาพที่มีอยู่ภายในชุมชนมาสร้างอัตลักษณ์และการส่งเสริมการท่องเที่ยวเชื่อมโยง โดยในส่วนของอุทยานประวัติศาสตร์สุโขทัยนั้น ได้รับการส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรมจากภาครัฐและเอกชน จัดสรรงบประมาณตลอดจนช่วยส่งเสริมการท่องเที่ยวร่วมกัน มีการใช้ศักยภาพชุมชนเข้ามาบูรณาการกับการขับเคลื่อนส่งเสริมการท่องเที่ยว ในขณะที่บุโรพุทโธจะมีทำเลที่ตั้งที่เป็นโอกาสทางการค้าเนื่องจากเป็นแหล่งทางเศรษฐกิจการค้า อีกทั้งมีการจำหน่ายสินค้าพื้นเมืองและอาหารพื้นเมืองนับเป็นเอกลักษณ์สำคัญของการเดินทางมาเมืองนี้ มีกิจกรรมส่งเสริมการท่องเที่ยวภาคกลางคืน และการแสดงซึ่งเป็นการถ่ายทอดอัตลักษณ์วิถีชุมชนให้แก่นักท่องเที่ยวได้รับชม

อภิปรายผลการวิจัย

เมืองมรดกโลกของประเทศอาเซียนในประเทศไทยและประเทศอินโดนีเซีย ได้รับการยกย่องจากยูเนสโก้หลายแห่ง โดยอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธจะใช้การเชื่อมโยงพระพุทธศาสนาและวัฒนธรรมเข้ามาเป็นจุดขายของการเพิ่มศักยภาพการท่องเที่ยวทั้งสองแห่ง โดยบุโรพุทโธจะได้เปรียบด้านของชัยภูมิที่ตั้งที่เป็นเมืองศูนย์กลางทางเศรษฐกิจของประเทศ มีเขตการปกครองพิเศษและเมืองมีขนาดใหญ่ สำหรับอุทยานประวัติศาสตร์สุโขทัยนั้น ตัวเมืองมีขนาดเล็กและมีแหล่งท่องเที่ยวไม่มากนักนักท่องเที่ยวคนไทยส่วนใหญ่จึงใช้เป็นสถานที่เมืองแวะและเดินทางไปเที่ยวที่อื่น แม้ในปัจจุบันจะมีการ

ส่งเสริมการท่องเที่ยวโดยเชื่อมโยงกิจกรรมต่าง ๆ เพื่อให้นักท่องเที่ยวมาพำนักค้างคืนมากยิ่งขึ้นก็ตาม อย่างไรก็ตามแม้นักท่องเที่ยวคนไทยจะไม่เน้นการมาพำนักค้างคืนในจังหวัดสุโขทัยมากนัก แต่ก็ยังมีนักท่องเที่ยวจากทวีปยุโรปที่หลงใหลในอารยสถาปัตยของอุทยานประวัติศาสตร์และมาพำนักอยู่ในจังหวัดสุโขทัยและเมืองย็อกยาการ์ต้าเพื่อมาชมความงดงามของเมืองมรดกโลกทั้งสองแห่งเป็นแรมเดือน โดยเดินทางแบบแบคแพคเกอร์ ใช้ชีวิตแบบสโลไลฟ์ในการเดินทางมาท่องเที่ยว นั่นสะท้อนให้เห็นถึงโอกาสในการที่เมืองทั้งสองแห่ง หากส่งเสริมศักยภาพการท่องเที่ยวให้สูงขึ้นจะสามารถสร้างมูลค่าเพิ่มทางเศรษฐกิจให้แก่ชุมชนและประเทศได้อีกมาก

ในส่วนของอุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธ มีทั้งข้อดี ข้อเด่นที่แตกต่างกันเมื่อพิจารณาการบริหารจัดการการท่องเที่ยวในประเด็น 4 ด้าน ได้แก่ ด้านการบริหารจัดการพื้นที่ ด้านการจัดการสิ่งแวดล้อม ด้านสินค้าที่ระลึกเพื่อสร้างมูลค่าเพิ่มทางเศรษฐกิจ ด้านกิจกรรมส่งเสริมการท่องเที่ยวประเพณีและวัฒนธรรม พบว่า มีหลายประการที่บุโรพุทโธยังได้เปรียบในด้านของพื้นที่ และความเป็นแหล่งท่องเที่ยวทางเศรษฐกิจและวัฒนธรรม และการบริหารจัดการที่มีการแบ่งส่วนที่ชัดเจน รวมทั้งยังเป็นสถานที่ที่มีการจัดกิจกรรมต่าง ๆ ที่เกี่ยวข้องกับทางศาสนาที่หลากหลายสอดคล้องกับที่ Gotravel (2022) กล่าวถึงไว้ว่า บุโรพุทโธเป็นสถานที่จัดงานวิสาขบูชาและวันอาสาฬหบูชา หลังจากใช้เป็นสถานที่ท่องเที่ยวทางศาสนาแล้ว ในอนาคตจะใช้เป็นสถานที่เฉลิมฉลองวันหยุดทางศาสนาอื่น ๆ อีกด้วย เช่น วันอาสาฬหบูชา วันหยุดกฐิน และวันมาฆบูชา รวมทั้งจัดกิจกรรมทางศาสนาอื่น ๆ เช่น การจาริกแสวงบุญ ธรรมยาตรา เป็นต้น ดังนั้นจึงเป็นไปได้ว่าในอนาคตอันใกล้ จะมีแนวโน้มที่บุโรพุทโธจะมีจำนวนผู้เดินทางไปมากยิ่งขึ้น ด้วยปัจจัยดังกล่าวอุทยานประวัติศาสตร์สุโขทัยจึงสามารถนำประเด็นในการบริหารจัดการพื้นที่ ในการแบ่งภาคส่วนการบริหารจัดการที่ชัดเจน อีกทั้งจัดอีเว้นท์ส่งเสริมการเดินทางมาเยือนในพื้นที่ให้มากยิ่งขึ้น เพื่อเป็นประโยชน์ในการพัฒนาศักยภาพการจัดการท่องเที่ยวต่อไป

อีกประการหนึ่งของศักยภาพของการนำทรัพยากรบุคคลในพื้นที่อุทยานประวัติศาสตร์สุโขทัยและบุโรพุทโธเข้ามามีส่วนร่วมในการบริหารจัดการการท่องเที่ยวนั่นก็คือ การให้ประชาชนในชุมชนมีส่วนร่วมในการสร้างสรรค์สินค้าที่ระลึกเพื่อให้เกิดมูลค่าเพิ่มทางเศรษฐกิจ อีกทั้งมีส่วนร่วมในการช่วยสอดส่องดูแลด้านความปลอดภัยการดูแลรักษาพื้นที่เมืองมรดกโลกของตนเองไม่ให้ถูกทำลาย ทั้งนี้ทั้งภาครัฐและเอกชนของทั้งสองพื้นที่ต่าง ๆ ก็มีนโยบายและมีการดำเนินการอย่างเป็นรูปธรรมในการอบรม พัฒนาส่งเสริมการสร้างความรู้ในทักษะภาษา การบริการที่ช่วยให้ประชาชนภายในชุมชนของตนเกิดอาชีพและมีความเป็นอยู่ที่ดีขึ้น ซึ่งสอดคล้องกับ ถวิลวดี บุรีกุล (2547) ที่กล่าวว่า การให้ประชาชนเข้ามามีส่วนร่วมบริหารจัดการนั้นต้องนำหลักของการมีส่วนร่วมมาใช้ คือ ให้ประชาชนมีส่วนร่วมที่เกี่ยวข้องกับทรัพยากรที่ประชาชนเป็นเจ้าของ และการบริหารตัดสินใจ การจัดสรรทรัพยากร ร่วมวางแผน ร่วมปฏิบัติการตลอดจนควบคุมโดยตรงจากประชาชน แต่ก็ยังคงต้องบูรณาการความร่วมมือระหว่างภาครัฐและเอกชนอันเนื่องมาจากยังมีทิศทางการพัฒนาการท่องเที่ยวที่ไม่ชัดเจนและสอดคล้องกันอย่างเป็นระบบ

การที่อุทยานประวัติศาสตร์สุโขทัยจะสามารถเพิ่มประสิทธิภาพในการบริหารจัดการการท่องเที่ยวได้จำเป็นต้องแก้ไขปัญหาด้านการท่องเที่ยวในจังหวัดสุโขทัยในหลาย ๆ ด้าน รวมถึงพัฒนาศักยภาพของบุคลากรและคนในชุมชนด้านทักษะทางภาษาต่างประเทศ อีกทั้งการพัฒนาอุทยานประวัติศาสตร์สุโขทัยควรมีการนำสื่อดิจิทัลเข้ามาขับเคลื่อนส่งเสริมการท่องเที่ยวที่ทันสมัยเพื่อให้เกิดประโยชน์สูงสุดต่ออุทยานประวัติศาสตร์สุโขทัย

การพัฒนาศักยภาพของการบริหารจัดการอุทยานประวัติศาสตร์สุโขทัยภายใต้ความเป็นเมืองมรดกโลกให้มีรูปแบบที่ดีขึ้นสู่การสร้างมูลค่าเพิ่มทางเศษฐกิจให้แก่ชุมชนและประเทศ จึงต้องมีการดำเนินการแบบบูรณาการร่วมกันระหว่างภาครัฐ ภาคเอกชน และภาคชุมชน นอกจากนี้ควรส่งเสริมการจัดการท่องเที่ยวทางวัฒนธรรมโดยมีการเชื่อมโยงการท่องเที่ยวเมืองมรดกโลกเพื่อสร้างความประทับใจ และสร้างแรงจูงใจให้แก่นักท่องเที่ยวให้อยากกลับมาเที่ยวซ้ำในสถานที่ท่องเที่ยวต่าง ๆ ในจังหวัดสุโขทัย อันจะก่อให้เกิดมูลค่าเพิ่มทางเศรษฐกิจและสังคมแก่ชุมชนและประเทศ ตลอดจนพัฒนาศักยภาพ เสริมสร้างองค์ความรู้ให้แก่นักท่องเที่ยวและคนในจังหวัดสุโขทัยได้เกิดคลังข้อมูลทางวัฒนธรรมของชาติต่อไป เพื่อให้เกิดประโยชน์อย่างยิ่งต่อเมืองมรดกโลกที่มีคุณค่าทางประวัติศาสตร์ความเป็นมาอันยาวนานต่อไป

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

1. หน่วยงานภาครัฐ ได้แก่ กระทรวงวัฒนธรรม การท่องเที่ยวแห่งประเทศไทย ภาคเอกชน ได้แก่ เจ้าของกิจการโรงแรม ร้านจำหน่ายสินค้า ร้านอาหารบริเวณโดยรอบเมืองมรดกโลกทั้ง 2 แห่ง และภาคประชาชนที่อยู่โดยรอบเมืองมรดกโลกทั้ง 2 แห่ง ควรมีการผสานความร่วมมือในการจัดทำข้อตกลงแนวทางในการดำเนินงานตามนโยบาย กิจกรรม โครงการต่าง ๆ ร่วมกันตั้งแต่ก่อนเริ่มดำเนินงานเพื่อที่เวลาดำเนินการต่าง ๆ ไปแล้ว การดำเนินการนั้น ๆ เกิดผลประโยชน์สูงสุดต่อพื้นที่

2. การสร้างความเข้าใจอันดีระหว่างนักท่องเที่ยวและคนในชุมชนเป็นสิ่งที่สำคัญที่ภาครัฐต้องเผยแพร่ข้อมูล ข่าวสาร กฎระเบียบ ข้อบังคับ นโยบายต่าง ๆ ที่นักท่องเที่ยวและคนในชุมชนควรรู้และต้องปฏิบัติตาม

3. ควรมีการพัฒนาสื่อเทคโนโลยีมาบูรณาการกับการท่องเที่ยวเมืองมรดกโลก ตลอดจนใช้ในการบริหารจัดการด้านต่าง ๆ ของอุทยานประวัติศาสตร์สุโขทัย เช่น การรักษาความปลอดภัย การเชื่อมโยงกิจกรรมการท่องเที่ยวเสมือนจริง การใช้แอพพลิเคชั่นเพื่อเสริมทักษะความรู้ทางประวัติศาสตร์ เป็นต้น

4. ควรมีการพัฒนาบรรจุภัณฑ์ผลิตภัณฑ์ต่าง ๆ ของสินค้าภายในชุมชน และนำอัตลักษณ์รวมทั้งเชื่อมโยงภาพเมืองมรดกโลกอุทยานประวัติศาสตร์สุโขทัยเข้ามาร่วมออกแบบเพื่อสร้างมูลค่าเพิ่มให้แก่สินค้า

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ควรมีการศึกษาแนวทางจัดการการท่องเที่ยวในเส้นทางมรดกทางวัฒนธรรม เพื่อให้เกิดการพัฒนาภายในพื้นที่แหล่งท่องเที่ยว รวมทั้งเชื่อมโยงสร้างเส้นทางท่องเที่ยวทางวัฒนธรรมในประเทศอาเซียน

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การเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังของร้านเครื่องมือช่าง กรณีศึกษา: ร้านพรโลหะภัณฑ์

An Efficiency Improvement of Inventory Management for Tool Store: A Case Study of Porn-Loha-Phun Store

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บทคัดย่อ

การวิจัยเรื่องการเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังของร้านเครื่องมือช่าง กรณีศึกษา: ร้านพรโลหะภัณฑ์ มีวัตถุประสงค์ (1) เพื่อศึกษาปัญหาระบบการจัดการสินค้าคงคลังของร้านพรโลหะภัณฑ์ และ (2) เพื่อศึกษาการเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังของร้านพรโลหะภัณฑ์ จากการเก็บรวบรวมข้อมูล พบว่า ร้านพรโลหะภัณฑ์มีปัญหาสินค้าไม่เพียงพอต่อการจำหน่ายในกลุ่มสินค้างานประปาประเภทท่อพีวีซีมากที่สุด คิดเป็นร้อยละ 92.66 จากการค้นหาสาเหตุของปัญหาโดยใช้แผนผังเหตุและผล พบว่า ทางร้านสั่งซื้อสินค้าตามประสบการณ์ ขาดความรู้เกี่ยวกับการจัดการสินค้าคงคลัง ไม่มีการจัดกลุ่มของสินค้า ไม่มีการกำหนดจุดสั่งซื้อที่เหมาะสม ไม่มีการสั่งซื้อสินค้าคงคลังสำรอง ทำให้เกิดปัญหาสินค้าที่ไม่เพียงพอต่อความต้องการและต้นทุนการจัดการสินค้าคงคลังสูง คณะผู้วิจัยจึงได้จัดลำดับความสำคัญของสินค้ากลุ่มงานประปา จำนวน 16 รายการ ด้วยวิธี ABC Analysis ผลการวิจัยพบว่า มีสินค้ากลุ่ม A จำนวน 4 รายการ มีมูลค่า 291,912 บาท คิดเป็นร้อยละ 74.30 ของมูลค่าทั้งหมด และมีสินค้ากลุ่ม B และ C คิดเป็นร้อยละ 18.76 และ 6.94 ตามลำดับ และจากการคำนวณปริมาณการสั่งซื้อที่ประหยัด ปริมาณสินค้าคงคลังสำรอง และจุดสั่งซื้อใหม่ ทำให้ร้านพรโลหะภัณฑ์มีต้นทุนรวมของการจัดการสินค้าคงคลังลดลงจาก 8,324.05 บาท เหลือ 3,949.32 บาท หรือลดลงร้อยละ 52.56 งานวิจัยฉบับนี้พิจารณากลุ่มตัวอย่างเฉพาะงานประปา 16 รายการ ควรขยายการบริหารสินค้าคงคลังไปยังกลุ่มสินค้าอื่น เพื่อให้การจัดการสินค้าคงคลังของร้านกรณีศึกษามีประสิทธิภาพมากขึ้น และควรฝึกอบรมพนักงานอย่างต่อเนื่องให้มีความรู้ความเข้าใจเกี่ยวกับการจัดการสินค้าคงคลัง

คำสำคัญ: การเพิ่มประสิทธิภาพ การบริหารจัดการสินค้าคงคลัง ร้านเครื่องมือช่าง

Abstract

This research is entitled “An Efficiency Improvement of Inventory Management for Tool Store: A Case Study of Porn-Loha-Phun Store”. There were two objectives: (1) to study the problem issues and guided for developing, (2) to improving the efficiency of inventory management of Porn-Loha-Phun store. Based on the data collected, it was found that the store faced a shortage of products for sale, particularly in the category of PVC pipes, accounting for 92.66% of the shortage. Upon investigating the causes using a cause-and-effect diagram, it was discovered that the store faced issues due to lack of knowledge in inventory management, absence of product grouping, failure to set appropriate reorder points, and the absence of safety stock orders. These issues led to inadequate product availability and high inventory management costs. Consequently, the research team prioritized the product groups within the plumbing category, totaling 16 items, using the ABC Analysis method. The findings revealed that there were 4 items in Group A, accounting for 74.30% of the total value, while Groups B and C accounted for 18.76% and 6.94% respectively. Subsequent calculations on optimal order quantities, safety stock levels, and reorder points resulted in a significant reduction in overall inventory management costs, from 8,324.05 THB to 3,949.32 THB, representing a 52.56% decrease. Based on this research, it is recommended to extend inventory management practices to other product groups to enhance the efficiency of inventory management in the hardware store's case study. Continuous training for employees to improve their understanding of inventory management is also advised.

Keywords: Efficiency Improvement, Inventory Management, Tool Store

บทนำ

ในปัจจุบันที่ภาคธุรกิจอุตสาหกรรมมีการแข่งขันกันอย่างรุนแรง หนึ่งในธุรกิจที่ได้รับผลกระทบเป็นอย่างมาก คือ กลุ่มธุรกิจขนาดเล็กที่ประกอบกิจการแบบดั้งเดิม (Traditional Trade) ที่จำหน่ายภายในร้านจะมีปริมาณน้อยและไม่มีความหลากหลาย (มยุรี จักรกระวาฬ, 2561) ร้านค้าแบบดั้งเดิมจะมีความเสียเปรียบจากธุรกิจหรือร้านค้าสมัยใหม่ (Modern Trade) ที่มีเงินทุนจำนวนมาก มีความชำนาญในด้านการบริหารจัดการ ตลอดจนใช้เทคโนโลยีที่ทันสมัยในการบริหารกิจการที่มีสาขาจำนวนมาก มีอำนาจต่อรองกับผู้จัดจำหน่ายนำไปสู่การประหยัดต่อขนาด (Economics of Scale) ทำให้เกิดต้นทุนในการดำเนินงานต่ำและสามารถจำหน่ายสินค้าในราคาที่ต่ำกว่าร้านค้าแบบดั้งเดิมได้ ในปี พ.ศ. 2564 ศูนย์วิจัยกสิกรไทย จึงกล่าวได้ว่า ร้านค้าขายแบบดั้งเดิมทั้งขนาดกลางและรายย่อยต้องมีการปรับตัวและพัฒนาระบบการจัดการสินค้าคงคลัง เพื่อให้มีประสิทธิภาพและมีศักยภาพในการแข่งขัน การมีกลยุทธ์ในการบริหารจัดการสินค้าคงคลังที่ดีจะเป็นการยกระดับมาตรฐานในกระบวนการดำเนินธุรกิจ เพื่อรับมือกับสภาวะการแข่งขันทางการค้าสามารถตอบสนองความต้องการของลูกค้าให้ได้สูงที่สุด ช่วยสร้างความเชื่อมั่นให้กับลูกค้าและภาพลักษณ์ทางธุรกิจได้ การจัดการคลังสินค้าสามารถสร้างสมดุลในห่วงโซ่อุปทานโดยการป้องกันความไม่แน่นอนของกระบวนการจัดซื้อ อีกทั้งก่อให้เกิดประโยชน์มากมาย เช่น การควบคุมปริมาณการสต๊อกสินค้าดีขึ้น (นูรีซัน สิเด๊ะ, กาญจนา ศรีสวัสดิ์, เพ็ญสุข เกตุมณี, ชุติมา

หวังเบ็ญหมัด และ ยรรยง คชรัตน์, 2566)

ร้านพรโลหะภัณฑ์ เป็นธุรกิจขนาดเล็กที่ประกอบกิจการจำหน่ายอุปกรณ์เครื่องมือช่างทุกชนิด ได้แก่ งานประปา งานเหล็ก งานปูน และเครื่องมือช่าง ร้านพรโลหะภัณฑ์ ตั้งอยู่ในตำบลบ่อยาง อำเภอเมืองสงขลา จังหวัดสงขลา เปิดให้บริการในวันจันทร์ถึงวันเสาร์ เวลา 07.30 - 18.30 น. มีลูกจ้างประจำจำนวน 1 คน และมีกลุ่มลูกค้าหลักคือ ช่าง และบุคคลทั่วไป จากการสัมภาษณ์เชิงลึกโดยใช้คำถามปลายเปิดเกี่ยวกับกระบวนการจัดการสินค้าคงคลังร่วมกับวิธีการสังเกตแบบมีส่วนร่วม และจากการเก็บข้อมูลเป็นระยะเวลา 1 เดือน พบว่า ร้านพรโลหะภัณฑ์ มีปัญหาสินค้าไม่เพียงพอต่อการจำหน่าย ในกลุ่มสินค้าท่อพีวีซี น้ำมันสน กาวประสานท่อ รถเข็น และตลับเมตร เนื่องจากไม่มีการจัดทำระบบสินค้าคงคลังที่ถูกต้อง ไม่มีการบันทึกข้อมูลสินค้าคงคลัง และขาดการวางแผนการจัดซื้อ จากปัญหาข้างต้น ทางคณะผู้จัดทำวิจัยจึงมีความสนใจที่จะศึกษาปัญหาระบบการจัดการสินค้าคงคลัง และศึกษาการเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังของร้านพรโลหะภัณฑ์ให้ดียิ่งขึ้น

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาปัญหาระบบการจัดการสินค้าคงคลังของร้านพรโลหะภัณฑ์
2. เพื่อศึกษาการเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังของร้านพรโลหะภัณฑ์

แนวคิด ทฤษฎี กรอบแนวคิด

1. แนวคิดที่เกี่ยวข้องกับการจัดการสินค้าคงคลัง (Inventory Management)

สินค้าคงคลัง หมายถึง สินค้าที่มีการเก็บสต็อกเพื่อเอาไว้ใช้งานในองค์กร ในองค์กรนั้นจะมีระบบและขั้นตอนในการควบคุมสินค้าคงคลังอย่างเป็นระบบระเบียบ ซึ่งระบบการควบคุมสินค้าคงคลังนั้นมุ่งเน้นไปที่สินค้าที่ควรจะต้องดำเนินการสั่งซื้อและจำนวนของสินค้าที่จะต้องดำเนินการสั่งซื้อ (ภัทรา อุดมกัลยารักษ์, 2560) ได้แบ่งประเภทของสินค้าคงคลังแบ่งออกได้เป็น 4 ประเภทดังนี้

1.1 วัตถุดิบและชิ้นส่วนที่สั่งซื้อ (Raw Material and Purchased Components) หมายถึง วัสดุขั้นต้นที่ใช้ในการทำชิ้นส่วน และผลิตภัณฑ์สำเร็จรูป

1.2 สินค้าคงคลังระหว่างกระบวนการผลิต (In-process Inventory) หมายถึง ชิ้นงานที่อยู่ในขั้นตอนการผลิตหรือรอคอยที่จะผลิตในขั้นตอนต่อไปให้เป็นผลิตภัณฑ์สำเร็จรูป

1.3 ผลิตภัณฑ์สำเร็จรูป (Finished Product) หมายถึง ผลิตภัณฑ์ที่พร้อมจะนำไปขายให้กับลูกค้าประกอบด้วยชิ้นส่วนเพื่อบริการ และผลิตภัณฑ์ขั้นสุดท้าย

1.4 สินค้าคงคลังที่เป็นเครื่องมือและชิ้นส่วน เพื่อการซ่อมบำรุงและการซ่อมแซม (Maintenance, Repair, and Tooling Inventories) สินค้าคงคลังเหล่านี้ ได้แก่ เครื่องมือ และชิ้นส่วนเพื่อการซ่อมแซมที่จำเป็นต่อการดำเนินการ

2. ทฤษฎี ABC Classification Analysis

ABC Analysis หรือการวิเคราะห์จัดกลุ่มด้วยระบบ ABC เป็นแนวคิดที่ให้ความสำคัญกับการจัดกลุ่มสินค้าเป็น 3 กลุ่ม คือ กลุ่ม A กลุ่ม B และกลุ่ม C เพื่อง่ายในการบริหารจัดการตามกลุ่มสินค้า โดยการจัดลำดับมีหลายแบบตามแนวนโยบายที่ต้องการใช้บริหารขององค์กร การแบ่งประเภทสินค้าคงคลังด้วยระบบ ABC Analysis สินค้าคงคลังกลุ่ม A จัดเป็นกลุ่มที่มีมูลค่าอยู่ประมาณ 75-80% ของมูลค่าสินค้าคงคลังทั้งหมด แต่สินค้าคงคลังอยู่ที่ 15-20% ของรายการสินค้าคงคลังทั้งหมด สินค้าคงคลังกลุ่ม B

จัดเป็นกลุ่มที่มีมูลค่าอยู่ประมาณ 15% ของมูลค่าสินค้าคงคลังทั้งหมด แต่สินค้าคงคลังอยู่ที่ 30-40% ของรายการสินค้าคงคลังทั้งหมด สินค้าคงคลังกลุ่ม C จัดเป็นกลุ่มที่มีมูลค่าอยู่ประมาณ 5-10% ของมูลค่าสินค้าคงคลังทั้งหมด แต่มีสินค้าคงคลังอยู่ที่ 40-50% ของรายการสินค้าคงคลัง (Diana, Francisco, Soumaya & Ada, 2017)

3. วิธีการสั่งซื้อที่ประหยัด (Economic Order Quantity: EOQ)

Economic Order Quantity หรือ EOQ เป็นวิธีการคำนวณที่ช่วยในการหาปริมาณสั่งซื้ออย่างประหยัดที่จะทำให้ต้นทุนรวม ซึ่งเกี่ยวข้องกับการจัดการสินค้าคงคลังที่เกิดขึ้นต่ำที่สุด ซึ่งต้นทุนรวมนั้นเกิดจากต้นทุนในการสั่งสินค้าและต้นทุนในการจัดเก็บรักษาสินค้า ผลที่ได้จากการคำนวณ EOQ Model จะสามารถทราบว่า ควรจะทำการสั่งซื้อเป็นจำนวนเท่าไหร่ถึงจะเหมาะสมกับลักษณะความต้องการสินค้า (วาสนา ซุ่นหิรัญ และ จิราพร ราชตบุตร, 2563) อีกทั้งรูปแบบการคำนวณ EOQ Model นี้มักใช้กับสินค้าคงคลังที่มีลักษณะความต้องการที่เป็นอิสระต่อกัน โดยไม่เกี่ยวข้องต่อเนื่องกับสินค้ารายการอื่น ๆ (Independent Demand) ซึ่งมีวัตถุประสงค์เพื่อให้ทราบต้นทุนรวมของสินค้าคงคลังที่ต่ำที่สุด เพื่อจะทำการกำหนดปริมาณการสั่งซื้อต่อครั้ง โดยมีสมมติฐานที่กำหนดเป็นขอบเขตดังนี้

3.1 สินค้าคงคลังที่กำลังพิจารณามีเพียงรายการเดียว
3.2 ความต้องการของสินค้าคงคลังเป็นความต้องการที่อิสระ
3.3 ทราบปริมาณอุปสงค์อย่างชัดเจนและอุปสงค์คงที่
3.4 ได้รับสินค้าที่สั่งซื้อพร้อมกับทั้งหมด
3.5 เวลานำในการสั่งซื้อ (Lead Time) ซึ่งเป็นช่วงเวลาตั้งแต่สั่งซื้อจนได้รับสินค้า
3.6 ราคาสินค้าที่สั่งซื้อคงที่
3.7 ไม่มีสภาวะสินค้าขาดมือ

ขนาดการสั่งซื้อที่ประหยัดจะพิจารณาต้นทุนรวมของสินค้าคงคลังที่ต่ำสุดเป็นหลัก เพื่อกำหนดระดับปริมาณการสั่งซื้อต่อครั้งที่เรียกว่า "ขนาดการสั่งซื้อที่ประหยัด" การใช้ระบบขนาดการสั่งซื้อที่ประหยัด มี 2 สถานการณ์ สำหรับงานวิจัยนี้จะทำการพิจารณาข้อมูลความต้องการสินค้า และการคำนวณต้นทุนรวมของสินค้าคงคลัง ซึ่งมีค่าตัวแปรต่าง ๆ ดังนี้

$$EOQ\ (*Q) = \sqrt{\frac{2PD}{H}} \qquad (1)$$

$$TC = \left[\frac{D}{Q}\right]P + \left[\frac{Q}{2}\right]H \qquad (2)$$

โดยที่ D = อุปสงค์หรือความต้องการสินค้าต่อปี (หน่วย)
P = ต้นทุนการสั่งซื้อสินค้า (บาท)
H = ต้นทุนการเก็บรักษาต่อหน่วยต่อปี (บาท)
Q = ปริมาณการสั่งซื้อต่อครั้ง (หน่วย)
TC = ต้นทุนสินค้าคงคลังโดยรวม (บาท)

3.1.1 การวิเคราะห์ความเหมาะสมของการสั่งซื้อที่ประหยัด

การคำนวณหาขนาดการสั่งซื้อที่ประหยัดจะมีความเหมาะสมเมื่ออุปสงค์มีรูปแบบคงที่ ซึ่งสามารถตรวจสอบความเหมาะสมได้จากการหาค่าสัมประสิทธิ์ความแปรปรวนยกกำลังสอง (Squared Coefficient of Variation) จากสมการดังต่อไปนี้

$$SCV = \frac{Variance\ of\ demand\ per\ period}{Square\ of\ demand\ per\ period}$$

$$= \frac{\frac{1}{n}\sum_{i=1}^{n}(d_{i^2} - \overline{d^2})}{\overline{d^2}}$$

โดยที่ di = ความต้องการวัตถุดิบต่อปี

d = ความต้องการวัตถุดิบเฉลี่ย

n = ช่วงระยะเวลาที่ทำการศึกษา

โดยขนาดการสั่งซื้อที่ประหยัด (EOQ) จะนำมาใช้ในการประมาณการสั่งซื้อได้หากค่า SCV ที่คำนวณได้ มีค่าน้อยกว่า 0.2 (Edward, David, & Douglas, 2017)

4. แนวคิดการกำหนดจุดสั่งซื้อใหม่ (Reorder Point: ROP)

ในการจัดซื้อสินค้าคงคลัง เวลาก็เป็นปัจจัยที่สำคัญอย่างยิ่ง โดยเฉพาะถ้าระบบการควบคุมสินค้าคงคลังของกิจการเป็นแบบต่อเนื่องจะสามารถกำหนดช่วงที่จะสั่งซื้อใหม่ได้ เมื่อพบว่าสินค้าคงคลัง ลดเหลือระดับหนึ่งก็จะสั่งซื้อของมาใหม่ในปริมาณคงที่เท่ากับปริมาณการสั่งซื้อที่กำหนดไว้ ซึ่งเรียกว่า Fixed Order Quantity System จุดสั่งซื้อใหม่นั้นมีความสัมพันธ์แปรตามตัวแปร 2 ตัว คือ อัตราความต้องการใช้สินค้าคงคลัง และรอบเวลาในการสั่งซื้อ (Lead Time) ซึ่งอยู่ภายใต้สภาวการณ์ 4 แบบ (พิภพ ลลิตาภรณ์, 2554) ดังต่อไปนี้

4.1 จุดสั่งซื้อใหม่ในอัตราความต้องการสินค้าคงคลังคงที่และรอบเวลาคงที่

4.2 จุดสั่งซื้อใหม่ในอัตราความต้องการสินค้าคงคลังที่แปรผันและรอบเวลาคงที่

4.3 จุดสั่งซื้อในอัตราความต้องการสินค้าคงคลังคงที่และรอบเวลาแปรผัน

4.4 จุดสั่งซื้อใหม่ในอัตราความต้องกรสินค้าแปรผันและรอบเวลาแปรฝัน

โดยงานวิจัยนี้อยู่ภายใต้สภาวการณ์รูปแบบจุดสั่งซื้อใหม่ในอัตราความต้องการสินค้าคงคลังที่แปรผันและรอบเวลาคงที่ ซึ่งเป็นสภาวะที่อาจเกิดของขาดมือได้เพราะว่าอัตราการใช้หรือความต้องการสินค้าคงคลังไม่สม่ำเสมอ จึงต้องมีการเก็บสินค้าคงคลังเผื่อขาดมือ (Cycle-service Level) ซึ่งจะเป็นโอกาสที่ไม่มีของขาดมือ โดยมีสมการดังต่อไปนี้

จุดสั่งซื้อใหม่ = (อัตราความต้องการ x รอบเวลา) + สินค้าคงคลังเพื่อความปลอดภัย

$$= \left(\overline{d} \times L\right) + z\sqrt{L}\,(\delta_d)$$

โดยที่ $\overline{d}$ = อัตราความต้องการสินค้าโดยเฉลี่ย

L = รอบเวลาคงที่

z = ค่าระดับความเชื่อมั่นว่าจะมีสินค้าเพียงพอต่อความต้องการ

δ_d = ความเบี่ยงเบนมาตรฐานของอัตราความต้องการสินค้า

5. ทฤษฎีสินค้าคงคลังสำรอง (Safety Stock)

สินค้าคงคลังสำรอง (Safety Stock) มีไว้เพื่อความปลอดภัยและป้องกันสินค้าขาดมือ เมื่อสินค้าถูกนำไปใช้และปริมาณลดลงจนถึงจุดสั่งซื้อ (Reorder Point) เป็นจุดที่เตือนสำหรับการสั่งซื้อรอบถัดไป เมื่ออุปสงค์สูงกว่าสินค้าคงคลังที่เก็บไว้ เป็นการเก็บสะสมสินค้าคงคลังในช่วงเวลานำในการสั่งซื้อ (Lead Time) (คำนาย อภิปรัชญาสกุล, 2553) โดยสามารถคำนวณ ได้จากสมการดังนี้

$$SS = Z(\sigma_d)\sqrt{L}$$

โดย SS = สินค้าคงคลังสำรอง (Safety stock)

Z = ค่าระดับความเชื่อมั่นว่าจะมีสินค้าเพียงพอต่อความต้องการ ซึ่งสามารถเปิดอ่านได้จากตารางการแจกแจงปกติ โดยการกำหนดค่าความเสี่ยงที่ยอมให้ของขาดมือได้

σ_d = ค่าความเบี่ยงเบนมาตรฐานของอุปสงค์หรือส่วนเบี่ยงเบนมาตรฐาน

L = ระยะเวลานำของสินค้าคงคลัง (Lead Time) (วัน)

6. งานวิจัยที่เกี่ยวข้อง

จิตรา โสดา (2562) ได้ศึกษาเรื่องการวิเคราะห์ปริมาณการสั่งซื้อที่เหมาะสมร้านค้าปลีกวัสดุก่อสร้าง กรณีศึกษา บริษัท ABC จำกัด โดยการประยุกต์ใช้ทฤษฎีการแบ่งกลุ่มสินค้า (ABC Analysis, ABC) การหาค่าสัมประสิทธิ์ความแปรปรวน (Variability Coefficient, VC) การคำนวณการสั่งซื้อ ที่ประหยัด (Economic Order Quantity: EOQ) และการหาจุดสั่งซื้อ (Reorder Point: ROP) ของการบริหารจัดการสินค้าคงคลัง ผลการศึกษาพบว่า เมื่อนำทฤษฎีการสั่งซื้อที่ประหยัด (EOQ) มาใช้ในการคำนวณหาปริมาณการสั่งซื้อที่เหมาะสม เพื่อลดต้นทุนในการสั่งซื้อ ลดต้นทุนด้านการจัดเก็บสินค้าจากผลการเปรียบเทียบข้อมูลการสั่งซื้อตั้งแต่เดือนมกราคม - ธันวาคม พ.ศ. 2561 ของบริษัทกรณีศึกษา โดยผลการคำนวณการสั่งซื้อที่ประหยัดของสินค้าประเภท กลุ่ม A ซึ่งแบ่งออกเป็น 4 ประเภท คือ แผนกไฟฟ้า แผนกประปา แผนกสี และแผนกฮาร์ดแวร์ พบว่า ทำให้ประหยัดค่าใช้จ่ายรวมทั้งปี ได้ถึง 274,495.47 บาท ซึ่งค่าใช้จ่ายที่ลดลงนั้นเกิดจากการค่าใช้จ่ายในการสั่งซื้อต่อครั้งและค่าใช้จ่ายในการจัดเก็บสินค้าลดลง เนื่องจากปริมาณการสั่งซื้อที่เหมาะสมมากขึ้นส่งผลให้เพิ่มสภาพคล่องทางการเงินให้กับทางบริษัท โดยทางบริษัทสามารถนำเงินส่วนดังกล่าวไปลงทุนหรือใช้จ่ายในส่วนอื่น ๆ เพื่อเพิ่มผลกำไรได้

ปรางรวี พันธ์สังวาล นันทิ สุทธิการนฤนัย และ สราวุธ จันทร์ผง (2564) ได้ศึกษาเรื่องการเพิ่มประสิทธิภาพการจัดการสินค้าคงคลัง กรณีศึกษา บริษัทค้าปลีก โดยการเสนอแนวทางการลดต้นทุนการจัดการสินค้าคงคลังผ่านกระบวนการ 3 ขั้นตอนดังนี้ 1) จัดกลุ่มลำดับความสำคัญของสินค้า 2) พยากรณ์ความต้องการสินค้า และ 3) กำหนดปริมาณการสั่งซื้อที่เหมาะสม ผลการศึกษาพบว่า 1.สินค้าประเภทครีมบำรุงผิวหน้าและครีมบำรุงผิวกายเป็นสินค้าที่มีความสำคัญมากที่สุด เมื่อใช้มูลค่ายอดขาย จำนวนวันถือครองสินค้าคงคลัง เปอร์เซ็นต์การเกิดสินค้าขาดมือ และระยะเวลาในการสั่งสินค้า เป็นเกณฑ์ในจัดกลุ่มความสำคัญของสินค้าแบบหลายเกณฑ์ 2.วิธีการพยากรณ์แบบการหาค่าเฉลี่ยเคลื่อนที่ การหาค่าเฉลี่ยถ่วงน้ำหนัก การปรับเรียบด้วยเอ็กซ์โปเนนเชียลมีความเหมาะสมกับการพยากรณ์สินค้าแตกต่างประเภทกันไปขึ้นกับว่าวิธีการใดก่อให้เกิดค่าความคลาดเคลื่อนในการพยากรณ์ต่ำที่สุด และ 3.การกำหนดปริมาณการสั่งซื้อตามช่วงเวลาก่อให้เกิดต้นทุนต่ำกว่าการกำหนดปริมาณการสั่งซื้ออย่างประหยัด สามารถลดต้นทุนรวมของการจัดการสินค้าคงคลังลงได้ 2,176,050 บาท หรือคิดเป็นลดลง 5% และก่อให้เกิดมูลค่าสินค้าคงคลังของกลุ่มเครื่องสำอางลดลง 1,255,230 บาท หรือคิดเป็นลดลง 2% ของมูลค่าสินค้าคงคลัง

ทั้งหมด และสามารถลดการเกิดสินค้าขาดมือในกลุ่มสินค้าเครื่องสำอางได้ 1.58%

มนัญณัฏฐ์ โภชนจันทร์ (2564) ได้ศึกษาเรื่องการลดต้นทุนสินค้าคงคลังของบริษัทผู้ผลิต อุปกรณ์อิเล็กทรอนิกส์เพื่อปรับปรุงนโยบาย การบริหารสินค้าคงคลังใช้รูปแบบการวิจัยแบบเชิงวิเคราะห์แก้ปัญหาเพื่อหาสาเหตุของปัญหา ปริมาณวัตถุดิบคงคลังไม่สัมพันธ์กับความต้องการใช้ ทำการเลือกวัตถุดิบหลักประเภท อีพอกซี่โมล (Epoxy Mold) มาทำการวิเคราะห์แก้ไขเป็นอันดับแรกตามความต้องการเร่งด่วน ผลการวิจัยพบว่า การลดต้นทุนสินค้าคงคลังของบริษัทผู้ผลิตอุปกรณ์อิเล็กทรอนิกส์ โดยการใช้นโยบายใหม่คือ เมื่อถึงจุดสั่งซื้อใหม่ (Reorder Point: ROP หรือ Min) ให้สั่งซื้อเพื่อเติมเต็มจนถึงระดับที่กำหนด (Max) จะช่วยประหยัดต้นทุนรวมวัตถุดิบคงคลังลง 5,191,643 บาท/ปี สำหรับวัตถุดิบประเภท A ทุกรายการ เมื่อเทียบกับนโยบายการจัดการสินค้าคงคลังแบบเก่า

อาธิตญา ฉวีวงษ์ และ พีระยุทธ คุ้มศักดิ์ (2560) ได้ศึกษาเรื่องการจัดการสินค้าคงคลังด้วย ABC Classification Analysis โดยใช้เทคนิค EOQ Model กรณีศึกษา บริษัท XYZ จำกัด งานวิจัยนี้เป็นการศึกษาการจัดการสินค้าคงคลังด้วย ABC Classification Analysis โดยใช้เทคนิค EOQ Model กรณีศึกษา บริษัท XYZ จำกัด พบว่า มีสินค้าคงคลัง จำนวน 7 รายการ ที่มีค่าสัมประสิทธิ์ความแปรปรวน < 0.25 แสดงว่า รูปแบบความต้องการมีลักษณะคงที่ สม่ำเสมอ จึงเหมาะสมกับเทคนิค EOQ Model ผลการวิจัยพบว่า จากการประยุกต์ใช้เทคนิค EOQ Model มีสินค้าคงคลัง จำนวน 5 รายการที่ต้นทุนลดลง และสามารถลดต้นทุนสินค้าคงคลังได้ถึง 16,672.96 บาท หรือลดลงร้อยละ 20.96

วิธีการดำเนินงาน

1. ศึกษาและวิเคราะห์ปัญหาการจัดการสินค้าคงคลังของร้านโลหะภัณฑ์

คณะผู้วิจัยลงพื้นที่ ณ สถานที่ปฏิบัติงานจริง ร้านพรโลหะภัณฑ์ เพื่อทำการศึกษาข้อมูลทั่วไปของธุรกิจ การจัดการคลังสินค้าในปัจจุบันโดยการสัมภาษณ์เชิงลึก (In-depth Interview) โดยใช้คำถามปลายเปิดเกี่ยวกับกระบวนการจัดการสินค้าคงคลังร่วมกับวิธีการสังเกตแบบมีส่วนร่วมกับเจ้าของกิจการและพนักงานในร้าน และทำการวิเคราะห์ปัญหาการจัดการสินค้าคงคลังของร้านโลหะภัณฑ์ ด้วยการใช้ผังก้างปลา (Fish Bone Chart) รวมทั้งเก็บรวบรวมข้อมูลปัญหาที่เกิดขึ้นในปัจจุบันเป็นระยะเวลา 1 เดือน (2 – 31 มกราคม พ.ศ. 2566)

2. ทบทวนทฤษฎีและงานวิจัยที่เกี่ยวข้อง

คณะผู้วิจัยได้ทำการศึกษาค้นคว้างานวิจัยที่เกี่ยวข้อง รวมทั้งทบทวนแนวคิดและทฤษฎีจากแหล่งข้อมูลทุติยภูมิ (Secondary Data) ซึ่งได้แก่ หนังสือ ตำรา วารสาร เอกสารวิชาการ และงานวิจัยที่เกี่ยวข้องกับการจัดการสินค้าคงคลัง การเพิ่มประสิทธิภาพ ทฤษฎี ABC Classification Analysis การสั่งซื้อที่ประหยัด แนวคิดการกำหนดจุดสั่งซื้อใหม่ ทฤษฎีสินค้าคงคลังสำรอง เป็นต้น

3. รวบรวมข้อมูลสินค้าคงคลังในปัจจุบันของร้านโลหะภัณฑ์

คณะผู้วิจัยดำเนินเก็บข้อมูลปริมาณความต้องการซื้อสินค้า (Demand) ในกลุ่มสินค้างานประปาประเภทท่อพีวีซี เป็นระยะเวลา 2 เดือน (มกราคม – กุมภาพันธ์ พ.ศ. 2566) รวมถึงต้นทุนต่อหน่วยของแต่ละรายการ ระยะเวลาในการสั่งซื้อของสินค้าแต่ละรายการ (Lead Time) ต้นทุนและค่าใช้จ่ายต่าง ๆ ของสถานประกอบการ เพื่อใช้ในการวิเคราะห์และศึกษาการเพิ่มประสิทธิภาพการบริหารจัดการสินค้าคงคลังต่อไป

4. วิเคราะห์ข้อมูลสินค้าคงคลังของร้านโลหะภัณฑ์

คณะผู้วิจัยทำการจัดลำดับกลุ่มสินค้าคงคลังแบบ ABC Analysis จากนั้นทำการหาปริมาณการสั่งซื้อที่ประหยัด (Economic Order Quantity: EOQ) ปริมาณสินค้าคงคลังสำรอง (Safety Stock) จุดสั่งซื้อใหม่ (Reorder Point: ROP) ต้นทุนรวม (Total Cost, TC) และทำการเปรียบเทียบต้นทุนการสั่งซื้อในรูปแบบเดิมและรูปแบบใหม่

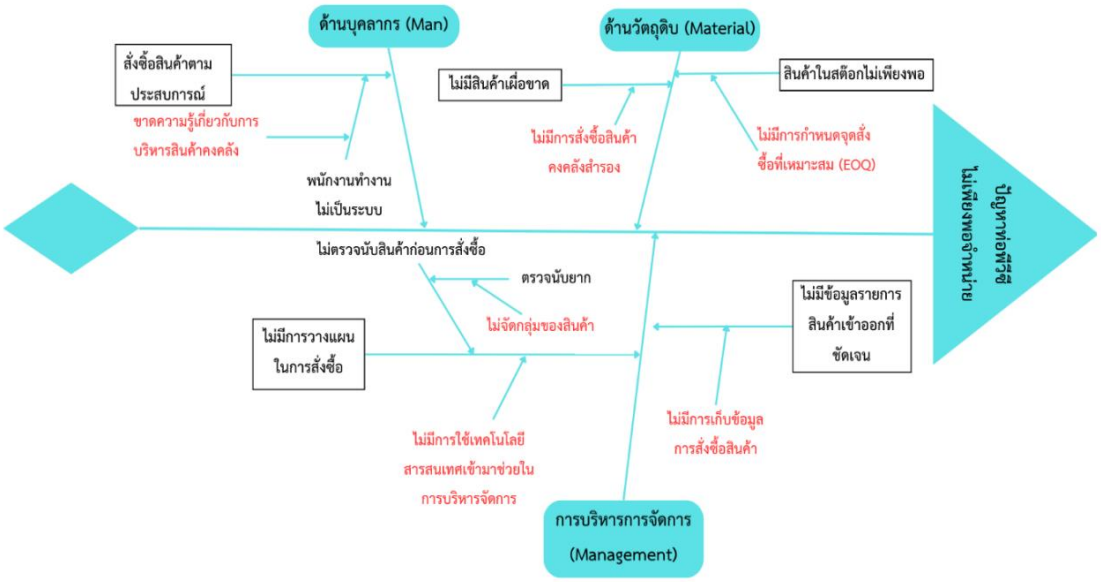
5. สรุปและนำเสนอผลการวิจัย

คณะผู้วิจัยสรุปและนำเสนอผลการวิจัย ในหัวข้อการวิเคราะห์แบ่งกลุ่มสินค้า โดยวิธี ABC Analysis และต้นทุนรวม (Total Cost, TC) จากนั้นทำการเสนอข้อเสนอแนะการนำผลการวิจัยไปใช้ และข้อเสนอแนะเพื่อการวิจัยครั้งต่อไป

ผลการวิจัย

1. ผลการศึกษาข้อมูลเบื้องต้น

จากการสำรวจพื้นที่จริงและเก็บข้อมูลเป็นระยะเวลา 1 เดือน พบว่า ร้านพรโลหะภัณฑ์มีสินค้าไม่เพียงพอต่อการจำหน่าย ซึ่งสินค้าที่ไม่เพียงพอสูงสุด คือ สินค้างานประปาประเภทท่อพีวีซี จำนวน 101 หน่วย คิดเป็นร้อยละ 92.66 และทำการวิเคราะห์หาสาเหตุของปัญหา โดยการใช้ผังก้างปลา (Fish Bone Chart) ซึ่งสามารถแสดงผลดังภาพที่ 1



ภาพที่ 1 สาเหตุของการเกิดปัญหาท่อพีวีซีไม่เพียงพอสำหรับการจำหน่าย

2. การแก้ไขปัญหา

จากข้อมูลของร้านกรณีศึกษาที่กล่าวมา และจากการศึกษาทบทวนทฤษฎีและงานวิจัยที่เกี่ยวข้องกับการจัดการสินค้าคงคลัง ผู้วิจัยจึงใช้ข้อมูลในอดีตของร้านกรณีศึกษามาทำการกำหนดนโยบายในการจัดการสินค้าคงคลัง โดยนำผลทฤษฎีการจัดการสินค้าคงคลังความต้องการสินค้าประเภทท่อพีวีซีที่ใช้ในการจำหน่ายในกิจการ ในเดือนมกราคม พ.ศ. 2566 ที่ได้จากคำนวณความต้องการท่อพีวีซีเดือนมกราคม พ.ศ. 2566 โดยโปรแกรม Microsoft Excel มาทำการศึกษา ด้วยขั้นตอนการศึกษาดังนี้

2.1 การแบ่งกลุ่มสินค้าโดยวิธี ABC Analysis

ภายในร้านพรโลหะภัณฑ์ มีสินค้าภายในร้านประมาณ 10,000 รายการ โดยทางร้านมีสินค้าที่มีการหมุนเวียนตลอดทุกเดือน จำนวน 16 รายการ ซึ่งสามารถแบ่งกลุ่มวัตถุดิบได้ตามตารางที่ 1

ตารางที่ 1 ลำดับความสำคัญโดยวิธี ABC Analysis ตามความต้องการเฉลี่ยต่อปี พ.ศ. 2566

ลำดับที่	ชื่อสินค้า	ความต้องการ (หน่วย/ปี)	ต้นทุนต่อหน่วย (บาท)	มูลค่ารวม	ร้อยละมูลค่า	ร้อยละปริมาณ	ร้อยละมูลค่ารวม	ร้อยละปริมาณรวม	กลุ่ม
1	ท่อขนาด 1/2 นิ้ว	1,602	52	83,304	21.20	10.19	74.30	22.60	A
2	ท่อขนาด 1 นิ้ว	852	85	72,420	18.43	5.42			
3	ท่อขนาด 2 นิ้ว	666	158	68,256	17.37	4.24			
4	ท่อขนาด 1 1/2 นิ้ว	432	102	67,932	17.29	2.75			
5	ข้องอ 90' 1/2 นิ้ว	3,396	4	13,584	3.46	21.59	18.76	53.14	B
6	ข้องอ 90' 1 นิ้ว	1,350	10	13,500	3.44	8.58			
7	ข้องอ 90' 1 1/2 นิ้ว	876	12	10,512	2.68	5.57			
8	ข้อต่อสามทาง 1 นิ้ว	294	12	10,080	2.57	1.87			
9	ข้อต่อตรง 1 1/2 นิ้ว	1,176	11	9,438	2.40	7.48			
10	ข้อต่อสามทาง 1/2 นิ้ว	840	8	9,408	2.39	5.34			
11	ข้อต่อตรง 1 นิ้ว	426	7	7,182	1.83	2.71			
12	ข้อต่อสามทาง 1 1/2 นิ้ว	288	15	6,390	1.63	1.83	6.94	24.26	C
13	ข้อต่อสามทาง 2 นิ้ว	1,350	20	5,760	1.47	8.58			
14	ข้อต่อตรง 1/2 นิ้ว	1,026	4	5,400	1.37	6.52			
15	ข้อต่อตรง 2 นิ้ว	858	18	5,292	1.35	5.46			
16	ข้องอ 90' 2 นิ้ว	294	15	4,410	1.12	1.87			
รวม				392,868	100	100			

นโยบายการจัดการสินค้าคงคลังตามกลุ่มสินค้า

สินค้ากลุ่ม A ควรมีการควบคุมอย่างเข้มงวดด้วยการลงบันทึกบัญชีทุกครั้งที่มีการรับจ่าย และมีการตรวจนับจำนวนจริงเพื่อเปรียบเทียบจำนวนในบัญชีอยู่บ่อย ๆ (ทุกสัปดาห์) และเก็บสินค้าในพื้นที่ใกล้ประตูทางออก เพื่อลดระยะทางในการเบิกจ่ายในด้านการจัดซื้อควรมีผู้ขายไว้หลายรายเพื่อลดความเสี่ยงจากการขาดแคลนสินค้าและสามารถเจรจาต่อรองราคาสินค้าได้

สินค้ากลุ่ม B ควรมีการควบคุมอย่างเข้มงวดปานกลางด้วยการลงบัญชีคุมยอดบันทึกเสมอ เช่นเดียวกลับสินค้ากลุ่ม A ควรมีการเบิกจ่ายอย่างเป็นระบบเพื่อป้องกันการสูญหาย การตรวจนับควรทำเช่นเดียวกับสินค้ากลุ่ม A แต่ความถี่น้อยลงได้และการควบคุมสินค้ากลุ่ม B ควรใช้ระบบสินค้าคงคลังอย่างต่อเนื่องเช่นเดียวกับสินค้ากลุ่ม A

สินค้ากลุ่ม C ควรมีจดบันทึกเพียงเล็กน้อยและเก็บสินค้าในพื้นที่ให้หยิบใช้ได้สะดวก เนื่องจากเป็นสินค้าราคาถูกและปริมาณมาก หากทำการควบคุมอย่างเข้มงวดจะทำให้มีค่าใช้จ่ายมาก ซึ่งไม่คุ้มค่ากับประโยชน์ที่ได้ การตรวจนับใช้ระบบสินค้าคงคลังแบบสิ้นงวด คือ เว้นสักระยะจะมาตรวจนับดูว่าพร่องไปเท่าใดแล้วจึงซื้อมาเติมหรืออาจใช้ระบบสองกล่อง ซึ่งมีกล่องวัสดุอยู่ 2 กล่องเป็นการเผื่อไว้เมื่อใช้ของในกล่องแรกหมด จึงนำเอากล่องสำรองมาใช้แล้วรีบซื้อของเติมใส่กล่องสำรองแทน ซึ่งจะทำให้ไม่มีการขาดมือเกิดขึ้น

2.2 คำนวณปริมาณการสั่งซื้อที่ประหยัด (Economic Order Quantity: EOQ)

โดยเป็นขนาดการสั่งซื้อที่ประหยัดที่อุปสงค์คงที่และสินค้าคงคลังไม่ขาดมือ ตามสมการหาขนาดการสั่งซื้อที่ประหยัด (EOQ) จะทำได้จากสมการที่ 1 ดังนี้

$$EOQ\ (*Q) = \sqrt{\frac{2PD}{H}} \qquad (1)$$

ตามสมการที่ 1 ข้างต้น จะแทนค่าตัวแปรต่าง ๆ ที่ได้จากการคำนวณ เพื่อหาค่า EOQ เพื่อให้เกิดความสอดคล้องในการแสดงตัวอย่างการคำนวณในส่วนถัดไป จะใช้ข้อมูลท่อพีวีซีขนาด ½ นิ้ว ในการคำนวณดังนี้

D คือ อุปสงค์หรือความต้องการสินค้าต่อปี มีค่าเท่ากับ 1,602 ชิ้นต่อปี

P คือ ต้นทุนการสั่งซื้อสินค้าต่อครั้ง (บาท) ประกอบไปด้วยเงินเดือนพนักงาน ค่าใช้จ่ายในการติดต่อสื่อสาร เท่ากับ 19.04 บาทต่อครั้ง

H คือ ต้นทุนการเก็บรักษา ประกอบไปด้วย เงินเดือนพนักงาน ค่าสาธารณูปโภคค่าพัสดุเสื่อมเสียล้างสมัย = 240,000 + 31,200 + 86,102.40 = 357,302.40 บาท ดังนั้น ต้นทุนในการเก็บรักษา /ค่าเฉลี่ยมูลค่าการจัดเก็บวัสดุ = 357,302.40/4,305,120 = 8.30%

จากการคำนวณปริมาณการสั่งซื้อที่ประหยัด (EOQ) โดยทางร้านมีสินค้าที่มีการหมุนเวียนตลอดทุกเดือน จำนวน 16 รายการ ซึ่งสามารถแสดงได้ตามตารางที่ 2

ตารางที่ 2 ปริมาณการสั่งซื้อที่ประหยัด (EOQ) ของสินค้า

ลำดับที่	ชื่อสินค้า	ความต้องการเฉลี่ย(หน่วยต่อปี)	ต้นทุนต่อหน่วย (บาท)	ต้นทุนการสั่งซื้อ (บาทต่อครั้ง)	ต้นทุนการเก็บรักษา (บาทต่อปี)	ปริมาณการสั่งซื้อที่ประหยัด (หน่วยต่อครั้ง)
1	ท่อขนาด 1/2 นิ้ว	1,602	52	19.04	4.32	119
2	ท่อขนาด 1 นิ้ว	852	85	19.04	7.06	68
3	ท่อขนาด 2 นิ้ว	666	158	19.04	13.11	44
4	ท่อขนาด 1 1/2 นิ้ว	423	102	19.04	8.47	44
5	ข้องอ 90' 1/2 นิ้ว	3396	4	19.04	0.33	624
6	ข้องอ 90' 1 นิ้ว	1350	10	19.04	0.83	249
7	ข้องอ 90' 1 1/2 นิ้ว	876	12	19.04	1.00	183
8	ข้อต่อสามทาง 1 นิ้ว	294	12	19.04	1.00	106
9	ข้อต่อตรง 1 1/2 นิ้ว	1176	11	19.04	0.91	221

ตารางที่ 2 (ต่อ)

ลำดับที่	ชื่อสินค้า	ความต้องการเฉลี่ย(หน่วยต่อปี)	ต้นทุนต่อหน่วย (บาท)	ต้นทุนการสั่งซื้อ (บาทต่อครั้ง)	ต้นทุนการเก็บรักษา (บาทต่อปี)	ปริมาณการสั่งซื้อที่ประหยัด (หน่วยต่อครั้ง)
10	ข้อต่อสามทาง 1/2 นิ้ว	840	8	19.04	0.66	219
11	ข้อต่อตรง 1 นิ้ว	426	7	19.04	0.58	167
12	ข้อต่อสามทาง 1 1/2 นิ้ว	288	15	19.04	1.25	94
13	ข้อต่อสามทาง 2 นิ้ว	1350	20	19.04	1.66	176
14	ข้อต่อตรง 1/2 นิ้ว	1026	4	19.04	0.33	343
15	ข้อต่อตรง 2 นิ้ว	858	18	19.04	1.49	148
16	ข้องอ 90' 2 นิ้ว	294	15	19.04	1.25	95

2.3 จุดสั่งซื้อใหม่ในอัตราความต้องการสินค้าคงคลังที่แปรผันและรอบเวลาคงที่

ตัวอย่าง ที่ใช้พิจารณา คือ ข้อมูลของสินค้าท่อพีวีซี ½ นิ้ว ได้แก่

D = ความต้องการโดยเฉลี่ยต่อปี 1,602 หน่วย

$\bar{d}$ = อัตราความต้องการสินค้าโดยเฉลี่ย 4 ชิ้นต่อวัน

LT = ช่วงเวลาในการรอคอยสินค้า 14 วัน

P = ต้นทุนในการสั่งซื้อ 19.04 บาท

H = ต้นทุนในการเก็บรักษา 4.32 บาท

1) รอบเวลาการสั่งซื้อที่ประหยัด

$$T0 = \sqrt{\frac{2P}{HD}}$$

$$= \sqrt{\frac{2\times19.04}{4.32\times1,602}}$$

= 0.0741 ปี หรือ 27.07 วัน ≈ 27 วัน

2) ระดับสินค้าคงคลังสำรอง

$$SS = Z_{\sigma_d}\sqrt{T+LT}$$

$$= 1.645(11.26)\sqrt{27+14}$$

= 118.60 ≈ 119 หน่วย

3) จุดสั่งซื้อใหม่ = (อัตราความต้องการ x รอบเวลา) + สินค้าคงคลังเพื่อความปลอดภัย

= ($\bar{d}$ x L) + SS

= (4 × 14) +115

= 171 หน่วย

ดังนั้น จุดสั่งซื้อใหม่ของข้อมูลของสินค้าท่อพีวีซี ½ นิ้ว เท่ากับ 171 หน่วยโดย จุดสั่งซื้อใหม่ (ROP) ของสินค้าทั้งหมดซึ่งสามารถแสดงได้ตามตารางที่ 3

ตารางที่ 3 จุดสั่งซื้อใหม่ (ROP) ของสินค้า

ลำดับที่	ชื่อสินค้า	ความต้องการโดยเฉลี่ยต่อวัน	ระยะรอคอยสินค้า (วัน)	รอบเวลาที่ประหยัด T0 (วัน)	Safety Stock (หน่วยต่อครั้ง)	ROP (หน่วย)
1	ท่อขนาด 1/2 นิ้ว	4	14	45	119	203
2	ท่อขนาด 1 นิ้ว	2	14	61	122	85
3	ท่อขนาด 2 นิ้ว	2	14	69	114	53
4	ท่อขนาด 1 1/2 นิ้ว	1	14	86	133	57
5	ข้องอ 90' 1/2 นิ้ว	9	14	31	167	269
6	ข้องอ 90' 1 นิ้ว	4	14	49	167	149
7	ข้องอ 90' 1 1/2 นิ้ว	2	14	61	176	81
8	ข้อต่อสามทาง 1 นิ้ว	1	14	104	224	74
9	ข้อต่อตรง 1 1/2 นิ้ว	3	14	52	168	109
10	ข้อต่อสามทาง 1/2นิ้ว	2	14	62	194	109
11	ข้อต่อตรง 1 นิ้ว	1	14	87	232	89
12	ข้อต่อสามทาง1 1/2นิ้ว	1	14	106	214	53
13	ข้อต่อสามทาง 2 นิ้ว	4	14	49	145	85
14	ข้อต่อตรง 1/2 นิ้ว	3	14	56	216	133
15	ข้อต่อตรง 2 นิ้ว	2	14	61	162	68
16	ข้องอ 90' 2 นิ้ว	1	14	104	213	35

2.4 คำนวณต้นทุนรวม (Total Cost, TC) ของวิธีการจัดการสินค้าคงคลังแบบใหม่เทียบกับการจัดการสินค้าคงคลังแบบเดิมของร้านกรณีศึกษา โดยต้นทุนรวม (TC) จะทำได้จากสมการที่ 2 ดังนี้

$$TC = \left[\frac{D}{Q}\right] P + \left[\frac{Q}{2}\right] H \quad (2)$$

โดยที่ D = อุปสงค์หรือความต้องการสินค้าต่อปี (หน่วย)
P = ต้นทุนการสั่งซื้อสินค้า (บาท)
H = ต้นทุนการเก็บรักษาต่อหน่วยต่อปี (บาท)
Q = ปริมาณการสั่งซื้อต่อครั้ง (หน่วย)
TC = ต้นทุนสินค้าคงคลังโดยรวม (บาท)

โดยต้นทุนรวมของสินค้าในปี พ.ศ. 2566 จากการจัดการสินค้าคงคลังแบบใหม่ แสดงดังตารางที่ 4 และต้นทุนรวมของสินค้าในปี พ.ศ. 2566 จากการจัดการสินค้าคงคลังแบบเดิม แสดงดังตารางที่ 5

ตารางที่ 4 ต้นทุนในการสั่งซื้อของสินค้าในปี พ.ศ. 2566 จากการจัดการสินค้าคงคลังแบบเดิม

ลำดับที่	ชื่อสินค้า	ความต้องการเฉลี่ย (หน่วยต่อปี)	ต้นทุนการสั่งซื้อ (บาทต่อครั้ง)	ต้นทุนการเก็บรักษา (บาทต่อปี)	จำนวนการสั่งซื้อแต่ละครั้ง (หน่วยต่อครั้ง)	ต้นทุนรวมแบบใหม่ (บาท)
1	ท่อขนาด 1/2 นิ้ว	1,602	19.04	4.32	50	718.04
2	ท่อขนาด 1 นิ้ว	852	19.04	7.06	30	646.64
3	ท่อขนาด 2 นิ้ว	666	19.04	13.11	25	671.10
4	ท่อขนาด 1 1/2 นิ้ว	432	19.04	8.47	17	555.84
5	ข้องอ 90' 1/2 นิ้ว	3,396	19.04	0.33	150	455.82
6	ข้องอ 90' 1 นิ้ว	1,350	19.04	0.83	60	453.30
7	ข้องอ 90' 1 1/2 นิ้ว	876	19.04	1.00	40	436.98
8	ข้อต่อสามทาง 1 นิ้ว	294	19.04	1.00	15	380.68
9	ข้อต่อตรง 1 1/2 นิ้ว	1,176	19.04	0.91	50	470.57
10	ข้อต่อสามทาง 1/2 นิ้ว	840	19.04	0.66	36	456.15
11	ข้อต่อตรง 1 นิ้ว	426	19.04	0.58	20	411.35
12	ข้อต่อสามทาง 1 1/2 นิ้ว	288	19.04	1.25	15	374.94
13	ข้อต่อสามทาง 2 นิ้ว	1,350	19.04	1.66	60	478.20
14	ข้อต่อตรง 1/2 นิ้ว	1,026	19.04	0.33	50	398.95
15	ข้อต่อตรง 2 นิ้ว	858	19.04	1.49	16	1032.94
16	ข้องอ 90' 2 นิ้ว	294	19.04	1.25	15	382.56
	รวม					**8,324.05**

จากตารางที่ 4 พบว่าต้นทุนในการสั่งซื้อของสินค้าในปี พ.ศ. 2566 จากการจัดการสินค้าคงคลังแบบเดิมมีต้นทุนในการสั่งซื้อ เท่ากับ 19.04 บาทต่อครั้ง และมีต้นทุนการเก็บรักษา เท่ากับร้อยละ 8.30 โดยการจัดการสินค้าคงคลังแบบใหม่มีต้นทุนรวม เท่ากับ 8,324.05 บาท

ตารางที่ 5 ต้นทุนในการสั่งซื้อของสินค้าในปี พ.ศ. 2566 จากการจัดการสินค้าคงคลังแบบใหม่

ลำดับที่	ชื่อสินค้า	ความต้องการเฉลี่ย (หน่วยต่อปี)	ต้นทุนการสั่งซื้อ (บาทต่อครั้ง)	ต้นทุนการเก็บรักษา (บาทต่อปี)	จำนวนการสั่งซื้อแต่ละครั้ง (หน่วยต่อครั้ง)	ต้นทุนรวมแบบเดิม (บาท)
1	ท่อขนาด 1/2 นิ้ว	1,602	19.04	4.32	119	513.36
2	ท่อขนาด 1 นิ้ว	852	19.04	7.06	68	478.60
3	ท่อขนาด 2 นิ้ว	666	19.04	13.11	44	576.62
4	ท่อขนาด 1 1/2 นิ้ว	432	19.04	8.47	44	373.28
5	ข้องอ 90' 1/2 นิ้ว	3,396	19.04	0.33	624	206.58
6	ข้องอ 90' 1 นิ้ว	1,350	19.04	0.83	249	206.56

ตารางที่ 5 (ต่อ)

ลำดับที่	ชื่อสินค้า	ความต้องการเฉลี่ย (หน่วยต่อปี)	ต้นทุนการสั่งซื้อ (บาทต่อครั้ง)	ต้นทุนการเก็บรักษา (บาทต่อปี)	จำนวนการสั่งซื้อแต่ละครั้ง (หน่วยต่อครั้ง)	ต้นทุนรวมแบบเดิม (บาท)
7	ข้องอ 90' 1 1/2 นิ้ว	876	19.04	1.00	183	182.64
8	ข้อต่อสามทาง 1 นิ้ว	294	19.04	1.00	106	105.81
9	ข้อต่อตรง 1 1/2 นิ้ว	1,176	19.04	0.91	221	201.87
10	ข้อต่อสามทาง 1/2 นิ้ว	840	19.04	0.66	219	145.30
11	ข้อต่อตรง 1 นิ้ว	426	19.04	0.58	167	97.00
12	ข้อต่อสามทาง 1 1/2 นิ้ว	288	19.04	1.25	94	117.09
13	ข้อต่อสามทาง 2 นิ้ว	1,350	19.04	1.66	176	292.13
14	ข้อต่อตรง 1/2 นิ้ว	1,026	19.04	0.33	343	113.55
15	ข้อต่อตรง 2 นิ้ว	858	19.04	1.49	148	220.64
16	ข้องอ 90' 2 นิ้ว	294	19.04	1.25	95	118.30
	รวม					**3,949.32**

จากตารางที่ 5 พบว่าต้นทุนในการสั่งซื้อของสินค้าในปี พ.ศ. 2566 จากการจัดการสินค้าคงคลังแบบใหม่มีต้นทุนในการสั่งซื้อ เท่ากับ 19.04 บาทต่อครั้ง และมีต้นทุนการเก็บรักษา เท่ากับ ร้อยละ 8.30 โดยการจัดการสินค้าคงคลังแบบใหม่มีต้นทุนรวม เท่ากับ 3,949.32 บาทต่อปี

จากการคำนวณต้นทุนรวมของการจัดการสินค้าคงคลังแบบเดิมและแบบใหม่ สามารถแสดงการเปรียบเทียบต้นทุนรวมได้ดัง ตารางที่ 6

ตารางที่ 6 ผลการเปรียบเทียบต้นทุนรวมของการจัดการสินค้าคงคลังแบบเดิมและแบบใหม่

รายการ	ต้นทุนรวม
การจัดการสินค้าคงคลังแบบเดิม	8,324.05
การจัดการสินค้าคงคลังแบบใหม่	3,949.32
ผลต่าง	**4,374.73**
คิดเป็นร้อยละ	**52.56**

จากตารางที่ 6 จะเห็นได้ว่า ต้นทุนรวมของการจัดการสินค้าคงคลังในปัจจุบันของร้านพรโลหะภัณฑ์ เท่ากับ 8,324.05 บาท และต้นทุนรวมของการจัดการสินค้าคงคลังแบบใหม่ เท่ากับ 3,949.32 บาท ซึ่งต้นทุนรวมการจัดการสินค้าคงคลังแบบใหม่ สามารถลดต้นทุนรวมลงได้ 4,374.73 บาท คิดเป็นร้อยละ 52.56

สรุปและอภิปรายผล

สินค้ากลุ่ม A จำนวน 4 รายการ มีมูลค่า 291,912 บาท คิดเป็นร้อยละ 74.30 ของมูลค่าทั้งหมด สินค้ากลุ่ม B จำนวน 7 รายการ มีมูลค่า 73,704 บาท คิดเป็นร้อยละ 18.76 ของมูลค่าทั้งหมด สินค้ากลุ่ม C จำนวน 5 รายการ มีมูลค่า 20,862 บาท คิดเป็นร้อยละ 6.94 ของมูลค่าทั้งหมด และคำนวณต้นทุนในการสั่งซื้อ เท่ากับ 19.04 บาท ต่อครั้ง และมีต้นทุนการเก็บรักษา เท่ากับร้อยละ 8.30 พบว่าต้นทุนรวมของการจัดการสินค้าคงคลัง ในปัจจุบันของร้านพรโลหะภัณฑ์ เท่ากับ 8,324.05 บาท และต้นทุนรวมของการจัดการสินค้าคงคลังแบบใหม่ เท่ากับ 3,949.32 บาท ซึ่งสามารถลดต้นทุนรวมในการจัดการสินค้าคงคลัง ได้เท่ากับ 4,374.73 บาท คิดเป็นร้อยละ 52.56

จากการปรับปรุงกระบวนการจัดการสินค้าคงคลังของร้านพรโลหะภัณฑ์ โดยการใช้ทฤษฎี ABC Analysis ทำให้ร้านสามารถจำแนกกลุ่มสินค้าคงคลังเป็น 3 กลุ่มตามความสำคัญและปริมาณการขาย โดยมีแนวทางในการจำแนกกลุ่มสินค้าคงคลังที่มีจำนวนมากภายในร้านค้าดังนี้:

1. สินค้ากลุ่ม A สินค้าในกลุ่มนี้มีความสำคัญสูงและมีปริมาณการขายมาก ซึ่งมักจะมีรายได้สูงสุดสำหรับร้าน การจัดเก็บและจัดการสินค้าคงคลังในกลุ่มนี้จึงต้องเน้นการจัดเก็บที่มีประสิทธิภาพและการสั่งซื้อที่ถูกต้อง เพื่อลดค่าใช้จ่ายในการเก็บคลังและค่าใช้จ่ายในการสั่งซื้อสินค้า

2. สินค้ากลุ่ม B สินค้าในกลุ่มนี้มีความสำคัญระดับกลาง การจัดเก็บและการสั่งซื้อสินค้าคงคลังสามารถทำได้โดยไม่ต้องใช้ทรัพยากรน้อยกว่ากลุ่ม A แต่ยังต้องให้ความสำคัญในการจัดการเพื่อไม่ให้มีการขาดสินค้าหรือการสั่งซื้อเกินไป

3. สินค้ากลุ่ม C สินค้าในกลุ่มนี้มีความสำคัญต่ำและมีปริมาณการขายน้อย การจัดเก็บและการสั่งซื้อสินค้าในกลุ่มนี้มักเป็นไปในลักษณะที่เรียบง่ายและมีค่าใช้จ่ายต่ำ

นอกจากนี้ การกำหนดปริมาณการสั่งซื้อที่ประหยัด (Economic Order Quantity: EOQ) ปริมาณสินค้าคงคลังสำรอง (Safety Stock) และจุดสั่งซื้อใหม่ (Reorder Point: ROP) เป็นวิธีที่สามารถช่วยให้ร้านพรโลหะภัณฑ์ลดค่าใช้จ่ายในการจัดการสินค้าคงคลัง สามารถหาปริมาณการสั่งซื้อที่เหมาะสมเพื่อลดต้นทุนการจัดการสินค้าคงคลัง ทั้งยังสามารถกำหนดปริมาณสินค้าคงคลังสำรองเพื่อรองรับความไม่แน่นอนในการสั่งซื้อและกำหนดจุดสั่งซื้อใหม่ที่เหมาะสม เพื่อให้สามารถสั่งซื้อสินค้าใหม่ได้ทันทีเมื่อสินค้าในสต็อกลดลงไปถึงระดับที่กำหนดไว้ ด้วยการปรับปรุงกระบวนการจัดการสินค้าคงคลังตามทฤษฎี ABC Analysis และการกำหนด EOQ, Safety Stock, และ ROP ที่เหมาะสมร้านพรโลหะภัณฑ์จึงสามารถลดต้นทุนรวมของการจัดการสินค้าคงคลังได้อย่างมีประสิทธิภาพ

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

จากการศึกษาครั้งนี้พบว่า ร้านค้าควรมีการควรฝึกอบรมพนักงานอย่างต่อเนื่องให้มีความรู้ความเข้าใจเกี่ยวกับการจัดการสินค้าคงคลัง และควรมีการดำเนินการให้พนักงานมีการตรวจนับสินค้าคงเหลืออย่างสม่ำเสมอ และควรนำเทคโนโลยีขั้นพื้นฐานเข้ามาช่วยในการตรวจสอบการตรวจนับจำนวนสินค้าคงเหลือ

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

ในงานวิจัยฉบับนี้ พิจารณากลุ่มตัวอย่างงานประปาเพียง 16 รายการ เท่านั้น ควรขยายการบริหารสินค้าคงคลังไปยังกลุ่มสินค้าอื่นเพิ่มเติม หรือกำหนดนโยบายการจัดการสินค้าคงคลังแบบใหม่เพื่อให้การจัดการสินค้าคงคลังของร้านกรณีศึกษามีประสิทธิภาพมากขึ้น

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รูปแบบและการปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ กรณีศึกษา ห้างหุ้นส่วนจำกัด ตัวอย่าง อำเภอหาดใหญ่ จังหวัดสงขลา

Patterns and Improvements in the Furniture Production Process: A Case Study of the Example Limited Partnership, Hat Yai, Songkhla

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บทคัดย่อ

การวิจัยในครั้งนี้ มีวัตถุประสงค์ เพื่อ (1) เพื่อศึกษากระบวนการ และรูปแบบในการผลิตเฟอร์นิเจอร์ของห้างหุ้นส่วนจำกัดตัวอย่าง และ (2) เพื่อปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ของห้างหุ้นส่วนจำกัดตัวอย่าง ในการวิจัยจะใช้รูปแบบการศึกษาวิธีการทำงานและใช้เครื่องมือในการปรับปรุงการทำงานด้วยแผนภูมิกระบวนการไหล การวิจัยนี้ได้มีการสัมภาษณ์กับกลุ่มตัวอย่างที่เกี่ยวข้องกับกระบวนการผลิตเฟอร์นิเจอร์ที่ประกอบด้วยผู้จัดการ ช่างออกแบบ ช่างไม้ และช่างสี เพื่อให้เข้าใจลักษณะการทำงานของพนักงานแต่ละตำแหน่งและทำการวิเคราะห์ขั้นตอนการทำงาน เพื่อใช้ในการวิเคราะห์และปรับปรุงกระบวนการทำงานให้มีประสิทธิภาพ

ผลการศึกษา พบว่า กระบวนการผลิตเฟอร์นิเจอร์แบบเดิมใช้เวลาทั้งหมดในกระบวนการผลิตเฟอร์นิเจอร์ (เตียง) เท่ากับ 6,180 นาที โดยแบ่งเป็น แผนกช่างออกแบบใช้เวลา 940 นาที (~15.66 ชั่วโมง) แผนกช่างไม้ใช้เวลา 4,125 นาที (~68.75 ชั่วโมง) แผนกช่างสีใช้เวลา 1,075 นาที (~17.91 ชั่วโมง) และไม่สามารถกำหนดแผนกได้ 40 นาที (~0.67 ชั่วโมง) เมื่อทำการปรับปรุงกระบวนการเดิมแล้วทำให้กระบวนการผลิตเฟอร์นิเจอร์ (เตียง) มีเวลาในการผลิต 5,459 นาที ซึ่งลดลงจากเดิม 712 นาที (~12.02 ชั่วโมง) หรือลดลงร้อยละ 11.67

คำสำคัญ: การปรับปรุงกระบวนการผลิต, เฟอร์นิเจอร์, ห้างหุ้นส่วนจำกัด

Abstract

The objectives of this research were: (1) to study the processes and patterns of furniture production in a sample limited partnership, and (2) to improve the furniture production processes of said limited partnership. The research employed a methodology of method study and utilized tools for process improvement, including flowcharts. The study involved interviews with a sample group comprising a manager, a designer, a carpenter, and a painter to understand the nature of their work, followed by an analysis of their work processes.

The study revealed that the traditional furniture production process took a total of 6,180 minutes to produce a bed. This was broken down as follows: the design department took 940 minutes (~15.66 hours), the carpentry department took 4,125 minutes (~68.75 hours), the painting department took 1,075 minutes (~17.91 hours), and 40 minutes (~0.67 hours) were unallocated. After implementing improvements to the existing processes, the production time for furniture (bed) was reduced to 5,459 minutes, representing a decrease of 712 minutes (~12.02 hours) or a reduction of 11.67 percent compared to the traditional process.

Keywords: Manufacturing Process Improvement, Furniture, Limited Partnership

บทนำ

ปัจจุบันอุตสาหกรรมต่าง ๆ ได้มีการเจริญเติบโตและเพิ่มขึ้นอย่างต่อเนื่องในทุกภาคของอุตสาหกรรม การเติบโตขึ้นและเพิ่มขึ้นของอุตสาหกรรมเหล่านี้ล้วนส่งผลในหลาย ๆ ด้าน โดยมีข้อดี คือ การที่ผู้บริโภคได้มีตัวเลือกมากขึ้นในการซื้อสินค้าแต่ละประเภทและข้อเสีย คือ การแข่งขันกันในทางด้านผู้ผลิต ในที่นี้จะขอกล่าวถึงอุตสาหกรรมเฟอร์นิเจอร์ที่มีการพัฒนาไปจากเดิมเป็นอย่างมาก เหตุผลที่เลือกอุตสาหกรรมในด้านนี้ เพราะในปัจจุบันนี้จะเห็นได้ชัดว่ามีการก่อสร้างที่อยู่อาศัยหรือแม้แต่สถานที่ทำงาน ไม่ว่าจะเป็นบ้าน คอนโดมิเนียมหรือบริษัทเพิ่มขึ้นเป็นจำนวนมาก ซึ่งสิ่งสำคัญที่จะทำให้ที่อยู่อาศัยเหล่านั้นน่าอยู่น่าดึงดูด ผลมาจากการใช้เฟอร์นิเจอร์ภายใน ภาพรวมของตลาดเฟอร์นิเจอร์ไทยกลับมาเติบโตมากขึ้นในรอบ 2 ปี เนื่องจากอสังหาริมทรัพย์เติบโตคาดว่ามูลค่ารวมในไทยขยายตัวร้อยละ 6 ด้านผู้ประกอบการขยายกำลังมุ่งรุกออนไลน์สอดรับกับการเปลี่ยนแปลงของผู้บริโภคยุคใหม่ธุรกิจเฟอร์นิเจอร์และของตกแต่งบ้าน นับเป็นตลาดใหญ่ที่มีมูลค่ารวมกว่าปีละ 80,000 ล้านบาท เฉพาะการส่งออกสามารถสร้างรายได้กว่า 30,000 ล้านบาท จากรายงานของสภาอุตสาหกรรมแห่งประเทศไทย เผยถึงแนวโน้มตลาดเฟอร์นิเจอร์ในประเทศไทย ปี พ.ศ. 2566 คาดว่าจะขยายตัวโดยมีปัจจัยมาจากโครงการคอนโดมิเนียมและอสังหาริมทรัพย์ที่เพิ่มขึ้น โดยเฉพาะในเขตกรุงเทพฯ ที่มีโครงการขึ้นตามแนวเส้นทางรถไฟฟ้าสายต่าง ๆ ทั่วเมือง รวมทั้งการลงทุนในเขตเศรษฐกิจพิเศษที่จะส่งเสริมให้เกิดการลงทุนในตลาดอสังหาริมทรัพย์เพิ่มขึ้นในพื้นที่ภาคตะวันออก ซึ่งจากข้อมูลของกรมโรงงานอุตสาหกรรมในปี พ.ศ. 2558 มีจำนวนโรงงานเฟอร์นิเจอร์ไม้ขนาดใหญ่ กลาง และเล็ก จำนวน 3,126 ราย ทุกภาคการผลิตมีการแข่งขันกันเพื่อตอบสนองความต้องการของลูกค้าให้ได้มากที่สุด การตอบสนองลูกค้านั้นมีหลายหลายวิธี ไม่ว่าจะเป็นการออกแบบแนวใหม่ การหาวัตถุดิบที่ราคาถูกกว่าแบบเดิมแต่คุณภาพเทียบเท่า การลดของเสียที่เกิดขึ้นจากการผลิตต่าง ๆ เป็นต้น โดยมีการนำเทคนิคต่าง ๆ มาใช้ในการบริหารภายใต้การผลิตของตนเองเพื่อลดต้นทุน ลดเวลา และสามารถตอบสนองความต้องการและความพึงพอใจของลูกค้าได้ หากมองในด้านธุรกิจทางด้านของผู้ผลิตอาจจะไม่ได้เกิดผลดีทั้งหมด เพราะเมื่อเกิดการขยายตัวก็ย่อมมีผู้ผลิตสนใจในอุตสาหกรรมด้านนี้มากขึ้น ส่งผลให้มีการแข่งขันกันในหลาย ๆ ด้าน ทั้งในด้านราคา คุณภาพ การบริการ การส่งมอบให้ลูกค้าได้ทันเวลา มีทั้งอุตสาหกรรมขนาดใหญ่ในรูปแบบบริษัทหรืออุตสาหกรรมขนาดเล็กในรูปแบบครัวเรือน การแข่งขันกันในลักษณะนี้มีจุดประสงค์ เพื่อปรับปรุงพัฒนาคุณภาพอย่างต่อเนื่องให้สินค้าสามารถวางจำหน่ายในท้องตลาดได้

การเปลี่ยนแปลงเหล่านี้หากผู้ผลิตมีเทคนิคหรือวิธีที่จะนำมาลดต้นทุน ลดระยะเวลา และตอบสนองความต้องการของลูกค้าได้ตรงจุดจะส่งผลดีและสร้างโอกาสให้กับผู้ผลิตได้ เพราะจะได้ลด

ต้นทุน ลดระยะเวลาในการทำงาน ลดกระบวนการที่ไม่จำเป็นในการผลิตออก หรือปรับปรุงผังโรงงานให้มีการทำงานที่เชื่อมกัน เพราะระยะเวลาในการผลิตเฟอร์นิเจอร์แต่ละชิ้นนั้นส่วนใหญ่ใช้ระยะเวลาในการผลิตค่อนข้างนาน หากแก้ไขในเรื่องนี้ได้บริษัทจะสามารถแข่งขันทางการค้ากับบริษัทคู่แข่งได้ ทั้งนี้บริษัทสามารถนำเวลาที่เหลือไปใช้ในการผลิตสินค้าชนิดอื่นเพื่อสร้างรายได้ได้อีกทาง และสามารถจัดส่งสินค้าให้กับลูกค้าได้อย่างถูกต้อง ตรงตามความต้องการ และทันเวลา

คณะผู้วิจัยได้เล็งเห็นในความสำคัญของเรื่องนี้ จึงได้เลือกศึกษากระบวนการผลิตเฟอร์นิเจอร์ เพื่อนำมาใช้กับศาสตร์การศึกษาวิธีการทำงาน เครื่องมือดังกล่าวจะช่วยเพิ่มประสิทธิภาพในการทำงานหาวิธีการทำงานที่ดีกว่า อีกทั้งยังสามารถปรับปรุงกระบวนการทำงานให้ดีขึ้น และยังปรับปรุงสภาพแวดล้อมภายในโรงงานได้ ซึ่งการปรับปรุงในส่วนต่าง ๆ เหล่านี้ในการผลิตเฟอร์นิเจอร์จะช่วยให้ผู้ผลิตมีต้นทุนที่ต่ำลง สามารถเพิ่มผลผลิต และสามารถลดขั้นตอนกระบวนการที่ไม่จำเป็นออกได้

วัตถุประสงค์ของการวิจัย

1) เพื่อศึกษากระบวนการและรูปแบบในการผลิตเฟอร์นิเจอร์ของห้างหุ้นส่วนจำกัดตัวอย่าง

2) เพื่อปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ของห้างหุ้นส่วนจำกัดตัวอย่าง

แนวคิด ทฤษฎี กรอบแนวคิด

1. การศึกษาวิธีการทำงาน

การศึกษาวิธีการทำงานเป็นเทคนิคของการปรับปรุงงาน เพื่อให้คนงานสามารถทำงานอย่างมีระบบและมีประสิทธิภาพ โดยปรับปรุงวิธีการทำงานของคนงานและทรัพยากรอื่น ๆ ตลอดจนสภาพแวดล้อมการทำงานให้เหมาะสม โดยการเก็บบันทึกข้อมูลของวิธีการทำงานแบบเดิมและตรวจสอบข้อมูลที่ได้บันทึกมาแล้ว เสนอแนะวิธีการทำงานใหม่ เพื่อนำไปสู่วิธีการทำงานที่ง่ายขึ้น ซึ่งจะส่งผลให้สามารถลดค่าใช้จ่ายลงได้

ขั้นตอนของการศึกษา วิธีการทำงานมี 7 ขั้นตอน ดังนี้ การเลือกงานที่จะศึกษา การบันทึกวิธีการทำงาน การตรวจตราข้อมูล พัฒนาวิธีการทำงาน ตั้งนิยามการทำงาน การติดตั้งวิธีการทำงานใหม่ และรักษาการปฏิบัติงานตามวิธีการใหม่ มีรายละเอียดดังนี้ (วิจิตร ตัณฑสุทธิ์ และคณะ, 2543)

1) เลือกงานที่จะศึกษา (Select) งานที่นักออกแบบวิธีการทำงานเลือกมาศึกษา เพื่อปรับปรุงวิธีการทำงานนั้น ควรมีสิ่งบอกเหตุว่าสมควรนำมาศึกษาหรือไม่ เช่น งานที่มีปัญหาเกี่ยวกับค่าใช้จ่าย งานที่มีปัญหาเกี่ยวกับเทคโนโลยี งานที่มีปัญหาเกี่ยวกับพนักงาน เป็นต้น สิ่งบอกเหตุว่างานนั้นสมควรมีการศึกษาวิธีการทำงานก็คือ การที่พนักงานขาดงานบ่อยหรือลาออกบางครั้งอันเป็นผลมาจากลักษณะของงานที่น่าเบื่อหน่าย การทำงานซ้ำซากจำเจ และเมื่อทำการศึกษางานนั้นแล้วต้องเปลี่ยนวิธีการทำงานนั้นใหม่ ควรพิจารณาถึงปฏิกิริยาของคนงานด้วยว่ามีแรงต่อต้านมากน้อยเท่าใด ควรเลือกงานที่เมื่อเกิดการเปลี่ยนแปลงวิธีการทำงานแล้วปฏิกิริยาต่อต้านน้อย

2) การบันทึกวิธีการทำงาน (Record) เป็นการบันทึกวิธีการทำงานจริงที่ทำอยู่ปัจจุบัน ซึ่งการบันทึกนั้นต้องง่ายสำหรับการอ่านสามารถเข้าใจวิธีการทำงานได้ทันที จึงใช้แผนภูมิและแผนภาพที่มีแบบฟอร์มเป็นมาตรฐานเดียวกัน แผนภูมิและแผนภาพเหล่านี้ เป็นพื้นฐานที่สำหรับการตรวจตราเพื่อพัฒนาการทำงานที่ดีกว่าแผนภูมิและแผนภาพมีหลายชนิด ซึ่งใช้เป็นเครื่องมือในการบันทึกวิธีการทำงานในการศึกษางาน

3) การตรวจตราข้อมูลที่ได้อย่างละเอียด (Examine) การตรวจตราข้อมูลที่บันทึกไว้โดยใช้เทคนิคการตั้งคำถาม คำถามสำหรับการตรวจตราเป็นคำถามสำเร็จรูป (Checklist) ที่ตั้งไว้อย่างเป็นระบบและ

ต่อเนื่อง จุดประสงค์ของการตรวจตราเพื่อให้ทราบต้นเหตุของปัญหาและนำไปสู่การพัฒนาวิธีการทำงานที่ดีกว่า

4) พัฒนาวิธีการทำงานที่เหมาะสม (Develop) เมื่อทำการตรวจตราหรือวิเคราะห์วิธีการทำงานโดยการตั้งคำถามอย่างครบถ้วนและเป็นระบบแล้วก็จะได้วิธีการทำงานใหม่ที่ดีกว่า ฉะนั้นขั้นนี้เป็นขั้นตอนของการใช้ความคิดเพื่อค้นหาวิธีการทำงานใหม่ที่ดีที่สุด และบันทึกวิธีการทำงานใหม่ลงบนแผนภูมิและแผนภาพต่าง ๆ ที่เกี่ยวข้องพร้อมกับตรวจสอบว่ามีสิ่งใดหลุดรอดไปจากการพิจารณาบ้าง อีกทั้งเปรียบเทียบวิธีการเดิมกับวิธีการใหม่ เช่น จำนวนครั้งของการดำเนินงานระยะทางการเคลื่อนย้าย การประหยัดเวลา เป็นต้น

5) ตั้งนิยามการทำงาน (Define) เป็นการกำหนดรายละเอียดของวิธีการที่เสนอแนะไว้ในแผ่นปฏิบัติงานมาตรฐาน แล้วดำเนินการขออนุญาตวิธีการทำงานที่เสนอแนะโดยการทำเป็นรายงานแสดงถึงรายละเอียด เช่น การเปรียบเทียบค่าใช้จ่ายวิธีการเดิมและวิธีการปรับปรุง ค่าใช้จ่ายในการจัดตั้งวิธีการทำงานใหม่ สิ่งที่ผู้บริหารควรกระทำเพื่อสนับสนุนวิธีการทำงานใหม่ เมื่อได้รับอนุมัติให้ดำเนินงานด้วยวิธีใหม่ เช่น บันทึกวิธีการทำงานนั้นลงในแผ่นปฏิบัติงานมาตรฐาน เพื่อให้ผู้ปฏิบัติงานใช้เป็นคู่มือในการทำงาน การบันทึกควรอธิบายถึงวิธีการทำงานตามมาตรฐานสิ่งที่ต้องบันทึก คือ สภาพโดยทั่วไปของการปฏิบัติงาน วิธีการทำงานและแผนผังสถานที่ทำงาน

6) การติดตั้งวิธีการทำงานใหม่ (Install) ก่อนเริ่มวิธีการทำงานใหม่ พยายามโน้มน้าวจิตใจของผู้ที่เกี่ยวข้องในการทำงานทั้งหมดให้ยอมรับการเปลี่ยนแปลง ตั้งแต่ผู้ควบคุมโรงงาน ฝ่ายบริหาร คนงาน หลังจากเมื่อทุกฝ่ายยอมรับแล้วจำเป็นต้องมีการฝึกคนงานตามวิธีการที่เสนอแนะ ในการนี้อาจใช้รูปภาพ ภาพนิ่ง ภาพยนตร์ ประกอบการบรรยาย บางโรงงานอาจมีห้องทดลองเพื่อให้คนงานได้ฝึกงานตามวิธีการใหม่ เมื่อฝึกคนงานเรียบร้อยแล้วจึงเริ่มใช้วิธีการนั้นในการทำงานจริง

7) รักษาการปฏิบัติตามวิธีการใหม่อย่างสม่ำเสมอ (Maintain) เป็นการควบคุมดูแลความก้าวหน้าของงานจนกว่าจะแน่ใจว่าสามารถทำงานได้ตามวิธีเสนอแนะ และก่อให้เกิดความมีประสิทธิภาพขึ้นจริง ถ้าสามารถปรับปรุงวิธีการทำงานให้ดีกว่าเดิมได้อีก ก็ให้ดำเนินการศึกษาวิธีการทำงานใหม่

2. แผนภูมิกระบวนการไหล

แผนภูมิกระบวนการไหล (Flow Process Chart) (วันชัย ริจิรวนิช, 2553) เป็นเครื่องมือที่ใช้บันทึกกระบวนการผลิตหรือวิธีทำงานให้อยู่ในลักษณะที่เห็นได้ชัดเจน เข้าใจง่าย ในแผนภูมิแสดงถึงขั้นตอนการทำงานตั้งแต่ต้นจนจบกระบวนการ โดยมักเขียนตั้งแต่วัตถุดิบเข้าสู่โรงงานแล้วติดตามบันทึกเหตุการณ์ที่เกิดขึ้นกับวัตถุดิบนั้นไปทุกขั้นตอน เช่น การลำเลียงไปยังห้องเก็บ การตรวจสอบ การเปลี่ยนรูปร่างโดยเครื่องจักร จนกระทั่งเป็นชิ้นส่วนหรือประกอบเป็นผลิตภัณฑ์

การศึกษาแผนภูมิกระบวนการไหลอย่างละเอียดอาจมีรูปภาพประกอบของทุกขั้นตอนในกระบวนการผลิตทำให้พบว่า การทำงานบางอย่างควรถูกขจัดทิ้งไปได้การทำงาน บางอย่างสามารถรวมเข้าด้วยกันได้กับงานอื่น อาจใช้เครื่องจักรที่ประหยัดกว่าสามารถลดหรือขจัดการล่าช้าหรือการรอคอยที่เกิดขึ้น รวมถึงการปรับปรุงโดยวิธีอื่นสิ่งเหล่านี้ทำให้การผลิตมีต้นทุนที่ต่ำลง

แผนภูมิกระบวนการไหล หมายถึง แผนภูมิที่แสดงการเคลื่อนย้ายตามลำดับก่อนหลังหรือแนวทางการทำงานของผลิตภัณฑ์ แสดงถึงขั้นตอนการดำเนินงาน (Operation) การเคลื่อนย้าย (Transformation) การตรวจสอบ (Inspection) การรอคอย (Delay) และการเก็บรักษา (Storage) ที่เกิดขึ้นกับคน วัสดุ เครื่องมือในกระบวนการผลิต รวมทั้งเวลาที่ใช้ในแต่ละขั้นตอนกับระยะเวลาการเคลื่อนที่

แผนภูมิกระบวนการไหล (คณิศร ภูนิคม, 2560) เหมือนกับแผนภูมิทั่วไปที่ใช้สัญลักษณ์ถึงความหมายต่าง ๆ สามารถดัดแปลงเพื่อนำไปใช้กับงานที่เหมาะสมเป็นอย่าง ๆ ไป เช่น แสดงลำดับการทำงานของคนงานแสดงขั้นตอนต่าง ๆ เมื่อวัตถุดิบผ่านเข้าสู่กระบวนการผลิตแผนภูมิสามารถแบ่ง เป็น 3 ชนิด คือ

1) แผนภูมิแบบบันทึกการทำงานของคน (Man Type) เป็นการบันทึกขั้นตอนการทำงานของคนเท่านั้น มุ่งที่ลำดับขั้นตอนการทำงานหรือกิจกรรมคนกระทำ

2) แผนภูมิแบบบันทึกการแปรรูปวัสดุ (Material Type) บันทึกขั้นตอนที่วัสดุจะต้องผ่านหรือถูกกระทำต่อในการแปรรูปวัสดุนั้น

3) แผนภูมิแบบบันทึกการใช้เครื่องมือ (Equipment Type) บันทึกสภาพการถูกใช้งานของอุปกรณ์เครื่องมือที่เกี่ยวข้องกับการทำงาน

การใช้สัญลักษณ์ของแผนภูมิถูกกำหนดโดยสมาคมวิศวกรเครื่องกลของอเมริกา (ASME) โดยแบ่งกิจกรรมในวิธีการทำงานออกเป็น 5 กิจกรรมใหญ่ ๆ ดังนี้

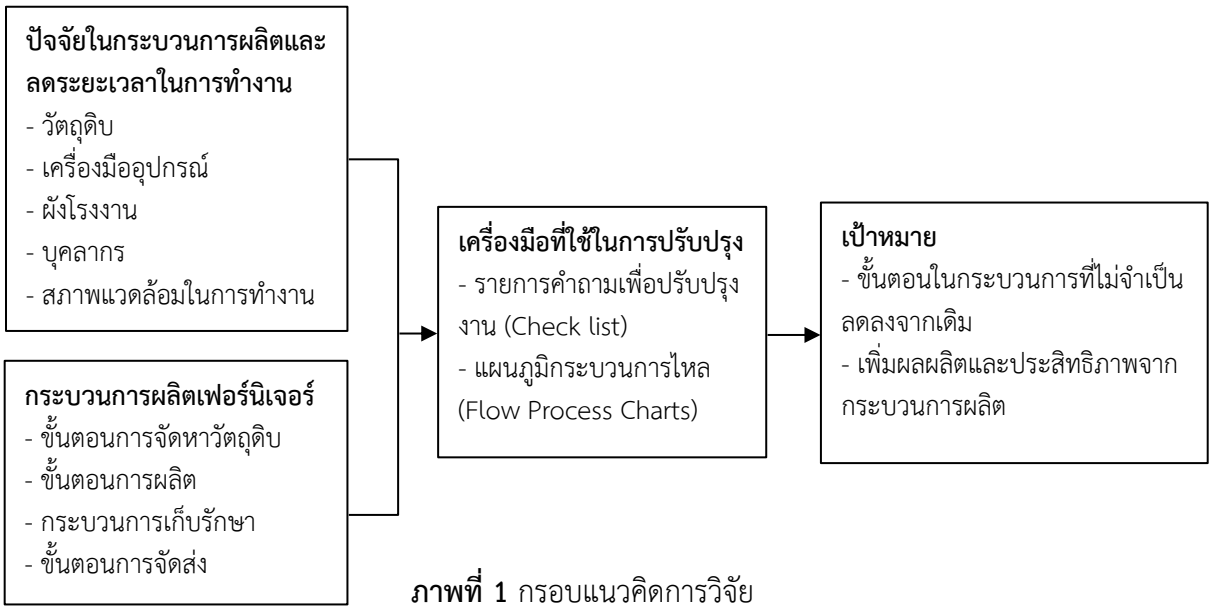
1) การดำเนินงานหรือปฏิบัติงาน หมายถึง กิจกรรมที่ทำให้วัสดุเปลี่ยนแปลง เช่น การเปลี่ยนแปลงทางกายภาพหรือทางเคมี กิจกรรมที่แยกหรือประกอบ กิจกรรมที่จัดและเตรียมวัสดุสำหรับขั้นตอนในการผลิต รวมถึงการรับส่งข่าวสารการคำนวณ

2) การขนส่งหรือการขนย้าย หมายถึง กิจกรรมที่ทำให้วัสดุเคลื่อนย้ายจากที่หนึ่งไปอีกที่หนึ่ง ยกเว้นการเคลื่อนย้ายขณะอยู่ในขั้นตอนการผลิต และยกเว้นกรณีที่เป็นการเคลื่อนย้ายโดยขนถ่ายงานภายในสถานีงานระหว่างการตรวจสอบ

3) การตรวจสอบ หมายถึง กิจกรรมเกี่ยวกับการตรวจสอบเปรียบเทียบเชิงคุณภาพและเชิงปริมาณของวัสดุ

4) ความล่าช้าหรือการรอคอย หมายถึง กิจกรรมที่มีการรอหรือหยุดพักก่อนการทำงานขั้นต่อไป

5) การจัดเก็บหรือการพัก หมายถึง กิจกรรมที่วัสดุถูกเก็บ พัก หรือถูกควบคุมเอาไว้ ซึ่งสามารถนำมาใช้ได้ถ้าต้องการ



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

การศึกษาการทำวิจัยเรื่องการปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ กรณีศึกษา ห้างหุ้นส่วนตัวอย่าง อำเภอหาดใหญ่ จังหวัดสงขลา โดยมีจุดมุ่งหมายเพื่อศึกษากระบวนการผลิตและลดกระบวนการผลิตที่ไม่จำเป็นออก ซึ่งมีวิธีการดำเนินการวิจัยดังต่อไปนี้

1. ประชากรที่ใช้ในการศึกษา

ประชากรที่ใช้ในการศึกษา ประกอบไปด้วย 4 คน ได้แก่ ตำแหน่งผู้จัดการ ช่างออกแบบ ช่างไม้ และช่างสี โดยใช้วิธีการสัมภาษณ์ลักษณะการทำงานของพนักงาน ทั้งนี้ประชากรดังกล่าวคัดเลือกโดยใช้วิธีการเลือกแบบเจาะจง

2. เครื่องมือที่ใช้ในการวิจัย

การศึกษากระบวนการผลิตของห้างหุ้นส่วนจำกัดตัวอย่างในครั้งนี้ ได้ใช้เครื่องมือในการวิจัยทั้งหมด 3 รูปแบบ ดังต่อไปนี้

- แบบสัมภาษณ์ (Interview) เป็นแบบสัมภาษณ์แบบมีโครงสร้าง เพื่อใช้สัมภาษณ์ในประเด็นคำถามของความมุ่งหมายในงานวิจัย

- รายการคำถามเพื่อปรับปรุงงาน (Check list) เป็นรายการคำถามในการตรวจสอบกระบวนการทำงานก่อนนำไปสู่การปรับปรุงงาน

- แผนภูมิกระบวนการไหล (Flow Process Charts) ใช้สำหรับการวิเคราะห์กระบวนการไหลของวัตถุดิบ ชิ้นส่วน พนักงาน และอุปกรณ์ในกระบวนการผลิต

3. การเก็บรวบรวมข้อมูล

ในการเก็บรวบรวมข้อมูลจะทำการเก็บรวบรวมข้อมูลจากแหล่งข้อมูล 2 แหล่ง ดังนี้

- ข้อมูลปฐมภูมิ (Primary Data) คือ ข้อมูลที่ได้จากการเก็บรวบรวมข้อมูลจากแหล่งข้อมูลโดยตรง ซึ่งข้อมูลดังกล่าวเป็นข้อมูลที่ได้จากการสัมภาษณ์โดยตรงจากบุคคลในแผนกต่าง ๆ ของห้างหุ้นส่วนจำกัดตัวอย่าง

- ข้อมูลทุติยภูมิ (Secondary data) คือ ข้อมูลที่ได้จากรวบรวมอย่างเป็นระบบของห้างหุ้นส่วนจำกัดตัวอย่าง

4. การวิเคราะห์ข้อมูล

ในขั้นตอนนี้ผู้วิจัยได้แบ่งขั้นตอนในการวิเคราะห์ข้อมูล ดังนี้

- นำข้อมูลที่ได้จากการจดบันทึกจากการสัมภาษณ์ของช่างแผนกต่าง ๆ มาจัดกลุ่ม เพื่อเรียบเรียงให้อยู่ในประเด็นเดียวกัน

- นำข้อมูลที่ทำการเรียบเรียงแล้วนำมาใช้กับเครื่องมือในการวิจัย เพื่อหาขั้นตอนในกระบวนการในการทำงานที่ไม่จำเป็นหรือไม่สร้างมูลค่า แล้วทำการแก้ไขตามเครื่องมือนั้น ๆ

- การนำเสนอข้อมูลที่ได้จากแนวคิด ทฤษฎี เพื่อใช้สนับสนุนในการนำเสนอวิธีการผลิตแบบใหม่ที่สามารถลดขั้นตอน การรอคอยและระยะเวลาลดลง

ผลการวิจัย

การศึกษาวิจัยในครั้งเรื่องการปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ กรณีศึกษา ห้างหุ้นส่วนจำกัด ตัวอย่าง อำเภอหาดใหญ่ จังหวัดสงขลา คณะผู้วิจัยได้วิเคราะห์ข้อมูลเป็น 3 ส่วน คือ ส่วนที่ 1 การสัมภาษณ์ภาพรวมของการบริหารและการผลิตภายในห้างหุ้นส่วนจำกัดตัวอย่าง ส่วนที่ 2 การสัมภาษณ์

ขั้นตอนและกระบวนการผลิตเฟอร์นิเจอร์ และส่วนที่ 3 การศึกษากระบวนการทำงานของคนและเครื่องจักรในการผลิตเฟอร์นิเจอร์ เมื่อได้ทำการเก็บรวบรวมข้อมูลจากการสัมภาษณ์ประชากร และข้อมูลของกระบวนการผลิตแล้วก็ได้ทำการปรับปรุงกระบวนการทำงานที่ไม่จำเป็นออก

ส่วนที่ 1 การสัมภาษณ์ภาพรวมของการบริหารและการผลิตภายในห้างหุ้นส่วนจำกัดตัวอย่าง ซึ่งผลการสัมภาษณ์พบว่า

ผู้ให้สัมภาษณ์ตำแหน่ง: ผู้จัดการ ได้ให้สัมภาษณ์ว่า ในลักษณะภาพรวมของห้างหุ้นส่วนจำกัดจะเป็นการผลิตเฟอร์นิเจอร์ในรูปแบบของการรับทำงานตามสั่ง ตามขนาด และตามความต้องการของลูกค้า และนำมาออกแบบงานเฟอร์นิเจอร์เพื่อดำเนินการผลิตตามกระบวนการสายการผลิตโดยช่างมืออาชีพ มีฝีมือเฉพาะด้านและบริการติดตั้งให้สินค้าที่มีคุณภาพให้กับลูกค้า ณ สถานที่ที่ลูกค้าติดต่อไว้อย่างรวดเร็ว ตรงตามเวลา เพื่อเป็นการสร้างความพึงพอใจให้กับลูกค้า ใส่ใจลูกค้าจนถึงปัจจุบัน และในส่วนของกลุ่มลูกค้าเป้าหมายของห้างหุ้นส่วนจำกัดส่วนใหญ่จะเป็นในส่วนของลูกค้าที่ต้องการใช้เฟอร์นิเจอร์ในรูปแบบเดียวกันและในปริมาณที่มาก เช่น โรงแรม บ้านจัดสรร รีสอร์ท หอพัก ฯลฯ ส่วนการสรรหาและคัดเลือกพนักงานที่จะเข้ามาทำงานในห้างหุ้นส่วนจำกัดจะใช้วิธีการคัดเลือกพนักงานที่มีประสบการณ์ในด้านการทำงานเฉพาะ มีความสามารถ มีความรับผิดชอบต่อหน้าที่ของตนเอง เพราะภายในห้างหุ้นส่วนจำกัดมีการแบ่งหน้าที่ความรับผิดชอบให้กับพนักงานอย่างชัดเจนในการทำงานตามตำแหน่งหน้าที่ที่ได้รับมอบหมาย ได้แก่ ช่างออกแบบ มีหน้าที่เขียนแบบ ออกแบบให้แก่ช่างไม้, ช่างไม้ มีหน้าที่ผลิตเฟอร์นิเจอร์ตามรูปแบบที่ช่างออกแบบออกมาให้, ช่างสี รับงานต่อจากช่างไม้ และในส่วนของวัตถุดิบหลักที่ห้างหุ้นส่วนจำกัดใช้ในการผลิตคือ ไม้ที่มีการสั่งซื้อมาจากกรุงเทพฯ ส่วนอุปกรณ์ย่อยสามารถหาได้จากพื้นที่ใกล้เคียง สาเหตุที่สั่งซื้อจากกรุงเทพฯ เพราะมีราคาที่ถูกกว่า มีขนาดของแผ่นไม้ที่ใหญ่กว่า มีบริการขนส่งจากบริษัทโดยตรงทำให้ประหยัดในเรื่องของค่าใช้จ่ายมากขึ้น

ส่วนที่ 2 การสัมภาษณ์ขั้นตอนและกระบวนการผลิตเฟอร์นิเจอร์ซึ่งผลการสัมภาษณ์ พบว่า

1) ผู้ให้สัมภาษณ์ตำแหน่ง: ช่างออกแบบ ได้ให้สัมภาษณ์ว่า ขั้นตอนการทำงานของช่างออกแบบเริ่มจากการที่ลูกค้าเป็นผู้ติดต่องานและเสนอรูปแบบงานตามความต้องการที่ลูกค้าสนใจ และทางเราให้ลูกค้าดูผลงานจากการทำงานของโรงงานที่เคยทำมาแล้วส่งให้ลูกค้าดู หากลูกค้าสนใจและตกลงทางเราจึงต้องเข้าถึงหน้างาน เพื่อเข้าตรวจสอบวัดพื้นที่ ตรวจเช็คจากรูปแบบอาคาร พื้นที่ในการติดตั้งชิ้นงาน และรูปแบบชิ้นงานที่จะออกแบบมาเพื่อให้เหมาะสมและสวยงาม หากลูกค้าตกลงและพร้อมเริ่มทำงาน ทางช่างออกแบบจะออกแบบแปลนขึ้นมา และเข้าวัดพื้นที่หน้างานอีกครั้งพร้อมช่างไม้ เมื่อพร้อมจะผลิตรูปแบบชิ้นงาน ระยะเวลาที่ใช้ในการออกแบบเฟอร์นิเจอร์นั้นขึ้นอยู่กับหน้างานว่าแต่ละงานมีพื้นที่มากน้อยเพียงใด และขึ้นอยู่กับความยากง่ายของชิ้นงาน อุปกรณ์ที่ใช้ในการออกแบบประกอบไปด้วยโปรแกรม AutoCAD และโปรแกรม SketchUp หลังจากการเขียนแบบเสร็จและส่งแบบงานให้แก่ช่างไม้ขึ้นรูปพร้อมผลิต ทางเราจะรอเข้าติดตั้งงานอีกครั้งหลังจากขึ้นรูปเฟอร์นิเจอร์สำเร็จ

2) ผู้ให้สัมภาษณ์ ตำแหน่ง: พนักงานผลิต (ช่างไม้) ได้ให้สัมภาษณ์ว่า ในการทำงานขึ้นรูปการผลิตเฟอร์นิเจอร์ตามการสั่งงานจากลูกค้าตามแบบที่ลูกค้าต้องการ ช่างไม้จำเป็นต้องเข้าวัดพื้นที่ก่อนทำงานเสมอ เพราะป้องกันการผิดพลาดในการนำชิ้นงานเข้าติดตั้ง หลังจากที่ได้แบบแล้วสามารถผลิตชิ้นงานนั้นได้เลย ในการขึ้นรูปไม้เฟอร์นิเจอร์มีกระบวนการและขั้นตอนการผลิต คือ จะขึ้นรูปตามแบบที่ช่างออกแบบได้ออกแบบไว้ เช่น การผ่าไม้ การตัดไม้ตามแบบของชิ้นงาน เวลาที่ใช้ในการขึ้นรูปไม้เฟอร์นิเจอร์แต่ละชิ้นงาน ขึ้นอยู่กับขนาดชิ้นงานหรือการออกแบบของช่างออกแบบ และขึ้นอยู่กับ

เฟอร์นิเจอร์ เช่น การผลิตเตียง ใช้ระยะเวลาในการทำ 1 วัน การผลิตตู้เสื้อผ้า ใช้ระยะเวลาในการทำ 1 อาทิตย์ และการผลิตหิ้งพระ ใช้ระยะเวลาในการทำครึ่งวัน เป็นต้น เศษไม้ที่เหลือจากการขึ้นรูป นำไปใช้ประโยชน์อย่างอื่นได้ เช่น เศษไม้ที่ใช้ประกอบเฟอร์นิเจอร์สามารถนำมาประกอบในส่วนชิ้นงานที่ขาดไม่มาก สามารถนำมาต่อได้ หรือหากเป็นเศษไม้ที่เล็กไม่สามารถนำมาใช้ต่อได้ สามารถนำมาบดและนำขี้เลื่อยมาอัดเป็นไม้อัดแผ่นได้ การทำโต๊ะหมู่บูชาเล็ก ๆ การทำเก้าอี้เล็ก ๆ โต๊ะทำงาน เป็นต้น อุปกรณ์ที่ใช้ในการขึ้นรูปไม้ ได้แก่ โต๊ะเลื่อย แม็ก กาว ตะปู กบไสไม้ ถังลม เลื่อยมือ สิ่ว เป็นต้น

3) ผู้ให้สัมภาษณ์ ตำแหน่ง: พนักงานผลิต (ช่างสี) ได้ให้สัมภาษณ์ว่า ในกระบวนการผลิตมีขั้นตอนการทำโดยการรับชิ้นงานจากช่างไม้ตรวจชิ้นงานว่าได้ตามแบบที่เขียนไว้หรือไม่ หากชิ้นงานถูกต้องตามแบบที่ลูกค้าสั่ง เริ่มต้นจากการเก็บรายละเอียดของชิ้นงานไม้หรือเฟอร์นิเจอร์ไม้ให้อยู่ในสถานะพร้อมที่จะทำสี เริ่มด้วยทำความสะอาดคราบกาว และขัดผิวด้วยกระดาษทรายเก็บรอยตำหนิของไม้ และเก็บรอยจากเครื่องมือช่าง หลังจากนั้นก็ทำการโป๊วสีเพื่อเก็บรายละเอียดอีกครั้ง หลังจากเก็บรายละเอียดเรียบร้อยแล้วก็ทำการพ่นสีรองพื้นเพื่อให้ไม้หรือชิ้นงานมีความเรียบเนียนเต็มเสี้ยน หรือเปิดเสี้ยนไม้ได้อย่างสม่ำเสมอ หลังจากนั้นเมื่อสีรองพื้นแห้งแล้วก็ทำการลงสีจริง หรือสีทับหน้า โดยขั้นตอนนี้จะเป็นการเคลือบสีให้เกิดความเรียบเนียน สวยงาม มีความแข็งแรง ทนทาน ทนการขูดขีดในขณะใช้งาน ทนต่อการซึมน้ำ กรด ด่าง และสารเคมีต่าง ๆ ได้ดี ระยะเวลาในการรอให้เฟอร์นิเจอร์แห้งหลังจากทาสีและสามารถนำไปติดตั้งใช้ระยะเวลา ถ้าชิ้นงานมีขนาดที่ใหญ่อาจจะต้องใช้เวลารอสีให้แห้ง 1 - 2 วัน ตั้งในที่ร่มได้โดยไม่ต้องตากแดดและสามารถนำไปติดตั้งนอกสถานที่ได้ ในกรณีการติดตั้งเตียงจะใช้ระยะเวลาในการติดตั้งเพียง 1 วัน หากเป็นการติดตั้งเฟอร์นิเจอร์อื่น ๆ อาจต้องใช้ระยะเวลานาน 2 - 3 วัน

ส่วนที่ 3 การศึกษากระบวนการทำงานของคนและเครื่องจักรในการผลิตเฟอร์นิเจอร์

เครื่องมือที่ 1 รายการคำถามเพื่อปรับปรุงงาน ในเครื่องมือนี้จะทำการประเมินเบื้องต้นภายในห้างหุ้นส่วนจำกัดตัวอย่างว่า มีรายการใดบ้างในกระบวนการผลิตที่สามารถปรับปรุงให้การทำงานดีขึ้นและขจัดความไม่จำเป็นออกได้ โดยคณะผู้วิจัยได้ทำการสัมภาษณ์จากช่างแผนกต่าง ๆ ถึงขั้นตอนที่สามารถนำมาทำการแก้ไขปรับปรุงได้ จากประเด็นคำถามสามารถแก้ไขและปรับเปลี่ยนกระบวนการทำงานจากส่วนต่าง ๆ ได้หลายส่วน ในส่วนของวัสดุ สามารถลดขั้นตอนได้จากการลดปริมาณวัสดุที่คั่งค้างอยู่ในสายการผลิต หรือการเพิ่มผลิตภาพการใช้วัสดุ ในส่วนของการเคลื่อนย้ายวัสดุ สามารถลดขั้นตอนได้จากการลดจำนวนครั้งของการเคลื่อนย้าย การลดระยะทางของการเคลื่อนย้าย การลดความล่าช้าหรือปริมาณการรอคอยลงได้ การนำเครื่องจักรอัตโนมัติมาช่วยใช้ในการปฏิบัติงาน การขจัดการขนย้ายที่ซ้ำซ้อน และการเพิ่มปริมาณบรรจุในการเคลื่อนย้ายต่อเที่ยวได้ ในส่วนเครื่องมือและอุปกรณ์ สามารถลดขั้นตอน ลดระยะเวลาได้จากการเลือกเครื่องมือที่ดีกว่ามาใช้ การปรับแต่งเครื่องมือให้มีประสิทธิภาพสูงขึ้น และการบำรุงรักษาเครื่องมือและอุปกรณ์ให้มีประสิทธิภาพสูงขึ้น ในส่วนเครื่องจักรและการทำงาน สามารถแก้ไขลดขั้นตอนได้จากการวางแผนการผลิตที่ดี การลดเวลาจากการตั้งเครื่องมือ การลดกิจกรรมการปฏิบัติการลง การแบ่งย่อยงาน การรวมงานหลายขั้นตอนให้เหลือขั้นตอนเดียว ในส่วนของผู้ปฏิบัติงาน สามารถลดระยะเวลาได้จากการเลือกพนักงานที่มีความเหมาะสม ลดความเครียดของผู้ปฏิบัติงาน ให้ค่าตอบแทนที่เหมาะสมกับลักษณะงาน มีการดูแลและให้คำแนะนำที่ถูกต้องในการทำงาน รวมถึงสอนงานหรือมีการฝึกอบรมเพิ่มเติม และในส่วนสุดท้าย สภาพแวดล้อมในการทำงานสามารถปรับปรุงได้จากการปรับแสงสว่าง อุณหภูมิ และการถ่ายเทอากาศภายในบริเวณทำงานอยู่ในสภาพที่ดี พนักงานมีความสะดวกสบายในการทำงาน ชั่วโมงการทำงาน และการจัดช่วงสำหรับการพักเหนื่อยเหมาะสม

เครื่องมือที่ 2 แผนภูมิกระบวนการไหล (Flow Process Chart)

ตารางที่ 1 แผนภูมิกระบวนการไหลการผลิตเฟอร์นิเจอร์ (วิธีเดิม)

แผนภูมิกระบวนการไหล ☐ คน ☑ วัสดุ ☐ เครื่องจักร							
แผนภูมิหมายเลข	**สรุปผล**						
ชื่อบริษัท : ห้างหุ้นส่วนจำกัดตัวอย่าง	**สัญลักษณ์**		**ปัจจุบัน**		**เสนอ**		**ลดลง**
กรรมวิธี : กระบวนการออกแบบขึ้นรูปเฟอร์นิเจอร์ชนิดเตียง ทำสีและติดตั้ง	การปฏิบัติงาน	○	17				
	การเคลื่อนย้าย	⇨	4				
	การรอคอย	D	4				
☑ วิธีเดิม ☐ วิธีการปรับปรุง	การตรวจสอบ	□	12				
ตำแหน่งที่ตั้ง : อ.หาดใหญ่ จ.สงขลา	การจัดเก็บ	▽	1				

รายการ	**เวลา (นาที)**	**สัญลักษณ์**					**หมายเหตุ**
		○	⇨	D	□	▽	
ช่างออกแบบสอบถามความต้องการของลูกค้า(A)	60						
เข้าดูสถานที่งานที่ใช้ติดตั้งเตียง (A)	30						
เข้าไปวัดพื้นที่งาน (A)	90						
เขียนแบบเฟอร์นิเจอร์ตามความต้องการของลูกค้า (A)	480						
เสนอแบบให้ลูกค้า (A)	60						
รอคำตอบจากลูกค้า (A)	40						
ลูกค้าตกลงแบบและคุยเสนอราคา (A)	20						
เซ็นหนังสือสัญญาและจ่ายค่ามัดจำ (N/A)	10						
ส่งงานออกแบบแก่ช่างไม้ (A)	40						
ช่างออกแบบและช่างไม้เข้าวัดพื้นที่อีกครั้ง (A,B)	60						
ตรวจเช็ดขนาดของชิ้นงานที่ออกแบบกับพื้นที่จริง (B)	90						
ช่างไม้ตรวจเช็ควัตถุดิบที่ต้องใช้ในการผลิต (B)	30						
สั่งวัตถุดิบที่ยังขาดในการผลิตชิ้นงาน (N/A)	30						
รอวัตถุดิบ (B)	2,880						
ช่างไม้เริ่มวัดไม้ (B)	180						
ตัดไม้-ผ่าไม้ (B)	30						
ทำแผงเตียงประกอบชิ้นงาน (B)	60						เปลี่ยนสภาพ
นำแผงเตียงมาประกอบเพื่อขึ้นรูปชิ้นงาน (B)	60						
ติดตั้งอุปกรณ์เสริมของชิ้นงาน (B)	60						
ตรวจเก็บรายละเอียดของชิ้นงาน (B)	30						
ส่งชิ้นงานไปยังช่างสี (B)	15						
ช่างสีตรวจสอบรายละเอียดจากแบบงาน (C)	15						
โป๊วสีลบรอยตะปูแม็กซ์ให้ชิ้นงานเป็นผิวเรียบ(C)	120						เปลี่ยนสภาพ
รอสีโป๊วแห้ง (C)	120						
ขัดผิวงานให้เรียบด้วยกระดาษทราย (C)	180						
ผสมสีตามแบบ (C)	30						
ตรวจสอบสีโดยการทดลองสีลงแผ่นไม้เพื่อเทียบสี (C)	10						
ทำการพ่นสีหรือทาสีลงบนชิ้นงาน (C)	30						เปลี่ยนสภาพ
รอสีในชิ้นงานแห้ง (C)	240						

ลงแล็กเกอร์เพื่อเคลือบเงาในชิ้นงาน (C)	70						
รอแล็กเกอร์ในชิ้นงานแห้ง (C)	240						เปลี่ยนสภาพ
ตรวจสอบและเช็ครายละเอียดในชิ้นงาน (C)	10						
ส่งชิ้นงานให้ช่างไม้ (C)	10						
ช่างไม้นำชิ้นงานไปยังสถานที่ติดตั้ง (B)	60						
ช่างไม้เริ่มทำการติดตั้งชิ้นงาน (B)	420						
เก็บรายละเอียด (B)	180						
ช่างออกแบบเข้าตรวจสอบงาน (A)	60						
ส่งผลงานให้แก่ลูกค้า (A)	30						
รวม	**6,180**	**17**	**4**	**4**	**12**	**1**	

จากตารางที่ 1 พบว่า เวลาทั้งหมดในกระบวนการผลิตเฟอร์นิเจอร์ เท่ากับ 6,180 นาที หรือ 4.2916 วัน

หมายเหตุ A คือ แผนกช่างออกแบบใช้เวลา 940 นาที ~15.66 ชั่วโมง

B คือ แผนกช่างไม้ใช้เวลา 4,125 นาที ~68.75 ชั่วโมง

C คือ แผนกช่างสีใช้เวลา 1,075 นาที ~17.91 ชั่วโมง

N/A คือ ไม่สามารถกำหนดแผนกได้

การออกแบบเฟอร์นิเจอร์แบบเดิมจะได้เห็นได้ถึงส่วนที่ต้องใช้เวลาในการรอคอยงานนาน คือ การแยกกัดไปวัดงานของช่างแต่ละฝ่าย การรอคอยคำตอบจากลูกค้า การรอคอยวัตถุดิบ ซึ่งการรอคอยเหล่านี้ทำให้การทำงานมีระยะเวลาที่เพิ่มขึ้นซึ่งไม่ได้ใช้ให้เกิดประโยชน์ได้ ดังนั้นจึงจะทำการปรับปรุงแก้ไขงานในส่วนนี้เพื่อลดการรอคอยให้มีจำนวนน้อยที่สุดและใช้ระยะเวลาในการรอคอยให้เกิดประโยชน์มากที่สุด

ตารางที่ 2 แผนภูมิกระบวนการไหลการผลิตเฟอร์นิเจอร์ (วิธีการปรับปรุง)

แผนภูมิกระบวนการไหล ☐ คน ☑ วัสดุ ☐ เครื่องจักร						
แผนภูมิหมายเลข	**สรุปผล**					
ชื่อบริษัท : ห้างหุ้นส่วนจำกัดตัวอย่าง	**สัญลักษณ์**		**ปัจจุบัน**	**เสนอ**	**ลดลง**
กรรมวิธี : กระบวนการออกแบบขึ้นรูปเฟอร์นิเจอร์ชนิดเตียง ทำสีและติดตั้ง	การปฏิบัติงาน	○	17	15	2
	การเคลื่อนย้าย	⇨	4	3	1
	การรอคอย	D	4	4	0
☐ วิธีเดิม ☑ วิธีการปรับปรุง	การตรวจสอบ	□	12	9	3
ตำแหน่งที่ตั้ง : อ.หาดใหญ่ จ.สงขลา	การจัดเก็บ	▽	1	1	0
ช่างออกแบบสอบถามความต้องการของลูกค้า (A)	60					
ช่างออกแบบและช่างไม้เข้าวัดพื้นที่งาน (A,B)	90					
เขียนแบบเตียงตามความต้องการของลูกค้า (A)	480					
เสนอแบบพร้อมราคาให้กับลูกค้า (A)	60					
รอคำตอบจากลูกค้าในการเลือกแบบ (A)	30					
ลูกค้าตกลงพร้อมเซ็นสัญญาจ่ายค่ามัดจำ (A)	30					
ส่งงานออกแบบแก่ช่างไม้ (A)	20					
ช่างไม้ตรวจเช็ควัตถุดิบที่ต้องใช้ในการผลิต (B)	30					

สั่งวัตถุดิบที่ยังขาดในการออกแบบชิ้นงาน (N/A)	30						
ช่างไม้ใช้วัตถุดิบที่มีผลิตเตียงก่อนในระหว่างรอวัตถุดิบใหม่ (B)	2,880						
ช่างไม้เริ่มวัดไม้จากวัตถุดิบใหม่ (B)	120						
ตัดไม้-ผ่าไม้ (B)	30						
ทำแผงเตรียมประกอบชิ้นงานจากวัตถุดิบใหม่ (B)	45						เปลี่ยนสภาพ
นำแผงเตรียมประกอบขึ้นรูปชิ้นงาน (B)	45						
ติดตั้งอุปกรณ์เสริมของชิ้นงาน (B)	45						
ตรวจเก็บรายระเอียดจากแบบงาน (B)	10						
ส่งชิ้นงานไปยังช่างสี (B)	15						
ช่างสีตรวจเช็คราระเอียดจากแบบงาน (C)	15						
โป๊วสีลบรอยตะปูแม็กซ์ในชิ้นงานเป็นผิวเรียบ (C)	120						เปลี่ยนสภาพ
ผสมสีและทดลองสีลงแผ่นไม้เพื่อเทียบสีก่อนลงชิ้นงาน ระหว่างรอสีโป๊วแห้ง (C)	120						
ขัดผิวงานให้เรียบด้วยกระดาษทราย (C)	180						
ทำการพ่นหรือทาสีลงบนชิ้นงาน (C)	30						เปลี่ยนสภาพ
รอสีในชิ้นงานแห้ง (C)	240						
ลงแล็กเกอร์เพื่อเคลือบเงาในชิ้นงาน (C)	70						
รอแล็กเกอร์ในชิ้นงานแห้ง (C)	240						เปลี่ยนสภาพ
ตรวจสอบและเช็คราย์ละเอียดในชิ้นงาน (C)	10						
ส่งชิ้นงานให้ช่างไม้ (C)	10						
ช่างไม้นำชิ้นงานไปยังสถานที่ติดตั้ง (B)	7						
ช่างไม้เริ่มทำการติดตั้งชิ้นงาน (B)	7						
เก็บรายละเอียด (B)	300						
ช่างออกแบบเข้าตรวจสอบงาน (A)	60						
ส่งผลงานให้แก่ลูกค้า (A)	30						
รวม	**5,459**	**15**	**3**	**4**	**9**	**1**	

จากตารางที่ 2 พบว่า เวลาทั้งหมดในกระบวนการผลิตเฟอร์นิเจอร์ เท่ากับ 5,459 นาที หรือ 3.7909 วัน

หมายเหตุ A คือ แผนกช่างออกแบบใช้เวลา 815 นาที ~13.58 ชั่วโมง

B คือ แผนกช่างไม้ใช้เวลา 3,579 นาที ~59.65 ชั่วโมง

C คือ แผนกช่างสีใช้เวลา 1,035 นาที ~17.25 ชั่วโมง

N/A คือ ไม่สามารถกำหนดแผนกได้

การออกแบบเฟอร์นิเจอร์กระบวนการปรับปรุง คณะผู้วิจัยได้ทำการปรับปรุงขั้นตอนการทำงานของช่างออกแบบและช่างไม้ให้เข้าปฏิบัติงานพร้อมกัน ในส่วนของการเข้าไปวัดพื้นที่ส่วนแรกก่อนทำการออกแบบ เพื่อลดเวลาการรอคอยและการว่างงาน ซึ่งสามารถเพิ่มประสิทธิภาพในการทำงานของช่างไม้ได้อีกด้วย ส่วนต่อมา คือ การรอคอยวัตถุดิบ ในระยะเวลาที่ต้องรอคอยวัตถุดิบเพื่อให้มาครบพร้อมกันนั้นจะทำให้เสียเวลาไปอย่างไม่เกิดประโยชน์ คณะผู้วิจัยจึงได้ทำการปรับปรุงโดยให้ช่างไม้ทำการผลิตชิ้นส่วนจากวัตถุดิบที่มีไว้ก่อน เมื่อวัตถุดิบใหม่มาก็ทำการผลิตชิ้นส่วนจากวัตถุดิบใหม่จะทำให้ไม่เกิดการว่างงาน

ในระหว่างที่รอคอย ทำให้สามารถลดเวลาในการผลิตเฟอร์นิเจอร์ จาก 6,180 นาที เป็น 5,459 นาที หรือลดลง 721 นาที (~12.02 ชั่วโมง)

สรุปและอภิปรายผล

1) กระบวนการและรูปแบบในการผลิตเฟอร์นิเจอร์ของห้างหุ้นส่วนจำกัด ตัวอย่างจากการศึกษาพบว่า การทำงานของผู้เชี่ยวชาญทั้ง 3 ด้านได้มีการจัดวางแผนกระบวนการทำงานค่อนข้างที่จะเป็นระบบ อาจจะมีบางขั้นตอนเท่านั้นที่ยังใช้เวลาในการรอคอยที่มากไป ทั้งนี้เพราะบริษัทได้มีการจัดแผนการทำงานอย่างเป็นระบบทำให้สามารถแบ่งสัดส่วนในการทำงานระหว่างคนและเครื่องจักรในการทำงานแต่ละแผนกได้ มีผู้บริหารได้มีการแบ่งหน้าที่และมอบหมายงานอย่างชัดเจนให้สอดคล้องกับความรู้ความสามารถของแต่ละบุคคลเพื่อให้แต่ละแผนกงานมีหน้าที่การทำงานที่ไม่ซ้ำซ้อนกัน ในส่วนของขั้นตอนที่ไม่จำเป็นและใช้ระยะเวลาในการรอคอยนานนั้น ทางคณะผู้วิจัยได้ทำการปรับปรุงในส่วนที่สามารถแก้ไขได้ ลดขั้นตอนของการรอคอยที่ไม่ทำให้เกิดประโยชน์ ซึ่งขั้นตอนเหล่านั้นอาจทำให้สิ้นเปลืองเวลาที่จะทำให้สามารถนำไปใช้ให้เกิดประโยชน์หรือนำไปเพิ่มผลผลิตได้ ซึ่งสอดคล้องกับทฤษฎีระยะทำการผลิตของ สุรสิทธิ์ ระวังวงศ์ (2553) ได้กล่าวไว้ว่า การใช้งานเครื่องจักรและวัตถุดิบอย่างมีประสิทธิภาพและประสิทธิผลมากที่สุดเท่าที่จะทำได้ สิ่งสำคัญในระยะทำการผลิต คือ การควบคุมการทำงานโดยคน งานต้องทำงานตามมาตรฐานและเวลาที่กำหนด และเป็นการตรวจสอบวิธีการทำที่ทำอยู่นั้น เพื่อแก้ไขปัญหาที่เกิดขึ้น และปรับปรุงให้ดีกว่าเดิมอีก

2) ปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ของห้างหุ้นส่วนจำกัดตัวอย่าง พบว่า ทำให้สามารถลดเวลาในการผลิตเฟอร์นิเจอร์ จาก 6,180 นาที เป็น 5,459 นาที หรือลดลง 721 นาที (~12.02 ชั่วโมง) และจำนวนของการปฏิบัติงานลดลง 2 ขั้นตอน ขั้นตอนการเคลื่อนย้ายลดลง 1 ขั้นตอน และขั้นตอนการตรวจสอบลดลง 3 ขั้นตอน ผลการวิจัยยังสอดคล้องกับ สุจิตรา บัวผัน (2563) การศึกษางานและศึกษาเวลาในการทำงาน วิเคราะห์โดยใช้แผนภูมิการทำงานของคนและเครื่องจักร และนำหลักการ ECRS เข้ามาวิเคราะห์และหาแนวทางในการปรับปรุงเพื่อลดความสูญเปล่าจากการทำงาน จากผลการศึกษาพบว่ากระบวนการที่สนใจในการแก้ปัญหา สามารถปรับปรุงและกำหนดมาตรฐานของจำนวนพนักงานได้ โดยพิจารณาจากจำนวนพนักงานเดิมที่ใช้ และยังสอดคล้องกับ จุฑาภรณ์ แก้วสุด (2562) เป้าหมายของการวิจัยเพื่อการลดกิจกรรมในกระบวนการผลิต และลดระยะเวลารวมของกระบวนการผลิตของบริษัทกรณีศึกษา โดยการศึกษาเริ่มจากศึกษาข้อมูลกระบวนการดำเนินงานเพื่อจัดทำแผนผังสายธารคุณค่าสถานการณ์ปัจจุบัน จากนั้นจึงวิเคราะห์กระบวนการปฏิบัติงานในแต่ละกิจกรรม เพื่อระบุความสูญเปล่าที่เกิดขึ้นในกระบวนการผลิต และทำการกำหนดแนวทางการแก้ไข โดยใช้แผนผังแสดงสาเหตุและผลหลักการ 5W+1H (What, Why, Where, When, Who, How) และเทคนิค ECRS (Eliminate, Combine, Rearrange, Simplify) จากนั้นได้จัดทำแผนผังสายธารคุณค่าในสถานการณ์หลังการปรับปรุงเพื่อเปรียบเทียบผลลัพธ์ระหว่างก่อนและหลังปรับปรุงภายใต้แนวคิดลีน ซึ่งพบว่า จำนวนกิจกรรมการผลิตลดลงและระยะเวลากระบวนการผลิตลดลง

ข้อเสนอแนะ

ข้อเสนอแนะจากการทำวิจัยในครั้งนี้คณะผู้วิจัยพบว่า ยังมีบางส่วนที่ห้างหุ้นส่วนจำกัดตัวอย่างควรมีการปรับปรุงกระบวนการผลิตเฟอร์นิเจอร์ดังนี้

1) ควรเพิ่มช่องโล่งภายในโรงงานให้มีมากขึ้น เพราะบรรยากาศในการทำงานค่อยข้างมีฝุ่นเยอะจากเศษไม้ต่าง ๆ ดังนั้นแล้วสถานที่ทำงานต้องสามารถถ่ายเทได้ดีจะทำให้ไม่อับชื้น

2) เพิ่มการจัดระเบียบคลังวัสดุให้เป็นหมวดหมู่ ซึ่งจะทำให้สามารถหยิบค้นวัสดุต่าง ๆ ได้ง่ายและทำให้มีพื้นที่เหลือในการนำไปใช้ประโยชน์ด้านอื่น ๆ

3) ควรมีการฝึกอบรมการใช้เครื่องจักร อุปกรณ์ เครื่องมือที่มีความอันตราย เพื่อลดอุบัติเหตุที่จะเกิดขึ้นได้จากการทำงาน และเทคนิคและวิธีการต่าง ๆ เพื่อให้ช่างในโรงงานสามารถทำงานได้อย่างมีประสิทธิภาพมากขึ้น และมีความชำนาญในผลิตชิ้นงานออกมาให้ลูกค้ามีความพึงพอใจสูงสุด

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

1) การวิจัยเชิงคุณภาพ จะต้องมีการสัมภาษณ์เชิงลึกและมีการสร้างแบบสอบถามที่ชัดเจนให้กับผู้ตอบแบบสอบถาม

2) ควรมีการศึกษาต่อยอดในผลิตภัณฑ์อื่น ๆ ของห้างหุ้นส่วนจำกัด

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ความสัมพันธ์ระหว่างดัชนีค่าระวางเรือกับราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

The Relationship between the Freight Index and the Price of Container Ship Stocks on the Stock Exchange of Thailand.

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ระหว่างดัชนีค่าระวางเรือต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย โดยดัชนีค่าระวางเรือประกอบไปด้วย ดัชนีค่าระวางเรือ BDI, CCFI และ SCFI ตามลำดับ ข้อมูลที่ใช้ในการศึกษานี้เป็นการนำข้อมูลทุติยภูมิที่ได้มาจากตลาดหลักทรัพย์แห่งประเทศไทย และข้อมูลดัชนีค่าระวางเรือประเภทต่าง ๆ ที่มีการเก็บข้อมูลแบบอนุกรมเวลา ตั้งแต่ปี ค.ศ. 2021 - 2024 ที่ได้รวบรวมไว้นำมาวิเคราะห์ด้วยสถิติวิเคราะห์ถดถอยพหุคูณ ผลการวิจัยพบว่า ดัชนีค่าระวางเรือ CCFI ส่งผลกระทบเชิงบวกต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยอย่างมีนัยสำคัญทางสถิติ เมื่อนำดัชนีค่าระวางเรือทั้งสามประเภทมาทำนายราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย พบว่า มีเพียงดัชนีค่าระวางเรือ CCFI เท่านั้นที่สามารถทำนายราคาหุ้นได้ที่ระดับนัยสำคัญทางสถิติที่ 0.05 โดยดัชนีค่าระวางเรือ CCFI สามารถร่วมทำนายราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยได้ร้อยละ 84.5

คำสำคัญ: ดัชนีค่าระวางเรือ, BDI, CCFI, SCFI, หุ้นเรือคอนเทนเนอร์

Abstract

This research aims to explore the relationship between the freight index and the price of container ship stocks on the Stock Exchange of Thailand. The freight index comprises the BDI, CCFI, and SCFI freight index. The study utilized secondary data sourced from the Stock Exchange of Thailand and information on different sorts of freight indexes. The time series data obtained from 2021 to 2024 has been evaluated using multiple regression analysis statistics. The findings indicated that CCFI freight index exert a positive and statistically significant influence on the value of container ship stocks on the Stock Exchange of Thailand. The results revealed that only the CCFI freight index had a statistically significant predictive power on container ship stock prices at a significant level of 0.05. The CCFI freight index accurately forecasted 84.5% of container ship stocks' share prices on the Stock Exchange of Thailand.

Keywords: Freight Index, BDI, CCFI, SCFI, Container Ships Stock

บทนำ

นับตั้งแต่มีการแพร่ระบาดของโรคโควิด-19 ตั้งแต่ปี พ.ศ 2563 ทำให้หลายประเทศทั่วโลกได้รับผลกระทบ โดยเฉพาะกิจกรรมทางเศรษฐกิจต้องหยุดชะงัก และชะลอตัวจากมาตรการการปิดประเทศ การเว้นระยะห่างทางสังคม และการควบคุมกิจกรรมทางสังคม เพื่อเป็นไปตามมาตรการป้องกันและควบคุมการแพร่ระบาดของแต่ละประเทศส่งผลให้ทุกอุตสาหกรรมได้รับผลกระทบและต้องปรับตัวอย่างรวดเร็ว จากมาตรการดังกล่าวส่งผลกระทบต่อมิติเศรษฐกิจอย่างมีนัยสำคัญ ตลอดจนได้สร้างความเสียหายต่อภาคการท่องเที่ยวและภาคบริการของประเทศไทยที่จำนวนนักท่องเที่ยวหดตัวลงตลอดช่วงเวลาของการแพร่ระบาดจนถึงปัจจุบัน (สำนักงานเศรษฐกิจอุตสาหกรรม, 2564)

ประเทศไทยเป็นประเทศผู้นำเข้าวัตถุดิบเพื่อนำมาผลิตสินค้าในประเทศ และส่งออกสินค้าไปยังต่างประเทศ การแพร่ระบาดของโรคโควิด-19 ส่งผลให้ภาคอุตสาหกรรมการผลิตชะลอตัวจากการไม่สามารถนำเข้าวัตถุดิบเพื่อมาผลิตสินค้า และไม่สามารถส่งออกสินค้าที่ผลิตเสร็จแล้วไปยังต่างประเทศได้ เมื่อนำข้อมูลมูลค่าการนำเข้าและส่งออกของประเทศไทยมาพิจารณา ภายหลังการแพร่ระบาดของโรคโควิด-19 พบว่า การส่งออกของประเทศไทยในปี พ.ศ 2566 ยังคงได้รับแรงกดดันจากการชะลอตัวของเศรษฐกิจโลก โดยปัจจัยหลักมาจากการชะลอตัวของเศรษฐกิจประเทศคู่ค้าสำคัญของไทย อาทิ ประเทศสหรัฐอเมริกา สหภาพยุโรป และประเทศญี่ปุ่น โดยเฉพาะในกลุ่มสินค้าอิเล็กทรอนิกส์ เครื่องใช้ไฟฟ้า เม็ดและผลิตภัณฑ์พลาสติกที่มูลค่าการส่งออกลดลง ถึงแม้การส่งออกไปยังประเทศจีนจะมีทิศทางดีขึ้นแต่โดยรวมแล้วมูลค่าการส่งออกยังติดลบ (ศูนย์วิจัยกสิกรไทย, 2566)

นอกจากปัจจัยการชะลอตัวของเศรษฐกิจโลกที่ส่งผลต่อการนำเข้าและส่งออกแล้ว อีกปัจจัยนึงที่ส่งผลกระทบโดยตรงต่อผู้ส่งออก คือ อัตราค่าระวางเรือขนส่งตู้คอนเทนเนอร์ (Freight) ที่สูงเป็นประวัติการณ์ ในปี พ.ศ. 2564 เนื่องจากสาเหตุสำคัญ คือ 1) ความต้องการส่งออกระหว่างประเทศมีแนวโน้มเพิ่มขึ้นอีกครั้ง เมื่อบริษัทในประเทศจีนกลับมาเปิดทำการหลังจากมาตรการปิดประเทศ และ 2) การแพร่ระบาดของโรคโควิด-19 ทำให้การดำเนินการที่ท่าเรือล่าช้า และปัญหาความแออัดที่ท่าเรือ (Port Congestion) ส่งผลให้เกิดปัญหาการขาดแคลนตู้คอนเทนเนอร์ทำให้กระทบต่อผู้ส่งออกและตัวแทนผู้ขนส่งสินค้า (Freight Forwarder) ของไทยในการหาตู้คอนเทนเนอร์ (ศูนย์วิจัยเศรษฐกิจและธุรกิจธนาคารไทยพาณิชย์, 2564) ตลอดจนต้นทุนค่าขนส่งที่สูงขึ้นทั้งอัตราค่าระวางเรือขนส่งตู้คอนเทนเนอร์ในเส้นทางไทย-สหรัฐอเมริกาและไทย-สหภาพยุโรป สาเหตุที่อัตราค่าระวางเรือ (Freight) สำหรับส่งสินค้าโดยตู้คอนเทนเนอร์สูงขึ้นมาก เนื่องจากค่าระวางเรือนั้นถูกกำหนดจากหลักอุปสงค์และอุปทาน ในด้านฝั่งอุปสงค์นั้นเป็นผลจากความต้องการสินค้าที่มากขึ้นโดยเฉพาะจากประเทศสหรัฐอเมริกาและสหภาพยุโรปหลังจากมาตรการปิดเมืองในช่วงการแพร่ระบาดของโรคโควิด-19 และการที่ธุรกิจต่าง ๆ เริ่มกลับมาดำเนินการได้อีกครั้ง ในฝั่งด้านอุปทานนั้น ประเทศที่ต้องการส่งออกสินค้าโดยเฉพาะประเทศจีนนั้นมีตู้คอนเทนเนอร์ไม่เพียงพอ เนื่องจากปัญหาตู้คอนเทนเนอร์ตกค้างในประเทศปลายทาง รวมถึงเกิดความล่าช้าในการขนส่งเนื่องจากมาตรการควบคุมการแพร่ระบาดที่ยังมีอยู่ทำให้อัตราค่าระวางเรือสำหรับการขนส่งผ่านตู้คอนเทนเนอร์ปรับสูงขึ้นมากในช่วงไตรมาสที่ 3 ของปี พ.ศ 2563 เป็นต้นมา ประกอบกับเหตุการณ์เรือเอเวอร์กิฟเวนโดนพายุพัดเสียหลักเกยตื้นขวางคลองสุเอซที่ตั้งอยู่ทางตะวันออกเฉียงเหนือของอียิปต์ที่เป็นเส้นทางเดินเรือที่สำคัญของการค้าที่เชื่อมระหว่างทวีปเอเชียและทวีปยุโรป ในปี พ.ศ. 2564 ตลอดจนเหตุการณ์นับตั้งแต่เดือนพฤศจิกายน พ.ศ. 2566 ที่กบฏฮูตีปล่อยโดรน และยิงขีปนาวุธเข้าใส่เรือของนานาชาติที่ล่องผ่านทะเลแดงส่งผลกระทบต่อเส้นทางขนส่งสินค้าสำคัญที่เชื่อมทวีปยุโรป

และทวีปอเมริกาเหนือกับทวีปเอเชียผ่านคลองสุเอซ ส่งผลให้บริษัทเรือขนส่งสินค้าและเรือบรรทุกน้ำมันทยอยระงับการเดินเรือในทะเลแดงชั่วคราว และทำการเปลี่ยนเส้นทางการขนส่ง โดยอ้อมไปยังทวีปแอฟริกาบริเวณแหลมกู๊ดโฮป ซึ่งเป็นเส้นทางที่ไกลกว่าทำให้ต้นทุนเพิ่มขึ้นและเพิ่มระยะเวลาการขนส่ง (ผู้จัดการออนไลน์, 2566) จากปัญหาดังกล่าวยิ่งทำให้เกิดปัญหาการขาดแคลนตู้คอนเทนเนอร์ และอัตราค่าระวางเรือที่สูงขึ้นไปอีก อย่างไรก็ตาม อัตราค่าระวางเรือที่ปรับขึ้นสูงมีทั้งผู้ที่ได้ประโยชน์และเสียประโยชน์ โดยธุรกิจเดินเรือประจำเส้นทางรายใหญ่สามารถทำกำไรอย่างมาก อาทิ Maersk Group, Hapag-Lloyd และ Evergreen Marine Corp. และยังส่งผลให้บริษัทในประเทศไทยที่เกี่ยวข้องกับการขนส่งทางเรือคอนเทนเนอร์มีรายได้และผลกำไรที่มากขึ้น ส่งผลให้ราคาหุ้นในตลาดหลักทรัพย์ของไทยที่เกี่ยวข้องกับการขนส่งทางเรือคอนเทนเนอร์ก็ได้รับอานิสงส์ทางบวกไปด้วย คือ หุ้นของบริษัท บริษัท อาร์ ซี แอล จำกัด (มหาชน) หรือ Regional Container Lines (RCL)

บริษัท อาร์ ซี แอล จำกัด (มหาชน) หรือ Regional Container Lines (RCL) เป็นสายการเดินเรือที่ประกอบธุรกิจขนส่งตู้คอนเทนเนอร์ทางทะเลที่มีฐานประกอบกิจการในประเทศไทย ดำเนิน 3 สายธุรกิจ ได้แก่ 1) Shipper Owned Container 2) Carrier Owned Container และ 3) การให้บริการที่สร้างมูลค่าเพิ่มในด้านโลจิสติกส์โดยมีเครือข่ายสำนักงานที่ครอบคลุมภูมิภาคเอเชียตะวันออกเฉียงเหนือ เอเชียตะวันออกเฉียงใต้ คาบสมุทรเอเชียใต้ และตะวันออกกลาง (ตลาดหลักทรัพย์แห่งประเทศไทย, 2567) สำหรับการขนส่งสินค้าทางเรือ เรือแต่ละประเภทจะมีดัชนีค่าระวางของตนเอง การดูหุ้นเรือต้องดูดัชนีที่ถูกต้องยิ่งดัชนีสูงขึ้นจะส่งผลให้บริษัทผู้ให้บริการนั้นมีรายได้สูงขึ้นทางหนึ่ง งานวิจัยนี้จึงทำการศึกษาเพื่อให้หาความสัมพันธ์ระหว่างดัชนีค่าระวางเรือและราคาหุ้นของบริษัทผู้ให้บริการการส่งสินค้าประเภทตู้คอนเทนเนอร์ เพื่อให้ทราบถึงผลกระทบของดัชนีค่าระวางเรือต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาความสัมพันธ์ระหว่างดัชนีค่าระวางเรือ BDI ที่ส่งผลต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย
2. เพื่อศึกษาความสัมพันธ์ระหว่างดัชนีค่าระวางเรือ CCFI ที่ส่งผลต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย
3. เพื่อศึกษาความสัมพันธ์ระหว่างดัชนีค่าระวางเรือ SCFI ที่ส่งผลต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

สมมติฐานการวิจัย

สมมติฐานที่ 1 ดัชนีค่าระวางเรือ BDI ส่งผลกระทบเชิงบวกต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

สมมติฐานที่ 2 ดัชนีค่าระวางเรือ CCFI ส่งผลกระทบเชิงบวกต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

สมมติฐานที่ 3 ดัชนีค่าระวางเรือ SCFI ส่งผลกระทบเชิงบวกต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

แนวคิด ทฤษฎี กรอบแนวคิด

ดัชนีค่าระวางเรือ BDI

ดัชนีค่าระวางเรือ (Baltic Dry Index) เรียกโดยย่อว่า BDI คือ ดัชนีที่สะท้อนภาวะระหว่างอุปทานของเรือขนส่งสินค้าแห้งเทกองกับอุปสงค์ความต้องการใช้เรือและเส้นทางการค้า ณ ขณะใดขณะหนึ่ง ซึ่งตัวเลขนี้จะสามารถบอกถึงปริมาณกิจกรรมการค้าขายระหว่างประเทศ และแนวโน้มของเศรษฐกิจโลกได้ โดยเป็นดัชนีที่ช่วยให้มองเห็นค่าระวางเรือในเส้นทางการค้ารอบโลก (มาโครไมโคร, 2567) จึงถือเป็นอีกดัชนีชี้นำสำคัญของเศรษฐกิจโลก (Leading Indicator) โดยดัชนีค่าระวางเรือเทกอง BDI ประกอบไปด้วยค่าเฉลี่ยของค่าระวางเรือประเภทต่าง ๆ ผสมกัน ได้แก่

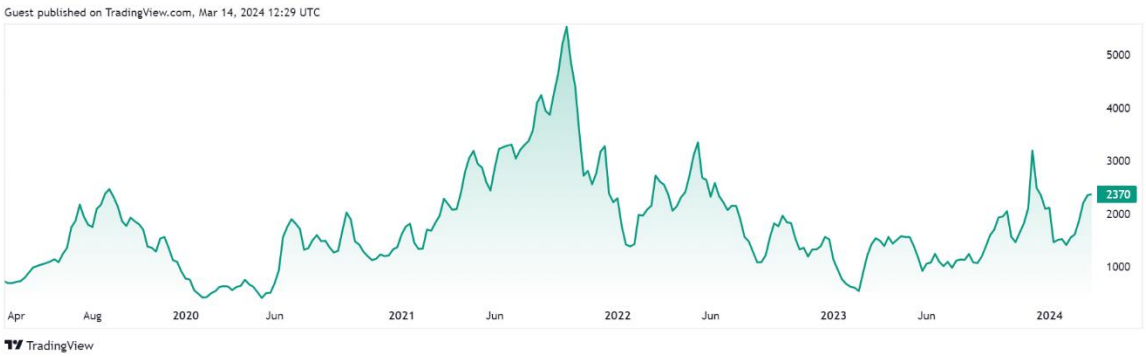
1) Capesize (BCI): ส่วนใหญ่จะบรรทุกสินค้าหนักในปริมาณมาก ๆ เช่น ถ่านหิน สินแร่เหล็ก และผลิตภัณฑ์จากเหล็กถือว่าเป็นเรือขนาดใหญ่ที่สุดใน 3 ประเภทนี้

2) Panamax (BPI): มีขนาดรองลงมา ส่วนใหญ่จะเอาไว้บรรทุกธัญพืช สินแร่เหล็ก ถ่านหิน

3) Supramax (BSI): มีขนาดรองลงมาอีกระดับ โดยส่วนใหญ่จะบรรทุก ธัญพืช สินแร่เหล็ก ถ่านหิน แต่เรือขนาดนี้สามารถล่องเข้าไปในทะเล หรือแม่น้ำที่ไม่ลึกได้

ดัชนีค่าระวางเรือมีความสำคัญต่อธุรกิจการเดินเรือ โดยดัชนีนี้ชี้ให้เห็นเกณฑ์มาตรฐานของราคาที่ใช้ในการขนส่งสินค้าโภคภัณฑ์แห้งทางทะเล ทั้งนี้ ปัจจัยทางเศรษฐกิจต่าง ๆ ส่งผลต่อค่าระวางเดินเรือด้วยเช่นกัน ไม่ว่าจะเป็นอุปสงค์ อุปทาน และราคาของสินค้าแห้งเทกอง, อุปทานของเรือบรรทุก และความจุ, ราคาของน้ำมันดิบ และต้นทุนที่เกิดจากน้ำมันเตา, ฤดูกาลในการขนส่งสินค้าโภคภัณฑ์, ค่าใช้จ่ายที่เกิดขึ้นเมื่อท่าเรือหนาแน่น, ช่องแคบคลองทางยุทธศาสตร์ที่เป็นเส้นทางเดินเรือ, สถานการณ์ตลาดและการเงินของโลก รวมถึงสถานการณ์การเมือง ประเด็นแรงงาน สภาพภูมิอากาศในประเทศต้นทางระหว่างทางและปลายทางขนส่ง

นอกจากนี้ ปัจจัยทางเศรษฐกิจยังมีความสัมพันธ์ต่อดัชนีค่าระวางเรือ ดังนั้นนักลงทุนจึงมักจะใช้ดัชนีค่าระวางเรือเป็นตัวชี้วัดหลักในการพิจารณาทิศทางของเศรษฐกิจ เนื่องจากดัชนีค่าระวางเรือแสดงให้เห็นถึงอุปสงค์และอุปทานที่ตลาดโลกมีต่อสินค้าโภคภัณฑ์แห้งที่ขนส่งทางเรือ ยิ่งดัชนีค่าระวางเรือสูงขึ้นเท่าไหร่ ยิ่งแสดงให้เห็นแนวโน้มที่เศรษฐกิจโลกจะเติบโตได้ดีมากขึ้นเท่านั้น ในทางกลับกัน ดัชนีค่าระวางเรือที่ตกต่ำมักเป็นสัญญาณเตือนของภาวะเศรษฐกิจขาลง เช่น ในช่วงเดือนมกราคม ปี พ.ศ. 2563 ที่โลกเผชิญกับการแพร่ระบาดของโรคโควิด-19 ดัชนีค่าระวางเรือลดต่ำลงมากถึงร้อยละ 70 ดัชนีค่าระวางเรือจึงนับเป็นหนึ่งในตัวชี้วัดภาพรวมเศรษฐกิจโลกที่น่าสนใจ (ลงทุนศาสตร์, 2564)



ภาพที่ 1 ดัชนีค่าระวางเรือ BDI ช่วงระหว่างปี ค.ศ. 2019 - 2024
ที่มา: www.tradingview.com

ดัชนีค่าระวางเรือ CCFI และ SCFI

ดัชนีค่าระวางเรือคอนเทนเนอร์จีน (China Containerized Freight Index: CCFI) ก่อตั้งขึ้นในปี ค.ศ. 1998 เพื่อติดตามอัตราการขนส่งสินค้าผ่านตู้คอนเทนเนอร์ในท่าเรือหลัก 10 แห่งในประเทศจีน ได้แก่ ท่าเรือต้าเหลียน เทียนจิน ชิงเต่า เซี่ยงไฮ้ หนานจิง หนิงโป เซียะเหมิน ฝูโจว เซินเจิ้น และกวางโจว

ดัชนีค่าระวางเรือคอนเทนเนอร์เซี่ยงไฮ้ (Shanghai Containerized Freight Index: SCFI) เปิดตัวอย่างเป็นทางการเมื่อปี ค.ศ. 2009 เป็นดัชนีนี้สะท้อนถึงค่าขนส่งทางทะเลและค่าธรรมเนียมทางทะเลที่เกี่ยวข้องกับเส้นทางการเดินเรือในแต่ละเส้นทาง โดยเป็นเส้นทางการขนส่งสินค้าผ่านตู้คอนเทนเนอร์ที่ส่งออกจากเมืองเซี่ยงไฮ้ ประเทศจีน ไปยังภูมิภาคต่อไปนี้ ยุโรป ทะเลเมดิเตอร์เรเนียน ชายฝั่งตะวันตกของสหรัฐอเมริกา ชายฝั่งตะวันออกของสหรัฐอเมริกา อ่าวเปอร์เซีย ออสเตรเลีย/นิวซีแลนด์ แอฟริกาตะวันตก แอฟริกาใต้ อเมริกาใต้ ญี่ปุ่นฝั่งตะวันตก ญี่ปุ่นฝั่งตะวันออก เอเชียตะวันออกเฉียงใต้ และเกาหลีใต้ โดยท่าเรือปลายทางจะถูกกำหนดไว้ในเส้นทางการค้าแต่ละเส้นทาง

โดย ดัชนีค่าระวางเรือ SCFI ได้ทำสถิติสูงสุดใหม่ที่ 5,109.60 จุด เมื่อวันที่ 7 มกราคม พ.ศ. 2565 และมีแนวโน้มลดลงในปี พ.ศ. 2565 และทรงตัวในปี พ.ศ. 2566 และขยับตัวสูงขึ้นจากวิกฤติในทะเลแดงเมื่อปลายปี พ.ศ. 2566 จนถึงปัจจุบัน ดังแสดงในภาพที่ 2

ภาพที่ 2 ดัชนีค่าระวางเรือ CCFI และ SCFI ช่วงระหว่างปี ค.ศ. 2014 - 2024
ที่มา: www.macromicro.me

เมื่อพิจารณาในช่วงเวลาที่ดัชนีค่าระวางเรือ SCFI ปรับตัวสูงขึ้นมีสาเหตุดังนี้

1. การเติมสต็อกสินค้า (Restock) ตามคำสั่งซื้อสินค้าคงค้างรวมถึงคำสั่งซื้อใหม่จากการที่วิกฤติการแพร่ระบาดของโรคโควิด-19 คลี่คลายลงเป็นบางช่วงเวลา

2. มาตรการควบคุมการระบาดของโรคโควิด-19 ส่งผลให้เรือต้องเสียเวลาดำเนินการในท่าเรือต่าง ๆ อันมาจากการปิดประเทศ มาตรการเรื่องของการควบคุมเรื่องความปลอดภัย

3. เรือขนส่งสินค้าประเภทตู้คอนเทนเนอร์ และตู้คอนเทนเนอร์ขาดแคลนจากมาตรการ IMO 2020 ขององค์การทางทะเลระหว่างประเทศ กดดันให้ปริมาณเรือขนส่งทางทะเลทั่วโลกลดลง และแม้ว่าผู้ประกอบการเร่งสั่งต่อเรือขนส่งตู้คอนเทนเนอร์เพิ่มขึ้นถึง 20% เมื่อเทียบกับปริมาณกองเรือทั่วโลก แต่เรือใหม่เหล่านี้จะทยอยเข้าสู่ตลาดตั้งแต่ช่วงปี พ.ศ. 2566 เป็นต้นไป

4. ปัจจัยอันเนื่องมาจากความไม่ปกติ เช่น เรือเอเวอร์กิฟเวน ขวางคลองที่คลองสุเอซ ประเทศอียิปต์ ทำให้การเดินเรือในคลองสุเอชนั้นเกิดการหยุดชะงักส่งผลต่อการใช้เส้นทางการเดินเรือระหว่างเอเชียกับยุโรป ทำให้กระทบต่อการขนส่งทางเรือและค้าขายทางทะเลทั่วโลก

ความแตกต่างระหว่างดัชนีค่าระวางเรือ CCFI และ SCFI

1. ความครอบคลุมทางภูมิศาสตร์ที่แตกต่างกัน ดัชนีค่าระวางเรือ SCFI เป็นค่าเฉลี่ยถ่วงน้ำหนักของ 15 เส้นทาง โดยเส้นทางการค้าแต่ละเส้นทางสะท้อนถึงปริมาณตู้คอนเทนเนอร์ส่งออกจากเซี่ยงไฮ้ด้วยอัตราค่าขนส่งเฉลี่ย และค่าระวางสินค้าระหว่างท่าเรือ (Port-to-Port Freight) ในส่วนดัชนีค่าระวางเรือ CCFI สะท้อนถึงการขนส่งตู้คอนเทนเนอร์ที่ส่งออกจากท่าเรือทั่วประเทศของจีน

2. ตลาดเป้าหมายที่แตกต่างกัน ดัชนีค่าระวางเรือ SCFI กำหนดเป้าหมายตลาดการขนส่งตู้คอนเทนเนอร์ที่ส่งออกจากเมืองเซี่ยงไฮ้ ซึ่งมีความละเอียดอ่อนมากกว่าดัชนีค่าระวางเรือ CCFI เนื่องจากดัชนี CCFI กำหนดเป้าหมายระดับค่าระวางโดยรวม คือ สามารถทำสัญญาซื้อขายล่วงหน้าได้ และเป็นดัชนีของการขนส่งตู้คอนเทนเนอร์ที่ส่งออกของประเทศจีนในสิบท่าหลัก ซึ่งมีความครอบคลุมมากกว่าดัชนี SCFI

หุ้นกลุ่มเรือ

ตลาดหลักทรัพย์แห่งประเทศไทย (2565) ได้มีการแบ่งกลุ่มประเภทหุ้นเป็นกลุ่มเดินเรือ และท่าเทียบเรือดังนี้

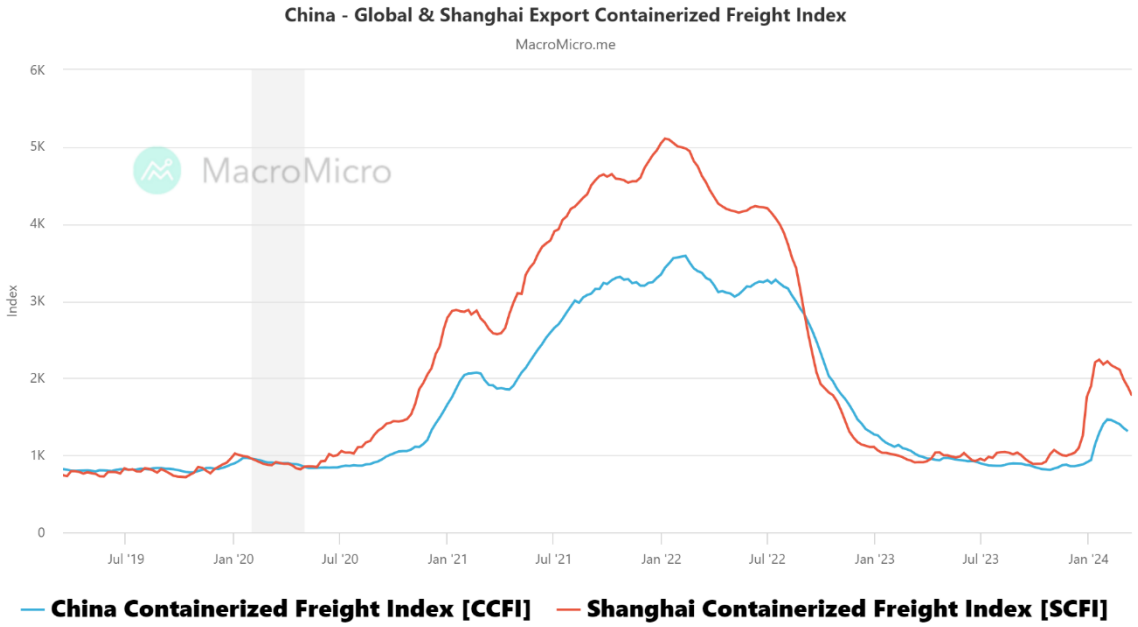
1) หุ้นเรือเทกอง เรือเทกอง คือ เรือที่ใช้ขนส่งสินค้า สินค้าโภคภัณฑ์จำนวนมาก เช่น แร่, ถ่านหิน, เหล็ก, สินค้าเกษตร ได้แก่ หุ้น TTA และ PSL

2) หุ้นเรือคอนเทนเนอร์ เรือคอนเทนเนอร์ คือ เรือที่ใช้ขนส่งตู้คอนเทนเนอร์ มักเป็นอุปกรณ์อิเล็กทรอนิกส์และสินค้าอุปโภคบริโภค ได้แก่ หุ้น RCL

3) หุ้นเรือขนส่งน้ำมันและปิโตรเคมีเหลว เรือขนส่งน้ำมันดิบและปิโตรเคมีเหลว จะใช้เรือที่เรียกว่า Tanker ให้บริการบริษัทผู้ค้าน้ำมันเป็นหลัก เช่น PTT, PTG และ TASCO สำหรับหุ้นกลุ่มนี้ ได้แก่ หุ้น AMA, VLและ PRM เป็นต้น

4) หุ้นที่เกี่ยวข้องกับเรืออื่น ได้แก่ หุ้น ASIMAR เป็นอู่ซ่อมเรือ NYT บริษัทประกอบธุรกิจให้บริการท่าเทียบเรือเพื่อการส่งออกและนำเข้ารถยนต์ (Roll-on/Roll-off: Ro/Ro) และสินค้าทั่วไป และธุรกิจผู้ให้บริการด้านโลจิสติกส์อื่น ๆ เช่น III, PORT และ TSTE เป็นต้น

ทั้งนี้ เมื่อพิจารณาหุ้นเรือแต่ละประเภทนั้น จะมีลักษณะการดำเนินธุรกิจที่ไม่เหมือนกันโครงสร้างรายได้แตกต่างกัน ปัจจัยที่มากระทบรายได้และกำไรของบริษัทตลอดจนทำให้ราคาหุ้นขึ้นหรือลงก็จะไม่เหมือนกัน ดังนั้นจำเป็นต้องพิจารณาอย่างถี่ถ้วน ในงานวิจัยนี้จะทำการศึกษาเฉพาะหุ้นเรือคอนเทนเนอร์ คือ บริษัท อาร์ ซี แอล จำกัด (มหาชน) หรือ Regional Container Lines (RCL) เท่านั้น เพื่อดูความสัมพันธ์ระหว่างดัชนีค่าระวางเรือแต่ละประเภทส่งผลกระทบต่อราคาหุ้น RCL ย้อนหลังจนถึงปัจจุบันอย่างไร



ภาพที่ 3 ดัชนีค่าระวางเรือ CCFI และ SCFI ช่วงระหว่างปี ค.ศ. 2019 - 2024
ช่วงก่อน ระหว่าง และหลังการเกิดการแพร่ระบาดของโรคโควิด-19
ที่มา: www.macromicro.me

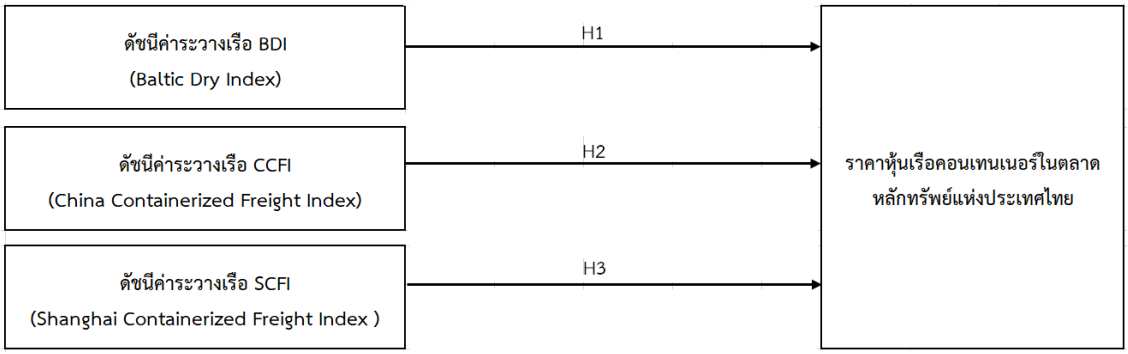
งานวิจัยที่เกี่ยวข้อง

วรากร ประเสริฐสม (2552) ได้ทำการศึกษาเรื่อง ปัจจัยที่มีอิทธิพลต่ออัตราผลตอบแทนของหลักทรัพย์หมวดขนส่งและโลจิสติกส์ ในตลาดหลักทรัพย์แห่งประเทศไทย โดยวิธีวิเคราะห์สมการถดถอยด้วยวิธีกำลังสองน้อยที่สุด ซึ่งใช้ตัวแปรอิสระดังต่อไปนี้ อัตราการเปลี่ยนแปลงของดัชนีค่าระวางเรือ BDI อัตราการเปลี่ยนแปลงของราคาน้ำมันดิบตลาด NYMEX อัตราดอกเบี้ยกู้ยืมระหว่างธนาคาร อัตราการเปลี่ยนแปลงของอัตราแลกเปลี่ยนเงินสกุลบาทต่อดอลลาร์สหรัฐ อัตราการเปลี่ยนแปลงของดัชนีราคาหลักทรัพย์ตลาดหลักทรัพย์แห่งประเทศไทย และอัตราการเจริญเติบโตของผลิตภัณฑ์มวลรวมประเทศ ผลการศึกษาพบว่า ปัจจัยที่มีผลกระทบต่ออัตราผลตอบแทนของดัชนีหลักทรัพย์หมวดขนส่งและโลจิสติกส์ในตลาดหลักทรัพย์แห่งประเทศไทยในทิศทางเดียวกันอย่างมีนัยสำคัญ คือ อัตราการเปลี่ยนแปลงของดัชนีราคาหลักทรัพย์ตลาดหลักทรัพย์แห่งประเทศไทย และอัตราการเจริญเติบโตของผลิตภัณฑ์มวลรวมประเทศ โดยอัตราการเปลี่ยนแปลงของดัชนีค่าระวางเรือ BDI ไม่มีผลกระทบต่ออัตราผลตอบแทนของดัชนีหลักทรัพย์หมวดขนส่งและโลจิสติกส์อย่างมีนัยสำคัญทางสถิติ ซึ่งสอดคล้องกับงานวิจัยของ กันต์สุดา อินทรสุวรรณ (2564) ที่ทำการศึกษาปัจจัยทางเศรษฐกิจที่มีผลกระทบต่อดัชนีราคาหลักทรัพย์ในตลาดหลักทรัพย์แห่งประเทศไทย หมวดขนส่งและโลจิสติกส์ ตั้งแต่เดือนมกราคม พ.ศ. 2552 ถึง เดือนธันวาคม พ.ศ. 2562 จำนวนทั้งหมด 132 เดือน ด้วยการวิเคราะห์ในรูปสมการถดถอยพหุคูณเชิงเส้น (Multiple Linear Regression) ผลการศึกษาพบว่า ปัจจัยที่ส่งผลต่อดัชนีราคาหลักทรัพย์หมวดขนส่งและโลจิสติกส์ที่ระดับนัยสำคัญ 0.05 ได้แก่ ดัชนีราคาหลักทรัพย์แห่งประเทศไทย (SET) ดัชนีมูลค่าค้าปลีกทั่วประเทศ (RE) มีความสัมพันธ์ในทิศทางเดียวกัน แต่ดัชนีค่าระวางเรือ (BDI) ดัชนีความเชื่อมั่นผู้บริโภค (CCI) มูลค่านำเข้า(IMPORT) มูลค่าส่งออก (EXPORT) อัตราแลกเปลี่ยน (EXCHANGE) ไม่มีความสัมพันธ์กับดัชนีราคาหลักทรัพย์หมวดขนส่งและโลจิสติกส์อย่างมีนัยสำคัญทางสถิติ

ในขณะที่งานวิจัยของ เติมเดช จิมากุลโกมล (2550) ที่ได้ศึกษาเรื่องปัจจัยกำหนดดัชนีราคาหุ้นกลุ่มขนส่งและโลจิสติกส์ด้วยวิธีสมการถดถอยน้อยที่สุด (Ordinary Least Squares) โดยใช้ตัวแปรอิสระเป็นดัชนีหลักทรัพย์ในตลาดหลักทรัพย์แห่งประเทศไทย (SET) ดัชนีค่าระวางเรือ (BDI) อัตราดอกเบี้ยของธนาคารกลาง ประเทศสหรัฐอเมริกา (FDR) ราคาน้ำมันดิบ (NYMEX) อัตราดอกเบี้ยของธนาคารแห่งประเทศไทย (I) ซึ่งผลการศึกษาพบว่า ดัชนีหลักทรัพย์ในตลาดหลักทรัพย์แห่งประเทศไทย (SET) และดัชนีค่าระวางเรือ (BDI) มีความสัมพันธ์กับดัชนีราคาหุ้นกลุ่มขนส่งและโลจิสติกส์ในทิศทางเดียวกัน

จากการทบทวนวรรณกรรมพบว่า งานวิจัยก่อนหน้านี้มีผลการศึกษาเรื่องดัชนีค่าระวางเรือมีความสัมพันธ์กับดัชนีราคาหุ้นกลุ่มขนส่งและโลจิสติกส์ในทิศทางเดียวกันและไม่มีความสัมพันธ์กันระหว่างสองตัวแปรดังกล่าว งานวิจัยนี้จึงทำการศึกษาเพื่อหาความสัมพันธ์ระหว่างดัชนีค่าระวางเรือในแต่ละประเภทและราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย เพื่อให้เกิดความเข้าใจมากขึ้น

กรอบแนวคิดการวิจัย



ภาพที่ 4 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

การวิจัยนี้เป็นการวิจัยเชิงปริมาณ ในส่วนนี้จะนำเสนอกรอบแนวคิดในการวิจัยข้อมูลที่จะใช้ในการศึกษาตัวแปรและสถิติที่จะใช้ในการศึกษาครั้งนี้ ดังกรอบแนวคิดการวิจัย

1. ข้อมูลที่ใช้ในการวิจัย

ข้อมูลที่ใช้ในการศึกษานี้ เป็นการนำข้อมูลทุติยภูมิที่ได้มาจากตลาดหลักทรัพย์แห่งประเทศไทยและข้อมูลจากเว็บไซต์ต่างประเทศที่มีการรวบรวมดัชนีค่าระวางเรือประเภทต่าง ๆ ที่มีการเก็บข้อมูลแบบอนุกรมเวลา โดยในการวิจัยครั้งนี้จะใช้ข้อมูลตั้งแต่ปี ค.ศ. 2021 - 2024 ที่ได้รวบรวมไว้นำมาวิเคราะห์ โดยข้อมูลที่นำมาใช้จะแบ่งออกเป็นสองชุดข้อมูล คือ ดัชนีค่าระวางเรือประเภทต่าง ๆ และราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

2. ตัวแปรที่ใช้ในการวิจัย

ตัวแปรที่ใช้ในการวิจัยนี้ประกอบไปด้วย

1) ตัวแปรตาม (Dependent Variable) คือ ราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย คือ ราคาหุ้นของบริษัท บริษัท อาร์ ซี แอล จำกัด (มหาชน) หรือ Regional Container Lines (RCL)

2) ตัวแปรต้น (Independent Variable) คือ ดัชนีค่าระวางเรือ 3 ดัชนี ได้แก่ 1) ดัชนีค่าระวางเรือ BDI 2) ดัชนีค่าระวางเรือ CCFI 3) ดัชนีค่าระวางเรือ SCFI

3. การวิเคราะห์ข้อมูล

งานวิจัยนี้ ผู้วิจัยใช้การวิเคราะห์สถิติเชิงอ้างอิง (Inferential Statistic) เป็นการทดสอบความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตาม ด้วยสถิติวิเคราะห์ถดถอยพหุคูณ (Multiple Regression Analysis) ซึ่งกำหนดระดับนัยสำคัญทางสถิติที่ 0.05

การวิเคราะห์การถดถอย (Regression Analysis)

การวิเคราะห์การถดถอย เป็นวิธีการทางสถิติอย่างหนึ่งที่ใช้ในการตรวจสอบลักษณะของความสัมพันธ์ระหว่างตัวแปร ตั้งแต่ 2 ตัวขึ้นไป โดยแบ่งเป็นตัวแปรอิสระ (Independent Variable) และตัวแปรตาม (Dependent Variable) (กัลยา วานิชย์บัญชา, 2556)

โดยผลของการศึกษาจะให้ทราบถึง

1. ขนาดของความสัมพันธ์ระหว่างตัวแปรอิสระที่มีต่อตัวแปรตาม

2. แบบจำลองความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตาม ในการวิเคราะห์การถดถอยจะเรียกตัวแปรอิสระว่า ตัวทำนาย (Predictor) หรือตัวแปรกระตุ้น (Stimulus Variable) ส่วนตัวแปรตามจะเรียกว่า ตัวแปรตอบสนอง (Response Variable) หรือตัวแปรเกณฑ์ (Criterion Variable)

การวิเคราะห์การถดถอยพหุคูณ (Multiple Regression) จะประกอบด้วยตัวแปรตาม 1 ตัว และตัวแปรอิสระตั้งแต่ 2 ตัวขึ้นไป การวิเคราะห์เป็นการหาขนาดของความสัมพันธ์ และสร้างรูปแบบสมการทางคณิตศาสตร์ที่เป็นการพยากรณ์ค่าของตัวแปรตามโดยใช้ตัวแปรอิสระที่ศึกษา ซึ่งในการตรวจสอบว่าสมการความถดถอยนั้นสามารถอธิบายของสัมพันธ์ได้ดีหรือไม่นั้น โดยส่วนใหญ่แล้วจะดูจากสัมประสิทธิ์การตัดสินใจ (R^2) ซึ่งการวิเคราะห์การถดถอยพหุคูณมีข้อตกลงเบื้องต้นที่สำคัญ 4 ประการ (บุญธรรม กิจปรีดาบริสุทธิ์, 2553) คือ

1) ค่าความคลาดเคลื่อน (Error or Residual: e) จะต้องมีการแจกแจงแบบปกติ

2) ค่าความแปรปรวนของค่าความคลาดเคลื่อนคงที่

3) ค่าความคลาดเคลื่อนต้องเป็นอิสระจากกัน

4) ตัวแปรอิสระจะต้องไม่มีความสัมพันธ์กัน

ผลการวิจัย

ผลการวิเคราะห์สถิติเชิงอ้างอิง (Inferential Statistic)

ผลการวิจัยด้วยสถิติวิเคราะห์ถดถอยพหุคูณ (Multiple Regression Analysis) เพื่อทดสอบความสัมพันธ์ของตัวแปรอิสระ และตัวแปรตาม เป็นดังนี้

ตารางที่ 1 การทดสอบสถิติด้วยวิเคราะห์ถดถอยพหุคูณ (Multiple Regression Analysis)

ตัวแปร	Coef.	Std.Err	95% CI	P-value	R^2	Adjusted R^2
ดัชนีค่าระวางเรือ BDI	0.001	0.001	-0.0008, 0.004	0.230	0.861	0.845
ดัชนีค่าระวางเรือ CCFI	0.008	0.003	0.002, 0.014	0.015*		
ดัชนีค่าระวางเรือ SCFI	0.0001	0.002	-0.004, 0.004	0.955		
constant	18.757	1.483	15.720, 21.795	0.001**		

ผลจากการทดสอบความสัมพันธ์ดัชนีค่าระวางเรือ BDI กับราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยพบว่า ค่าสัมประสิทธิ์ของตัวแปรทำนายเท่ากับ 0.001 และมีค่า P-value เท่ากับ 0.230 แสดงว่า ดัชนีค่าระวางเรือ BDI ไม่มีความสัมพันธ์ต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

ผลจากการทดสอบความสัมพันธ์ดัชนีค่าระวางเรือ CCFI กับราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยพบว่า ค่าสัมประสิทธิ์ของตัวแปรทำนายเท่ากับ 0.008 และมีค่า P-value เท่ากับ 0.015 แสดงว่าดัชนีค่าระวางเรือ CCFI ส่งผลกระทบเชิงบวกต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยอย่างมีนัยสำคัญทางสถิติ

ผลจากการทดสอบความสัมพันธ์ดัชนีค่าระวางเรือ SCFI กับราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยพบว่า ค่าสัมประสิทธิ์ของตัวแปรทำนายเท่ากับ 0.0001 และมีค่า P-value เท่ากับ 0.955 แสดงว่า ดัชนีค่าระวางเรือ SCFI ไม่มีความสัมพันธ์ต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย

จากการวิเคราะห์การถดถอยเมื่อนำตัวแปรอิสระด้านดัชนีค่าระวางเรือทั้งสามตัว ได้แก่ ดัชนีค่าระวางเรือ BDI ดัชนีค่าระวางเรือ CCFI ดัชนีค่าระวางเรือ SCFI มาทำนายราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยพบว่า ดัชนีค่าระวางเรือ CCFI ส่งผลกระทบเชิงบวกต่อราคาหุ้นอย่างมีนัยสำคัญทางสถิติ โดยมีค่า R^2 มีค่าเท่ากับ 0.861 และค่า Adjusted R^2 เท่ากับ 0.845

สรุปและอภิปรายผล

จากผลการวิจัยสามารถอภิปรายผลได้ว่า ดัชนีค่าระวางเรือ BDI ไม่มีความสัมพันธ์ต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย เมื่อพิจารณารายดัชนีพบว่า ดัชนีค่าระวางเรือ BDI ที่เป็นดัชนีอัตราค่าเช่าเหมาลำของเรือเทกองไม่ใช่ดัชนีที่เกี่ยวข้องกับเรือคอนเทนเนอร์โดยตรง จึงไม่มีความสัมพันธ์เชิงบวกต่อราคาหุ้นและไม่สามารถร่วมทำนายราคาหุ้นเรือคอนเทนเนอร์ได้ ซึ่งสอดคล้องกับงานวิจัยของ กันต์สุดา อินทรสุวรรณ์ (2564) ที่พบว่า ดัชนีค่าระวางเรือ (BDI) ไม่มีความสัมพันธ์กับดัชนีราคาหลักทรัพย์หมวดขนส่งและโลจิสติกส์อย่างมีนัยสำคัญทางสถิติ

สำหรับดัชนีค่าระวางเรือ CCFI มีผลกระทบเชิงบวกต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทยอย่างมีนัยสำคัญทางสถิติ เนื่องจากหุ้น RCL เป็นหุ้นที่บริษัทเน้นการขนส่งในเอเชียเป็นหลัก ดัชนีค่าระวางเรือของประเทศจีนจึงมีความสำคัญและมีผลกระทบโดยตรงต่อรายได้และกำไรของบริษัท เพราะประเทศจีนเป็นหนึ่งในประเทศที่นำเข้าส่งออกสินค้ามากที่สุดในโลก ทำให้ปริมาณการนำเข้า-ส่งออกของจีนจากท่าเรือต่าง ๆ ส่งผลกระทบต่ออุตสาหกรรมขนส่งทางเรือของโลก โดยเฉพาะดัชนีค่าระวางเรือ CCFI ที่มีการตรวจสอบอัตราค่าระวางเรือคอนเทนเนอร์จากท่าเรือหลัก 10 แห่งในประเทศจีน ได้แก่ ท่าเรือต้าเหลียน ท่าเรือเทียนจิน ท่าเรือชิงเต่า ท่าเรือเซี่ยงไฮ้ ท่าเรือหนานจิง ท่าเรือหนิงโป ท่าเรือเซียะเหมิน ท่าเรือฝูโจว ท่าเรือเซินเจิ้น และท่าเรือกวางโจว ครอบคลุมการค้าหลัก 12 แห่งในภูมิภาคตะวันออกไกล เอเชีย ยุโรป ทะเลเมดิเตอร์เรเนียน ออสเตรเลีย อเมริกาเหนือ อเมริกาใต้ แอฟริกาและตะวันออกกลาง

เมื่อพิจารณาดัชนีค่าระวางเรือ SCFI เพิ่มเติมพบว่า ไม่มีความสัมพันธ์ต่อราคาหุ้นเรือคอนเทนเนอร์ในตลาดหลักทรัพย์แห่งประเทศไทย เนื่องจาก SCFI เป็นดัชนีค่าระวางเรือที่เน้นการส่งออกจากท่าเรือเซี่ยงไฮ้เป็นหลัก เมื่อนำไปทำนายร่วมจึงพบว่า ดัชนีค่าระวางเรือ SCFI ไม่สามารถทำนายราคาหุ้นเรือคอนเทนเนอร์ได้อย่างมีนัยสำคัญทางสถิติ มีเพียงดัชนีค่าระวางเรือ CCFI เท่านั้นที่สามารถทำนายราคาหุ้นเรือ

คอนเนอร์ได้อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 ดังนั้นเมื่อผู้ลงทุนต้องการที่จะพิจารณาการลงทุนในหุ้นเรือคอนเทนเนอร์ การติดตามดัชนีค่าระวางเรือทั้งสามประเภทนั้นช่วยให้เห็นแนวโน้มรวมถึงภาพรวมของธุรกิจเดินเรือได้ โดยเฉพาะดัชนีค่าระวางเรือ CCFI ที่สามารถร่วมทำนายราคาหุ้น RCL ได้อย่างมีนัยสำคัญทางสถิติ เนื่องจากบริษัท RCL เป็นสายการเดินเรือที่ประกอบธุรกิจขนส่งตู้คอนเทนเนอร์ทางทะเลที่มีฐานประกอบกิจการในประเทศไทยและครอบคลุมภูมิภาคเอเชียตะวันออกเฉียงเหนือ เอเชียตะวันออกเฉียงใต้ คาบสมุทรเอเชียใต้ และตะวันออกกลาง ทำให้ดัชนีค่าระวางเรือของประเทศจีนส่งผลโดยตรงไม่เพียงแต่จากท่าเรือเซียงไฮ้ แต่การนำเข้า-ส่งออกในเมืองท่าอื่น ๆ ของจีน ก็มีปริมาณมากเช่นกัน ดังนั้นหากพิจารณาให้ครอบคลุมถึงการขึ้นลงของดัชนีค่าระวางเรือ CCFI จะช่วยให้วิเคราะห์หุ้นกลุ่มเรือคอนเทนเนอร์ได้ดียิ่งขึ้น เพราะดัชนีเหล่านี้กระทบโดยตรงกับรายได้ของบริษัท

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

งานวิจัยนี้ทำการศึกษาเฉพาะหุ้นเรือคอนเทนเนอร์เท่านั้น ในการวิจัยครั้งต่อไปควรเพิ่มขอบเขตหุ้นหมวดขนส่งและโลจิสติกส์ในกลุ่มอื่น ๆ เพื่อให้เห็นผลกระทบของดัชนีค่าระวางเรือว่าส่งผลต่อราคาหุ้นในกลุ่มอื่น ๆ อย่างไร

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ปัจจัยที่ส่งผลต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรี
Factors Affecting Undergraduate Students' Satisfaction with Google Analytics Usage

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บทคัดย่อ

การวิจัยนี้เป็นการวิจัยเชิงปริมาณในรูปแบบการวิจัยเชิงสำรวจ และใช้แบบสอบถามเป็นเครื่องมือในการเก็บรวบรวมข้อมูลจากกลุ่มตัวอย่างเพื่อศึกษาปัจจัยที่ส่งผลต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรี มหาวิทยาลัยเอกชนในประเทศไทย ด้วยแบบสอบถาม จำนวน 221 ชุด และใช้การวิเคราะห์การถดถอยเชิงพหุคูณ ผลการวิจัยพบว่า ปัจจัยราคาที่ยั่งยืนและปัจจัยการรับรู้ถึงความสะดวกในการใช้งานส่งผลเชิงบวกต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรี มหาวิทยาลัยเอกชนแห่งหนึ่งในประเทศไทยอย่างมีนัยสำคัญทางสถิติที่ระดับ .01

คำสำคัญ: กูเกิลแอนะลิติกส์, การรับรู้ถึงความสะดวกในการใช้งาน, ความพึงพอใจ

Abstract

This research is a quantitative study conducted in the form of survey research, utilizing questionnaires as a tool for data collection from a sample group. The objectives of the research are to study factors which affect satisfaction in using Google Analytics among undergraduate students at a private university in Thailand. A total of 221 questionnaires were administered and the data were analyzed using multiple regression analysis. The research findings reveal that sustainable prices factor and familiarity and comfort with technology factor positively influence satisfaction in using Google Analytics among undergraduate students at a private university in Thailand, with statistical significance at .01 level.

Keywords: Google Analytics, Perceived Convenience, Satisfaction

บทนำ

ในปัจจุบันเป็นยุคที่เทคโนโลยีเป็นสิ่งที่สำคัญในการใช้ชีวิตประจำวัน นักการตลาดดิจิทัลเผชิญกับการตัดสินใจที่ซับซ้อนที่ต้องการความรู้เกี่ยวกับแนวโน้มในพฤติกรรมของผู้บริโภคในโลกดิจิทัล การใช้งานของสมาร์ทโฟนในการซื้อสินค้าหรือการใช้บริการต่าง ๆ ยิ่งส่งเสริมให้กลุ่มผู้บริโภคมีพฤติกรรมการซื้อสินค้าหรือการใช้บริการที่เปลี่ยนแปลงอย่างรวดเร็วและมีความซับซ้อนมากขึ้น เช่น การซื้อสินค้าประเภทแฟชั่น มีการซื้อขายผ่านสมาร์ทโฟนมากขึ้นร้อยละ 64 โดยผู้ซื้อพูดสั่งซื้อสินค้าผ่านลำโพงอัจฉริยะ (Smart Speakers) และแว่นโลกเสมือนของกูเกิ้ล (Virtual Reality Googles) ในขณะที่ตราสินค้าต่าง ๆ นิยมใช้เครื่องมือใหม่ ๆ มากขึ้น ไม่ว่าจะการค้าด้วยการถ่ายทอดสดหรือการไลฟ์สดขายของ (Live Commerce) หรือ การลองเสื้อผ้าแบบเสมือน (Virtual Dressing) (3DLook, 2024) ในประเทศเยอรมันมีการศึกษาความต้องการของผู้บริโภคเกี่ยวกับการซื้อสินค้าแฟชั่นจากหน้าร้าน (In-store Fashion Retailing-ISFR) ไปยังร้านค้าออนไลน์ (Online Fashion Retailing–OFR) พบว่า นอกจากลูกค้าต้องการตัวสินค้าที่เป็นเสื้อผ้าแฟชั่นที่ต้องการซื้อแล้ว ลูกค้ายังต้องการใช้เครื่องมืออัจฉริยะ หรือต้องการโต้ตอบกับผู้อื่นทั้งในร้านค้าจริงและร้านค้าออนไลน์เพื่อซื้อสินค้าด้วย (Kullak, Baier, & Woratschek, 2023) ในประเทศอังกฤษ สินค้าแฟชั่นก็เป็นหมวดหมู่ที่มีการซื้อขายมากที่สุดในช่องทางออนไลน์มากกว่าร้อยละ 61 ของการซื้อสินค้าแฟชั่นออนไลน์ ผู้บริโภคเลือกซื้อสินค้าโดยใช้สมาร์ทโฟนแต่ผู้บริโภคจำนวนมากยังรู้สึกผิดหวังต่อประสบการณ์การซื้อผ่านสมาร์ทโฟน (Tupikovskaja-Omovie & Tyler, 2021)

การวิเคราะห์ทางการตลาดโดยการใช้ประโยชน์จากฐานข้อมูลดิจิทัลขนาดใหญ่มีความจำเป็นต่อนักวิเคราะห์ผู้ปฏิบัติมาหลายปีแล้วแต่การใช้งานยังไม่เต็มประสิทธิภาพอย่างแท้จริง บริษัทค้าปลีกด้านดิจิทัลหรือบริษัทพาณิชย์อิเล็กทรอนิกส์ใช้งานกูเกิลแอนะลิติกส์ (Google Analytics - GA) ส่วนใหญ่กับการวิเคราะห์ตัวชี้วัดประสิทธิภาพหลัก (KPIs) ที่เก็บรวบรวมจากเว็บไซต์ต่าง ๆ วิธีการนี้ ถือเป็นทางเลือกสำหรับการวิเคราะห์ขั้นสูง โดยการเข้าใจกระบวนการตัดสินใจของผู้บริโภคที่มีลักษณะที่ซับซ้อนและหลากหลาย ดังนั้นการศึกษาถึงปัญหาและความไม่พึงพอใจกับประสบการณ์การซื้อสินค้าทั้งทางเว็บไซต์ของร้านค้าหรือการซื้อผ่านสมาร์ทโฟนหรือการใช้นวัตกรรมต่าง ๆ ในการตลาดดิจิทัลจะสามารถวิเคราะห์ได้โดยการใช้งานกูเกิลแอนะลิติกส์ (Google Analytics-GA) ให้มากขึ้น (พัณณ์ชิตา ชัชจิราคุณานนท์, 2562) เพื่อทำให้นักการตลาดดิจิทัลสามารถวิเคราะห์วิธีการต่าง ๆ เพื่อสร้างประสบการณ์ที่ดีในการซื้อขายสินค้าผ่านระบบออนไลน์ในอนาคตได้ (Tupikovskaja-Omovie & Tyler, 2021)

มหาวิทยาลัยเอกชนแห่งหนึ่งในประเทศไทย หมายถึง สถาบันการศึกษาระดับอุดมศึกษาที่ก่อตั้งเป็นหนึ่งในห้าแห่งแรกในประเทศไทย มีโอกาสใช้งานกูเกิลแอนะลิติกส์ในการเรียนเพื่อช่วยเก็บข้อมูลจากเว็บไซต์และแอปพลิเคชันบนแพลตฟอร์มโทรศัพท์เคลื่อนที่ เพื่อให้นักศึกษานำข้อมูลที่ได้ไปวิเคราะห์ปรับปรุงเว็บไซต์และแอปพลิเคชันบนแพลตฟอร์มโทรศัพท์เคลื่อนที่ ทั้งข้อมูลด้านการตลาด การซื้อโฆษณา หรือการปรับปรุงรูปแบบเว็บไซต์ และการหาสิ่งที่ผู้เข้าชมเว็บไซต์สนใจ เช่น สินค้า บริการ รวมถึงเนื้อหาต่าง ๆ บนเว็บไซต์ด้วยกูเกิลแอนะลิติกส์ ทั้งนี้ กูเกิลแอนะลิติกส์ ยังเป็นเครื่องมือที่ใช้ในการวิเคราะห์ และเก็บข้อมูลสถิติของเว็บไซต์หรือสถิติผู้ใช้งานแอปพลิเคชันบนโทรศัพท์เคลื่อนที่ของคนที่เข้ามาใช้งานเว็บไซต์ เช่น เพศ อายุ อุปกรณ์ที่ใช้

เข้าเว็บไซต์เป็นโน้ตบุ๊กหรือโทรศัพท์ จาก Google หรือ Facebook เพื่อให้นักศึกษาสามารถนำข้อมูลเหล่านี้มาใช้วิเคราะห์และวางกลยุทธ์ในการทำการตลาดพร้อมวัดผลได้อย่างแม่นยำ

อย่างไรก็ตามนักศึกษาหลายคนมองว่า กูเกิลแอนะลิติกส์เป็นเครื่องมือที่เข้าใจยาก มีตาราง และตัวเลขค่อนข้างมาก หรือใช้งานยากและซับซ้อน อีกทั้งการติดตั้งกูเกิลแอนะลิติกส์ อาจต้องการความรู้ในด้านเทคนิคบางประการ เช่น การเพิ่มโค้ดติดตามลงในเว็บไซต์ การตั้งค่าในส่วนของรายงาน ซึ่งอาจทำให้ผู้ใช้ไม่สะดวกหรือไม่สามารถทำด้วยตนเองได้ ดังนั้นเหตุผลเหล่านี้ จึงเป็นปัจจัยสำคัญที่ทำให้ผู้ใช้เกิดความไม่พึงพอใจในการใช้กูเกิลแอนะลิติกส์ได้ ซึ่งเป็นที่มาของปัญหานำวิจัยในการศึกษาครั้งนี้

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาปัจจัยที่ส่งผลต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรีมหาวิทยาลัยเอกชนในประเทศไทย

ทบทวนวรรณกรรม

Begany, Martin, and Yuan (2021) มีการใช้กูเกิลแอนะลิติกส์ เพื่อจัดหมวดหมู่ข้อมูลการเข้าชมเว็บไซต์เป็น 4 แนวทาง คือ การมีความสัมพันธ์กับเว็บไซต์ที่มีการเข้าชมสูงหรือต่ำ และใช้การวิเคราะห์ถดถอยโลจิสติกส์เพื่อทดสอบความสัมพันธ์ระหว่างการเข้าชมเว็บไซต์สูงกับเพศ เกณฑ์อายุ ประเภทอุปกรณ์และความสนใจของผู้บริโภค พบว่า กลุ่มผู้บริโภคที่มีอายุที่น้อย ส่วนใหญ่เป็นเพศชาย ผู้ใช้เดสก์ท็อปและคนที่ชื่นชอบเทคโนโลยีมีความสัมพันธ์กับการมีการเข้าชมเว็บไซต์สูง ผลการวิจัยนี้ทำให้เข้าใจแนวโน้มในโครงการข้อมูลภาครัฐ (Open Government Data–OGD) และพฤติกรรมข้อมูลสุขภาพของผู้บริโภคมากขึ้น และกลุ่มนักวิจัยยังพบว่า ผู้จัดการ OGD สามารถใช้ข้อมูลวิเคราะห์เว็บไซต์ของพวกเขา เพื่อเข้าใจว่าผู้ใช้ใดมีการเข้าชมมากที่สุดซึ่งจะช่วยให้ผู้พัฒนาเว็บไซต์ต่าง ๆ สามารถเน้นเนื้อหาที่จำเป็นในเว็บไซต์ได้ดีขึ้น

Abdelkader (2023) ได้ศึกษาเรื่อง ChatGPT เป็นโมเดลปัญญาประดิษฐ์ที่ออกแบบมาเพื่อใช้ในการสนทนา ซึ่งเพิ่มความนิยมในการตลาดดิจิทัล ซึ่งสามารถช่วยนักการตลาดดิจิทัลในการสรรหาข้อมูล หรือจัดทำงานเขียนเพื่อใช้ในการติดต่อกับลูกค้าและปรับปรุงการให้บริการต่าง ๆ ของพวกเขาให้ดียิ่งขึ้น โดยงานวิจัยนี้ศึกษา ปัจจัยความคุ้นเคยและความสบายในการใช้เทคโนโลยี (Familiarity and Comfort with Technology) ต่อประสบการณ์ของลูกค้า ตลอดจนศึกษาว่า เพศ อายุ และระดับการศึกษาของผู้ใช้งาน ChatGPT จำนวน 394 คน มีผลกระทบต่อประสบการณ์การใช้งานของผู้ใช้งาน ChatGPT อย่างไร ซึ่งผลการวิจัยพบว่า ปัจจัยความคุ้นเคยและความสบายในการใช้เทคโนโลยี ประเภทธุรกิจ อายุ และระดับการศึกษา มีผลต่อประสบการณ์ของลูกค้ากับการใช้งาน ChatGPT และความพึงพอใจทั่วไปของการตลาดดิจิทัล Abdelkader ยังศึกษา ปัจจัยการรับรู้ความสะดวกในการใช้งาน (Perceived Convenience) หมายถึงระบบใช้งานง่าย ให้ข้อมูลได้อย่างรวดเร็ว เป็นเครื่องมือที่มีประสิทธิภาพ เป็นต้น (Abdelkader, 2023) ในการศึกษาของ Abdelkader (2023) ยังพบอีกว่า ปัจจัยการรับรู้เฉพาะบุคคล (Perceived Personalization) การรับรู้ความเกี่ยวข้อง Perceived Relevance การรับรู้ถึงความถูกต้อง Perceived Accuracy การรับรู้ถึงความสะดวกในการใช้งาน Perceived Convenience มีผลต่อความพึงพอใจ (Satisfaction) ของผู้ใช้

ChatGPT ดังนั้นในการประยุกต์ใช้กับงานวิจัยนี้ ปัจจัยการรับรู้เฉพาะบุคคล หมายถึง การใช้งานกูเกิลแอนะลิติกส์ ทำให้ผู้ใช้ได้ข้อมูลที่ตรงตามความต้องการของพวกเขาและข้อมูลที่ได้ยังสามารถนำมาวิเคราะห์สถานการณ์ที่เกิดขึ้นในปัจจุบันและอนาคตของธุรกิจที่ผู้ใช้งานวิเคราะห์ได้ ส่วนปัจจัยการรับรู้ความเกี่ยวข้อง หมายถึง การใช้งานกูเกิลแอนะลิติกส์ ทำให้ผู้ใช้งานได้รับข้อมูลที่เกี่ยวข้องกับธุรกิจที่พวกเขาสนใจหรือต้องการวิเคราะห์ได้ ส่วนปัจจัยการรับรู้ถึงความถูกต้อง หมายถึง การใช้งานกูเกิลแอนะลิติกส์ ทำให้ผู้ใช้ได้ข้อมูลที่ถูกต้องไว้ใจได้ เชื่อถือได้ ส่วนปัจจัยการรับรู้ถึงความสะดวกในการใช้งาน หมายถึง การใช้งานกูเกิลแอนะลิติกส์ ทำให้ผู้ใช้รู้สึกว่าใช้งานง่าย ได้ข้อมูลรวดเร็ว มีประสิทธิภาพ หรือ ดีกว่าคู่แข่ง เช่น Power BI เป็นต้น

นอกจากนั้น Yun, Lee, Cottingham, and Hyun (2023) ศึกษาเรื่อง การค้าด้วยการถ่ายทอดสด (Live Commerce หรือ L-Commerce) เป็นช่องทางการกระจายสินค้าที่กำลังเติบโต ซึ่งได้ทำการเปลี่ยนแปลงการเลือกซื้อของผู้บริโภคไปในทิศทางใหม่ ซึ่งเริ่มจากการระบาดของโรค COVID-19 ทำให้ความต้องการของผู้บริโภคในการทำธุรกิจที่ไม่ต้องพบหน้าเพิ่มขึ้นอย่างรวดเร็ว อย่างไรก็ตาม ภาคธุรกิจที่ไม่ต้องพบหน้ามีข้อเสียต่าง ๆ เช่น ไม่มีการตอบสนองอย่างมีประสิทธิภาพ การค้าด้วยการถ่ายทอดสดที่เพิ่งปรากฏขึ้น คือ การแก้ไขข้อบกพร่องนี้โดยใช้เทคโนโลยีสตรีมมิ่งแบบเรียลไทม์ ได้ผลตอบรับทางบวกจากกลุ่มธุรกิจต่าง ๆ งานวิจัยนี้ยังพบว่า ประโยชน์ที่รู้สึกได้จากราคาหรือราคาที่ยั่งยืน (Sustainable Price) ก่อให้เกิดความพึงพอใจในกลุ่มลูกค้าที่ซื้อสินค้าจากการชมการถ่ายทอดสดอีกด้วย

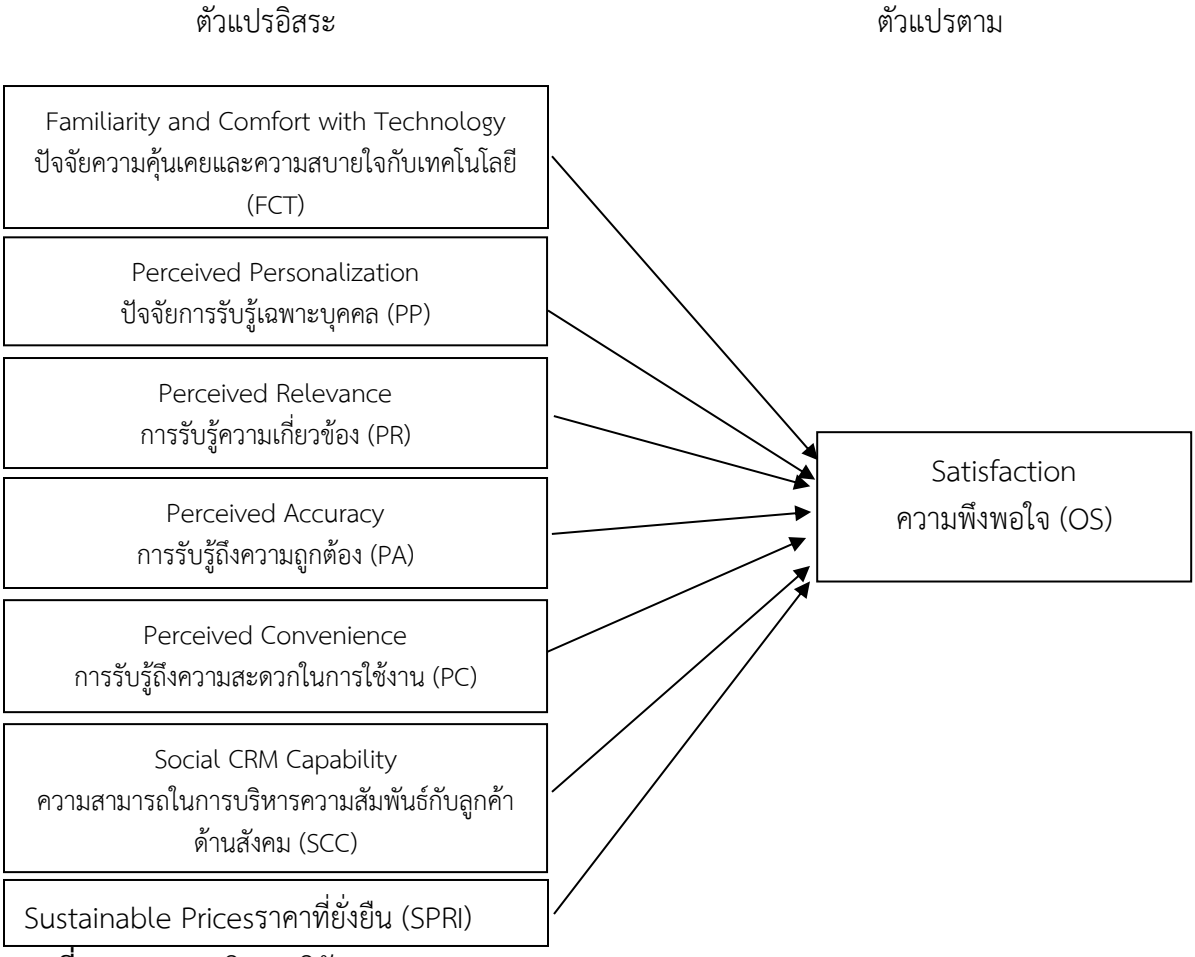
Chou, Horng, Liu, Yu, and Kuo (2022) มีการศึกษาวิจัยเรื่อง การระบุปัจจัยที่สำคัญสำหรับการตลาดที่ยั่งยืนในอุตสาหกรรมการให้บริการ โดยศึกษาปัจจัยอิทธิพลของการใช้แอปพลิเคชันข้อมูลขนาดใหญ่ นวัตกรรมทางการตลาด ปัจจัยจากแบบจำลองการยอมรับเทคโนโลยี ซึ่งการบริโภคของมนุษย์มีผลกระทบอย่างมีนัยสำคัญต่อความยั่งยืนทางสิ่งแวดล้อมที่เป็นสิ่งสำคัญในโลก และการประยุกต์ใช้ข้อมูลขนาดใหญ่จะเป็นกุญแจในการแก้ไขปัญหาที่เกี่ยวข้องกับความยั่งยืน การศึกษานี้มีวัตถุประสงค์เพื่อส่งเสริมการเข้าใจเพิ่มเติมเกี่ยวกับผสานทรรศน์แบบวิเคราะห์ทางการกระตุ้นการตอบสนอง (Stimulus-Organism-Response, SOR) และแบบจำลองการยอมรับเทคโนโลยี (Technology Acceptance Model-TAM) เพื่อสนับสนุนการทำความเข้าใจเกี่ยวกับการผสมผสานทางการตลาดที่ยั่งยืน การศึกษานี้ใช้กลุ่มตัวอย่างของพนักงาน จำนวน 300 คน ในอุตสาหกรรมอาหารแบบการให้บริการ ผลการวิจัยแสดงให้เห็นว่า การมีทัศนคติทางการตลาดที่ยั่งยืนและมีนวัตกรรม มีผลกระทบทางบวกต่อการใช้ของแอปพลิเคชันข้อมูลขนาดใหญ่ กลุ่มนักวิจัยศึกษาปัจจัยราคาที่ยั่งยืน (Sustainable Prices) หมายถึง การใช้งานที่ไม่เสียค่าใช้จ่ายสำหรับธุรกิจขนาดเล็ก ราคาไม่แพงเมื่อเทียบกับบริการที่คล้ายกันของคู่แข่งขันสามารถใช้งานได้โดยไม่เสียค่าใช้จ่าย ยังเชื่อมโยงกับการใช้บริการฟรีแบบอื่น ๆ จากผู้ให้บริการรายเดียวกันอีกด้วย ในการประยุกต์ใช้กับงานวิจัยนี้ ปัจจัยราคาที่ยั่งยืน หมายถึง การใช้งานกูเกิลแอนะลิติกส์ทำให้ผู้ใช้สามารถใช้งานโดยไม่เสียค่าใช้จ่ายสำหรับธุรกิจขนาดเล็กหรือขนาดกลางได้ หรือสำหรับธุรกิจขนาดใหญ่ ราคาการใช้งานกูเกิลแอนะลิติกส์ถือว่าไม่แพงเมื่อเทียบกับโปรแกรมอื่น เช่น Power BI และการใช้งานกูเกิลแอนะลิติกส์ยังสามารถเชื่อมโยงกับการใช้โปรแกรมฟรี เช่น กูเกิลดาต้าสตูดิโอ (Google Data Studio) ได้

Luo, Guo, Benitez, Scaringella, and Lin (2024) พบว่า ปัจจัยความสามารถในการบริหารความสัมพันธ์กับลูกค้าด้านสังคม (Social CRM Capability) เป็นตัวแปรคั่นกลางระหว่างการใช้งานสื่อสังคม

ออนไลน์และผลการดำเนินงานด้านการตลาด และปัจจัยความสามารถในการบริหารความสัมพันธ์กับลูกค้าด้านสังคมยังเพิ่มประสิทธิภาพการดำเนินงานด้านการตลาดของกลุ่มองค์กรธุรกิจขนาดต่าง ๆ อีกด้วย ในการประยุกต์ใช้กับงานวิจัยนี้ ปัจจัยความสามารถในการบริหารความสัมพันธ์กับลูกค้าด้านสังคม หมายถึง การใช้งานกูเกิลแอนะลิติกส์ ทำให้ผู้ใช้สามารถวิเคราะห์ รวบรวม ข้อมูลจากสื่อสังคมออนไลน์ เช่น Facebook Instagram และ Line ได้ดี ตลอดจนสามารถแยกได้ว่าลูกค้ามาจากสื่อสังคมออนไลน์ชนิดใด อีกทั้งยังสามารถจัดทำฐานข้อมูลลูกค้าได้ด้วย

ดังนั้นงานวิจัยนี้มีสมมติฐานการวิจัยคือ ปัจจัยความคุ้นเคยและความสบายใจกับเทคโนโลยี ปัจจัยด้านการรับรู้เฉพาะบุคคล ปัจจัยการรับรู้ความเกี่ยวข้อง ปัจจัยการรับรู้ถึงความถูกต้อง ปัจจัยการรับรู้ถึงความสะดวกในการใช้งาน ปัจจัยความสามารถในการบริหารความสัมพันธ์กับลูกค้าด้านสังคม ปัจจัยด้านราคาที่ยั่งยืนมีผลเชิงบวกต่อปัจจัยความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรีมหาวิทยาลัยเอกชนแห่งหนึ่ง

กรอบแนวคิดงานวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

ประชากร กลุ่มตัวอย่าง และวิธีการเก็บรวบรวมข้อมูล

ประชากร คือ นักศึกษาปริญญาตรีของมหาวิทยาลัยเอกชนแห่งหนึ่ง นักวิจัยมีการเลือกกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) (กัลยา วานิชย์บัญชา, 2542) โดยการตอบแบบสอบถามผ่าน Google Form เพื่อตอบแบบสอบถาม ในระหว่างวันที่ 1 - 31 ธันวาคม พ.ศ. 2566 ซึ่งผู้วิจัยได้กำหนดขนาดกลุ่มตัวอย่างในการวิจัยครั้งนี้ โดยใช้หลักการคำนวณการใช้แบบสอบถามที่เป็น Pilot Test จำนวน 40 ชุด เพื่อตรวจสอบความน่าเชื่อถือของแบบสอบถาม แบบสอบถามที่ใช้ในการวิจัยนั้นจำเป็นต้องมีความน่าเชื่อถือสูง เพื่อให้สามารถวัดสิ่งที่ต้องการวัดได้อย่างแม่นยำ ดังนั้นนักวิจัยจึงทำการ Pilot Test ก่อนการวิจัยจริงและเพื่อคำนวณขนาดของกลุ่มตัวอย่างของงานวิจัยนี้ โดยใช้โปรแกรม G*Power เวอร์ชั่น 3.1.9.7 (Cohen, 1977) เพราะเป็นโปรแกรมที่สร้างจากสูตรของ Cohen ซึ่งผ่านการรับรองและตรวจสอบจากนักวิจัยหลายท่าน (นงลักษณ์ วิรัชชัย, 2555; Erdfelder, Faul, & Buchner, 1996) ในการคำนวณกำหนดค่าเพาเวอร์ (1- β) เท่ากับ .85 ค่าอัลฟา (α) เท่ากับ .15 จำนวนตัวแปรทำนายเท่ากับ 7 ค่าขนาดของอิทธิพล (Effect Size) เท่ากับ .0360357 (ซึ่งคำนวณได้จากค่า Partial R^2 เท่ากับ 0.060025) ผลที่ได้คือ ขนาดของกลุ่มตัวอย่างอย่างน้อย 188 ชุด (Cohen, 1977) ดังนั้นผู้วิจัยจึงเก็บข้อมูลที่ใช้ได้ทั้งหมด จำนวน 221 ชุด

เครื่องมือที่ใช้ในการวิจัย

ในการศึกษาวิจัยครั้งนี้เป็นการวิจัยเชิงปริมาณ (Quantitative Approach) โดยการวิจัยเชิงสำรวจ (Survey Method) และใช้แบบสอบถาม (Questionnaire) เป็นเครื่องมือในการเก็บรวบรวมข้อมูล

การวิเคราะห์ข้อมูล

ผู้วิจัยได้นำผลลัพธ์การตอบแบบสอบถามมาวิเคราะห์หาความเชื่อมั่นและความสอดคล้องกันในแต่ละตัวแปรด้วยวิธีการหาค่าสัมประสิทธิ์แอลฟาครอนบาคได้ค่าอยู่ระหว่าง .791– .917 ซึ่งถือว่ามีความเชื่อมั่น (Reliability) สูงเกินเกณฑ์ เนื่องจากมีค่าใกล้เคียง 1 และไม่ต่ำ .70 (Nunnally, 1978) จากนั้นนำข้อมูลมาวิเคราะห์สถิติด้วยค่าการวิเคราะห์การถดถอยเชิงพหุคูณ

ผลการวิจัย

ผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง อายุ 21 ปี กำลังศึกษาอยู่ชั้นปีที่ 3 เกรดเฉลี่ยรวม 3.00 - 3.99 คณะบริหารธุรกิจ สาขาวิชาการตลาดดิจิทัล ค่าใช้จ่ายต่อเดือน 10,001 - 20,000 บาท เคยใช้ Google Analytics เพื่อการวิเคราะห์ข้อมูลของเว็บไซต์มาแล้ว 1 เว็บไซต์ ไม่เคยใช้กูเกิลแอนะลิติกส์ เพื่อการวิเคราะห์ข้อมูลของแอปพลิเคชัน โดยรู้จักกูเกิลแอนะลิติกส์จากบุคคล เช่น อาจารย์ หรือ เพื่อนแนะนำ และมีความสนใจที่จะใช้เครื่องมือวิเคราะห์ข้อมูลเพิ่มเติม คือ Google Data Studio แต่มีเพียงราคาที่ยั่งยืน (Sustainable Prices - SPRI) *(β = .276) (Sig.<.000)* ปัจจัยการรับรู้ความสะดวกในการใช้งาน (Perceived Convenience - PC) *(β = .221) (Sig.< .003)* ที่มีอิทธิพลเชิงบวกต่อความความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรี มหาวิทยาลัยเอกชนแห่งหนึ่งอย่างมีนัยสำคัญทางสถิติที่ระดับ .01 ซึ่ง

สามารถอธิบายอิทธิพลต่อความพึงพอใจในการใช้ระบบดังกล่าว ได้ร้อยละ 70.20 และอีกร้อยละ 29.80 เกิดจากอิทธิพลตัวแปรอื่น ๆ ที่ไม่ได้นำมาศึกษา และมีค่าความคลาดเคลื่อนของการพยากรณ์ที่ ± .172

ตารางที่ 1 ผลการวิเคราะห์การถดถอยเชิงพหุคูณ (Multiple Regression Analysis) ของปัจจัยที่มีอิทธิพลเชิงบวกต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์

ตัวแปรอิสระ	Stand Error	Standardized Beta	Sig.	VIF
ความคุ้นเคยและความสบายใจกับเทคโนโลยี (Familiarity and Comfort with Technology) (FCT)	0.065	0.157	0.012	2.711
การรับรู้เฉพาะบุคคล (Perceived Personalization) (PP)	0.080	0.002	0.982	3.907
การรับรู้ความเกี่ยวข้อง (Perceived Relevance) (PR)	0.080	0.118	0.121	4.068
การรับรู้ถึงความถูกต้อง (Perceived Accuracy) (PA)	0.078	0.056	0.451	3.976
การรับรู้ถึงความสะดวกในการใช้งาน (Perceived Convenience) (PC)	0.077	0.221**	0.003**	3.843
ความสามารถในการบริหารความสัมพันธ์กับลูกค้าด้านสังคม (Social CRM Capability) (SCC)	0.068	0.121	0.077	3.307
ราคาที่ยั่งยืน (Sustainable prices) (SPRI)	0.075	0.276**	0.000**	3.624
$R = .838$, $R^2 = .702$, Constant = .975				

** มีนัยสำคัญทางสถิติที่ระดับ .01

สรุปและอภิปรายผล

สมมติฐานการวิจัย คือ ปัจจัยความคุ้นเคยและความสบายใจกับเทคโนโลยี ปัจจัยด้านการรับรู้เฉพาะบุคคล ปัจจัยการรับรู้ความเกี่ยวข้อง ปัจจัยการรับรู้ถึงความถูกต้อง ปัจจัยการรับรู้ถึงความสะดวกในการใช้งาน ปัจจัยความสามารถในการบริหารความสัมพันธ์กับลูกค้าด้านสังคม ปัจจัยด้านราคาที่ยั่งยืน มีผลเชิงบวกต่อปัจจัยความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ของนักศึกษาปริญญาตรี มหาวิทยาลัยเอกชนแห่งหนึ่ง ผลการวิจัยพบว่า มีเพียงปัจจัยด้านราคาที่ยั่งยืนและปัจจัยการรับรู้ถึงความสะดวกในการใช้งาน ที่ส่งผลเชิงบวกต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ ของนักศึกษาปริญญาตรี มหาวิทยาลัยเอกชนแห่งหนึ่ง ซึ่งผลของงานวิจัยนี้ตรงกับงานวิจัยในอดีตที่ว่า ปัจจัยราคาที่ยั่งยืน หมายถึง การใช้งานที่ไม่เสียค่าใช้จ่ายสำหรับธุรกิจขนาดเล็ก ราคาไม่แพง เมื่อเทียบกับบริการที่คล้ายกันของคู่แข่งขัน สามารถใช้งานได้โดยไม่เสียค่าใช้จ่าย ยังเชื่อมโยงกับการใช้บริการฟรีแบบอื่น ๆ จากผู้ให้บริการรายเดียวกันอีกด้วย (Chou et al., 2022) และการรับรู้ถึงความสะดวกในการใช้งาน หมายถึง ระบบใช้งานง่ายให้ข้อมูลได้อย่างรวดเร็ว เป็นเครื่องมือที่มีประสิทธิภาพ เป็นต้น (Abdelkader, 2023) ส่วนปัจจัยอื่น ๆ ที่ยังไม่ส่งผลต่อความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ อาจจะเป็นเพราะนักศึกษายังใช้งานได้ไม่นาน ในช่วงการใช้งานเริ่มต้นกลุ่มนักศึกษาเห็นถึงประโยชน์เรื่องราคามีความยั่งยืน คือ ไม่เสียค่าใช้จ่าย และยังใช้งานเชื่อมโยงกับ Google Data Studio ได้อีกด้วยเป็นจุดสำคัญมากกว่าปัจจัยอื่น ๆ ในช่วงการเริ่มต้นใช้งานนี้

ข้อเสนอแนะ

ข้อเสนอแนะสำหรับการนำผลวิจัยไปใช้

ผู้ประกอบการหรือผู้จัดการทางการตลาดของกูเกิลแอนะลิติกส์ ในประเทศไทย นำผลการวิจัยนี้ไปวางแผนและพัฒนากลยุทธ์ทางการตลาดที่เกี่ยวข้อง โดยมุ่งเน้นพัฒนา Google Analytics (กูเกิลแอนะลิติกส์) สำหรับนักศึกษาปริญญาตรี ให้เน้นปัจจัยราคาที่ยั่งยืน หมายถึง การใช้งานที่ไม่เสียค่าใช้จ่ายสำหรับธุรกิจขนาดเล็ก ราคาไม่แพงเมื่อเทียบกับบริการที่คล้ายกันของคู่แข่งขัน สามารถใช้งานได้โดยไม่เสียค่าใช้จ่าย ยังเชื่อมโยงกับการใช้บริการฟรีแบบอื่น ๆ จากผู้ให้บริการรายเดียวกันอีกด้วย และการรับรู้ถึงความสะดวกในการใช้งาน หมายถึง ระบบใช้งานง่าย ให้ข้อมูลได้อย่างรวดเร็ว เป็นเครื่องมือที่มีประสิทธิภาพ เป็นต้น

ประโยชน์สำหรับผู้ประกอบการคือ เจ้าของธุรกิจทั้งขนาดเล็ก ขนาดกลาง ขนาดใหญ่ นักการตลาด หรือ ผู้พัฒนาเครื่องมือทางการตลาดดิจิทัล (MarTech) ทราบว่า บุคลากรที่จะทำงานทางด้านการตลาดดิจิทัลขององค์กรในอนาคตมีความรู้พื้นฐานเกี่ยวกับการใช้งานกูเกิลแอนะลิติกส์ และการอบรมบุคลากรในองค์กรให้สามารถวิเคราะห์ข้อมูลทางการตลาดดิจิทัลได้นั้นถ้าองค์กรให้ความสำคัญกับราคาที่ไม่แพง ราคาที่ยั่งยืนและการรับรู้ถึงความสะดวกในการใช้งานแล้ว กูเกิลแอนะลิติกส์อาจจะเป็นตัวเลือกหนึ่งที่ทำให้บุคลากรที่จะใช้งานเกิดความพึงพอใจได้ เป็นต้น

ข้อเสนอแนะสำหรับการวิจัยครั้งต่อไป

งานวิจัยนี้ ขยายองค์ความรู้เกี่ยวกับปัจจัยด้านราคาที่ยั่งยืน และปัจจัยการรับรู้ถึงความสะดวกในการใช้งานส่งผลเชิงบวกต่อปัจจัยความพึงพอใจในการใช้งานกูเกิลแอนะลิติกส์ ของนักศึกษาปริญญาตรี มหาวิทยาลัยเอกชนแห่งหนึ่ง งานวิจัยในอนาคตนักวิจัยสามารถใช้อ้างอิงหรือเปรียบเทียบปัจจัยด้านอื่น ๆ

ของกลุ่มเครื่องมือที่ใช้วิเคราะห์ข้อมูล Data Analytics เช่น Microsoft Power BI, Tableau, Zoho Analytics, Google Data Studio, Python, หรือ Adobe Analytics กับผู้ใช้งานทั่วไป หรือนักศึกษาในมหาวิทยาลัยอื่น ๆ ได้ นอกจากนั้นงานวิจัยในอนาคตสามารถศึกษาปัจจัยความภักดีหรือปัจจัยการใช้ซ้ำในการใช้งานกูเกิลแอนะลิติกส์หรือเครื่องมือวิเคราะห์อื่น ๆ เพื่อพัฒนาเครื่องมือใหม่ ๆ ได้อย่างมีประสิทธิภาพมากขึ้น

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ความต้องการและความคาดหวังของผู้ใช้บัณฑิตในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย

Graduate users' Need and Requirements in Developing the Bachelor of Business Administration Curriculum, Management Field Faculty of Business Administration Rajamangala University of Technology Srivijaya

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บทคัดย่อ

การศึกษาครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาความต้องการและความคาดหวังของผู้ใช้บัณฑิตในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย ซึ่งเป็นการวิจัยเชิงคุณภาพ (Qualitative Research) โดยการสนทนากลุ่ม (Focus Group Discussion) ผู้มีส่วนได้เสียที่เป็นกลุ่มผู้ใช้บัณฑิตซึ่งมีอิทธิสูงต่อการพัฒนาปรับปรุงหลักสูตรได้รับผลกระทบโดยตรงจากการดำเนินการของหลักสูตร จากผลการศึกษาความต้องการและความคาดหวังของผู้ใช้บัณฑิตสามารถสรุปประเด็นที่เกี่ยวข้องกับการพัฒนาปรับปรุงหลักสูตรเพื่อให้สามารถผลิตบัณฑิตที่มีลักษณะที่คาดหวัง ดังต่อไปนี้ (1) เป็นผู้แสดงออกถึงทัศนคติที่ดีต่องานอาชีพ ซื่อสัตย์สุจริต มีสำนึกในจรรยาบรรณในงานอาชีพ ตระหนักและคำนึงถึงภารกิจหน้าที่และความรับผิดชอบต่อตนเองและส่วนรวม (2) เป็นผู้อธิบายหลักการ แนวคิด ทฤษฎีด้านการบริหารธุรกิจ และองค์ความรู้เฉพาะด้านการจัดการได้อย่างถูกต้อง (3) เป็นผู้รู้และเข้าใจในกระบวนการคิดเชิงออกแบบด้านนวัตกรรม (4) เป็นผู้ประยุกต์ใช้ความรู้และเทคโนโลยีสารสนเทศทางด้านการจัดการในการปฏิบัติงานได้ตามความต้องการของตลาดแรงงาน (5) เป็นผู้บูรณาการการสื่อสารทางธุรกิจได้อย่างเหมาะสมเพื่อการทำงานท่ามกลางพลวัตของสังคมที่เปลี่ยนแปลง

คำสำคัญ: ความต้องการและความคาดหวัง, ผู้ใช้บัณฑิต, หลักสูตร

Abstract

This study aims to analyze the needs and expectations of graduate users in developing the Master of Business Administration curriculum, specializing in Management, at the Faculty of Business Administration, Rajamangala University of Technology Srivijaya. It is a qualitative research conducted through Focus Group Discussions with graduate user groups, who have a significant influence on curriculum development and are directly

impacted by curriculum implementation. From the analysis of the needs and expectations of graduate users, the following relevant points regarding curriculum development and improvement to produce graduates with desired characteristics can be summarized as follows: (1) Being an advocate for positive attitudes towards professionalism, integrity, and ethical conduct in the workplace, being conscientious of duties, responsibilities, both individually and collectively. (2) Being able to articulate principles, concepts, and theories of business management accurately. (3) Demonstrating knowledge and understanding of innovative thinking processes. (4) Applying knowledge and information technology in management practices according to market demand. (5) Integrating business communication appropriately for functioning within the dynamically changing societal landscape.

Keywords: Need and Requirements, Graduate Users, Curriculum

บทนำ

การเปลี่ยนแปลงอย่างรวดเร็วในด้านเศรษฐกิจ สังคม การเมือง กฎหมาย เทคโนโลยี และนวัตกรรม ส่งผลกระทบอย่างมีนัยสำคัญต่อการพัฒนาประเทศในทุกระดับแรงงาน ซึ่งเป็นปัจจัยสำคัญในการสร้างคุณค่าให้กับระบบเศรษฐกิจ ทั้งในภาคการผลิต ภาคเกษตรกรรม ภาคการค้า และภาคบริการ จำเป็นต้องมีความรู้ ทักษะ และศักยภาพที่สูงขึ้นเพื่อช่วยเพิ่มผลิตภาพ (Productivity) อันจะนำไปสู่การพัฒนาเศรษฐกิจในภาพรวมของประเทศ ดังนั้นการเพิ่มขีดความสามารถในการแข่งขันสถาบันการศึกษา โดยเฉพาะมหาวิทยาลัยฯ จึงต้องปรับตัวให้สอดคล้องกับสถานการณ์ปัจจุบัน มุ่งพัฒนาบัณฑิตให้มีความรู้ความสามารถ มีศักยภาพที่โดดเด่นพร้อมรับมือกับความท้าทายใหม่ ๆ ในโลกยุคปัจจุบัน

มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัยมีบทบาทต่อความสำเร็จในการพัฒนาทรัพยากรมนุษย์ระดับอุดมศึกษา เนื่องจากเป็นองค์กรขับเคลื่อนยุทธศาสตร์การพัฒนาเทคโนโลยีและส่งเสริมการสร้างนวัตกรรม (Technology Development and Innovation) ซึ่งมหาวิทยาลัยได้กำหนดแผนยุทธศาสตร์การพัฒนามหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย ระยะปานกลาง 5 ปี (พ.ศ. 2566 - 2570) จัดทำขึ้นเป็นกลไกในการขับเคลื่อนแผนยุทธศาสตร์ในระดับชาติ ภายใต้วิสัยทัศน์ในระยะที่สอง มหาวิทยาลัยแห่ง “โอกาส” เพื่อการพัฒนาประเทศให้มั่นคงที่มีความมุ่งมั่นในการสร้างผู้ประกอบการฐานนักปฏิบัติด้านเทคโนโลยีและนวัตกรรม รวมทั้งเพิ่มขีดความสามารถในการแข่งขันของประเทศโดยกำหนดบทบาทหน้าที่ด้านการผลิตกำลังคนที่เฉพาะทางที่มีคุณภาพตอบสนองอุตสาหกรรมเป้าหมาย ทั้งนี้ เพื่อให้เกิดกลไกที่มีประสิทธิภาพในการผลิตบัณฑิตให้มีความรู้และทักษะปฏิบัติด้านการจัดการธุรกิจโดยใช้เทคโนโลยีและนวัตกรรม เพื่อพัฒนาธุรกิจและสังคมอย่างยั่งยืนควบคู่กับความมีคุณธรรมและจริยธรรม หลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการจึงได้ปรับปรุงหลักสูตร เพื่อผลิตบัณฑิตให้สามารถปฏิบัติงานตรงตามความต้องการของหน่วยงานทั้งภาครัฐ ภาคเอกชน เพื่อตอบสนองทิศทางในการพัฒนาทุนมนุษย์ของประเทศเพื่อเพิ่มขีดความสามารถในการแข่งขันให้สูงขึ้น และตามประกาศกฎกระทรวง เรื่อง มาตรฐานหลักสูตรการศึกษาระดับอุดมศึกษา พ.ศ. 2565 ซึ่งเป็นกรอบมาตรฐานให้สถาบันอุดมศึกษาใช้เป็นแนวทางในการพัฒนาปรับปรุงหลักสูตร การจัดการเรียนการสอนพัฒนาคุณภาพการจัดการศึกษา การรับรองมาตรฐานคุณวุฒิในระดับอุดมศึกษาเพื่อให้การศึกษามุ่งสู่เป้าหมายในการผลิตบัณฑิตได้อย่างมี

คุณภาพเป็นไปตามความต้องการและความคาดหวังของผู้ใช้บัณฑิต

นอกจากนี้ตามประกาศ เรื่อง เกณฑ์มาตรฐานหลักสูตรระดับปริญญาตรี/โท/เอก พ.ศ. 2565 และเรื่อง รายละเอียดผลลัพธ์การเรียนรู้ตามมาตรฐานคุณวุฒิระดับอุดมศึกษา พ.ศ. 2565 ซึ่งออกโดยคณะกรรมการมาตรฐานการอุดมศึกษาได้มีผลบังคับให้หน่วยงานที่มีหน้าที่จัดการศึกษาจะต้องดำเนินการจัดทำหลักสูตรที่มุ่งเน้นผลลัพธ์การเรียนรู้ในแนวทาง Outcome Based Education (OBE) โดยมีการปรับเปลี่ยนในส่วนของผลลัพธ์การเรียนรู้ตามกรอบมาตรฐานคุณวุฒิระดับอุดมศึกษาแห่งชาติ พ.ศ. 2552 Thai Qualifications Framework for Higher Education (TQF: HEd) แต่ละระดับต้องสอดคล้องกับอัตลักษณ์ของหลักสูตร สถาบันอุดมศึกษา วิชาชีพ ประเทศชาติ และบริบทโลก ประกอบด้วยอย่างน้อย 4 ด้าน ได้แก่ 1) ความรู้ (Knowledge) 2) ทักษะ (Skills) 3) จริยธรรม (Ethics) 4) ลักษณะบุคคล (Character) ซึ่งมหาวิทยาลัยมีพันธกิจในการผลิตบัณฑิตให้ได้ผลลัพธ์การเรียนรู้ที่กำหนดในหลักสูตรเพื่อให้เป็นไปตามมาตรฐานการอุดมศึกษา

ทั้งนี้ หลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการได้นำหลักเกณฑ์ที่เน้นผลการเรียนรู้ที่คาดหวัง (Expected Learning Outcome: ELO) ที่พัฒนาขึ้นจากความจำเป็นต่าง ๆ ของกลุ่มผู้มีส่วนได้เสียของหลักสูตร ได้แก่ สถานประกอบการหรือผู้ใช้บัณฑิต มหาวิทยาลัย คณาจารย์ ศิษย์เก่า นักศึกษาปัจจุบัน ผู้สนใจศึกษาต่อ และชุมชน เป็นต้น มากำหนดวัตถุประสงค์ของหลักสูตรและผลลัพธ์การเรียนรู้ระดับหลักสูตร (Program Learning Outcomes: PLOs) เพื่อนำไปกระจายความรับผิดชอบในการเรียนการสอนรายวิชาต่าง ๆ โดยการกำหนดผลลัพธ์การเรียนรู้ระดับรายวิชา (Course Learning Outcomes: CLOs) ต่อไป

หลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ มุ่งเน้นการพัฒนาบัณฑิตให้มีความรอบรู้และความสามารถด้านการบริหารธุรกิจ รวมถึงความรู้เฉพาะด้านการจัดการ ดังนั้นคณะผู้วิจัยจึงสนใจศึกษาความต้องการและความคาดหวังของกลุ่มผู้ใช้บัณฑิตในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย เพื่อเป็นประโยชน์ต่อการพัฒนาและปรับปรุงหลักสูตร ให้ตอบสนองความต้องการของผู้มีส่วนได้เสียกลุ่มต่าง ๆ และมุ่งเน้นให้การพัฒนาบัณฑิตด้านการบริหารธุรกิจมีประสิทธิผล มุ่งหวังผลิตบัณฑิตที่มีคุณลักษณะที่พึงประสงค์สอดคล้องกับสมรรถนะของผู้เรียนตามมาตรฐานคุณวุฒิระดับอุดมศึกษา พ.ศ. 2565

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาความต้องการและความคาดหวังของผู้ใช้บัณฑิต ในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย

แนวคิดและทฤษฎีที่เกี่ยวข้อง

แนวคิดเกี่ยวกับความคาดหวัง

แนวคิดเกี่ยวกับความคาดหวังเป็นเรื่องที่ศึกษา และสำรวจอย่างกว้างขวางในวงการวิจัยทางจิตวิทยาและสังคมศาสตร์ ความคาดหวังมีความสำคัญต่อการปรับตัวการดำเนินชีวิต และคุณภาพชีวิตของผู้มีส่วนได้เสีย ซึ่ง Snyder (1994) ได้นิยามคำว่า “ความคาดหวัง” ว่าเป็นความมุ่งมั่นในการทำให้เกิดเป็นจริง เป็นการกำหนดเป้าหมายและวางแผนการกระทำเพื่อให้เกิดผลลัพธ์ตามที่คาดหวัง ซึ่งประกอบด้วย 1) การตั้งเป้าหมายที่เป็นไปได้ 2) การพยายามในการบรรลุเป้าหมาย และ 3) การมองโลกในแง่ดี ซึ่งความ

คาดหวังส่งผลต่อการปรับตัวในสถานการณ์ที่ท้าทายสอดคล้องกับแนวคิดของ Bandura (1977) ได้กล่าวถึงความสำคัญของความคาดหวังที่ช่วยให้บุคคลสามารถเผชิญกับความท้าทาย และสามารถปรับตัวต่อสถานการณ์ได้อย่างเหมาะสม ทั้งนี้การพัฒนาความคาดหวังมีความสำคัญต่อองค์กรในการพัฒนาขีดความสามารถในการก้าวข้ามอุปสรรคและปรับตัวต่อสถานการณ์ที่ซับซ้อนได้อย่างมีประสิทธิภาพ

แนวคิดเกี่ยวกับการพัฒนาหลักสูตรบนพื้นฐานผลลัพธ์การเรียนรู้

แนวคิดเกี่ยวกับการพัฒนาหลักสูตรบนพื้นฐานผลลัพธ์การเรียนรู้ (Outcome Based Education: OBE) เป็นการออกแบบหลักสูตรที่เน้นผลสัมฤทธิ์กับผู้เรียน ซึ่งผู้เรียนจะต้องพัฒนาความรู้ ทักษะ และคุณลักษณะที่จำเป็นต่อการนำไปใช้ในสถานการณ์จริงในอนาคต ทั้งนี้ผลสัมฤทธิ์ทางการศึกษาที่จะเกิดขึ้นกับผู้เรียนมาจากกระบวนการดังต่อไปนี้ (Fink, 2013) ได้แก่

1. การกำหนดผลลัพธ์การเรียนรู้ (Learning Outcomes): การกำหนดผลลัพธ์การเรียนรู้ที่ชัดเจนและเน้นไปที่ความรู้ ทักษะ และทัศนคติที่ต้องการให้ผู้เรียนพัฒนาขึ้นจากการศึกษา โดยผลลัพธ์นี้ควรสามารถวัดและประเมินได้อย่างชัดเจน

2. การออกแบบกระบวนการเรียนรู้ (Learning Activities): การออกแบบกิจกรรมการเรียนรู้ที่สอดคล้องกับผลลัพธ์การเรียนรู้ และสามารถสนับสนุนให้ผู้เรียนพัฒนาความรู้และทักษะตามที่กำหนดไว้

3. การใช้เทคโนโลยีและสื่อการเรียนรู้ (Technology and Learning Resources): การใช้เทคโนโลยีและสื่อการเรียนรู้เพื่อสนับสนุนกระบวนการเรียนรู้ให้มีประสิทธิภาพและเพิ่มประสิทธิภาพในการส่งเสริมการเรียนรู้

4. การวัดและประเมิน (Assessment and Evaluation): การกำหนดวิธีการวัดและประเมินผลลัพธ์การเรียนรู้เพื่อให้ทราบถึงความสำเร็จในการทำความเข้าใจและการพัฒนาของผู้เรียน

5. การปรับปรุง (Continuous Improvement): การทบทวนและปรับปรุงหลักสูตรอย่างต่อเนื่องเพื่อให้สอดคล้องกับความเปลี่ยนแปลงของความต้องการในการศึกษาและสังคม

แนวคิดข้างต้นสอดคล้องกับหลักการตรวจสอบและรับรองมาตรฐานการอุดมศึกษาในหลักสูตรการศึกษาพิจารณาตามหลักการพื้นฐาน 5 ประการ (คณะกรรมการมาตรฐานการอุดมศึกษา, 2565) ดังต่อไปนี้

1. การมุ่งเน้นผู้เรียนและผู้มีส่วนได้เสีย (Customer and Stakeholder Focus) การดำเนินการที่มุ่งเน้นการตอบสนองต่อความต้องการและความคาดหวังทั้งในปัจจุบันและอนาคตของผู้เรียนและผู้มีส่วนได้เสีย และพยายามดำเนินการให้ได้เหนือความคาดหวัง (Beyond Expectation)

2. การดำเนินงานเชิงกระบวนการ (Process Approach) การดำเนินการที่มีประสิทธิผลอย่างมีประสิทธิภาพเพื่อให้บรรลุผลสัมฤทธิ์ที่ต้องการ โดยมีการถ่ายทอดให้เกิดความเข้าใจกระบวนการและจัดการกระบวนการต่าง ๆ ให้มีความสัมพันธ์ระหว่างกัน

3. การตัดสินใจบนหลักฐานเชิงประจักษ์ (Evidence-based Decision Making) การดำเนินการบนพื้นฐานของการวิเคราะห์และประมวลผลข้อมูลที่แสดงถึงหลักฐานเชิงประจักษ์ ซึ่งต้องแสดงให้เห็นถึงผลลัพธ์การเรียนรู้ (Learning Outcomes) ของผู้เรียนตามที่หลักสูตรการศึกษาได้ออกแบบไว้ และตามที่มาตรฐานคุณวุฒิระดับอุดมศึกษา พ.ศ. 2565 กำหนดให้ผู้สำเร็จการศึกษาต้องมีผลลัพธ์การเรียนรู้อย่างน้อย 4 ด้าน ได้แก่ ด้านความรู้ ด้านทักษะ ด้านจริยธรรม และด้านลักษณะบุคคล

4. การปรับปรุงและพัฒนาคุณภาพอย่างต่อเนื่อง (Continuous Improvement) การดำเนินงานภายใต้หลักการของการปรับปรุงและพัฒนาคุณภาพอย่างต่อเนื่องเพื่อการรักษาไว้ซึ่งความพึงพอใจและ

ความมั่นใจของผู้เรียนและผู้มีส่วนได้เสียทั้งในปัจจุบันและอนาคต ซึ่งอาจมีการเปลี่ยนแปลงตลอดเวลาและรวดเร็ว และทำให้เหนือความคาดหวัง (Beyond Expectation)

5. การมุ่งเน้นผลลัพธ์การเรียนรู้ (Learning Outcomes Focus) การดำเนินงานให้เกิดผลลัพธ์การเรียนรู้ โดยกำหนดเป้าหมายเป็นผลลัพธ์การเรียนรู้ที่คาดหวัง การออกแบบกระบวนการและการติดตามประเมินผลที่สอดคล้องกับผลลัพธ์

ทั้งนี้ การมุ่งเน้นผู้เรียนและผู้มีส่วนได้เสียนั้น การออกแบบหลักสูตรการศึกษาที่ดีต้องกำหนดผลลัพธ์การเรียนรู้ของบัณฑิตที่ตอบสนองความต้องการ และสร้างความพึงพอใจให้กับผู้เรียนและผู้มีส่วนได้เสีย ซึ่งเกณฑ์การตัดสินการตรวจสอบและรับรองมาตรฐานการอุดมศึกษาในหลักสูตรการศึกษาได้กำหนดประเด็นการพิจารณาโครงสร้างหลักสูตรการศึกษาและรายวิชาที่มาจากการสะท้อนของผู้มีส่วนได้เสียไว้อีกด้วย

แนวคิดเกี่ยวกับการวิเคราะห์ความต้องการของผู้มีส่วนได้เสีย

แนวคิดเกี่ยวกับการวิเคราะห์ความต้องการของผู้มีส่วนได้เสีย (Stakeholders' Need Analysis) เป็นการกำหนดผู้มีส่วนได้เสียและวิธีการได้มา ซึ่งผลลัพธ์การเรียนรู้ที่สะท้อนความต้องการและความคาดหวัง และเป้าหมายการพัฒนาผู้เรียนทั้งระยะสั้นและระยะยาว นอกจากนี้แล้วยังเป็นกระบวนการสำคัญในการพัฒนาหลักสูตร เพื่อให้แน่ใจว่าหลักสูตรเป็นที่ต้องการของผู้มีส่วนได้เสีย รองรับการเติบโตของภาคอุตสาหกรรมที่เกี่ยวข้องทั้งในปัจจุบันและอนาคต ซึ่งขั้นตอนในการวิเคราะห์ความต้องการของผู้มีส่วนได้เสียของหลักสูตร มีดังต่อไปนี้ (คณะมนุษยศาสตร์และสังคมศาสตร์ มหาวิทยาลัยราชภัฏเพชรบูรณ์, 2566)

1. กำหนดผู้มีส่วนได้เสียที่ชัดเจนโดยควรเลือกกลุ่มที่มีความสำคัญจริง ๆ ต่อหลักสูตร

2. จัดกลุ่มประเภทของผู้มีส่วนได้เสียโดยพิจารณาจากระดับอิทธิพล (Power) ของผู้มีส่วนได้เสียที่มีต่อการพิจารณาปรับปรุงหลักสูตรและผลกระทบ (Impact) จากการปรับปรุงหลักสูตร

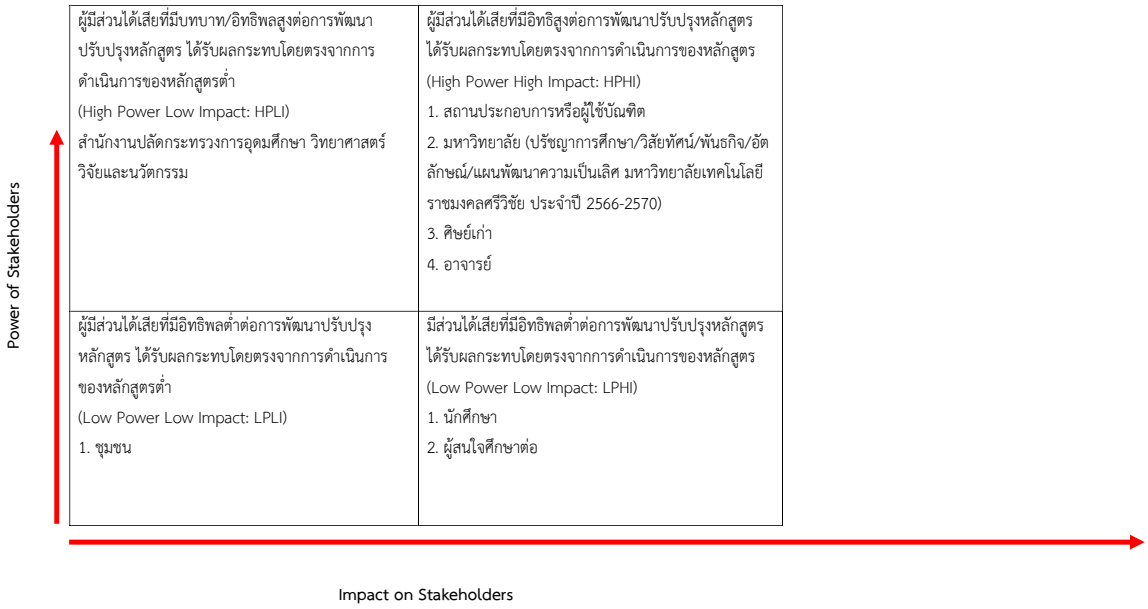
3. วิเคราะห์บทบาทและระดับที่ผู้มีส่วนได้เสียแต่ละกลุ่มควรเข้ามามีส่วนร่วมในการปรับปรุงหลักสูตร

4. เลือกเครื่องมือที่สอดคล้องกับลักษณะการเข้ามามีส่วนร่วมของแต่ละกลุ่มเพื่อให้ได้มาซึ่งข้อมูลที่จำเป็นและสำคัญ (Needs)

5. พิจารณาความต้องการที่เหมาะสมและสอดคล้องกับระดับของหลักสูตร

วิธีดำเนินการวิจัย

การศึกษาครั้งนี้ ใช้แนวทางการวิจัยเชิงคุณภาพ (Qualitative Research) โดยการสนทนากลุ่ม (Focus Group Discussion) สำหรับกลุ่มอาสาสมัครในการวิจัย (Participants) คือ ผู้ใช้บัณฑิตของหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย ซึ่งเป็นผู้มีส่วนได้เสียที่มีอิทธิพลสูงต่อการพัฒนาปรับปรุงหลักสูตรได้รับผลกระทบโดยตรงจากการดำเนินการของหลักสูตร (High Power High Impact) ซึ่งวิธีนี้สอดคล้องกับลักษณะการเข้ามามีส่วนร่วมของผู้มีส่วนได้เสียกลุ่มดังกล่าว ที่สามารถให้ความคิดเห็นและทัศนะด้านต่าง ๆ รวมถึงการแลกเปลี่ยนประสบการณ์ระหว่างกัน ทำให้ได้มาซึ่งข้อมูลที่จำเป็นและสำคัญ (Needs) เกี่ยวกับประเด็นการวิจัย



ภาพที่ 1 การกำหนดและวิเคราะห์กลุ่มผู้มีส่วนได้เสีย

สำหรับกระบวนการคัดเลือกกลุ่มอาสาสมัครในการวิจัยใช้วิธีการสุ่มตัวอย่างแบบโควต้า (Quota Sampling) กล่าวคือ คณะผู้วิจัยได้กำหนดคุณลักษณะและสัดส่วนของผู้ใช้บัณฑิต โดยแบ่งออกเป็นผู้ใช้บัณฑิตจากหน่วยงานเอกชน จำนวน 3 คน หน่วยงานราชการ จำนวน 3 คน และหน่วยงานรัฐวิสาหกิจ จำนวน 3 คน ซึ่งกลุ่มอาสาสมัครทั้งหมดดังกล่าวเป็นผู้มีบทบาท หน้าที่ หรืออยู่ในตำแหน่งที่เกี่ยวข้องกับการกำหนดคุณสมบัติเฉพาะตำแหน่งงาน (Job Specification) ในการสรรหาและคัดเลือกบุคลากรของหน่วยงาน และสามารถแสดงทรรศนะถึงความคาดหวังต่อการพัฒนาความรู้ ทักษะ และคุณลักษณะที่จำเป็นให้กับบัณฑิตของหลักสูตรบริหารธุรกิจบัณฑิต ทั้งนี้ข้อมูลที่ได้รับจากกลุ่มอาสาสมัครจะถูกนำมาประมวลผลและสังเคราะห์เพื่อนำมาสร้างข้อสรุปที่เกี่ยวข้องกับประเด็นที่ศึกษาต่อไป

ผลการศึกษา

จากการสนทนากลุ่มอาสาสมัครในการวิจัย สามารถรวบรวมข้อมูลที่ผู้ใช้บัณฑิตได้แสดงทัศนะถึงความคาดหวังต่อการพัฒนาความรู้ ทักษะ และคุณลักษณะที่จำเป็นให้กับบัณฑิตของหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย สรุปได้ดังต่อไปนี้

ตารางที่ 1 แสดงความต้องการและความคาดหวังของผู้มีส่วนได้เสีย

ความต้องการและความคาดหวังต่อการพัฒนาความรู้ ทักษะ และคุณลักษณะที่จำเป็นให้กับบัณฑิตของหลักสูตรบริหารธุรกิจบัณฑิต	**สรุปประเด็นความต้องการและความคาดหวัง**
ผู้ใช้บัณฑิตจากหน่วยงานเอกชนมีความต้องการให้หลักสูตรฯ ผลิตบัณฑิตที่สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมี - ความรู้ความเข้าใจเกี่ยวกับการจัดการเปลี่ยนแปลงกระบวนการคิดเชิงออกแบบ การสร้างคอนเทนต์ทางธุรกิจ การบริหารจัดการโครงการ และการสื่อสารที่เกี่ยวข้องกับงานธุรกิจ - ความรู้ความเข้าใจเกี่ยวกับกฎหมายธุรกิจและหลักการทางภาษีอากร - ความรู้เกี่ยวกับการจัดตั้งธุรกิจรูปแบบขนาดเล็กและขนาดกลาง รวมถึงธุรกิจสตาร์ทอัพ - ความสามารถในการคิดวิเคราะห์ สามารถมองภาพองค์รวมขององค์กรได้ และการจัดลำดับความสำคัญในการทำงาน - ความสามารถในการสื่อสารภาษาอังกฤษเชิงธุรกิจ - ความสามารถในการใช้เทคโนโลยีสารสนเทศ เทคโนโลยีเกี่ยวกับการจัดทำฐานข้อมูล โปรแกรมสำเร็จรูปทางธุรกิจ - ความสามารถในการประยุกต์ใช้เทคโนโลยีปัญญา ประดิษฐ์ - ความสามารถในการประสานงาน และส่งเสริมการสร้างความสัมพันธ์ที่ดีในการทำงานข้ามวัฒนธรรม/ช่วงอายุ - เป็นผู้ที่มีความรับผิดชอบ มีระเบียบวินัย ทำงานอย่างชาญฉลาด มีความคิดสร้างสรรค์ ควบคุมตนเองได้ มีความยืดหยุ่นผ่อนปรน มีจิตสำนึกการบริการที่ดี เป็นผู้มีความเชื่อมั่นในคุณค่าความสามารถของตนเอง แก้ปัญหาได้มีความอดทน มีความเป็นผู้นำ และทำงานเป็นทีมได้	ผู้ใช้บัณฑิตจากหน่วยงานเอกชนมีความต้องการให้หลักสูตรฯ พัฒนาความรู้และทักษะด้านการพัฒนาธุรกิจ การสื่อสารทางธุรกิจ การประยุกต์ใช้เครื่องมือทางการจัดการ การประยุกต์ใช้เทคโนโลยีสารสนเทศ การวางแผนทางธุรกิจการออกแบบกระบวนการทำงาน ทักษะการคิดแบบผู้ประกอบ การทำงานเป็นทีม และคุณลักษณะที่จำเป็น ได้แก่ ความคิดสร้างสรรค์ ภาวะผู้นำ

ตารางที่ 1 (ต่อ)

ความต้องการและความคาดหวังต่อการพัฒนาความรู้ ทักษะ และคุณลักษณะที่จำเป็นให้กับบัณฑิตของหลักสูตรบริหารธุรกิจบัณฑิต	สรุปประเด็นความต้องการและความคาดหวัง
ผู้ใช้บัณฑิตจากหน่วยงานราชการมีความต้องการให้หลักสูตรฯ ผลิตบัณฑิตที่สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมี - ความรู้ความเข้าใจเกี่ยวกับการปฏิบัติงานด้านการจัดการเฉพาะตำแหน่ง - ความสามารถในการใช้โปรแกรมสำนักงานขั้นสูง และเทคโนโลยีสารสนเทศ - ความสามารถในการเลือกใช้วิธีการสื่อสารที่เหมาะสม และสามารถประสานงานได้อย่างมีประสิทธิภาพ - เป็นผู้มีมีจรรยาบรรณในงานอาชีพ	ผู้ใช้บัณฑิตจากหน่วยงานราชการมีความต้องการให้หลักสูตรฯ พัฒนาความรู้และทักษะด้านการปฏิบัติงานด้านการจัดการเฉพาะตำแหน่ง การใช้เทคโนโลยีสารสนเทศ การสื่อสารและประสานงาน รวมถึงการมีจรรยาบรรณในงานอาชีพ
ผู้ใช้บัณฑิตจากหน่วยงานรัฐวิสาหกิจมีความต้องการให้หลักสูตรฯ ผลิตบัณฑิตที่สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมี - ความสามารถในการใช้โปรแกรมสำเร็จรูป - ความสามารถในการผลิตและออกแบบสื่อดิจิทัล - ความสามารถในการสื่อสารและการนำเสนอ - ความสามารถในการบริหารโครงการ - ความสามารถในการใช้เครื่องมือเกี่ยวกับกระบวนการคิดเชิงออกแบบ - ความสามารถในการจัดลำดับความสำคัญของงาน - ความสามารถในการคิดเชิงวิพากษ์ - ความสามารถในการค้นหาข้อมูล การคิดวิเคราะห์ และการสังเคราะห์ข้อมูล - ความสามารถในการการทำงานเป็นทีม - ความสามารถในการทำงานร่วมกันกับบุคคลต่างช่วงวัยและแตกต่างวัฒนธรรม - เป็นผู้ที่เชื่อมั่นในคุณค่าความสามารถของตนเอง - เป็นผู้ที่มีความรับผิดชอบต่อตนเอง สังคมและสิ่งแวดล้อม	ผู้ใช้บัณฑิตจากหน่วยงานรัฐวิสาหกิจมีความต้องการให้หลักสูตรฯ พัฒนาความรู้และทักษะด้านการใช้โปรแกรมสำเร็จรูป การผลิตและออกแบบสื่อดิจิทัล การสื่อสารและการนำเสนอ การบริหารโครงการ การคิดวิเคราะห์ การทำงานร่วมกับผู้อื่น เชื่อมั่นในคุณค่าความสามารถของตนเอง และเป็นผู้มีความรับผิดชอบต่อตนเอง สังคมและสิ่งแวดล้อม

จากการสังเคราะห์ความต้องการและความคาดหวังของผู้ใช้บัณฑิตในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย พบว่า ผู้ใช้บัณฑิตต้องการให้หลักสูตรพัฒนารูปแบบการจัดการเรียนการสอนที่ส่งเสริมคุณลักษณะของบัณฑิต ดังประเด็นต่อไปนี้

1. ด้านความรู้ (Knowledge)

1.1 สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมีความรู้ ความเข้าใจเกี่ยวกับการจัดการเปลี่ยนแปลงกระบวนการคิดเชิงออกแบบ การสร้างคอนเทนต์ทางธุรกิจ การเขียนแผนงาน/โครงการและการบริหารจัดการโครงการ การสื่อสารที่เกี่ยวข้องกับงานธุรกิจ

1.2 สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมีความรู้ ความเข้าใจเกี่ยวกับกฎหมายธุรกิจ ที่ทันสมัย และหลักการทางภาษีอากร

1.3 สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมีความรู้ ความเข้าใจเกี่ยวกับการจัดตั้งธุรกิจรูปแบบขนาดเล็กและขนาดกลาง รวมถึงธุรกิจสตาร์ทอัพ

1.4 สามารถปฏิบัติงานประจำขั้นพื้นฐานได้โดยมีความรู้ ความเข้าใจเกี่ยวกับการออกแบบสถาปัตยกรรมองค์กรด้านเทคโนโลยีสารสนเทศได้

2. ด้านทักษะ (Skills)

2.1 สามารถปฏิบัติงานประจำขั้นพื้นฐานโดยใช้ทักษะการคิดวิเคราะห์ในการมองภาพองค์รวมขององค์กรได้ และการจัดลำดับความสำคัญในการทำงานได้

2.2 สามารถปฏิบัติงานประจำขั้นพื้นฐานโดยใช้ทักษะในการสื่อสาร สามารถนำเสนอและสื่อสารทางธุรกิจได้ การประยุกต์ใช้ปัญญาประดิษฐ์ในงานธุรกิจ รวมถึงสามารถใช้เทคโนโลยีออกแบบกราฟิกการตลาดและการโฆษณา

2.3 สามารถปฏิบัติงานประจำขั้นพื้นฐาน โดยใช้เทคโนโลยีเกี่ยวกับการจัดทำฐานข้อมูลสามารถใช้โปรแกรมสำเร็จรูปในการบริหารจัดการทรัพยากรองค์กรธุรกิจได้ รวมถึงการออกแบบกราฟิกการตลาดและการโฆษณา

3. ด้านจริยธรรม (Ethics)

3.1 สามารถปฏิบัติงานประจำขั้นพื้นฐานด้วยจรรยาบรรณในงานอาชีพ

4. ด้านลักษณะบุคคล (Character)

4.1 สามารถปฏิบัติงานประจำขั้นพื้นฐานด้วยความสัมพันธ์ที่ดีในการทำงานข้ามวัฒนธรรมช่วงอายุ มีจิตสำนึกการบริการที่ดี มีความยืดหยุ่นผ่อนปรน สามารถจัดการความขัดแย้งในองค์การได้

4.2 สามารถปฏิบัติงานประจำขั้นพื้นฐานด้วยความรับผิดชอบ มีระเบียบวินัย มีความอดทน

4.3 สามารถปฏิบัติงานประจำขั้นพื้นฐานด้วยความคิดสร้างสรรค์ ทำงานอย่างชาญฉลาด

4.4 เป็นผู้มีความเชื่อมั่นในคุณค่าความสามารถของตนเอง มีความเป็นผู้นำและทำงานเป็นทีมได้

สรุปและอภิปรายผล

จากผลการศึกษาที่พบว่า ผู้ใช้บัณฑิตมีความคาดหวังต่อการพัฒนาคุณลักษณะที่จำเป็นให้กับบัณฑิตของหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย สรุปได้ออกเป็น 4 ด้าน ได้แก่ ความรู้ (Knowledge) ทักษะ (Skills) จริยธรรม (Ethics) และลักษณะบุคคล (Character) ซึ่งมาจากกระบวนการสำคัญในการพัฒนาหลักสูตรที่กำหนดให้มีการ

วิเคราะห์ความต้องการของผู้มีส่วนได้เสีย (Stakeholders' Need Analysis) เป็นการกำหนดผู้มีส่วนได้เสียเพื่อสะท้อนความต้องการและความคาดหวัง และเป้าหมายการพัฒนาผู้เรียน สอดคล้องกับหลักการตรวจสอบและรับรองมาตรฐานการอุดมศึกษาในหลักสูตรการศึกษาพิจารณาตามหลักการพื้นฐาน 5 ประการ (คณะกรรมการมาตรฐานการอุดมศึกษา, 2565) ที่มุ่งเน้นผู้มีส่วนได้เสีย (Stakeholder focus) และการตัดสินใจบนหลักฐานเชิงประจักษ์ (Evidence-based decision making) ซึ่งแสดงให้เห็นถึงผลลัพธ์การเรียนรู้ (Learning outcomes) ตามมาตรฐานคุณวุฒิระดับอุดมศึกษา พ.ศ. 2565

การศึกษาครั้งนี้ สอดคล้องกับแนวคิดเกี่ยวกับการพัฒนาหลักสูตรบนพื้นฐานผลลัพธ์การเรียนรู้ (Outcome Based Education: OBE) เป็นการออกแบบหลักสูตรที่เน้นผลสัมฤทธิ์กับผู้เรียน ซึ่งผู้เรียนจะต้องพัฒนาความรู้ ทักษะ และคุณลักษณะที่จำเป็นตามความต้องการและความคาดหวังของผู้มีส่วนได้เสีย ซึ่งผลการศึกษาความต้องการและความคาดหวังของผู้ใช้บัณฑิตของหลักสูตร บริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัย สามารถสรุปประเด็นที่เกี่ยวข้องกับการพัฒนาปรับปรุงหลักสูตรเพื่อให้สามารถผลิตบัณฑิตที่มีลักษณะที่คาดหวัง ดังต่อไปนี้

1. เป็นผู้แสดงออกถึงทัศนคติที่ดีต่องานอาชีพ ซื่อสัตย์สุจริต มีสำนึกในจรรยาบรรณในงานอาชีพตระหนักและคำนึงถึงภารกิจหน้าที่และความรับผิดชอบต่อตนเองและส่วนรวม
2. เป็นผู้อธิบายหลักการ แนวคิด ทฤษฎี ด้านการบริหารธุรกิจ และองค์ความรู้เฉพาะด้านการจัดการได้อย่างถูกต้อง
3. เป็นผู้รู้และเข้าใจในกระบวนการคิดเชิงออกแบบด้านนวัตกรรม
4. เป็นผู้ประยุกต์ใช้ความรู้และเทคโนโลยีสารสนเทศทางด้านการจัดการในการปฏิบัติงานได้ตามความต้องการของตลาดแรงงาน
5. เป็นผู้บูรณาการการสื่อสารทางธุรกิจได้อย่างเหมาะสม เพื่อการทำงานท่ามกลางพลวัตของสังคมที่เปลี่ยนแปลง

ข้อเสนอแนะ

การศึกษาความต้องการและความคาดหวังของผู้ใช้บัณฑิต ในการพัฒนาหลักสูตรบริหารธุรกิจบัณฑิต สาขาวิชาการจัดการ คณะบริหารธุรกิจ มหาวิทยาลัยเทคโนโลยีราชมงคลศรีวิชัยในครั้งนี้ เป็นผลการวิเคราะห์ความต้องการของกลุ่มผู้มีส่วนได้เสียเพียงกลุ่มหนึ่งเท่านั้น ซึ่งการพัฒนาปรับปรุงหลักสูตรควรวิเคราะห์ข้อมูลจากผู้มีส่วนได้เสียกลุ่มอื่น ๆ ด้วย เช่น มหาวิทยาลัย คณาจารย์ ศิษย์เก่า นักศึกษาปัจจุบัน ผู้สนใจศึกษาต่อ และชุมชน ด้วยวิธีการรวบรวมข้อมูลป้อนกลับที่หลากหลายเหมาะสม เช่น การสำรวจ การสัมภาษณ์ และการศึกษาข้อมูลจากรายงานผลการฝึกงานและสหกิจศึกษาของคณาจารย์นิเทศเพื่อการพัฒนาและปรับปรุงหลักสูตรให้ตอบสนองความต้องการของผู้มีส่วนได้ส่วนเสียกลุ่มต่าง ๆ และสามารถกำหนดสมรรถนะของผู้เรียนตามมาตรฐานคุณวุฒิระดับอุดมศึกษา พ.ศ. 2565 ซึ่งประกอบด้วยความรู้ ทักษะ จริยธรรม และลักษณะบุคคลที่ตรงตามความต้องการของตลาดแรงงาน

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ผลิตภัณฑ์เพื่อสิ่งแวดล้อม การทดสอบการยอมรับผู้บริโภคต่อการพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์สครับจากกากชาเขียว

Adding Value to Green Tea Residue Products

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บทคัดย่อ

งานนี้มีวัตถุประสงค์ 1) เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์สบู่สครับกากชาเขียว 2) เพื่อพัฒนาผลิตภัณฑ์และออกแบบบรรจุภัณฑ์และทดสอบผู้บริโภคต่อการยอมรับผลิตภัณฑ์และบรรจุภัณฑ์ที่พัฒนา วิธีการศึกษาแบ่งเป็น 4 ขั้นตอน คือ 1) สำรวจความต้องการของผู้บริโภคที่มีต่อสบู่กากชาเขียวสครับ 2) พัฒนาผลิตภัณฑ์ และทดสอบการยอมรับจากผู้บริโภค 3) การออกแบบบรรจุภัณฑ์และตราสินค้า และ 4) สำรวจความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์ ผลการศึกษาพบว่า กลุ่มตัวอย่างมีความสนใจต่อสบู่กากชาเขียวสครับ และมีความต้องการผลิตภัณฑ์กากชาเขียวสครับผิวผสมว่านหางจระเข้เพื่อเพิ่มความชุ่มชื้นให้กับผิว ผลการทดสอบการยอมรับของผู้บริโภค มีค่าระดับความชอบเฉลี่ยอยู่ในระดับมาก การออกแบบตราสินค้า ชื่อ แบรนด์ Catechin Art Work font Bahnschrift Condensed ตราสัญลักษณ์ใช้รูปวาดลายเส้นรูปผู้หญิงยิ้ม แสดงถึงความเรียบง่าย มีสุขภาพดี วัสดุที่พัฒนาบรรจุภัณฑ์เป็นกระดาษบรรจุภัณฑ์ที่เบามีความง่ายต่อการขนส่งและการจัดเก็บ ผลการประเมินความพึงพอใจที่มีต่อบรรจุภัณฑ์อยู่ในระดับมาก

คำสำคัญ: การเพิ่มมูลค่า, กากชาเขียวเหลือทิ้ง

Abstract

The objectives of this project are 1) to analyze the demand for green tea scrub soap products. 2) to develop products and design packaging and test consumers' acceptance of the developed products and packaging. The process divided into four steps: a) survey consumer demand for green tea scrub soap. b) develop and test the product, and assess consumer acceptance. c) design packaging and brand identity, and 4) survey satisfaction with packaging design. The study found that the sample group is interested in green tea scrub soap and desires a product for combination skin with added moisturizing

properties from aloe vera extract. Consumer acceptance testing resulted in high levels of satisfaction. The brand name "Catechin" Art work uses the Bahnschrift Condensed font, and the brand symbol features a simple line drawing of a smiling woman, representing simplicity and good health. The packaging material is paper, chosen for its lightweight and easy transport and storage. The consumer satisfaction survey results with the packaging design are high.

Keywords: Adding Value, Green Tea Residue

บทนำ

กากชาเป็นขยะอินทรีย์ที่เกิดขึ้นจากการชงชา ปริมาณกากชาที่ทิ้งในแต่ละวันมีจำนวนมาก กากชาเหล่านี้สร้างปัญหาสิ่งแวดล้อม การจัดการกากชาอย่างเหมาะสมเป็นปัจจัยสำคัญในการลดปัญหาที่เกิดจากการสะสมขยะซึ่งเป็นปัญหาสิ่งแวดล้อม กากชาเขียวก็เป็นหนึ่งในขยะอินทรีย์ที่ย่อยสลายยาก ก่อให้เกิดปัญหาขยะล้นหลาม กากชาเขียวที่ถูกนำไปฝังกลบจะปล่อยก๊าซมีเทน ซึ่งเป็นก๊าซเรือนกระจกที่ส่งผลต่อภาวะโลกร้อนการเผากากชาเขียวจะสร้างมลพิษทางอากาศ การลดปริมาณขยะจากกากชาเขียวเป็นสิ่งสำคัญช่วยลดปัญหาสิ่งแวดล้อมส่งเสริมการใช้ทรัพยากรอย่างยั่งยืน ส่งผลดีต่อสุขภาพ บรรเทาปัญหาการเปลี่ยนแปลงสภาพภูมิอากาศ กากชาเขียวก็เป็นหนึ่งในสาเหตุหลักของปัญหาสิ่งแวดล้อมที่ก่อให้เกิดขยะ ในวงการผู้ผลิตชาเขียวในรูปแบบ Commercial ซึ่งทิ้งกากชาเขียวเป็นจำนวนหลายล้านตันต่อปี ปัจจุบันมีการแก้ปัญหาโลกร้อนจากกากชาเขียวด้วยการนำกากชาเขียวมาแปรรูปเป็นสินค้าต่าง ๆ เพิ่มมากขึ้น เช่น สบู่ ที่กำจัดกลิ่น อุปกรณ์ซ่อมแซมงานไม้ น้ำยาย้อมผ้า ผลิตภัณฑ์เครื่องสำอาง สกินแคร์ เช่น มาส์กหน้า โลชั่น หรือครีมบำรุงผิว พลังงานเชื้อเพลิงกากชาเขียวสามารถนำมาใช้เป็นเชื้อเพลิงในกระบวนการผลิตพลังงานไฟฟ้าหรือพลังงานไฟฟ้าจากไฟถ่าน ซึ่งช่วยลดการใช้พลังงานจากแหล่งพลังงานที่มีอันตรายต่อสิ่งแวดล้อม เป็นต้น

ผู้จัดทำโครงงานได้เห็นประโยชน์จากกากชาเขียวที่ใช้งานแล้วว่าสามารถนำมาพัฒนาเป็นสครับจากกากชาเขียว เพราะผลิตภัณฑ์บำรุงผิวประเภทสครับได้รับความนิยมอย่างมาก คุณสมบัติที่เด่นของสครับเป็นการขจัดเซลล์ผิวที่ตายแล้วรวมถึงสิ่งสกปรกที่ฝังลึกใต้เซลล์ผิวหนังให้หมดไป การขัดผิวยังช่วยกระตุ้นการไหลเวียนของเลือด อีกทั้งสรรพคุณของชาเขียวมีสารต้านอนุมูลอิสระสูง ช่วยให้ผิวชุ่มชื้น ลดรอยแผลเป็นและรอยแตกลาย ปรับสีผิวให้สม่ำเสมอ และปกป้องผิวจากแสงแดด สบู่สครับชาเขียวใช้วัตถุดิบธรรมชาติ ปลอดภัยต่อผิว เหมาะสำหรับผู้ที่มีผิวแพ้ง่าย การนำกากชาเขียวที่เหลือทิ้งจำนวนมากนี้มาเป็นส่วนผสมของสบู่ยังช่วยลดปัญหาสิ่งแวดล้อมเป็นการนำทรัพยากรนี้กลับมาใช้ประโยชน์อีกครั้ง อย่างไรก็ตามในการพัฒนาผลิตภัณฑ์ต้องสำรวจความคิดเห็น (Validate Idea) เหล่านี้กับผู้บริโภคโดยศึกษาความต้องการผลิตภัณฑ์แปรรูปจาก Waste กากชาเขียวในรูปแบบสบู่ Scrub รวมทั้งการศึกษาคะแนนการยอมรับ (Customer Acceptance) ทั้ง สี กลิ่น การล้างออก และความสะอาด

วัตถุประสงค์ของการวิจัย

1) เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์สบู่สครับกากชาเขียว

2) เพื่อพัฒนาผลิตภัณฑ์และออกแบบบรรจุภัณฑ์และทดสอบผู้บริโภคต่อการยอมรับผลิตภัณฑ์และบรรจุภัณฑ์ที่พัฒนา

แนวคิด ทฤษฎีที่เกี่ยวข้อง

แนวคิดการพัฒนาผลิตภัณฑ์จากของเหลือทิ้ง

การพัฒนาผลิตภัณฑ์จากของเหลือทิ้งเป็นแนวคิดที่สำคัญในการลดการใช้ทรัพยากรและลดปัญหาสิ่งแวดล้อม ได้แก่

การใช้ใหม่หรือการรีไซเคิล เป็นการนำของเหลือทิ้งมาใช้ใหม่หรือรีไซเคิลให้เป็นวัตถุดิบในการผลิตผลิตภัณฑ์ใหม่ เช่น การนำของเหลือทิ้งจากอุตสาหกรรมอาหารมาใช้ในการผลิตปุ๋ยหรือการนำพลาสติกที่ใช้แล้วมาทำเป็นวัสดุสำหรับการผลิตอื่น ๆ

การสร้างการเพิ่มมูลค่า เป็นการพัฒนาผลิตภัณฑ์ใหม่โดยใช้ของเหลือทิ้งเป็นวัตถุดิบ สามารถสร้างมูลค่าที่มากขึ้นโดยการเพิ่มคุณค่าให้กับวัตถุดิบที่มีอยู่แล้ว

การเปลี่ยนแปลงพฤติกรรมผู้บริโภค เป็นการสร้างความตระหนักให้กับผู้บริโภคเกี่ยวกับการใช้ของเหลือทิ้งและการสร้างผลิตภัณฑ์ที่มีคุณค่าจากของเหลือทิ้ง เช่น การสร้างแพลตฟอร์มการแลกเปลี่ยนของเหลือทิ้งหรือการใช้เทคโนโลยีการติดตามต้นทางของวัตถุดิบ เพื่อให้ผู้บริโภคเข้าใจถึงแหล่งที่มาของสินค้าและกระบวนการผลิต

สำหรับในโครงงานนี้เป็นการเพิ่มมูลค่ากากชาเขียวเหลือทิ้ง โดยพัฒนาผลิตภัณฑ์สครับจากกากชาเขียว การพัฒนาผลิตภัณฑ์จากของเหลือทิ้งไม่เพียงแต่ช่วยลดปัญหาสิ่งแวดล้อมและการใช้ทรัพยากร แต่ยังสามารถเป็นแรงขับเคลื่อนการพัฒนาทางเศรษฐกิจและสังคม

กากชาเขียวเป็นผลต้นทางอาหารที่เหลือทิ้งจากกระบวนการผลิตชาเขียว คาเทคิน (Catechin) เป็นกลุ่มของสารสารสกัดที่พบอยู่ในชาเขียวและกากชาเขียว ซึ่งมีคุณสมบัติทางสุขภาพที่ดีต่อร่างกาย คาเทชินมีหลายประเภทและมีบทบาททางสุขภาพหลายประการ เช่น Epigallocatechin Gallate (EGCG) เป็นคาเทชินที่มีประสิทธิภาพในการป้องกันความเสียหายจากอนุมูลอิสระ และมีส่วนสำคัญในการช่วยปกป้องเนื้อเยื่อต่าง ๆ ในร่างกายจากอันตรายของอนุมูลอิสระที่สามารถทำให้เกิดความเสียหายกับเซลล์ได้ (Lee, Jang, Kim, Kim, & Seong, 2018)

งานวิจัยที่เกี่ยวข้อง

นุชเนตร ตาเย๊ะ และ วิภาดา มุนินทร์นพมาศ (2562) ศึกษาพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์สำหรับผลิตภัณฑ์ขนมผูกรักกลุ่มอาชีพโรตีกรอบ ตำบลลำพญา อำเภอรามัน จังหวัดยะลา โดยศึกษาความพึงพอใจต่อบรรจุภัณฑ์ดังนี้ (1) ตราสินค้า “ชาววังพญา” มีความโดดเด่น จดจำง่าย (2) บรรจุภัณฑ์มีความสวยงามทันสมัย (3) บรรจุภัณฑ์สามารถนำเสนอข้อมูลครบถ้วน ชัดเจน (4) บรรจุภัณฑ์สามารถบ่งบอกคุณลักษณะที่สำคัญของผลิตภัณฑ์ได้ และ (5) ความพึงพอใจรวมต่อผลิตภัณฑ์ ซึ่งผู้วิจัยได้นำข้อคำถามดังกล่าวมาปรับใช้ในงานครั้งนี้

ระเบียบวิธีวิจัย

การวิจัยเชิงปฏิบัติการ กลุ่มตัวอย่าง 30 คน ให้ข้อมูลเกี่ยวกับความต้องการผลิตภัณฑ์สครับ จากกากชาเขียว และทดสอบการยอมรับจากผู้บริโภคที่มีต่อผลิตภัณฑ์และบรรจุภัณฑ์ ตราสินค้า จำนวน 10 ราย และวิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา (Descriptive Statistics) ได้แก่ ค่าร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

วิธีดำเนินการวิจัย

ขั้นตอนที่ 1	วิเคราะห์ความต้องการสบู่สครับกากชาเขียว
ขั้นตอนที่ 2	พัฒนาสบู่สครับกากชาเขียว และ ทดสอบการยอมรับจากผู้บริโภค
ขั้นตอนที่ 3	ออกแบบบรรจุภัณฑ์ และ ตราสินค้า และ สำรวจความพึงพอใจ ต่อการออกแบบพัฒนาบรรจุภัณฑ์

ผลการวิจัย

1) วิเคราะห์ความต้องการสบู่สครับกากชาเขียว ทำการสำรวจเบื้องต้น (Exploratory Study) จำนวน 30 ราย สัมภาษณ์ตัวต่อตัว พบว่า โดยส่วนใหญ่กลุ่มตัวอย่างมีความสนใจซื้อสบู่สครับชาเขียว คิดเป็น 90% และจากข้อคำถาม ท่านมีความสนใจให้มีสมุนไพรใดอีกบ้างใน สบู่ Scrub กากชาเขียว ผลการสัมภาษณ์พบว่า กลุ่มตัวอย่างให้ความสนใจต่อสมุนไพรว่านหางจระเข้ เพราะว่านหางจระเข้มีสารต้านอนุมูลอิสระช่วยบำรุงผิวให้เนียนนุ่ม ชุ่มชื้น

2) วิจัยและพัฒนาสูตรสบู่สครับกากชาเขียว
จากผลการสำรวจเบื้องต้น นักศึกษาได้มีการพัฒนาสบู่สครับกากชาเขียวผสมว่านหางจระเข้ ตามขั้นตอนดังต่อไปนี้

2.1 วัสดุในการทำ สบู่สครับชาเขียว

1) กลีเซอรีนว่านหางจระเข้ (หัวเชื้อสบู่) 1000 กรัม
2) กากชาเขียว 40 กรัม
3) น้ำชาเขียว 40 มิลลิกรัม
4) น้ำมันหอมระเหยกลิ่นน้ำนมข้าว 15 มิลลิกรัม

ภาพที่ 1 กลีเซอรีน

2.2 อุปกรณ์ที่ใช้

1) หม้อต้มจำนวน 2 ใบ
2) แม่พิมพ์สบู่
3) ไม้คน (ทัพพี)

ภาพที่ 2 สบู่สครับชาเขียว

2.3 ขั้นตอนการทำ สบู่สครับชาเขียว

1) ตั้งกระทะบนไฟอ่อนและใส่น้ำลงไปในกระทะ ตั้งหม้อลงบนน้ำในกระทะ
2) ใส่กลีเซอรีนลงในหม้อให้ละลายเรื่อย ๆ จนละลายทั้งหมด
3) ใส่น้ำชาเขียวและกากชาเขียวลงไปในหม้อ ใช้ไม้คนให้เข้ากันกับกลีเซอรีน
4) ผสมน้ำมันหอมระเหยกลิ่นน้ำนมข้าว
5) ตักใส่แม่พิมพ์ รอให้สบู่แข็งตัว ประมาณ 1 ชั่วโมง
6) นำออกจากแม่พิมพ์

ภาพที่ 3 ทดสอบการยอมรับจากผู้บริโภค

3) ทดสอบการยอมรับจากผู้บริโภคที่มีต่อสบู่กากชาเขียวสครับ

ตารางที่ 1 ผลการทดสอบการยอมรับสบู่กากชาเขียวสครับ

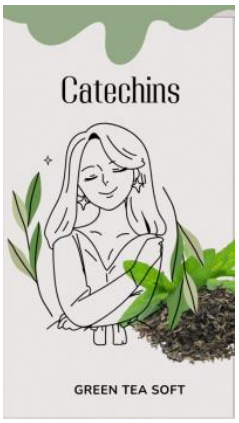
คุณลักษณะ	คะแนนเฉลี่ยการยอมรับ
1) สี	8.60
2) กลิ่น	8.60
3) การล้างออก	8.10
4) ความสะอาด	8.40
5) ความชอบโดยรวม	8.50

คะแนนการยอมรับ สี กลิ่น การล้างออก ความสะอาด อยู่ในระดับชอบมาก เหตุผลที่กลุ่มตัวอย่างสนใจซื้อผลิตภัณฑ์สบู่กากชาเขียวสครับ คือ รู้สึกผ่อนคลายสบายผิว คิดเป็น 40% รองลงมา ผิวนุ่มชุ่มชื้นไม่แห้งตึง คิดเป็น 30% ลดความเสื่อมโทรมของผิวที่ถูกทำลายจากแสงแดด คิดเป็น 20% ลดการอักเสบของผิวหนัง คิดเป็น 10% และให้ความคิดเห็นว่า มีความตั้งใจซื้อสบู่สครับจากกากชาเขียว 100 %

4) การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์

ชื่อแบรนด์ Catechin มีส่วนผสมหลักเป็นกากชาเขียวที่มีปริมาณสารสกัดคาเทชิน การใช้ชื่อ “Catechin” ในชื่อสินค้าที่ชัดเจน เป็นน่าสนใจต่อผู้บริโภคที่รู้จักคุณสมบัติทางสุขภาพของคาเทชิน ซึ่งมีชื่อเสียงเป็นอย่างมากในวงการสุขภาพและความงาม สามารถเป็นส่วนหนึ่งในด้านการตลาด แสดงถึงสินค้าที่มีประสิทธิภาพ ทำให้ผู้บริโภคมีความคุ้นเคย และมีความไว้วางใจต่อคุณค่าของสินค้า ในส่วนของตราสัญลักษณ์ “รูปผู้หญิง” มีความหมายที่บ่งบอกถึง ความสวยงามสดชื่น มีออร่า สำหรับสัญลักษณ์ของสีโลโก้ “ใช้สีเขียว” เป็นสีหลัก ให้ความหมายว่า ความเป็นธรรมชาติ ปลอดภัย ความรู้สึกสบาย สดชื่นตลอดเวลา ลักษณะตัวอักษรที่ใช้ในแบรนด์ อักษร Bahnschrift Condensed

สำหรับการใช้บรรจุภัณฑ์กระดาษ แสดงถึง บรรจุภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อม สามารถย่อยสลายได้ในธรรมชาติ รวมทั้งบรรจุภัณฑ์มีน้ำหนักเบา และมีความง่ายต่อการขนส่งและการจัดเก็บ



ภาพที่ 3 ทดสอบการยอมรับจากผู้บริโภค

5) ผลการศึกษาความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์

ตารางที่ 2 ค่าเฉลี่ยความพึงพอใจองค์ประกอบบรรจุภัณฑ์

องค์ประกอบบรรจุภัณฑ์	ค่าเฉลี่ยความพึงพอใจ	การแปลผล
1. ด้านการออกแบบกราฟฟิกบนบรรจุภัณฑ์		
1.1 สื่อจุดเด่นเอกลักษณ์สินค้า	4.10	มาก
1.2 การออกแบบโลโก้ ตราสินค้า	4.20	มาก
1.3 รูปแบบตัวอักษร	4.10	มาก
1.4 รูปภาพลวดลาย สีสัน ที่ ตกแต่ง	4.10	มาก
2. ด้านรูปแบบบรรจุภัณฑ์		
2.1 รูปร่าง รูปทรง	4.50	มากที่สุด
2.2 วัสดุที่ใช้	4.40	มากที่สุด
2.3 ขนาด	4.60	มากที่สุด
2.4 ข้อมูลแสดงรายละเอียดบนบรรจุภัณฑ์	4.20	มาก
3. ด้านความเหมาะสมใน การบรรจุ การขนส่ง		
3.1 ความสะดวกในการพกพา จัดเก็บและวางจำหน่าย	4.60	มากที่สุด
3.2 ความสะดวกในการขนส่ง	4.40	มากที่สุด

สรุปและอภิปรายผล

ในปัจจุบันปัญหาสิ่งแวดล้อมกลายเป็นประเด็นสำคัญที่ทั่วโลกให้ความสนใจ การพัฒนาผลิตภัณฑ์จากวัสดุเหลือใช้ หรือ Waste เป็นแนวทางหนึ่งในการลดปริมาณขยะและส่งเสริมเศรษฐกิจหมุนเวียน “การพัฒนาสูตรสครับจากกากชาเขียว”

ผลการวิจัย 1) กลุ่มตัวอย่างส่วนใหญ่ มีความสนใจซื้อสบู่สครับชาเขียว คิดเป็น 90 % เนื่องจากกระแสความงาม ผู้บริโภคมีความสนใจในการดูแลผิวมากขึ้น ผิวที่ดีเป็นอีกหนึ่งปัจจัยที่ทำให้ผู้หญิงดูสวย ดังนั้นจึงมีคนมากมายให้ความสำคัญกับการบำรุงผิว (ลลิดา เกษมวงศ์, 2563) และในการพัฒนาสบู่กากชาเขียวสครับ กลุ่มตัวอย่างส่วนใหญ่แสดงความคิดเห็นเพิ่มเติม คือ ต้องการให้มีส่วนผสมของว่านหางจระเข้เพิ่มเติม ซึ่งเป็นไอเดียที่น่าสนใจ เนื่องจากทั้งกากชาเขียวและว่านหางจระเข้ มีคุณสมบัติในการบำรุงความชุ่มชื้น ลดการอักเสบของผิว ลดริ้วรอย ซึ่งเป็นปัญหาที่พบได้ในผิวที่เสื่อมสภาพ มีสารต้านอนุมูลอิสระที่ช่วยปกป้องผิวจากอันตรายของอนุมูลอิสระและการเสื่อมสภาพของผิว (Saleem, Naeem,

Murad, Maqsood, & Tasleem, 2022) 2) การทดสอบผลิตภัณฑ์สครับผิวกาย ด้าน สี กลิ่น การล้างออก ความสะอาด พบว่า กลุ่มตัวอย่างมีความชอบอยู่ในระดับมาก 3) การประเมินความพึงพอใจต่อบรรจุภัณฑ์และกราฟฟิกองค์ประกอบบรรจุภัณฑ์ ได้แก่ ด้านการออกแบบกราฟฟิกบนบรรจุภัณฑ์ ด้านรูปแบบบรรจุภัณฑ์ ด้านความเหมาะสมในการบรรจุ การขนส่ง พบว่า มีค่าเฉลี่ยอยู่ในระดับมาก ตราสินค้า Catechin font Bahnschrift Condensed Art work ใช้โทนสีเขียวเป็นสีหลัก ให้ความหมายว่า ความเป็นธรรมชาติ ปลอดภัย ความรู้สึกสบาย สดชื่น สีเขียวนิยมใช้เป็นสื่อสำหรับสินค้าปลอดสารเคมี หรือการอนุรักษ์สิ่งแวดล้อม (ฑิตยา ตันเจริญ, 2561)

การใช้โทนสีในบรรจุภัณฑ์เป็นส่วนสำคัญในการสร้างบรรยากาศและสร้างความสัมพันธ์กับผู้บริโภคการเลือกใช้โทนสีให้เหมาะสมกับแบรนด์และผลิตภัณฑ์มีความสำคัญอย่างมาก โทนสีในบรรจุภัณฑ์สำหรับผลิตภัณฑ์สำหรับผิวกาย ควรเลือกใช้โทนสีที่อ่อนโยนและสดใส ตราสัญลักษณ์ใช้รูปวาดลายเส้นรูปผู้หญิงในตราสินค้า เนื่องจากการตีความและเชื่อมโยงความสัมพันธ์กับกลุ่มเป้าหมายและค่านิยมของแบรนด์ และสอดคล้องกับพฤติกรรมและความคาดหวังของผู้บริโภคในตลาด

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การพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด

Development of Natural Herbal Liquid Soap Products and Packaging for Treating Skin Diseases from Kaffir Lime and Thunbergia laurifolia

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บทคัดย่อ

วัตถุประสงค์ของการวิจัย 1) เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด 2) เพื่อพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด 3) ออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด และ 4) ศึกษาความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด กลุ่มตัวอย่างมีความสนใจซื้อสบู่เหลวสูตรกลิ่นมะกรูดผสมรางจืด คิดเป็น 100% การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ใช้รูปภาพของมะกรูดและรางจืดที่สวยงามและสะดุดตา โทนสีเขียว ช่วยเสริมความรู้สึกของความสดใส สุขภาพและธรรมชาติ ใช้สีม่วง แสดงรายละเอียดสรรพคุณเพื่อให้ผลิตภัณฑ์ดูมีความสมบูรณ์และน่าสนใจ ทำเน้นโทนสีให้เข้ม เพื่อเน้นคุณสมบัติหรือส่วนประกอบที่สำคัญของผลิตภัณฑ์

คำสำคัญ: การพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์, สบู่เหลวสมุนไพรธรรมชาติ

Abstract

Research Objectives: 1) analyze the consumer demand for natural herbal liquid soap products for skin diseases, combining Kaffir Lime and Thunbergia laurifolia. 2) develop the formula and packaging of natural herbal liquid soap products for skin diseases, combining Kaffir Lime and Thunbergia laurifolia. 3) design the packaging and graphics for the packaging of natural herbal liquid soap products for skin diseases, combining Kaffir Lime and Thunbergia laurifolia. 4) study the satisfaction with the packaging design and development of natural herbal liquid soap products for skin diseases, combining Kaffir Lime and Thunbergia laurifolia. Results: 100% of the sample group was interested in buying Kaffir Lime and Thunbergia laurifolia liquid soap. Packaging and graphic

design: Uses beautiful and eye-catching images of Kaffir Lime and Thunbergia laurifolia. Green tones to enhance the feeling of freshness, health, and nature. Purple is used to show details and properties to make the product look complete and attractive. Emphasizes color tones to highlight important product features or ingredients.

Keywords: Product and packaging development, Natural herbal liquid soap

บทนำ

การวิจัยและพัฒนาสมุนไพร เป็นรากฐานที่สำคัญในการพัฒนาเศรษฐกิจ สังคม และสิ่งแวดล้อมของประเทศ เนื่องจากประเทศไทยตั้งอยู่ในพื้นที่ที่มีความหลากหลายทางชีวภาพสูง จึงเป็นแหล่งผลิตสมุนไพรที่สำคัญ และมีความได้เปรียบที่จะนำทรัพยากรสมุนไพรมาพัฒนาต่อยอด และเพิ่มมูลค่าให้สูงขึ้น สำหรับโครงงานวิจัยนี้เป็นการพัฒนาผลิตภัณฑ์จากฐานทรัพยากรชีวภาพ การใช้ทรัพยากรในชุมชนเป็นวัตถุดิบ การผลิตที่เป็นมิตรกับสิ่งแวดล้อมและปัจจุบันกระแสนิยมผลิตภัณฑ์จากสมุนไพรมีเพิ่มมากขึ้น เนื่องจากเป็นผลิตภัณฑ์ที่มีความปลอดภัยสูงกว่าการใช้ผลิตภัณฑ์ที่ทำจากสารเคมี สมุนไพรจึงมีโอกาสพัฒนาเป็นพืชเศรษฐกิจที่สำคัญ ที่สร้างรายได้ให้แก่คนในชุมชนและประเทศได้สอดคล้องกับยุทธศาสตร์การพัฒนาประเทศตามแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติ ฉบับที่ 13 การสร้างความเข้มแข็งทางเศรษฐกิจและแข่งขันได้อย่างยั่งยืน และสอดคล้องกับยุทธศาสตร์การวิจัยของชาติรายประเด็น ด้านการพัฒนาสมุนไพร ซึ่งบริเวณท้องถิ่นต่าง ๆ มีพืชสมุนไพรที่หลากหลาย สามารถนำมาพัฒนาต่อยอดทางผลิตภัณฑ์ทำความสะอาดร่างกายที่มีความปลอดภัยต่อผู้บริโภค และไม่มีสารเคมีตกค้างในสิ่งแวดล้อม

มะกรูด เป็นสมุนไพรที่มีความสำคัญทางเศรษฐกิจชนิดหนึ่ง สามารถปลูกได้ทั่วทุกภาคเป็นสมุนไพรที่ราคาถูกหาได้ง่ายในหลายท้องถิ่นในประเทศไทย ซึ่งมะกรูดเป็นสมุนไพรที่มีชื่อทางวิทยาศาสตร์ชื่อวิทยาศาสตร์ คือ Citrus hystrix DC. และชื่อสามัญ คือ Leech Lime, Mauritus Papeda อยู่ในวงศ์ Rutaceae เปลือกมะกรูดมีน้ำมันหอมระเหยที่ประกอบด้วยสารสำคัญ ลิโมนีน (Limonene) มีฤทธิ์ต้านแบคทีเรีย ต้านเชื้อรา ต้านการอักเสบ และช่วยให้ผ่อนคลาย เบต้าไพนีน (Beta-pinene) มีฤทธิ์ต้านการอักเสบ ต้านแบคทีเรีย ซาบินีน (Sabinene) มีฤทธิ์ต้านแบคทีเรีย ต้านเชื้อรา เปลือกมะกรูดมีกรดซิตริกสูง มีฤทธิ์ต้านอนุมูลอิสระ ช่วยผลัดเซลล์ผิวเก่า เผยผิวใหม่ให้ขาวกระจ่างใส และช่วยขจัดคราบสกปรกบนผิว (Zaki, Jai, Shahrizan, Fardhyanti, Megawati, & Imani, 2022)

ส่วนของรางจืด สรรพคุณแก้โรคผิวหนัง ลดอาการแพ้ ผดผื่นคัน ใช้ใบต้มน้ำอาบหรือผสมในสบู่เหลวแก้โรคผิวหนัง ลดอาการแพ้ ผดผื่นคัน โดยใช้อาบทุกวัน ใบรางจืดมีสารต้านอนุมูลอิสระหลายชนิด เช่น ฟลาโวนอยด์ แอนโทไซยานิน และกรดเฟโนลิก สารเหล่านี้มีฤทธิ์ต้านการอักเสบ ต้านแบคทีเรียและต้านเชื้อรา นอกจากนี้ยังช่วยชะลอความเสื่อมของเซลล์ ช่วยป้องกันเซลล์จากสารพิษ ทำให้ผิวสดใส ผิวพรรณเต่งตึงและช่วยต้านการแก่ (อาภา ฤกษ์วิรี, 2559).

ภาพที่ 1 ใบรางจืด
ที่มา: https://www.dd-productbkk.com/product/cosmetic

ผู้วิจัยจึงมีแนวคิดในการนำน้ำต้มผิวมะกรูดและใบรางจืด มาแปรรูปและประยุกต์ใช้ให้เกิดประโยชน์สูงสุด โดยนำมาผลิตเป็นสบู่เหลวอาบน้ำที่มีความสามารถในการต้านเชื้อแบคทีเรีย แก้โรคผิวหนัง ลดอาการแพ้ ผดผื่นคัน และรวมทั้งเป็นมิตรต่อสิ่งแวดล้อม รวมทั้งเป็นแนวทางในการอนุรักษ์พันธ์พืชสมุนไพรของไทยให้คงอยู่อย่างยั่งยืนต่อไป

วัตถุประสงค์ของการวิจัย

1) เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด

2) เพื่อพัฒนาผลิตภัณฑ์และบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด

3) การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด

4) ศึกษาความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์สบู่เหลวสมุนไพรธรรมชาติแก้โรคผิวหนังมะกรูดผสมรางจืด

แนวคิด ทฤษฎี กรอบแนวคิด

Design Thinking Concept การพัฒนาผลิตภัณฑ์สบู่เหลวสมุนไพรแก้โรคผิวหนังมะกรูดผสมรางจืด

1. เข้าใจ (Empathize)

- ศึกษาปัญหาของผู้ที่มีโรคผิวหนัง เช่น สิว ผื่นคัน กลาก เกลื้อน
- เข้าใจความต้องการของผู้บริโภคที่ต้องการผลิตภัณฑ์ดูแลผิวที่ปลอดภัย มีประสิทธิภาพ
- ศึกษาข้อมูลเกี่ยวกับสรรพคุณของมะกรูดและรางจืด

2. กำหนด (Define)

- กำหนดกลุ่มเป้าหมายของผลิตภัณฑ์
- กำหนดคุณสมบัติของผลิตภัณฑ์

3. คิด (Ideate)
   - ระดมความคิดเกี่ยวกับสูตรและส่วนผสมของสบู่
   - ออกแบบรูปลักษณ์และบรรจุภัณฑ์ของผลิตภัณฑ์

4. ต้นแบบ (Prototype)
   - ผลิตสบู่ตัวอย่างเพื่อทดสอบ

5. ทดสอบ (Test)
   - ทดสอบผลิตภัณฑ์กับกลุ่มเป้าหมาย
   - เก็บรวบรวมความคิดเห็นและข้อเสนอแนะ
   - ปรับปรุงผลิตภัณฑ์ให้ตรงกับความต้องการของผู้บริโภค

วิธีดำเนินการวิจัย

ขั้นตอนที่ 1	สำรวจพฤติกรรมและความต้องการของผู้บริโภคที่มีต่อสบู่เหลวมะกรูดผสมรางจืด
ขั้นตอนที่ 2	การทบทวนวรรณกรรมก่อนการพัฒนาสูตรผลิตภัณฑ์
ขั้นตอนที่ 3	วิจัยและพัฒนาสูตรผลิตภัณฑ์ที่เหมาะสม
ขั้นตอนที่ 4	ทดสอบการยอมรับจากผู้บริโภค
ขั้นตอนที่ 5	ออกแบบบรรจุภัณฑ์และตราสินค้า
ขั้นตอนที่ 6	สำรวจความพึงพอใจต่อการออกแบบบรรจุภัณฑ์

ผลการวิจัย

1. ผลการวิเคราะห์พฤติกรรมและความต้องการของผู้บริโภคที่มีต่อผลิตภัณฑ์สบู่เหลว กลิ่นมะกรูดผสมรางจืด (Exploratory Study) จำนวน 30 ราย สัมภาษณ์ตัวต่อตัว พบว่า หากมีการผลิตสบู่ที่มีส่วนผสมของรางจืด มะกรูดกลุ่มตัวอย่างมีความสนใจรูปแบบสบู่ก้อนอาบน้ำ 10% สบู่เหลวอาบน้ำ 45 % ครีมอาบน้ำ 30% เจลอาบน้ำ 15% จากสรรพคุณของมะกรูดและรางจืด กลุ่มตัวอย่างมีความสนใจซื้อสบู่เหลวสูตรกลิ่นมะกรูดผสมรางจืด คิดเป็น 100% และขนาดที่เหมาะสมในการ คือ 200 ML

2. พัฒนาสูตรผลิตภัณฑ์ที่เหมาะสม

1. สารตั้งต้นหลัก สบู่เหลวช่วยให้เกิดฟอง ทำความสะอาดผิว LPS 1 กก.
2. K.D. ช่วยให้ผิวชุ่มชื้น ป้องกันผิวแห้งตึง 50 กรัม
3. สารสกัดข้าวโพด ช่วยให้ผิวเรียบเนียน PI 200 50 กรัม

4. ลาโนลีน ช่วยให้ผิวนุ่มชุ่มชื้น 50 กรัม
5. สารกันเสีย ป้องกันการเจริญเติบโตของแบคทีเรียและเชื้อรา 10 ซีซี
6. น้ำต้มผิวมะกรูด มีสารต้านอนุมูลอิสระ ต้านเชื้อรา ช่วยให้ผิวพรรณสดใส 2 ออนซ์
7. น้ำต้มรางจืด มีฤทธิ์ต้านการอักเสบ ต้านแบคทีเรีย ช่วยลดผื่นคัน 2 ออนซ์
8. น้ำหอม เพิ่มกลิ่น 1 ออนซ์
9. เกลือ ช่วยให้ผิวสะอาด ขจัดสิ่งสกปรก 100 กรัม
10. น้ำเปล่า เป็นตัวทำละลาย 4 ลิตร

3. ขั้นตอนการผลิต

1. จัดเตรียมวัตถุดิบ
2. ผสมหัวเชื้อสบู่เหลว LPS กับ K.D. ลาโนลีน และสารสกัดข้าวโพด PI 200 คนให้เข้ากัน
3. ต้มผิวมะกรูดผสมใบรางจืด แล้วกรองด้วยผ้าขาวบาง
4. ใส่น้ำต้มผิวมะกรูดผสมใบรางจืด น้ำหอมและสารกันเสีย คนให้เข้ากัน
5. นำส่วนผสม 2 และ 4 มารวมกันแล้วกวนให้เป็นเนื้อเดียวกัน
6. ใส่บรรจุภัณฑ์

ภาพที่ 2 สบู่เหลวมะกรูดผสมรางจืด

4. ทดสอบการยอมรับจากผู้บริโภค

ตารางที่ 1 ผลการทดสอบการยอมรับสบู่เหลวมะกรูดผสมรางจืด

คุณลักษณะ	คะแนนเฉลี่ยการยอมรับ
1. สี	7.00
2. กลิ่น	6.90
3. การล้างออก	7.30
4. ความสะอาด	7.20
ค่าเฉลี่ย	**7.10**

กลุ่มตัวอย่าง ให้คะแนนการยอมรับ สี กลิ่น การล้างออก ความสะอาด อยู่ในระดับมาก เหตุผลที่สนใจซื้อผลิตภัณฑ์สบู่เหลวมะกรูดผสมรางจืด คือ ลดอาการคันและรู้สึกผ่อนคลายสบายผิว คิดเป็น 80% การประเมินผลคุณลักษณะโดยภาพรวมการยอมรับจากผู้ทดสอบมีคะแนนเฉลี่ย 7.10 อยู่ในเกณฑ์ระดับชอบปานกลาง

5. การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์

ภาพที่ 3 แบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์

ตารางที่ 2 ค่าเฉลี่ยความพึงพอใจองค์ประกอบบรรจุภัณฑ์

องค์ประกอบบรรจุภัณฑ์	ค่าเฉลี่ยความพึงพอใจ	การแปลผล
1. ด้านการออกแบบกราฟฟิกบนบรรจุภัณฑ์		
1.1 สื่อจุดเด่นเอกลักษณ์สินค้า	3.33	ปานกลาง
1.2 การออกแบบโลโก้ ตราสินค้า	3.0	ปานกลาง
1.3 รูปแบบตัวอักษร	3.33	ปานกลาง
1.4 รูปภาพลวดลาย สีสัน ที่ ตกแต่ง	3.0	ปานกลาง
2. ด้านรูปแบบบรรจุภัณฑ์		
2.1 รูปร่าง รูปทรง	3.0	ปานกลาง
2.2 วัสดุที่ใช้	3.2	ปานกลาง
2.3 ขนาด	2.7	ปานกลาง
2.4 ข้อมูลแสดงรายละเอียดบนบรรจุภัณฑ์	3.7	มาก
3. ด้านความเหมาะสมใน การบรรจุ การขนส่ง		
3.1 ความสะดวกในการพกพา จัดเก็บ และวางจำหน่าย	3.0	ปานกลาง
3.2 ความสะดวกในการขนส่ง	2.8	ปานกลาง

การประเมินการออกแบบบรรจุภัณฑ์โดยภาพรวมอยู่ในระดับปานกลาง ต้องปรับปรุงด้านการออกแบบกราฟฟิกบนบรรจุภัณฑ์ ด้านโลโก้ ตราสินค้า การใช้ลวดลายสีสันที่ตกแต่ง รวมทั้งขนาด

สรุปและอภิปรายผล

กระบวนการคิดเชิงออกแบบ Design Thinking Concept การพัฒนาผลิตภัณฑ์สบู่เหลวสมุนไพรแก้โรคผิวหนังมะกรูดผสมรางจืด เกิดจาก Pain Point ปัญหาโรคผิวหนังอาการคัน เนื่องจากปัญหามลพิษและสิ่งสกปรกในสิ่งแวดล้อมที่ส่งผลกระทบต่อผิวหนังของผู้คนมากขึ้น โดยเฉพาะอาการผื่นคัน โครงงานดังกล่าวผู้วิจัยมีไอเดียและการแก้ปัญหาโดยเน้นการใช้สมุนไพรธรรมชาติที่มีสมบัติบำรุงผิวหนัง การสร้างความคิดสร้างสรรค์เพื่อแก้ปัญหาโดยการผสมสมุนไพรธรรมชาติ เช่น มะกรูดและรางจืดที่มีสมบัติบำรุงผิวและลดอาการคัน การทดสอบผลิตภัณฑ์กับกลุ่มเป้าหมายเพื่อรับข้อเสนอแนะและคำแนะนำ พบว่า กลุ่มตัวอย่างให้การยอมรับ คะแนนค่าเฉลี่ย 7.10 (ระดับปานกลาง) ต้องปรับปรุงด้าน สี กลิ่น การล้างออก

และความสะอาด และเหตุผลที่กลุ่มตัวอย่างสนใจซื้อผลิตภัณฑ์สบู่เหลวมะกรูดผสมรางจืด คือ สรรพคุณลดอาการคันและรู้สึกผ่อนคลายสบายผิว คิดเป็น 80% มีการออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ใช้รูปภาพของมะกรูดและรางจืดที่สวยงามและสะดุดตา โทนสีเขียวช่วยเสริมความรู้สึกของความสดใส สุขภาพ และธรรมชาติ ใช้สีม่วงแสดงรายละเอียดสรรพคุณเพื่อให้ผลิตภัณฑ์ดูมีความสมบูรณ์และน่าสนใจ ใช้สีดำเพื่อเน้นคุณสมบัติหรือส่วนประกอบที่สำคัญของผลิตภัณฑ์

การใช้โทนสีในบรรจุภัณฑ์ สามารถช่วยเพิ่มมูลค่าและสร้างความประทับใจต่อผู้บริโภคได้อย่างมีประสิทธิภาพ การประเมินการออกแบบบรรจุภัณฑ์โดยภาพรวมอยู่ในระดับปานกลาง ต้องปรับปรุงด้านการออกแบกราฟฟิกบนบรรจุภัณฑ์ ด้านโลโก้ ตราสินค้า การใช้ลวดลายสีสันที่ตกแต่ง รวมทั้งขนาดเพื่อให้บรรจุภัณฑ์ตรงกับความต้องการของผู้บริโภคและสามารถนำจำหน่ายในท้องตลาดต่อไป

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การศึกษาพฤติกรรมผู้บริโภคและแนวทางในการพัฒนาผลิตภัณฑ์สบู่สครับสมุนไพร
Studying Consumer Behavior and Guidelines for Developing Herbal Soap Products

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บทคัดย่อ

งานนี้มีวัตถุประสงค์ 1) สำรวจพฤติกรรมและความต้องการผลิตภัณฑ์สครับผิว 2) พัฒนาผลิตภัณฑ์สครับผิว 3) ออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ผลิตภัณฑ์สครับผิว 4) ศึกษาความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์ผลิตภัณฑ์สครับผิว วิธีการศึกษาแบ่งเป็น 6 ขั้นตอน คือ 1) สำรวจพฤติกรรมและความต้องการของผู้บริโภคที่มีต่อผลิตภัณฑ์สครับผิวจากธรรมชาติ 2) การทบทวนวรรณกรรมก่อนการพัฒนาสูตรผลิตภัณฑ์สำหรับสครับผิวกาย 3) วิจัยและพัฒนาสูตรผลิตภัณฑ์ที่เหมาะสมกับสครับผิวกาย 4) ทดสอบการยอมรับจากผู้บริโภค 5) ออกแบบบรรจุภัณฑ์และตราสินค้า 6) สำรวจความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์ ผลการศึกษาพบว่า กลุ่มตัวอย่างนิยมใช้ผลิตภัณฑ์สครับผิวและมีความต้องการผลิตภัณฑ์สครับผิวที่มีส่วนผสมจากสมุนไพรธรรมชาติ การวิจัยและพัฒนาสูตรสครับผิวกายมีส่วนประกอบของเกลือหิมาลายัน ขมิ้น น้ำผึ้ง และมะขาม ผลการทดสอบการยอมรับของผู้บริโภค มีค่าระดับความชอบเฉลี่ยอยู่ในระดับมาก ผลการประเมินความพึงพอใจที่มีต่อบรรจุภัณฑ์อยู่ในระดับมาก

คำสำคัญ: การพัฒนาผลิตภัณฑ์สครับผิวสมุนไพร, เกลือหิมาลายัน

Abstract

This project aims to: (1) Survey consumer behaviors and preferences towards natural skincare products (2) Develop natural skincare products (3) Design packaging and graphics for the skincare product packaging (4) Study satisfaction with the packaging design and development.

The methodology is divided into 6 steps: (1) Conduct a survey of consumer behaviors and preferences towards natural skincare products (2) Review literature before developing formulations for skincare products (3) Research and develop formulations suitable for natural skincare product (4) Test consumer acceptance (5) Design packaging and branding (6) Conduct a satisfaction survey on the packaging design and development.

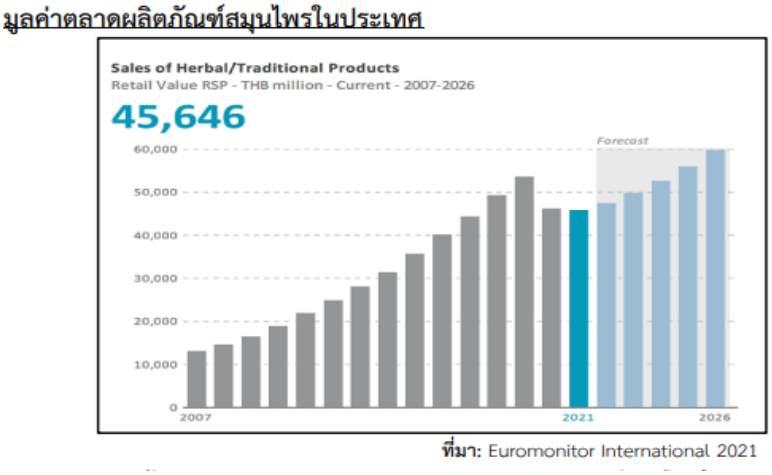
The study found that the sample group prefers to use natural skincare products and has a high demand for skincare products made from herbal ingredients. The research and development of skincare formulations include ingredients such as Himalayan salt, turmeric, honey, and tamarind. The consumer acceptance test results showed a high level of preference. Satisfaction with the packaging design was also found to be high.

Keywords: Scrub Product Development, Himalayan salt

บทนำ

ผิวพรรณเปรียบเสมือนด่านแรกที่ปกป้องร่างกายจากมลภาวะ แบคทีเรีย และแสงแดด ผิวที่แข็งแรงและมีสุขภาพดีจึงส่งผลต่อทั้งบุคลิกภาพ ความมั่นใจ และความสุขของเรา ปัจจัยต่าง ๆ เช่น มลภาวะ แสงแดด ความเครียด และฮอร์โมน ล้วนส่งผลต่อสุขภาพผิว เซลล์ผิวเก่า สิ่งสกปรก และความมันบนผิวล้วนเป็นสาเหตุของปัญหาผิว เช่น ผิวหมองคล้ำ ไม่เรียบเนียน รูขุมขนกว้าง สิว ริ้วรอย และความแห้งกร้าน สบู่สครับสมุนไพรนับเป็นหนึ่งในผลิตภัณฑ์ความงามและสุขภาพที่ได้รับความนิยม เน้นการใช้สมุนไพรธรรมชาติที่มีประโยชน์ต่อผิวและสุขภาพของผู้บริโภคอย่างมีประสิทธิภาพและปลอดภัย สมุนไพรมีคุณสมบัติที่มีประโยชน์ต่อผิว เช่น มีสารต้านอนุมูลอิสระ ช่วยบำรุงผิว และลดปัญหาผิวหรือสุขภาพที่เกี่ยวข้องได้ (มณีกัญญา นากามัทสึ, อภิรัช ประชาสุภาพ, ชยานนท์ เชาวน์วุฒิกุล, และปรียากมล มีอยู่เต็ม, 2566) การใช้สมุนไพรบำรุงผิวเป็นภูมิปัญญาไทยที่มีมาช้านาน บรรพบุรุษของเราใช้สมุนไพรไทยที่มีสรรพคุณหลากหลายในการดูแลผิวพรรณ เช่น ขมิ้นชัน ว่านหางจระเข้ มะขามเปียก ทานาคา ฯลฯ

ตลาดผลิตภัณฑ์บำรุงผิวจากสมุนไพรมีแนวโน้มเติบโตอย่างต่อเนื่อง ผู้บริโภคมีความต้องการผลิตภัณฑ์จากธรรมชาติ ออร์แกนิค ปลอดภัยมากขึ้น ประกอบกับสมุนไพรไทยมีสรรพคุณในการดูแลผิวที่หลากหลายส่งผลให้ผลิตภัณฑ์บำรุงผิวจากสมุนไพรเป็นที่นิยม จากข้อมูลของ Euromonitor มีการคาดการณ์ว่า ผลิตภัณฑ์สมุนไพรจะเติบโตเพิ่มขึ้นทุก ๆ ปี และจะมีมูลค่าตลาดสูงถึง 59.5 พันล้านบาท ในปี พ.ศ. 2569



ที่มา: Euromonitor International 2021

ภาพที่ 1 มูลค่าตลาดผลิตภัณฑ์สมุนไพรประเทศไทย

โครงการวิจัยนี้ มุ่งเน้นการพัฒนาผลิตภัณฑ์สครับบำรุงผิวจากสมุนไพรไทยที่มีสรรพคุณในการบำรุงผิว แก้ปัญหาผิว และเหมาะกับสภาพผิวคนไทย โดยศึกษาข้อมูลเกี่ยวกับตลาด ศึกษาสรรพคุณของสมุนไพรไทยที่เหมาะสำหรับการพัฒนาผลิตภัณฑ์สครับบำรุงผิว พัฒนาสูตรผลิตภัณฑ์สครับบำรุงผิว ออกแบบบรรจุภัณฑ์ให้สวยงาม ใช้งานสะดวก

วัตถุประสงค์ของการวิจัย

1) สำรวจพฤติกรรมและความต้องการผลิตภัณฑ์สครับผิว
2) เพื่อพัฒนาผลิตภัณฑ์สครับผิวและศึกษาการยอมรับผลิตภัณฑ์ที่ได้
3) เพื่อออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ผลิตภัณฑ์สครับผิว
4) ศึกษาความพึงพอใจของผู้บริโภคที่มีต่อการออกแบบพัฒนาบรรจุภัณฑ์ผลิตภัณฑ์สครับผิว

แนวคิด ทฤษฎีที่เกี่ยวข้อง

แนวคิดการพัฒนาผลิตภัณฑ์

แนวคิดการพัฒนาผลิตภัณฑ์ที่ดีจะช่วยสร้างผลิตภัณฑ์ที่ตรงความต้องการของตลาด ประสบความสำเร็จ และสร้างรายได้ให้กับธุรกิจ แนวคิดสำคัญในการพัฒนาผลิตภัณฑ์ มีดังนี้

1. เข้าใจความต้องการของลูกค้า

- ศึกษาข้อมูลเกี่ยวกับตลาด ผลิตภัณฑ์ คู่แข่ง และกลุ่มเป้าหมาย
- วิเคราะห์พฤติกรรม ความต้องการ และปัญหาของลูกค้า
- ระบุกลุ่มเป้าหมายที่ชัดเจน

2. ค้นหาจุดแข็งและจุดอ่อนของผลิตภัณฑ์

- วิเคราะห์จุดแข็ง จุดอ่อน โอกาส และอุปสรรค (SWOT Analysis)
- เปรียบเทียบผลิตภัณฑ์กับคู่แข่ง
- ค้นหาจุดเด่นที่แตกต่าง (Unique Selling Proposition)

3. พัฒนาผลิตภัณฑ์ที่มีคุณภาพและปลอดภัย

- เลือกวัตถุดิบที่มีคุณภาพ
- พัฒนาสูตรผลิตภัณฑ์อย่างรอบคอบ
- ทดสอบประสิทธิภาพและความปลอดภัย
- ออกแบบผลิตภัณฑ์ให้สวยงาม ดึงดูดใจ ใช้งานสะดวก

แนวคิดการวิเคราะห์พฤติกรรมผู้บริโภค

พฤติกรรมผู้บริโภค หมายถึง พฤติกรรมการตัดสินใจและการกระทำของผู้บริโภคที่เกี่ยวข้องกับการซื้อและการใช้สินค้าและบริการ เพื่อตอบสนองต่อความต้องการและความพึงพอใจของเขา (Schiffman & Kanuk, 2000)

การวิเคราะห์พฤติกรรมผู้บริโภค หมายถึง การค้นหาหรือวิจัยเกี่ยวกับพฤติกรรมการซื้อและการใช้ของผู้บริโภค เพื่อทราบถึงลักษณะความต้องการและพฤติกรรมการซื้อและการใช้ของผู้บริโภค การวิเคราะห์พฤติกรรมผู้บริโภคมีหลากหลายรูปแบบขึ้นอยู่กับวัตถุประสงค์ของการวิเคราะห์ เช่น การวิจัยทางการตลาดเก็บรวบรวมข้อมูลเชิงปริมาณและเชิงคุณภาพจากผู้บริโภค เช่น แบบสอบถาม และการสัมภาษณ์กลุ่มเป้าหมาย ดังนั้นการวิเคราะห์พฤติกรรมผู้บริโภคเปรียบเสมือนสิ่งสำคัญทางธุรกิจ เพื่อเข้าใจ

ลูกค้าอย่างถ่องแท้ คาดการณ์พฤติกรรม ตอบสนองความต้องการ และสร้างความพึงพอใจ ซึ่งเป็นหัวใจสำคัญที่นำไปสู่ความสำเร็จ

การทบทวนวรรณกรรมก่อนการพัฒนาสูตร

เกลือหิมาลายัน ลักษณะของเกลือนี้เป็นเอกลักษณ์และมีคุณสมบัติที่แตกต่างจากเกลือทั่วไป เป็นเกลือที่มีประโยชน์สูงสุดและสะอาดที่สุดที่มีอยู่ในโลก ซึ่งกว่าจะได้มานั้นต้องผ่านการระเหยของน้ำทะเลเป็นเวลากว่า 250 ล้านปี จนกลายเป็นผลึกเกลือโครงสร้างหลัก คือ โซเดียมคลอไรด์เหมือนเกลือปกติทั่วไปแต่มีสีชมพู เพราะมีแร่ธาตุถึง 84 ชนิดเป็นองค์ประกอบ ด้วยความพิเศษนี้เองทำให้เกลือสีชมพูเหนือกว่าเกลือธรรมดามีคุณค่ามากมายต่อร่างกาย

เกลือหิมาลายันมีคุณสมบัติช่วยผลัดเซลล์ผิวที่ตายแล้วให้หลุดลอกออก เผยผิวใหม่ที่ขาวกระจ่างใสอย่างเป็นธรรมชาติ กลไกการผลัดเซลล์ผิว เกลือหิมาลายันมีเนื้อสัมผัสที่หยาบเล็กน้อยเมื่อขัดผิวจะช่วยขจัดเซลล์ผิวที่ตายแล้วออกอย่างอ่อนโยน เกลือหิมาลายันอุดมไปด้วยแร่ธาตุต่าง ๆ เช่น โซเดียม โพแทสเซียม แมกนีเซียม แคลเซียม และเหล็ก แร่ธาตุเหล่านี้ช่วยกระตุ้นการไหลเวียนโลหิตส่งผลให้ผิวพรรณสดใส เกลือหิมาลายันยังมีคุณสมบัติต้านการอักเสบช่วยลดการระคายเคืองและอาการแพ้

ภาพที่ 2 เกลือหิมาลายัน
ที่มา: www.cheewajit.com

สรรพคุณมะขาม ช่วยผลัดเซลล์ผิว มะขามมีกรด AHA (Alpha Hydroxyl Acids) ซึ่งเป็นกรดผลไม้ที่มีคุณสมบัติช่วยผลัดเซลล์ผิวที่ตายแล้วให้หลุดลอกออกไป เผยผิวใหม่ที่กระจ่างใสและเนียนนุ่ม ลดเลือนจุดด่างดำ มะขามมีวิตามินซีและวิตามินเอ ซึ่งมีคุณสมบัติช่วยยับยั้งการสร้างเม็ดสีเมลานิน ซึ่งเป็นสาเหตุของจุดด่างดำ นอกจากนี้มะขามยังมีสารต้านอนุมูลอิสระที่ช่วยปกป้องผิวจากแสงแดด ซึ่งเป็นสาเหตุหนึ่งของจุดด่างดำ ลดสิว มะขามมีกรดทาทาริก (Tartaric Acid) ซึ่งเป็นกรดผลไม้ที่มีคุณสมบัติช่วยยับยั้งการเจริญเติบโตของแบคทีเรียที่เป็นสาเหตุของสิว นอกจากนี้มะขามยังมีวิตามินซีและวิตามินบี ซึ่งมีคุณสมบัติช่วยต้านการอักเสบของสิว เพิ่มความชุ่มชื้นให้ผิว มะขามมีวิตามินเอ วิตามินซี และวิตามินอี ซึ่งมีคุณสมบัติช่วยเพิ่มความชุ่มชื้นให้ผิวปกป้องผิวจากแสงแดด มะขามมีวิตามินซีและวิตามินเอ ซึ่งเป็นสารต้านอนุมูลอิสระที่ช่วยปกป้องผิวจากแสงแดด

สรรพคุณของขมิ้นชัน มีสารเคอร์คูมิน ซึ่งเป็นสารต้านอนุมูลอิสระและสารต้านการอักเสบที่มีประสิทธิภาพช่วยลดการอักเสบของผิว ช่วยผลัดเซลล์ผิวที่ตายแล้วให้หลุดลอกออกไป เผยผิวใหม่ที่กระจ่างใสและเนียนนุ่มลดเลือนจุดด่างดำ เพราะสารเคอร์คูมินมีคุณสมบัติช่วยยับยั้งการสร้างเม็ดสี

เมลานินซึ่งเป็นสาเหตุของจุดด่างดำลดสิว มีคุณสมบัติช่วยต้านการอักเสบของสิว เพิ่มความชุ่มชื้นให้ผิว และปกป้องผิวจากแสงแดด

สรรพคุณน้ำผึ้ง มีสารต้านอนุมูลอิสระที่ช่วยปกป้องผิวจากริ้วรอยและความเสียหายจากแสงแดด และมีคุณสมบัติในการดึงดูดความชื้น ช่วยให้ผิวชุ่มชื้นและอ่อนนุ่ม ต้านการอักเสบ ช่วยลดอาการแดง คัน และระคายเคือง น้ำผึ้งจึงมีคุณสมบัติต่อต้านแบคทีเรีย และช่วยป้องกันการเกิดสิว

วิธีดำเนินการวิธีวิจัย

การวิจัยเชิงปฏิบัติการ กลุ่มตัวอย่าง 30 คน ให้ข้อมูลเกี่ยวกับพฤติกรรมการใช้ผลิตภัณฑ์สครับผิว และรูปแบบความต้องการที่มีต่อผลิตภัณฑ์สครับผิว และทดสอบการยอมรับจากผู้บริโภค จำนวน 10 ราย ที่มีต่อผลิตภัณฑ์ บรรจุภัณฑ์ และตราสินค้า

กระบวนการวิจัย

ขั้นตอนที่ 1	สำรวจพฤติกรรมและความต้องการของผู้บริโภคที่มีต่อผลิตภัณฑ์สครับผิวจากธรรมชาติ
ขั้นตอนที่ 2	การทบทวนวรรณกรรมก่อนการพัฒนาสูตรผลิตภัณฑ์สำหรับสครับผิวกาย
ขั้นตอนที่ 3	วิจัยและพัฒนาสูตรผลิตภัณฑ์ที่เหมาะสมกับสครับผิวกาย
ขั้นตอนที่ 4	ทดสอบการยอมรับจากผู้บริโภค
ขั้นตอนที่ 5	ออกแบบบรรจุภัณฑ์และตราสินค้า
ขั้นตอนที่ 6	สำรวจความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์

ผลการวิจัย

1. ผลการวิเคราะห์พฤติกรรมการใช้ผลิตภัณฑ์ขัดผิวกายและทำความสะอาดผิว ทำการสำรวจเบื้องต้น (Exploratory Study) จำนวน 30 ราย สัมภาษณ์ตัวต่อตัว พบว่า โดยส่วนใหญ่กลุ่มตัวอย่างนิยมใช้ผลิตภัณฑ์ในสครับผิวกาย คิดเป็นร้อยละ 90 โดยความถี่ 2 - 3 ครั้ง/สัปดาห์ คิดเป็น 51.70%, 1 - 2 ครั้ง/สัปดาห์ คิดเป็น 27.6% และ 4-5 ครั้ง คิดเป็น 13.80% เหตุผลที่เลือกใช้ผลิตภัณฑ์สครับผิวพบว่า เพื่อขจัดเซลล์ผิวให้ผลัดออกไปและเพื่อให้ผิวแลดูกระจ่างใส คิดเป็นเปอร์เซ็นต์ที่เท่ากัน คือ 33.30% สำหรับปัญหาที่พบในการใช้ผลิตภัณฑ์ ประกอบด้วย กลิ่นของสครับเนื้อสครับเหลวจนเกินไป และเนื้อละเอียดจนเกินไป เนื้อหยาบบาดผิว แสบผิว ผลิตภัณฑ์ตกแตกง่าย การใช้งานพกพาไม่สะดวก เมื่อถามถึงความตั้งใจซื้อสครับผิวมะขามพบว่า ส่วนใหญ่มีความสนใจ คิดเป็น 93.30% และแสดงความคิดเห็นเพิ่มเติมว่า มีความต้องการคุณสมบัติอื่น ๆ จากสครับผิวในด้านกลิ่นของผลิตภัณฑ์ บำรุงผิว ผิวชุ่มชื่น และนุ่มลื่น ผิวขาวกระจ่างใส และสมุนไพรที่ต้องการให้มีในผลิตภัณฑ์สครับผิว ได้แก่ ขมิ้น น้ำผึ้ง สมุนไพรที่มีกลิ่นหอมผ่อนคลาย เป็นต้น รูปแบบของผลิตภัณฑ์ Scrub ที่

สนใจ ได้แก่ บรรจุในหลอดบีบคิดเป็น 41.40% บรรจุในกระปุก คิดเป็น 20.70% และข้อเสนอแนะเพิ่มเติมที่เป็นประโยชน์ต่อการพัฒนาผลิตภัณฑ์สครับ ได้แก่ บรรจุภัณฑ์น่ารักเหมาะแก่การพกพา บรรจุภัณฑ์สะดวกต่อการใช้งานผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง คิดเป็น 83.30% อาชีพข้าราชการ/รัฐวิสาหกิจ คิดเป็น 36.70% นักเรียนนักศึกษา คิดเป็น 33.30% พนักงานบริษัทเอกชน คิดเป็น 23.30% อายุ 20 - 30 ปี คิดเป็น 56.70% รองลงมา 31 - 40 ปี คิดเป็น 23.30% และ 41 - 50 ปี คิดเป็น 20% ตามลำดับ

2. การทบทวนวรรณกรรมก่อนการพัฒนาสูตรผลิตภัณฑ์สำหรับสครับผิวกาย จากผลการสำรวจดังกล่าว โครงงานนี้นักศึกษามีไอเดียในการพัฒนาผลิตภัณฑ์สครับธรรมชาติไม่มีสารเคมี โดยใช้ส่วนผสมของผิวเกลือหิมาลายันที่มีส่วนผสมของแร่ธาตุที่ช่วยในการบำรุงผิว โดยเกลือมีเนื้อละเอียดพิเศษบดจนเป็นผงเนียนนุ่ม เพื่อป้องกันการบาดผิว ผสมด้วยสมุนไพรขมิ้นชันที่มีสาร Curcumin เป็นสารต้านออกซิเดชันที่มีคุณสมบัติในการต่อต้านอนุมูลอิสระที่เป็นต้นเหตุของความเสื่อมสภาพของผิว ซึ่งช่วยลดการเสื่อมของเซลล์ผิว น้ำผึ้งที่ช่วยให้ผิวชุ่มชื่นและนุ่มลื่น และมะขามมีสารแอลฟาไฮโดรกซีและวิตามินซีที่ช่วยให้ผิวขาวกระจ่างใส

3. วิจัยและพัฒนาสูตรผลิตภัณฑ์ที่เหมาะสมกับสครับผิวกาย

การกำหนดส่วนผสมและเลือกสารประกอบที่เหมาะสม (ภาพที่ 2) ในผลิตภัณฑ์สครับผิว ปริมาณ 200 กรัม ประกอบด้วย ส่วนผสมดังนี้

<table>
<tr>
<td>น้ำมะขามเปียก 200 กรัม
 </td>
<td>ผงขมิ้นชัน 8 กรัม
 </td>
</tr>
<tr>
<td>น้ำผึ้ง 50 กรัม
 </td>
<td>เกลือหิมาลายัน 40 กรัม
</td>
</tr>
</table>

ภาพที่ 3 วัตถุดิบ
ที่มา: www.vogue.co.th/beauty/body/body/article/tamarind-scrub

ขั้นตอนการทำผลิตภัณฑ์ สครับมะขาม

1. นำมะขามเปียกแช่น้ำอุ่น 10 นาที เสร็จแล้วทำการขยำกรองผ่านตะแกรง เอาแต่น้ำมะขามเปียก

ภาพที่ 4 มะขามเปียกแช่น้ำอุ่น

2. นำมะขามเปียกมาผสมกับผงขมิ้นใสในกระทะ โดยใช้ไฟอ่อนคนให้เข้ากัน
3. ใส่น้ำผึ้งรวง คนให้เข้ากัน
4. ใส่เกลือหิมาลายันและเกลือสปากลิ่นนม คนให้เข้ากัน
5. จากนั้นปิดไฟ พักไว้ให้อุ่น แล้วนำใส่บรรจุภัณฑ์

4. ทดสอบการยอมรับจากผู้บริโภคที่มีต่อผลิตภัณฑ์สครับผิว

ผลการทดสอบโดยใช้วิธีการให้คะแนนความชอบ 1 ถึง 9 (9-Point Hedonic Scale) จำนวน 10 ราย ผลปรากฏดังตารางที่ 1

ตารางที่ 1 ผลการทดสอบการยอมรับ

คุณลักษณะ	คะแนนเฉลี่ยการยอมรับ
1. สี	8.30
2. กลิ่น	7.90
3. การล้างออก	8.60
4. ความสะอาด	8.50

คะแนนการยอมรับ สี กลิ่น การล้างออก ความสะอาด อยู่ในระดับชอบมาก สำหรับความรู้สึกภายหลังการใช้ พบว่า กลุ่มตัวอย่างให้ความคิดเห็นว่า รู้สึกผ่อนคลายสบายผิว คิดเป็น 40% รองลงมา ผิวนุ่มชุ่มชื้น คิดเป็น 30% ผิวกระจ่างใส คิดเป็น 30%

ภาพที่ 5 การทดสอบการยอมรับจากผู้บริโภคที่มีต่อผลิตภัณฑ์สครับผิว

5. การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์

ชื่อแบรนด์ Lamoon Body Scrub ความหมายสื่อถึง ผลลัพธ์ที่ผิวเนียนนุ่มและขาวกระจ่างใส สีฉลากชมพู สื่อถึงความนุ่มนวล ความอ่อนโยน แลดูสุขภาพดี สีน้ำตาลให้ความรู้สึกถึงความอบอุ่น Art Work ที่ใช้ในแบรนด์โทนสีเขียว เป็นกลุ่มโทนเย็นให้ความรู้สึกสดชื่น ผ่อนคลาย ลักษณะตัวอักษรที่ใช้ในแบรนด์ (Font) The Bigmarker

ภาพที่ 6 บรรจุภัณฑ์ผลิตภัณฑ์สบู่สครับสมุนไพร

รูปแบบที่ 1

ภาพที่ 7 บรรจุภัณฑ์รูปแบบที่ 1

รูปแบบที่ 2

ภาพที่ 8 บรรจุภัณฑ์รูปแบบที่ 2

ตารางที่ 2 ค่าเฉลี่ยความพึงพอใจขององค์ประกอบบรรจุภัณฑ์

องค์ประกอบบรรจุภัณฑ์	ค่าเฉลี่ยความพึงพอใจ	การแปลผล
1. ด้านการออกแบบกราฟฟิกบนบรรจุภัณฑ์		
1.1 สื่อจุดเด่นเอกลักษณ์สินค้า	4.10	มาก
1.2 การออกแบบโลโก้ ตราสินค้า	4.30	มากที่สุด
1.3 รูปแบบตัวอักษร	4.10	มาก
1.4 รูปภาพลวดลาย สีสัน ที่ตกแต่ง	4.20	มาก
2. ด้านรูปแบบบรรจุภัณฑ์		
2.1 รูปร่าง รูปทรง	4.60	มากที่สุด
2.2 วัสดุที่ใช้	4.70	มากที่สุด
2.3 ขนาด	4.40	มากที่สุด
2.4 ข้อมูลแสดงรายละเอียดบนบรรจุภัณฑ์	4.40	มากที่สุด
3. ด้านความเหมาะสมใน การบรรจุ การขนส่ง		
3.1 ความสะดวกในการพกพา จัดเก็บและวางจำหน่าย	4.60	มากที่สุด
3.2 ความสะดวกในการขนส่ง	4.40	มากที่สุด
รวม	**4.38**	**มากที่สุด**

สรุปและอภิปรายผล

ผลการวิจัย 1) พฤติกรรมของกลุ่มตัวอย่างส่วนใหญ่มีความนิยมสครับผิว เนื่องจากกระแสความงาม ผู้บริโภคมีความสนใจในการดูแลผิวมากขึ้น ผิวที่ดีเป็นอีกหนึ่งปัจจัยที่ทำให้ผู้หญิงดูสวย ดังนั้นจึงมีคนมากมายให้ความสำคัญกับการบำรุงผิว (ลลิดา เกษมวงศ์, 2563) 2) ความต้องการผลิตภัณฑ์สครับผิวที่มีส่วนผสมจากธรรมชาติ โดยเฉพาะสมุนไพรที่มีคุณสมบัติช่วยให้ผิวนุ่ม ชุ่มชื่น ผิวกระจ่างใส จากความต้องการดังกล่าวนำไปสู่การพัฒนาสูตรผลิตภัณฑ์สำหรับสครับผิวกาย ซึ่งสมุนไพรที่มีคุณสมบัติเด่นเรื่องผิวขาวกระจ่างใส ได้แก่ มะขาม เนื่องจากอุดมไปด้วยวิตามินซี กรด AHA (Nadia, 2019) สำหรับน้ำผึ้งมีคุณสมบัติช่วยให้ผิวนุ่มชุ่มชื่น เรียบเนียน (Hadi, Omar's, & Awadh, 2016) ขมิ้นป้องกันการเสื่อมสภาพผิว ซึ่งสารเคอร์คูมินในขมิ้นมีคุณสมบัติต้านอนุมูลอิสระ ช่วยปกป้องผิวจากมลภาวะ แสงแดด และความร้อนที่เป็นสาเหตุหลักของการเสื่อมสภาพผิว (Kasprzak-Drozd et al., 2024) 3) การทดสอบผลิตภัณฑ์สครับผิวกาย ด้านสี กลิ่น การล้างออก และความสะอาด พบว่า กลุ่มตัวอย่างมีความชอบอยู่ในระดับมาก 4) การประเมินความพึงพอใจต่อบรรจุภัณฑ์และกราฟฟิกองค์ประกอบบรรจุภัณฑ์ ได้แก่ ด้านการออกแบบกราฟฟิกบนบรรจุภัณฑ์ ด้านรูปแบบบรรจุภัณฑ์ ด้านความเหมาะสมในการบรรจุ การขนส่ง พบว่า มีค่าเฉลี่ยอยู่ในระดับมาก และรูปแบบที่ได้รับการคัดเลือก ได้แก่ รูปแบบที่ 1 ชื่อตราสินค้า Lamoon Font The Bigmarker Script เส้นสายโค้งมน ดูอ่อนโยน ตัวอักษรหวัด ดูเป็นธรรมชาติ Art Work ที่ใช้ในแบรนด์เลือกโทนสีเขียวสื่อถึงธรรมชาติ ความสดชื่น หลักการในการตั้งชื่อแบรนด์สครับผิวสื่อถึงประโยชน์ของสครับผิว เช่น Lamoon สื่อถึงผิวเรียบเนียนออกเสียงง่าย ไม่ซับซ้อน

ข้อเสนอแนะ

จากการที่ผู้วิจัยได้ศึกษาพฤติกรรมผู้บริโภคและแนวทางในการพัฒนาผลิตภัณฑ์ สบู่สครับสมุนไพร โดยการศึกษาความต้องการของตลาด ในการใช้สบู่สครับสมุนไพรมีการสำรวจผู้บริโภคเพื่อเข้าใจความต้องการ ในการใช้งานการศึกษาคุณสมบัติและประโยชน์ของสมุนไพรที่นำมาใช้ในสบู่สครับ เพื่อให้ผลิตภัณฑ์มีคุณค่าทางสุขภาพและผลประโยชน์ที่ดีต่อผู้ใช้ ในงานวิจัยนี้ ได้แก่ เกลือหิมาลายัน ขมิ้น น้ำผึ้ง และมะขาม การออกแบบกราฟฟิกบนบรรจุภัณฑ์ให้สื่อถึงคุณสมบัติและประโยชน์ของผลิตภัณฑ์ และให้สะดวกต่อการใช้งาน และได้มีการทดสอบการยอมรับจากผู้บริโภค อย่างไรก็ตามในการออกแบบบรรจุภัณฑ์ครั้งนี้ ควรต้องพิจารณาเรื่องของต้นทุน โดยคำนึงถึงความคุ้มค่า และความต้องการของผู้บริโภค

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การพัฒนาคุณค่าในผลิตภัณฑ์เทียนหอมจากการใช้ Soy Wax

Creating Fantasy Scented Candle Products by Adding Value Through the Use of Soy Wax

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บทคัดย่อ

การวิจัยเรื่องการพัฒนาคุณค่าในผลิตภัณฑ์เทียนหอมมีวัตถุประสงค์เพื่อ (1) เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์เทียนหอมแฟนตาซี (2) เพื่อพัฒนาผลิตภัณฑ์ผ่านกระบวนการคิดเชิงออกแบบ (3) การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ (4) ศึกษาความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์ผลการศึกษาดังนี้ (1) พฤติกรรมการซื้อผลิตภัณฑ์เทียนหอมแฟนตาซีพบว่า กลุ่มตัวอย่างส่วนใหญ่เลือกซื้อเทียนหอมทุกเดือน คิดเป็น 28.9% จำนวนที่ซื้อ 2 – 3 ชิ้นต่อครั้ง คิดเป็น 41.9% เหตุผลในการเลือกซื้อ 3 ลำดับแรก (1) กลิ่นของเทียนหอม คิดเป็น 77.8% (2) คุณภาพและส่วนผสมของเทียน คิดเป็น 77.8% และ (3) การออกแบบผลิตภัณฑ์ คิดเป็น 46.7% คุณสมบัติของผลิตภัณฑ์ที่ต้องการซื้อ 3 ลำดับแรก (1) เทียนหอมเมื่อจุดแล้วทำให้ผ่อนคลาย คิดเป็น 73.3% (2) เทียนหอมมีรูปร่างและสีสันที่สวยงาม คิดเป็น 55.6% (3) การให้ประโยชน์มากกว่าแสงสว่าง เช่น ตกแต่งบ้าน คิดเป็น 53.3% หากมีเทียนหอมแฟนตาซีที่มีรูปแบบน่ารักเหมาะสำหรับโอกาสต่าง ๆ กลุ่มตัวอย่างสนใจรูปเค้ก 57.8% (2) การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ ชื่อ การออกแบบตราสินค้า ชื่อ แบรนด์ The Scented เป็นชื่อที่เรียบง่าย สื่อความหมายชัดเจน จดจำง่าย สื่อถึงผลิตภัณฑ์เทียนหอมได้ดี การใช้ฟอนต์แบบลายมือ (Cursive) สื่อถึงความอบอุ่น อ่อนโยน ผ่อนคลาย ซึ่งสอดคล้องกับบรรยากาศที่เทียนหอมมอบให้ โลโก้รูปหัวใจมีเปลวไฟ เปรียบเหมือนความมีชีวิตชีวา การทดสอบความพึงพอใจของผู้บริโภค พบว่า กลุ่มตัวอย่างเลือกรูปแบบที่ 1 คิดเป็น 100 % และมีความชอบกลิ่นวานิลามากที่สุดคิดเป็น 80%

คำสำคัญ: การพัฒนาคุณค่า, ผลิตภัณฑ์เทียนหอม

Abstract

The research on developing value in scented products aims to (1) analyze the demand for fantasy-themed scented products, (2) develop products through a design thinking process, (3) design packaging and graphics on the packaging, and (4) study satisfaction with the design and development of packaging. Findings are as follows: (1) the survey of consumer behavior results: majority of the sample group purchase fantasy-

themed scented products every month, accounting for 28.9%, 41.9% purchase 2-3 items per occasion, top three reasons for purchase are scent (77.8%), quality and ingredients (77.8%), and product design (46.7%). For desired product characteristics: the top three desired product characteristics are relaxation-inducing scent (73.3%), attractive shape and color (55.6%), and providing benefits beyond just fragrance, such as home decoration (53.3%). Sample group is interested in cute-themed scented products for various occasions, with 57.8% interested in cake-shaped designs. (2) Packaging design and graphics: the product name "The Scented" is straightforward, clear in meaning, easy to remember, and effectively communicates the product. The use of cursive fonts conveys warmth, gentleness, and relaxation, aligning with the ambiance the scented products provide. The logo, depicting a heart-shaped flame, symbolizes liveliness and vitality. (3) Consumer Satisfaction Testing: 100% of the sample group preferred design 1, with 80% expressing a strong preference for the vanilla scent.

Keywords: The Development of Values, Scented Candles

บทนำ

ในปัจจุบันนี้ ด้วยสังคมรอบตัวทั้งในที่ทำงานและที่โรงเรียนมีความกดดัน วิตกกังวล นอนไม่หลับ จนนำมาซึ่งสุขภาพด้านอื่นมากกว่าสมัยก่อน ทำให้ผู้คนมีความเครียดสะสมและมีความต้องการที่จะทำให้สมองผ่อนคลายหลังจากการที่ไปทำงานหรือไปเรียนและเหนื่อยมากมาทั้งวัน และเทียนหอมเป็นอีกหนึ่งทางเลือกที่จะสามารถทำให้สมองผ่อนคลายจากกลิ่นหอมอย่างอโรมาเธอราพีมาเป็นทางเลือกสำหรับผู้ประสบปัญหาความเครียดและยังมีรูปทรงที่สวยงามน่ามองสามารถนำเอาไปประดับบ้าน เพื่อความสวยงามได้อีกเช่นเดียวกัน

อโรมาเธอราพี (Aromatherapy) เป็นคำที่มีรากศัพท์มาจากภาษากรีกคำว่า Aroma หมายถึง ความหอมหรือกลิ่น และ Therapy จึงมีความหมายว่า บำบัดด้วยอากาศ ซึ่งรวมไปถึงการบำบัดรักษาด้วยการใช้กลิ่นหรือเครื่องหอมนั่นเอง ส่วนวัตถุดิบสำคัญสำหรับอโรมาเธอราพี คือ น้ำมันหอมระเหย สกัดจากธรรมชาติ น้ำมันหอมระเหยนั้นจะช่วยให้จิตใจสงบ ผ่อนคลายความเครียดและให้พลังความสดชื่นกระปรี้กระเปร่า ซึ่งก็มีการนำน้ำมันหอมระเหยมาแปรรูปหลากหลายรูปแบบ นอกจากบำบัดจิตใจเพื่อช่วยคลายความเครียดแล้ว ยังเพิ่มคุณค่าให้เทียนหอม คือ เป็นเทียนหอมที่ผลิตจาก Soy Wax จากวัตถุดิบธรรมชาติมีคุณค่าทั้งในด้านสุขภาพ ความปลอดภัย และการรักษาสิ่งแวดล้อม และคุณค่าที่ส่งมอบในโอกาสพิเศษต่าง ๆ ออกแบบ และสร้างขึ้นเพื่อการใช้งานในโอกาสพิเศษ เช่น งานเลี้ยงสังสรรค์ งานเยี่ยมบ้าน งานแต่งงาน งานเฉลิมฉลองคริสต์มาส หรือวันเกิด เป็นต้น แนวคิดคือ เทียนหอม ไม่ได้เป็นเพียงผลิตภัณฑ์ที่สร้างความหอมและแสงสว่างเท่านั้น แต่ยังสามารถพัฒนาให้มีคุณค่าเพิ่มเติมเพื่อดึงดูดผู้บริโภคและสร้างความแตกต่างให้กับแบรนด์ ซึ่งผลการพัฒนาเทียนหอมจาก Soy Wax ช่วยเสริมสร้างโอกาสในการทำงานและการจ้างงานในชุมชนท้องถิ่น ซึ่งส่งผลให้เกิดการเพิ่มรายได้และการเจริญเติบโตทางเศรษฐกิจในระดับท้องถิ่น ทำให้มีการลดอัตราการว่างงานและเสริมสร้างฐานะเศรษฐกิจในระดับพื้นที่ อีกทั้งการผลิตเทียนหอมจากวัตถุดิบธรรมชาติ เช่น Soy Wax ผลิตจากพืชพรรณธรรมชาติซึ่งดูดซับคาร์บอนไดออกไซด์จากชั้นบรรยากาศ ลดการปล่อยก๊าซเรือนกระจก เทียบกับเทียนหอมทั่วไปที่ผลิตจาก

ปิโตรเลียมที่ปล่อยก๊าซเรือนกระจกเมื่อเผาไหม้ อีกทั้งคุณสมบัติ Soy Wax การเผาไหม้สะอาด ปล่อยควันดำและเขม่าน้อยเมื่อเทียบกับเทียนหอมทั่วไปที่ปล่อยควันดำและเขม่าซึ่งเป็นอันตรายต่อสุขภาพและสิ่งแวดล้อม

โครงงานวิจัยนี้ จัดทำขึ้นเพื่อออกแบบผลิตภัณฑ์ที่ตอบสนองความต้องการของผู้บริโภค การออกแบบเทียนหอมด้วยกระบวนการคิดเชิงออกแบบรวมทั้งการศึกษาวิเคราะห์รูปแบบความต้องการการพัฒนาผลิตภัณฑ์รวมทั้งการออกแบบโลโก้ ฉลาก และบรรจุภัณฑ์

วัตถุประสงค์ของการวิจัย

1) เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์เทียนหอมแฟนตาซี

2) เพื่อพัฒนาผลิตภัณฑ์ผ่านกระบวนการคิดเชิงออกแบบ

3) เพื่อออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์

4) เพื่อศึกษาการยอมรับของผู้บริโภคที่มีต่อผลิตภัณฑ์ และความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์

แนวคิด ทฤษฎี กรอบแนวคิด

ในการศึกษาโครงงานเทียนหอมแฟนตาซี ทางด้านผู้จัดทำโครงงานได้รวบรวมแนวคิด ทฤษฎี โดยมีเนื้อหาและรายละเอียด ดังต่อไปนี้

2.1 ข้อมูลเกี่ยวกับ Soy Wax (ไขถั่วเหลือง)

Soy Wax (ไขถั่วเหลือง) เป็นเทียนจากธรรมชาติที่ผลิตจากน้ำมันถั่วเหลือง นิยมนำมาใช้ทำเทียนหอม โดยมีคุณสมบัติที่น่าสนใจ ดังนี้

- เป็นมิตรกับสิ่งแวดล้อม: Soy Wax ย่อยสลายได้ตามธรรมชาติจาก Soy Wax ที่เป็นวัสดุธรรมชาติและไม่มีส่วนผสมที่เป็นพิษ เมื่อใช้งานไม่ส่งกลิ่นอันตรายหรือส่งกลิ่นติดขัดผิดปกติ ซึ่งทำให้เทียนหอมจาก Soy Wax เป็นที่นิยมในกลุ่มผู้ใช้ที่มีความสำคัญต่อสุขภาพและสภาพแวดล้อม เป็นทางเลือกที่ดีกว่าพาราฟินเว็กซ์ (Paraffin Wax) ที่ได้จากปิโตรเลียม

- เผาไหม้สะอาด: Soy Wax ปล่อยควันน้อยกว่าเผาไหม้อย่างสะอาดและไม่สร้างควันหรือมลพิษเพราะมันไม่มีสารเคมีที่สามารถสร้างกลิ่นหรือควันที่อันตรายได้ จึงดีต่อสุขภาพและไม่ทำให้เกิดคราบดำบนภาชนะ

- กระจายกลิ่นได้ดี: Soy Wax มีความสามารถในการรับกลิ่นหอมได้ดี เมื่อผสมกับน้ำหอมหรือกลิ่นอื่น ๆ มันสามารถแพร่กระจายกลิ่นหอมอย่างดี และเนื้อหอมที่กลิ่นอยู่ได้นาน มีเนื้อสัมผัสที่นุ่มสามารถดูดซับและกระจายกลิ่นของน้ำมันหอมระเหยได้ดีกว่าพาราฟินเว็กซ์

- มีจุดเผาไหม้ต่ำและเผาไหม้เร็ว: ซึ่งทำให้เทียนหอมที่ผลิตจาก Soy Wax สามารถสร้างแสง และกลิ่นหอมได้เร็วขึ้น และเมื่อเทียนเผาไหม้จบมันจะแทบไม่มีขุยเหลือซึ่งทำให้ผู้ใช้รู้สึกพึงพอใจในประสบการณ์การใช้งาน

- การใช้งาน Soy Wax นิยมนำมาใช้ทำเทียนหอม เทียนอโรม่า เนื่องจากปลอดภัย มีกลิ่นรบกวนน้อย และกระจายกลิ่นได้ดี นอกจากนี้ยังสามารถใช้เป็นส่วนผสมของเครื่องสำอาง เช่น ลิปสติก บาล์มทาปาก โลชั่น เนื่องจากมีคุณสมบัติในการให้ความชุ่มชื้น

Soy Wax เป็นเทียนจากธรรมชาติ เผาไหม้สะอาด กระจายกลิ่นได้ดี มันจะสร้างกลิ่นหอมและแสงที่สวยงาม โดยไม่ส่งมลพิษหรือเกิดปัญหาต่อสิ่งแวดล้อม ดังนั้นเทียนหอมที่ผลิตจาก Soy Wax เป็นตัวเลือกที่ดีที่มีคุณค่าทั้งในด้านสุขภาพ ความปลอดภัย และการรักษาสิ่งแวดล้อม

ภาพที่ 1 ลักษณะไขถั่วเหลืองที่นำมาผลิตเทียนหอม
ที่มา: https://www.chankapor.com/

เทียนหอม เป็นผลิตภัณฑ์ที่ได้จากการนำไขถั่วเหลืองมาละลายรวมกันและเติมสีผงไม้ก้า และน้ำมันหอมระเหยข้นผสมให้เข้ากัน และใส่ลงในพิมพ์เพื่อขึ้นรูปหรือกดจากพิมพ์ให้มีรูปทรงตามความต้องการ อาจประกอบด้วยวัสดุอื่นเพื่อให้เกิดความสวยงาม มีไส้เทียนสำหรับจุดไฟ และมีกลิ่นหอมของน้ำมันหอมระเหย เทียนหอมเน้นการใช้ประโยชน์และความสวยงาม โดยมีกลิ่นหอมรูปแบบสวยและอาจจะใช้ไล่ยุงหรือแมลงได้อีกด้วย

เทียน เป็นสัญลักษณ์แห่งความหวังและแรงบันดาลใจ แสงเทียนสามารถสะท้อนได้ถึงความอบอุ่น เทียนที่ผลิตจากไขถั่วเหลืองเป็นที่ได้รับการนิยมเป็นอย่างมากเพราะเป็นมิตรต่อสิ่งแวดล้อมและมนุษย์ ด้วยคุณสมบัติของไขถั่วเหลืองและความปลอดภัยจากวัตถุดิบธรรมชาติ ควันจึงเป็นสีขาวระหว่างการใช้งานและมีควันน้อยมาก ไขถั่วเหลืองมีคุณสมบัติในการให้กลิ่นได้ดีกว่าไขชนิดอื่น ๆ ทำให้ง่ายต่อการใช้งาน เพราะสามารถนำไปทำเทียนหอมได้เลย โดยไม่ต้องผสมสารเคมีชนิดอื่น ๆ และจะมีกลิ่นเฉพาะตัว

2.2 แนวคิดการสร้างคุณค่าผลิตภัณฑ์

การสร้างคุณค่าให้กับผลิตภัณฑ์เกี่ยวข้องกับการพัฒนาและการนำเสนอผลิตภัณฑ์ที่มีคุณค่าสูงต่อลูกค้า แนวคิดในการสร้างคุณค่าให้กับผลิตภัณฑ์ อันได้แก่ คุณค่าด้านประโยชน์ใช้สอย (Utilitarian Value) คุณค่าด้านความสุข ความเพลิดเพลินทางอารมณ์ (Hedonic Value) คุณค่าด้านประสาทสัมผัส (Sensory Value) สำหรับคุณค่าผลิตภัณฑ์จากเทียนหอม Soy Wax ได้แก่

1. คุณค่าด้านประโยชน์ใช้สอย (Utilitarian Value)

- จุดเด่น เทียนหอมจาก Soy Wax เผาไหม้ได้นานกว่าเทียนหอมทั่วไป 30 - 50% ช่วยให้ผู้ใช้ประหยัดเงินและลดขยะ

- ความปลอดภัย เนื่องจากไขถั่วเหลืองเป็นวัตถุดิบธรรมชาติ ปลอดภัยต่อสุขภาพ ไม่ปล่อยสารพิษเมื่อเผาไหม้ เหมาะสำหรับเด็ก สตรีมีครรภ์ และผู้ที่มีภาวะภูมิแพ้

- ทำความสะอาดง่าย เนื่องจากน้ำตาเทียนจาก Soy Wax สามารถล้างออกด้วยน้ำและสบู่อ่อน ไม่ทิ้งคราบเหนียวเหนอะหนะ

- อเนกประสงค์ (สารพัดประโยชน์) โดยเทียนหอมจาก Soy Wax สามารถใช้เพื่อสร้างบรรยากาศผ่อนคลายหรือใช้เป็นของขวัญ

2. คุณค่าด้านความสุข ความเพลิดเพลินทางอารมณ์ (Hedonic Value)

- เทียนหอมจาก Soy Wax มีกลิ่นหอมที่ละมุน อ่อนโยน และหลากหลาย เหมาะกับความชอบส่วนตัว และช่วยสร้างบรรยากาศที่แตกต่าง
- กลิ่นหอมจากเทียนหอมช่วยให้รู้สึกผ่อนคลาย ลดความเครียด และส่งเสริมการนอนหลับ
- เทียนหอมช่วยสร้างบรรยากาศโรแมนติก เหมาะสำหรับการใช้ในโอกาสพิเศษ
- การใช้เทียนหอมช่วยเพิ่มความรู้สึกดี ผ่อนคลาย และสร้างความสุข

3. คุณค่าด้านประสาทสัมผัส (Sensory Value)

- เทียนหอมจาก Soy Wax มีเนื้อสัมผัสนุ่มนวล ลื่น ไม่เหนียวเหนอะหนะ
- เทียนหอมจาก Soy Wax มีรูปลักษณ์ที่สวยงาม หลากหลายดีไซน์ เหมาะกับการตกแต่งบ้าน
- แสงไฟจากเทียนหอมช่วยให้รู้สึกผ่อนคลาย สงบ สร้างบรรยากาศอบอุ่น อ่อนโยน ช่วยให้รู้สึกสบายตา ดังนั้น การสร้างคุณค่าให้กับผลิตภัณฑ์ไม่ได้หมายความว่า จะเน้นเพียงแค่คุณค่าทางเศรษฐกิจเท่านั้น แต่ยังเน้นไปที่คุณค่าทางสังคม สร้างความรู้สึกที่ดี และการเชื่อมั่นให้กับลูกค้าด้วย

2.3 แนวคิดเกี่ยวกับการบำบัดความเครียดด้วยกลิ่นหอมจากธรรมชาติ

ความเครียดเป็นปัญหาที่พบบ่อยในปัจจุบันส่งผลต่อทั้งสุขภาพกายและสุขภาพจิต การบำบัดความเครียดด้วยกลิ่นหอมจากธรรมชาติหรืออโรมาเธอราพี เป็นแนวทางที่ได้รับความนิยมโดยใช้กลิ่นหอมจากน้ำมันหอมระเหย สมุนไพร และดอกไม้ การบำบัดความเครียดด้วยกลิ่นหอมจากธรรมชาติเป็นแนวคิดที่ได้รับความนิยม เนื่องจากความเชื่อที่กล่าวถึงความสามารถของกลิ่นหอมที่สามารถมีผลต่อสุขภาพจิตและอารมณ์ของมนุษย์ได้ แนวคิดที่เกี่ยวกับการบำบัดความเครียดด้วยกลิ่นหอมจากธรรมชาติ (วิจิตรา หลวงอินทร์, 2561)

1. กลิ่นหอมที่ผ่อนคลาย เช่น กลิ่นจากพืชสมุนไพร เทียนหอมหรือน้ำมันหอมระเหย เชื่อว่าสามารถผ่อนคลายความเครียดและเสริมสร้างอารมณ์ที่ดีได้ เช่น กลิ่นหอมจากดอกไม้บางชนิดมักมีผลบวกต่ออารมณ์และสามารถช่วยลดความเครียดได้

2. ผลกระทบทางจิตวิญญาณ การสัมผัสกับกลิ่นหอมที่ผ่อนคลายและสบายตา อาจมีผลกระทบทางจิตวิญญาณ โดยเริ่มจากการกระตุ้นระบบประสาทกลางทำให้ผู้รับบรรยากาศมีความสบายผ่อนคลายและสงบใจมากขึ้น ซึ่งเป็นสิ่งสำคัญในการจัดการกับความเครียดและภาวะวิตกกังวล

3. การใช้กลิ่นหอมในการสร้างสถานที่สบายใจ การใช้กลิ่นหอมที่ผ่อนคลายเข้ามาในสถานที่ทำงานหรือที่อยู่อาศัยสามารถช่วยสร้างบรรยากาศที่สบายใจและผ่อนคลายได้ เช่น การใช้เทียนหอมหรือเครื่องพ่นหอมระเหยในห้องพักหรือบริเวณทำงาน

4. การใช้กลิ่นหอมระหว่างทำโยคะและการมาสสาจ กลิ่นหอมที่ผ่อนคลายเป็นที่นิยมในระหว่างการทำโยคะและการมาสสาจ เนื่องจากสามารถช่วยให้ผู้ฝึกโยคะหรือการมาสสาจมีสมาธิและผ่อนคลายได้มากขึ้น

5. การใช้กลิ่นหอมในการฟื้นฟูสมรรถภาพ ในบางกรณีกลิ่นหอมที่ผ่อนคลายสามารถใช้เพื่อช่วยในการฟื้นฟูสมรรถภาพหลังจากการเจ็บป่วยหรืออุบัติเหตุ ซึ่งมีผลกระทบทางจิตวิญญาณอย่างมาก

6. การใช้กลิ่นหอมในการลดความเครียดในงานด้านสุขภาพ ในงานด้านสุขภาพ เช่น การรักษาและการพยาบาล กลิ่นหอมที่ผ่อนคลายอาจถูกใช้เพื่อช่วยในการลดความเครียด และเสริมสร้างสภาพจิตใจที่ดีของผู้ป่วยและบุคลากรทางการแพทย์

2.4 แนวคิดเกี่ยวกับการบำบัดความเครียดด้วยกลิ่นหอมจากธรรมชาติ

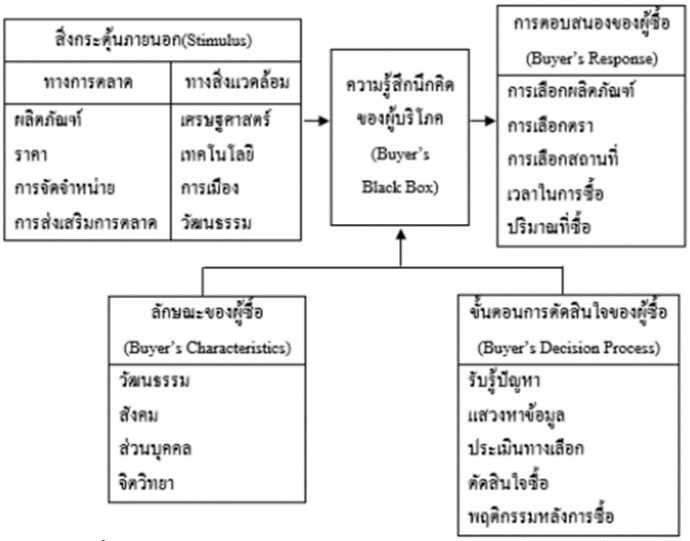
ความเครียด (Stress) ถูกนิยามขึ้นครั้งแรกในปี ค.ศ. 1936 โดย Hans Selye แพทย์และนักวิทยาศาสตร์ชาวแคนาดา Hans Selye ว่า "the non-specific response of the body to any demand for change" คือ การตอบสนองแบบไม่จำเพาะของร่างกายต่อความต้องการการเปลี่ยนแปลงใด ๆ ได้มีคนนิยามความเครียดไว้อย่างมากมาย เช่น ความเครียด คือ กระบวนการที่เกิดขึ้นเมื่อคนเราต้องปรับตัวหรือจัดการกับสถานการณ์แวดล้อมที่คุกคามหรือขัดขวางการปฏิบัติทางกายและทางจิตใจ (Taylor, 1986)

Aromatherapy หรือกลิ่นบำบัด เป็นการใช้น้ำมันหอมระเหยจากธรรมชาติ เพื่อส่งเสริมสุขภาพและความเป็นอยู่ที่ดี กลิ่นหอมเหล่านี้สามารถกระตุ้นระบบประสาทอัตโนมัติส่งผลต่ออารมณ์ความรู้สึกและความเครียด อโรมาเธอราพี (Aromatherapy) มาจากรากศัพท์ 2 คำคือ Aroma ซึ่งหมายถึง กลิ่นหอม และTherapy หมายถึง การบำบัดรักษา ดังนั้น Aromatherapy จึงหมายถึง การบำบัดรักษาด้วยกลิ่นหอม ซึ่งกลิ่นหอมส่วนใหญ่ได้มาจากน้ำมันหอมระเหย (Essential Oil) ได้จากส่วนต่าง ๆ ของพืช เช่น ดอกใบ รากผล เปลือกไม้ ยางไม้ หรือ เรจีน

Aromatherapy มีชื่อเป็นทางการ คือ สุคนธบำบัด ด้วยในภาวะที่เหนื่อยล้าและอ่อนเพลีย เครียด กลิ่นหอมช่วยบรรเทาความเครียด โดยเลือกเทียนหอมที่มีส่วนผสมของน้ำมันหอมระเหย หากได้สูดกลิ่นหอมที่ชอบจะช่วยให้รู้สึกสดชื่นผ่อนคลาย ซึ่งกลิ่นที่ว่านี้เราสามารถทำได้ง่าย ๆ เลือกได้หลายแบบ เช่น การจุดเทียนหอม การวางก้านไม้หอมกระจายกลิ่น หรือจะใช้เป็นเครื่องพ่นไอน้ำอโรม่า ซึ่งสามารถวางไว้ตามจุดต่าง ๆ ทั้งที่บ้านและที่ทำงาน การเลือกกลิ่นที่จะนำมาใช้ส่วนใหญ่ขึ้นอยู่กับความชอบส่วนบุคคล หรืออาจจะคำนึงถึงสรรพคุณของกลิ่นนั้น

2.5 ทฤษฎีพฤติกรรมผู้บริโภค

ทฤษฎีพฤติกรรมผู้บริโภค อธิบายถึงกลไกเบื้องหลังการตัดสินใจซื้อของผู้บริโภค ช่วยให้นักการตลาดเข้าใจแรงจูงใจ ความต้องการ และกระบวนการตัดสินใจของผู้บริโภค



ภาพที่ 1 รูปแบบพฤติกรรมผู้ซื้อ หรือ S-R Theory
ที่มา: ศิริวรรณ เสรีรัตน์, ศุภร เสรีรัตน, ปณิศา มีจินดา, จิระวัฒน อนุชชานนท, และ อรทัย เลิศวรรณวิทย (2560)

วิธีดำเนินการวิจัย

1. การสำรวจพฤติกรรมการซื้อผลิตภัณฑ์เทียนหอมแฟนตาซี (Exploratory Study) กลุ่มตัวอย่างที่เป็นผู้บริโภคเทียนหอมแฟนตาซีใช้แบบสอบถามออนไลน์ เพื่อเก็บรวบรวมข้อมูลเกี่ยวกับพฤติกรรมการซื้อ การรับรู้ และความสนใจเกี่ยวกับเทียนหอมแฟนตาซี การวิเคราะห์ข้อมูลด้วยค่าความถี่ (ร้อยละ)

2. พัฒนาผลิตภัณฑ์ตรงตามความต้องการผู้บริโภค จากผลการสำรวจความต้องการผลิตภัณฑ์เทียนหอมแฟนตาซี พบว่า เหตุผลสำคัญอันดับแรกในการเลือกซื้อ คือ กลิ่นของเทียนหอม กับคุณภาพและส่วนผสมของเทียน รองลงมา คือ การออกแบบผลิตภัณฑ์ จากผลการสำรวจสะท้อนว่ามุมมองของผู้บริโภคที่มีต่อเทียนหอมให้ความสำคัญกับความปลอดภัยของผลิตภัณฑ์ที่มีต่อสุขภาพ ดังนั้นในการจัดทำโครงงานนี้จึงเลือกใช้วัตถุดิบ Soy Wax

3. ออกแบบบรรจุภัณฑ์และตราสินค้า โดยหลักการในการออกแบบบรรจุภัณฑ์และตราสินค้าจากแนวการคิดเชิงออกแบบ ต้องเข้าใจความต้องการของผู้ใช้ นำมาสร้างไอเดียออกแบบบรรจุภัณฑ์จากฟังก์ชันการใช้งาน ความสวยงาม ความสะดวก สำหรับตราสินค้า ต้องการสื่อถึงอะไร ต้องการดึงดูดใคร โดยเทียนหอมแฟนตาซี ต้องการสื่อถึงกลิ่นหอมที่ผ่อนคลาย สำหรับโลโก้ ต้องสื่อถึงเอกลักษณ์ของแบรนด์

4. ทดสอบการยอมรับจากผู้บริโภค ประเมินความชอบความรู้สึกของผู้บริโภคต่อผลิตภัณฑ์ และสำรวจความพึงพอใจต่อการออกแบบบรรจุภัณฑ์และตราสินค้าโดยใช้แบบสอบถาม

ผลการวิจัย

(1) ผลการสำรวจเบื้องต้น จำนวน 50 ราย โดยส่วนใหญ่เป็นเพศหญิง (66.7%) อายุ 20 – 30 ปี (73.3%) ระดับการศึกษา (46.7%) อาชีพนักเรียนนักศึกษา (51.1%) รายได้ 5000 – 10,000 บาท (37.8%) พฤติกรรมการซื้อผลิตภัณฑ์เทียนหอมแฟนตาซี พบว่า กลุ่มตัวอย่างส่วนใหญ่เลือกซื้อเทียนหอมทุกเดือน คิดเป็น 28.9% จำนวนที่ซื้อ 2 – 3 ชิ้นต่อครั้ง คิดเป็น 41.9% เหตุผลในการเลือกซื้อ 3 ลำดับแรก (1) กลิ่นของเทียนหอม คิดเป็น 77.8% (2) คุณภาพและส่วนผสมของเทียน คิดเป็น 57.8% และ (3) การออกแบบผลิตภัณฑ์ คิดเป็น 46.7% คุณสมบัติของผลิตภัณฑ์ที่ต้องการซื้อ 3 ลำดับแรก (1) เทียนหอมเมื่อจุดแล้วทำให้ผ่อนคลาย คิดเป็น 73.3% (2) เทียนหอมมีรูปร่างและสีสันที่สวยงาม คิดเป็น 55.6% (3) การให้ประโยชน์มากกว่าแสงสว่าง เช่น ตกแต่งบ้าน คิดเป็น 53.3% หากมีเทียนหอมแฟนตาซีที่มีรูปแบบน่ารักเหมาะสำหรับโอกาสต่าง ๆ กลุ่มตัวอย่างสนใจรูปเค้ก 57.8% ข้อเสนอแนะเพิ่มเติม รูปลักษณ์ของเทียนหอมต้องไม่แตกหักง่าย มีหลากหลายแบบ มีหลากหลายกลิ่น การคิดค้นสูตรใหม่ ๆ ให้ไม่ซ้ำกัน

(2) ดำเนินการพัฒนาผลิตภัณฑ์โดยมีขั้นตอนการดำเนินงานดังนี้

1. เตรียมวัสดุอุปกรณ์ที่จะต้องใช้ในการทำเทียนหอม

ไขถั่วเหลือง (แบบเม็ด)

น้ำมันหอมระเหย

สีไม้ก้า(สีผสมเทียน)

ไส้เทียน

พิมพ์ซิลิโคน

ของตกแต่ง

ภาพที่ 2 วัสดุ อุปกรณ์ที่นำมาผลิตเทียนหอม
ที่มา: https://shop.line.me/@littlelattehouse

2. ดำเนินการพัฒนาผลิตภัณฑ์โดยการสร้างคุณค่าให้กับผลิตภัณฑ์ใช้วัตถุดิบจากธรรมชาติปลอดภัยต่อสุขภาพ มีขั้นตอนการดำเนินงานดังนี้

2.1) นำไขถั่วเหลืองไปใส่ภาชนะทนไฟ ใช้เวลาประมาณ 5 นาที เพื่อทำการละลาย

2.2) ตั้งพักให้อุ่น ความร้อนไม่เกิน 40 องศา เพื่อไม่ให้มีผลต่อน้ำมันหอมระเหย วิธีการทดสอบอย่างง่าย ๆ คือ ให้ใช้นิ้วสัมผัสกับภาชนะ และ นับ 1 ถึง 10 หากทนได้แสดงว่าใช้ได้แล้ว

2.3) เลือกผสมสีที่ต้องการลงในเทียนที่ได้อุณหภูมิที่พอดีแล้วใช้ไม้คนให้เข้ากัน

2.4) หยดน้ำมันหอมระเหยลงไปพอประมาณ 3 - 5 หยด แล้วคนให้เข้ากัน

2.5) เทส่วนผสมทั้งหมดลงในบรรจุซิลิโคนที่เตรียมไว้หย่อนใส้เทียนลงไป ให้ใส้เทียนอยู่ตรงกลางรอจนเนื้อเทียนแข็งตัว

2.6) หลังจากเนื้อเทียนแข็งตัวดีแล้ว นำไขถั่วเหลืองที่เตรียมไว้สำหรับราดหน้าตกแต่งหน้าเค้กให้สวยงาม

2.7) นำเทียนหอมที่ทำเสร็จแล้วมาใส่บรรจุภัณฑ์ที่เราได้เตรียมไว้

ภาพที่ 3 กระบวนการพัฒนาผลิตภัณฑ์

(3) การออกแบบตราสินค้า การตั้งชื่อสินค้าเป็นส่วนสำคัญของการสร้างภาพลักษณ์แบรนด์ควรสื่อถึงความหมาย คุณสมบัติ ประโยชน์ของสินค้า สำหรับชื่อแบรนด์ The Scented เป็นชื่อที่เรียบง่าย สื่อความหมายชัดเจนจดจำง่าย สื่อถึงผลิตภัณฑ์เทียนหอมได้ดี การใช้ฟอนต์แบบลายมือ (Cursive) สื่อถึงความอบอุ่น อ่อนโยนผ่อนคลาย ซึ่งสอดคล้องกับบรรยากาศที่เทียนหอมมอบให้ โลโก้รูปหัวใจมีเปลวไฟเปรียบเหมือนความมีชีวิตชีวา

แบบที่ 1 แบบที่ 2

ภาพที่ 4 รูปแบบตราสินค้า

(4) การทดสอบความพึงพอใจของผู้บริโภค พบว่า กลุ่มตัวอย่างเลือกรูปแบบที่ 1 คิดเป็น 100 % และความพึงพอใจต่อเทียนหอมแฟนตาซีกลิ่นวานิลลา อยู่ระดับมากที่สุดคิดเป็น 80%

สรุปและอภิปรายผล

ผลการศึกษาวัตถุประสงค์ข้อที่ 1 เพื่อวิเคราะห์ความต้องการผลิตภัณฑ์เทียนหอมแฟนตาซี พบว่า เหตุผลในการเลือกซื้อด้านที่สำคัญที่สุดคือ กลิ่นของเทียนหอม รองลงมาคือ คุณภาพและส่วนผสมของเทียน และการออกแบบผลิตภัณฑ์ ตามลำดับ จากผลการสำรวจพฤติกรรมการซื้อเทียนหอมแฟนตาซี พบว่า ผู้บริโภคให้ความสำคัญกับทั้งกลิ่นหอมและคุณภาพของเทียนหอม สะท้อนให้เห็นถึงการเปลี่ยนแปลงมุมมองของผู้บริโภคที่มีต่อเทียนหอม ที่ไม่ได้จำกัดอยู่แค่ความหอมเพียงอย่างเดียวแต่ยังให้ความสำคัญกับความปลอดภัยของผลิตภัณฑ์ที่มีต่อสุขภาพอีกด้วย สอดคล้องกับงานวิจัยจาก Euromonitor International (2024) พบว่า ตลาดเทียนหอมทั่วโลกมีมูลค่ากว่า 7.4 พันล้านดอลลาร์สหรัฐ ในปี ค.ศ. 2021 และคาดว่าจะเติบโตอย่างต่อเนื่องไปจนถึงปี ค.ศ. 2026 หนึ่งในปัจจัยสำคัญที่ขับเคลื่อนการเติบโตนี้คือ ผู้บริโภคที่คำนึงถึงสุขภาพมากขึ้น งานวิจัยจาก Mintel (2022) พบว่า 72% ของผู้บริโภคในสหรัฐอเมริกาอ่านฉลากผลิตภัณฑ์เทียนหอมก่อนซื้อ และงานวิจัยจาก National Candle Association (2023) พบว่า 65% ของผู้บริโภคในสหรัฐอเมริกากังวลเกี่ยวกับความปลอดภัยของเทียนหอม

ผลการศึกษาวัตถุประสงค์ข้อที่ 2 การพัฒนาผลิตภัณฑ์เทียนหอมแฟนตาซีให้มีคุณค่าโดยใช้วัตถุดิบจากธรรมชาติปลอดภัย 100% กลิ่นน้ำมันหอมระเหยวานิลลามีคุณสมบัติผ่อนคลายความเครียดและความวิตกกังวลเช่นกัน บทความวิจัยจาก Healthline ได้ทำการศึกษาและวิจัยเกี่ยวกับวานิลลา ซึ่งได้กล่าวว่า วานิลลาอุดมไปด้วยสารต้านอนุมูลอิสระที่มีส่วนช่วยซ่อมแซมร่างกายในระดับโมเลกุล และยังช่วยลดความเสี่ยงของการเกิดโรคมะเร็งและเบาหวาน และกลิ่นของวานิลลายังช่วยลดคอเลสเตอรอลที่ไม่ดีภายในร่างกายที่เป็นสาเหตุหลักของการเกิดโรคหัวใจ และจากผลการศึกษาในปี ค.ศ. 2018 ที่ตีพิมพ์โดย Indian Journal of Experimental Biology ได้ทำการทดลองการลดระดับของคอเลสเตอรอลในร่างกายมนุษย์โดยการนำกลิ่นวานิลลามาให้มนุษย์สูดดมในปริมาณที่พอดีต่อร่างกาย ทำการทดลองเป็นระยะเวลา 45 วัน หลังจากครบกำหนดระยะเวลาพบว่า มีการลดลงของระดับคอเลสเตอรอลอย่างมีนัยสำคัญ และจากการศึกษายังพบว่า วานิลลายังทำหน้าที่เป็นยากล่อมประสาทอ่อน ๆ ช่วยขจัดอาการนอนไม่หลับอีกด้วย การออกแบบเทียนหอมแฟนตาซีเป็นรูปเค้กอาจเนื่องจากประโยชน์ด้านการใช้งานของผู้บริโภค รูปแบบเค้กดึงดูดความสนใจของผู้บริโภคที่มองหาสินค้าตกแต่งบ้านหรือของขวัญที่แหวกแนวอีกทั้งเหมาะกับการตกแต่งบ้านหรือเป็นของขวัญ (Ahmad, Khera, Hanif, Ayub, & Jilani, 2020).

ผลการศึกษาวัตถุประสงค์ข้อที่ 3 การออกแบบบรรจุภัณฑ์และกราฟฟิกบนบรรจุภัณฑ์ ออกแบบตราสินค้าชื่อแบรนด์ The Scented ซึ่งหลักการตั้งชื่อแบรนด์ คือ ชื่อแบรนด์ควรสั้น กระชับ ออกเสียงง่าย จดจำง่าย ไม่ควรยาวหรือซับซ้อนจนเกินไป (มนวดี ศิริเปรมฤดี, 2565) การออกแบบโลโก้ใช้ตัวอักษรฟอนต์ Cursive (แบบลายมือ) การเขียนด้วยมือมักมีเส้นสายที่ไม่เรียบเป๊ะ มีความพลิ้วไหวสื่อถึงความอบอุ่น อ่อนโยน ผ่อนคลาย กล่าวได้ว่า ฟอนต์เป็นองค์ประกอบสำคัญของโลโก้ มีบทบาทสำคัญในการสื่อถึงอารมณ์ ความรู้สึก และเอกลักษณ์ของแบรนด์ การเลือกใช้ฟอนต์ที่เหมาะสมจะช่วยให้โลโก้โดดเด่น น่าจดจำ และสร้างการจดจำให้กับแบรนด์ (โยษิตา ชีวาสัจจาสกุล, 2566) สัญลักษณ์โลโก้ รูปหัวใจมีเปลวไฟ คือ รูปหัวใจ เป็นสัญลักษณ์ที่เกี่ยวข้องกับความรักและความผูกพัน เปลวไฟ เปรียบเหมือนความมีชีวิตชีวา กล่าวว่า โลโก้ เป็นส่วนหนึ่งของภาพลักษณ์แบรนด์ ควรออกแบบให้สอดคล้องเอกลักษณ์ คุณค่าของ

ผลิตภัณฑ์ สอดคล้องกับ Brian (2019) ที่ศึกษาโลโก้ที่รูปแบบต่าง ๆ ช่วยสร้างภาพลักษณ์และบุคลิกภาพของแบรนด์ให้แตกต่างกันไปในสายตาของผู้บริโภคอย่างไร พบว่า 80% ของผู้บริโภค ตัดสินใจซื้อสินค้าหรือบริการจากแบรนด์ที่มีโลโก้ที่น่าจดจำ

ผลการศึกษาวัตถุประสงค์ข้อที่ 4 ศึกษาการยอมรับของผู้บริโภคที่มีต่อผลิตภัณฑ์และความพึงพอใจต่อการออกแบบพัฒนาบรรจุภัณฑ์ พบว่า กลุ่มตัวอย่างจำนวน 100% ให้การยอมรับกลิ่นวานิลลาและมีความชอบมากที่สุด คิดเป็น 80% ของกลุ่มตัวอย่าง

ข้อเสนอแนะ

1. การปรับปรุงผลิตภัณฑ์และพัฒนาบรรจุภัณฑ์เทียนหอมให้สามารถใช้งานได้มีประสิทธิภาพมากยิ่งขึ้น ควรใช้วัสดุของพิมพ์เทียนหอมที่ไม่นำความร้อนหรือใช้เศษจากวัสดุตามธรรมชาติ เช่น กะลาเป็นที่รองสำหรับวางเทียนหอม

2. ควรเพิ่มจำนวนรูปแบบและกลิ่นของผลิตภัณฑ์เทียนหอม รวมทั้งปรับเปลี่ยนเพิ่มสีของเทียนหอมให้มีหลากหลายสีสันมากขึ้น เช่น เพิ่มสีพาสเทลที่ทำให้เทียนหอมน่ารักเพิ่มขึ้น

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(ระดับชาติ)

กลุ่มวิทยาศาสตร์

ประสิทธิผลผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา

Effectiveness of Rang Chuet herbal soap products of the Prik community herbal processing community enterprise Sadao District, Songkhla Province.

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บทคัดย่อ

การวิจัยนี้เป็นการศึกษาแบบกึ่งทดลอง มีวัตถุประสงค์เพื่อ 1) เปรียบเทียบผลการใช้สบู่สมุนไพรรางจืดของกลุ่มทดลองที่ใช้สบู่สมุนไพรรางจืดและกลุ่มควบคุมที่ไม่ได้ใช้สบู่สมุนไพรรางจืด 2) ความพึงพอใจของกลุ่มทดลองที่มีต่อสบู่สมุนไพรรางจืด กลุ่มตัวอย่าง คือ กลุ่มเกษตรกรตำบลปริก อำเภอสะเดา จังหวัดสงขลา จำนวน 60 คน แบ่งเป็นกลุ่มทดลอง จำนวน 30 คน ให้ใช้สบู่สมุนไพรรางจืดในการทำความสะอาดร่างกาย (เช้าและเย็น) เป็นเวลา 14 วัน และกลุ่มควบคุม จำนวน 30 คน ให้ใช้สบู่สูตรพื้นชนิดเดียวกันในการทำความสะอาดร่างกาย (เช้าและเย็น) เป็นเวลา 14 วัน ด้วยวิธีการสุ่มแบบเจาะจง (Consecutive Sampling) เครื่องมือวิจัย คือ แบบประเมินภาวะสุขภาพผิวหนัง และแบบสอบถามความพึงพอใจต่อสบู่สมุนไพรรางจืด วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนาไคสแควร์ และการทดสอบค่าทีด้วย Paired samples t-test และ Independent t-test ผลการวิจัยสรุปได้ดังนี้

1) กลุ่มทดลองมีลักษณะอาการคัน ผดผื่นตามผิวหนังลดลงอย่างมีนัยสำคัญ (p-value < 0.05) เมื่อเปรียบเทียบกับกลุ่มควบคุม อีกทั้งยังไม่พบอาการไม่พึงประสงค์

2) กลุ่มทดลองมีความพึงพอใจต่อผลิตภัณฑ์สบู่สมุนไพรรางจืดรวมทุกด้านอยู่ในระดับมาก ผลการวิจัยแสดงให้เห็นว่า ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา ให้ผลดีในการบรรเทาอาการคัน ผดผื่น ตามผิวหนัง ผิวนุ่มชุ่มชื่นไม่แห้ง และมีศักยภาพในการพัฒนาต่อยอดในเชิงพาณิชย์

คำสำคัญ: รางจืด, สบู่สมุนไพรรางจืด, ภาวะสุขภาพผิวหนัง

Abstract

This research quasi-experimental study aimed to 1) Comparison of the results of using *Thunbergia laurifolia* herbal soap of the experimental group using Rang Chuet herbal soap and the control group that use soap base without Rang Chuet herbal soap. 2) The satisfaction of the experimental group towards *Thunbergia laurifolia* herbal soap. The sample group was a group of farmers in Prik Subdistrict, Sadao District, Songkhla Province, consisting of 60 people were divided into 2 groups; an experimental group consisted of 30 people, using *Thunbergia laurifolia* herbal soap to clean the body (morning and evening) for 14 days and a control group of 30 people, used normal soap to clean the body (morning and evening) for 14 days by purposive random sampling. Research tools include skin health assessment form and satisfaction questionnaire on *Thunbergia laurifolia* herbal soap. The data were analyzed using descriptive statistic, chi-square, paired samples t-test and independent t-test

The findings can be summarized as follow:

1) The experimental group had a significant decrease in itching and rashes on the skin. (p-value<0.05). When comparing the control group. Moreover, no adverse reaction was observed.

2) The experimental group was satisfied with all aspects of *Thunbergia laurifolia* herbal soap products at a high level.

Keywords: *Thunbergia laurifolia*, *Thunbergia laurifolia* herbal soap, Skin health

บทนำ

รางจืด *(Thunbergia laurifolia Lindl.)* เป็นพืชสมุนไพรพื้นบ้านที่มีสรรพคุณในการแก้ร้อนใน แก้อาการกระหายน้ำ ถอนพิษไข้ รักษาแผลไฟไหม้ น้ำร้อนลวก บรรเทาอาการผื่นแพ้ต่าง ๆ ช่วยทำลายพิษจากยาฆ่าแมลง ยาฆ่าหญ้า ช่วยแก้พิษจากสัตว์ที่เป็นพิษและพืชที่เป็นพิษ ต่อต้านพิษจากสารตะกั่วต่อสมอง ช่วยถอนพิษจากยาเบื่อชนิดต่าง ๆ ช่วยแก้อาการเมาค้าง ช่วยลดระดับน้ำตาลในเลือดและแก้อาการอักเสบต่าง ๆ (Faculty of Pharmacy, Mahidol University, 2011) มีการศึกษาองค์ประกอบทางเคมีของใบรางจืด พบสารกลุ่มสเตอรอล (Tansuwan, 1983) สารกลุ่มฟีนอลิก (Oonsivilai, et al., 2007) สารกลุ่มแคโรทีนอยด์ สารกลุ่มไกลโคไซด์ (Kanchanapoom, Kasai, Yamasaki, 2002) สารกลุ่มสเตียรอยด์หลายชนิด และกรดแอมิโน (Chittuengngam, 1979) และใบของรางจืดมีสารออกฤทธิ์ต้านพิษ (Chuthaputti, 2010) และในปี 2554 คณะกรรมการพัฒนาระบบยาแห่งชาติ ได้บรรจุรางจืดเข้าในบัญชียาหลักแห่งชาติ พ.ศ. 2554 หมวดบัญชี ยาจากสมุนไพร ในรูปแบบยาแคปซูล และชาชง โดยมีข้อ

บ่งใช้ คือ ถอนพิษไข้ แก้ร้อนใน และถอนพิษเบื่อเมา รางจืด จึงมีสถานะเป็นยาสมุนไพรต้านพิษที่อยู่ในบัญชียาหลักแห่งชาติตลอดมาจนถึงปัจจุบัน (National Drug System Development Committee, 2019)

วิทยาลัยชุมชนสงขลา ดำเนินการพัฒนาทักษะอาชีพตามความต้องการของประชาชน และฐานทรัพยากรที่มีอยู่ โดยในพื้นที่ตำบลปริก อำเภอสะเดา จังหวัดสงขลา มีสมุนไพรรางจืดจำนวนมากทั้งจากการเติบโตเองตามธรรมชาติ และจากการปลูกของประชาชนในพื้นที่ เพื่อนำมาใช้ประโยชน์ทางยาตามสรรพคุณของรางจืด คณะผู้รับผิดชอบโครงการภายใต้โครงการพัฒนาทักษะอาชีพตามความต้องการในเขตเศรษฐกิจพิเศษ จังหวัดสงขลา วิทยาลัยชุมชนสงขลา จึงดำเนินการพัฒนาทักษะอาชีพให้กับกลุ่มแม่บ้านและเกษตรกรในพื้นที่โดยนำสมุนไพรรางจืดมาพัฒนาเป็นผลิตภัณฑ์สบู่ก้อนสมุนไพรรางจืด โดยมีส่วนประกอบหลักคือ กลีเซอลีน และน้ำต้มสุกรางจืด ในปริมาณสัดส่วนตามการผลิต โดยหลักคิดดังกล่าวเกิดจากผลการศึกษาวิจัยที่หลากหลายและเป็นข้อมูลเชิงประจักษ์ที่ว่า การนำสมุนไพรมาใช้เป็นส่วนผสมของสบู่ โดยเลือกสมุนไพรตามภูมิปัญญาท้องถิ่นที่มีสรรพคุณที่เหมาะสมกับคุณสมบัติที่ต้องการของสบู่จะได้สบู่ที่มีส่วนผสมระหว่างกรดไขมันกับเบสหรือด่างในอัตราส่วนที่ทำให้สามารถทำความสะอาดที่มีค่า pH อยู่ระหว่าง 8 - 10 ซึ่งไม่เป็นอันตรายต่อผิว มีคุณภาพ ปลอดสารเคมี เหมาะสมกับผิวในแต่ละช่วงวัย (Thanesuan, 2016) และจากสรรพคุณของใบรางจืด นำมาต้มน้ำอาบโดยใช้อาบทุกวันเป็นเวลา 5 - 7 วัน สามารถลดอาการแพ้ ผดผื่นคัน แก้โรคผิวหนัง อีกทั้งรางจืดเป็นพืชสมุนไพรที่มีสรรพคุณหลากหลายที่เหมาะสมในการนำมาทำเป็นสบู่ โดยสบู่สมุนไพรรางจืดมีสรรพคุณที่ช่วยคืนความชุ่มชื่น ปรับสมดุลของผิว ลดรอยแผลเป็น รักษาโรคผิวหนัง แก้ผื่นคันจากการแพ้สารต่าง ๆ ได้ (Somruedee, et al., 2017) จากฐานทรัพยากรที่มีอยู่ในพื้นที่ กรรมวิธีการผลิตสบู่ก้อนที่ไม่ซับซ้อนสามารถทำได้ด้วยตนเอง เหมาะสมเป็นอย่างยิ่งที่จะพัฒนาผลิตภัณฑ์จากรางจืดต้นทุนต่ำเป็นผลิตภัณฑ์ชุมชนสบู่สมุนไพรรางจืด

ดังนั้น คณะผู้วิจัย ภายใต้โครงการพัฒนาทักษะอาชีพตามความต้องการในเขตเศรษฐกิจพิเศษ วิทยาลัยชุมชนสงขลา จึงทำการศึกษาและรวบรวมองค์ความรู้เพื่อนำมาต่อยอดในการใช้สมุนไพรรางจืดในการพัฒนาเป็นผลิตภัณฑ์ เพื่อดูแลสุขภาพผิวหนัง และทำการทดลองประสิทธิภาพของผลิตภัณฑ์จากการพัฒนา ดำเนินการศึกษาเปรียบเทียบลักษณะสุขภาพผิวหนังระหว่างการใช้ผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา กับการใช้ผลิตภัณฑ์สบู่พื้น และความพึงพอใจของผู้ใช้สบู่สมุนไพรรางจืด ซึ่งการศึกษาครั้งนี้จะเป็นข้อมูล เชิงประจักษ์ในการใช้สมุนไพรรางจืดเป็นส่วนประกอบหลักในการพัฒนาเป็นผลิตภัณฑ์ เพื่อดูแลสุขภาพทางผิวหนัง รวมทั้งนำมาต่อยอดในการพัฒนาผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา ให้เป็นไปตามเกณฑ์ที่กำหนดคุณภาพสำหรับสบู่ก้อนผสมสมุนไพร ของประกาศสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม เรื่อง กำหนดมาตรฐานอุตสาหกรรมเอส ประเภทสบู่ก้อนผสมสมุนไพร เพื่อส่งเสริมและยกระดับคุณภาพผลิตภัณฑ์ให้เป็นที่ยอมรับของตลาด สร้างความเชื่อมั่นให้กับผู้บริโภคมั่นใจได้ว่า สบู่สมุนไพรรางจืดมีความปลอดภัย และไม่เป็นอันตรายต่อผิวหนัง

วัตถุประสงค์ของการวิจัย

1. เพื่อเปรียบเทียบผลการใช้สบู่สมุนไพรรางจืดของกลุ่มทดลองที่ใช้สบู่สมุนไพรรางจืดและกลุ่มควบคุมที่ไม่ได้ใช้สบู่สมุนไพรรางจืด

2. เพื่อศึกษาความพึงพอใจของกลุ่มทดลองที่มีต่อสบู่สมุนไพรรางจืด ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา

แนวคิด ทฤษฎี กรอบแนวคิด

1. รางจืด (Thunbergia laurifolia Lindl) ชื่อสามัญ Laurel clock vine อยู่ในวงศ์ Acanthaceae มีชื่ออื่น กำลังช้างเผือก ขอบชะนาง เครือเขาเขียว ยาเขียว (ภาคกลาง) คาย รางเย็น (ยะลา) จอลอดิเออ ซั้งกะ ปั้งกะล่ะ พอหน่อเตอ (กะเหรี่ยง-แม่ฮ่องสอน) ดุเหว่า (ปัตตานี) ทิดพุด (นครศรีธรรมราช) น้ำนอง (สระบุรี) ย่ำแย้ แอดแอ (เพชรบูรณ์) เป็นสมุนไพรประเภทไม้เถาชนิดหนึ่งในการแพทย์แผนไทย ตำรายาไทยใช้ใบสดตำคั้นน้ำกินแก้ไข้ และถอนพิษ ที่ผ่านมานักวิจัยไทยให้ความสนใจกับฤทธิ์ถอนพิษของรางจืดเป็นพิเศษ และได้ศึกษาวิจัยฤทธิ์ของสารสกัดรางจืดในการแก้พิษของสารพิษต่าง ๆ ทั้งในระดับพรีคลินิกและคลินิก เพื่อหาหลักฐานทางวิทยาศาสตร์ยืนยันสรรพคุณดังกล่าว ข้อมูลที่ได้จากการวิจัยและประวัติการใช้ยาจากสมุนไพรรางจืดในโรงพยาบาลชุมชนหลายแห่งมามากกว่า 10 ปี ทำให้รางจืดได้รับการคัดเลือกเป็นยาพัฒนาจากสมุนไพรรายการหนึ่งในบัญชียาจากสมุนไพร ในส่วนของเภสัชตำรับโรงพยาบาลในบัญชียาหลักแห่งชาติ (ฉบับที่ 2) พ.ศ. 2554 (Anchalee, 2010)

2. องค์ประกอบทางเคมีของใบรางจืด

ดอก apigenin; cosmosin; delphinidin-3-5-di-o-β-D-glucoside

ใบ phytol, stigmaste-5.22-dien-3-ol, chlorophyll, carotenoid, lutein

ส่วนที่อยู่เหนือดิน apigenin-6-C-glucoside benzyl-β-(2'-O-β-D-glucopyranosyl) glucoside; benzyl-β-D-glucopyranoside: grandifloric acid; hex-trans-2-en-1-ol-β-D-glucoside; N-hexyl-β-D-glucoside; stilbericoside-3'-O- β-D-glucopyranoside vicenin 2 (Oonsivilai et al., 2007)

3. การศึกษาทางคลินิกจากการใช้รางจืด

ฤทธิ์ต้านพิษของสารกำจัดศัตรูพืช นักวิจัย ศึกษาฤทธิ์ของรางจืดในการต้านพิษของสารพิษต่าง ๆ ได้แก่ การศึกษาฤทธิ์ต้านพิษของสาร กำจัดศัตรูพืชกลุ่มออร์กาโนฟอสเฟต (Organophosphates) เช่น โฟลิดอล Folidol หรือเมทิลพาราไทออน (Methyl Parathion), พาราไทออน (Parathion) และยาฆ่าหญ้าพาราควอต (Pamquint) ในสัตว์ทดลอง โดยให้สารสกัดด้วยน้ำของรางจืดทางปากหลังจากได้รับสารกำจัดศัตรูพืชเหล่านั้น พบว่า ช่วยลดพิษของสารกำจัดศัตรูพืชได้ ทำให้อัตราการตายของหนูทดลองลดลง (Phanee, 1980) สำหรับการศึกษากลไกการออกฤทธิ์ต้านการพิษของรางจืดนั้น เมื่อศึกษาผลของสารสกัดรางจืดต่อระดับเอนไซม์โคลีนเอสเทอเรส (Cholinesterase) ในหนูแรกที่ได้รับพาราไทออนหรือ เมโทมิล (Methomyl) ซึ่งเป็นสารกำจัดศัตรูพืชกลุ่มคาร์บาเมต พบว่า กลไกการต้านพิษยากำจัดศัตรู พืชของ

รางจืด อาจเนื่องจากสารสกัดรางจืดทำให้ระดับเอนไซม์โคลีนเอสเทอเรมเพิ่มขึ้น หรือลดการยับยั้งเอนไซม์โคลีนเอสเทอเรส ต้านพิษของเมโทมิลโดยทำให้จำนวนเซลล์ประสาท เส้นใยประสาท และความเข้มข้นของเอนไซม์ Acetylcholine Esterase ที่ลดลงจากพิษของเมโทมิลกลับเพิ่มขึ้น (Kanokwan, 2014)

สารสกัดใบและกิ่งราง ด้วย 1% Tween 80 และเอทานอลด้วยความเข้มข้น 2.5% ทำการทดสอบกับเห็บวัวควาย *(Boophilus microplus)* โดยวิธีการแช่ (Dipping Method) จากนั้นบันทึกอัตราการตายของเห็บหลังการแช่ในเวลา 24 ชั่วโมง 48 ชั่วโมง และ 7 วัน พบว่า สารสกัดจากใบและกิ่งของรางจืดไม่มีผลต่ออัตราการตายของเห็บวัวควาย สารสกัดเหง้าแห่งรางจืดด้วยปิโตรเลียมอีเทอร์ และการสกัดน้ำเหง้าสดรางจืด เมื่อนำไปทดสอบฤทธิ์ฆ่าแมลงวันทอง *(Dacus corsalis)* และบันทึกอัตราการตายของแมลงที่ 1, 3, 6, 9, 12, 24 ชั่วโมง พบว่า สารสกัดเหง้าแห้งด้วยปิโตรเลียมอีเทอร์ และสารสกัดน้ำเหง้าสดมีผลทำให้อัตราการตายของแมลงผลไม้ เท่ากับ 9.5, 9.5, 9.5, 9.5, 9.5, 95 และ 21.5, 24, 24, 24, 24, 24 % ตามลำดับ ซึ่งถือว่าสารสกัดดังกล่าวมีฤทธิ์ฆ่าแมลงผลไม้ได้น้อย (Panida, 2011)

กลุ่มงานการแพทย์แผนไทย โรงพยาบาลโป่งน้ำร้อน ตำบลทับไทร อำเภอโป่งน้ำร้อน จังหวัดจันทบุรี ผลิตสบู่จากส่วนผสมน้ำใบรางจืด ใช้ในการรักษาผู้ป่วยที่มีอาการคันตามผิวหนังจากการประกอบอาชีพทำสวนผลไม้และมีการใช้สารเคมีในการฉีดพ่นผลผลิต โดยกำหนดให้ใช้สบู่จากส่วนผสมน้ำใบรางจืดอาบน้ำวันละ 2 ครั้ง (เช้าและเย็น) ซึ่งผู้ป่วยที่ได้ใช้สบู่จากส่วนผสมน้ำใบรางจืด มีอาการคันตามผิวหนังลดลงจนถึงไม่มีอาการคันตามผิวหนัง หลังจากใช้ติดต่อกัน 14 วัน โดยใบรางจืดมีสรรพคุณช่วยถอนพิษแมลงสัตว์กัดต่อย บรรเทาอาการผื่นแพ้ ผื่นคัน ถอนพิษผื่นคันจากสารเคมีต่าง ๆ (Praditsathawong, 2009; Pongnamron Hospital, 2017) ใช้รางจืดเป็นยาต้านพิษของหมอพื้นบ้านและบุคลากรสาธารณสุข ทั้งจากการได้รับพิษทั้งจากการรับประทาน สูดดม และสัมผัสทางผิวหนัง (แพ้สารพิษตกค้างในอาหาร อาหารเป็นพิษ เมาเห็ด เมาค้าง แพ้อาหารทะเล เมากลอย แพ้อาหารพื้นถิ่น พิษจากไข่แมงดาทะเล แพ้ยา แพ้ ผงชูรส รับประทานเมล็ดสบู่ดำ สูดดมสัมผัสสารเคมีเกษตร แมลงสัตว์กัดต่อย ลมพิษและร้อนใน) สอดคล้องกับข้อมูลในตำราการแพทย์แผนโบราณของไทยที่กล่าวว่า รางจืดสามารถใช้แก้ร้อนใน แก้ไข้ ใช้เป็นยาแก้พิษจากสัตว์และพืช ใช้ถอนพิษเบื่อเมาจากอาหาร ยา สุรา และสารเคมีได้ (Pongbunrod, 1979 ; Prommanee, 1996; Wuttithamavej, 1997) นอกจากนี้จากการศึกษาผลของการใช้รางจืดเป็นยาต้านพิษของหมอพื้นบ้านในพื้นที่จังหวัดชุมชนใช้ใบรางจืดในการรักษาอาการแพ้ตามผิวหนังจากการสัมผัสสารเคมีเกษตร อาการลมพิษ แมลงสัตว์กัดต่อย ในรูปแบบใช้ใบรางจืดสดผสมเหล้าขาวทาแผล กากใบรางจืดพอกแผล มีอาการดีขึ้นเฉลี่ยภายใน 20 นาที อาการหายเป็นปกติเฉลี่ยภายใน 60 นาที (Chanthaporn, 2020)

4. สรรพคุณในทางการแพทย์แผนไทย

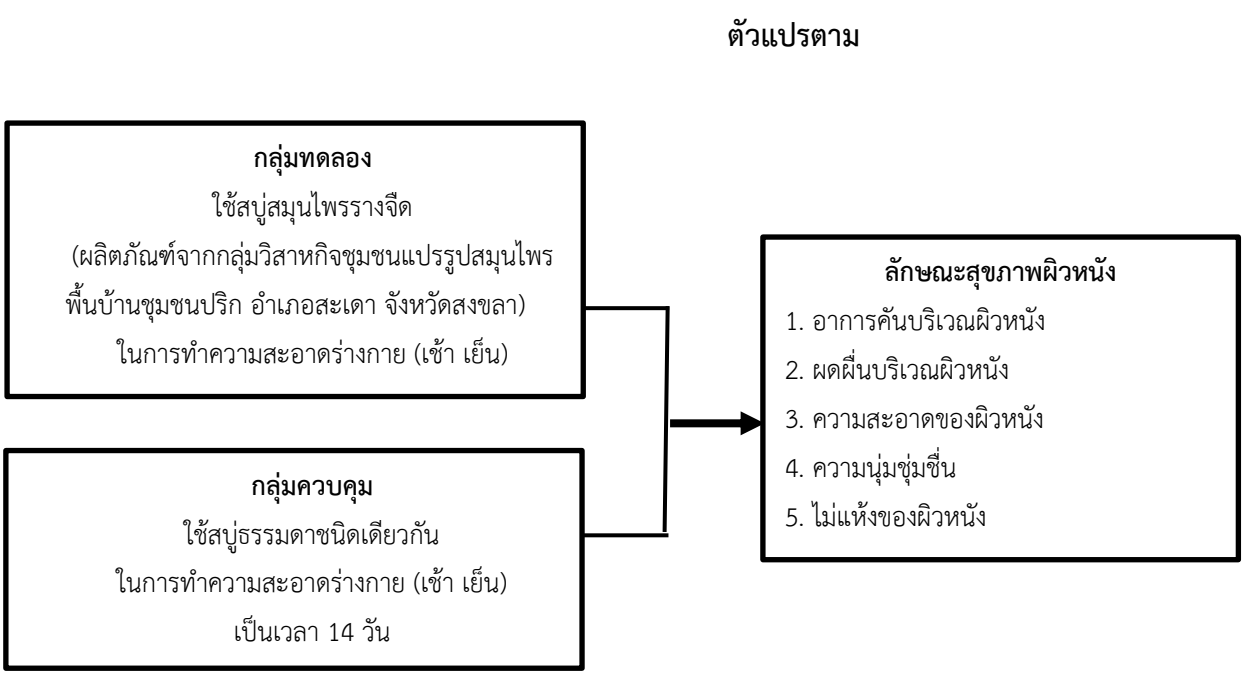
ใบรางจืดสดคั้นน้ำกินแก้ไข้และถอนพิษ รางจืดหรือรางเย็น รสเย็น ใช้ปรุงเป็นยาเขียว รับประทานเป็นยาถอนพิษ ทำให้ลดความร้อนในร่างกาย แก้ไข้ แก้พิษ กระทุ้งพิษไข้หัว สำหรับรากและเถา ใช้รับประทานเป็นยาแก้ร้อนในกระหายน้ำ แก้พิษร้อน (Sengiam, 1971)

5. การผลิตสบู่สมุนไพรรางจืด

สบู่เป็นเครื่องสำอางชนิดหนึ่งที่นำมาใช้ทำความสะอาดและชำระล้างสิ่งสกปรกออกจากผิวหนังทำให้ร่างกายสะอาด สบู่โดยทั่วไปมีส่วนผสมระหว่างกรดไขมันกับเบสหรือด่างในอัตราส่วนที่ทำให้สามารถทำความสะอาดที่ค่า pH อยู่ระหว่าง 8-10 ซึ่งไม่เป็นอันตรายต่อผิว โดยการผลิตสบู่สมุนไพรที่สามารถผลิตได้ด้วยตนเองจะใช้กลีเซอรีนเป็นส่วนประกอบสำคัญในการทำ โดยนำกลีเซอรีนต้มในภาชนะสเตนเลส ในระดับไฟปานกลาง 20 นาที จากนั้นผสมกลีเซอรีนกับน้ำต้มสุกใบรางจืดเข้าด้วยกันกวนให้เป็นเนื้อเดียวกัน 20 นาที เติม Tea tree oil และสารแต่งกลิ่น เทใส่พิมพ์ทิ้งไว้ 1 ชั่วโมง เพื่อให้สบู่แข็งตัวแล้วนำออกจากพิมพ์นำไปบรรจุภัณฑ์ (Somruedee et al., 2017)

กรอบแนวคิด

การกำหนดกรอบแนวคิดการวิจัยครั้งนี้ ผู้วิจัยสังเคราะห์จากงานวิจัยกึ่งทดลอง จากการพัฒนาผลิตภัณฑ์สมุนไพร ดังนี้ กรอบแนวคิดการวิจัย Winai, Phanthanon, Waranya, and Wannisa. (2022) ได้แก่ กลุ่มทดลองที่ใช้ผลิตภัณฑ์สบู่สมุนไพรรางจืด กลุ่มควบคุมที่ใช้สบู่ธรรมดาชนิดเดียวกัน เปรียบเทียบลักษณะสุขภาพผิวหนัง จากกรอบแนวคิดการวิจัย Somruedee et al. (2017) สามารถสร้างเป็นกรอบแนวคิดการวิจัย ดังภาพที่ 1



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

1) ประชากรและกลุ่มตัวอย่าง

ประชากร ได้แก่ ประชากรตำบลปริก อำเภอสะเดา จังหวัดสงขลา จำนวน 415 คน

กลุ่มตัวอย่างคำนวณโดยใช้สถิติ t-test ทั้งสองกลุ่มมีอิสระต่อกัน โดยให้ค่า α เท่ากับ 0.05 การศึกษาครั้งนี้ใช้ค่า Power เท่ากับ 0.8 และค่า Effect size เท่ากับร้อยละ 70 ซึ่งมีการคัดเลือกกลุ่มตัวอย่างโดยวิธีการสุ่มตัวอย่างแบบ Consecutive Sampling โดยใช้การเจาะจงเลือกกลุ่มตัวอย่างที่มีคุณสมบัติ (Inclusion Criteria) ได้แก่ 1) เป็นเกษตรกรตำบลปริก อำเภอสะเดา จังหวัดสงขลา 2) อายุ 18-60 ปี 3) มีระดับสุขภาพผิวหนังอยู่ในระดับมาก ปานกลาง น้อย 4) ตัดสินใจและตอบคำถามเองได้ 5) ไม่แพ้สมุนไพรหรือผลิตภัณฑ์จากรางจืด ซึ่งมีผู้ที่มีคุณสมบัติตามเกณฑ์ และยินดีเข้าร่วมวิจัย จำนวน 60 คน แบ่งเป็น 2 กลุ่ม กลุ่มควบคุมจำนวน 30 คน ให้ใช้สบู่ธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย (เช้าและเย็น) เป็นเวลา 14 วัน และกลุ่มทดลอง จำนวน 30 คน ให้ใช้สบู่สมุนไพรรางจืดในการทำความสะอาดร่างกาย (เช้าและเย็น) เป็นเวลา 14 วัน

ทั้งนี้ การวิจัยครั้งนี้ ดำเนินการตามหลักจริยธรรมการวิจัยในมนุษย์ของมหาวิทยาลัยราชภัฏสงขลา ได้หมายเลขรับรอง SKRU-HREC-66010008 ผู้วิจัยพิทักษ์สิทธิ์กลุ่มตัวอย่าง โดยชี้แจงสิทธิ์ในการเข้าร่วมด้วยความสมัครใจ ข้อมูลที่ได้จะเก็บเป็นความลับ ชี้แจงวัตถุประสงค์วิธีดำเนินการวิจัย และวิธีเก็บรวบรวมข้อมูล รวมถึงชี้แจงผลการวิจัยที่จะเผยแพร่และนำเสนอในภาพรวมเท่านั้น

2) เครื่องมือที่ใช้ในการวิจัย

เครื่องมือที่ใช้ในการทดลอง ได้แก่

1) สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย

2) สบู่สมุนไพรรางจืด ประกอบด้วย น้ำรางจืด (ปริมาณใบสด 1 กิโลกรัม ต่อ น้ำ 1 ลิตร ได้ปริมาณน้ำรางจืด 400 มิลลิลิตร) กลีเซอรีน ลักษณะก้อน ขนาด 50 กรัม ผลิตโดยกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา

เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล ได้แก่

1) แบบสอบถามข้อมูลทั่วไป ประกอบด้วย เพศ อายุ น้ำหนัก ส่วนสูง ระดับการศึกษา อาชีพ โรคประจำตัว เป็นแบบเลือกตอบและเติมคำ

2) แบบประเมินลักษณะสุขภาพผิวหนัง ปรับปรุงจาก Somruedee et al. (2017) แบ่งเป็น 6 ลักษณะ ประกอบด้วย อาการคันบริเวณผิวหนัง ผดผื่นบริเวณผิวหนัง ความสะอาดของผิวหนัง ความนุ่มชุ่มชื่น ไม่แห้งของผิวหนัง อาการไม่พึงประสงค์บริเวณผิวหนัง โดยค่าเฉลี่ย 1.00-1.80 หมายถึง ไม่มีลักษณะดังกล่าว, 1.81-2.60 หมายถึง มีลักษณะดังกล่าว ระดับน้อย, 2.61-3.40 หมายถึง มีลักษณะดังกล่าว ระดับปานกลาง, 3.41-4.20 หมายถึง มีลักษณะดังกล่าว ระดับมาก และ 4.21-5.00 หมายถึง มีลักษณะดังกล่าวระดับมากที่สุด

3) แบบสอบถามความพึงพอใจแบบมาตราส่วนประมาณค่า 3 ระดับ มีคำถาม 3 ด้าน ได้แก่ 1) ด้านบรรจุภัณฑ์ จำนวน 3 ข้อ 2) ด้านผลิตภัณฑ์ จำนวน 3 ข้อ และ 3) ด้านประสิทธิผลและความปลอดภัย จำนวน 3 ข้อ โดย 1 คะแนน หมายถึง ไม่พึงพอใจ 2 คะแนน หมายถึง พึงพอใจระดับปานกลาง และ 3 คะแนน หมายถึง พึงพอใจระดับมาก ซึ่งคะแนนเฉลี่ย 1.00-1.66 หมายถึง พึงพอใจระดับน้อย , 1.67–2.33 หมายถึง พึงพอใจระดับปานกลาง และ 2.34–3.00 หมายถึง พึงพอใจระดับมาก

3) การตรวจสอบคุณภาพของเครื่องมือ

ผู้วิจัยตรวจสอบความตรงตามเนื้อหา (Content Validity) ของเครื่องมือวิจัยโดยผู้ทรงคุณวุฒิด้านการแพทย์แผนไทย เภสัชวิทยา และการวิจัย ค่าดัชนีความสอดคล้อง (IOC) ของเนื้อหาทุกข้อมากกว่า 0.5 ค่าความเชื่อมั่น (Reliability) สัมประสิทธิ์แอลฟาครอนบาค (Cronbach‘s Alpha Coefficient) เท่ากับ 0.83

4) วิธีเก็บรวบรวมข้อมูล

งานวิจัยนี้เป็นงานวิจัยกึ่งทดลอง (Quasi Experimental Research) กลุ่มควบคุมให้ใช้สบู่ธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย (เช้าและเย็น) และกลุ่มทดลองให้ใช้สบู่สมุนไพรรางจืดในการทำความสะอาดร่างกาย (เช้าและเย็น) เก็บรวบรวมข้อมูลเป็นเวลา 14 วัน โดยให้กลุ่มตัวอย่างสังเกตและทำแบบประเมินลักษณะสุขภาพผิวหนังในวันที่ 1 และวันที่ 14 แล้วให้กลุ่มทดลองทำแบบสอบถามความพึงพอใจต่อการใช้สบู่สมุนไพรรางจืด

5) การวิเคราะห์ข้อมูลและสถิติที่ใช้ในการวิจัย

5.1) สถิติเชิงพรรณนา การแจกแจงความถี่ ร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน เพื่อเปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มทดลอง กลุ่มควบคุม ก่อนและหลังการทดลอง และระดับความพึงพอใจของกลุ่มทดลองที่มีต่อสบู่สมุนไพรรางจืด ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา

5.2) สถิติทดสอบไคสแควร์สถิติทดสอบ Paired Samples t-test และสถิติทดสอบ Independent t-test เพื่อเปรียบเทียบลักษณะสุขภาพผิวหนังระหว่างกลุ่มทดลองกับกลุ่มควบคุม ก่อนและหลังการทดลอง

ผลการวิจัย

ผลการวิจัยพบว่า กลุ่มควบคุมส่วนใหญ่เป็น เพศหญิง ร้อยละ 58.1 อายุเฉลี่ย 54.7 ปี ดัชนีมวลกาย (BMI) อยู่ระหว่าง 18-25 ร้อยละ 48.4 ศึกษาอยู่ ระดับมัธยมศึกษาตอนต้น ร้อยละ 32.3 ไม่มีโรคประจำตัว ร้อยละ 87.1 ไม่สูบบุหรี่ ร้อยละ 80.6 ส่วนกลุ่มทดลองส่วนใหญ่เป็นเพศหญิง ร้อยละ 53.3 อายุเฉลี่ย 37.9 ปี ดัชนีมวลกาย (BMI) อยู่ระหว่าง 18-25 ร้อยละ 63.3 ศึกษาอยู่ระดับมัธยมศึกษาตอนปลาย ร้อยละ 33.3 ไม่มีโรคประจำตัว ร้อยละ 69.0 ไม่สูบบุหรี่ ร้อยละ 70.0 เมื่อใช้สถิติไคสแควร์ที่ระดับนัยสำคัญทางสถิติ 0.05 ทดสอบพบว่า ไม่แตกต่างกัน

ผลการเปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มทดลองก่อนและหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อ.สะเดา จ.สงขลา ดังตารางที่ 1

ตารางที่ 1 เปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มทดลอง ก่อนและหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา (n=30) โดยใช้ Paired t-test

ลักษณะสุขภาพผิว	วันที่ 1			วันที่ 14			t-test	p-value
	$\bar{X}$	S.D.	ระดับ	$\bar{X}$	S.D.	ระดับ		
อาการคันบริเวณผิวหนัง	2.70	0.75	ปานกลาง	1.27	0.69	ไม่มีลักษณะดังกล่าว	10.780	<0.001*
ผดผื่นบริเวณผิวหนัง	1.97	0.66	น้อย	1.13	0.51	ไม่มีลักษณะดังกล่าว	6.110	<0.001*
ความสะอาดของผิวหนัง	2.73	0.69	ปานกลาง	4.23	0.91	มากที่สุด	4.530	<0.001*
ความนุ่มชุ่มชื่น	2.60	0.78	น้อย	4.11	0.78	มาก	4.810	<0.001*
ลักษณะผิวแห้ง	2.23	0.77	น้อย	1.17	0.53	ไม่มีลักษณะดังกล่าว	7.050	<0.001*
อาการไม่พึงประสงค์บริเวณผิวหนัง	1.88	0.90	น้อย	1.17	0.53	ไม่มีลักษณะดังกล่าว	4.370	<0.001*

*p-value < 0.05

1.00-1.80 หมายถึง ไม่มีลักษณะดังกล่าว, 1.81-2.60 หมายถึง มีลักษณะดังกล่าว ระดับน้อย, 2.61-3.40 หมายถึง มีลักษณะดังกล่าว ระดับปานกลาง, 3.41-4.20 หมายถึง มีลักษณะดังกล่าว ระดับมาก และ 4.21-5.00 หมายถึง มีลักษณะดังกล่าวระดับมากที่สุด

จากตารางที่ 1 กลุ่มทดลองหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา พบว่า มีอาการคันบริเวณผิวหนังลดลงจากระดับปานกลางเป็นระดับไม่มีลักษณะดังกล่าว อย่างมีนัยสำคัญ (p-value < 0.05) ค่าเฉลี่ย ($\bar{X}$=1.27±0.69) ผดผื่นบริเวณผิวหนังลดลงจากระดับน้อยเป็นระดับไม่มีลักษณะดังกล่าว อย่างมีนัยสำคัญ (p-value < 0.05) ค่าเฉลี่ย ($\bar{X}$=1.13±0.51) ความสะอาดของผิวหนังเพิ่มขึ้นจากระดับปานกลางเป็นระดับมากอย่างมีนัยสำคัญ (p-value < 0.05 ค่าเฉลี่ย ($\bar{X}$=4.23±0.91) ความนุ่มชุ่มชื่นเพิ่มขึ้นจากระดับน้อยเป็นระดับมากอย่างมีนัยสำคัญ (p-value < 0.05 ค่าเฉลี่ย ($\bar{X}$=4.11±0.78) ลักษณะแห้งของผิวหนังลดลงจากระดับน้อยเป็นระดับไม่มีลักษณะดังกล่าว อย่างมีนัยสำคัญ (p-value < 0.05) ค่าเฉลี่ย ($\bar{X}$=1.17±0.53) และไม่มีลักษณะอาการไม่พึงประสงค์บริเวณผิวหนังลดลงจากระดับน้อยเป็นระดับไม่มีลักษณะดังกล่าว อย่างมีนัยสำคัญ (p-value < 0.05) ค่าเฉลี่ย ($\bar{X}$=1.17±0.53)

ผลการเปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มควบคุมก่อนและหลังใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย ดังตารางที่ 2

ตารางที่ 2 เปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มควบคุม ก่อนและหลังใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย (n=30) โดยใช้ Paired t-test

ลักษณะสุขภาพผิว	วันที่ 1			วันที่ 14			t-test	p-value
	$\bar{X}$	S.D.	ระดับ	$\bar{X}$	S.D.	ระดับ		
อาการคันบริเวณผิวหนัง	2.55	0.76	น้อย	1.97	1.16	น้อย	2.466	0.020*
ผดผื่นบริเวณผิวหนัง	2.32	0.87	น้อย	1.81	1.07	น้อย	2.108	0.043*
ความสะอาดของผิวหนัง	2.65	0.69	ปานกลาง	3.21	1.23	ปานกลาง	0.373	0.712
ความนุ่มชุ่มชื่น	2.10	0.78	น้อย	3.87	1.07	ปานกลาง	1.283	0.209
ลักษณะผิวแห้ง	2.03	0.83	น้อย	2.06	1.28	น้อย	0.166	0.869

ตารางที่ 2 (ต่อ)

ลักษณะสุขภาพผิว	วันที่ 1			วันที่ 14			t-test	p-value
	$\bar{X}$	S.D.	ระดับ	$\bar{X}$	S.D.	ระดับ		
อาการไม่พึงประสงค์บริเวณผิวหนัง	2.13	0.99	น้อย	2.13	1.36	น้อย	0.000	1.000

*p-value < 0.05

1.00-1.80 หมายถึง ไม่มีลักษณะดังกล่าว, 1.81-2.60 หมายถึง มีลักษณะดังกล่าว ระดับน้อย, 2.61-3.40 หมายถึง มีลักษณะดังกล่าว ระดับปานกลาง, 3.41-4.20 หมายถึง มีลักษณะดังกล่าว ระดับมาก และ 4.21-5.00 หมายถึง มีลักษณะดังกล่าวระดับมากที่สุด

จากตารางที่ 2 กลุ่มควบคุมหลังใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย พบว่า มีลักษณะอาการคันบริเวณผิวหนังไม่ลดลงเมื่อเทียบกับก่อนทดลอง อย่างมีนัยสำคัญ (p-value < 0.05) ค่าเฉลี่ย ($\bar{X}$=1.27±0.69) ผดผื่นบริเวณผิวหนังไม่ลดลงเมื่อเทียบกับก่อนทดลอง อย่างมีนัยสำคัญ (p-value < 0.05) ค่าเฉลี่ย ($\bar{X}$=1.13±0.51) ความสะอาดของผิวหนังไม่ลดลงเมื่อเทียบกับก่อนทดลอง ค่าเฉลี่ย ($\bar{X}$=4.23±0.91) ความนุ่มชุ่มชื่นเพิ่มขึ้นจากระดับน้อยเป็นระดับปานกลาง ค่าเฉลี่ย ($\bar{X}$=4.11±0.78) ลักษณะแห้งของผิวหนังไม่เพิ่มขึ้นเมื่อเทียบกับก่อนทดลอง ค่าเฉลี่ย ($\bar{X}$=1.17±0.53) และลักษณะอาการไม่พึงประสงค์บริเวณผิวหนังไม่ลดลงเมื่อเทียบกับก่อนทดลอง ค่าเฉลี่ย ($\bar{X}$=1.17±0.53)

ผลการเปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มทดลองหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา และกลุ่มควบคุมหลังใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย ดังตารางที่ 3

ตารางที่ 3 เปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มทดลองหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา และกลุ่มควบคุมหลังใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย โดยใช้ Independent t-test

ลักษณะสุขภาพผิว	วันที่ 14 กลุ่มควบคุม			วันที่ 14 กลุ่มทดลอง			t-test	p-value
	$\overline{X}$	S.D.	ระดับ	$\overline{X}$	S.D.	ระดับ		
อาการคันบริเวณผิวหนัง	1.97	1.16	น้อย	1.27	0.69	ไม่มีลักษณะดังกล่าว	2.862	0.006*
ผดผื่นบริเวณผิวหนัง	1.81	1.07	น้อย	1.13	0.51	ไม่มีลักษณะดังกล่าว	3.137	0.003*
ความสะอาดของผิวหนัง	3.21	1.23	ปานกลาง	4.23	0.91	มากที่สุด	3.597	0.001*
ความนุ่มชุ่มชื่น	3.87	1.07	ปานกลาง	4.11	0.78	มาก	3.159	0.003*
ลักษณะผิวแห้ง	2.06	1.28	น้อย	1.17	0.53	ไม่มีลักษณะดังกล่าว	3.577	0.001*
อาการไม่พึงประสงค์บริเวณผิวหนัง	2.13	1.36	น้อย	1.17	0.53	ไม่มีลักษณะดังกล่าว	3.662	0.001*

*p-value < 0.05

1.00-1.80 หมายถึง ไม่มีลักษณะดังกล่าว, 1.81-2.60 หมายถึง มีลักษณะดังกล่าว ระดับน้อย, 2.61-3.40 หมายถึง มีลักษณะดังกล่าว ระดับปานกลาง, 3.41-4.20 หมายถึง มีลักษณะดังกล่าว ระดับมาก และ 4.21-5.00 หมายถึง มีลักษณะดังกล่าวระดับมากที่สุด

จากตารางที่ 3 เมื่อเปรียบเทียบลักษณะสุขภาพผิวหนังของกลุ่มทดลองหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา และกลุ่มควบคุมหลังใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย เมื่อใช้เป็นระยะเวลา 14 วัน พบว่า กลุ่มทดลองมีลักษณะสุขภาพผิวดีกว่ากลุ่มควบคุม อย่างมีนัยสำคัญทุกด้าน (p-value < 0.05) โดย

เมื่อครบ 14 วัน กลุ่มทดลองมีค่าคะแนนเฉลี่ยลักษณะสุขภาพผิวดีขึ้นอยู่ในระดับไม่มีลักษณะสุขภาพผิวดังกล่าวและมีลักษณะสุขภาพผิวดีขึ้นอยู่ในระดับมากที่สุด ($\bar{X}$=4.23±0.91 – 1.13±0.51) ในขณะที่กลุ่มควบคุมมีค่าคะแนนเฉลี่ยลักษณะสุขภาพผิวอยู่ในระดับปานกลางจนอยู่ในระดับน้อย ($\bar{X}$=3.87±1.07 – 1.81±1.07)

ความพึงพอใจของกลุ่มทดลองที่มีต่อสบู่สมุนไพรรางจืด ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา

ตารางที่ 4 ผลประเมินความพึงพอใจของกลุ่มทดลองหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา (n=30)

หัวข้อ	ความพึงพอใจของกลุ่มตัวอย่าง		
	ค่าเฉลี่ย ($\bar{X}$)	ส่วนเบี่ยงเบนมาตรฐาน (S.D.)	ระดับ
1. ความพึงพอใจต่อผลิตภัณฑ์			
1.1 กลิ่นหอม ปริมาณฟองน่าใช้	2.93	0.26	มาก
1.2 รูปร่าง ลักษณะ ขนาด	2.89	0.32	มาก
1.3 สามารถใช้ได้กับทุกวัย	2.87	0.34	มาก
รวม	**2.90**	**0.21**	**มาก**
2. ความพึงพอใจต่อบรรจุภัณฑ์			
2.1 สวยงามและน่าใช้	2.84	0.37	มาก
2.2 สะดวกในการพกพา	2.89	0.32	มาก
2.3 ใช้งานง่าย	2.82	0.39	มาก
รวม	**2.85**	**0.25**	**มาก**
3. ความพึงพอใจต่อประสิทธิผลและความปลอดภัย			
3.1 ผิวหนังสะอาด ไม่ก่อให้เกิดการระคายเคือง	2.96	0.21	มาก
3.2 ลดผดผื่น อาการคันบริเวณผิวหนัง	2.98	0.15	มาก
3.2 มีฉลากและข้อบ่งใช้ติดชัดเจน	2.98	0.15	มาก
รวม	**2.97**	**0.12**	**มาก**
4. ความพึงพอใจโดยภาพรวม	2.97	0.12	มาก
ความพึงพอใจรวมทุกด้าน	**2.91**	**0.15**	**มาก**

1.00-1.66 หมายถึง พึงพอใจระดับน้อย , 1.67–2.33 หมายถึง พึงพอใจระดับปานกลาง และ 2.34–3.00 หมายถึง พึงพอใจระดับมาก

จากตารางที่ 4 กลุ่มทดลองหลังใช้ผลิตภัณฑ์สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา มีความพึงพอใจรวมทุกด้านมีค่าเฉลี่ยอยู่ในระดับ

มาก ($\bar{X}$=2.91±0.15) ด้านที่มีความพึงพอใจมากที่สุด ได้แก่ ด้านประสิทธิผลและความปลอดภัย มีค่าเฉลี่ยอยู่ในระดับมาก ($\bar{X}$=2.97±0.12) เมื่อพิจารณารายข้อพบว่า กลุ่มทดลองมีความพึงพอใจในทุกข้ออยู่ในระดับมาก โดยประเด็นที่มีความพึงพอใจมากที่สุด คือ ผลิตภัณฑ์ลดผดผื่น อาการคันบริเวณผิวหนัง และมีฉลากและข้อบ่งใช้ติดชัดเจน ($\bar{X}$=2.98±0.12)

สรุปและอภิปรายผล

ผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา หลังใช้ 14 วัน สามารถทำให้ลักษณะสุขภาพผิวหนังอยู่ในระดับที่ดีขึ้น ซึ่งทางการแพทย์แผนไทย ตำรายาไทยใช้ใบสดตำคั้นน้ำกินแก้ไข้ และถอนพิษ (Anchalee, 2553) ซึ่งรางจืดเป็นสมุนไพร รายการหนึ่งในบัญชียาจากสมุนไพรในบัญชียาหลักแห่งชาติ (ฉบับที่ 2) พ.ศ. 2554 กลุ่มยาถอนพิษไข้ แก้ร้อนใน (National Drug Information, 2013) และเป็นนวัตกรรมเพื่อสุขภาพของกลุ่มงานการแพทย์แผนไทย โรงพยาบาลโป่งน้ำร้อน ตำบลทับไทร อำเภอโป่งน้ำร้อน จังหวัดจันทบุรี โดยผลิตสบู่จากส่วนผสมน้ำใบรางจืด ใช้ในการรักษาผู้ป่วยที่มีอาการคันตามผิวหนังจากการประกอบอาชีพทำสวนผลไม้ และมีการใช้สารเคมีในการฉีดพ่นผลผลิตให้ใช้สบู่จากส่วนผสมน้ำใบรางจืดอาบน้ำวันละ 2 ครั้ง (เช้าและเย็น) ซึ่งผู้ป่วยที่ได้ใช้สบู่จากส่วนผสมน้ำใบรางจืด มีอาการคันตามผิวหนังลดลงจนถึงไม่มีอาการคันตามผิวหนัง หลังจากใช้ติดต่อกัน 14 วัน โดยใบรางจืด มีสรรพคุณ ใช้อาบช่วยถอนพิษแมลงสัตว์กัดต่อย บรรเทาอาการผื่นแพ้ ผื่นคัน ถอนพิษผื่นคันจากสารเคมีต่าง ๆ (Pongnamron Hospital, 2017) สอดคล้องกับการใช้รางจืดเป็นยาต้านพิษของหมอพื้นบ้านและบุคลากรสาธารณสุข (Praditsathawong, 2009) โดยจากการได้รับพิษทั้งจากการรับประทาน สูดดม และสัมผัสทางผิวหนัง (แพ้สารพิษตกค้างในอาหาร อาหารเป็นพิษ เมาเห็ด เมาค้าง แพ้อาหารทะเล เมากลอย แพ้อาหารพื้นถิ่น พิษจากไข่แมงดาทะเล แพ้ยา แพ้ผงชูรส รับประทานเมล็ดสบู่ดำ สูดดมสัมผัสสารเคมีเกษตร แมลงสัตว์กัดต่อย ลมพิษ และร้อนใน) สอดคล้องกับข้อมูลในตำราการแพทย์แผนโบราณของไทย (Pongbunrod, 1979 ; Prommanee , 1996 ; Wuttithamavej, 1997) ที่กล่าวว่า รางจืดสามารถใช้แก้ร้อนใน แก้ไข้ ใช้เป็นยาแก้พิษจากสัตว์และพืช ใช้ถอนพิษเบื่อเมาจากอาหาร ยา สุรา และสารเคมีได้ นอกจากนี้จากการศึกษา ผลของการใช้รางจืดเป็นยาต้านพิษของหมอพื้นบ้านในพื้นที่จังหวัดชุมพร ใช้ใบรางจืดในการรักษาอาการแพ้ตามผิวหนังจากการสัมผัสสารเคมีเกษตร อาการลมพิษ แมลงสัตว์กัดต่อย ในรูปแบบใช้ใบรางจืดสดผสมเหล้าขาวทาแผล กากใบรางจืดพอกแผล มีอาการดีขึ้นเฉลี่ยภายใน 20 นาที อาการหายเป็นปกติเฉลี่ยภายใน 60 นาที (Chanthaporn, 2020)

โดยใบรางจืดเมื่อทำการสกัดจะมีองค์ประกอบทางเคมี กลุ่ม Flavonoid, Phenolic, Apigenin, Cosmosin, Delphinidin 3.5-di-O-β-D-glucoside, Chlorogenic acid, caffeic acid การสกัดด้วยการต้ม พบว่า ให้ปริมาณสารสำคัญ และทำให้ได้สารที่มีฤทธิ์ต้านอนุมูลอิสระสูงสุด (Tansuwan, 1983) เมื่อนำมาเป็นส่วนผสมของสบู่สมุนไพรที่ใช้กลีเซอรีนเป็นส่วนประกอบสำคัญและไขมันจากพืช มีคุณสมบัติ

คือ ช่วยหล่อลื่นเหมือนมอยซ์เจอร์ไรเซอร์ เพื่อปกป้องผิวไม่ให้แห้ง และดูดซับความชื้นเมื่อสัมผัสกับอากาศ ซึ่งจะทำให้รู้สึกว่าผิวมีความชุ่มชื้น ไม่ทำให้อุดตันรูขุมขน (Pongnamron Hospital, 2017) สนับสนุนผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา ได้ประสิทธิผล ทำให้ลักษณะสุขภาพผิวหนังของกลุ่มทดลองดีขึ้นอย่างต่อเนื่อง อาการคันบริเวณผิวหนังลดลงจากระดับปานกลางเป็นระดับไม่มีลักษณะดังกล่าว ผดผื่นบริเวณผิวหนังลดลงจากระดับน้อยเป็นระดับไม่มีลักษณะดังกล่าว ความสะอาดของผิวหนังเพิ่มขึ้นจากระดับปานกลางเป็นระดับมาก ความนุ่มชุ่มชื่นเพิ่มขึ้นจากระดับน้อยเป็นระดับมาก ลักษณะแห้งของผิวหนังลดลงจากระดับน้อยเป็นระดับไม่มีลักษณะดังกล่าว และไม่มีลักษณะอาการไม่พึงประสงค์บริเวณผิวหนังลดลงจากระดับน้อยเป็นระดับไม่มีลักษณะดังกล่าว อย่างไรก็ตามงานวิจัยเหล่านี้ยังไม่สามารถยืนยันประสิทธิผลการต้านเชื้อจุลินทรีย์ต่อผิวหนังจึงต้องมีการศึกษาเพิ่มเติมทางคลินิกต่อไป

กล่าวโดยสรุปได้ว่า ผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา หลังใช้ 14 วัน สามารถทำให้ลักษณะสุขภาพผิวหนัง อยู่ในระดับที่ดีขึ้นอย่างมีนัยสำคัญทางสถิติ เมื่อเปรียบเทียบกับก่อนใช้ผลิตภัณฑ์ และเปรียบเทียบกับกลุ่มควบคุมที่ใช้สบู่ก้อนธรรมดาชนิดเดียวกันในการทำความสะอาดร่างกาย โดยไม่พบว่า มีอาสาสมัครคนใดเกิดอาการแพ้หรือระคายเคืองระหว่างการทดลองใช้ผลิตภัณฑ์ อีกทั้งกลุ่มตัวอย่างที่ทดลองใช้ผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา ยังมีความพึงพอใจต่อผลิตภัณฑ์ในระดับมาก ทั้งนี้ ควรมีการวิเคราะห์ฤทธิ์การต้านอนุมูลอิสระ ปริมาณวิตามินซี ความเป็นกรด-ด่าง (pH) เพื่อนำไปใช้ในการพัฒนาผลิตภัณฑ์สบู่ให้เป็นไปตามเกณฑ์ที่กำหนดคุณภาพสำหรับสบู่ก้อนผสมสมุนไพรของประกาศสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม เรื่อง กำหนดมาตรฐานอุตสาหกรรมเอส ประเภทสบู่ก้อนผสมสมุนไพร เพื่อส่งเสริมและยกระดับคุณภาพผลิตภัณฑ์ให้เป็นที่ยอมรับของตลาด สร้างความเชื่อมั่นให้กับผู้บริโภคมั่นใจได้ว่า สบู่สมุนไพรรางจืดมีความปลอดภัยและไม่เป็นอันตรายต่อผิวหนัง จะเป็นการส่งเสริมการแปรรูปผลิตภัณฑ์จากรางจืดในรูปแบบเครื่องสำอางหรือผลิตภัณฑ์สปาต่าง ๆ ให้ได้มาตรฐาน จะช่วยสร้างรายได้ ทางเลือกให้กับประชาชน ในพื้นที่เขตเศรษฐกิจพิเศษจากฐานทรัพยากรที่มีอยู่ในพื้นที่เป็นการพัฒนาอย่างยั่งยืน และเป็นการใช้ทรัพยากรให้มีประสิทธิภาพมากที่สุดต่อไป

ข้อเสนอแนะ

1) ข้อเสนอแนะในการนำไปประยุกต์ใช้

ผลการวิจัยในครั้งนี้ สามารถนำไปเป็นข้อมูลส่งเสริมคุณสมบัติของผลิตภัณฑ์สบู่สมุนไพรรางจืดของกลุ่มวิสาหกิจชุมชนแปรรูปสมุนไพรพื้นบ้านชุมชนปริก อำเภอสะเดา จังหวัดสงขลา ที่มากกว่าการทำความสะอาดผิวหนัง แต่ยังสามารถทำให้สุขภาพผิวหนังดีขึ้น ลดอาการทางผิวหนังได้ ซึ่งสามารถนำไปใช้

ในการวางแผนทางการตลาด เพื่อจัดจำหน่ายที่ให้มีความหลากหลายทั้งด้านช่องทาง ราคา ในการจำหน่าย รวมทั้งการควบคุมการผลิตที่ให้มีมาตรฐานและคงคุณภาพของผลิตภัณฑ์

2) ข้อเสนอแนะในการทำวิจัยครั้งถัดไป

ควรมีการวิเคราะห์ฤทธิ์การต้านอนุมูลอิสระ ปริมาณวิตามินซี ความเป็นกรด-ด่าง (pH) เพื่อนำไปใช้ในการพัฒนาผลิตภัณฑ์สบู่สมุนไพรรางจืดให้ได้มาตรฐานผลิตภัณฑ์ชุมชน รวมทั้งส่งเสริมสรรพคุณของสบู่สมุนไพรรางจืดให้เป็นสบู่สมุนไพรทางเลือกในการทำความสะอาดผิวหนังและยังสามารถทำให้สุขภาพผิวหนังดีขึ้นจากสรรพคุณของรางจืดที่ช่วยคืนความชุ่มชื้น ปรับสมดุลของผิว ลดรอยแผลเป็น รักษาโรคผิวหนัง แก้ผื่นคันจากการแพ้สารต่าง ๆ

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พฤติกรรมการใช้พลาสติกครั้งเดียวทิ้งของผู้บริโภคจากธุรกิจจัดส่งอาหารในช่วงการระบาดของโรคติดเชื้อไวรัสโคโรนา 2019

Consumer Behavior of Single-use Plastic Disposal from Food Delivery Business During the COVID-19 Pandemic

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บทคัดย่อ

งานวิจัยนี้ศึกษาปริมาณขยะ พฤติกรรมการใช้บริการธุรกิจจัดส่งอาหารและการจัดการขยะพลาสติกในช่วงการแพร่ระบาดของเชื้อไวรัสโคโรนา 2019 (COVID-19) ในจังหวัดสมุทรสาคร ปัจจัยที่ส่งผลต่อพฤติกรรม และเสนอแนวทางการจัดการขยะพลาสติก ผลการศึกษา พบว่า 1) เมื่อเทียบในช่วงระหว่างปี พ.ศ. 2560 - 2565 จังหวัดสมุทรสาครมีปริมาณขยะมูลฝอยชุมชน ขยะพลาสติก และขยะอันตรายสูงสุด ในปี พ.ศ. 2562 2) ส่วนใหญ่จัดการขยะพลาสติกโดยเก็บรวบรวมทิ้งนาน ๆ ครั้ง ไม่เคยจัดการด้วยวิธีรวบรวมเพื่อขาย ฝังกลบ เผา คัดแยกขยะ ล้างทำความสะอาดก่อนทิ้ง พิจารณาประเภทขยะก่อนทิ้งเป็นบางครั้ง บ่อยครั้งนำบรรจุภัณฑ์อาหารกลับมาใช้ใหม่ ด้านทัศนคติของผู้ตอบแบบสอบถามส่วนใหญ่เห็นด้วยมากที่สุดในการรวบรวมขยะพลาสติกเพื่อขาย เปลี่ยนจากพลาสติกเป็นแบบย่อยสลายง่าย ลดใช้พลาสติกและโฟม 3) ปัจจัยที่มีผลต่อพฤติกรรมการจัดการขยะพลาสติก ได้แก่ เพศ อายุ ลักษณะหน่วยงาน/ที่อยู่อาศัย อาชีพ และรายได้ ส่วนความรู้และทัศนคติไม่มีผล 4) ผู้ประกอบการไม่เห็นด้วยที่จะใช้บรรจุภัณฑ์อื่นแทนพลาสติกเพราะเพิ่มต้นทุน ผู้เชี่ยวชาญเห็นว่ามีขยะพลาสติกจากธุรกิจจัดส่งอาหารเพิ่มขึ้น มีการรณรงค์ และให้ความรู้การจัดการขยะพลาสติก

คำสำคัญ: การจัดการขยะ, ขยะพลาสติก, ธุรกิจจัดส่งอาหาร, พฤติกรรม, ไวรัสโคโรนา 2019

Abstract

This research studied the amount of waste, the behavior of using food delivery services and plastic waste management, factors affecting behavior, and proffered guidelines for plastic waste management during the Coronavirus 2019 (COVID-19) outbreak in Samut Sakhon. Key findings were: 1) Between 2017 and 2022, Samut Sakhon Province had the highest amount of solid plastic and hazardous waste in 2019. 2) Most plastic waste was rarely collected to discard, never gathered for selling, landfilled, incinerated, sorted, and cleaned before discarding. Sometimes the types of waste were considered and food packaging was often reused. In terms of attitude, plastic waste was most agreed upon by gathering for selling, strongly changing plastic packaging to biodegradable materials, and reducing plastic and foam use. 3) Factors affecting plastic waste management behavior included gender, age, organization/residence, occupation, and income. However, knowledge and attitude did not. 4) Using substitute materials meant higher costs. Specialists agreed food delivery business increased plastic waste, and they provided campaigns and knowledge on plastic waste management.

Keywords: Behavior, COVID-19, Food delivery, Plastic waste, Waste management.

บทนำ

สมุทรสาครเป็นหนึ่งในจังหวัดที่ได้รับผลกระทบอย่างหนักจากการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 โดยมีผู้ป่วยสะสมตั้งแต่วันที่ 17 ธันวาคม 2563 จนถึงวันที่ 13 กันยายน 2564 มากถึง 101,729 คน (ประชาชาติธุรกิจออนไลน์, 2564) ทำให้สมุทรสาครเป็นจังหวัดที่ต้องอยู่ภายใต้มาตรการป้องกันการแพร่ระบาดของเชื้อไวรัสด้วยการล็อกดาวน์พื้นที่

สถานการณ์การแพร่ระบาดทำให้มีมาตรการ “อยู่บ้าน หยุดเชื้อ เพื่อชาติ” เกิดขึ้น ส่งผลให้ธุรกิจจัดส่งอาหาร (food delivery) เจริญเติบโตสูงถึง 78-84% ก่อให้เกิดขยะพลาสติกแบบใช้ครั้งเดียว 6,300 ตันต่อวัน เพิ่มขึ้นเฉลี่ยจากเดิม 15% รวมถึงขยะพลาสติกที่เกิดจากหน้ากากอนามัยประมาณ 2 ล้านชิ้นต่อวัน (สำนักงานกองทุนสนับสนุนการสร้างเสริมสุขภาพ, 2563)

การกำจัดขยะในช่วงการแพร่ระบาดดังกล่าว ประเทศไทยกำหนดให้แต่ละครัวเรือนแยกหน้ากากอนามัยใส่ถุงซิปล็อคและแยกทิ้งในถังขยะติดเชื้อ (สีแดง) แยกออกจากขยะครัวเรือนที่ใส่ถุงรวบรวมแล้วทิ้งในถังขยะทั่วไป ให้เทศบาลหรือผู้ให้บริการจัดการตามมาตรฐานของกรมการปกครองส่วนท้องถิ่น

จากผลกระทบข้างต้น จึงเป็นประเด็นสำคัญในการศึกษา ดังนี้ 1) ปริมาณขยะที่เปลี่ยนแปลงไปในช่วงการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 ในจังหวัดสมุทรสาคร 2) พฤติกรรมการใช้บริการธุรกิจจัดส่งอาหารและการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหาร 3) ปัจจัยที่ส่งผลต่อพฤติกรรมฯ

และ 4) เสนอแนวทางการจัดการขยะพลาสติกในช่วงของการแพร่ระบาดของจังหวัดสมุทรสาคร เพื่อเป็นประโยชน์ต่อหน่วยงานที่เกี่ยวข้องในการหาแนวทางการแก้ไขปัญหาขยะพลาสติกในพื้นที่จังหวัดสมุทรสาคร และเป็นแนวทางในการช่วยลดหรือแก้ปัญหาขยะพลาสติกในระยะยาวต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาปริมาณขยะพลาสติกที่เปลี่ยนแปลงไปในช่วงการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) ของจังหวัดสมุทรสาคร
2. เพื่อศึกษาพฤติกรรมการใช้บริการธุรกิจจัดส่งอาหาร และพฤติกรรมการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหารของประชากรจังหวัดสมุทรสาครในช่วงการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19)
3. เพื่อศึกษาปัจจัยที่ส่งผลต่อพฤติกรรมการการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหารที่เปลี่ยนแปลงในสถานการณ์การแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) ของประชาชนในจังหวัดสมุทรสาคร
4. เพื่อเสนอแนวทางการจัดการขยะพลาสติกที่เปลี่ยนแปลงไปในช่วงของการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19)

แนวคิด ทฤษฎี กรอบแนวคิด

1. ขยะพลาสติก

ศุลีพร แสงกระจ่าง, ปัทมา พลอยสว่าง และ ปริณดา พรหมหิตาธร (2556) ให้ความหมายของขยะพลาสติกไว้ว่าเป็น ขยะมูลฝอยประเภทพลาสติก เกิดจากการใช้งานของพลาสติกแล้วทิ้งเป็นขยะมูลฝอย โดยขยะมูลฝอยประเภทพลาสติกนี้จะสามารถคงอยู่ได้เป็นเวลานาน ด้าน Saikia and de Brito (2012) ระบุว่าขยะพลาสติกเป็นวัสดุที่ไม่สามารถย่อยสลายได้หรือใช้ระยะเวลานานในการย่อยสลาย จึงส่งผลกระทบกับสภาพแวดล้อม สร้างความเป็นพิษให้แก่แหล่งน้ำรวมถึงพื้นดินที่เป็นที่กำจัดขยะพลาสติก กรมควบคุมมลพิษ (2564) ได้ให้คำจำกัดความว่า “ขยะพลาสติก” หมายถึง ของเสียพลาสติกที่รวบรวมจากบ้านเรือน โรงแรม ภัตตาคาร โรงพยาบาล ร้านค้า สำนักงาน โรงงานอุตสาหกรรม โดยเป็นพลาสติกหรือชิ้นส่วนที่ใช้งานแล้ว หรือเสื่อมสภาพไม่สามารถใช้งานได้หรือไม่เป็นที่ต้องการใช้อีกต่อไป โดยไม่มีการแยกประเภทของพลาสติก หรือ ปะปนกับวัสดุอื่น หรือ สกปรกปนเปื้อน

2. สถานการณ์ขยะพลาสติกในประเทศไทย

กรมควบคุมมลพิษ (2564) ได้สรุปสถานการณ์ขยะที่เกิดขึ้นในปี 2563 ว่ามีขยะมูลฝอยรวมทั้งหมด 27.35 ล้านตัน ถูกนำกลับใช้ประโยชน์ 11.93 ล้านตัน กำจัดอย่างถูกต้อง 11.19 ล้านตัน และกำจัดไม่ถูกต้อง 4.3 ล้านตัน แต่ในช่วงวันที่ 26 เดือนมีนาคม 2563 จนถึงวันที่ 31 เดือนพฤษภาคม 2563 นั้นในพื้นที่ที่มีการควบคุมการเดินทางมีปริมาณขยะพลาสติกใช้ครั้งเดียวเพิ่มขึ้นโดยเฉพาะในเขตเมืองโดย

มาจากการใช้บริการจัดส่งอาหารและการสั่งซื้อสินค้าผ่านระบบออนไลน์นอกจากนี้ขยะพลาสติกเฉลี่ยต่อวันที่เกิดขึ้นเพิ่มขึ้นถึงร้อยละ 15 โดยจากที่ผ่านมีมีขยะพลาสติก 5,500 ชิ้น/วัน เพิ่มขึ้นเป็น 6300 ชิ้น/วัน

3. โรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19)

กรมควบคุมโรค (2563) อธิบายไว้ว่า เป็นตระกูลของไวรัสที่ก่อให้อาการป่วยตั้งแต่โรคไข้หวัดธรรมดาไปจนถึงโรคที่มีความรุนแรงมาก เช่น โรคระบบทางเดินหายใจตะวันออกกลาง (MERS-CoV) และโรคระบบทางเดินหายใจเฉียบพลันรุนแรง (SARS-CoV) เป็นต้น ซึ่งเป็นสายพันธุ์ใหม่ที่ไม่เคยพบมาก่อนในมนุษย์ก่อให้เกิดอาการป่วยระบบทางเดินหายใจในคน และสามารถแพร่เชื้อจากคนสู่คนได้ โดยเชื้อไวรัสนี้พบครั้งแรกในการระบาดในเมืองอู่ฮั่น มณฑลหูเป่ย์ สาธารณรัฐประชาชนจีน ในช่วงปลายปี 2019

โรคติดเชื้อไวรัสโคโรนา 2019 ในจังหวัดสมุทรสาคร สถานการณ์การแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) จังหวัดสมุทรสาครผู้ป่วยสะสมตั้งแต่วันที่ 17 ธันวาคม 2563 จนถึงวันที่ 13 กันยายน 2564 มากถึง 101,729 คน โดยการแพร่ระบาดครั้งใหญ่ของจังหวัดสมุทรสาครที่ตลาดกลางกุ้ง ตำบาลมหาชัย อำเภอเมืองจังหวัดสมุทรสาคร (ประชาชาติธุรกิจ, 2564)

4. ธุรกิจจัดส่งอาหาร

ศรานนท์ โตบุญมา และ ณัฐวัฒน์ กุณาหล่าย (2562) ได้อธิบายถึง ธุรกิจจัดส่งอาหาร (Food Delivery) ไว้ว่า เป็นธุรกิจที่ใช้เทคโนโลยีจัดทำ Platform ระบบการบริการ แอปพลิเคชันหรือเว็บไซต์เป็นตัวกลางในการบริการผู้บริโภค โดยที่จะสมารถจัดระบบได้อย่างมีประสิทธิภาพ และมีราคากลางในค่าบริการการจัดส่ง ทำให้ร้านอาหารไม่ต้องจัดส่งด้วยตัวเองและผู้บริโภคได้รับความสะดวกสบายในการใช้บริการ ปัจจุบันในประเทศไทยธุรกิจจัดส่งอาหารที่เป็นที่นิยมมีดังนี้ Line Man, Food Panda, Grab และ Robinhood

5. แนวคิดและทฤษฎีด้านพฤติกรรม

สำนักงานราชบัณฑิตยสภา (2550) ได้ให้ความหมายของ พฤติกรรม ว่าหมายถึง การกระทำหรืออาการที่แสดงออกทางกล้ามเนื้อ ความคิด และความรู้สึกที่ตอบสนองต่อสิ่งเร้า นอกจากนี้ บุรฉัตร จันทร์แดง, เสาวลักษณ์ โกศลกิตติอัมพร และสัญญา เคณาภูมิ (2562) ได้สรุปไว้ว่า การกระทำหรือการแสดงออกทางจิตใจทั้งภายในและภายนอกเพื่อตอบสนองความต้องการของบุคคล พฤติกรรมสามารถแบ่งได้เป็นพฤติกรรมที่เกิดจากภาวะทางกายและพฤติกรรมที่เกิดจากภาวะทางจิตใจ ซึ่งมีแบบทั้งที่รู้ตัวและไม่รู้ตัว การเกิดพฤติกรรมแบ่งเป็น 3 ระดับ 1. พฤติกรรมระดับอุปนิสัย เป็นพฤติกรรมเป็นพฤติกรรมที่เกิดจากความคิดและอารมณ์เฉพาะบุคคล 2. พฤติกรรมระดับบุคลิกภาพเป็นพฤติกรรมระดับบุคลิกภาพ เป็นพฤติกรรมที่เกิดจากแบบแผนของความติด 3. พฤติกรรมระดับพฤติกรรม เป็นการผสมผสานขององค์ประกอบต่างๆในตัวมนุษย์ ได้แก่ การรับรู้ สติปัญญา การคิด เจตคติ และอารมณ์ โดยปัจจัยที่มีผลต่อการเปลี่ยนแปลงพฤติกรรมประกอบด้วย 3 ปัจจัย คือ 1. ปัจจัยด้านจิตวิทยา ประกอบไปด้วยการรับรู้ เจตคติ และสติปัญญา 2. ปัจจัยด้านสังคม ประกอบด้วยครอบครัว ชุมชน และเพื่อน 3. ปัจจัยด้านสถานการณ์ ประกอบไปด้วยอิทธิพลจากดารา สื่อ และบุคคลรอบข้าง

6. งานวิจัยที่เกี่ยวข้อง

ณัธภัชร เฉลิมแดน (2563) ได้ศึกษาพฤติกรรมผู้บริโภคในกรุงเทพมหานครที่เคยสั่งอาหารแบบเดลิเวอรี่ผ่านโมบายแอปพลิเคชันในช่วงของการเกิดโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) พบว่ากลุ่มตัวอย่างผู้บริโภคส่วนใหญ่เลือกใช้แอป LINEMAN บ่อยที่สุด รองลงไป ได้แก่ Grab food และ Food Panda ตามลำดับ สำหรับประเภทอาหารที่สั่งมากที่สุด 3 อันดับแรก ได้แก่ ฟาสต์ฟู้ด รองลงไป คือ อาหารตามสั่ง และเครื่องดื่ม ตามลำดับ ช่วงเวลาที่สั่งอาหารมากที่สุดคือช่วงเวลา 12.01-14.00 น.

บุญชนิต ว่องประพิณกุล และ สุจิตรา วาสนาดำรงดี (2564) พบว่าผู้บริโภคมีพฤติกรรมคุ้นชินกับการสั่งอาหารออนไลน์มากขึ้นจากการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (COVID-19) โดยเฉพาะช่างที่ร้านอาหารหยุดให้บริการนั่งทานในร้านส่งผลให้ความถี่ของการสั่งอาหารผ่านแอปพลิเคชันมากถึงร้อยละ 101.5 และเมื่อร้านอาหารเปิดให้บริการปกติความถี่ลดลงเพียงร้อยละ 33.1 ทำให้ความถี่ยังสูงกว่าก่อนการแพร่ระบาด นอกจากนี้ผู้บริโภคส่วนใหญ่ ร้อยละ 72.6 เห็นว่าบรรจุภัณฑ์พลาสติกที่ได้รับมีจำนวนมากเกินความจำเป็น ร้อยละ 55.5 ของผู้ตอบแบบสอบถามคิดว่าบรรจุภัณฑ์จากโฟม (Polystyrene Foam) ควรปรับเปลี่ยนเป็นบรรจุภัณฑ์อื่น สำหรับการสำรวจความคิดเห็นของผู้บริโภคพบว่ามีค่าเฉลี่ยความคาดหวัง 4.63 จาก 5 ใน 4 มาตรการการลดการใช้พลาสติกคือ

1. การลดการแจกพลาสติกแบบใช้ครั้งเดียว โดยผู้ประกอบการจะตั้งค่าเริ่มต้นในระบบคือ ร้านอาหารจะไม่แจก ช้อนส้อม มีด หลอด พลาสติก แต่หากลูกค้าต้องการ สามารถกดเลือก ‘ขอรับช้อนส้อม’ ได้

2. แพลตฟอร์มช่วยจัดหาบรรจุภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อมเช่น กล่องชานอ้อย หรือ กล่องกระดาษเคลือบพลาสติกชีวภาพ เพื่อขายให้ร้านค้าในเครือข่าย

3. แสดงร้านค้าสีเขียว (Eco Label) แอปพลิเคชัน โดยแพลตฟอร์มจัดทำฐานข้อมูล การใช้บรรจุภัณฑ์ของร้านค้าและทำสัญลักษณ์ที่แสดงว่าร้านค้าดังกล่าวใช้บรรจุภัณฑ์ที่เป็นมิตรต่อสิ่งแวดล้อม (Eco Label)

4. การใช้ภาชนะที่ใช้ซ้ำได้ เป็น มาตรการที่ต้องอาศัยความร่วมมือของผู้บริโภคมากกว่ามาตรการอื่น ๆ โดยแพลตฟอร์มมีตัวเลือกให้ลูกค้า เลือกใช้บรรจุภัณฑ์ที่สามารถใช้ซ้ำได้โดยเก็บค่ามัดจำภาชนะ และเมื่อนำไปคืนที่จุดรับคืนภาชนะที่กระจายตามอาคารในย่านธุรกิจ และย่านที่อยู่อาศัย สแกนคืนผ่านแอปพลิเคชันและรับเงินคืน

จอมตวัญจ์ อาคมานนท์ และปัญญา ศรีสิงห์ (2563) ได้ศึกษาความรู้และการรับรู้ที่มีต่อพฤติกรรมในการจัดการขยะพลาสติกของคนในกรุงเทพมหานครพบว่าพฤติกรรมการลดปริมาณพลาสติกและการคัดแยกขยะพลาสติกอยู่ในระดับบ่อยมาก โดย เพศ อายุ อาชีพ และรายได้เฉลี่ยส่งผลต่อพฤติกรรมการจัดการขยะพลาสติกอย่างมีนัยสำคัญที่ 0.01 และ ระดับการศึกษาส่งผลกระทบต่อพฤติกรรมการจัดการขยะพลาสติกอย่างมีนัยสำคัญที่ 0.05 แต่จำนวนสมาชิกในครอบครัวไม่ได้ส่งผลต่อพฤติกรรมการจัดการขยะพลาสติก สำหรับปัจจัยด้านความรู้และการรับรู้ข่าวสารเป็นปัจจัยที่ส่งผลต่อการจัดการขยะพลาสติก

ทั้งจากการรับข้อมูลผ่าน แผ่นพับ/คู่มือ โทรทัศน์ บุคคลใกล้ชิด บุคคลที่มีชื่อเสียง

สุจินดา ไผ่สมบูรณ์, ศุภาพิชญ์ ตั้งถึงถิ่น และพุฒิพัตน์ ทวีวชิรพัฒน์ (2563) ได้ศึกษาปัจจัยที่ส่งลต่อพฤติกรรมการจัดการขยะพลาสติกของผู้ใช้บริการ Food Delivery พบว่าปัจจัยที่มีผลต่อพฤติกรรมการจัดการพลาสติกของผู้ใช้บริการ Food Delivery คือ เพศ และการคำนึงถึงบรรจุภัณฑ์อาหาร มีความสัมพันธ์ต่อพฤติกรรมที่ระดับนัยสำคัญที่ 0.01 ส่วนการเข้าถึงคัดแยกขยะบริเวณที่พักอาศัย ความรู้เกี่ยวกับการจัดการขยะพลาสติก การเข้าถึงข้อมูลข่าวสารของโครงการ และทักศนคติเกี่ยวกับการจัดการขยะ มีความสัมพันธ์ต่อพฤติกรรมการจัดการขยะพลาสติกที่ระดับนัยสำคัญที่ 0.05 แต่ปัจจัยการอบรมเลี้ยงดูจากครอบครัว และการดำเนินชีวิตที่เร่งรีบไม่มีความสัมพันธ์กับพฤติกรรมการจัดการขยะ

วิธีดำเนินการวิจัย

การวิจัยครั้งนี้เป็นการวิจัยเชิงคุณภาพและเชิงปริมาณในจังหวัดสมุทรสาคร การวิจัยเชิงปริมาณเก็บข้อมูลจากกลุ่มตัวอย่างภาคประชาชนแบบเฉพาะเจาะจง 210 คน โดยกำหนดผู้ให้ข้อมูลจากแต่ละประเภทหน่วยงานและที่พักอาศัย จำนวนประเภทละ 3 หน่วยงาน หน่วยงานละ 10 คน การวิจัยเชิงคุณภาพเก็บข้อมูลด้วยการสัมภาษณ์เชิงลึกจากนักวิชาการผู้เชี่ยวชาญ บุคลากรที่ทำงานเกี่ยวข้องกับด้านสิ่งแวดล้อม (เจ้าหน้าที่สาธารณสุขของเทศบาล เจ้าหน้าที่สาธารณสุขขององค์การบริหารส่วนตำบล เจ้าหน้าที่สาธารณสุขจังหวัด ที่มีประสบการณ์การทำงานอย่างน้อย 3 ปี จำนวน 10 คน) และผู้ให้บริการธุรกิจจัดส่งอาหารในช่วงการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 จำนวน 20 คน

เครื่องมือเก็บข้อมูล ได้แก่ 1) แบบสอบถาม แบ่งเป็น 4 ตอน คือ (1) ข้อมูลทั่วไปเกี่ยวกับผู้ตอบแบบสอบถาม ได้แก่ ข้อมูลส่วนบุคคล เพศ อายุ อาชีพ รายได้ การศึกษา ที่อยู่ จำนวนสมาชิกในครอบครัว จำนวนเด็กเล็ก และผู้ป่วยติดเตียง (2) พฤติกรรมการใช้บริการธุรกิจจัดส่งอาหาร ความถี่ในการสั่งอาหาร ช่วงเวลาที่ใช้บริการ แอปพลิเคชันที่เลือกใช้ มูลค่าในการสั่งต่อครั้ง ประเภทของอาหารที่สั่ง (3) พฤติกรรมการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหาร วิธีการจัดการขยะขยะพลาสติก ความถี่ในการจัดการขยะ ทัศนคติ และความรู้ในการจัดการขยะพลาสติก (4) แนวทางและข้อเสนอแนะในการแก้ไขปัญหา 2) แนวคำถามสัมภาษณ์ ชุดที่ 1 กลุ่มผู้เชี่ยวชาญ/บุคลากรฯ แบ่งเป็น 3 ตอน คือ (1) ข้อมูลส่วนบุคคล อาชีพ ตำแหน่ง ความเชี่ยวชาญ (2) การจัดการขยะในปัจจุบัน วิธีรวบรวมขยะ วิธีกำจัดขยะ การคัดแยกขยะ นโยบายด้านขยะของท้องถิ่น ทรัพยากรที่หน่วยงานได้รับ ความร่วมมือจากหน่วยงานภายนอก และภาคเอกชน อุปสรรคและปัญหาในการจัดการขยะ วิธีการแก้ปัญหาในการจัดการขยะ (3) ข้อเสนอแนะ แนวทางและมาตรการในการจัดการขยะในช่วงการแพร่ระบาด แนวคำถามสัมภาษณ์ ชุดที่ 2 ผู้ให้บริการธุรกิจจัดส่งอาหาร แบ่งเป็น 3 ตอน คือ (1) ข้อมูลส่วนบุคคล ประเภทของผู้ให้บริการ (2) ข้อมูลการใช้บริการก่อน ระหว่างและหลังการล็อกดาวน์ (3) ความคิดเห็นต่อขยะพลาสติกจากธุรกิจจัดส่งอาหาร

การวิเคราะห์ข้อมูลเชิงปริมาณด้วยโปรแกรมสำเร็จรูปทางสถิติ (SPSS) และสถิติเชิงพรรณนาและเชิงอนุมาน วิเคราะห์ปัจจัยที่ส่งผลต่อพฤติกรรมการจัดการขยะพลาสติกจากธุรกิจขนส่งอาหารโดยใช้การ

วิเคราะห์ถดถอยโลจิสติกพหุกลุ่ม เพื่อพยากรณ์ปัจจัยที่น่าจะส่งผลต่อพฤติกรรมการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหาร ด้วยวิธี Backward stepwise: likelihood ratio วิเคราะห์ข้อมูลเชิงคุณภาพโดยรวบรวมความคิดเห็นและแนวทางข้อเสนอแนะในแบบสอบถามและแนวคำถามสัมภาษณ์เพื่อสรุปประเด็นจัดหมวดหมู่ของข้อมูล วิเคราะห์จุดแข็ง-จุดอ่อน-โอกาส-อุปสรรค และนำเสนอผลการศึกษา

ผลการวิจัย

1. ปริมาณขยะที่เปลี่ยนแปลงไปในช่วงการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 ข้อมูลทุติยภูมิจากสำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมจังหวัดสมุทรสาคร พบว่า ปี พ.ศ. 2562 จังหวัดสมุทรสาครมีปริมาณขยะมูลฝอยชุมชนสูงสุด (950.42 ตัน/วัน) เมื่อเทียบระหว่างปี พ.ศ. 2560 - 2565 ปริมาณขยะพลาสติกที่เกิดขึ้นต่อวันสูงสุด (120 ตัน/วัน) และปริมาณขยะอันตรายสูงสุด (5,760 กิโลกรัม/วัน) ขณะที่ปริมาณขยะพลาสติกที่พบมากในลำดับรองลงมา คือ ปี พ.ศ. 2560 (ขยะพลาสติก 104 ตัน/วัน จากปริมาณขยะมูลฝอยชุมชน 948 ตัน/วัน)

2. การใช้บริการธุรกิจจัดส่งอาหาร ผู้บริโภคส่วนใหญ่ ร้อยละ 44.0 ใช้บริการผ่านแอปพลิเคชัน line man รองลงมา คือ Grab ร้อยละ 29.3 โดยมีความถี่ของการใช้บริการ 1 - 4 ครั้ง/สัปดาห์ คิดเป็นร้อยละ 75.7 โดยใช้บริการในช่วงเวลากลางวัน คิดเป็นร้อยละ 74.8 มีค่าอาหารเฉลี่ย 200 - 500 บาท/ครั้ง คิดเป็นร้อยละ 51.0 ประเภทอาหารที่สั่งส่วนใหญ่เป็นอาหารตามสั่ง คิดเป็นร้อยละ 36.9 และไม่มีความกังวลในการติดเชื้อไวรัสผ่านการสั่งอาหารผ่านธุรกิจจัดส่งอาหาร คิดเป็นร้อยละ 51.0 ของผู้ตอบแบบสอบถาม

พฤติกรรมการจัดการขยะพลาสติก ส่วนใหญ่จัดการขยะทั่วไปด้วยการเก็บรวบรวมทิ้งในระยะ 3 - 4 ครั้ง/สัปดาห์ (ร้อยละ 56.5) ความถี่ในการเก็บรวบรวมขยะพลาสติกทิ้ง ส่วนใหญ่นาน ๆ ครั้ง (ร้อยละ 53.8) ไม่เคยจัดการขยะพลาสติกด้วยวิธีการรวบรวมเพื่อขาย (ร้อยละ 41.9) ไม่ฝังกลบ (ร้อยละ 91.0) ไม่เผา (ร้อยละ 85.2) ไม่เคยมีการคัดแยกขยะเปียกและขยะแห้งออกจากกัน (ร้อยละ 29.0) ไม่เคยล้างทำความสะอาดภาชนะพลาสติกจากบรรจุภัณฑ์อาหารก่อนทิ้ง (ร้อยละ 43.3) และทิ้งขยะพลาสติกจากบรรจุภัณฑ์อาหารลงในถังขยะสำหรับทิ้งพลาสติกนาน ๆ ครั้ง (ร้อยละ 31.4) บ่อยครั้งได้พิจารณาประเภทของขยะก่อนทิ้ง (ร้อยละ 32.9) นำภาชนะพลาสติกจากบรรจุภัณฑ์อาหารที่ใช้กลับมาใช้ใหม่ (ร้อยละ 40.0) ซึ่งในช่วงล็อกดาวน์ผู้ตอบแบบสอบถามส่วนใหญ่กังวลมากเรื่องปัญหาพลาสติกใช้ครั้งเดียว (ร้อยละ 41.0) อย่างไรก็ตาม ยังคงใช้พลาสติกแบบครั้งเดียวทิ้งเพิ่มขึ้น (ร้อยละ 67.2) ช่องทางหลักที่ได้รับข้อมูลด้านการจัดการขยะคือ โทรทัศน์ (ร้อยละ 28.9) ด้านทัศนคติการจัดการขยะพลาสติก ส่วนใหญ่มีความคิดเห็นในระดับมากที่สุดต่อ การเก็บรวบรวมขยะพลาสติกเพื่อนำไปขาย การให้ร้านค้าเปลี่ยนบรรจุภัณฑ์จากพลาสติกเป็นบรรจุภัณฑ์ที่ย่อยสลายง่าย และการลดการใช้บรรจุภัณฑ์จากพลาสติกและโฟมเนื่องจากย่อยสลายยาก สำหรับความรู้และความเข้าใจในการจัดการขยะพลาสติกพบว่า อยู่ในระดับสูง (ร้อยละ 80 ของผู้ตอบแบบสอบถาม)

3. ปัจจัยที่ส่งผลต่อพฤติกรรมการจัดการขยะ การศึกษานี้วิเคราะห์ 10 พฤติกรรม พบว่า ปัจจัยส่วนบุคคลที่ส่งผลต่อพฤติกรรมการจัดการขยะที่ระดับนัยสำคัญ 0.05 โดยพิจารณาจากปัจจัยที่ส่งผลต่อจำนวนพฤติกรรมมากไปน้อย ประกอบด้วย ปัจจัยด้านลักษณะหน่วยงานและที่อยู่อาศัย (8 พฤติกรรม) อาชีพ (6 พฤติกรรม) รายได้ (3 พฤติกรรม) อายุ (2 พฤติกรรม) และ เพศ (1 พฤติกรรม) ตามลำดับ ขณะที่ปัจจัยด้านการศึกษา ความรู้ และทัศนคติ พบว่าไม่ส่งผลต่อพฤติกรรมการจัดการขยะที่ระดับนัยสำคัญ 0.05 (ตารางที่ 1)

4. สถานการณ์ขยะพลาสติกในช่วงของการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 มีแนวโน้มสูงขึ้นปัจจุบันหน่วยงานที่เกี่ยวข้องได้มีแนวทางการจัดการขยะพลาสติก โดยจัดกิจกรรมอบรมให้ความรู้และรณรงค์เกี่ยวกับการจัดการขยะพลาสติก กิจกรรมตลาดนัดขยะรีไซเคิล กิจกรรมทอดผ้าป่าขยะรีไซเคิล การสร้างภาคีเพื่อระดมความคิดและจัดกิจกรรมการเก็บและคัดแยกขยะด้วยความร่วมมือจากทั้งภาคเอกชนและบริษัทอุตสาหกรรม ทั้งยังเห็นว่าควรปรับเปลี่ยนบรรจุภัณฑ์สำหรับจัดส่งอาหารจากพลาสติกเป็นบรรจุภัณฑ์ที่มาจากธรรมชาติ หรือบรรจุภัณฑ์ที่ย่อยสลายง่าย และควรลดการใช้พลาสติกตั้งแต่ต้นทาง

ดังตัวอย่างการสัมภาษณ์ เจ้าหน้าที่ปฏิบัติงานอยู่ในสำนักสิ่งแวดล้อมจังหวังสมุทรสาคร ตำแหน่งนักวิชาสิ่งแวดล้อมชำนาญการพิเศษ ประสบการการทำงาน 29 ปี ได้ระบุว่า สถานการณ์ขยะในช่วงการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 มีการเปลี่ยนแปลงของขยะพลาสติกเพิ่มขึ้น ในขณะที่การจัดการขยะในจังหวัดสมุทรสาครที่เพิ่มขึ้นนั้นทำให้องค์การปกครองส่วนท้องถิ่นมีภาระเพิ่มขึ้น ทำให้มีค่าใช้จ่ายสูงขึ้น มีขยะตกค้างเพิ่มขึ้น โทยทางสำนักงานทรัพยากรธรรมชาติและสิ่งแวดล้อมขแงจังหวัดสมุทรสาครได้กำหนดนโนบาย ให้มีมาตราการคัดแยกขยะในศาลากลาง มีการรณรงค์ให้ลดการใช้พลาสติก มีโครงการ “ลดรับ ลดให้ ลดใช้พลาสติก” ทั้งในตลาด ในห้าง ร้านสะดวกซื้อ นอกจากนี้ความร่วมมือจากหน่วยงานภายนอก ได้รับความร่วมมือจากองค์การปกครองส่วนท้องถิ่น และบริษัทเอกชนโดยเฉพาะการจัดกิจกรรมในเรื่องขยะทะเล

ตัวอย่างการสัมภาษณ์ร้านค้าที่ให้บริการธุรกิจจัดส่งอาหารมาแล้ว 8 ปี ระบุว่ามีผู้ใช้บริการธุรกิจจัดส่งอาหารเพิ่มขึ้นในช่วงล็อกดาวน์จากการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 โดยภายหลังการล็อกดาวน์มีลูกค้ากลับมาใช้บริการหน้าร้านเพิ่มมากขึ้น แต่บางส่วนยังคงใช้บริการผ่านธุรกิจจัดส่งอาหารอยู่ ทางร้านค้ามีความคิดเห็นว่าหากเปลี่ยนบรรจุภัณฑ์จากพลาสติกเป็นบรรจุภัณฑ์ทดแทนอาจจะเป็นปัญหากับร้านค้าในเรื่องของต้นทุนราคา แต่เห็นด้วยเป็นย่างยิ่งในการเปลี่ยนบรรจุภัณฑ์หากผู้บริโภครับผิดชอบค่าใช้จ่าย

ตารางที่ 1 ปัจจัยส่วนบุคคลที่ส่งผลต่อพฤติกรรมการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหาร

พฤติกรรมการจัดการขยะพลาสติก	เพศ	อายุ	ลักษณะหน่วยงาน	อาชีพ	รายได้	ระดับการศึกษา
1. ท่านมีการกำจัดขยะด้วยวิธีอื่น นอกการเก็บรวบรวมทิ้งบ่อยเพียงใด (ครั้งต่อสัปดาห์)	0.467 (0.628)	0.610 (0.693)	1.716 (0.119)	0.894 (0.523)	0.861 (0.488)	0.369 (0.919)
2. ท่านจัดการขยะพลาสติกจากบรรจุภัณฑ์อาหารด้วยวิธีการเก็บรวบรวมทิ้งบ่อยเพียงใด	1.145 (0.320)	2.178 (0.058)	2.465* (0.025)	1.475 (0.168)	0.522 (0.720)	0.723 (0.653)
3. ท่านจัดการขยะพลาสติกจากบรรจุภัณฑ์อาหารด้วยวิธีการรวบรวมเพื่อขายบ่อยเพียงใด	3.851* (0.023)	1.620 (0.156)	6.116** (0.000)	10.262** (0.000)	2.585* (0.038)	2.014 (0.055)
4. ท่านจัดการขยะพลาสติกจากบรรจุภัณฑ์อาหารด้วยวิธีการเผาบ่อยเพียงใด	0.774 (0.463)	0.790 (0.558)	1.364 (0.231)	3.545** (0.001)	2.201 (0.070)	1.314 (0.245)
5. ท่านจัดการขยะพลาสติกจากบรรจุภัณฑ์อาหารด้วยวิธีการฝังกลบบ่อยเพียงใด	1.361 (0.259)	2.216 (0.054)	4.634** (0.000)	2.256* (0.025)	3.267* (0.013)	1.921 (0.068)
6. ในการนำขยะไปกำจัดท่านมีการคัดแยกขยะเปียกและขยะแห้งออกจากกัน	0.466 (0.628)	0.604 (0.697)	5.772** (0.000)	3.570** (0.001)	3.551* (0.008)	1.462 (0.183)
7. ท่านมีการล้างทำความสะอาดภาชนะพลาสติกจากบรรจุภัณฑ์อาหารก่อนทิ้งหรือไม่	0.705 (0.495)	0.640 (0.669)	5.894** (0.000)	2.595* (0.010)	1.915 (0.109)	1.284 (0.260)
8. ท่านมีการทิ้งขยะพลาสติกจากบรรจุภัณฑ์อาหารลงในถังขยะสำหรับทิ้งพลาสติกบ่อยเพียงใด	2.074 (0.128)	2.437* (0.036)	4.258** (0.000)	2.550* (0.012)	0.613 (0.653)	0.971 (0.453)
9. ท่านมีการพิจารณาประเภทของขยะก่อนทิ้ง	0.681 (0.507)	0.172 (0.973)	3.420* (0.003)	1.966 (0.052)	1.279 (0.279)	0.947 (0.471)

ตารางที่ 1 (ต่อ)

	เพศ	อายุ	ลักษณะหน่วยงาน	อาชีพ	รายได้	ระดับการศึกษา
10. ท่านมีการนำภาชนะพลาสติกจากบรรจุภัณฑ์อาหารใช้แล้วกลับมาใช้ใหม่	0.276 (0.759)	2.421* (0.037)	4.146** (0.001)	2.407* (0.017)	1.191 (0.316)	1.082 (0.376)

* หมายถึง มีความแตกต่างอย่างมีนัยสำคัญที่ 0.05

** หมายถึง มีความแตกต่างอย่างมีนัยสำคัญที่ 0.001

(ตัวเลข) หมายถึง ค่าระดับนัยสำคัญ

สรุปและอภิปรายผล

จากข้อมูลปริมาณขยะจังหวัดสมุทรสาครในปี พ.ศ. 2562 ที่พบปริมาณขยะมูลฝอยชุมชน ขยะพลาสติก และขยะอันตรายสูงสุดเมื่อเทียบในช่วงระหว่างปี พ.ศ. 2560 - 2565 อาจเป็นเพราะ ปี พ.ศ. 2562 เป็นปีแรกของการระบาดของเชื้อไวรัสโคโรนา 2019 ทำให้ทั้งประชาชน ภาคเอกชน และภาครัฐยังไม่มีการปรับตัวและเตรียมตัวรับมือสำหรับการแพร่ระบาด ทำให้เกิดขยะพลาสติกและขยะมูลฝอยเพิ่มมากขึ้นจากวิถีชีวิตที่เปลี่ยนแปลงไป ต่อมาผู้คนเริ่มปรับตัวและปรับเปลี่ยนวิถีชีวิต เกิดความคุ้นชินกับการแพร่ระบาด จำนวนผู้ติดเชื้อลดลง และมีนโยบายภาครัฐเข้ามาสนับสนุนจึงส่งผลต่อปริมาณขยะในช่วงกลางจนถึงปลายของการแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 ช่วยลดปริมาณขยะได้

การใช้บริการธุรกิจจัดส่งอาหารในช่วงการระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 มีปริมาณเพิ่มขึ้นมากกว่าในช่วงสถานการณ์ปกติ โดยปัจจัยที่ส่งผลต่อพฤติกรรมการจัดการขยะพลาสติกจากธุรกิจจัดส่งอาหารพบว่า ปัจจัยด้านเพศ อายุ ลักษณะหน่วยงานและที่อยู่อาศัย อาชีพ และรายได้ ส่งผลต่อพฤติกรรมการจัดการขยะ อาจเป็นเพราะปัจจัยส่วนบุคคลเป็นปัจจัยที่มีบทบาทสำคัญในการเลือกใช้บริการโดยเฉพาะปัจจัยด้านอาชีพและปัจจัยในด้ายรายได้ ปัจจัยด้านเพศและอายุก็เป็นปัจจัยที่สำคัญต่อการดำรงชีวิตรวมถึงเป็นสิ่งแวดล้อมสำคัญที่ส่งผลต่อพฤติกรรมโดยเฉพาะด้านลักษณะหน่วยงานและที่อยู่อาศัย ซึ่งสอดคล้องกับการศึกษาของ จอมตวัญจ์ อาคมานนท์ และปัญญา ศรีสิงห์ (2563) ขณะที่ปัจจัยด้านระดับการศึกษา ความรู้และทัศนคติไม่ส่งผลต่อพฤติกรรมการจัดการขยะพลาสติก อาจเป็นเพราะในการศึกษาครั้งนี้เก็บข้อมูลกว่ากลุ่มตัวอย่างในพื้นที่ใกล้เคียงกันจึงทำให้เกิดข้อจำกัดในการจัดการด้านพื้นที่ทำให้กลุ่มตัวอย่างอาจมีพฤติกรรมการจัดการขยะในข้อจำกัดของสิ่งแวดล้อมที่อยู่ ซึ่งแตกต่างจากการศึกษาของ สุจินดา ไผ่สมบูรณ์, ศุภาพิชญ์ ตั้งถึงถิ่น และพุฒิพัฒน์ ทวีวชิรพัฒน์ (2563) ที่พบว่า ความรู้เกี่ยวกับการจัดการขยะและทัศนคติเกี่ยวกับการจัดการขยะ มีความสัมพันธ์ต่อพฤติกรรมการจัดการขยะพลาสติกที่ระดับนัยสำคัญที่ 0.05 นอกจากนี้ Begum, Siwar, Pereira and Jaafar (2009) กล่าวว่า การมีส่วนร่วมของบุคคลในการสร้างทัศนคติที่ดีในการจัดการขยะ สามารถส่งเสริมได้ด้วยการจัดโปรแกรมการ

ฝึกอบรมและให้ความรู้วิธีการกำจัดของเสีย ซึ่งสอดคล้องกับผลการศึกษาความรู้และความเข้าใจที่ผิดเกี่ยวกับวิธีการกำจัดขยะที่ถูกต้อง คือ การรวบรวมแล้วเผาในที่โล่งแจ้ง ขยะพลาสติกหรือโฟมสามารถกำจัดได้ด้วยวิธีการเผา ถุงพลาสติกใส่แกง ภาชนะพลาสติกที่บรรจุอาหารถือเป็นขยะแห้ง การฝังกลบและการเผาไม่จำเป็นต้องมีการคัดแยกประเภทขยะ และการกำจัดขยะพลาสติกควรกำจัดด้วยวิธีการเผาเนื่องจากจะสามารถกำจัดได้มาก

ดังนั้นแนวทางส่งเสริมพฤติกรรมการใช้พลาสติกครั้งเดียวทิ้งด้วยการส่งเสริมความรู้ ความเข้าใจในการใช้บรรจุภัณฑ์ที่เป็นมิตรกับสิ่งแวดล้อมแก่ผู้ประกอบการร้านอาหาร การหาบรรจุภัณฑ์ทดแทนที่มีคุณภาพและราคาที่ไม่แตกต่างกันเพื่อใช้ใช้ทดแทนบรรุภัณฑ์พลาสติกตอบสนองความต้องการของร้านค้าที่มีความกังวลอย่างมากให้เรื่องของต้นทุนและการใช้งานบรรจุภัณฑ์ เพื่อลดปริมาณพลาสติกตั้งแต่ต้นทางดังที่ผู้ให้บริการธุรกิจจัดส่งอาหารให้ความคิดเห็นไว้ว่าการเลือกปฏิเสธการรับบรรจุภัณฑ์พลาสติกจากลูกค้าสามารถลดปริมาณขยะพลาสติกได้ดีที่สุด และให้ความรู้เรื่องการรีไซเคิลแก่ผู้บริโภคเพื่อการคัดแยกขยะ และนำขยะกลับมาใช้อีกครั้ง ซึ่งเป็นการลดปริมาณขยะพลาสติกที่จะเข้าสู่กระบวนการจัดการให้น้อยลงได้

ข้อเสนอแนะ

1) ควรจัดกิจกรรมส่งเสริม และวัดระดับความรู้ความเข้าใจในการจัดการขยะพลาสติก ก่อน-หลังการจัดกิจกรรม เพื่อให้ทราบผลของการส่งเสริมความรู้

2) ควรศึกษารูปแบบการจัดการขยะพลาสติกในชุมชนขนาดใหญ่ที่มีผู้พักอาศัยจำนวนมาก และต้องอาศัยระบบการจัดการขยะร่วมกันเป็นส่วนกลาง เพื่อให้ทราบถึงทัศนคติการจัดการขยะของบุคคลที่ส่งผลต่อรูปแบบการบริหารจัดการขยะของชุมชน

3) ควรศึกษาปัจจัยหลักแต่ละด้านที่มีผลต่อพฤติกรรมการจัดการขยะพลาสติกของผู้บริโภค เช่น การดำรงชีวิต การคมนาคมขนส่ง รูปแบบชุมชน ความสามารถส่วนบุคคลในการจัดการขยะ เป็นต้น เพื่อให้ทราบถึงประเด็นที่ส่งผลต่อพฤติกรรมการจัดการขยะของผู้บริโภคที่ชัดเจนมากขึ้น

4) ควรจำแนกประเภทกลุ่มผู้ตอบแบบสอบถามตามประเภทที่พักอาศัยเพิ่มเติม ได้แก่ บ้านเดี่ยว บ้านแฝด คอนโดมิเนียม เป็นต้น ซึ่งจะแสดงให้เห็นถึงขั้นตอนการจัดการขยะพลาสติกของสถานที่นั้นร่วมด้วย

5) ควรให้ร้านค้าใช้บรรจุภัณฑ์ย่อยสลายง่ายแทนบรรจุภัณฑ์พลาสติก รวมถึงให้ความรู้ในการใช้วัสดุจากธรรมชาติมาใช้แทนบรรจุภัณฑ์พลาสติก

6) ควรปลูกฝัง ให้ความรู้ และส่งเสริมให้ผู้บริโภคลดการใช้ และปฏิเสธการรับบรรจุภัณฑ์และอุปกรณ์พลาสติก คัดแยกและทำความสะอาดบรรจุภัณฑ์พลาสติกก่อนทิ้ง

7) ควรสนับสนุนให้ผู้บริโภคนำบรรจุภัณฑ์พลาสติกที่ได้รับจากธุรกิจจัดส่งอาหารกลับมาใช้ซ้ำและนำกลับมาใช้ใหม่

8) ผู้ประกอบการธุรกิจจัดส่งอาหารควรสร้างแรงจูงใจให้ผู้บริโภคที่เลือกไม่รับช้อน ส้อม หลอด รวมถึงพลาสติกอื่นๆ จากธุรกิจจัดส่งอาหารด้วยการให้ส่วนลดหรือการสะสมคะแนนจากทางผู้ให้บริการ

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การประเมินการปลดปล่อยแอมโมเนียที่เป็นสารตั้งต้น PM 2.5 ทุติยภูมิจากการใช้ปุ๋ยเคมีไนโตรเจนและการจัดการปศุสัตว์ในพื้นที่ภาคกลางของประเทศไทย

Assessment of Release of Ammonia Precursor Contribution to Secondary PM 2.5 from Nitrogen Chemical Fertilizer Usage and Livestock Management in Central Region, Thailand

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บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาแหล่งกำเนิดของก๊าซแอมโมเนียผ่านการจัดทำบัญชีระบายมลพิษในอากาศจากภาคการเกษตรในพื้นที่ภาคกลางของประเทศ ข้อมูลกิจกรรมที่นำมาศึกษาจะถูกเก็บรวบรวมโดยใช้ข้อมูลทุติยภูมิเกี่ยวกับการใส่ปุ๋ยที่มีก๊าซแอมโนเนียและการจัดการปศุสัตว์ ปริมาณมลพิษจะคำนวณตามวิธีในคู่มือ European Monitoring and Evaluation Program / The European Environment Agency air pollutant emission inventory guidebook 2019 โดยใช้ค่าสัมประสิทธิ์การระบายมลพิษซึ่งเป็นค่าเฉพาะของประเทศที่ได้มาจากรายงานบัญชีก๊าซเรือนกระจก ภาคเกษตร ระหว่างปี พ.ศ. 2543 – 2560 รวมถึงการวิเคราะห์ข้อมูลการระบายก๊าซแอมโมเนียเชิงพื้นที่และเวลาจากภาคการเกษตร ผลการศึกษา พบว่า การระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ในพื้นที่ภาคกลางมีปริมาณการระบายก๊าซแอมโมเนียทั้งหมดเท่ากับ 62,610 ตัน โดยสัตว์ที่มีการระบายก๊าซแอมโมเนียมากที่สุด คือ ไก่เนื้อ สุกรขุน และโคนม ตามลำดับ และการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชในพื้นที่ภาคกลางมีการระบายก๊าซแอมโมเนียทั้งหมด 41.47 ตัน โดยพืชที่มีการระบายก๊าซแอมโมเนียมากที่สุด คือ ข้าวนาปี ข้าวนาปรัง และอ้อย ตามลำดับ นอกจากนี้ยัง

พบว่า ช่วงเวลาที่เกิดวิกฤตฝุ่น PM 2.5 บริเวณพื้นที่ภาคกลาง คือ ช่วงเดือนกุมภาพันธ์ ถึง มีนาคม จะมีการระบายก๊าซแอมโนเมียจากการจัดการมูลสัตว์ และการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชสูงกว่าช่วงเดือนอื่น สำหรับมาตรการการลดการปลดปล่อยก๊าซแอมโนเนียจากภาคเกษตร ในช่วงเวลาที่เกิดวิกฤตฝุ่น PM 2.5 ภาครัฐควรมีการกำหนดมาตรการที่สนับสนุนแนวการจัดการมูลสัตว์ภายในฟาร์มของเกษตรกรให้แพร่หลายมากขึ้น และควรมีการกำหนดมาตรการควบคุมการใช้ปุ๋ยเคมีไนโตรเจนของเกษตรกรให้มีความเหมาะสมต่อความต้องการของพืช

คำสำคัญ: การปล่อยก๊าซแอมโมเนีย, ภาคการเกษตร, PM 2.5, ภาคกลาง

Abstract

This study aimed to investigate the sources of ammonia pollutants by compiling an inventory of air pollutant emissions from the agricultural sector in the Central Region of Thailand. Secondary data sources were used to collect activity data, including livestock management and applying ammonia-containing fertilizers. The pollution amounts were calculated following the European Monitoring and Evaluation Program / The European Environment Agency air pollutant emission inventory guidebook 2019, using country-specific emission factors derived from the agricultural sector's greenhouse gas inventory reports from 2000 to 2017. In addition, the research examines the emission of ammonia from agriculture, analyzing its spatial and temporal aspects. This study's findings will help devise effective plans to minimize ammonia emissions from the agricultural sector. The study found that ammonia emissions from livestock manure management in the Central Region amounted to 62,610 tons. In descending order, the highest emissions were from broiler chickens, finishing pigs, and dairy cattle. Chemical nitrogen fertilizers used in crop cultivation caused 41.47 tons of ammonia emissions. Rainfed rice, irrigated rice, and sugarcane were the top three crops with the highest emissions. During the PM2.5 dust crisis in the Central Region from February to March, higher ammonia emissions occurred due to livestock manure management and chemical nitrogen fertilizer usage compared to other months. To reduce ammonia emissions from agriculture during the PM2.5 crisis, it was recommended that the government implement policies to support the widespread adoption of in-farm livestock manure management practices among agriculturists and regulate chemical nitrogen fertilizer usage to align with plant needs.

Keywords: Ammonia emission, Agricultural sector, Secondary PM 2.5, Central region

บทนำ

ในช่วงหลายปีที่ผ่านมาประเทศไทยประสบปัญหามลพิษทางอากาศอย่างเห็นได้ชัด โดยเฉพาะปัญหาฝุ่น PM 2.5 ซึ่งก่อให้เกิดผลกระทบต่อสุขภาพของมนุษย์ทั้งในระยะสั้นและระยะยาว ฝุ่น PM 2.5 สามารถเข้าสู่ร่างกายได้โดยการหายใจ ซึ่งเมื่อสูดดมเข้าไปสามารถก่อให้เกิดการระคายเคือง แสบจมูก ไอ จาม มีเสมหะ หอบหืด และยังเพิ่มความเสี่ยงในการเกิดโรคต่าง ๆ เช่น ภูมิแพ้ ถุงลมโป่งพอง มะเร็งปอด และโรคหัวใจ เป็นต้น จากรายงานสถานการณ์และการจัดการมลพิษทางอากาศและเสียง ปี พ.ศ. 2563 พบว่า ภาพรวมคุณภาพอากาศในปีพ.ศ. 2563 ดีขึ้นกว่าปีที่ผ่านมา โดยปริมาณฝุ่น PM 2.5 ในประเทศไทยมีค่าเฉลี่ยเท่ากับ 23 ไมโครกรัมต่อลูกบาศก์เมตร ซึ่งลดลงจากปี 2562 ร้อยละ 8 (กรมควบคุมมลพิษ กระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม, 2563ข)

PM2.5 จำแนกได้เป็น 2 ประเภท ได้แก่ ฝุ่นละอองปฐมภูมิและฝุ่นละอองทุติยภูมิ (กรมอนามัย กระทรวงสาธารณสุข, 2558) โดยฝุ่นละอองปฐมภูมิที่ปล่อยออกมาจากแหล่งธรรมชาติ เช่น ฝุ่นเกลือทะเล ฝุ่นจากลมพัด เถ้า เขม่าและการกระทำของมนุษย์โดยตรง เช่น การใช้เชื้อเพลิงฟอสซิลจากโรงไฟฟ้า โรงงานอุตสาหกรรม การเผาไหม้ในที่โล่ง ในขณะที่ฝุ่นละอองทุติยภูมิมาจากปฏิกิริยาในบรรยากาศหลังจากที่ฝุ่นออกจากแหล่งกำเนิดไประยะหนึ่งแล้ว ฝุ่นประเภทนี้อาจเป็นอนุภาคใหม่หรืออนุภาคดั้งเดิมที่มีองค์ประกอบเพิ่มขึ้นโดยฝุ่นละอองทุติยภูมิมาจากกิจกรรมการขนส่ง การเดินทางและการเกษตร (พัชรศักดิ์ อาลัย,2562)

อนุภาคแอมโมเนียเกิดขึ้นจากแอมโมเนียเร่งปฏิกิริยาออกซิเดชันในบรรยากาศของซัลเฟอร์ไดออกไซด์ไปเป็นซัลเฟอร์ไตรออกไซด์และทำปฏิกิริยาอย่างรวดเร็วกับส่วนประกอบที่เป็นกรดของบรรยากาศ (กรดซัลฟิวริก ไนตริก และกรดไฮโดรคลอริก) เกลือแอมโมเนียมที่เกิดขึ้นเป็นส่วนประกอบหลักของฝุ่นละออง เกษตรกรรมมีบทบาทหลักในเกิดมลพิษทางอากาศซึ่งฝุ่นละอองจากกิจกรรมต่างๆ เช่น การไถพรวน การขนส่ง และการเก็บเกี่ยว การแผ้วถางและเผาในพื้นที่เกษตรกรรม เป็นต้น มลพิษทางอากาศจากกิจกรรมการเกษตรปรากฏในรูปแบบของก๊าซแอมโมเนียอย่างรุนแรงมากที่สุด (EIT,2019)

ดังนั้นงานวิจัยนี้จึงมีวัตถุประสงค์เพื่อศึกษาแหล่งที่มาของก๊าซแอมโมเนีย ด้วยการรวบรวมรายงานการระบายมลพิษทางอากาศจากภาคเกษตรกรรม ในพื้นที่ภาคกลางของประเทศไทย เพื่อเป็นแนวทางในการกำหนดมาตรการในการควบคุมการปล่อยก๊าซแอมโมเนียในภาคเกษตรกรรม โดยเก็บข้อมูลเกี่ยวกับการใช้ปุ๋ยเคมีและการจัดการปศุสัตว์ และคำนวณตามวิธีในคู่มือ European Monitoring and Evaluation Program / The European Environment Agency air pollutant emission inventory guidebook 2019 (Amon et al., 2019 ; Hutchings et al., 2019) โดยใช้ค่าสัมประสิทธิ์การระบายมลพิษซึ่งเป็นค่าเฉพาะของประเทศที่ได้จากรายงานบัญชีก๊าซเรือนกระจก ภาคเกษตร ระหว่างปี พ.ศ. 2543 – 2560 (กองประสานการการจัดการการเปลี่ยนแปลงสภาพภูมิอากาศ, 2563) ซึ่งผลที่ได้จากการวิจัยครั้งนี้สามารถนำไปใช้เป็นแนวทางในการจัดการปศุสัตว์และควบคุมการใช้ปุ๋ยเคมีไนโตรเจนของเกษตรกรเพื่อลดการระบายก๊าซแอมโมเนียได้อย่างมีประสิทธิภาพ

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาแหล่งกำเนิดของก๊าซแอมโมเนียผ่านการจัดทำบัญชีการระบายก๊าซแอมโมเนียจากภาคการเกษตรในพื้นที่ภาคกลางของประเทศไทย พ.ศ. 2564
2. เพื่อพัฒนาการกระจายเชิงพื้นที่และเวลาของการระบายก๊าซแอมโมเนียจากภาคการเกษตร
3. เพื่อกำหนดมาตรการในการลดการระบายก๊าซแอมโมเนียในภาคเกษตรกรรมที่เหมาะสมกับบริบทของประเทศไทย

วิธีดำเนินการวิจัย

1. พื้นที่ศึกษา

ในการวิจัยครั้งนี้ผู้วิจัยได้เลือกพื้นที่ในการศึกษา คือ จังหวัดในภาคกลางของประเทศไทย จำนวน 19 จังหวัด ได้แก่ กรุงเทพมหานคร กาญจนบุรี ชัยนาท นครนายก นครปฐม นนทบุรี ปทุมธานี ประจวบคีรีขันธ์ พระนครศรีอยุธยา เพชรบุรี ราชบุรี ลพบุรี สิงห์บุรี สระบุรี อ่างทอง สุพรรณบุรี สมุทรสงคราม สมุทรปราการ และสมุทรสาคร

2. การประเมินการระบายก๊าซแอมโมเนียจากปศุสัตว์

การประเมินปริมาณการระบายก๊าซแอมโมเนียที่มาจากการจัดการมูลสัตว์ภายในฟาร์ม ผู้วิจัยคำนวณตามคู่มือ European Monitoring and Evaluation Program / The European Environment Agency air pollutant emission inventory guidebook 2019 (Amon et al. 2019) โดยใช้ค่าสัมประสิทธิ์การระบายมลพิษซึ่งเป็นค่าเฉพาะของประเทศจากรายงานบัญชีก๊าซเรือนกระจก ภาคเกษตร ระหว่างปี พ.ศ. 2543 – 2560 (กองประสานการการจัดการการเปลี่ยนแปลงสภาพภูมิอากาศ, 2563) ดังแสดงในตารางที่ 1 การประมาณการระบายก๊าซแอมโมเนียที่มาจากการจัดการมูลสัตว์ มีสมการการคำนวณพื้นฐานแสดงดังนี้

$$E_{pollutant_animal} = AAP_{animal} \times EF_{pollution_animal}$$

โดยที่ AAP_{animal} = จำนวนสัตว์เฉลี่ยต่อปี (ตัว)

$EF_{pollution}$ = ค่าสัมประสิทธิ์การระบายมลพิษ (%)

ตารางที่ 1 สัดส่วนมูลสัตว์หรือสัดส่วนไนโตรเจนที่สัตว์ขับถ่ายตามระบบการจัดการมูลสัตว์ต่าง ๆ

ชนิดสัตว์	สัดส่วนไนโตรเจนที่สัตว์ขับถ่ายตามระบบการจัดการมูลต่างๆ(%)										
	ทุ่งหญ้าและคอก	การเกลี่ย/ผึ่งตาก	การเก็บแบบของแข็ง	การเก็บในที่แห้ง	มูลสัตว์ที่ถ่ายลงพื้น		บ่อไร้อากาศแบบเปิด	บ่อหมักไร้อากาศ	การทิ้งมูลสัตว์เป็นชั้นหนา	การหมักทำแบบพลิกกลับกองทุกวัน	ระบบอื่นๆ
					มีวัสดุรองพื้น	ไม่มีวัสดุรองพื้น					
โคเนื้อ	49	-	51	-	-	-	-	-	-	-	-
โคนม	5	51	23	14	-	-	7	-	-	-	-
กระบือ	50	-	25	25	-	-	-	-	-	-	-
สุกร (พื้นเมือง)	17.5	0	80	-	-	-	0	0	2.5	-	-
สุกร(ขุน)	0	19	10	-	-	-	7	64	0	-	-
สุกร(พันธุ์)	0	19	10	-	-	-	7	64	0	-	-
ไก่ (พื้นเมือง)	80	-	20	-	0	0	-	0	-	0	0
ไก่(เนื้อ)	0	-	0	-	100	0	-	0	-	0	0
ไก่(ไข่)	0	-	0	-	30	48	-	12	-	1	9
เป็ด(เนื้อ)	45	-	-	-	41	14	-	-	-	-	-
เป็ด(ไข่)	45	-	-	-	41	14	-	-	-	-	-

ที่มา: กองประสานการการจัดการการเปลี่ยนแปลงสภาพภูมิอากาศ

3. การประเมินการระบายก๊าซแอมโมเนียจากดิน

การประเมินปริมาณการระบายก๊าซแอมโมเนียจากดิน ผู้วิจัยคำนวณและใช้ค่าสัมประสิทธิ์การระบายมลพิษตามคู่มือ European Monitoring and Evaluation Program / The European Environment Agency air pollutant emission inventory guidebook 2019 (Hutchings et al. 2019) การประมาณการระบายก๊าซแอมโมเนียที่มาจากดิน มีสมการการคำนวณพื้นฐานแสดงดังนี้

$$E_{pollution} = AR_{N_applied} \times EF_{pollution}$$

โดยที่ $E_{pollution}$ = ปริมาณมลพิษที่ปล่อย (ตัน)

$AR_{N_applied}$ = ปริมาณไนโตรเจนที่ใช้ในปุ๋ย (kg N)

$EF_{pollution}$ = ค่าสัมประสิทธิ์การระบายมลพิษ (kt NH_3/kg N)

ในการศึกษาครั้งนี้ ผู้วิจัยเลือกใช้ค่าสัมประสิทธิ์การระบายก๊าซแอมโมเนียเท่ากับ 0.182

4. การเก็บรวบรวมข้อมูล

4.1 ข้อมูลทุติยภูมิ

4.1.1ข้อมูลอรรถาธิบาย (Attribute data)

ผู้วิจัยรวบรวมข้อมูลจากเอกสารจากหน่วยงานภาครัฐ เช่น ข้อมูลพื้นที่เพาะปลูก ปริมาณปุ๋ยที่ใช้ จำนวนปศุสัตว์ และปริมาณมูลสัตว์ที่ได้จากปศุสัตว์ เพื่อจัดทำบัญชีการระบายก๊าซแอมโมเนียจากภาคการเกษตรในพื้นที่ภาคกลาง

4.1.2 ข้อมูลเชิงพื้นที่ (Spatial data)

ผู้วิจัยรวบรวมข้อมูลทุติยภูมิจากข้อมูลเขตการปกครองจังหวัดในพื้นที่ภาคกลางและข้อมูลการใช้ที่ดินจากกรมพัฒนาที่ดินบริเวณพื้นที่ภาคกลาง ได้แก่ ข้อมูลพื้นที่เพาะปลูกพืช (ข้าว อ้อย มันสำปะหลัง ข้าวโพดเลี้ยงสัตว์) และข้อมูลพื้นที่เลี้ยงปศุสัตว์ (โคเนื้อ โคนม กระบือ สุกร ไก่เนื้อ ไก่ไข่ เป็ดเนื้อ เป็ดไข่)

4.2 ข้อมูลปฐมภูมิ

ผู้วิจัยรวบรวมข้อมูลปฐมภูมิจากการสัมภาษณ์โดยใช้วิธีการสุ่มแบบเจาะจง (Purposive Sampling) ซึ่งเป็นการเลือกกลุ่มตัวอย่างให้ตรงตามหลักเกณฑ์หรือจุดมุ่งหมายของผู้วิจัย กล่าวคือ ในการศึกษาครั้งนี้ผู้วิจัยต้องการทราบถึงการจัดการหรือเทคโนโลยีในการบำบัดและควบคุมการระบายก๊าซแอมโมเนียในภาคปศุสัตว์และการใช้ปุ๋ยเคมีไนโตรเจน ที่เกษตรกรใช้อยู่ในปัจจุบัน ซึ่งในปัจจุบันขาดการรวบรวมข้อมูล อย่างไรก็ตาม เจ้าหน้าที่ภาครัฐซึ่งมีหน้าที่รับผิดชอบดูแลและควบคุมการจัดการปศุสัตว์ / การใช้ปุ๋ยเคมีไนโตรเจนจะทราบถึงข้อมูลดังกล่าว และคาดการณ์ได้ว่ามีสัดส่วนการจัดการหรือการใช้เทคโนโลยีในแต่ละรูปแบบเป็นสัดส่วนเท่าไหร่ของเกษตรกรในพื้นที่ภาคกลาง ทำให้ผู้วิจัยเลือกสัมภาษณ์เจ้าหน้าที่ที่มีความรับผิดชอบโดยตรง โดยคัดเลือกเจ้าหน้าที่รัฐในระดับชำนาญการพิเศษขึ้นไปเป็นผู้ให้ข้อมูล

5. การวิเคราะห์ข้อมูล

5.1 การจัดทำบัญชีการระบายก๊าซแอมโมเนียในภาคการเกษตร

ประเมินปริมาณการระบายมลพิษทางอากาศที่ปล่อยออกมาจากภาคการเกษตรตามคู่มือ EMEP / EEA air pollutant inventory guidebook 2019 (Amon et al., 2019; Hutchings et al., 2019) และใช้ค่าสัมประสิทธิ์การระบายมลพิษซึ่งเป็นค่าเฉพาะของประเทศที่ได้มาจากรายงานบัญชีก๊าซเรือนกระจก ภาคเกษตร ระหว่างปี พ.ศ. 2543 – 2560 (กองประสานการการจัดการการเปลี่ยนแปลงสภาพภูมิอากาศ, 2563) โดยใช้ข้อมูลทุติยภูมิจากหน่วยงานภาครัฐที่เกี่ยวข้องโดยแบ่งออกเป็น 2 กลุ่ม คือ ภาคการเกษตรและภาคปศุสัตว์

5.2 การกระจายตัวเชิงพื้นที่ของการระบายก๊าซแอมโมเนียจากภาคการเกษตร

วิเคราะห์การกระจายตัวเชิงพื้นที่ของการระบายแอมโมเนียจากภาคการเกษตรในพื้นที่ภาคกลาง โดยนำข้อมูลการระบายแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ในปี พ.ศ. 2564 และข้อมูลระบายแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชในปี พ.ศ. 2563 ร่วมกับข้อมูลการใช้ประโยชน์ที่ดินจากกรมพัฒนาที่ดินมาซ้อนทับกันด้วยโปรแกรมระบบสารสนเทศภูมิศาสตร์ (ArcGIS) จากนั้นทำการแบ่งระดับการระบายก๊าซแอมโมเนียด้วยวิธีการหาค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐานออกเป็น 5 ระดับ ได้แก่ พื้นที่ที่มีการระบายก๊าซแอมโมเนียระดับน้อยที่สุด น้อย ปานกลาง มาก และมากที่สุด

5.3 การกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากภาคการเกษตร

วิเคราะห์ความสัมพันธ์ระหว่างปริมาณการระบายก๊าซแอมโมเนียจากภาคปศุสัตว์กับช่วงเดือนที่เกิดฝุ่น PM2.5 ในปี พ.ศ. 2564 และวิเคราะห์ความสัมพันธ์ระหว่างปริมาณการระบายก๊าซแอมโมเนียจากภาคการเกษตรกับช่วงเดือนที่เกิดฝุ่น PM2.5 ในปี พ.ศ. 2563

5.4 มาตราการแนวทางการลดปริมาณการระบายก๊าซแอมโมเนียจากภาคการเกษตร

ผู้วิจัยรวบรวมข้อมูลจากการสัมภาษณ์ผู้เชี่ยวชาญด้านการเกษตรและผู้เชี่ยวชาญด้านปศุสัตว์มาวิเคราะห์หาแนวทางลดปริมาณการระบายแอมโมเนียจากภาคการเกษตรที่เหมาะสมในพื้นที่ภาคกลาง

ผลการวิจัย

1. การประมาณการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ในพื้นที่ภาคกลาง

จากการศึกษาการประมาณการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ในพื้นที่ภาคกลาง พบว่า พื้นที่ภาคกลางทั้งหมดทั้ง 19 จังหวัดมีการระบายก๊าซแอมโมเนียทั้งหมดเท่ากับ 62,610 ตัน โดยสัตว์ที่มีการระบายก๊าซแอมโมเนียมากที่สุด คือ ไก่เนื้อเท่ากับ 20,662 ตัน รองลงมาคือ หมูขุนเท่ากับ 17,473 ตัน และโคนม 6,658 ตัน ตามลำดับ ขณะที่สัตว์ที่มีการระบายก๊าซแอมโมเนียน้อยที่สุด คือ ไก่พื้นเมือง 320 ตัน รองลงมาคือ กระบือ 270 ตัน และหมูพื้นเมือง 87 ตัน เมื่อเทียบกับสัตว์ชนิดอื่น ดังแสดงในตารางที่ 2

ตารางที่ 2 ปริมาณการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์จำแนกตามประเภทสัตว์ในพื้นที่ภาคกลาง ปี พ.ศ. 2564

จังหวัด	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)											
	โคเนื้อ	โคนม	กระบือ	สุกรพื้นเมือง	สุกรขุน	สุกรพันธุ์	ไก่พื้นเมือง	ไก่เนื้อ	ไก่ไข่	เป็ดเนื้อ	เป็ดไข่	รวม
กรุงเทพฯ	16	2	1.1	0.21	11	0	3	5	2	2	6	49
นนทบุรี	8	0	0.7	0	0	0	4	2	1	2	33	50
ปทุมธานี	18	1	2.8	3.04	29	0.6	19	26	21	22	80	222
พระนครศรีอยุธยา	40	0	5.8	0.95	8	2.8	19	356	690	27	98	1,248
อ่างทอง	52	0	3.2	0.92	177	299.8	27	168	183	9	412	1,331
ลพบุรี	220	1,445	14.0	17.44	1,762	731.4	32	8,157	160	117	116	12,771
สิงห์บุรี	11	2	0.5	0.3	149	50.3	8	232	10	5	20	488
ชัยนาท	193	20	68.1	5.39	574	119.7	33	755	13	31	241	2,054
สระบุรี	118	2,530	45.6	1.2	549	305.4	20	2,385	284	165	61	6,464
นครนายก	43	2	56.2	0.96	895	163.7	9	323	864	149	11	2,516
ราชบุรี	389	754	4.3	4.19	7,429	2,523.30	22	1,407	169	141	28	12,871
กาญจนบุรี	1,094	533	43.3	9.93	1,521	427.2	32	4,332	75	115	64	8,247
สุพรรณบุรี	656	16	17.1	19.36	2,117	420.4	39	1,530	579	66	808	6,269

ตารางที่ 2 (ต่อ)

จังหวัด	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)											
	โคเนื้อ	โคนม	กระบือ	สุกรพื้นเมือง	สุกรขุน	สุกรพันธุ์	ไก่พื้นเมือง	ไก่เนื้อ	ไก่ไข่	เป็ดเนื้อ	เป็ดไข่	รวม
จังหวัด	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)											
	โคเนื้อ	โคนม	กระบือ	สุกรพื้นเมือง	สุกรขุน	สุกรพันธุ์	ไก่พื้นเมือง	ไก่เนื้อ	ไก่ไข่	เป็ดเนื้อ	เป็ดไข่	รวม
นครปฐม	175	468	1.7	5.29	1,315	205.1	21	598	429	265	215	3,698
สมุทรสาคร	1	0	0.1	0.07	0	0.3	2	4	13	1	2	24
สมุทรปราการ	1	0	0.1	0.01	0	0.7	2	0	0	1	2	6
สมุทรสงคราม	4	0	0.1	0.11	5	4.2	1	0	8	0	1	24
เพชรบุรี	829	219	3.5	5.5	431	172.8	13	198	55	20	105	2,053
ประจวบคีรีขันธ์	583	666	2.3	12.56	499	219.3	15	184	27	4	12	2,224
รวม	4,450	6,658	270	87	17,473	5,647	320	20,662	3,583	1,143	2,316	62,610

2. การประมาณการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชในพื้นที่ภาคกลาง

จากการศึกษาการประมาณการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชในพื้นที่ภาคกลาง พบว่า พื้นที่ภาคกลางทั้งหมดทั้ง 19 จังหวัด มีการระบายปริมาณการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชมีการระบายก๊าซแอมโมเนียทั้งหมดเท่ากับ 41.47 ตัน โดยพืชที่มีการระบายก๊าซแอมโมเนียมากที่สุด คือ ข้าวนาปีเท่ากับ 17.03 ตัน รองลงมาคือข้าวนาปรังเท่ากับ 12.46 ตันและอ้อยโรงงานเท่ากับ 8.27 ตันตามลำดับ ขณะที่พืชที่มีการระบายก๊าซแอมโมเนียน้อยที่สุด คือ มันสำปะหลังเท่ากับ 2.51 ตัน และข้าวโพดเลี้ยงสัตว์เท่ากับ 1.24 ตัน ดังแสดงในตารางที่ 3

ตารางที่ 3 ปริมาณการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชจำแนกตามประเภทพืชในพื้นที่ภาคกลาง ปีพ.ศ.2563

จังหวัด	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)					
	ข้าวนาปี	ข้าวนาปรัง	อ้อย	ข้าวโพดเลี้ยงสัตว์	มันสำปะหลัง	รวม
กรุงเทพฯ	0.21	0.25	0	0	0	0.46
นนทบุรี	0.22	0.25	0	0	0	0.47
ปทุมธานี	0.80	0.79	0	0	0	1.59
พระนครศรีอยุธยา	2.06	2.09	0	0	0	4.15
อ่างทอง	0.86	0.66	0.09	0	0	1.61
ลพบุรี	1.94	0.82	2.54	0.66	0.71	6.66

ตารางที่ 3 (ต่อ)

จังหวัด	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)					
	ข้าวนาปี	ข้าวนาปรัง	อ้อย	ข้าวโพดเลี้ยงสัตว์	มันสำปะหลัง	รวม
สิงห์บุรี	0.78	0.65	0.13	0	0	1.56
ชัยนาท	2.18	1.36	0.48	0.03	0.19	4.23
สระบุรี	0.84	0.52	0.48	0.36	0.10	2.29
นครนายก	0.94	0.45	0	0	0	1.39
ราชบุรี	0.61	0.47	0.58	0.002	0.19	1.86
กาญจนบุรี	0.96	0.49	1.54	0.11	1.16	4.25
สุพรรณบุรี	3.09	2.48	1.87	0.07	0.15	7.65
นครปฐม	0.70	0.68	0.28	0	0	1.66
สมุทรสาคร	0.01	0.008	0	0	0	0.02
สมุทรปราการ	0.05	0.05	0	0	0	0.10
สมุทรสงคราม	0.006	0.004	0	0	0	0.01
เพชรบุรี	0.72	0.41	0.14	0.002	0.01	1.28
ประจวบคีรีขันธ์	0.05	0.03	0.14	0.001	0.002	0.23
รวม	17.03	12.46	8.27	1.24	2.51	41.47

3. การกระจายตัวเชิงพื้นที่การระบายก๊าซแอมโมเนีย

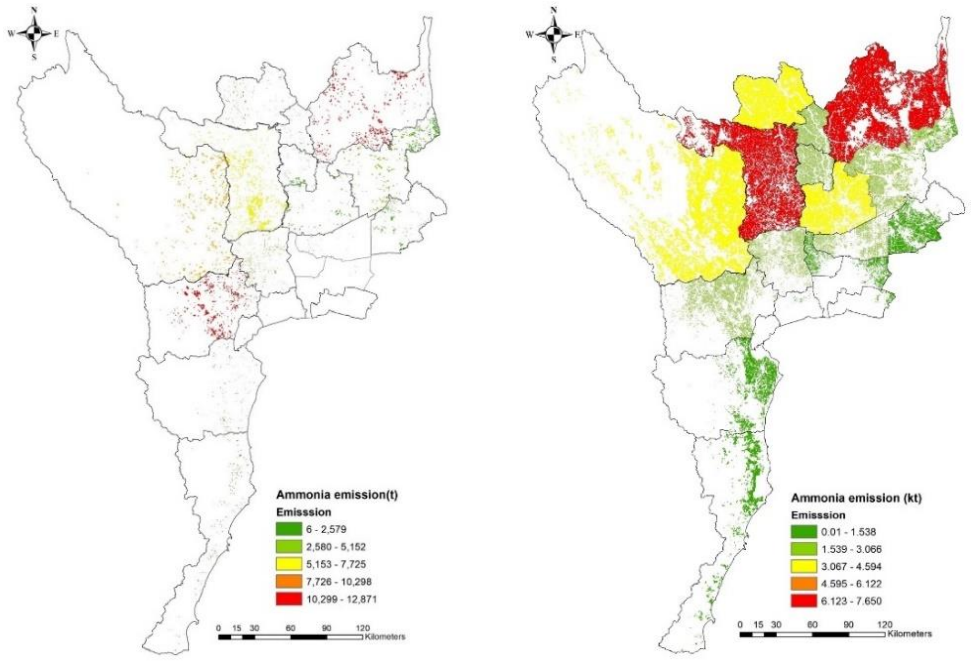
3.1 การกระจายตัวของการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์

จากการศึกษาการกระจายตัวชิงพื้นที่ของการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ พบว่า พื้นที่ภาคกลางส่วนใหญ่มีการระบายก๊าซแอมโมเนียอยู่ในระดับน้อยที่สุดได้แก่ จังหวัดกรุงเทพมหานคร ชัยนาท นครนายก เพชรบุรี ประจวบคีรีขันธ์ สมุทรปราการ นนทบุรี ปทุมธานี พระนครศรีอยุธยา อ่างทอง สิงบุรี สมุทรสาคร สมุทรสงคราม รองลงมาคือพื้นที่ที่มีการระบายก๊าซแอมโมเนียระดับน้อย ได้แก่ จังหวัดนครปฐม พื้นที่ที่มีการระบายก๊าซแอมโมเนียระดับปานกลาง ได้แก่ จังหวัดสระบุรีและสุพรรณบุรี พื้นที่ที่มีการระบายก๊าซแอมโมเนียระดับมาก ได้แก่ จังหวัดกาญจนบุรี และพื้นที่ที่มีการระบายก๊าซแอมโมเนียระดับมากที่สุด ได้แก่ จังหวัดลพบุรีและราชบุรี ดังรูปที่ (ภาพที่ 1ก)

3.2 การกระจายตัวของการระบายแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช

จากการศึกษาการกระจายตัวชิงพื้นที่ของการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช พบว่า พื้นที่ภาคกลางส่วนใหญ่มีการระบายก๊าซแอมโมเนียอยู่ในระดับน้อยที่สุด ได้แก่ จังหวัดกรุงเทพมหานคร สมุทรปราการ นนทบุรี นครนายก สมุทรสาคร สมุทรสงคราม เพชรบุรี

และประจวบคีรีขันธ์ รองลงมาพื้นที่ที่มีการระบายก๊าซแอมโมเนียอยู่ในระดับน้อย ได้แก่ จังหวัดปทุมธานี อ่างทอง สิงบุรี สระบุรี ราชบุรีและนครปฐม พื้นที่ที่มีการระบายก๊าซแอมโมเนียอยู่ในระดับปานกลาง ได้แก่ จังหวัดพระนครศรีอยุธยา ชัยนาทและกาญจนบุรี และพื้นที่ที่มีการระบายก๊าซแอมโมเนียอยู่ในระดับมากที่สุด ได้แก่ จังหวัดสุพรรณบุรีและลพบุรี ดังรูปที่ (ภาพที่ 1ข)



(ก) (ข)

ภาพที่ 1 การกระจายตัวเชิงพื้นที่ของปริมาณการระบายก๊าซแอมโมเนียจาก (ก) การจัดการมูลสัตว์ของฟาร์มปศุสัตว์และ (ข) การใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช

4. การกระจายตัวเชิงเวลาการระบายก๊าซแอมโมเนีย

4.1 การกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์

จากการศึกษาการกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ ในปี พ.ศ. 2564 พบว่า สำหรับในช่วงเวลาที่เกิดวิกฤตฝุ่น PM 2.5 ในพื้นที่ภาคกลาง(เดือนมกราคมถึงมีนาคม) มีปริมาณการระบายแอมโมเนียสูงในช่วงเดือนกุมภาพันธ์ถึงมีนาคมที่สูงเมื่อเปรียบเทียบกับช่วงเวลาอื่นๆโดยช่วงเดือนกุมภาพันธ์ถึงมีนาคมมีระบายก๊าซแอมโมเนียเท่ากับ 58,464.13 ตัน และ 58,883.86 ตัน ตามลำดับ (ตารางที่ 4)

ตารางที่ 4 ปริมาณการระบายก๊าซแอมโมเนียรายเดือนจากการจัดการมูลสัตว์ในพื้นที่ภาคกลาง ปี พ.ศ. 2564

เดือน	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)									
	โคเนื้อ	โคนม	กระบือ	สุกรขุน	ไก่พื้นเมือง	ไก่เนื้อ	ไก่ไข่	เป็ดเนื้อ	เป็ดไข่	รวม
ม.ค.	4,417.05	6,676.13	68.30	18,783.35	312.67	20,487.87	3,599.59	1,051.91	2,383.27	57,980.15
ก.พ.	4,311.95	6,648.35	270.29	19,314.00	307.53	20,627.14	3,589.47	1,046.68	2,348.71	58,464.13
มี.ค.	4,462.80	6,676.81	271.14	19,578.92	309.66	20,592.21	3,598.37	1,048.34	2,345.60	58,883.86
เม.ย.	4,450.49	6,658.30	270.39	19,292.05	308.89	20,661.58	3,602.42	1,048.78	2,332.75	58,625.66
พ.ค.	4,443.58	6,677.56	270.31	19,281.11	308.60	20,680.60	3,601.74	1,048.91	2,335.44	58,647.85
มิ.ย.	4546.94	6,679.49	273.32	19,412.32	309.76	21,090.28	3,602.91	1,048.99	2,350.87	59,314.88
ก.ค.	4,808.37	6,671.84	277.38	19,314.39	311.29	20,733.77	3,611.91	1,063.02	2,363.40	59,155.37
ส.ค.	4,865.23	6,664.91	281.89	19,553.99	310.73	20,685.29	3,606.24	1,046.30	2,373.34	59,387.92
ก.ย.	4,930.45	6,653.57	284.30	19,656.17	310.60	20,637.71	3,625.54	1,046.23	2,391.57	59,536.13
ต.ค.	4,967.01	6,598.33	284.59	19,727.56	310.68	2,0647.60	3,630.67	1,048.32	2,420.89	59,635.64
พ.ย.	5,176.97	6,521.43	285.32	19,635.89	310.27	20,625.90	3,628.57	1,028.73	2,436.79	59,649.88
ธ.ค.	5,223.98	6,486.68	286.96	19,630.18	310.89	20,436.49	3,755.99	1,005.19	2,454.49	59,590.85
รวม	56,604.83	79,613.40	3,324.20	233,179.93	3,721.57	247,906.44	43,453.41	12,531.40	28,537.13	708,872.32

4.2 การกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช

จากการศึกษาการกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชในปีพ.ศ. 2563 พบว่า สำหรับในช่วงเวลาที่เกิดวิกฤตฝุ่น PM 2.5 ในพื้นที่ภาคกลาง (เดือนมกราคมถึงมีนาคม) มีปริมาณการระบายก๊าซแอมโมเนียในช่วงเดือนกุมภาพันธ์ถึงมีนาคม ที่สูงเมื่อเปรียบเทียบกับช่วงเวลาอื่นๆ โดยช่วงเดือนมกุมภาพันธ์ถึงมีนาคมมีการระบายก๊าซแอมโมเนียเท่ากับ 5.22 ตัน และ 4.32 ตัน ตามลำดับ (ตารางที่ 5)

ตารางที่ 5 ปริมาณการระบายก๊าซแอมโมเนียรายเดือนจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกในพื้นที่ภาคกลาง ปี พ.ศ. 2563

เดือน	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)					
	ข้าวนาปี	ข้าวนาปรัง	อ้อย	ข้าวโพดเลี้ยงสัตว์	มันสำปะหลัง	รวม
ม.ค.	0.07	2.71	0.30	0.01	0.33	3.4
ก.พ.	-	3.78	0.95	0.01	0.49	5.22
มี.ค.	-	2.32	1.36	0.01	0.64	4.32
เม.ย.	-	1.20	1.43	0.01	0.41	3.06

ตารางที่ 5 (ต่อ)

เดือน	ปริมาณการระบายก๊าซแอมโมเนีย (ตัน)					
	ข้าวนาปี	ข้าวนาปรัง	อ้อย	ข้าวโพดเลี้ยงสัตว์	มันสำปะหลัง	รวม
พ.ค.	-	1.10	1.03	0.01	0.30	2.44
มิ.ย.	3.03	0.30	1.38	0.01	0.17	4.89
ก.ค.	3.72	-	1.08	0.00	0.06	4.86
ส.ค.	2.96	-	0.14	0.03	0.04	3.16
ก.ย.	2.93	-	0.11	0.08	0.03	3.15
ต.ค.	2.26	-	-	0.21	0.03	2.50
พ.ย.	1.51	-	0.08	0.40	0.00	2.34
ธ.ค.	0.54	1.06	0.03	0.43	0.01	2.10
รวม	17.01	12.46	8.27	1.22	2.50	41.47

5. การกำหนดมาตรการในการควบคุมปริมาณการระบายก๊าซแอมโมเนีย

5.1 การกำหนดมาตรการในการควบคุมปริมาณการระบายก๊าซแอมโมเนียจากการจัดการปศุสัตว์

จากผลการศึกษาการกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์ พบว่า การระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์จะมีปริมาณที่สูงกว่าในช่วงเดือนที่เกิดวิกฤตฝุ่น PM 2.5 โดยเฉพาะในช่วงเดือนมกราคม กุมภาพันธ์ มีนาคม ช่วงเวลาดังกล่าวเกษตรกรในพื้นที่มีแนวทางการจัดการมูลสัตว์ของฟาร์มปศุสัตว์เพื่อลดการระบายก๊าซแอมโมเนีย เช่น นำมูลสัตว์มาผลิตก๊าซชีวภาพ การไถกลบมูลสัตว์ในพื้นที่เพาะปลูก การทำปุ๋ยหมักจากมูลสัตว์ เป็นต้น แนวทางการจัดการมูลสัตว์ของฟาร์มปศุสัตว์เหล่านี้เกษตรกรในพื้นที่มีการใช้แนวทางการจัดการมูลสัตว์ในระดับน้อย ดังนั้นในช่วงเวลาดังกล่าวภาครัฐควรมีการกำหนดมาตรการที่สนับสนุนแนวการการจัดการมูลสัตว์ภายในฟาร์มเพื่อให้เกษตรกรใช้กันแพร่หลายมากขึ้น

5.2 การกำหนดมาตรการในการควบคุมปริมาณการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช

จากผลการศึกษาการกระจายตัวเชิงเวลาของระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช พบว่า การระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนจะมีปริมาณที่สูงกว่าในช่วงเดือนที่เกิดวิกฤตฝุ่น PM 2.5 โดยเฉพาะในช่วงเดือนมกราคม กุมภาพันธ์ มีนาคม ช่วงเวลาดังกล่าวเกษตรกรในพื้นที่มีการใช้ปุ๋ยแคมีจำนวนมากเพื่อเพาะปลูกข้าวนาปรังและอ้อยโรงงาน ดังนั้นในช่วงเวลาดังกล่าวภาครัฐควรมีการกำหนดมาตรการควบคุมการใช้ปุ๋ยเคมีไนโตรเจนของเกษตรกรให้มีความเหมาะสมต่อความต้องการของพืชซึ่งในปัจจุบันภาครัฐได้มีการดำเนินโครงการสนับสนุนให้เกษตรกรผู้ปลูกข้าวโดยการใช้ปุ๋ยเคมีสั่งตัดที่มีความเหมาะสมกับความต้องการของพืชในแต่ละช่วงอายุ ซึ่งจากโครงการ

ดังกล่าวจะสามารถลดค่าใช้จ่ายในซื้อปุ๋ยเคมีและลดปริมาณการใช้ปุ๋ยเคมีลงได้ถึง 30 – 50% (ทัศนีย์ อัตตะนันทน์, 2558)

อภิปรายผล

ผลการศึกษาจากการกระจายตัวเชิงพื้นที่ของการระบายก๊าซแอมโมเนียจากการจัดการปศุสัตว์และการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูก พบว่า ปัญหาฝุ่น PM 2.5 ทุติยภูมิในจังหวัดกรุงเทพมหานครอาจเป็นผลเนื่องมาจากจังหวัดใกล้เคียงและจังหวัดอื่น ๆ ในภาคกลาง มีการทำกิจกรรมทางการเกษตรทั้งการเพาะปลูกพืชและเลี้ยงสัตว์ เช่น จังหวัดนครปฐม กาญจนบุรี ลพบุรี และสุพรรณบุรี ซึ่งเป็นแหล่งเพาะปลูกข้าวและอ้อยที่สำคัญ จึงทำให้เมื่อมีลมพัดพื้นที่รอบข้างเข้าสู่พื้นที่กรุงเทพมหานครในช่วงเดือนมกราคม กุมภาพันธ์ และมีนาคม ทำให้พื้นที่กรุงเทพมหานครมีมลพิษอากาศเพิ่มสูงขึ้นเนื่องจากการก่อตัวของ PM2.5 ทุติยภูมิจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืชและการจัดการปศุสัตว์

ผลการศึกษาจากการกระจายตัวเชิงเวลาของการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูก พบว่า พื้นที่ภาคกลางมีปริมาณของการระบายก๊าซแอมโมเนียมากในช่วงเดือนกุมภาพันธ์ถึงมีนาคม โดยเกษตรกรใส่ปุ๋ยยูเรียและปุ๋ยเคมีไนโตรเจนอื่นๆให้กับการเพาะปลูกข้าวนาปรังและอ้อยเป็นหลัก ซึ่งสาเหตุที่ข้าวนาปรังและอ้อยมีการระบายก๊าซแอมโมเนียมากเนื่องจากช่วงเวลาการเพาะปลูกข้าวนาปีจะเริ่มต้นในช่วงเดือนพฤษภาคมไปจนถึงเดือนตุลาคม (กรมควบคุมมลพิษ, 2563ก) ซึ่งขึ้นอยู่ลักษณะของพื้นที่นาข้าวในแต่ละจังหวัด จะเห็นได้ว่าการใช้ปุ๋ยเคมีไนโตรเจนในช่วงเวลาเวลาการเพาะปลูกข้าวนาปีส่งผลน้อยมากต่อช่วงเวลาการเกิด PM2.5 ในเดือนกุมภาพันธ์ อย่างไรก็ตาม สำหรับการเพาะปลูกข้าวนาปรัง พบว่า มีผลอย่างมากต่อการใช้ปุ๋ยเคมีไนโตรเจนในช่วงเดือนกุมภาพันธ์ กล่าวคือ ข้าวนาปรังมีการเริ่มต้นเพาะปลูกในช่วงเดือนพฤศจิกายนไปจนถึงเดือนเมษายน (กรมควบคุมมลพิษ, 2563ก) จะเห็นได้ว่าการเพาะปลูกตั้งแต่เดือนพฤศจิกายน เกษตรกรยังคงมีความจำเป็นต้องใช้ปุ๋ยเคมีไนโตรเจนในเดือนกุมภาพันธ์ เพื่อให้ข้าวเจริญเติบโตก่อนสู่ช่วงข้าวออกผลผลิต นอกจากนี้จะเห็นได้ว่าการปลูกอ้อย มีการเพาะปลูกเป็นบางส่วนในช่วงดือนกุมภาพันธ์ อย่างไรก็ตามการเพาะปลูกพืชทั้งสามประเภท ในช่วงก่อนเดือนกุมภาพันธ์ยังส่งผลต่อปริมาณการใช้ปุ๋ยเคมีไนโตรเจนในช่วงเดือนกุมภาพันธ์เช่นเดียวกันกับการเพาะปลูกข้าวนาปรัง

ในการลดการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีและการจัดการมูลสัตว์ที่ทำให้เกิด PM2.5 ทุติยภูมิ พบว่า ฤดูกาลก็เป็นปัจจัยหนึ่งที่สำคัญที่สามารถลดการระบายก๊าซแอมโมเนียได้ ซึ่งงานวิจัยของ (Jonson et al., 2022) พบว่า การลดการระบายก๊าซแอมโมเนียในฤดูหนาวมีผลกระทบต่อการก่อตัวฝุ่น PM2.5 ทุติยภูมิ มากกว่าในฤดูกาลอื่น ๆ ดังนั้นในการลดการการระบายก๊าซแอมโมเนียจากการใช้ปุ๋ยเคมีไนโตรเจนและการจัดการมูลสัตว์ที่ทำให้เกิดฝุ่น PM2.5 ทุติยภูมิในพื้นที่ภาคกลาง ภาครัฐควรมีการใช้มาตราการลดการระบายก๊าซแอมโมเนียตั้งแต่ช่วงเดือนพฤศจิกายถึงธันวาคม

ข้อเสนอแนะจากการวิจัย

ข้อเสนอแนะจากการวิจัย

จากผลการศึกษาการระบายก๊าซแอมโมเนียจากการจัดการมูลสัตว์ของฟาร์มปศุสัตว์และการใช้ปุ๋ยเคมีไนโตรเจนในการเพาะปลูกพืช แสดงให้เห็นว่า ภาครัฐควรสนับสนุนพืชประเภทข้าวและอ้อยเป็นพืชเศรษฐกิจและปศุสัตว์ประเภทไก่เนื้อ หมูขุน และโคนม เป็นสัตว์เศรษฐกิจเป็นหลัก ภาครัฐหรือหน่วยงานที่เกี่ยวข้องควรให้ความสำคัญเรื่องการระบายมลพิษอากาศ ทั้งนี้ควรมีการศึกษามลพิษอากาศเพิ่มเติมจากระบบของการเพาะปลูกพืชและการเลี้ยงปศุสัตว์ครบทั้งวงจร เช่น มลพิษทางอากาศจากสารทุติยภูมิชนิดอื่น และทำการประเมิน Carbon footprint ควบคู่กันไปด้วย เพื่อให้ได้ข้อมูลที่มีความถูกต้องแม่นยำยิ่งขึ้น เพื่อให้ภาครัฐหรือหน่วยงานที่เกี่ยวข้องนำข้อมูลที่ได้มาพิจารณาถึงมาตรการต่าง ๆ เพื่อลดการปล่อยมลพิษที่มีประสิทธิภาพ

ข้อเสนอแนะในการศึกษาครั้งต่อไป

การประเมินการระบายก๊าซแอมโมเนียผ่านการจัดทำบัญชีการระบายก๊าซแอมโมเนียจากภาคการเกษตรในครั้งนี้เป็นการรวบรวมข้อมูลทุติยภูมิเกี่ยวกับการใส่ปุ๋ยเคมีไนโตรเจนและการจัดการปศุสัตว์คำนวณปริมาณการระบายก๊าซแอมโมเนียจากแหล่งตามคู่มือ European Monitoring and Evaluation Program / The European Environment Agency air pollutant emission inventory guidebook 2019 (Amon et al., 2019; Hutchings et al., 2019) โดยใช้ค่าสัมประสิทธิ์การระบายมลพิษซึ่งเป็นค่าเฉพาะของประเทศที่ได้มาจากรายงานบัญชีก๊าซเรือนกระจก ภาคเกษตร ระหว่างปี พ.ศ. 2543 – 2560 (กองประสานการการจัดการการเปลี่ยนแปลงสภาพภูมิอากาศ, 2563) ซึ่งเป็นการคำนวณตามวิธีเทียร์ 1 อาจทำให้ขาดข้อมูลที่สำคัญบางประการไป ดังนั้นในการวิจัยครั้งต่อไปควรใช้ข้อมูลที่มีความเฉพาะเจาะจงเพื่อการประมาณการระบายมลพิษอากาศที่มีความถูกต้องแม่นยำยิ่งขึ้น

ควรมีการศึกษาเพิ่มเติมเกี่ยวกับกระบวนการหรือกลไก (Mechanism) ที่สัมพันธ์หรือเกี่ยวข้องในการเกิด PM2.5 หรือมลพิษทางอากาศตัวอื่น ๆ โดยเฉพาะกลุ่มที่เป็นสารก่อเร็ง/ก่อการกลายพันธุ์ รวมทั้งศึกษาการปล่อยมลพิษทางอากาศจากพืชเศรษฐกิจชนิดอื่นด้วย

ควรมีการศึกษาเพิ่มเติมเกี่ยวกับมาตรการลดการระบายมลพิษอากาศทางด้านเทคโนโลยี ด้านเศรฐศาสตร์และด้านกฎหมาย เพื่อเปรียบเทียบหามาตราการที่เหมาะสมในการลดการระบายมลพิษทางอากาศจากภาคการเกษตร

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ภาวะปากแห้งของผู้ที่เคี้ยวใบกระท่อม: การศึกษาในพื้นที่ อ.จะนะ จ.สงขลา

Oral Dryness of Kratom Leaf Chewers: A Study at Chana District, Songkhla Province

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บทคัดย่อ

การศึกษาแบบตัดขวางนี้ เป็นงานวิจัยแรกที่ประเมินภาวะปากแห้งทางคลินิกในผู้ที่เคี้ยวใบกระท่อม โดยมีวัตถุประสงค์เพื่อรายงานรูปแบบการใช้ใบกระท่อมและภาวะปากแห้งในผู้ที่มีพฤติกรรมนี้ โดยทำการศึกษาในพื้นที่ตำบลสะพานไม้แก่น อำเภอจะนะ จังหวัดสงขลา ใช้เทคนิคการเลือกกลุ่มตัวอย่างแบบลูกโซ่ (Snowball Sampling) เก็บข้อมูลโดยใช้ 1. แบบสอบถามสำหรับรูปแบบการเคี้ยวใบกระท่อม 2. แบบสัมภาษณ์ความรู้สึกปากแห้ง เพื่อประเมินความรับรู้ภาวะปากแห้ง (Subjective Evaluation) 3. การตรวจภาวะน้ำลายน้อย (Objective Symptom) ด้วยแบบประเมินภาวะน้ำลายน้อยจากการตรวจทางคลินิกร่วมกับ 4. วัดอัตราการหลั่งน้ำลาย วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา กลุ่มตัวอย่างทั้งหมด 120 คน ส่วนใหญ่เป็นเพศชายร้อยละ 70 อายุเฉลี่ยทั้งเพศชายและเพศหญิง 37 ± 13.1 ปี ประกอบอาชีพเกษตรกรรม ร้อยละ 46.7 อายุเฉลี่ยที่เริ่มใช้กระท่อมคือ 27.5 ± 11.3 ปี ลักษณะใบกระท่อมที่เคี้ยวแทบทั้งหมดเป็นใบสด ร้อยละ 99.2 และใช้วิธีการเคี้ยวแล้วคายใบออกมา ร้อยละ 69.2 ปริมาณใบที่เคี้ยวเฉลี่ย 5.4 ใบต่อวัน ความรู้สึกปากแห้งจากการรับรู้ของผู้ที่เคี้ยวใบกระท่อมพบว่ามีผู้ที่รู้สึกปากแห้ง 82 คน คิดเป็นร้อยละ 68.3 โดยในกลุ่มนี้มีผู้ที่รู้สึกปากแห้งบางครั้ง ร้อยละ 92.7 และผู้ที่รู้สึกปากแห้งบ่อยครั้ง ร้อยละ 7.3 แต่จากการตรวจภาวะน้ำลายน้อย พบกลุ่มตัวอย่างมีภาวะปากแห้ง เพียงร้อยละ 6.7 และร้อยละ 96.7 มีอัตราการหลั่งน้ำลายปกติ ดังนั้นความรู้สึกปากแห้งที่เกิดขึ้นน่าจะเป็นแบบ

ชั่วคราวในช่วงที่มีการออกฤทธิ์ของสารสำคัญในใบกระท่อม โดยไม่มีผลกระทบที่ชัดเจนต่อการผลิตน้ำลายที่เป็นการเปลี่ยนแปลงแบบถาวร (Irreversible Change) อย่างไรก็ตามผู้ที่เคี้ยวใบกระท่อมบางส่วนอาจได้รับผลตามมาจากภาวะปากแห้ง ดังนั้นทันตแพทย์ควรตรวจประเมินภาวะปากแห้ง รวมทั้งให้คำแนะนำในการปฏิบัติตัว เพื่อส่งเสริมสุขภาวะช่องปากและคุณภาพชีวิตที่ดีต่อไป

คำสำคัญ: การเคี้ยวใบกระท่อม, ภาวะปากแห้ง, ความรู้สึกปากแห้ง, ภาวะน้ำลายน้อย

Abstract

This cross-sectional study is the first research to assess clinical oral dryness in Kratom leaf chewers and report the patterns of Kratom leaf usage and oral dryness in those who practice the habit. It was conducted in the Saphan Mai Kaen Sub-district, Chana District, Songkhla Province, and participants were recruited using the snowball sampling method. Data collection was performed by using: 1. a questionnaire for Kratom leaf usage patterns; 2. a xerostomia questionnaire for subjective evaluation of oral dryness; 3. a clinical oral dryness form for objective assessment of hyposalivation; and 4. salivary flow rate measure. Data analysis is performed using descriptive statistics. The entire sample group consists of 120 individuals, predominantly 70% males. The average age for both males and females is 37 ± 13.1 years. The majority of participants are 46.7% agriculturists. The average age of beginning Kratom usage is 27.5 ± 11.3 years. Almost all individuals chew fresh Kratom leaves at 99.2%, and chewing and then spitting the leaves at 69.2%. The average daily chew is 5.4 leaves. Regarding the perception of oral dryness among Kratom leaf chewers, 82 individuals, or 68.3%, report experiencing oral dryness. Dryness affects 92.7% of this group occasionally and 7.3% regularly. However, examinations for hyposalivation reveal that 6.7% of all participants have the condition, while 96.7% exhibit a normal salivary flow rate. The oral dryness experienced appears to be transient, possibly related to Kratom leaf active chemical action duration, and does not appear to have a substantial impact on irreversible changes in saliva production. However, Kratom leaf chewers may experience complications from oral dryness, which could affect their oral health. Therefore, dental professionals should assess oral dryness and provide recommendations in order to maintain good oral health and overall quality of life in this group.

Keywords: Kratom leaf chewing, dry mouth, xerostomia, hyposalivation,

บทนำ

กระท่อมเป็นพืชประจำถิ่นที่พบในภูมิภาคเอเชียตะวันออกเฉียงใต้ และพบมากในภาคใต้ของประเทศไทย (Hassan et al., 2013) และจัดเป็นพืชวัฒนธรรมของภาคใต้มาตั้งแต่อดีตจนถึงปัจจุบัน มีการใช้กระท่อมเป็นส่วนประกอบในตำรายาพื้นบ้านเพื่อรักษาโรคและเพื่อการเข้าสังคม (Prozialeck et al., 2019; Saingam et al., 2023) การใช้กระท่อมในรูปแบบดั้งเดิมคือการเคี้ยวใบหรือนำมาต้มชงน้ำดื่ม ประชากรในภาคใต้นิยมเคี้ยวใบกระท่อมจนเกิดเป็นพฤติกรรมที่ทำอยู่เป็นประจำ (สาวิตรี อัษณางค์กรชัย, 2563) โดยส่วนใหญ่มีรูปแบบการเคี้ยวใบแล้วคายกากร้อยละ 75.67 รองลงมาคือรับประทานทั้งกากร้อยละ 30.08 และใช้ใบต้มน้ำร้อยละ 24.71 (สาวิตรี อัษณางค์กรชัย และคณะ, 2553) ซึ่งมีวัตถุประสงค์เพื่อให้ทำงานได้นานขึ้น รวมทั้งใช้รักษาอาการเจ็บป่วย เช่น ลดอาการไอ ลดอาการปวดเมื่อย

ในอดีตพืชกระท่อมถือเป็นยาเสพติดให้โทษประเภท 5 ตามพระราชบัญญัติยาเสพติดให้โทษ พ.ศ.2522 ต่อมารัฐบาลไทยได้ประกาศยกเลิกพืชกระท่อมออกจากการเป็นยาเสพติดให้โทษตามพระราชบัญญัติยาเสพติดให้โทษ (ฉบับที่ 8) พ.ศ.2564 เพื่อประโยชน์ทางการแพทย์และเศรษฐกิจ ส่งผลให้ประชาชนสามารถใช้ได้อย่างเสรีและใช้กันอย่างแพร่หลายมากขึ้น

ถึงแม้ว่าพืชกระท่อมจะมีประโยชน์ แต่มีรายงานเกี่ยวกับอาการข้างเคียง ได้แก่ ปัสสาวะบ่อย เบื่ออาหาร ท้องผูก หอบหืด เป็นหวัดง่าย สั่นและกระตุก ความคิดอ่านช้าลง (บุญศิริ จันศิริมงคล, อรนลิน สิงขรณ์, บรรเจิด ทิพย์นุรักษ์, และดวงวิภรณ์ พ่วงรอด, 2552 ; สาวิตรี อัษณางค์กรชัย, 2553 ; Warner, Kaufman, & Grundmann, 2016 ; Fluyau & Revadigar, 2017) นอกจากนี้มีรายงานจากการสัมภาษณ์เกี่ยวกับผลข้างเคียงจากการเคี้ยวพืชกระท่อมต่อสุขภาพช่องปาก ได้แก่ อาการปากแห้งและชา ริมฝีปากแห้งและริมฝีปากคล้ำ (Saingam et al., 2023 ; Somreudee Eaimchaloaya, 2019)

ภาวะปากแห้ง (Oral Dryness) ใช้สำหรับผู้ที่มีอาการปากแห้ง คอแห้ง น้ำลายน้อย โดยแบ่งได้ 2 อย่าง คือความรู้สึกปากแห้ง (Xerostomia) และภาวะน้ำลายน้อย (Hyposalivation) โดยความรู้สึกปากแห้ง (Xerostomia) เป็นความรับรู้ส่วนบุคคล (Subjective Symptom) ว่าปากแห้ง รู้สึกไม่สบายในช่องปาก บางครั้งมีความรู้สึกปวดแสบโดยอาจมีน้ำลายปกติหรือน้อยได้ (Scully & Felix, 2005; Tanasiewicz, Hildebrandt, & Obersztyn, 2016; Thomson, 2015; Villa, Connell, & Abati, 2015) ส่งผลกระทบต่อการใช้ชีวิตประจำวันและเป็นอาการสำคัญที่มาพบทันตแพทย์ มักพบในผู้สูงอายุ ส่วนภาวะน้ำลายน้อยเป็นภาวะที่มีการหลั่งน้ำลายน้อยลง ซึ่งสามารถประเมินได้จากการตรวจทางคลินิก และวัดอัตราการหลั่งน้ำลาย สาเหตุเกิดจากประสิทธิภาพการทำงานของต่อมน้ำลายลดลงหรือโดนทำลาย มีผลให้ต่อมน้ำลายผลิตน้ำลายได้น้อยเกิดขึ้นได้ร้อยละ 50 ในผู้สูงอายุ พบได้ในผู้สูงอายุที่มีโรคประจำตัวและรับประทานยาที่มีผลต่อการหลั่งน้ำลาย (Turner, 2016) ภาวะปากแห้งถือเป็นความรู้สึกของแต่ละบุคคล ดังนั้นระดับความรุนแรงจึงแตกต่างไปตามแต่ละสาเหตุ อาการปากแห้งเกิดขึ้นได้ทั้งแบบชั่วคราวและถาวร โดยอาการปากแห้งชั่วคราวเกิดจากได้รับยาบางชนิดและใช้ยาอย่างสม่ำเสมอ ทำให้เพิ่มความเสี่ยงของการเกิดภาวะปากแห้งมากขึ้น (Shetty et al., 2012) พบว่า ผู้ป่วยที่รับประทานยามีความชุกการเกิดปากแห้งมากกว่า

ผู้ป่วยที่ไม่ได้รับยา 4 เท่า (Field et al., 2001) นอกจากนี้มีปัจจัยในเรื่องอายุและเพศ โดยเฉพาะในช่วงอายุ 65 ถึง 70 ปี ความชุกของภาวะปากแห้งเพิ่มขึ้น (Rech et al., 2019) ส่วนอาการปากแห้งถาวรมักพบได้ในโรคบางชนิด เช่น กลุ่มอาการโจเกรน (Sjögren's Syndrome) การได้รับรังสี และความผิดปกติของต่อมน้ำลายที่ทำให้เกิดภาวะปากแห้ง (Villa et al., 2015) ภาวะปากแห้ง (Oral Dryness) เป็นปัญหาหนึ่งที่ส่งผลเสียต่อสุขภาพ ทำให้เพิ่มความเสี่ยงต่อการเกิดโรคฟันผุ โรคปริทันต์ รวมทั้งโรคของเยื่อเมือกช่องปาก เช่น การติดเชื้อราในช่องปาก การรับรสผิดปกติไปจากเดิม ทำให้ความสามารถในการบดเคี้ยวอาหารลดลง ซึ่งกระทบต่อคุณภาพชีวิต (Das & Challacombe, 2016) มีรายงานที่ได้จากการสัมภาษณ์ถึงผลข้างเคียงในช่องปากจากการเคี้ยวใบกระท่อม คือ ภาวะปากแห้ง (Saingam et al., 2023; Singh et al., 2017) แต่ปัจจุบันยังไม่มีการศึกษาทางคลินิกที่เกี่ยวกับภาวะปากแห้งจากการเคี้ยวใบกระท่อมที่อาจเกิดผลกระทบต่อคุณภาพชีวิตของผู้ป่วยรวมทั้งสุขภาพช่องปากและฟันเพื่อให้ทันตบุคลากรนำผลการ ศึกษาที่ได้มาวางแผนดูแลสุขภาพช่องปากและเป็นแนวทางในการเฝ้าระวังผู้ที่เคี้ยวใบกระท่อมต่อไป

วัตถุประสงค์ของการวิจัย

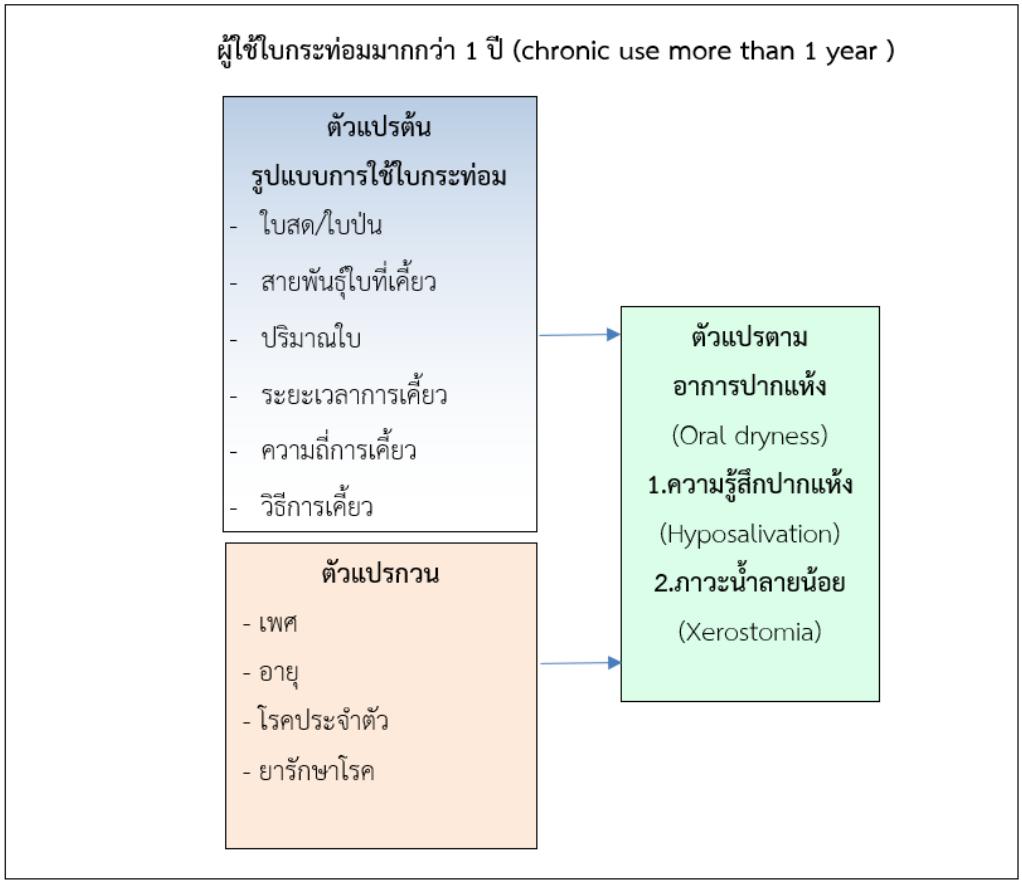
1. เพื่อศึกษารูปแบบการเคี้ยวใบกระท่อมในผู้ที่มีพฤติกรรมเคี้ยวใบกระท่อม
2. เพื่อศึกษาภาวะปากแห้งในผู้ที่มีพฤติกรรมเคี้ยวใบกระท่อม

แนวคิด ทฤษฎี กรอบแนวคิด

การเคี้ยวใบกระท่อมเป็นวิถีชุมชนดั้งเดิมทางภาคใต้ มาตั้งแต่อดีตจนถึงปัจจุบัน โดยมีวัตถุประสงค์เพื่อให้ทำงานได้นานขึ้นและใช้รักษาอาการเจ็บป่วยต่างๆ ซึ่งพฤติกรรมการเคี้ยวใบกระท่อมพบในผู้ชายมากกว่าผู้หญิง แต่การใช้พืชกระท่อมส่งผลให้เกิดอาการข้างเคียงทางระบบได้และยังส่งผลต่อสุขภาพช่องปากของผู้ที่เคี้ยวใบกระท่อมอีกด้วย ได้แก่ อาการปากแห้งและชา ริมฝีปากแห้งและริมฝีปากคล้ำ (Saingamet al., 2023 ; Somreudee Eaimchaloaya, 2019; สาวิตรี อัษณางค์กรชัย, 2553 ; สาวิตรี อัษณางค์กรชัย, 2563) เมื่อรัฐบาลไทยได้ประกาศยกเลิกพืชกระท่อมออกจากการเป็นยาเสพติดให้โทษ ส่งผลให้มีการใช้อย่างแพร่หลายมากขึ้นไปทั่วทุกภูมิภาคของประเทศไทย

ภาวะปากแห้ง สามารถแบ่งได้ 2 อย่างคือ 1) ความรู้สึกปากแห้ง เป็นความรู้สึกของบุคคลว่าตนเองมีอาการปากแห้ง กลืน เคี้ยว รับประทานอาหารลำบาก ซึ่งจะประเมินได้จากการถามโดยตรงต่อบุคคลและ 2) ภาวะน้ำลายน้อย เป็นภาวะที่มีการหลั่งน้ำลายน้อยลง ซึ่งสามารถประเมินได้จากการตรวจทางคลินิกและวัดอัตราการหลั่งน้ำลาย (Villa et al., 2015)

ภาวะปากแห้งเป็นภาวะที่ทำให้บุคคลรู้สึกไม่เป็นปกติและกระทบต่อคุณภาพชีวิต สำหรับภาวะปากแห้งของผู้ที่เคี้ยวใบกระท่อม นอกจากรายงานที่ได้จากการสัมภาษณ์แล้ว (Saingam et al., 2023; Singh et al., 2017) ยังไม่มีการศึกษาทางคลินิกเกี่ยวกับภาวะปากแห้งและผลกระทบที่เกิดขึ้น ดังนั้น ผู้วิจัยจึงมีความสนใจศึกษาเรื่องนี้ โดยมีกรอบแนวคิดการวิจัย ดังนี้



ภาพที่ 1 กรอบแนวคิดงานวิจัย

วิธีดำเนินการวิจัย

การวิจัยนี้เป็นการศึกษาแบบภาคตัดขวาง (Cross-Sectional Study) ซึ่งผู้วิจัยได้กำหนดวิธีดำเนินการวิจัยดังนี้

ประชากรและกลุ่มตัวอย่าง

เป็นกลุ่มผู้มีพฤติกรรมเคี้ยวใบกระท่อมที่อาศัยอยู่ในตำบลสะพานไม้แก่น อำเภอจะนะ จังหวัดสงขลา ทำการศึกษาในช่วง 1 กันยายน – 30 ธันวาคม พ.ศ. 2564 โดยใช้วิธีการเลือกกลุ่มตัวอย่างแบบเจาะจง (Purposive Sampling) และใช้เทคนิคการเลือกกลุ่มตัวอย่างแบบลูกโซ่ (Snowball Sampling) ดำเนินการเก็บข้อมูล โดยสอบถามจากประธานอาสาสมัครสาธารณสุขประจำหมู่บ้านให้ช่วยแนะนำผู้ที่มีคุณสมบัติ ดังนี้

เกณฑ์การคัดเข้า

(1) เป็นบุคคลที่มีอายุ 18 ปีบริบูรณ์ขึ้นไป

(2) เป็นบุคคลที่ปัจจุบันใช้พืชกระท่อมในรูปแบบการเคี้ยวใบมากกว่า 1 ปีขึ้นไป

(3) เป็นบุคคลที่สื่อสารภาษาไทยได้และสามารถให้ความร่วมมือในการทำแบบสอบถาม

เกณฑ์การคัดออก

(1) เป็นผู้ป่วยจิตเวชที่มีอาการทางจิตหรือมีอารมณ์ไม่มั่นคง ไม่สามารถตอบแบบสอบถามได้

(2) เป็นผู้ป่วยโรคสมองเสื่อมหรือโรคที่มีความเกี่ยวข้องกับการบกพร่องทางความจำ

(3) เป็นบุคคลที่ได้รับยาในกลุ่มที่มีผลต่อภาวการณ์หลั่งของน้ำลาย

(4) เป็นบุคคลที่มีโรคหรือภาวะปากแห้งถาวร ได้แก่ อาการโจเกรน (Sjögren's Syndrome) วัณโรค (Tuberculosis) ภาวะ Graft-Versus-Host Disease การปลูกถ่ายไขกระดูก (Bone Marrow Transplantation) ได้รับการฉายรังสีรักษาบริเวณใบหน้าและช่องปาก

การคำนวณขนาดกลุ่มตัวอย่าง อ้างอิงจากการศึกษาของ El Toum, Cassia, Bouchi, & Kassab (2018) โดยคำนวณสัดส่วนของกลุ่มตัวอย่างที่มีภาวะปากแห้ง ร้อยละ 3.4 ซึ่งกลุ่มตัวอย่างที่คำนวณได้จำนวน 99 คน และเพื่อป้องกันการสูญหายของกลุ่มอย่าง 20% จึงใช้จำนวนกลุ่มตัวอย่างรวมทั้งหมด 120 คน

เครื่องมือที่ใช้ในการวิจัย ที่ใช้ในการเก็บรวบรวมข้อมูลประกอบไปด้วย 4 เครื่องมือดังนี้

1. แบบสอบถามข้อมูลทั่วไป ประกอบด้วย อายุ ศาสนา สถานภาพ ระดับการศึกษา อาชีพ รายได้เฉลี่ยต่อเดือน โรคประจำตัว ยารักษาโรค และการใส่ฟันปลอม

2. แบบสัมภาษณ์ความรู้สึกปากแห้ง Shortening the Xerostomia Inventory (Thomson et al., 2011) มีข้อคำถาม 5 ข้อ ดังนี้

(1) รู้สึกปากแห้งเมื่อรับประทานอาหาร

(2) รู้สึกปากแห้ง

(3) รู้สึกมีความยากในการรับประทานอาหารแห้ง

(4) รู้สึกกลืนอาหารลำบาก

(5) รู้สึกริมฝีปากแห้ง

โดยมีระดับการประเมินความรู้สึกเป็นแบบประมาณค่า 3 ระดับ คือ ไม่เคย (1 คะแนน) บางครั้ง (2 คะแนน) และบ่อยครั้ง (3 คะแนน) มีคะแนนต่ำสุดและสูงสุดเท่ากับ 5-15 คะแนน 5 หมายถึง ไม่มีความรู้สึกปากแห้ง และ 15 หมายถึง มีความรู้สึกปากแห้งรุนแรง

3. แบบประเมินภาวะน้ำลายน้อยจากการตรวจทางคลินิก (Clinical Oral Dryness Score (CODS)) ของ Osailan et al. (2012) มีจำนวน 10 ข้อ โดยมีเกณฑ์ดังนี้

(1) ผิวหน้ากระจกตรวจกระพุ้งแก้ม

(2) ผิวหน้ากระจกตรวจติดลิ้น

(3) น้ำลายเป็นฟอง

(4) ไม่มีน้ำลายอยู่ที่พื้นปาก

(5) ปุ่มลิ้นหายไป

(6) เหงือกเปลี่ยนแปลง มีลักษณะผิวเรียบและมันบริเวณด้านหน้า

(7) เยื่อเมือกช่องปากมีลักษณะมันวาว สะท้อนแสงโดยเฉพาะเพดานปาก

(8) ลิ้นแตกเป็นร่องลึก

(9) บริเวณคอฟันมีรอยผุ รอยโรคดำเนินอยู่ หรือเพิ่งอุดได้ไม่เกิน 6 เดือนมากกว่า 2 ซี่

(10) มีเศษปนเปื้อน (Debris) บนเพดานปาก (ไม่รวมส่วนที่อยู่ใต้ฟันเทียม)

โดยถ้าตรวจพบตามเกณฑ์ คิดเป็นข้อละ 1 คะแนน แล้วนำคะแนนทั้งหมดมารวมกันเพื่อใช้ในการแบ่งระดับความรุนแรงของภาวะปากแห้งตามคะแนน ดังนี้

คะแนน 0 หมายถึง ไม่มีภาวะน้ำลายน้อย (No Dryness)

คะแนน 1-3 หมายถึง ภาวะน้ำลายน้อยระดับเล็กน้อย (Mild Dryness)

คะแนน 4-6 หมายถึง ภาวะน้ำลายน้อยระดับปานกลาง (Moderate Dryness)

คะแนน 7-10 หมายถึง ภาวะน้ำลายน้อยระดับรุนแรง (Severe Dryness)

4. แบบบันทึกการวัดอัตราการหลั่งของน้ำลาย ใช้วิธีการบ้วนน้ำลาย (Spitting Method) (Villa et al., 2015) เพื่อหาอัตราการหลั่งของน้ำลายขณะที่ไม่มีการกระตุ้น (Unstimulated Salivary Flow Rate) ซึ่งจะทำการเก็บน้ำลายในช่วงเวลาเดียวกันตอนเช้า คือ 8.30 - 11.30 น. โดยให้กลุ่มตัวอย่างงดน้ำและอาหารรวมทั้งการเคี้ยวกระท่อมมาก่อน 2 ชั่วโมง โดยให้กลุ่มตัวอย่างอยู่ในท่านั่งและก้มศีรษะมาข้างหน้าเล็กน้อย โดยไม่กลืนน้ำลาย บ้วนน้ำลายลงในภาชนะและเก็บน้ำลายเป็นเวลา 5 นาทีและอัตราการหลั่งของน้ำลายขณะกระตุ้น (Stimulated Salivary Flow Rate) ให้กลุ่มตัวอย่างเคี้ยวขี้ผึ้งพาราฟินของ Sigma Aldrich ติดต่อกันประมาณ 5 นาทีแล้วจับเวลา เก็บข้อมูลแบบบันทึกผลหน่วยเป็นมิลลิลิตรต่อนาที โดยแปลความหมายของการวัดอัตราการหลั่งของน้ำลายได้ (Villa et al., 2015) ดังนี้

(1) อัตราการหลั่งของน้ำลายขณะที่ไม่มีการกระตุ้น ค่า 0.3-0.4 มิลลิลิตรต่อนาที หมายถึง ภาวะปกติ ส่วนอัตราการหลั่งของน้ำลาย < 0.1 มิลลิลิตรต่อนาที หมายถึง อัตราการหลั่งน้ำลายน้อย

(2) อัตราการหลั่งของน้ำลายขณะกระตุ้น ค่า 1.5-2 มิลลิลิตรต่อนาที หมายถึง ภาวะปกติ ส่วนอัตราการหลั่งของน้ำลาย < 0.5 มิลลิลิตรต่อนาที หมายถึง อัตราการหลั่งน้ำลายน้อยได้ทำการศึกษานำร่อง (Pilot Study) ในกลุ่มตัวอย่างจำนวน 30 คน

การวิเคราะห์ข้อมูล นำเสนอข้อมูลด้วยสถิติเชิงพรรณนา (Descriptive Statistics) ได้แก่ ค่าความถี่ ร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน

การพิทักษ์สิทธิกลุ่มตัวอย่าง

การศึกษาครั้งนี้ผ่านการรับรองจริยธรรมการวิจัยในมนุษย์ของมหาวิทยาลัยสงขลานครินทร์ เลขที่ EC6404-018 เมื่อวันที่ 28 เมษายน 2564 ซึ่งก่อนเก็บข้อมูลทุกครั้งผู้วิจัยได้ชี้แจงวัตถุประสงค์ของการวิจัยให้กลุ่มตัวอย่างเข้าใจถึงสิทธิในการปฏิเสธหรือถอนตัวออกจากการวิจัยได้ตลอดเวลา โดยไม่มีผลกระทบใด ๆ ข้อมูลที่ได้รับจะถูกเก็บเป็นความลับและนำเสนอในภาพรวม หากกลุ่มตัวอย่างเกิดปัญหาขณะให้ข้อมูล ผู้วิจัยจะยุติการเก็บข้อมูลและส่งต่อให้แพทย์ สำหรับการวิจัยครั้งนี้ไม่มีผู้ถอนตัวออกจากการวิจัย

ผลการวิจัย

กลุ่มตัวอย่างที่เคี้ยวใบกระท่อมมีทั้งหมด 120 คน ส่วนใหญ่เป็นเพศชาย จำนวน 84 คน คิดเป็นร้อยละ 70.0 และเป็นเพศหญิง จำนวน 36 คน คิดเป็นร้อยละ 30 โดยมีอายุเฉลี่ย 37 ปี (SD=13.1) อายุต่ำสุด 18 ปี และสูงสุด 69 ปี นับถือศาสนาพุทธ จำนวน 110 คน คิดเป็นร้อยละ 91.7 และนับถือศาสนาอิสลาม จำนวน 10 คน คิดเป็นร้อยละ 8.3 ส่วนใหญ่มีสถานภาพสมรส จำนวน 61 คน คิดเป็นร้อยละ 50.8 จบการศึกษาสูงสุดระดับมัธยมศึกษา จำนวน 69 คน คิดเป็นร้อยละ 57.5 ประกอบอาชีพเกษตรกร จำนวน 56 คน คิดเป็นร้อยละ 46.7 รายได้ครอบครัวเฉลี่ยต่อเดือนในช่วง 5,001-10,000 บาท จำนวน 69 คน คิดเป็นร้อยละ 57.5 ไม่มีโรคประจำตัว จำนวน 104 คน คิดเป็นร้อยละ 86.7 ซึ่งในกลุ่มตัวอย่างมีโรคความดันโลหิตสูงมากที่สุด จำนวน 11 คน คิดเป็นร้อยละ 9.2 ไม่ได้รับประทานยา จำนวน 107 คน คิดเป็นร้อยละ 89.2 และมียาที่ต้องรับประทานจำนวน 13 คน คิดเป็นร้อยละ 10.8 ส่วนใหญ่ไม่ใส่ฟันปลอม จำนวน 114 คน คิดเป็นร้อยละ 95.0

พฤติกรรมการเคี้ยวใบกระท่อมของกลุ่มตัวอย่าง ส่วนใหญ่มีความถี่ของการเคี้ยวใบกระท่อมครั้งต่อวัน คิดเป็นร้อยละ 34.2 สำหรับเวลาที่ใช้เคี้ยวใบกระท่อมในแต่ละครั้ง เฉลี่ย 2.5 นาที เวลาที่เคี้ยวใบกระท่อมตลอดชีวิตเฉลี่ย 1.1 ชั่วโมงต่อปี ลักษณะใบกระท่อมที่เคี้ยวแทบทั้งหมดเป็นใบสด โดยปริมาณใบที่เคี้ยวในแต่ละวันเฉลี่ย 5.4 ใบ รูปแบบการเคี้ยวมักใช้วิธีการเคี้ยวแล้วคายใบออกมา พฤติกรรมการใช้ใบกระท่อม นอกเหนือจากการเคี้ยว มักต้มเป็นน้ำชา คิดเป็นร้อยละ 57.5 ดังแสดงในตารางที่ 1

ตารางที่ 1 พฤติกรรมการเคี้ยวใบกระท่อม

ข้อมูล	จำนวน (ร้อยละ)
อายุที่เริ่มเคี้ยวใบกระท่อม (ปี), Mean ± SD	27.5 ± 11.3
ปริมาณใบที่เคี้ยวใบกระท่อมต่อวัน, Mean ± SD	5.4 ± 5.6

ตารางที่ 1 พฤติกรรมการเคี้ยวใบกระท่อม

ข้อมูล	จำนวน (ร้อยละ)
เวลาที่ใช้เคี้ยวในแต่ละครั้ง (นาที) , Mean ± SD	2.5 ± 0.9
< 1	13 (10.8)
1-2	60 (50.0)
3-4	27 (22.5)
≥ 5	20 (16.7)
เวลาที่เคี้ยวใบกระท่อมตลอดชีวิต (ชั่วโมง-ปี), Mean ± SD	1.1 ± 1.2
วิธีการเคี้ยว	
เคี้ยวแล้วกลืน	22 (18.3)
เคี้ยวแล้วคาย	83 (69.2)
ทั้งกลืนและคาย	17 (14.2)
เหนียด	1 (0.8)
ลักษณะใบกระท่อมที่เคี้ยว	
ใบสด	119 (99.2)
ใบป่น	1 (0.8)
สายพันธุ์ใบกระท่อม (เลือกตอบได้มากกว่า 1 ข้อ)	
ก้านแดง	95 (79.8)
ก้านเขียว	40 (33.3)
ขอบหยัก	14 (11.7)
ไม่ทราบ	16 (13.3)
รูปแบบอื่นของการใช้ใบกระท่อม (เลือกตอบได้มากกว่า 1 ข้อ)	
ต้มเป็นน้ำชา	69 (57.5)
สี่คูณร้อย	16 (13.3)

ข้อมูลจากแบบสัมภาษณ์ความรู้สึกปากแห้ง พบว่ากลุ่มตัวอย่างรู้สึกปากแห้งจำนวน 82 คน คิดเป็นร้อยละ 68.3 ดังแสดงในตารางที่ 2

ตารางที่ 2 ผลการประเมินความรู้สึกปากแห้งโดยใช้แบบสัมภาษณ์ความรู้สึกปากแห้ง

ข้อมูลความรู้สึกปากแห้ง	จำนวน (ร้อยละ)
ไม่เคยรู้สึกปากแห้ง (never)	38 (31.7)
รู้สึกปากแห้งบางครั้ง (sometime)	76 (63.3)
รู้สึกปากแห้งบ่อยครั้ง (often)	6 (5.0)

สำหรับผลของการตรวจช่องปากโดยใช้แบบประเมินภาวะน้ำลายน้อยจากการตรวจทางคลินิก พบว่า กลุ่มตัวอย่างส่วนใหญ่ไม่มีภาวะปากแห้ง จำนวน 112 คน คิดเป็นร้อยละ 93.3 และมีภาวะปากแห้ง 8 คน คิดเป็นร้อยละ 6.7

ผลการวัดอัตราการหลั่งของน้ำลายในกลุ่มตัวอย่างพบว่า ค่าเฉลี่ยของอัตราการหลั่งน้ำลายในขณะไม่มีการกระตุ้น คิดเป็น 0.48 มิลลิลิตรต่อนาที (SD=0.34) และค่าเฉลี่ยของอัตราการหลั่งน้ำลายในขณะไม่มีการกระตุ้น คิดเป็น 1.75 มิลลิลิตรต่อนาที (SD=0.78) โดยมีผู้ที่มีอัตราการหลั่งน้ำลายปกติร้อยละ 96.7 และผู้ที่มีอัตราการหลั่งน้ำลายน้อยคิดเป็น ร้อยละ 3.3 เท่ากันทั้งในขณะที่ไม่มีการกระตุ้นและขณะถูกกระตุ้น ดังแสดงในตารางที่ 3

ตารางที่ 3 ผลอัตราการหลั่งของน้ำลายในผู้ที่เคี้ยวใบกระท่อม

ข้อมูล	การหลั่งน้ำลายในขณะที่ไม่มีการกระตุ้น จำนวน (ร้อยละ)	การหลั่งน้ำลายในขณะถูกกระตุ้น จำนวน (ร้อยละ)
ภาวะน้ำลายน้อย	4 (3.3)	4 (3.3)
ภาวะการหลั่งน้ำลายปกติ	116 (96.7)	116 (96.7)

สรุปและอภิปรายผล

การศึกษาที่ผ่านมา รายงานผลข้างเคียงจากการเคี้ยวใบกระท่อม คือภาวะปากแห้ง ซึ่งเป็นข้อมูลที่ได้จากสัมภาษณ์เท่านั้น (Somreudee Eaimchaloaya, 2019; Warner et al., 2016) การศึกษานี้เป็นการศึกษาแรกที่ได้ทำการประเมินภาวะปากแห้งของผู้ป่วยทางคลินิก โดยการประเมินทั้งความรับรู้ส่วนบุคคล การตรวจสภาพช่องปากโดยใช้แบบตรวจภาวะปากแห้งและการวัดอัตราการหลั่งน้ำลาย แม้ว่ากลุ่มตัวอย่างมีความรู้สึกปากแห้ง ร้อยละ 68.8 โดยส่วนใหญ่มีความรู้สึกปากแห้งบางครั้ง แต่การประเมินภาวะน้ำลายน้อยจากใช้แบบตรวจภาวะปากแห้งและการวัดอัตราการหลั่งน้ำลาย ส่วนใหญ่มากกว่าร้อยละ 93 อยู่ในระดับปกติ แสดงให้เห็นว่าการเคี้ยวกระท่อมไม่มีผลกระทบที่ชัดเจนต่อการผลิตน้ำลายที่เป็นการเปลี่ยนแปลงแบบถาวร (Irreversible Change) แม้ว่าผู้ที่เคี้ยวกระท่อมได้ทำพฤติกรรมซ้ำ ๆ เป็นประจำ

ใบกระท่อมสด มีน้ำหนักเฉลี่ย 1.7 กรัมต่อใบ ประกอบด้วย สารแอลคาลอยด์ 850 ไมโครกรัม คิดเป็นร้อยละ 0.5-0.8 โดยใบแก่จะพบสารดังกล่าว ประมาณ 40 ชนิด ชนิดที่พบมากที่สุด ได้แก่ เฮทเทอโรโยฮิมบิน (Heteroyohimbines) และออกซิอินโดล (Oxindoles) เมื่อทำการสกัดแอลคาลอยด์ชนิดเฮทเทอโรโยฮิมบินทำให้พบสารสำคัญหลักคือ สารไมทราไจนีน (Mitragynine) โดยพบประมาณร้อยละ 66 ของแอลคาลอยด์ ส่วนสารอื่นๆ พบเพียงเล็กน้อย (Hassan et al., 2013) ไมทราไจนีนสามารถออกฤทธิ์ได้ภายในเวลาประมาณ 30 นาที และมีค่าครึ่งอายุ (Half-life) ประมาณ 3.5 ชั่วโมง (Kruegel et al., 2016) อย่างไรก็ตาม ในปัจจุบันยังไม่มีการศึกษาใดที่บอกได้ว่า ความรู้สึกปากแห้งในผู้ที่เคี้ยวใบกระท่อมเกิดจากกลไกใด ดังนั้นถ้าหากสารนี้เป็นตัวทำให้เกิดการลดอัตราการหลั่งน้ำลาย หากมีการประเมินภาวะปากแห้งเลยช่วงเวลาที่ออกฤทธิ์ อาจตรวจไม่พบภาวะน้ำลายน้อย และถ้าการเกิดภาวะน้ำลายน้อยเกิดเฉพาะช่วงระยะเวลาที่เคี้ยว ไม่ได้เกิดต่อเนื่องก็อาจไม่มีหรือส่งผลกระทบน้อยต่อการเกิดเปลี่ยนแปลงของเยื่อเมือกในช่องปาก ซึ่งสอดคล้องกับผลของการศึกษานี้ที่การตรวจสภาวะช่องปากทางคลินิกไม่พบภาวะปากแห้งในกลุ่มตัวอย่างส่วนใหญ่ นอกจากนี้อาจจะมีปัจจัยอื่นที่ช่วยลดหรือป้องกันไม่ให้เกิดภาวะปากแห้งในผู้ที่เคี้ยวใบกระท่อม เช่น พฤติกรรมในรูปแบบเคี้ยวแล้วคายซึ่งอาจจะลดระยะเวลาที่สารจากใบกระท่อมจะตกค้างอยู่ในช่องปาก หรือผู้ที่มีพฤติกรรมการใบเคี้ยวกระท่อมอาจมีการปรับตัวทางชีวภาพที่ช่วยลดผลกระทบต่อการหลั่งน้ำลาย แต่อย่างไรก็ตามในการตรวจภาวะช่องปากทางคลินิกมีผู้ป่วยอยู่ร้อยละ 6.7 ที่มีการเปลี่ยนแปลงในช่องปากที่เป็นผลตามมาจากภาวะปากแห้งทำให้เกิดฟันผุง่ายขึ้นโดยเฉพาะฟันผุที่รากฟัน ปัญหาโรคปริทันต์ ทำให้การสูญเสียฟัน ส่งผลให้ความสามารถของการบดเคี้ยวลดลง ดังนั้นทันตแพทย์ควรให้ความสำคัญกับอาการปากแห้งในกลุ่มที่เคี้ยวใบกระท่อมด้วย เพื่อป้องกันภาวะแทรกซ้อนต่อสุขภาพช่องปากและคุณภาพชีวิตของผู้ป่วย (Tsuchiya, 2021) โดยให้คำแนะนำผู้ป่วยให้จิบน้ำบ่อย ๆ หรืออาจใช้หมากฝรั่งหรือลูกอมที่ไม่มีน้ำตาล กรณีที่มีภาวะปากแห้งระดับรุนแรงควรได้รับน้ำลายทดแทนและฟลูออไรด์เสริมเพื่อป้องกันฟันผุ หรือพิจารณาให้ยาพิโลคาพีนไฮโดรคลอไรด์ (pilocarpine hydrochloride) เพื่อกระตุ้นการหลั่งของน้ำลาย (Cassolato & Turnbull, 2003) และนัดผู้ป่วยมาติดตามอาการอย่างต่อเนื่อง (Plemons et al., 2014) ถ้ายังคงทำพฤติกรรมนี้อยู่

เนื่องจากในขณะทำการศึกษาเป็นช่วงเปลี่ยนผ่านของกฎหมาย ทำให้มีข้อจำกัด ไม่สามารถให้อาสาสมัครทดลองเคี้ยวใบกระท่อมในงานวิจัยแล้ววัดผลทันที การศึกษาต่อไปควรมีการประเมินภาวะปากแห้งทั้งจากการสอบถามความรู้สึกและการตรวจอัตราการหลั่งน้ำลายของผู้ที่เคี้ยวใบกระท่อมในระยะเวลาที่เหมาะสมในการออกฤทธิ์ของพืชกระท่อมหรือประเมินทันทีที่เคี้ยวใบกระท่อมเสร็จ ซึ่งจะเป็นข้อมูลที่ช่วยให้เข้าใจกลไกของภาวะปากแห้งในผู้ที่เคี้ยวใบกระท่อมได้ดีขึ้น

การศึกษาครั้งนี้แสดงให้เห็นว่า ผู้ที่เคี้ยวใบกระท่อมบางส่วนมีความรู้สึกปากแห้งได้ ซึ่งอาจสัมพันธ์กับช่วงเวลาที่มีสารออกฤทธิ์จากกระท่อม แต่ไม่ได้มีผลถาวรต่ออัตราการหลั่งน้ำลายและการเปลี่ยนแปลงของสภาพช่องปากจากภาวะน้ำลายแห้งอย่างชัดเจน แต่อย่างไรก็ตามบางส่วนของกลุ่มนี้อาจมีผลกระทบภายในช่องปากตามมาจากภาวะปากแห้งได้ นอกจากนี้ความรู้สึกปากแห้งอาจส่งผลกระทบ

ต่อคุณภาพชีวิตของผู้ที่เคี้ยวใบกระท่อม ดังนั้นทันตแพทย์จึงควรมีการวางแผนเพื่อติดตามและเฝ้าระวังให้คำแนะนำ เพื่อส่งเสริมสุขภาพช่องปากและคุณภาพชีวิตในผู้ที่มีพฤติกรรมนี้

ข้อเสนอแนะ

จากผลการศึกษาพบว่า กลุ่มตัวอย่างที่เคี้ยวใบกระท่อมส่วนใหญ่มีความรู้สึกปากแห้งบางครั้ง และมีบางส่วนตรวจพบผลกระทบจากภาวะปากแห้งในช่องปาก ซึ่งอาจมีผลต่อการใช้ชีวิตประจำวันและสามารถนำไปสู่โรคทางช่องปากและฟันได้ ดังนั้น

1) ทันตแพทย์ควรมีการซักประวัติเรื่องการเคี้ยวใบกระท่อมในผู้ที่มีภาวะปากแห้ง เพื่อจะได้ช่วยในการวินิจฉัยภาวะนี้แยกจากสาเหตุอื่นๆที่ทำให้ปากแห้ง

2) กรณีผู้ที่ทราบว่ามีพฤติกรรมเคี้ยวใบกระท่อมมาตรวจรักษาทางทันตกรรม ควรมีการตรวจหาผลกระทบที่อาจเกิดขึ้นได้จากภาวะปากแห้งเพื่อให้สามารถรักษารวมถึงให้คำแนะนำในการดูแลสุขภาพช่องปากได้อย่างเหมาะสม

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การแสดงออกของรอยโรคช่องปากในโรคติดเชื้อไวรัสโคโรนา 2019 (โควิด-19) ที่มีอาการทางระบบทางเดินหายใจน้อย: การศึกษาแบบตัดขวาง

Oral manifestations of COVID-19 infection with mild respiratory symptoms: A cross-sectional study

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บทคัดย่อ

การศึกษารอยโรคในช่องปากที่พบได้ในโรคติดเชื้อไวรัสโคโรนา 2019 ส่วนใหญ่เป็นการเก็บข้อมูลในผู้ที่มีอาการป่วยปานกลางและรุนแรง ดังนั้นงานวิจัยนี้จึงมีวัตถุประสงค์เพื่อรายงานรอยโรคและอาการแสดงทางคลินิกที่ปรากฏในช่องปากในผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 ในระดับที่มีอาการทางระบบทางเดินหายใจน้อย การศึกษาแบบตัดขวางในผู้ป่วยจำนวน 387 คน ได้ดำเนินการในโรงพยาบาลสนามภายใต้การดูแลของโรงพยาบาลจะนะ จังหวัดสงขลา ในระหว่างวันที่ 1 - 30 พฤศจิกายน พ.ศ. 2564 ผู้ป่วยทำแบบสอบถาม เกี่ยวกับรอยโรคในช่องปาก และทำการการตรวจช่องปากด้วยตนเองร่วมกับการถ่ายภาพในช่องปาก ส่งข้อมูลผ่านแอพพลิเคชั่น LINE® ผลการศึกษาพบผู้ที่มีรอยโรคในช่องปากและอาการแสดงทั้งสิ้น 249 คน (ร้อยละ 64.3) โดยพบการเปลี่ยนแปลงการรับรส (Taste Alteration) มากที่สุด 222 คน (ร้อยละ 57.4) และ พบรอยโรคและอาการแสดงของเยื่อเมือกช่องปาก 70 คน (ร้อยละ 18.1) โดยส่วนใหญ่พบ ลิ้นฝ้า (Coated tongue) 22 คน (ร้อยละ 5.2) ลิ้นเลี่ยน (Depapillated Tongue) 14 คน (ร้อยละ 3.6) และ รอยแผลคล้ายแอพทัส (Aphthous-liked ulcer) 11 คน (ร้อยละ 2.8) นอกจากนี้ยังมีรอยโรคอื่น ๆ อีกเช่น ตุ่มเลือดออก (Blood filled vesicle) รอยแดง (Erythematous lesion) รอยขาว (White lesion) และ จุดเลือดออก (Petechia) รอยโรคเหล่านี้ ถ้าปรากฏโดยไม่ทราบ

สาเหตุที่ชัดเจน สามารถนำไปใช้เป็นข้อมูลประกอบในการเฝ้าระวังการเกิดโรคติดเชื้อไวรัสโคโรนา 2019 ในผู้ป่วยที่มีอาการทางระบบทางเดินหายใจน้อย เพื่อเป็นการลดการแพร่ระบาดของโรค

คำสำคัญ: การแสดงออกของรอยโรคช่องปาก, โรคติดเชื้อไวรัสโคโรนา 2019 (โควิด 19), การเปลี่ยนแปลงการรับรส

Abstract

Most of the studies about the oral manifestations of the coronavirus disease 19 were performed on patients with moderate to severe symptoms. Thus, the objectives of this research were to report oral manifestations and symptoms in COVID-19 patients who had mild respiratory symptoms. The cross-sectional study was performed on 387 patients in field hospitals under the care of Chana Hospital, Songkhla Province, during November 1–30, 2021. Patients completed a questionnaire, conducted a self - oral examination, took oral cavity photographs, and submitted the data via the LINE® application. Oral lesions and symptoms were observed in 249 cases (64.3%), with taste alteration being the most prevalent in 222 cases (57.4%). Oral lesions and symptoms were presented in 70 cases (18.1%), with coated tongue 22 cases (5.2%), depapillated tongue 14 cases (3.6%), and aphthous-like ulcer 11 cases (2.8%) being the most prevalent. Additional oral lesions were observed, such as blood-filled vesicles, erythematous lesions, white lesions, and petechial lesions. The oral lesions the oral manifestations identified in this study, in the absence of any other known cause, can serve as a means of monitoring the emergence of Covid-19 in patients with mild respiratory symptoms, thereby mitigating the transmission of the disease.

Keywords: Oral Manifestations, Coronavirus Infection, COVID-19, Taste Alteration

บทนำ

การแพร่ระบาดของโรคติดเชื้อไวรัสโคโรนา 2019 (โควิด 19) เข้าสู่สถานะการระบาดระดับโลก นับตั้งแต่เริ่มเป็นโรคอุบัติใหม่ในปี พ.ศ. 2562 จนกระทั่งในในปี พ.ศ. 2567 การติดเชื้อทั่วโลกมีมากกว่า 774 ล้านคน และมีผู้เสียชีวิตมากกว่า 7 ล้านคน (World health organization, 2024) ส่งผลกระทบมากมายทั้งด้านเศรษฐกิจ สังคม รวมถึงด้านการสาธารณสุข อาการแสดงของโรคติดเชื้อไวรัสโคโรนา 2019 มีอาการแสดงที่หลากหลาย แต่โดยส่วนใหญ่จะพบอาการแสดงของระบบทางเดินหายใจ ตั้งแต่ไม่มีอาการ ไปจนถึงมีอาการรุนแรงถึงแก่ชีวิต นอกจากอาการทางระบบทางเดินหายใจแล้ว มีรายงานการเกิดรอยโรคในช่องปากร่วมด้วย (Gupta et al., 2023) (Pergolini et al., 2023) (Hussein et al., 2023) โดยเฉพาะในกลุ่มผู้ป่วยที่ไม่แสดงอาการ หรือมีอาการน้อย มีการศึกษาพบว่าผู้ป่วยกลุ่มนี้มีส่วนสำคัญทำให้การแพร่ระบาดเกิดขึ้นได้อย่างรวดเร็ว (Parasher A., 2021)

มีรายงานการแสดงออกของรอยโรคช่องปากของผู้ที่ติดเชื้อไวรัสโคโรนา 2019 ได้แก่ แผลในช่องปาก ก้อนบวมในช่องปาก จุดเลือดออก รอยขาว รอยแดง อาการกลืนลำบาก การรับรสที่เปลี่ยนไป และอาการปากแห้ง (Pergolini et al., 2023) (Sharma et al., 2022) (Erbaş et al., 2022) โดยมีรายงานการแสดงออกของรอยโรคช่องปากผิดปกติที่ร้อยละ 66.7 - 71.7 (Sharma et al., 2022) (Abubakr. et al., 2021) โดยที่อุบัติการณ์รอยโรคในช่องปากแยกตามเพศไม่มีความแตกต่างกัน การแสดงออกของรอยโรคช่องปากมักจะเกิดขึ้นพร้อมกับอาการแสดงของระบบทางเดินหายใจ ระยะเวลาในการแสดงอาการของรอยโรคในช่องปากประมาณ 7 - 24 วัน หลังจากเริ่มแสดงอาการทางเดินหายใจ (Gebretsadik, 2022) โดยส่วนมากมักจะหายได้เอง

รายงานการแสดงออกของรอยโรคช่องปากของผู้ที่ติดเชื้อไวรัสโคโรนา 2019 ส่วนใหญ่มีการศึกษาในกลุ่มผู้ป่วยที่อาการระดับปานกลางถึงรุนแรง ซึ่งผู้ป่วยส่วนใหญ่จะเข้ารับการรักษาในโรงพยาบาล อย่างไรก็ตาม มีงานวิจัยจำนวนจำกัดที่ประเมินอาการแสดงออกของรอยโรคช่องปากในผู้ป่วยติดเชื้อไวรัสโคโรนา 2019 ที่มีอาการทางระบบทางเดินหายใจน้อย นอกจากนี้จากข้อจำกัดในเรื่องการแพร่กระจายเชื้อ ทำให้การศึกษาส่วนใหญ่เก็บข้อมูลโดยการทำแบบสอบถาม และการศึกษาด้วยวิธีการตรวจช่องปากจึงยังมีน้อย ในผู้ป่วยที่มีอาการของโรคในระดับที่ไม่รุนแรง มีรายงานการแสดงออกของรอยโรคช่องปากร้อยละ 15.4 - 64.0 (Chawla et al., 2022) (Ganesan et al., 2022) โดยส่วนใหญ่พบอาการการรับรสที่เปลี่ยนไป

การแสดงออกของรอยโรคช่องปากของผู้ที่ติดเชื้อไวรัสโคโรนา 2019 ในผู้ป่วยที่มีอาการรุนแรงหรือต้องรักษาในโรงพยาบาล พบว่า จะมีอุบัติการณ์การแสดงออกของรอยโรคช่องปากที่สูงและรุนแรงกว่าผู้ป่วยที่มีอาการทางระบบทางเดินหายใจของโรคน้อย (Gebretsadik, 2022) รอยโรคในช่องปากของผู้ป่วย ที่มีอาการรุนแรง หรือต้องนอนรักษาในโรงพยาบาล อาจเป็นผลที่ตามมาของการรักษาหรือการติดเชื้อฉวยโอกาสในผู้ป่วยกลุ่มนี้ (Marouf et al., 2021) ในขณะที่กลุ่มที่มีอาการทางระบบทางเดินหายใจน้อย การแสดงออกของรอยโรคช่องปากอาจเป็นผลจากเชื้อไวรัสโคโรนา 2019

การศึกษาส่วนใหญ่จะทำในผู้ป่วยที่มีอาการทางระบบทางเดินหายใจรุนแรงและได้รับการรักษาในโรงพยาบาล ดังนั้นการศึกษารอยโรคช่องปากในกลุ่มผู้ป่วยที่มีอาการทางระบบทางเดินหายใจน้อยน่าจะเป็นข้อมูลที่ช่วยให้ทันตแพทย์สามารถเฝ้าระวังและแยกผู้ป่วยกลุ่มนี้ออกได้

วัตถุประสงค์ของการวิจัย

เพื่อรายงานรอยโรคและอาการแสดงทางคลินิกที่ปรากฏในช่องปากของผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 (โควิด-19) ในระดับที่มีอาการทางระบบทางเดินหายใจน้อย

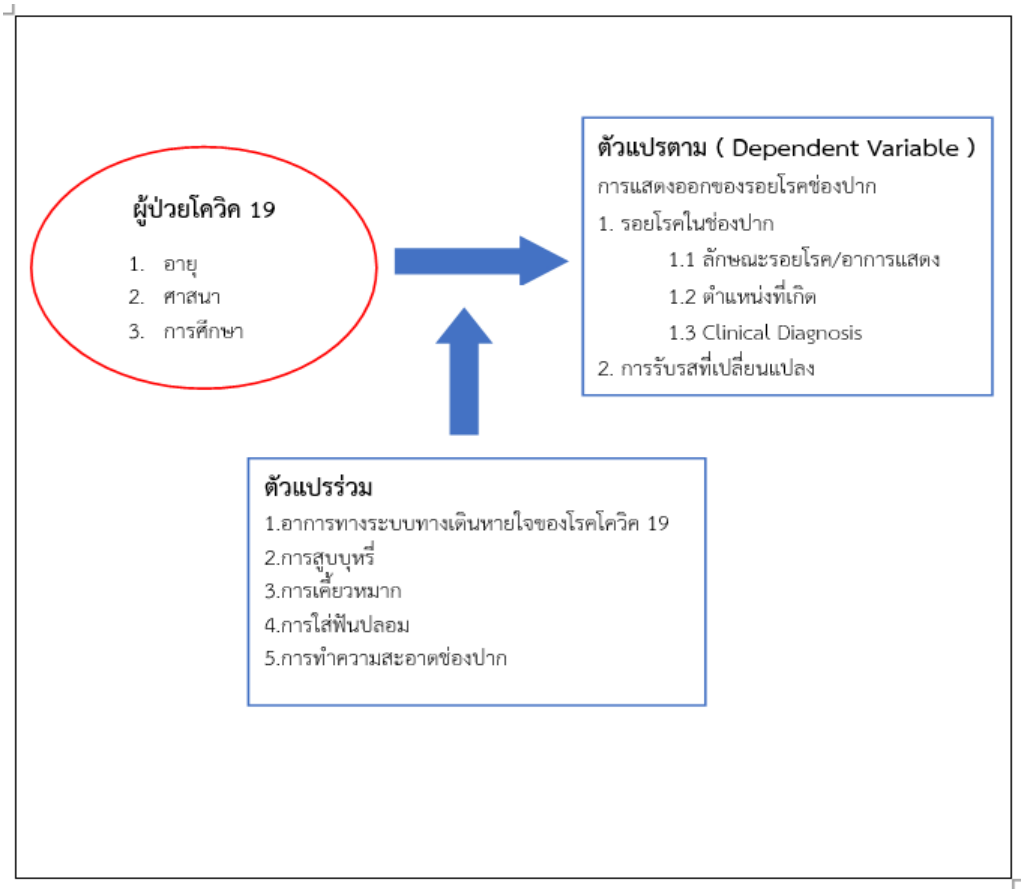
แนวคิด ทฤษฎี กรอบแนวคิด

การศึกษาการแสดงออกของรอยโรคช่องปากในโรคติดเชื้อไวรัสโคโรนา 2019 มีการศึกษาพร้อม ๆ

ไปกับอาการทางระบบต่าง ๆ ตั้งแต่เริ่มมีการระบาดของโรค การศึกษาส่วนใหญ่ทำในผู้ป่วยที่ต้องรักษาในโรงพยาบาล เนื่องจากข้อจำกัดในการป้องกันการแพร่กระจายเชื้อ มีการรายงานการเกิดรอยโรคช่องปากหลากหลายรูปแบบเช่น แผลในช่องปาก ก้อนบวมในช่องปาก จุดเลือดออก รอยขาว รอยแดง การรับรสที่เปลี่ยนไป (Sharma et al., 2022) (Sarasati. et al., 2023) (Wang et al., 2023) (Glavina et al., 2022)

การศึกษาส่วนใหญ่ ทำในกลุ่มที่มีอาการปานกลางถึงรุนแรง (Gherlone et al., 2021) (Hocková et al., 2021) (Salehi et al., 2020) และยังขาดการเก็บข้อมูลโดยผู้เชี่ยวชาญด้านเวชศาสตร์ช่องปากซึ่งจะช่วยยืนยันรอยโรคในช่องปากได้

ดังนั้นงานวิจัยนี้จะทำการศึกษารอยโรคช่องปากในกลุ่มผู้ป่วยที่โรคติดเชื้อไวรัสโคโรนา 2019 ที่มีอาการทางระบบทางเดินหายใจน้อย โดยการตรวจช่องปากและยืนยันผลการวินิจฉัยกับทันตแพทย์ผู้เชี่ยวชาญด้านเวชศาสตร์ช่องปาก ซึ่งจะมีความสำคัญในด้านการช่วยป้องกันและเฝ้าระวังการแพร่ระบาดได้อีกช่องทางหนึ่ง โดยมีกรอบแนวคิดการวิจัยดังนี้



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

การศึกษานี้เป็นการศึกษาชนิดตัดขวาง (Cross-sectional Study)

1. ประชากรและกลุ่มตัวอย่าง

ผู้ป่วยติดเชื้อไวรัสโคโรนา 2019 โดยเก็บข้อมูลครั้งเดียว ในวันแรกที่ผู้ป่วยเข้ารับการรักษาในโรงพยาบาลสนาม ในการดูแลของโรงพยาบาลจะนะ จังหวัดสงขลา ในช่วงวันที่ 1 - 30 พฤศจิกายน พ.ศ. 2564

เกณฑ์การคัดเลือกผู้เข้าร่วมการวิจัย (Inclusion Criteria)

1. เป็นผู้ที่ได้รับการวินิจฉัยว่าติดเชื้อไวรัสโคโรนา 2019 โดยมีผลตรวจทางห้องปฏิบัติการชนิด RT-PCR เป็นผลบวก
2. เป็นผู้ติดเชื้อที่ได้รับการคัดกรองแล้วว่าอยู่ในเกณฑ์ผู้ป่วยมีอาการทางระบบทางเดินหายใจน้อย (ผู้ป่วยสีเขียว ตามเกณฑ์การคัดกรองของกรมการแพทย์ กระทรวงสาธารณสุข
3. สามารถติดต่อสื่อสารผ่านการใช้โทรศัพท์มือถือและแอพลิเคชัน LINE ® ได้

2. เครื่องมือที่ใช้ในการวิจัย

แบบสอบถาม

ผู้เข้าร่วมวิจัยที่ผ่านเกณฑ์การคัดเลือกผู้เข้าร่วมการวิจัย จะทำการเก็บข้อมูลครั้งเดียวในวันแรกที่เข้ารับการรักษาในโรงพยาบาลสนาม โดยจะได้รับแบบสอบถามจำนวน 1 ฉบับ เป็นแบบให้เลือกตอบ ผู้เข้าร่วมวิจัยทำแบบสอบถามด้วยตนเองโดยใช้เวลาประมาณ 10 - 15 นาที เมื่อทำแบบสอบถามเสร็จผู้เข้าร่วมวิจัยถ่ายภาพแบบสอบถามส่งให้ผู้วิจัยผ่าน แอพลิเคชัน LINE® แบบสอบถามประกอบด้วยเนื้อหาดังนี้

ส่วนที่ 1 ข้อมูลทางประชากร

ส่วนที่ 2 ข้อมูลอาการแสดงของผู้ป่วยติดเชื้อไวรัสโคโรนา 2019 ใช้ข้อมูลจากบันทึกการรักษาของแพทย์ (Medical Records)

ส่วนที่ 3 ปัจจัยเสี่ยงต่อการเกิดรอยโรคในช่องปาก ได้แก่ ประวัติการสูบบุหรี่/ยาเส้น การดื่มแอลกอฮอล์ การเคี้ยวหมาก การใส่ฟันปลอม และการทำความสะอาดช่องปาก

ส่วนที่ 4 แบบสอบถามรอยโรคในช่องปาก เพื่อเก็บข้อมูลอาการแสดงรอยโรคในช่องปาก เช่น แผลในช่องปาก ก้อนบวมในช่องปาก จุดเลือดออก รอยขาว รอยแดง หรือลักษณะผิดปกติต่าง ๆ ที่ผู้ป่วยสังเกตได้หรือรับรู้ด้วยตนเอง โดยเก็บข้อมูล ลักษณะอาการ และตำแหน่งของรอยโรค อาการผิดปกติดังกล่าวต้องไม่เคยเป็นมาก่อนการติดเชื้อไวรัสโคโรน่า 2019

ส่วนที่ 5 แบบสอบถามการรับรสและการประเมินอาการเปลี่ยนแปลงการรับรส

การตรวจช่องปากด้วยตนเองและการถ่ายภาพในช่องปาก

ผู้เข้าร่วมวิจัยตรวจช่องปากด้วยตนเองโดยใช้วิธีมาตรฐาน (Binmadi, N.O. et al., 2022) โดยสรุปดังนี้ ทำการตรวจให้ครอบคลุมตำแหน่งต่าง ๆ ในช่องปากจำนวน 10 ตำแหน่ง ได้แก่ ริมฝีปากด้านนอกทั้งบนและล่าง ริมฝีปากด้านในบนและล่าง กระพุ้งแก้มด้านในซ้ายและขวา เพดานปาก ลิ้นด้านบน ลิ้นด้านข้างซ้ายและขวา พื้นช่องปาก และใต้ลิ้น ในที่ที่มีแสงสว่างเพียงพอจากแสงธรรมชาติ หรือแสงจากหลอดไฟฟลูออเรสเซนต์ และถ่ายภาพในช่องปากด้วยตนเองตามตำแหน่งต่าง ๆ ที่ทำการตรวจ ภาพที่ถ่ายได้ทำการส่งให้ผู้วิจัย (ป.อ.) ผ่านทางแอพลิเคชัน LINE® ผู้วิจัยทำการรวบรวมข้อมูลและตรวจสอบภาพถ่ายเบื้องต้น ถ้าทำการตรวจพบรอยโรค หรือความผิดปกติในช่องปาก ผู้วิจัย (ป.อ.) ทำการส่งภาพเพื่อยืนยันผลการตรวจกับทันตแพทย์ผู้เชี่ยวชาญ (ด.ก.) เพื่อให้การวินิจฉัยรวมถึงให้การรักษา ติดตามอาการตามความเหมาะสม

3. การวิเคราะห์ข้อมูล

การวิเคราะห์ข้อมูลใช้โปรแกรมสำเร็จรูป R version 4.3.2 โดยข้อมูลทั่วไปของกลุ่มตัวอย่างและตัวแปรที่ศึกษาใช้สถิติเชิงพรรณนา ได้แก่ ค่าความถี่ และร้อยละ การหาความสัมพันธ์ระหว่างเพศกับข้อมูลทั่วไป ปัจจัยเสี่ยงอื่นๆ และการเปลี่ยนแปลงการรับรส ใช้สถิติวิธีการทดสอบไคสแควร์ (Chi-Square Test) กำหนดระดับนัยสำคัญทางสถิติ ($p<0.05$)

4.การพิทักษ์สิทธิกลุ่มตัวอย่าง

ผู้ป่วยที่เข้าร่วมศึกษาทุกคนได้ให้ความยินยอมเป็นลายลักษณ์อักษรและการศึกษานี้ได้ผ่านการรับรองจากคณะกรรมการจริยธรรมการวิจัยในมนุษย์ คณะทันตแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์ (No. EC6409-063)

ผลการวิจัย

ผู้เข้าร่วมวิจัย ทั้งหมด 387 คน ส่วนใหญ่เป็นเพศหญิง ร้อยละ 69.7 ช่วงอายุ 13 - 59 ปี พบมากที่สุด ร้อยละ 78.0 รองลงมาเป็นกลุ่มผู้สูงอายุ ร้อยละ 17.1 นับถือศาสนาอิสลาม ร้อยละ 88.9 และมีการศึกษาต่ำกว่าระดับประถมศึกษา ร้อยละ 48.7 และพบว่าระดับการศึกษาและศาสนามีความสัมพันธ์กับเพศ ($p<0.05$) ดังแสดงในตารางที่ 1

ตารางที่ 1 ข้อมูลทั่วไป

ข้อมูล	ทั้งหมด n=387 (%)	ชาย n=117 (%)	หญิง n=270 (%)	p-value
กลุ่มอายุ (ปี)				0.093
6-12	19 (4.9)	10 (8.5)	9 (3.3)	

ตารางที่ 1 (ต่อ)

ข้อมูล	ทั้งหมด n=387 (%)	ชาย n=117 (%)	หญิง n=270 (%)	p-value
13-59	302 (78.0)	88 (75.2)	214 (79.3)	
≥ 60	66 (17.1)	19 (16.3)	47 (17.4)	
ระดับการศึกษา				**0.013**
ไม่ได้เรียนหนังสือ	181 (48.7)	52 (44.8)	129 (50.4)	
ประถมศึกษา	78 (21.0)	36 (31.0)	42 (16.4)	
มัธยมศึกษา	66 (17.7)	17 (14.7)	49 (19.1)	
อนุปริญญา	17 (4.6)	6 (5.2)	11 (4.3)	
ปริญญาตรี	30 (8.0)	5 (4.3)	25 (9.8)	
ศาสนา				**0.022**
พุทธ	43 (11.1)	6 (5.1)	37 (13.7)	
อิสลาม	344 (88.9)	111 (94.9)	233 (86.3)	

ตารางที่ 2 แสดงปัจจัยเสี่ยงต่อการเกิดรอยโรคต่างๆในช่องปาก ซึ่งจะใช้ประกอบการวินิจฉัยรอยโรคที่พบโดยผู้เข้าร่วมวิจัยมี การสูบบุหรี่ การเคี้ยวหมาก การดื่มแอลกอฮอล์ ร้อยละ 15.5, 3.4 และ 1.3 ตามลำดับ มีการใช้น้ำยาบ้วนปากเสริมจากการแปรงฟันปกติ ร้อยละ 4.9 โดยพบว่าการสูบบุหรี่และการดื่มแอลกอฮอล์มีความสัมพันธ์กับเพศ ($p<0.05$)

ตารางที่ 2 ปัจจัยเสี่ยงอื่น ๆ ต่อการเกิดรอยโรคในช่องปาก

ข้อมูล	ทั้งหมด n=387(%)	ชาย n=117(%)	หญิง n=270(%)	p-value
การสูบบุหรี่				**< 0.001**
สูบ	60 (15.5)	57 (48.7)	3 (1.1)	
ไม่สูบ	327 (84.5)	60 (51.3)	267 (98.9)	
การดื่มแอลกอฮอล์				**< 0.001**
ดื่ม	13 (3.4)	10 (8.5)	3 (1.1)	
ไม่ดื่ม	374 (96.6)	107 (91.5)	267 (98.9)	
การเคี้ยวหมาก				1.000
เคี้ยว	5 (1.3)	1 (0.9)	4 (1.5)	

ตารางที่ 2 (ต่อ)

ข้อมูล	ทั้งหมด n=387(%)	ชาย n=117(%)	หญิง n=270(%)	p-value
ไม่เคี้ยว	382 (98.7)	116 (99.1)	266 (98.5)	
การใส่ฟันปลอม				0.063
ใส่	54 (14)	10 (8.5)	44 (16.3)	
ไม่ใส่	333 (86)	107 (91.5)	226 (83.7)	
การใช้น้ำยาบ้วนปาก				0.097
ใช้	19 (4.9)	2 (1.7)	17 (6.3)	
ไม่ใช้	368 (95.1)	115 (98.3)	253 (93.7)	

จากผู้ป่วยทั้งหมดที่ติดเชื้อโคโรน่าไวรัส 2019 ที่มีอาการทางระบบทางเดินหายใจน้อย พบผู้ที่มีรอยโรคในช่องปากและอาการแสดงทั้งสิ้น 249 คน (ร้อยละ 64.3) โดยพบผู้ที่มีการเปลี่ยนแปลงการรับรส (Taste Alteration) มากที่สุด ร้อยละ 57.4 ถัดมาเป็นรอยโรคของเยื่อเมือกช่องปาก ร้อยละ 18.1 การรับรสเปลี่ยนแปลงร่วมกับอาการแสดงรอยโรคในช่องปาก ร้อยละ 11.1 ในส่วนการเปลี่ยนแปลงของเยื่อเมือกช่องปากส่วนใหญ่พบ ลิ้นฝ้า (Coated tongue) ร้อยละ 5.2 ลิ้นเลี่ยน (Depapillated tongue) ร้อยละ 3.6 และ รอยแผลคล้ายแอพทัส (Aphthous-liked ulcer) ร้อยละ 2.8 ตามลำดับ ตำแหน่งที่พบรอยโรคได้บ่อยที่สุด ได้แก่ ลิ้น ริมฝีปาก และ กระพุ้งแก้ม สำหรับ รอยแผลคล้ายแอพทัส (Aphthous-liked ulcer) ได้ทำการบันทึกเฉพาะผู้ป่วยที่ไม่ได้มีประวัติการเป็น รอยแผลแอพทัส Aphthous ulcer เพื่อป้องกันการนับรวมรอยโรคที่อาจมีสาเหตุอื่นอยู่ก่อน ซึ่งไม่ใช่รอยโรคที่เกิดจากการติดเชื้อโคโรน่าไวรัส 2019 ในผู้ป่วย และในการศึกษานี้พบผู้ป่วยที่มีรอยโรค 2 รอยโรค จำนวน 3 ราย ได้แก่ อาการแสบปากร่วมกับลิ้นเลี่ยน 2 ราย และ แสบปากร่วมกับลิ้นลายแผนที่ 1 ราย ดังแสดงในตารางที่ 3

ตารางที่ 3 รอยโรคในช่องปากและอาการแสดงที่พบในผู้ป่วยติดเชื้อไวรัสโคโรนา 2019 (n = 387)

Oral Finding (n=249,64.3%)	**จำนวน (%)**
การรับรสเปลี่ยนแปลง (Taste alteration)	222 (57.4)
อาการแสดงรอยโรคในช่องปาก (Oral manifestations)	70 (18.1)
การรับรสเปลี่ยนแปลง ร่วมกับ อาการแสดงรอยโรคในช่องปาก (Taste alteration and Oral manifestations)	43 (11.1)

ตารางที่ 3 (ต่อ)

Oral Finding (n=249,64.3%)	จำนวน (%)
Oral Manifestations	70 (18.1)
ลิ้นฝ้า Coated tongue	**22 (5.2)**
Dorsal tongue	20 (5.2)
ลิ้นเลี่ยน Depapillated tongue	**14 (3.6)**
Dorsal tongue	12 (3.1)
Tip of tongue	2 (0.5)
รอยแผลคล้ายแอพทัส Aphthous-like ulcer	**11 (2.8)**
Lower lip	4 (1.0)
Upper lip	2 (0.5)
Angles lip	2 (0.5)
Tip of tongue	1 (0.26)
Palate	1 (0.26)
Attach gingiva	1 (0.26)
แสบปาก Burning mouth	**10 (1.8)**
Dorsal tongue	3 (0.8)
Tip of tongue	3 (0.8)
Buccal mucosa	2 (0.5)
Dorsal tongue and buccal mucosa	1 (0.26)
Lateral tongue	1 (0.26)
Oral manifestations	70 (18.1)
ตุ่มเลือดออก Blood filled vesicle	**4 (1.0)**
Lateral of Tongue	3 (0.8)
Upper Lip	1 (0.26)
รอยแดง Erythematous lesion	**4 (1.0)**
Buccal mucosa	2 (0.5)
Palate	1 (0.26)
Angles of lip	1 (0.26)

ตารางที่ 3 (ต่อ)

Oral manifestations	70 (18.1)
รอยขาว White lesion	**3 (0.8)**
Buccal mucosa	3 (0.8)
ลิ้นลายแผนที่ Geographic tongue	**2 (0.5)**
Dorsal tongue	2 (0.5)
จุดเลือดออก Petechia	**2 (0.5)**
Lower lip	1 (0.26)
Angles of lip	1 (0.26)
กลางลิ้นอักเสบรูปเปียกปูน median rhomboid glossitis	**1(0.26)**
Dorsal tongue	1(0.26)

ตารางที่ 4 ผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 ทั้งหมดที่มีอาการทางระบบทางเดินหายใจน้อย ไม่พบการเปลี่ยนแปลงการรับรส ทั้งหมด 165 คน (ร้อยละ 42.6) สำหรับการเปลี่ยนแปลงการรับรสพบได้ทั้งหมด ร้อยละ 57.4 และในกลุ่มผู้ป่วยที่มีการเปลี่ยนแปลงการรับรสพบว่า ไม่มีความสัมพันธ์กับเพศ (p=0.114) โดยพบการเปลี่ยนแปลงใน 3 รูปแบบ ได้แก่ การรับรสที่เปลี่ยนแปลง ร้อยละ 41.9 รับรสได้น้อยลง ร้อยละ 36.9 และรับรสไม่ได้เลย ร้อยละ 21.2 ตามลำดับ สำหรับการรับรสที่เปลี่ยนแปลงมักจะเป็นอาการขมปาก และรับรสได้ผิดเพี้ยนไปจากเดิม

ตารางที่ 4 การเปลี่ยนแปลงการรับรส (Taste alteration) (n = 222)

การรับรส	**ทั้งหมด** n=222 (%)	**ชาย** n=58 (%)	**หญิง** n=164 (%)	**p-value**
การรับรสเปลี่ยนแปลง (Dysgeusia)	93 (41.9)	22 (43.1)	68 (41.5)	0.114
รับรสได้น้อยลง (Hypogeusia)	82 (36.9)	16 (27.6)	66 (40.2)	
รับรสไม่ได้เลย (Ageusia)	47 (21.2)	17 (29.3)	30 (18.3)	

สรุปและอภิปรายผล

การศึกษานี้ เป็นการศึกษาที่รายงานการแสดงออกของรอยโรคในช่องปากในผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 เป็นการศึกษาแรกในประเทศไทย โดยทำการศึกษาในผู้ป่วยที่มีอาการทางระบบทางเดินหายใจน้อย การศึกษาที่ผ่านมาส่วนใหญ่เป็นการศึกษาในผู้ป่วยที่มีอาการปานกลางถึงรุนแรง โดยผลการศึกษาที่สำคัญ คือ การเปลี่ยนแปลงการรับรส มากที่สุด ร้อยละ 57.4 รองลงไป คือรอยโรค

และอาการแสดงของเยื่อเมือกในช่องปาก ร้อยละ 18.1 โดยเรียงตามอาการแสดงหรือรอยโรคที่พบบ่อย ได้แก่ ลิ้นฝ้า (Coated tongue) ลิ้นเลี่ยน (Depapillated tongue) และรอยแผลคล้ายแอพทัส (Aphthous-liked ulcer) แสบปาก (Burning mouth) ตุ่มเลือดออก (Blood filled vesicle) รอยแดง (Erythematous lesion) รอยขาว (White lesion) ลิ้นลายแผนที่ (Geographic tongue) จุดเลือดออก (Petechia) และกลางลิ้นอักเสบรูปเปียกปูน (Median rhomboid glossitis) ตามลำดับ

การศึกษาที่ผ่านมาส่วนใหญ่พบ การเปลี่ยนแปลงการรับรสมากที่สุด ซึ่งสอดคล้องกับการศึกษานี้ และร้อยละที่ตรวจพบอยู่ในช่วงที่มีการรายงาน ร้อยละ 44 – 60 (Gupta et al.,2023) (Wang et al., 2023) (Binmadi et al., 2022) สอดคล้องกับการศึกษาของ Glavina et al. (2021) ซึ่งพบการเปลี่ยนแปลงการรับรสได้ใน 3 รูปแบบคือ การรับรสเปลี่ยนแปลง (Dysgeusia) รับรสได้น้อยลง (Hypogeusia) รับรสไม่ได้เลย (Ageusia)

รอยโรคและอาการแสดงของเยื่อเมือกในช่องปาก จากการศึกษาแบบการวิเคราะห์อภิมาน (Meta-analysis) ของ Gupta et al. (2023) ได้พบอาการแสดงออกของรอยโรคในช่องปากในผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 ดังต่อไปนี้ รอยแผล (Oral ulcerations), แสบปาก (Burning sensation), ปากแห้ง (Xerostomia), รอยแดงและรอยขาว (Red and white lesions), ตุ่มน้ำ (Vesiculobullous lesions), การเปลี่ยนแปลงรูปร่างของลิ้น (Morphological changes of the tongue), การเปลี่ยนแปลงการรับรส (Taste alteration), โรคเหงือกอักเสบและโรคปริทันต์อักเสบ (Gingival and periodontal lesions), และ ความผิดปกติของต่อมน้ำลาย (Salivary gland disorders)

โดยที่การศึกษานี้ตรวจพบรอยโรคสอดคล้องกับการศึกษาข้างต้น อย่างไรก็ตามการศึกษานี้ตรวจไม่พบรอยโรค การเปลี่ยนแปลงรูปร่างของลิ้น (Morphological changes of the tongue), โรคเหงือกอักเสบและโรคปริทันต์อักเสบ (Gingival and periodontal lesion) และ ความผิดปกติของต่อมน้ำลาย (Salivary gland disorders) เป็นไปได้ว่า การเปลี่ยนแปลงรูปร่างของลิ้น (Morphological change of the tongue) คือ ลิ้นมีขนาดใหญ่เป็นลักษณะปกติของผู้ป่วยคนนั้นที่เป็นมาก่อนการป่วย ไม่ได้เกิดจากการติดเชื้อไวรัสโคโรนา 2019 และการบันทึกข้อมูลโดยแพทย์ทั่วไปซึ่งไม่ใช่ผู้เชี่ยวชาญ อาจบันทึกข้อมูลผิดพลาดได้ โรคเหงือกอักเสบและโรคปริทันต์อักเสบ (Gingival and periodontal lesion) รอยโรคที่พบเป็นลักษณะรอยโรค โรคเหงือกลอกแดงและโรคปริทันต์อักเสบชนิดรุนแรง (Desquamative gingivitis, severe periodontitis) โดยจะพบในผู้ป่วยที่มีอาการของโรคติดเชื้อไวรัสโคโรนา 2019 ที่มีอาการรุนแรง (Marouf et al., 2021) โดยเฉพาะผู้ป่วยที่ใช้เครื่องช่วยหายใจ ซึ่งมีภาวะกดภูมิคุ้มกันเกิดขึ้นด้วย สำหรับรอยโรคความผิดปกติของต่อมน้ำลาย (Salivary gland disorders) เป็นรายงานจากการศึกษาจากข้อมูลผู้ป่วยโควิดที่นอนโรงพยาบาล มีการใช้ยาหลายชนิดในการรักษา (Gherlone et al., 2021) การศึกษานี้ที่ไม่พบโรคเหงือกลอกแดงและโรคปริทันต์อักเสบชนิดรุนแรง (Desquamative gingivitis, severe periodontitis) และ ความผิดปกติของต่อมน้ำลาย (Salivary gland disorders) จึงน่าจะเป็นจากการที่ทำการศึกษาในผู้ป่วยที่มีอาการน้อย

จากการศึกษาของ Sharma et al. (2022) และ Díaz et al. (2022) ได้อธิบายกลไกการเกิดรอยโรคในช่องปาก เชื้อไวรัสโคโรนา 2019 ทำให้เกิดกระบวนการอักเสบต่อระบบทางเดินหายใจและอวัยวะอื่น ๆ โดยผ่านการจับกันของไวรัสกับตัวรับ angiotensin-converting enzyme-2 (ACE2) ของเซลล์เยื่อบุผิวในช่องปาก ต่อมน้ำลาย และลิ้นซึ่งมีตัวรับเอนไซม์ ACE-2 ทำให้เกิดปฏิกิริยาการอักเสบในบริเวณเหล่านี้ อีกประการหนึ่งอาจเกิดจากการเติบโตของการติดเชื้อฉวยโอกาส เช่น ไวรัส แบคทีเรีย เชื้อราในช่องปาก การใช้ยารักษาโรค และภูมิคุ้มกันบกพร่องอื่นๆ ที่เกี่ยวข้อง ซึ่งทำให้เกิดการเปลี่ยนแปลงในระดับเซลล์ อย่างไรก้ตามจนถึงขณะนี้การศึกษาสาเหตุที่แท้จริงยังไม่เป็นที่แน่ชัด จำเป็นต้องมีการศึกษาต่อไปในอนาคต

การศึกษาการแสดงออกของรอยโรคในผู้ป่วยโรคติดเชื้อไวรัสโคโรนา 2019 ในระดับที่มีอาการทางระบบทางเดินหายใจที่มีอาการปานกลาง จนถึงรุนแรง หรือได้รับการรักษาในโรงพยาบาล พบว่า การพบรอยโรคในช่องปาก ที่มีอาการรุนแรงมากกว่า ซึ่งอาจเกิดจากภาวะแทรกซ้อนจากการรักษา การติดเชื้อฉวยโอกาส หรือผลข้างเคียงจากการใช้ยา (Iranmanesh et al., 2021) อย่างไรก็ตามผู้ป่วยที่รับการรักษาในโรงพยาบาลมักจะได้รับการตรวจและวินิจฉัยรอยโรคในช่องปากและให้การรักษาอย่างเหมาะสม ในขณะผู้ป่วยที่มีอาการน้อยจะมาพบแพทย์ด้วยอาการทางระบบทางเดินหายใจต่าง ๆ อาจไม่ได้รับการตรวจช่องปากร่วมด้วย จากการศึกษาพบว่า พบการเกิดการแสดงออกของรอยโรคในช่องปากในกลุ่มผู้ที่มีอาการทางระบบทางเดินหายใจมากกว่า 1 อาการ มักจะมีอาการแสดงออกของรอยโรคในช่องปากร่วมด้วย (El Tantawi et al., 2022) การตรวจช่องปากในผู้ป่วยกลุ่มนี้ อาจทำให้สามารถพบรอยโรคและให้การรักษาอย่างเหมาะสม ช่วยให้ผู้ป่วยติดเชื้อโคโรน่า 2019 เหล่านี้ มีคุณภาพชีวิตที่ดีขึ้น นอกจากนี้ การมีอาการรอยโรคในช่องปากร่วมกับอาการทางระบบทางเดินหายใจ จะช่วยให้บุคลากรทางการแพทย์รวมถึงผู้ป่วยเพิ่มความเข้มข้นในการคัดกรองผู้ติดเชื้อไวรัสโคโรนา 2019 ในการควบคุมการแพร่กระจายเชื้อให้มากขึ้นหรือรีบเข้ารับการรักษา เพื่อป้องกันการป่วยรุนแรง

การศึกษานี้ได้ทำการศึกษาเฉพาะตอนที่ผู้ป่วยเข้าโรงพยาบาลสนามครั้งแรก อาจมีรอยโรคในช่องปากเกิดขึ้นอีกในระหว่างการติดเชื้อไวรัสโคโรนา 2019 ดังนั้นอุบัติการณ์ของรอยโรคที่เกิดอาจน้อยกว่าการติดตามตลอดระยะเวลาที่ติดเชื้อ

การศึกษานี้บ่งชี้ว่า การเปลี่ยนแปลงการรับรส (Taste alteration) รอยโรคลิ้นเลี่ยน (Depapillated tongue) และรอยแผล (Aphthous -liked ulcer) ที่เจอ รวมถึงฝ้าขาวที่ลิ้น (Coated tongue) ในผู้ป่วยที่มีอาการทางระบบทางเดินหายใจน้อย โดยที่ไม่มีปัจจัยชักนำที่ชัดเจน อาจเป็นข้อพึงระวังว่าผู้ป่วยอาจติดเชื้อโคโรน่าไวรัส ซึ่งจะเป็นประโยชน์ต่อการป้องกันและควบคุมการแพร่กระจายเชื้อและช่วยให้การตรวจและการป้องกันการแพร่เชื้อทำได้อย่างรวดเร็วมีประสิทธิภาพมากขึ้น

ข้อเสนอแนะ (การนำไปใช้ประโยชน์)

การศึกษานี้พบว่า การแสดงออกของรอยโรคในช่องปากสามารถเกิดขึ้นในผู้ป่วยติดเชื้อโคโรน่า

ไวรัส 2019 ได้หลากหลายรูปแบบ การมีข้อมูลของรอยโรคและอาการแสดงที่พบบ่อย ได้แก่ การเปลี่ยนแปลงการรับรส รอยโรค ฝ้าขาวที่ลิ้น (Coated tongue) ลิ้นเลี่ยน (Depapillated tongue) และรอยแผล (Aphthous-liked ulcer) ในผู้ติดเชื้อที่มีอาการทางระบบทางเดินหายใจน้อย สามารถช่วยทำให้ทันตแพทย์ รวมถึงบุคลากรทางสาธารณสุข สามารถทำการเฝ้าระวังให้การวินิจฉัย รวมไปถึงการให้การรักษาที่เหมาะสม เพื่อคุณภาพชีวิตที่ดีของผู้ป่วยติดเชื้อโคโรน่าไวรัส 2019

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การปนเปื้อนไมโครพลาสติกในหอยนางรมธรรมชาติบริเวณป่าชายเลนของจังหวัดระยอง

Contamination of microplastics in natural oysters (*Saccostrea commercialis*) in the mangrove forests of Rayong Province

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บทคัดย่อ

การปนเปื้อนไมโครพลาสติกในอาหารทะเลเป็นเรื่องที่น่ากังวลอย่างมาก เนื่องจากมีผลกระทบต่อความปลอดภัยของอาหาร และอาจเป็นอันตรายต่อสุขภาพของมนุษย์ การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาการปนเปื้อนของไมโครพลาสติกในหอยสองฝาที่มีความสำคัญทางเศรษฐกิจ ได้แก่ หอยนางรม (*Saccostrea Commercialis*) ในธรรมชาติบริเวณป่าชายเลนของชายฝั่งจังหวัดระยอง ได้แก่ ป่าชายเลนบริเวณคลองลาวน ตำบลชากโดน (LV) และป่าชายเลนศูนย์การเรียนรู้(ศูนย์การเรียนรู้วิถีประมง ตำบลเนินฆ้อ) ตำบลเนินฆ้อ (NK) จากการศึกษาพบว่า ปริมาณไมโครพลาสติกโดยเฉลี่ยที่พบในตัวอย่างหอยนางรมอยู่ในช่วงระหว่าง 3.86 ถึง 4.39 อนุภาค/กรัมน้ำหนักเปียก และ 7.70 ถึง 10.87 อนุภาค/ตัว โดยปริมาณของไมโครพลาสติกที่พบในป่าชายเลน LV และ NK มีความแตกต่างอย่างมีนัยสำคัญ (p value < 0.01) รูปร่างไมโครพลาสติกที่พบในหอยนางรมของป่าชายเลน LV มากที่สุดคือรูปร่างเส้นใย (Fiber) แตกต่างจากป่าชายเลน NK ที่พบรูปร่างชิ้นส่วน (Fragment) มากที่สุด ไมโครพลาสติกที่พบส่วนใหญ่ในป่าชายเลยทั้ง 2 หาง มีสีดำและสีฟ้ามากที่สุด และมีขนาดเล็กกว่า 0.25 มิลลิเมตร จากการตรวจสอบ

ประเภทพอลิเมอร์ของไมโครพลาสติกด้วยเทคนิค μ-FTIR พบพอลิเมอร์ชนิดพอลิเอทิลีน (Polyethylene) มากที่สุด ดังนั้นงานวิจัยนี้ชี้ให้เห็นว่าหอยนางรมบริเวณป่าชายเลนจังหวัดระยองที่ตั้งอยู่ในประเทศไทยมีการปนเปื้อนไมโครพลาสติก และข้อมูลที่ได้จากงานวิจัยนี้สามารถนำไปใช้วิเคราะห์ปริมาณการได้รับการสัมผัส และประเมินค่าความเสี่ยงของไมโครพลาสติกที่ปนเปื้อนในหอยที่นิยมบริโภค เพื่อใช้เป็นความรู้ความเข้าใจสำหรับการประเมินความเสี่ยงด้านสุขภาพของมนุษย์

คำสำคัญ: ไมโครพลาสติก, หอยนางรม, ป่าชายเลน, ระยอง

Abstract

Microplastic contamination in seafood has been a considerable concern due to its impact on food safety and its potential to harm human health. This study aimed to investigate the presence of microplastics in economically important bivalve species: oysters (*Saccostrea commercialis*). These oyster samples were collected from the wild environment of two mangrove sites located in Rayong province, namely Lavon Canal Mangrove, Chak Don Subdistrict (LV), and the mangrove forest in the Fisheries Learning Center, Noen Kho Subdistrict (NK). The average abundance of microplastics in the oyster samples ranged from 3.86 to 4.39 particles/gram-wet weight and 7.70 to 10.87 particles/individual. There was a significant difference in microplastic abundance among the different sampling sites (p value < 0.01). The predominant shape of the microplastics in LV mangrove was fiber, while a fragment was the predominant shape found in NK mangrove, with colors of black and blue. The size of the microplastics discovered was less than 0.25 mm. According to the polymer analysis by μ-FTIR, polyethylene (PE) was the most prevalent type detected in oysters. The information obtained from this research can be used to analyze the amount of exposure and evaluate the risk of microplastic contamination in commonly consumed shellfish species, to be used for understanding human health risk assessment.

Keywords: Microplastics, Oysters, Mangrove, Rayong

บทนำ

ปัญหามลพิษทางทะเลที่เกิดจากไมโครพลาสติก (Microplastic) ซึ่งเป็นอนุภาคขนาดเล็กกว่า 5 มิลลิเมตร กำลังได้รับความสนใจเป็นอย่างมาก (Fang et al., 2019; Seltenrich, 2015) เนื่องจากมีรายงานว่าผลกระทบของไมโครพลาสติกในสิ่งแวดล้อมมีแนวโน้มที่เกิดขึ้นได้จากการดูดซับหรือการสะสมของสารพิษบนไมโครพลาสติก เช่น สารกลุ่มพอลิไซคลิกอะโรมาติกไฮโดรคาร์บอน (Polycyclic Aromatic

Hydrocarbons, PAHs) สารเหล่านี้มีคุณสมบัติไม่ชอบน้ำ (Hydrophobic) จึงทำให้สามารถเกิดการดูดซับและการคายซับโดยไมโครพลาสติกได้ดี รวมทั้งสามารถเกิดการสะสมในชั้นไขมันและเซลล์ของสิ่งมีชีวิต (Bioaccumulation) นอกจากนี้ไมโครพลาสติกยังสามารถดูดซับสารอนินทรีย์จำพวกโลหะหนักเช่นเดียวกัน เช่น ตะกั่ว (Pb) ทองแดง (Cu) นิกเกิล (Ni) สารหนู (As) แคดเมียม (Cd) สังกะสี (Zn) และปรอท (Hg) เป็นต้น (Deng et al., 2020) ซึ่งสารอินทรีย์ และอนินทรีย์กลุ่มดังกล่าวเป็นสารที่มีความเป็นพิษต่อสิ่งมีชีวิตแม้ในระดับความเข้มข้นต่ำ และจากความเป็นพิษของสารดังกล่าวจึงทำให้ไมโครพลาสติกก่อให้เกิดความเสี่ยงด้านสุขภาพต่อมนุษย์เมื่อได้รับผ่านห่วงโซ่อาหาร (Desforges et al., 2015 ; Devriese et al., 2015; Fossi et al., 2016; Li et al., 2016; Li et al., 2022; Lusher et al., 2013)

ปัจจุบันมีรายงานตรวจพบการปนเปื้อนไมโครพลาสติกในสิ่งแวดล้อมทั่วโลก ได้แก่ การปนเปื้อนในน้ำทะเล (Andrady, 2011) ตะกอนดิน (Van et al., 2013) แหล่งน้ำจืด (Fahrenfeld et al., 2019) และมีการรายงานการตรวจพบไมโครพลาสติกในสิ่งมีชีวิตทางทะเล (Daniel et al., 2021; Sparks et al., 2021; Ta et al., 2022) รวมทั้งในอาหารทะเลที่จำหน่ายทั่วไปในท้องตลาดอีกด้วย ยกตัวอย่างเช่น ไมโครพลาสติกในหอยแมลงภู่ *Cerastoderma lamarcki* บริเวณอ่าวกอร์แกน ทะเลแคสเปียน มีค่าความเข้มข้นเท่ากับ 19.8 ชิ้น/กรัมน้ำหนักเปียก (Bagheri et al., 2020) ไมโครพลาสติกในหอยแครง *Tegillarca granosa* ที่ซื้อจากตลาดท้องถิ่นในเซี่ยงไฮ้ ประเทศจีน มีค่า 7 ชิ้น/กรัมน้ำหนักเปียก (Li et al., 2015) ในสัตว์น้ำที่มีเปลือกแข็งลักษณะเชิงพาณิชย์ (กุ้ง ปู และปลาหมึก) จากท่าเรือประมงของรัฐเกรละ ประเทศอินเดีย โดยมีค่าเฉลี่ย 2.7 ± 12 ชิ้น/กิโลกรัมของเนื้อที่บริโภคได้ (Daniel et al., 2021) นอกจากนี้ ยังพบไมโครพลาสติกในหอยนางรมที่วางขายในตลาด ภาคตะวันออกของประเทศไทย มีค่าเฉลี่ย 0.37 ± 0.57 ชิ้น/กรัม (Thushari et al., 2017)

ประเทศไทยจัดอยู่ในอันดับที่ 11 ของโลกที่ส่งออกพลาสติกมากที่สุด (Khanunthong, 2021) โดยมีขยะพลาสติกประมาณ 1.03 ล้านตันถูกทิ้งลงสู่สภาพแวดล้อมทางทะเลของประเทศไทย (Babel et al., 2020) ส่งผลให้ประเทศไทยเป็นผู้ปล่อยพลาสติกทางทะเลรายใหญ่อันดับที่ 10 ของโลก (Meijer et al., 2021) ประกอบกับจังหวัดบริเวณชายฝั่งทะเลในภาคตะวันออกของประเทศไทย เช่น จังหวัดระยอง และชลบุรี เป็นศูนย์กลางอุตสาหกรรมของประเทศไทยในโครงการระเบียงเศรษฐกิจพิเศษภาคตะวันออก (EEC) ส่งผลให้การเพิ่มจำนวนประชากรจากการขยายพื้นที่ของเมือง และการเจริญของภาคการท่องเที่ยวก่อให้ให้เกิดการปนเปื้อนของพลาสติกตามแนวชายฝั่งของภาคตะวันออกมากยิ่งขึ้น ซึ่งจากการทบทวนวรรณกรรมที่ผ่านมา พบว่า บริเวณชายฝั่งทะเลของประเทศไทยเป็นจุดรวมของมลพิษจากไมโครพลาสติก (Akkajit et al., 2021; Bissen and Chawchai, 2020; Prarat and Hongsawat, 2022; Vibhatabandhu and Srithongouthai, 2022; Wang et al., 2020) การศึกษาบางส่วนมีการรายงานเกี่ยวกับการปนเปื้อนของไมโครพลาสติกในหอยสองฝา เช่น หอยเสียบ *Donax* sp. และหอยกระปุก *Paphia* sp.) บริเวณชายหาดเจ้าหลาว และชายหาดคุ้งวิมาน จังหวัดจันทบุรี (Tharamon et al., 2016) หอยนางรม (Akkajit et al., 2023 ; Thushari et al., 2017) หอยแครง และหอยแมลงภู่จากฟาร์ม และ

ตลาด (Ta et al., 2022) นอกจากนี้มีการรายงานดัชนีความเสี่ยงด้านสุขภาพที่อาจเกิดขึ้นในการบริโภครายวัน (Health Risk Assessment : HRA) จากการบริโภคหอยกาบ (*Marcia optima*) และหอยตะเกียง (*Lingula anatina*) ที่ปนเปื้อนด้วยโลหะหนัก (Cd, Pb และ Zn) ในจังหวัดภูเก็ต ประเทศไทย (Akkajit et al., 2023) การค้นพบนี้ชี้ให้เห็นว่าผลิตภัณฑ์จากทะเลอาจเป็นแหล่งที่มาสำคัญของการสัมผัสไมโครพลาสติกในมนุษย์

จากการสืบค้นข้อมูลการรายงานสถานการณ์การปนเปื้อนของไมโครพลาสติกในอาหารทะเลของประเทศไทยนั้นมีจำกัด และจากการศึกษาข้อมูลเชิงเปรียบเทียบชนิดของสิ่งมีชีวิตทางทะเลที่มีการตรวจพบไมโครพลาสติก เช่น กุ้ง หอย ปู และปลา และพบว่าหอยสองฝา (Bivalves) ได้ถูกเลือกในการนำมาเป็นตัวบ่งชี้ หรือตัวแทนทางชีวภาพ (Bioindicator) ของสิ่งมีชีวิตทางทะเลในการศึกษาการสะสมไมโครพลาสติกและสารพิษที่มากับไมโครพลาสติก เนื่องมาจากหอยสองฝามีความสามารถในการทนต่อสารพิษที่หลากหลาย สามารถทนต่อความเป็นพิษที่ความเข้มข้นสูง มีอัตราการเปลี่ยนแปลงสารอาหาร (Metabolism rate) และการเคลื่อนที่ (Immobility) ที่ต่ำ รวมทั้งหอยสองฝาได้รับความนิยมในการบริโภคในวงกว้าง นอกจากนี้หอยสองฝายังมีอัตราการเปลี่ยนแปลงสารอาหาร (Metabolism rate) และการเคลื่อนที่ (Immobility) ที่ต่ำ ซึ่งลักษณะดังข้างต้นเป็นประโยชน์ต่อการศึกษาการสะสมของไมโครพลาสติกในอาหารทะเลเป็นอย่างมาก (Zhou et al., 2008; Cho et al., 2019) ดังนั้น งานวิจัยนี้จึงมีวัตถุประสงค์เพื่อศึกษาปริมาณ การแพร่กระจาย ลักษณะและชนิดของไมโครพลาสติกที่ปนเปื้อนในหอยสองฝา โดยใช้หอยนางรมพันธ์เล็ก (*Saccostrea commercialis*) เป็นตัวแทน เนื่องจากเป็นหอยชนิดหนึ่งที่การบริโภคมากที่สุดในจังหวัดระยอง ข้อมูลที่ได้จากงานวิจัยนี้จะนำไปสู่แนวทางการจัดการปัญหาขยะทะเลที่ยั่งยืนในอนาคต และเป็นแนวทางให้กับการวิเคราะห์ความเป็นอันตรายของไมโครพลาสติกที่เข้าสู่ห่วงโซ่อาหารและการเข้าสู่ร่างกายมนุษย์ได้ในอนาคต เป็นการบูรณาการในการวางแผนการตรวจสอบ และเฝ้าระวังคุณภาพสิ่งแวดล้อม รวมทั้งใช้เป็นฐานข้อมูลในการกำหนดแนวทางและมาตรการในการบริหารจัดการปัญหามลพิษสิ่งแวดล้อมในพื้นที่ให้มีความเหมาะสมและมีประสิทธิภาพ เพื่อรองรับนโยบายของรัฐบาลภายใต้โครงการพัฒนาระเบียงเศรษฐกิจภาคตะวันออกที่จะมีการขยายตัวเพิ่มขึ้นในภูมิภาคนี้ต่อไป

วัตถุประสงค์ของการวิจัย

1. เพื่อศึกษาปริมาณของไมโครพลาสติกในตัวอย่างหอยนางรมตามธรรมชาติบริเวณป่าชายเลนของจังหวัดระยอง

2. เพื่อศึกษาลักษณะของไมโครพลาสติกที่ตรวจพบได้แก่ รูปร่าง ขนาด สี และชนิดของพอลิเมอร์ที่ปนเปื้อนในหอยนางรมตามธรรมชาติ

แนวคิด ทฤษฎี กรอบแนวคิด

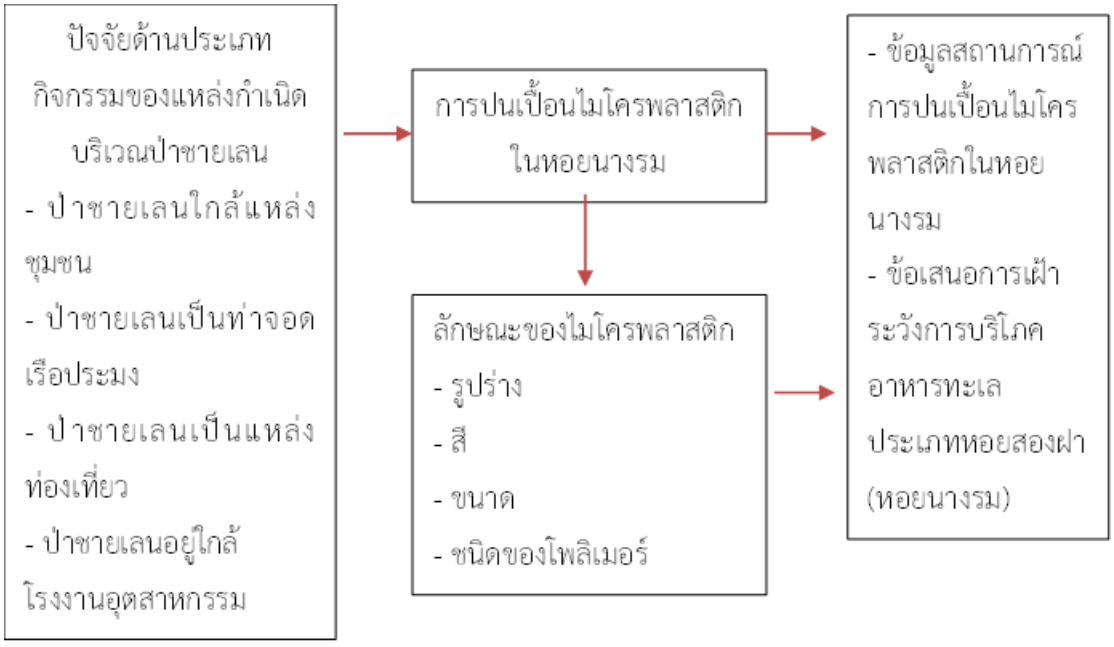
1. ไมโครพลาสติก

ไมโครพลาสติกเป็นชิ้นส่วนของพลาสติกที่เกิดการแตกหักด้วยกระบวนการย่อยสลายทางกายภาพ เคมี และชีวภาพรวมทั้งกระบวนการย่อยสลายด้วยแสง (Photodegradation) การย่อยสลายด้วยความร้อนที่เกิดปฏิกิริยาออกซิเดชัน (Thermooxidative degradation) และการย่อยสลายทางชีวภาพโดยจุลินทรีย์ (Biodegradation by microorganism) จนเกิดเป็นพลาสติกที่มีขนาดแตกต่างกัน ได้แก่ ชิ้นพลาสติกขนาดใหญ่ (Macroplastic) ชิ้นพลาสติกขนาดกลาง (Mesoplastic) ที่มีขนาดตั้งแต่ 5 – 25 มิลลิเมตร และชิ้นพลาสติกขนาดเล็ก (Microplastic) ที่มีขนาดเล็กกว่า 5 มิลลิเมตร (Desforges et al., 2014) และสามารถแบ่งประเภทของไมโครพลาสติกตามแหล่งที่มาได้ 2 ประเภท ได้แก่

1.1) Primary microplastics คือ พลาสติกที่ถูกผลิตใหม่มีขนาดเล็กตั้งแต่ต้น เช่น เม็ดพลาสติกที่เป็นวัสดุตั้งต้นของการผลิตผลิตภัณฑ์พลาสติก เม็ดพลาสติกที่อยู่ในผลิตภัณฑ์ทำความสะอาด เช่น โฟม ล้างหน้า ครีมขัดผิว ครีมอาบน้ำ ยาสีฟัน เป็นต้น ซึ่งภาคอุตสาหกรรมนิยมผลิตในปัจจุบันมักเรียกว่า ไมโครบีดส์ (Microbeads) หรือ “เม็ดสครับ” ส่วนใหญ่มีขนาดเล็กกว่า 5 มิลลิเมตร

1.2) Secondary microplastics คือ พลาสติกที่เกิดจากการแตกหักของผลิตภัณฑ์พลาสติกชนิดต่าง ๆ ด้วยกระบวนการทางเคมี ชีวภาพ และกายภาพ ซึ่งกระบวนการดังกล่าวจะทำให้สาร แต่งเติมในพลาสติกหลุดออกจากพลาสติก ทำให้โครงสร้างของพลาสติกเกิดการแตกตัวจนมีขนาดที่เล็ก คล้ายกับ primary microplastics

2. กรอบแนวคิดการวิจัย



ภาพที่ 1 กรอบแนวคิดการวิจัย

วิธีดำเนินการวิจัย

1. พื้นที่ศึกษา และการเก็บตัวอย่าง

การศึกษานี้ทำการเก็บตัวอย่างหอยนางรมจากป่าชายเลนเป็นจำนวน 2 แหล่ง ได้แก่ ป่าชายเลนชุมชนคลองลาวน (LV) และป่าชายเลนศูนย์การเรียนรู้วิถีประมง ตำบลเนินฆ้อ (NK) จังหวัดระยอง แสดงดังภาพที่ 1 โดยทำการเก็บสุ่มตัวอย่างหอยนางรม สถานที่ละ 30 ตัว ให้มีขนาดใกล้เคียงกันห่อด้วยฟอยล์อะลูเนียม จากนั้นใส่กล่องโฟม และนำมาเก็บรักษาโดยการแช่เย็นที่อุณหภูมิ 4 องศาเซลเซียส ก่อนทำกระบวนการต่อไป

ภาพที่ 2 แสดงสถานที่เก็บตัวอย่าง

2. การเตรียมตัวอย่าง

นำตัวอย่างหอยนางรมมาล้างด้วยน้ำสะอาด ซับให้แห้ง และวัดความกว้างและความยาวด้วยเวอร์เนีย บันทึกข้อมูลความกว้าง-ความยาวของเปลือกและน้ำหนักของตัวอย่างหอยนางรมก่อนแกะเปลือกและชำแหละเนื้อหอยพร้อมทั้งบันทึกน้ำหนักเปียกของเนื้อหอยแต่ละตัวอย่าง ซึ่งตัวอย่างหอยนางรมจากป่าชายเลน LV และ NK ที่นำมาวิเคราะห์มีความกว้างเฉลี่ยเท่ากับ 3.26 ± 0.92ซม. และ 2.68 ± 0.61 ซม. ตามลำดับ และมีความยาวเฉลี่ยเท่ากับ 4.7 ± 0.92 ซม. และ 3.84 ± 0.52 ซม. ตามลำดับ โดยน้ำหนักเปียกต่อตัว (ไม่รวมเปลือก) เท่ากับ 3.1 ± 1.41 กรัม และ 2.47 ± 0.99 กรัม ตามลำดับ (ลักษณะของหอยแสดงดังภาพที่ 2 และข้อมูลสัณฐานวิทยาของหอยนางรมแสดงดังตารางที่ 1)

ภาพที่ 3 หอยนางรม (*Saccostrea commercialis*)

ตารางที่ 1 ลักษณะสัณฐานวิทยาของหอยนางรม

ลักษณะสัณฐานวิทยา	สถานที่	
	LV	NK
จำนวน (ตัว)	30	30
ความกว้างเฉลี่ย (ซม.)	3.26 ± 0.92	2.68 ± 0.61
ความยาวเฉลี่ย (ซม.)	4.7 ± 0.92	3.84 ± 0.52
น้ำหนักตัวเฉลี่ย (กรัม)	16.11 ± 7.55	11.58 ± 2.63
น้ำหนักเปียกเฉลี่ย (กรัม)	3.1 ± 1.41	2.47 ± 0.99

3. การสกัดไมโครพลาสติก

การสกัดไมโครพลาสติกในหอยนางรม ดัดแปลงวิธีการจาก Thushari et al., 2017 โดยมีวิธีการดังนี้ นำตัวอย่างเนื้อหอย 1 ตัวใส่ในบีกเกอร์ขนาด 600 ml จากนั้นเติม 69% กรดไนตริก (HNO_3) (อัตราส่วน 1 : 5 %w/v) ตั้งทิ้งไว้ให้ย่อย เป็นเวลา 16 ชั่วโมง จากนั้นนำตัวอย่างไปให้ความร้อนที่อุณหภูมิ 80 องศาเซลเซียส เป็นเวลา 30 นาที ปั่นกวนด้วย Magnetic bar ที่ 350 รอบต่อนาทีจากนั้นปรับปริมาตรด้วยน้ำปราศจากไอออน (DI) (อัตราส่วน 1 : 10 %v/v) เป็นเวลา 1 ชั่วโมง จากนั้นเติมโซเดียมคลอไรด์ (NaCl) ลงไป (อัตราส่วน 1: 0.27 %v/w) เพื่อแยกความหนาแน่นของไมโครพลาสติก แล้วตั้งทิ้งไว้เป็นเวลาอย่างน้อย 16 ชั่วโมง ที่อุณหภูมิห้อง แล้วกรองแยกไมโครพลาสติกโดยใช้กระดาษกรอง Whatman GF/C และนำกระดาษกรองใส่ในเพลทแก้ว และทำให้แห้งในตู้อบที่อุณหภูมิ 50 องศาเซลเซียส เป็นเวลา 1 ชั่วโมง

จากนั้นจึงนำแผ่นกระดาษกรองมาวิเคราะห์เพื่อจำแนกลักษณะทางกายภาพของไมโครพลาสติก ได้แก่ ขนาด รูปร่าง สี และจำนวนที่พบโดยใช้กล้องจุลทรรศน์แบบสเตอริโอ (Stereo microscope) จำแนกลักษณะทางเคมีของไมโครพลาสติกโดยใช้เครื่อง Micro-Fourier Transform Infrared Microscope

(μ-FTIR) จากนั้นเทียบสเปกตรัมกับฐานข้อมูล (IR Library) ของโพลิเมอร์ ได้แก่ HR Polymer Additives and Plasticizers, HR Hummel Polymer and Additives, HR Comprehensive Forensic FT-IR Collection, HR Specta Polymers and Plasticizers by ATR, และ Hummel Polymer Sample Library สำหรับเกณฑ์การยอมรับของงานวิจัยนี้คือ มี %matching ตั้งแต่ร้อยละ 60 ขึ้นไป

4. การวิเคราะห์ทางสถิติ

วิเคราะห์ค่าความแตกต่างของปริมาณไมโครพลาสติกที่พบในหอยนางรมโดยใช้โปรแกรม SPSS version 29.0.1 ในการวิเคราะห์ข้อมูล และใช้สถิติ Two Sample Independent t-test ที่ระดับความเชื่อมั่น 95% (p value < 0.5)

5. การประเมินความเสี่ยงเนื่องจากการสัมผัสไมโครพลาสติก โดยใช้ดัชนีความเสี่ยงพอลิเมอร์ (Polymer Risk Index: H)

เป็นวิธีการประเมินระดับความเสี่ยง และลักษณะความเป็นพิษต่อสิ่งมีชีวิตในสิ่งแวดล้อมเมื่อได้สัมผัสกับไมโครพลาสติกโดยอาศัยข้อมูลชนิดพอลิเมอร์ของไมโครพลาสติก ดังสมการที่ 1

$$H = \Sigma Pn \times Sn \quad \text{(สมการที่ 1)}$$

เมื่อ Pn คือ ร้อยละของปริมาณไมโครพลาสติกแต่ละชนิดพอลิเมอร์ในแต่ละตัวอย่าง

Sn คือ ระดับความเป็นพิษของไมโครพลาสติกแต่ละชนิดอ้างอิงจาก (เรียบร้อย & จิรายุ ,2022) ผลการประเมินระดับความเสี่ยงของไมโครพลาสติกสามารถจำแนกออกเป็น 4 ระดับ (ดังตารางที่ 2)

ตารางที่ 2 ระดับความเสี่ยงจากการประเมินดัชนีความเสี่ยงพอลิเมอร์ (Ranjani et al., 2021)

H	ระดับความเสี่ยง
< 10	I
10-100	II
100-1000	III
>1000	IV

ผลการวิจัย

ผลจากการวิเคราะห์ลักษณะทางกายภาพโดยใช้กล้องจุลทรรศน์แบบสเตอริโอ พบว่า ไมโครพลาสติกที่พบในหอยนางรมของป่าชายเลน LV มีค่าเท่ากับ 4.39 ± 2.34 ชิ้น/กรัม หรือ 10.87 ± 2.9 ชิ้น/ตัว และหอยนางรมที่เก็บตัวอย่างจากป่าชายเลน NK พบจำนวน 3.86 ± 2.76 ชิ้น/กรัม หรือ 7.7 ± 2.1 ชิ้น/ตัว (ภาพที่ 3) ซึ่งคิดเป็นค่าเฉลี่ยปริมาณไมโครพลาสติกที่พบในหอยนางรมที่พบในจังหวัดระยองมีค่าเท่ากับ 9.28 ± 2.5 ชิ้น/ตัว หรือ 4.13 ± 2.55 ชิ้น/กรัม เมื่อเปรียบเทียบปริมาณไมโครพลาสติกที่พบ

กับงานวิจัยอื่นๆ ในหน่วยของชิ้น/กรัม พบว่าปริมาณไมโครพลาสติกที่พบในหอยนางรมในงานวิจัยนี้มีปริมาณสูงกว่าหลาย ๆ ประเทศที่มีการรายงาน ได้แก่ เกาหลีใต้ สหรัฐอเมริกา ฝรั่งเศษ เป็นต้น (ตารางที่ 4)

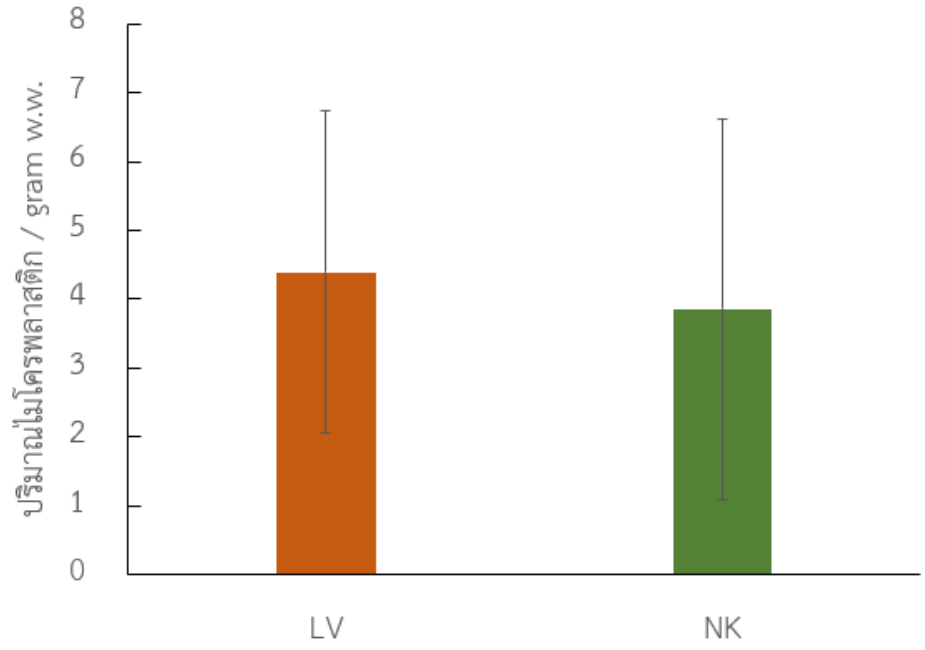
จากการศึกษารูปร่างของไมโครพลาสติกที่ตรวจพบในหอยนางรม พบว่า รูปร่างไมโครพลาสติกที่พบในหอยนางรมของป่าชายเลน LV พบลักษณะเส้นใย (Fiber) มากที่สุด คิดเป็นร้อยละ 75.46 รองลงมาคือชิ้นส่วน (Fragment) คิดเป็นร้อยละ 23.31 และฟิล์ม (Film) คิดเป็นร้อยละ 1.23 ตามลำดับ ในขณะที่รูปร่างไมโครพลาสติกที่พบในหอยนางรมป่าชายเลน NK พบรูปร่างลักษณะชิ้นส่วนมากที่สุด คิดเป็นร้อยละ 69.26 รองลงมาคือเส้นใย คิดเป็นร้อยละ 30.74 (ภาพที่ 4) สีของไมโครพลาสติกที่พบในหอยนางรมทั้ง 2 แหล่ง คือ พบสีดำมากที่สุด (ร้อยละ 53.07 – 61.9) รองลงมาคือ สีฟ้า (ร้อยละ 33.33 – 17.18) (ภาพที่ 6) นอกจากนี้ขนาดของไมโครพลาสติกที่พบในหอยนางรมทั้ง 2 แหล่ง คือขนาดน้อยกว่า 0.25 มิลลิเมตร โดยป่าชายเลน LV พบร้อยละ 48.47 และป่าชายเลน NK พบสูงถึงร้อยละ 74.03

จากการวิเคราะห์องค์ประกอบทางเคมีของไมโครพลาสติกโดยใช้เครื่อง (μ-FTIR) พบว่าชนิดของพอลิเมอร์ที่พบในหอยนางรมป่าชายเลน LV มากที่สุดคือชนิด Polyethylene (PE) ร้อยละ 55.56 รองลงมาคือชนิด Polypropylene (PP) ร้อยละ 44.44 และป่าชายเลน NK พบไมโครพลาสติกชนิด Polyethylene (PE) มากที่สุดคิดเป็นร้อยละ 73.68 รองลงมาคือชนิด Cellulose/linen ร้อยละ 21.05 และพบชนิด Polyester (PES) คิดเป็นร้อยละ 5.26 ตามลำดับ (ภาพที่ 7)

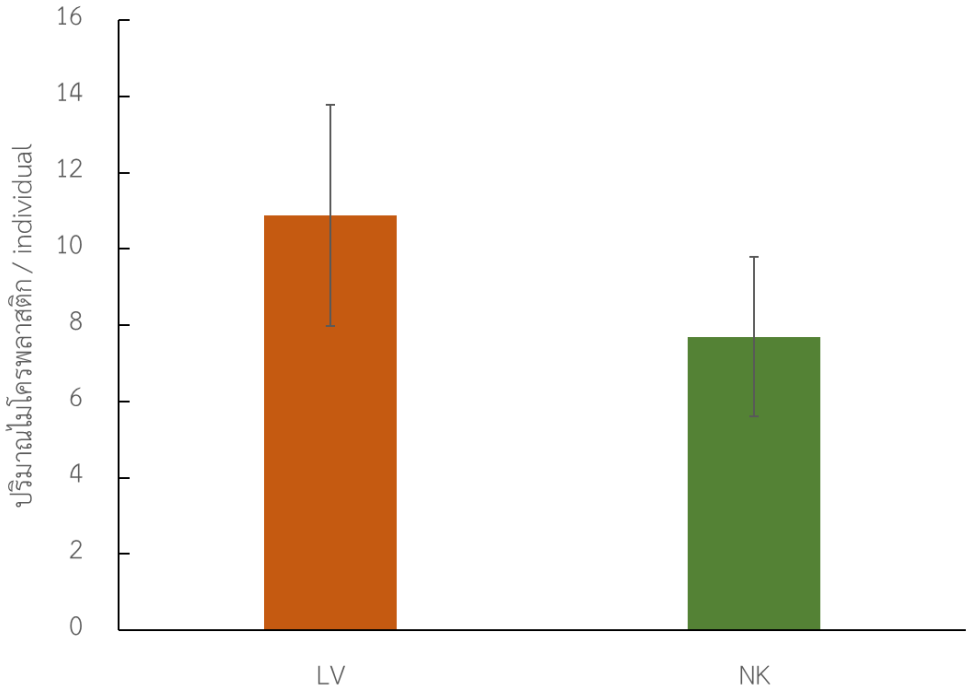
จากการประเมินความเสี่ยงต่อระบบนิเวศของไมโครพลาสติกในหอยนางรมโดยใช้ดัชนีความเสี่ยงพอลิเมอร์ (H) พบว่าความเสี่ยงของไมโครพลาสติกในหอยนางรมป่าชายเลน LV มีระดับความเสี่ยงที่ H_{III} = 600 และไมโครพลาสติกที่พบในหอยนางรมป่าชายเลน NK มีระดับความเสี่ยงที่ H_{III} = 847 ดังตารางที่ 3

ตารางที่ 3 ผลการประเมิน Polymer risk index (H) ของไมโครพลาสติกแต่ละชนิดในหอยนางรม ป่าชายเลน LV และ NK

ชนิดของพอลิเมอร์	ระดับความอันตราย (Sn)	ดัชนีความเสี่ยงพอลิเมอร์ (H)	
		ป่าชายเลน LV	ป่าชายเลน NK
PE	10	555.6	823.5
PP	1	44.44	-
PES	4	-	23.52
รวม		600.04	847.02
ระดับความเสี่ยง		H_{III}	H_{III}



(ก)



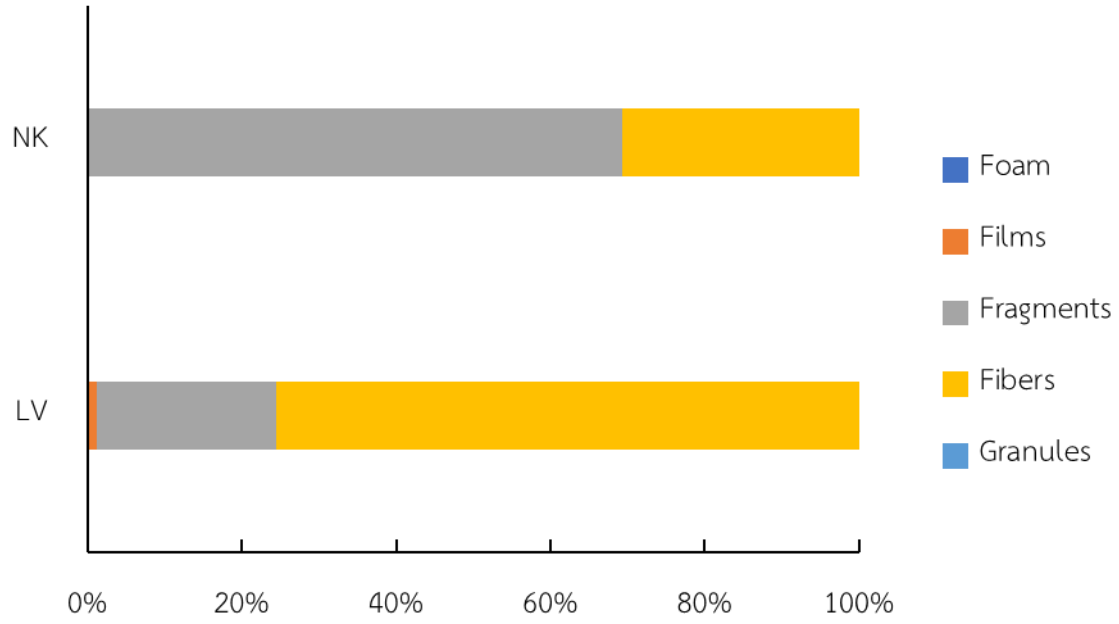
(ข)

ภาพที่ 4 ความเข้มข้นของไมโครพลาสติกในตัวอย่างหอยนางรม (ก) ชิ้น/กรัม และ (ข) ชิ้น/ตัว น้ำหนักเปียก

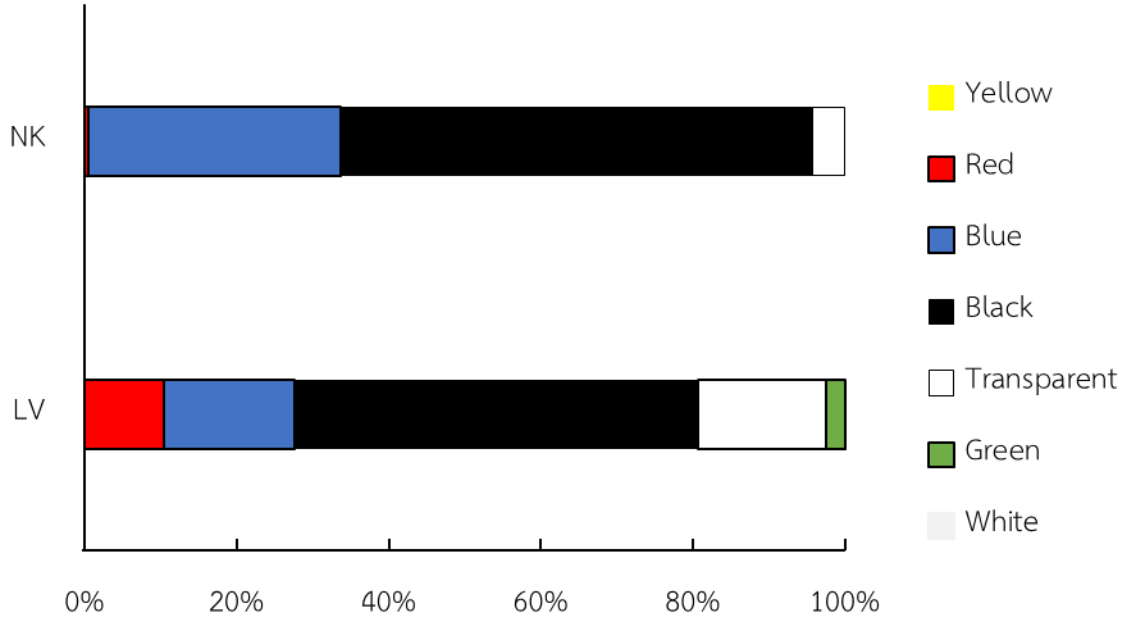
ตารางที่ 4 ลักษณะของไมโครพลาสติกที่พบในหอยนางรมแต่ละสถานที่

สถานที่	การสกัด	ปริมาณ	รูปร่าง	ขนาด (มม.)	สี	ชนิด	อ้างอิง
จังหวัดระยอง ประเทศไทย	NaCl	4.13 ± 2.55 ชิ้น/กรัม	ชิ้นส่วน เส้นใย	< 0.25	ดำ และ ฟ้า	PE, PP	การศึกษานี้
อ่างศิลา บางแสน แสมสาร ประเทศไทย	N/A	0.37 ± 0.57 ชิ้น/กรัม	เส้นใย	0.01	แดง น้ำเงิน น้ำตาล และใส	PET, PS, PA	Thushari *et al.*, 2017
แอตแลนติก ประเทศฝรั่งเศส	KI	2.1 ± 1.7 ชิ้น/ตัว	ชิ้นส่วน	0.05 -0.1	เทา ดำ เขียว เหลือง แดง ขาว และฟ้า	PE, PP ABS	Phuong et al., 2018
ประเทศเกาหลีใต้	N/A	0.07 ± 0.06 ชิ้น/กรัม	เส้นใย ชิ้นส่วน	0.1 - 0.2	ขาว	PE PP PS	Cho et al., 2019
ตลาดประมงชลบุรี ประเทศไทย	NaCl	49.60±10 ชิ้น/ตัว หรือ 9.5±0.71 ชิ้น/กรัม	เส้นใย และ ชิ้นส่วน	0.28 ± 0.22	ขาว เขียว เหลือง น้ำเงิน ดำ และแดง	PE, PTFE	Saelee et al., 2021
อ่าวกีนี ประเทศปาปัวนิวกินี	$ZnCl_2$	1.4 - 3.4 ชิ้น/ตัว หรือ 0.34 - 1.7 ชิ้น/กรัม	เส้นใย ชิ้นส่วน	< 1	ขาว เขียว เหลือง น้ำเงิน ดำ และแดง	PE, PP, PS	Addo et al., 2022
รัฐมิสซิสซิปปี ประเทศสหรัฐฯ	$ZnCl_2$	30.7± 11.5 to 4.7 ± 0.25 ชิ้น/กรัม	N/A	0.03 -0.09	ใส ดำ น้ำเงิน	PU, PA, PE	Wonter et al., 2023
ประเทศกรีซ	NaCl	1.54 ± 0.63 to 3.56 ± 0.35 ชิ้น/กรัม	เส้นใย ชิ้นส่วน	0.008 – 0.15	N/A	PET, PE, PP	Manolaki et al., 2023

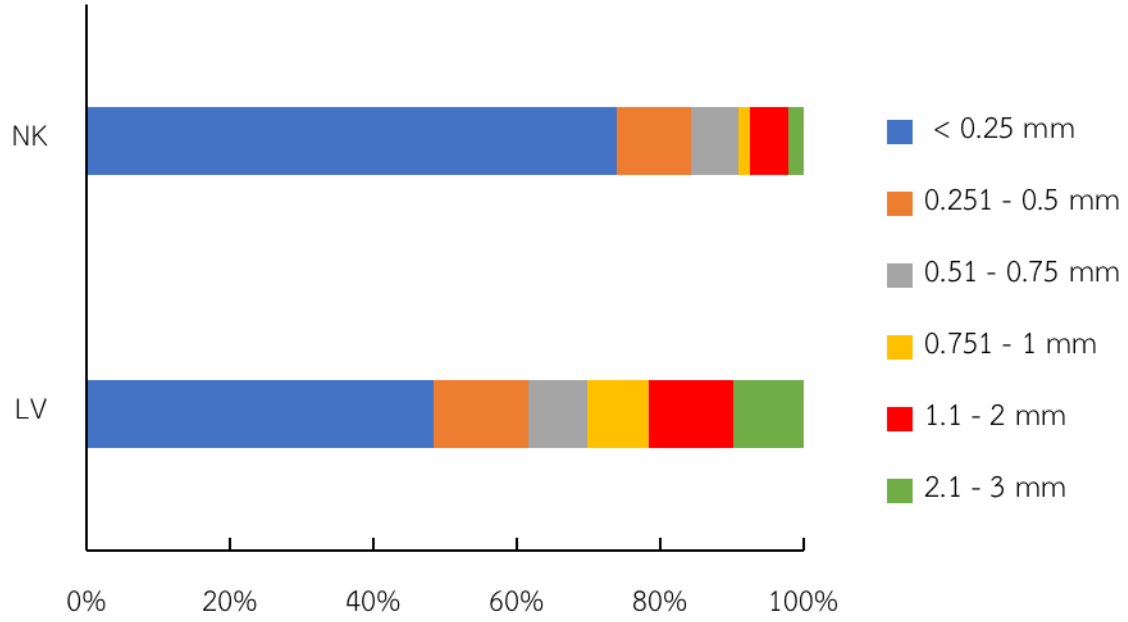
หมายเหตุ : Polystyrene (PS), Polyethylene (PE), Poly tetrafluoroethylene (Teflon: PTFE), Polyethylene terephthalate (PET), Polyamide (PA), Polypropylene (PP), acrylonitrile-butadiene-styrene (ABS), Polyester (PES), N/A : Not applicable



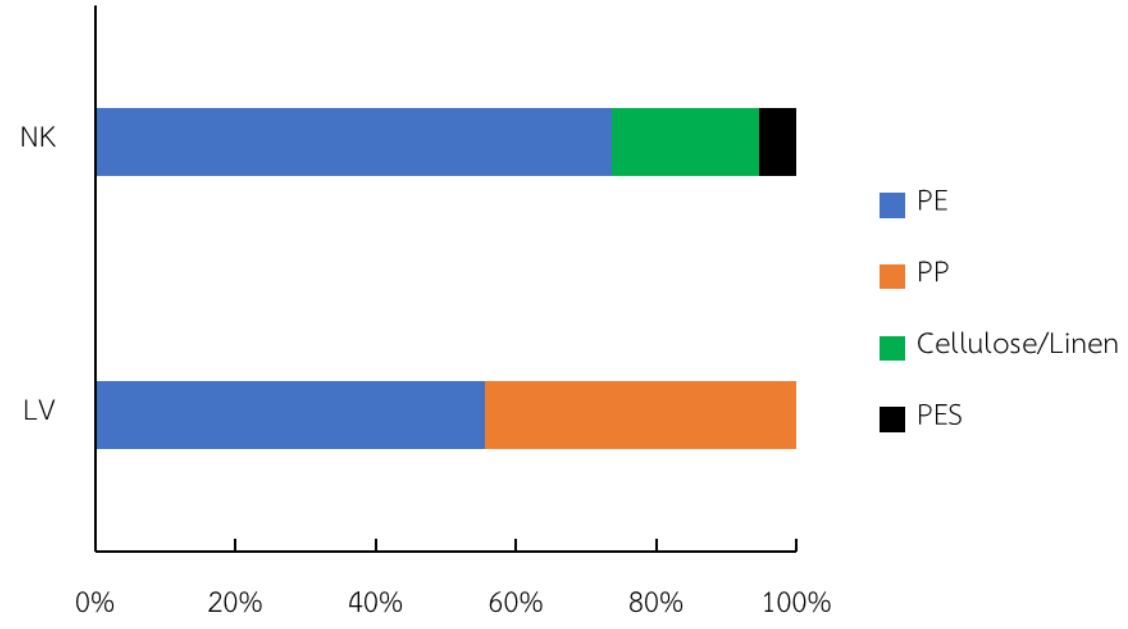
ภาพที่ 5 ร้อยละของรูปร่างไมโครพลาสติกที่พบในหอยนางรมแต่ละป่าชายเลน



ภาพที่ 6 ร้อยละของสีไมโครพลาสติกที่พบในหอยนางรมแต่ละป่าชายเลน



ภาพที่ 7 ร้อยละของขนาดไมโครพลาสติกที่พบในหอยนางรมแต่ละป่าชายเลน



ภาพที่ 8 ร้อยละของชนิดไมโครพลาสติกที่พบในหอยนางรมแต่ละป่าชายเลน

อภิปรายผลการวิจัย

ปริมาณเฉลี่ยของไมโครพลาสติกที่พบในหอยนางรมของการศึกษานี้มีค่าเฉลี่ยเท่ากับ 9.28 ± 2.5 ชิ้น/ตัว หรือ 4.13 ± 2.55 ชิ้น/กรัม โดยที่ไมโครพลาสติกที่พบในหอยนางรมของป่าชายเลน LV มีค่าเท่ากับ 4.39 ± 2.34 ชิ้น/กรัม หรือ 10.87 ± 2.9 ชิ้น/ตัว และหอยนางรมที่เก็บตัวอย่างจากป่าชายเลน NK พบจำนวน 3.86 ± 2.76 ชิ้น/กรัม หรือ 7.7 ± 2.1 ชิ้น/ตัว เมื่อทำการวิเคราะห์ความแตกต่างของปริมาณไมโครพลาสติกที่พบในป่าชายเลนทั้ง 2 แห่ง พบว่ามีแตกต่างอย่างมีนัยสำคัญทางสถิติ ($t = 4.84$, p-value <0.001) เนื่องจากหอยนางรมทั้งสองบริเวณที่นำมาวิเคราะห์ในงานวิจัยนี้อาศัยอยู่ตามธรรมชาติ ดังนั้นการสะสมของไมโครพลาสติกคาดว่าขึ้นกับการปนเปื้อนไมโครพลาสติกในตะกอนดินและน้ำทะเลในบริเวณที่อยู่อาศัยของหอยนางรม (Scott et al., 2019; Phuong et al., 2018) ซึ่งเป็นผลมาจากกิจกรรมของมนุษย์ในพื้นที่ป่าชายเลน โดยป่าชายเลน LV มีลักษณะพื้นที่เป็นป่าชายเลนที่มีขดเขี้ยวตามลักษณะของคลองลาวน และตลอดแนวโดยรอบส่วนใหญ่เป็นฟาร์มเพาะเลี้ยงหอยนางรมกระจายอยู่หลายพื้นที่เป็นพื้นที่ชุมชนประมง อีกทั้งเป็นสถานที่ท่องเที่ยวเชิงนิเวศที่สำคัญแห่งหนึ่งของอำเภอแกลง จ.ระยอง เมื่อเทียบกับกิจกรรมโดยรอบของป่าชายเลน NK พบว่าป่าชายเลน NK เป็นป่าชายเลนที่อยู่ใกล้กับชายฝั่งทะเล กิจกรรมในบริเวณดังกล่าวเป็นการทำประมงพื้นบ้าน เขตชุมชนแต่มีการกระจายของชุมชนหนาแน่นน้อยกว่าในพื้นที่ของป่าชายเลน LV ด้วยเหตุผลดังกล่าวคาดว่าส่งผลให้ปริมาณไมโครพลาสติกของป่าชายเลน LV มีค่าสูงกว่าป่าชายเลน NK นอกานี้เมื่อเทียบปริมาณเฉลี่ยของไมโครพลาสติกที่พบในการศึกษานี้กับประเทศอื่น พบว่ามีปริมาณเฉลี่ยของไมโครพลาสติกที่มากกว่าประเทศปาปัวนิวกินี (0.34 - 1.7 ชิ้น/กรัม) ประเทศกรีซ (3.56 ± 0.35 ชิ้น/กรัม) ประเทศเกาหลีใต้ (0.07 ± 0.06 ชิ้น/กรัม) อ่างศิลา บางแสน แสมสาร ประเทศไทย (0.37 ± 0.57 ชิ้น/กรัม) และประเทศฝรั่งเศส(2.1 ± 1.7 ชิ้น/ตัว) แต่พบปริมาณเฉลี่ยของไมโครพลาสติกที่น้อยกว่าประเทศสหรัฐอเมริกา (4.7 ± 0.25 ชิ้น/กรัม) และตลาดประมงจังหวัดชลบุรี ประเทศไทย (9.5±0.71 ชิ้น/กรัม)

ลักษณะรูปร่างทางกายภาพที่พบในการศึกษานี้มากที่สุดคือ รูปร่างเส้นใย และชิ้นส่วน สอดคล้องกับงานวิจัยของ Addo et al., 2022; Manolaki et al., 2023; Cho et al., 2019; Saelee et al., 2021 สาเหตุที่พบรูปร่างแบบเส้นใยมากที่สุดที่สุด เนื่องจากในพื้นที่มีกิจกรรมประมง ได้แก่ ฟาร์มเพาะเลี้ยงหอยนางรมที่มีการผูกเชือกให้หอยนางรมลอยในน้ำ การจับสัตว์น้ำโดยใช้แห/อวนตามวิถีชุมชนประมงในพื้นที่ ซึ่งวัสดุสำหรับการพยุงหอยนางรม และแห-อวนผลิตจากเส้นใยสังเคราะห์ ผลที่ได้สอดคล้องกับรายงานของ Prarat และคณะ (2022) ที่พบว่า ไมโครพลาสติกประเภทเส้นใยพบมากที่สุดในน้ำทะเลบริเวณชายหาดของจังหวัดระยอง สำหรับไมโครพลาสติกแบบชิ้นส่วนอาจเกิดได้จากกระบวนการทางกายภาพของผลิตภัณฑ์พลาสติกที่มีขนาดใหญ่ สีที่พบในการศึกษานี้ พบสีดำมากที่สุด สอดคล้องกับงานวิจัยของ Phuong et al., 2018; Saelee et al., 2021; Addo et al., 2022; Wonter et al., 2023 โดยสีของไมโครพลาสติกนั้นสามารถใช้ประเมินเบื้องต้นเกี่ยวกับองค์ประกอบทางเคมี ประเภท และแหล่งกำเนิดของผลิตภัณฑ์พลาสติกเดิมก่อนจะแตกหักผ่านกระบวนการย่อยสลายทางกายภาพ เคมี ชีวภาพ อย่างไรก็

ตามสีของไมโครพลาสติกอาจเปลี่ยนแปลงได้เมื่ออยู่ในสภาพแวดล้อมเป็นเวลานาน (Stolte et al., 2015) สำหรับขนาดของไมโครพลาสติกที่พบมากที่สุดในการศึกษานี้คือ ขนาดน้อยกว่า 0.25 มิลลิเมตร สอดคล้องกับงานวิจัยของ Thushari et al., 2017; Phuong et al., 2018; Cho et al., 2019; Wonter et al., 2023; Manolaki et al., 2023 โดยมีความเป็นไปได้ว่าไมโครพลาสติกขนาดเล็กอาจเกิดจากการแตกหัก ย่อยสลายหรือถูกกัดกร่อนจากสภาวะโดยรอบของไมโครพลาสติกขนาดใหญ่ (Phuong et al., 2018) จึงทำให้เกิดไมโครพลาสติกขนาดเล็กจำนวนมาก ส่งผลให้ไมโครพลาสติกขนาดเล็กก็มีโอกาสเข้าไปเป็นอาหารของสิ่งมีชีวิตได้ง่ายมากยิ่งขึ้น

ชนิดของพอลลิเมอร์ที่พบมากที่สุดในการศึกษานี้คือ ชนิด Polyethylene (PE) สอดคล้องกับงานวิจัยของ Phuong et al., 2018; Cho et al., 2019; Saelee et al., 2021; Addo et al., 2022; Wonter et al., 2023; Manolaki et al., 2023 โดยพลาสติกชนิด Polyethylene (PE) คือสารที่เป็นส่วนผสมของการขึ้นรูปพลาสติก มักถูกใช้ผลิตเป็นอุปกรณ์ประมง และใช้ผลิตเป็นถุง หรือกระสอบพลาสติก (Tangchaiwattana, 2017)

สรุปและอภิปรายผล

จากการศึกษาการปนเปื้อนไมโครพลาสติกในหอยนางรมบริเวณป่าชายเลน LV และป่าชายเลน NK พบไมโครพลาสติกปนเปื้อนในหอยนางรมบริเวณป่าชายเลน LV จำนวน 4.39 ± 2.34 ชิ้น/กรัม หรือ 10.87 ± 2.9 ชิ้น/ตัว ที่ป่าชายเลน NK จำนวน 3.86 ± 2.76 ชิ้น/กรัม หรือ 7.7 ± 2.1 ชิ้น/ตัว และเมื่อจำแนกรูปร่างไมโครพลาสติกในหอยนางรมป่าชายเลน LV พบว่ามีลักษณะเส้นใยสูงสุด คิดเป็นร้อยละ 75.46 และ ป่าชายเลน NK พบว่ามีลักษณะชิ้นส่วนสูงสุด คิดเป็นร้อยละ 69.26 สีที่พบ ได้แก่ แดง น้ำเงิน ดำ ใส ขนาดของไมโครพลาสติกที่พบในหอยนางรมป่าชายเลน LV และป่าชายเลน NK มากที่สุดคือ ขนาดน้อยกว่า 0.25 มิลลิเมตร รูปร่างไมโครพลาสติกที่พบในหอยนางรมบริเวณป่าชายเลนคลองลาวนมากที่สุดคือรูปร่างเส้นใย จากการศึกษาการปนเปื้อนไมโครพลาสติกในหอยนางรมบริเวณป่าชายเลน LV และป่าชายเลน NK พบปริมาณไมโครพลาสติกปนเปื้อนในหอยนางรมบริเวณป่าชายเลน LV จำนวน 4.39 ± 2.34 ชิ้น/กรัม หรือ 10.87 ± 2.9 ชิ้น/ตัว ในขณะที่หอยนางรมบริเวณป่าชายเลน NK พบจำนวน 3.86 ± 2.76 ชิ้น/กรัม หรือ 7.7 ± 2.1 ชิ้น/ตัว และมีค่าปริมาณเฉลี่ยของไมโครพลาสติกที่พบในการศึกษานี้เท่ากับ 9.28 ± 2.5 ชิ้น/ตัว หรือ 4.13 ± 2.55 ชิ้น/กรัม ซึ่งมีปริมาณสูงเมื่อเทียบกับประเทศอื่นที่มีการรายงาน รูปร่างของไมโครพลาสติกที่พบในหอยนางรมบริเวณป่าชายเลนคลองลาวนมากที่สุดคือรูปร่างเส้นใย คิดเป็นร้อยละ 75.46 และ ป่าชายเลน NK พบว่ามีลักษณะชิ้นส่วนสูงสุด คิดเป็นร้อยละ 69.26 สี และขนาดของไมโครพลาสติกที่พบมากที่สุดในป่าชายเลนทั้ง 2 แห่ง คือ สีดำ และขนาดเล็กว่า 0.25 มิลลิเมตร ตามลำดับ และชนิดพอลิเมอร์ที่พบมากที่สุดในหอยนางรม คือ ชนิดพอลิเอทิลีน (PE) ซึ่งอาจมาจากส่วนประกอบของผลิตภัณฑ์พลาสติก อุปกรณ์ที่ใช้ในการประมง ของจากโรงงานอุตสาหกรรม ของเสียจากครัวเรือน เป็นต้น และจากการประเมินความเสี่ยงต่อระบบนิเวศของไมโครพลาสติกในหอยนางรมโดย

ใช้ดัชนีความเสี่ยงพอลิเมอร์ (H) พบว่าความเสี่ยงของไมโครพลาสติกในหอยนางรมป่าชายเลน LV (H_{III} = 600) และไมโครพลาสติกที่พบในหอยนางรมป่าชายเลน NK (H_{III} = 847) อยู่ในระดับมีความเสี่ยงสูง เนื่องจากในตัวอย่างหอยนางรมมีการปนเปื้อนไมโครพลาสติกชนิด PE ที่มีความเป็นพิษสูง ส่งผลให้คะแนนการประเมินความเสี่ยงพอลิเมอร์มีความเสี่ยงต่อระบบนิเวศสูงมากขึ้นจะเห็นได้ว่าในปัจจุบันมีการปนเปื้อนของไมโครพลาสติกในหอยนางรมที่เป็นหนึ่งในหอยที่คนไทยนิยมบริโภค และวางจำหน่ายในแหล่งตลาดต่าง ๆ ของประเทศไทย ซึ่งส่งผลให้ผู้บริโภคได้มีโอกาสในการสัมผัสไมโครพลาสติกที่ปนเปื้อนในหอยที่เป็นที่นิยมบริโภค และข้อมูลจากงานวิจัยนี้สามารถนำไปใช้ในการเฝ้าระวังการปนเปื้อนของไมโครพลาสติกในอาหารทะเลของทางหน่วยงานภาครัฐ และภาคเอกชนได้ต่อไป

ข้อเสนอแนะ

1. ควรเพิ่มสถานที่เก็บตัวอย่างให้มีความหลากหลายมากขึ้น เพื่อนำมาหาความแตกต่างในการปนเปื้อนของไมโครพลาสติก

2. ควรศึกษาในประเภทของหอยสองฝาชนิดอื่น เช่น หอยแมลงภู่ หอยแครง หอยตลับ เป็นต้น เพื่อนำมาเปรียบเทียบกับงานวิจัยนี้

เอกสารอ้างอิง

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คุณสมบัติของไม้อัดยางพาราจากไม้บางที่ผ่านกระบวนการเทอร์โมวู้ด

Properties of Rubberwood Plywood from Thermo-Veneer

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บทคัดย่อ

งานวิจัยนี้ศึกษาความทนทานต่อปลวกของไม้อัดไม้ยางพาราจากไม้บางที่ผ่านกระบวนการเทอร์โมวู้ด โดยมีชุดทดลองคือ 1) อุณหภูมิในการทำเทอร์โทวู้ด ได้แก่ 180 200 และ 220 องศาเซลเซียส 2) เวลาในการทำเทอร์โมวู้ด ได้แก่ 10 15 และ 20 นาที 3) กาวที่ใช้ในการทำไม้อัด ได้แก่ ยูเรียฟอร์มัลดีไฮด์และฟีนอลฟอร์มัลดีไฮด์ และชุดควบคุมคือไม้อัดไม้ยางพาราจากไม้บางที่ไม่ได้ผ่านกระบวนการเทอร์โมวู้ด จากนั้นนำไม้อัดทั้งหมดเข้าทดสอบความทนทานต่อการเข้าทำลายของปลวก

ผลการศึกษาพบว่า ไม้อัดไม้ยางพาราที่ไม่ผ่านกระบวนการเทอร์โมวู้ดที่ใช้กาวยูเรียฟอร์มัลดีไฮด์และฟีนอลฟอร์มัลดีไฮด์มีร้อยละการสูญเสียน้ำหนัก 19.32 และ 17.96 ตามลำดับ ในขณะที่ไม้อัดไม้ยางพาราที่ใช้กาวยูเรียฟอร์มัลดีไฮด์ที่ผ่านกระบวนการเทอร์โมวู้ดที่อุณหภูมิ 220 องศาเซลเซียสนาน 20 นาที มีการสูญเสียน้ำหนักเฉลี่ยต่ำสุด คิดเป็นร้อยละ 6.96 และไม้อัดไม้ยางพาราที่ใช้กาวฟีนอลฟอร์มัลดีไฮด์ที่ผ่านกระบวนการเทอร์โมวู้ดที่อุณหภูมิ 180 องศาเซลเซียสนาน 15 นาที มีการสูญเสียน้ำหนักเฉลี่ยต่ำสุด คิดเป็นร้อยละ 4.02 ดังนั้นไม้อัดไม้ยางพาราจากไม้บางที่ผ่านกระบวนการเทอร์โมวู้ดจึงมีความทนทานต่อการเข้าทำลายของปลวก อีกทั้งยังไม่ส่งผลเสียต่อสิ่งแวดล้อมและผู้ใช้งาน

คำสำคัญ: ไม้ยางพารา, ไม้อัด, เทอร์โมวู้ด, ไม้บาง, ปลวก

Abstract

This research aims to study the termite resistance of rubberwood plywood made from thermo-veneer. The control factor is rubberwood plywood without thermo-veneer and 3 factors in the experiment: the first factor is the temperature for making

ThermoWood: 180, 200, and 220 degrees Celsius. Second is Time in Making thermowood: 10, 15, and 20 minutes. The third is adhesive used in making plywood: urea formaldehyde and phenol formaldehyde. Then all the plywood was tested for resistance to termite infestation.

The results of the study found that untreated rubberwood plywood using urea-formaldehyde and phenol-formaldehyde adhesives had a higher percentage loss. Weight loss 19.32 and 17.96 respectively. Meanwhile, rubberwood plywood using urea-formaldehyde glue that was processed by thermowood at 220 degrees Celsius for 20 minutes had the lowest average weight loss, accounting for 6.96 percent. Rubberwood plywood using phenol-formaldehyde glue that went through the thermowood process at 180 degrees Celsius for 15 minutes had the lowest average weight loss, accounting for 4.02 percent. Therefore, rubberwood plywood from thermos-veneer is resistant to termite infestation. It also is not toxic to the environment and users.

Keywords: Rubber wood, Plywood, ThermoWood, Veneer, Termite

บทนำ

ยางพารา (*Hevea Brasiliensis* Mull-Arg.) มีถิ่นกำเนิดในประเทศบราซิล ในในปัจจุบันมีการปลูกกันอย่างแพร่หลายในเขตร้อนและทวีปเอเชีย รวมถึงประเทศไทย กล่าวได้ว่าไม้ยางพาราเป็นไม้เศรษฐกิจอันดับหนึ่งของประเทศไทย เนื่องจากในปัจจุบันประเทศไทยมีพื้นที่เพาะปลูกไม้ยางพารามากกว่า 20 ล้านไร่ (International Thermowood Association, 2021 ; สำนักงานเศรษฐกิจการเกษตร, 2563) อีกทั้งไม้ยางพารายังเป็นไม้เศรษฐกิจเพียงชนิดเดียวในขณะนี้ที่สามารถส่งออกได้โดยไม่จำกัดปริมาณ และไม้ยางพารายังมีสีและลวดลายที่สวยงาม โดยจะพบว่ามีการใช้ไม้ยางพาราเป็นวัตถุดิบหลักในหลายอุตสาหกรรม เช่น อุตสาหกรรมไม้ยางพาราอบแห้ง อุตสาหกรรมแผ่นไม้ทดแทนธรรมชาติ อุตสาหกรรมไม้อัด และอุตสาหกรรมเฟอร์นิเจอร์ เป็นต้น

แม้ว่าในปัจจุบันจะมีการใช้งานไม้ยางพาราอย่างแพร่หลาย แต่ไม้ยางพารานั้นยังคงมีข้อจำกัดหลายปัจจัยที่ส่งผลต่ออายุและการใช้งาน โดยธรรมชาติแล้วไม้ยางพาราเป็นไม้ที่มีปริมาณแป้งและน้ำตาลอิสระสูง หลังจากผ่านการอบแห้งแล้วมีอัตราการดูดกลับความชื้นสูง ความหนาแน่นต่ำ มีปริมาณลิกนินและสารแทรกต่ำ (วิสุทธิ์ สิทธิฉายา และ อรัญ งามผ่องใส, 2552) ซึ่งเป็นสาเหตุหลักที่ทำให้ไม้ยางพารามีความไวต่อการถูกแมลงทำลายไม้ เช่น มอด ปลวก เข้าทำลายรวมถึงการเข้าทำลายของเชื้อรา ทั้งเชื้อราเสียสี (Stain) และเชื้อราทำลายไม้ (Wood Decay Fungi)

ด้วยข้อจำกัดดังกล่าวของไม้ยางพารานั้นจึงเป็นไปได้ยากที่จะนำไม้ยางพาราใช้ในสภาพแวดล้อมภายนอกซึ่งมีองค์ระกอบทั้งความร้อน ความชื้น และศัตรูทำลายไม้จะส่งผลไม้ยางพารามีอายุการใช้งานที่

สั้นลงมากกว่าปกติ ก่อนการใช้งานจึงจำเป็นที่จะต้องนำไม้ยางพาราไปผ่านกระบวนการยืดอายุการใช้งานเสียก่อน ในปัจจุบันมีวิธีการยืดอายุการใช้งานของไม้อยู่ด้วยกันหลายวิธี การอัดน้ำยาป้องกันและรักษาเนื้อไม้เป็นวิธีที่นิยมใช้กันอย่างแพร่หลาย การใช้สารเคมีนับว่าเป็นวิธีที่ประสบความสำเร็จในการป้องกันการเจริญเติบโตของเชื้อรา แต่สารเคมีส่งผลเสียต่อสิ่งแวดล้อมและสุขภาพของผู้ใช้งาน (Teoh, Don & Ujang, 2011)

กระบวนการเทอร์โมวู้ดเป็นทางเลือกของการยืดอายุการใช้งานไม้ จากการศึกษาของ (Lovrić et al., 2017) พบว่า ไม้บางจากไม้ป็อบลาร์พันธุ์ลูกผสม (Populus x euramericana ‘I-214’) หรือใช้ชื่อสามัญเวโรเนสป็อปลาร์ (Veronese poplar) ที่ผ่านกระบวนการเทอร์โมวู้ดมีความคงขนาดที่ดีขึ้น และมีการดูดซึมความชื้นที่ลดลง อีกทั้งยังไม่ส่งผลเสียต่อสิ่งแวดล้อมและผู้ใช้งานโดยการไม่ใช้สารเคมีให้มีความสอดคล้องกับนโยบายเศรษฐกิจแบบบีซีจีที่มุ่งเน้นไปยังการรักษาทรัพยากร ลดของเสียจากระบบการผลิตและลดผลกระทบต่อสิ่งแวดล้อม

วัตถุประสงค์ของการวิจัย

การศึกษาคุณสมบัติของไม้อัดยางพาราจากไม้บางที่ผ่านกระบวนการเทอร์โมวู้ดมีวัตถุประสงค์ในการเลือกใช้อุณหภูมิ เวลา และชนิดกาวที่เหมาะสม เพื่อให้ไม้อัดจากไม้ยางพารามีความทนทานต่อศัตรูทำลายไม้ประเภทปลวก

แนวคิด ทฤษฎี กรอบแนวคิด

ไม้ยางพารา

ลักษณะทางพฤกษศาสตร์

ยางพารา (*Hevea brasiliensis* Muell-Arg.) เป็นไม้ต้นขนาดกลางถึงขนาดใหญ่ ผลัดใบ ลำต้นกลมในภาคตัดขวาง เปลือกมีน้ำยางสีขาวขุ่น เนื้อไม้สีขาวอมเหลือง ใบประกอบแบบนิ้วมือเรียงเวียน มีใบย่อย 3 ใบ รูปรี (วิสุทธิ์ สิทธิฉายา, 2563) ยางพาราเป็นไม้พื้นเมืองในแถบลุ่มน้ำอเมซอน ประเทศบราซิลเป็นผู้ผลิตน้ำยางอันดับต้นของโลกในช่วงศตวรรษที่ 19 โดยได้น้ำยางจากการกรีดต้นยางพาราในธรรมชาติ (Killmann, 2001) ไม้ยางพาราเป็นผลผลิตพลอยได้จากการเกษตรกรรมของป่าไม้เขตร้อน เหมาะสำหรับเป็นแหล่งกักเก็บคาร์บอนเนื่องจากมีปริมาณเซลลูโลสสูง มีแป้งและน้ำตาลอิสระถึง 8% (Li et al., 2022) และมีความสำคัญต่อเศรษฐกิจ ปัจจุบันความต้องการใช้ไม้ยางพารามีแนวโน้มเพิ่มมากขึ้น ไม้ยางพารามีรอบตัดฟันอยู่ที่ 25-30 ปี (Teoh *et al.*, 2011) โดยจะถูกโค่นเพื่อปลูกต้นใหม่เมื่อระดับผลผลิตน้ำยางลดลง ไม้ยางพาราถูกยอมรับว่าเป็นป่าปลูกที่มีความยั่งยืน มีความเป็นมิตรต่อสิ่งแวดล้อม (FAO Food and Agriculture Organization of the United Nations, 2001) คุณสมบัติของไม้ยางพารา

คุณภาพของเนื้อไม้ขึ้นอยู่กับคุณสมบัติทางเคมี คุณสมบัติเชิงกล คุณสมบัติทางกายภาพ และปัจจัยอื่น ๆ ไม้มีองค์ประกอบหลักทางเคมี ได้แก่ เซลลูโลส เฮมิเซลลูโลส ลิกนิน และสารแทรกในปริมาณ

ที่ต่างกัน ขึ้นอยู่กับสายพันธุ์ ความสูง ชนิดของไม้ และสภาพแวดล้อม ในปัจจุบันไม้ยางพาราได้ถูกพัฒนาให้มีพันธุ์โคลนหลายสายพันธุ์ จิรวัฒน์ ริยาพันธ์ (2556) ได้ทำการศึกษาคุณสมบัติทางเคมีและเชิงกลของไม้ยางพารา 7 โคลนพันธุ์ พบว่า คุณสมบัติเชิงกลของไม้ยางพาราทั้ง 7 โคลนพันธุ์ไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติที่ $P < 0.05$

สมบัติทางกายภาพของไม้ยางพารา

ลักษณะของพอร์เป็นพอร์แบบเดี่ยว (Solitary Pore) และพอร์แฝด (Multiple Pore) เรียงตัวแบบกระจัดกระจาย (Diffusion Porous) พอร์มีขนาดใหญ่ ภายในพอร์มีสารตกค้าง (Deposit) เส้นเรย์เห็นได้ชัด พาเรงคิมาไม่ติดพอร์ มีความหนาแน่น 700 กก./ลบ.ม. การหดตัวด้านรัศมี 2.95% การหดตัวด้านสัมผัส 5.58% (ส่วนพัฒนาผลิตผลป่าไม้, 2547)

สมบัติทางเคมีของไม้ยางพารา

องค์ประกอบทางเคมีมีความแปรผันตามส่วนของต้นไม้ เช่น ราก หน่อ และกิ่ง ชนิดของต้นไม้ ที่ตั้งทางภูมิศาสตร์ ภูมิอากาศ และสภาพดิน

สมบัติเชิงกลของไม้ยางพารา

คุณสมบัติทางกลของไม้ยางพาราขึ้นอยู่กับปัจจัยอื่นๆ ที่ส่งผลให้ค่าความแข็งแรงเปลี่ยนแปลงไป เนื่องจากไม้เป็นวัสดุที่มีโครงสร้างเป็นรูพรุน จึงมีความสามารถในการดูดและคายความความชื้น นอกจากนี้ องค์ประกอบทางเคมี ความหนาแน่น ตำหนิของเนื้อไม้ อายุ น้ำหนักและระยะเวลาที่โดนกระทำนั้นยังส่งผลกับความแข็งแรงของไม้ทั้งสิ้น (วรวิทย์ จตุรพาณิชย์, 2540)

ไม้ยางพาราเป็นไม้ที่สำคัญที่สุดชนิดหนึ่งสำหรับอุตสาหกรรมผลิตภัณฑ์จากไม้ในพื้นที่เขตร้อนไม่เพียงแค่ในประเทศไทยแต่ยังรวมไปถึงประเทศมาเลเซีย ด้วยความเสื่อมโทรมของป่าเขตร้อนทำให้เกิดการขาดแคลนไม้ซุง จึงได้เกิดการหันมาใช้ไม้ยางพาราเป็นทางเลือกเพื่อทดแทนไม้ซุง ส่งผลให้มีการใช้ไม้ยางพาราอย่างแพร่หลาย (Naji *et al.*, 2011) จากข้อมูลพื้นที่ปลูกยางพารารายจังหวัดแบ่งตามภูมิภาคในประเทศไทย ปี พ.ศ. 2563 โดยสำนักงานเศษกิจการเกษตร พบว่าประเทศไทยมีพื้นที่ปลูกยางพาราสูงถึง 24,753,253 ไร่ โดยแบ่งเป็นพื้นที่ในภาคเหนือ 963,254 ไร่ ภาคตะวันออกเฉียงเหนือ 6,246,548 ไร่ ภาคตะวันตก 488,488 ไร่ ภาคกลาง 582,118 ไร่ ภาคตะวันออก 2,084,533 ไร่ และภาคใต้ 14,388,272 ไร่

ทรงกลด จารุสมบัติ (2557). ได้กล่าวไว้ว่า เทอร์โมวู้ด หมายถึง ไม้ที่ผ่านกระบวนการอบด้วยความร้อนที่สูงกว่า 180°C ขึ้นไป มีวิธีการพ่นไอน้ำเพื่อลดปริมาณอากาศและส่งผลในการเปลี่ยนแปลงองค์ประกอบทางเคมีที่เกิดขึ้นภายในเนื้อไม้ กระบวนการเทอร์โมวู้ดจะส่งผลให้ไม้มีสีที่ต่างออกจากเดิม โดยสีที่ได้จะมีลักษณะเข้มขึ้นกว่าเดิม ลักษณะของสีที่เปลี่ยนไปจะขึ้นอยู่กับอุณหภูมิและเวลาที่ใช้ เมื่อมีการเปลี่ยนแปลงความชื้นการยืดและหดตัวของไม้ที่ผ่านกระบวนการเทอร์โมวู้ดจะลดลง มีคุณสมบัติในการเป็นฉนวนความร้อนที่เพิ่มมากขึ้น มีความต้านทานต่อการผุที่เกิดจากปัจจัยที่มีชีวิต (Biotic Agent) ดีขึ้น แต่ความแข็งแรงในการต้านแรงดัดลดลง

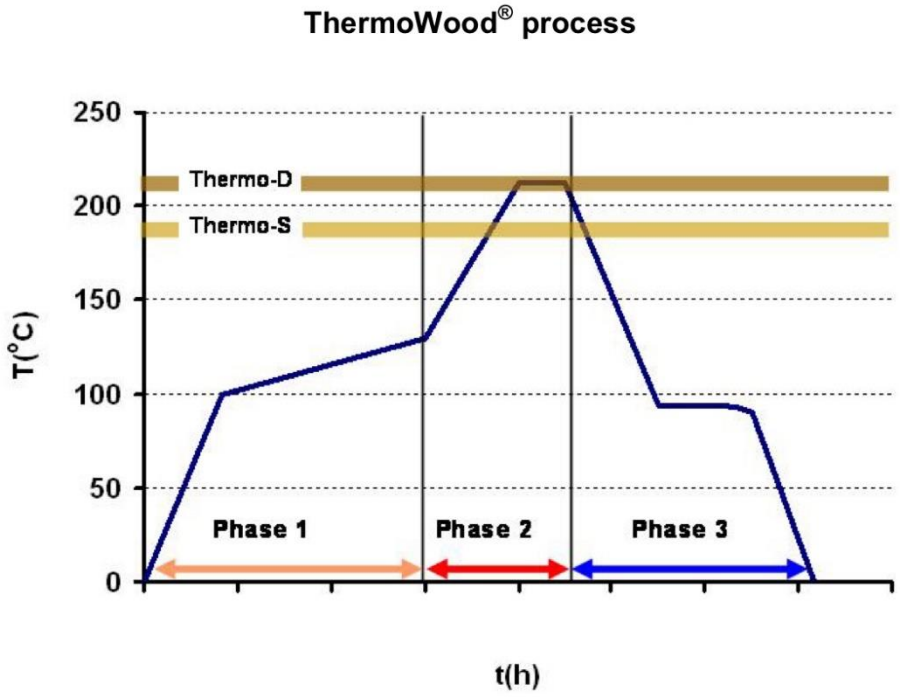
ขั้นตอนการทำเทอร์โมวู้ด

การทำเทอร์โมวู้ดมี 3 ขั้นตอน ดังนี้

ขั้นตอนที่ 1 การพ่นไอน้ำและความร้อนเข้าไปภายในเตาอบให้มีอุณหภูมิสูงถึง 100°C และมีความชื้นสัมพัทธ์ 100% จากนั้นจึงค่อย ๆ เพิ่มแค่ความร้อนเพียงอย่างเดียว เมื่อมีอุณหภูมิสูงถึง 130°C ไม้จะมีลักษณะแห้งจนไม่มีความชื้นเหลืออยู่เลย

ขั้นตอนที่ 2 หลังจากไม้แห้งแล้วจะมีการเพิ่มอุณหภูมิให้สูงถึง 185-215°C เมื่ออุณหภูมิสูงถึงระดับที่ต้องการ จึงทำการรักษาอุณหภูมิไว้ที่ระดับนั้นๆเป็นเวลา 2-3 ชั่วโมง (อุณหภูมิและเวลาที่ใช้ ขึ้นอยู่ลักษณะของการนำไม้เทอร์โมวู้ดใช้งาน)

ขั้นตอนที่ 3 หลังจากอบไม้ได้ตามลักษณะที่ต้องการแล้วจะเข้าสู่ขั้นตอนการทำให้ไม้เย็นลงโดยการพ่นน้ำจนไม้มีอุณหภูมิลดลง เท่ากับ 80-90°C แล้วจึงปรับความชื้นภายในเนื้อไม้ให้อยู่ที่ 4-7% หากมีการเพิ่มหรือลดอุณหภูมิจำเป็นที่จะต้องทำการปรับสภาวะในเตาอบเพื่อลดการแตกและปริที่ผิวหน้าไม้และลดการแตกภายในเนื้อไม้ ซึ่งสภาวะที่ใช้จะแตกต่างกันขึ้นกับชนิดและความหนาของไม้



ภาพที่ 1 ขั้นตอนการผลิตเทอร์โมวู้ด

ที่มา: The International Thermowood Association (2003).

การเปลี่ยนแปลงโครงสร้างไม้และปฏิกิริยาเคมี

ไม้ที่ถูกความร้อนจะมีการเปลี่ยนแปลงคุณสมบัติทางเคมีและคุณสมบัติเชิงกลหลายประการ การเปลี่ยนแปลงคุณสมบัติส่วนใหญ่เกิดจากการสลายตัวของเฮมิเซลลูโลสเนื่องมาจากความร้อน การสลายตัว

ของเฮมิเซลลูโลสจะเริ่มตั้งแต่อุณหภูมิ 200°C การเปลี่ยนแปลงจะดำเนินต่อไปเมื่ออุณหภูมิเพิ่มขึ้นในระยะนี้ ผลที่ตามมาคือการพองและการหดตัวเนื่องจากความชื้นลดลง ความทนทานต่อสภาพแวดล้อมเพิ่มมากขึ้น สีเข้มขึ้นสารแทรกหลายชนิดสลายไป น้ำหนักเบาลง ความชื้นสัมบูรณ์ลดลง และมีความเป็นฉนวนมากยิ่งขึ้น อย่างไรก็ตามคุณสมบัติความแข็งแรงของไม้ก็เปลี่ยนไปเช่นกัน (The International Thermowood Association, 2003)

มาตรฐานการจำแนกประเภทเทอร์โมวู้ด

เทอร์โมวู้ดมีมาตรฐานการปรับสภาพอยู่สองชั้น คือ Thermo-S และ Thermo-D

1. Thermo-S ตัวอักษร “S” มาจากคำว่าคงตัว (Stability) ความคงตัวเป็นคุณสมบัติหลักในการใช้งานของ Thermo-S การพองตัวและการหดตัวโดยเฉลี่ยเนื่องจากการสัมผัสความชื้นของไม้ทางด้านสัมผัส คือ 6-8% Thermo-S จัดเป็นเทอร์โมวู้ดที่มีความทนทานตามมาตรฐาน EN-113 มีความทนทานตามธรรมชาติต่อเชื้อราตามข้อกำหนดอยู่ในระดับ 3 ผลของคุณภาพไม้ที่ผ่านกระบวนการเทอร์โมวู้ด Thermo-S แสดงดังตารางที่ 2

ตารางที่ 2 ผลของคุณภาพไม้ที่ผ่านกระบวนการเทอร์โมวู้ด (Thermo-S)

ชั้นคุณภาพ	อุณหภูมิของกระบวนการ	เปรียบเทียบคุณสมบัติกับไม้ที่ไม่ได้ผ่านกระบวนการ		
		ความทนทานต่อสภาพอากาศ	ความคงขนาด	ความเข้มของสี
Thermo-S Nordic softwood	190°C (+/- 3°C)	+	+	+
Thermo-S Radiata pine	190°C (+/- 3°C)	O	O	O
Thermo-S Hardwoods	185°C (+/- 3°C)	O	+	+

(+ = คุณสมบัติดีขึ้น)

(++ = คุณสมบัติดีขึ้นอย่างมาก)

(O = ไม่มีการเปลี่ยนแปลง)

ที่มา: (International Thermowood Association, 2021)

2. Thermo-D ตัวอักษร “D” มาจากคำว่า ความทนทาน (Durability) ความทนทานตามธรรมชาติเป็นคุณสมบัติหลักของ Thermo-D การพองตัวและการหดตัวโดยเฉลี่ยเนื่องจากการสัมผัสความชื้นของไม้

ทางด้านสัมผัส คือ 5-6% Thermo-D จัดเป็นเทอร์โมวู้ดที่มีความทนทานตามมาตรฐาน EN-113 มีความทนทานตามธรรมชาติต่อเชื้อราตามข้อกำหนดอยู่ในระดับ 2 ผลของคุณภาพไม้ที่ผ่านกระบวนการเทอร์โมวู้ด Thermo-D แสดงดังตารางที่ 3

ตารางที่ 3 ผลของคุณภาพไม้ที่ผ่านกระบวนการเทอร์โมวู้ด (Thermo-D)

ชั้นคุณภาพ	อุณหภูมิของกระบวนการ	เปรียบเทียบคุณสมบัติกับไม้ที่ไม่ได้ผ่านกระบวนการ		
		ความทนทานต่อสภาพอากาศ	ความคงขนาด	ความเข้มของสี
Thermo-D Nordic softwood	212°C (+/- 3°C)	++	++	++
Thermo-D Radiata pine	230°C (+/- 3°C)	++	++	++
Thermo-D Ayous (hardwoods)	212°C (+/- 3°C)	+	+	++
Thermo-D Frake (hardwoods)	212°C (+/- 3°C)	+	+	++
Thermo-D Ash (hardwoods)	212°C (+/- 3°C)	+	+	++

ที่มา: (International Thermowood Association, 2021)

(+ = คุณสมบัติดีขึ้น)

(++ = คุณสมบัติดีขึ้นอย่างมาก)

(O = ไม่มีการเปลี่ยนแปลง)

ข้อมูลทั่วไปเกี่ยวกับไม้อัด

ไม้อัดผลิตโดยวิธีการนำไม้บาง (Veneer) จำนวนชั้นเป็นเลขคี่ มาประกอบยึดติดกันด้วยกาว ชั้นกาวจะต้องเป็นแนวเสี้ยนขวางตั้งฉากซึ่งกันและกันเพื่อให้เกิดสมดุลทางโครงสร้าง ช่วยลดการบิด โก่งงอ จากการเปลี่ยนแปลงความชื้น ชั้นนอกทั้งสองด้านจะถูกกำเรียกว่าไม้หน้า (Face) และไม้หลัง (Back) ชั้นด้านในจะถูกเรียกว่าชั้นไส้ (Core) (Terry, 1985) ไม้อัดถูกนำมาใช้อย่างแพร่หลายในอุตสาหกรรมหลายประเภท เช่น อุตสาหกรรมเฟอร์นิเจอร์ อุตสาหกรรมการตกแต่งภายในและภายนอก ในปี 2560

ทั่วโลกได้มีการผลิตไม้อัดถึงประมาณ 190 ล้านลูกบาศก์เมตร (FAO, 2021) ค่าความแข็งแรงต่อแรงอัด (MOR) และค่ามอดูลัสยืดหยุ่น (MOE) ของไม้อัดมีผลมาจากหลายปัจจัย เช่น สายพันธุ์ของต้นไม้ คุณภาพไม้ ความชื้นของไม้ ความหนาแน่น โครงสร้าง จำนวนชั้นของไม้บาง ความหนาของไม้บาง และกาว โดยทั่วไปแล้วความหนาแน่นเป็นหนึ่งในคุณสมบัติที่สำคัญที่สุด เนื่องจากมีความสัมพันธ์กับความแข็งของไม้เป็นอย่างมาก (Bekhta *et al.*, 2020)

การแบ่งประเภทไม้อัด

สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม (2550) ได้แบ่งประเภทไม้อัดตามกาวที่ใช้ออกเป็น 4 ประเภท คือ

1. ไม้อัดประเภทภายนอก ใช้กาวที่ทนทานต่อสภาพอากาศภายนอก น้ำเย็น น้ำเดือด ไอน้ำและความร้อนแห้งได้ดี เหมาะสำหรับใช้ภายนอกอาคารหรือในพื้นที่ซึ่งถูกน้ำหรือละอองน้ำ

2. ประเภททนความชื้น ใช้กาวที่ทนต่อลมฟ้าอากาศ น้ำเย็น น้ำเดือด ไอน้ำ และความร้อนแห้งในเวลาจำกัด เหมาะสำหรับใช้ภายในและภายนอกอาคารหรือในที่ซึ่งถูกน้ำหรือละอองน้ำเป็นครั้งคราว

3. ประเภทภายใน ใช้กาวที่ทนน้ำเย็นได้ดีพอสมควร ทนทานในน้ำร้อนได้ในเวลาจำกัดไม่ทนทานในน้ำเดือด เหมาะสำหรับใช้ภายในอาคารหรือในที่ซึ่งไม่ถูกน้ำหรือละอองน้ำ

4. ประเภทชั่วคราว ใช้กาวที่ทนน้ำเย็นได้ในเวลาจำกัด เหมาะสำหรับใช้งานชั่วคราว

ปลวก

นิเวศวิทยาของปลวก

ปลวกเป็นแมลงที่มีความสำคัญต่อระบบเศรษฐกิจเป็นอย่างมาก มีทั้งประโยชน์และโทษ ในแง่ของประโยชน์ปลวกเป็นส่วนหนึ่งของสังคมป่าไม้ที่มีความสำคัญเป็นอย่างมาก โดยปลวกเป็นทั้งผู้บริโภคและผู้ย่อยสลายในระบบนิเวศ โทษของปลวกนั้นเกิดจากการที่ปลวกเป็นแมลงที่ใช้เซลลูโลสเป็น อาหารหลักเพื่อการดำรงชีวิต ซึ่งเซลลูโลสเป็นส่วนประกอบที่สำคัญในไม้และเส้นใยต่างๆ ดังนั้นจึงพบปัญหาว่าปลวกเข้าทำลายจนเกิดความเสียหายอย่างรุนแรงแก่ไม้ หรือโครงสร้างไม้ภายในอาคารสถานที่ต่างๆ รวมไปถึงเครื่องใช้ต่างๆจากไม้และผลิตภัณฑ์ที่มีเซลลูโลสเป็นส่วนประกอบ ปลวกพบได้ทั่วโลกและชุกชุมในเขตอากาศอบอุ่น ปลวกที่ทำลายไม้มากในโซนร้อนแบ่งออกเป็น

1. ปลวกใต้ดิน (Subterranean Termites) เป็นปลวกที่อาศัยและทำรังอยู่ใต้ดิน ลักษณะการเข้าทำลายไม้และที่อยู่อาศัยจะแตกต่างไปตามแต่ละสกุล ปลวกชนิด *Coptotermes gestroi* เป็นปลวกใต้ดินที่ก่อให้เกิดความเสียหายทางเศรษฐกิจสูงที่สุด

2. ปลวกกินไม้แห้ง (Dry Wood Termites) ปลวกชนิดนี้อาศัยในไม้ที่แห้ง หรือมีอายุการใช้งานนาน มีความชื้นต่ำ โดยทั่วไปจะทำลายเฉพาะภายในของไม้และจะเหลือผิวไม้ด้านนอกไว้ทำให้ดูเหมือนว่าไม้ยังอยู่ในสภาพดี

3. ปลวกกินไม้ชื้น (Damp Wood Termites) ปลวกชนิดนี้มักอาศัยอยู่ในบริเวณไม้ที่แห้ง หรือไม้ล้มตายที่มีความชื้นสูง โดยปกติแล้วจะพบในบริเวณป่าดิบชื้น โดยเฉพาะปลวกในสกุล *Archotermopsis*

ซึ่งจัดว่าเป็นปลวกดึกดำบรรพ์ ปลวกที่ทำลายไม้มากที่สุดในประเทศไทยคือปลวกใต้ดิน รองลงมาคือปลวกกินไม้แห้ง ในขณะที่ปลวกกินไม้ชื้นมักจะไม่ทำลายไม้ที่ใช้ประโยชน์แต่จะทำลายเศษไม้และไม้ผุ ปลวกต้องอาศัย Protozoa ที่อยู่ในลำไส้ในการช่วยย่อยเซลลูโลสที่กินเข้าไปให้กลายเป็นแป้งก่อนที่จะกลายเป็นอาหารต่อไป

ผลกระทบของปลวกใต้ดินต่อวัสดุ

อาหารหลักของปลวกใต้ดินคือเซลลูโลสที่ได้จากไม้และพืชอื่นๆ ปลวกกินส่วนที่เป็นไม้ของอาคาร เสาเอนกประสงค์ เสารั้ว หรือไม้อื่นๆ รวมไปถึงกระดาษ แผ่นไม้อัด และเส้นใยจากฝ้ายหรือพืชอื่นๆ เมื่อปลวกออกหาอาหารสามารถสร้างความเสียหายเป็นอย่างมากแก่วัสดุที่ไม่ใช่เซลลูโลส เช่น พลาสติก ยาง รวมไปถึงโลหะบางๆ แม้ว่าวัสดุเหล่านี้จะไม่ใช่แหล่งอาหาร (Beal *et al.*, 1983; Peterson *et al.*, 2006) สามารถพบปลวกใต้ดินมากขึ้นในบริเวณดินที่ชื้นและมีอาหารจำนวนมาก บริเวณใต้อาคารที่มีการระยายน้ำที่ไม่ดี หรือบริเวณเศษไม้ ตอไม้ เมื่อพบปลวกบริเวณดังกล่าวแล้วสามารถเคลื่อนที่เข้าสู่อาคารได้หลายวิธี โดยปกติจะเคลื่อนผ่านไม้ที่มีการสัมผัสกับดินโดยตรง ปลวกสามารถเข้าสู่อาคารได้ง่ายผ่านรอยแตกหรือช่องว่างของอาคาร การทำลายไม้ของปลวกจะไม่สามารถเห็นได้ในบริเวณผิวหน้า เนื่องจากปลวกหลีกเลี่ยงการถูกแสงและอากาศโดยตรง

รายงานผลการศึกษาของ Jacob *et al.* (2013) พบว่าไม้ที่มีความหนาแน่นสูง ความหนนาแน่นปานกลาง และความหนาแน่นต่ำจากไนจีเรียจำนวน 10 ชนิดที่ถูกปลวกใต้ดินเข้าทำลายเป็นเวลา 24 วัน มีความหนาแน่นลดลงทั้งสิ้น

วิธีดำเนินการวิจัย

ตารางที่ 4 ปัจจัยในการดำเนินการวิจัย

ชนิดกาว	เวลา (นาที)	อุณหภูมิ (°C)		
		180	200	220
Urea formaldehyde	5	x	x	x
	10	x	x	x
	15	x	x	x
Phenol formaldehyde	5	x	x	x
	10	x	x	x
	15	x	x	x

การวิจัยครั้งนี้วางแผนการทดลองแบบสุ่มตลอด (CRD) ประกอบด้วย 3 ปัจจัย คือ อุณหภูมิที่ใช้ในการทำเทอร์โมวู้ด เวลาที่ใช้ในการทำเทอร์โมวู้ด และชนิดกาวที่ใช้ในการอัดไม้ จำนวน 3 ซ้ำ (3x3x2x3)

วิธีการ

การปรับสภาพด้วยความร้อนโดยนำวิธี ThermoWood® (International Thermowood Association, 2021) มาปรับใช้

1. ตัดไม้บางจากไม้ยางพาราให้มีขนาด 40 x 40 เซนติเมตร
2. นำไม้บางเข้าเครื่องอัดร้อนที่ความดัน 8 กิโลกรัมต่อตารางเซนติเมตร
3. ตั้งอุณหภูมิของเครื่องอัดร้อนที่ 180, 200 และ 220 องศาเซลเซียส
4. ทำการปรับสภาพด้วยความร้อนนาน 10, 15 และ 20 นาที

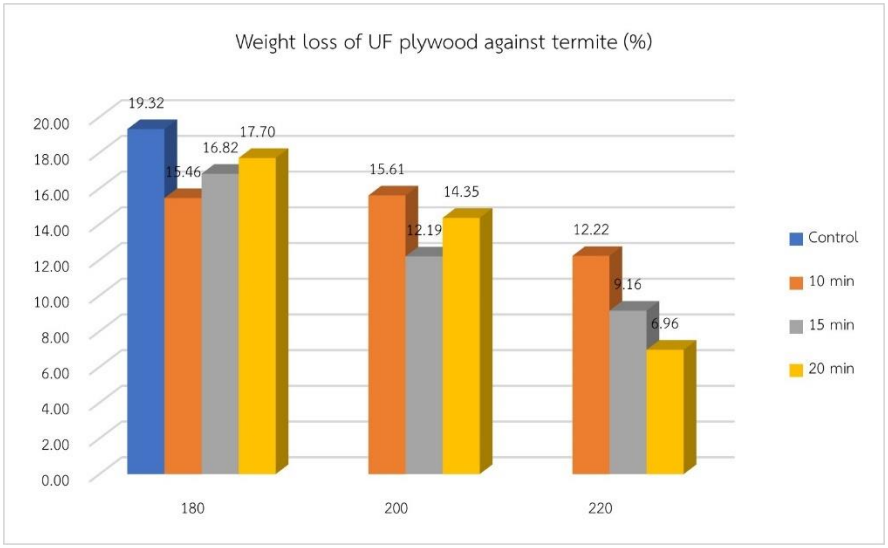
วิธีการทำแผ่นไม้อัด

1. ทากาวยูเรียฟอร์มัลดีไฮด์ (Uria Formaldehyde: UF) กาวฟีนอลฟอร์มัลดีไฮด์ (Phenol Formaldehyde: PF) ในปริมาณ 200 ± 10 กรัมต่อตารางเมตร
2. ทำการอัดไม้โดยใช้ไม้บางที่ผ่านการปรับสภาพด้วยความร้อนที่ทากาวเรียบร้อยแล้ว เรียงในด้านสลับเสี้ยนจำนวน 3 ชั้น
3. อัดไม้ด้วยความดัน 10 กิโลกรัมต่อตารางเซนติเมตร
4. อุณหภูมิสำหรับอัดไม้อัดที่ใช้กาวยูเรียฟอร์มัลดีไฮด์ 110 องศาเซลเซียส สำหรับกาวฟีนอลฟอร์มัลดีไฮด์ 135 องศาเซลเซียส
5. นำแผ่นไม้อัดเข้าสู่ห้องปรับสภาวะ

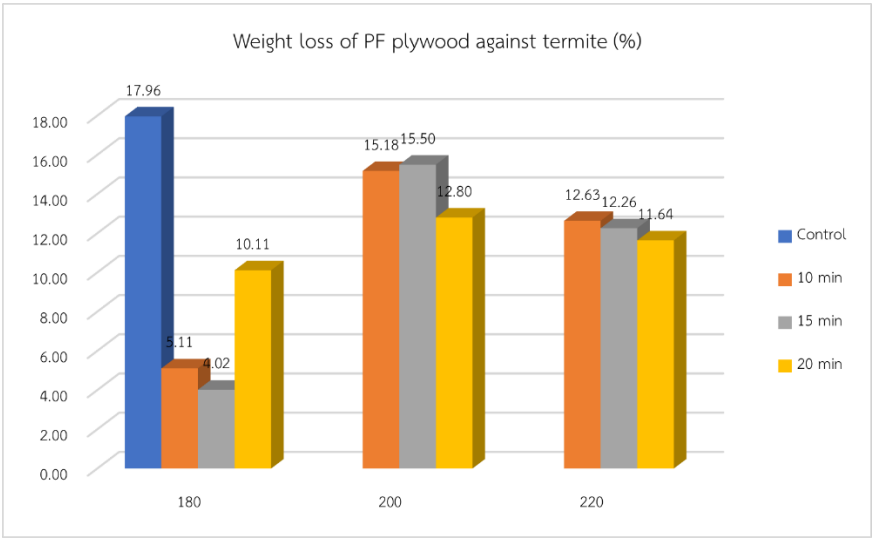
ผลการวิจัย

การทดสอบความทนทานของไม้อัดจากไม้ยางพาราที่ไม่ได้ผ่านกระบวนการเทอร์โมวู้ด (ควบคุม) และไม้อัดจากไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ดที่ใช้กาวยูเรียฟอร์มัลดีไฮด์และฟีนอลฟอร์มัลดีไฮด์ โดยอุณหภูมิและเวลาที่ใช้ประกอบด้วย 180 200 และ 200 องศาเซลเซียส เป็นเวลา 10 15 และ 20 นาที เมื่อทำการวิเคราะห์สถิติสำหรับไม้อัดที่ใช้กาวยูเรียฟอร์มัลดีไฮด์พบว่าไม้อัดไม้ยางพาราจากไม้บางที่ไม่ผ่านกระบวนการเทอร์โมวู้ดกับไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 180 องศาเซลเซียส 20 นาที มีค่าเฉลี่ยของการสูญเสียน้ำหนักร้อยละ 17.70 ไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ในขณะที่ไม้อัดไม้ยางพาราจากไม้บางที่ไม่ผ่านกระบวนการเทอร์โมวู้ดมีค่าเฉลี่ยของการสูญเสียน้ำหนักแตกต่างกันอย่างมีนัยสำคัญกับไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 180 องศาเซลเซียส 10 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 180 องศาเซลเซียส 15 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 200 องศาเซลเซียส 10 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 200 องศาเซลเซียส 15 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 200 องศาเซลเซียส 20 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 220 องศาเซลเซียส 10 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 220 องศาเซลเซียส 15 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 220 องศาเซลเซียส 20 นาที

เมื่อทำการวิเคราะห์สถิติสำหรับไม้อัดที่ใช้กาวฟีนอลฟอร์มัลดีไฮด์พบว่าไม้อัดไม้ยางพาราจากไม้บางที่ไม่ผ่านกระบวนการเทอร์โมวู้ดแตกต่างกันอย่างมีนัยสำคัญทางสถิติกับไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 180 องศาเซลเซียส 10 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 180 องศาเซลเซียส 15 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 180 องศาเซลเซียส 20 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 200 องศาเซลเซียส 10 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 200 องศาเซลเซียส 15 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 200 องศาเซลเซียส 20 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 220 องศาเซลเซียส 10 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 220 องศาเซลเซียส 15 นาที ไม้อัดไม้ยางพาราที่ผ่านกระบวนการเทอร์โมวู้ด 220 องศาเซลเซียส 20 นาที



ภาพที่ 2 กราฟเปรียบเทียบร้อยละการสูญเสียน้ำหนักของไม้อัดไม้ยางพาราที่ใช้กาวยูเรียฟอร์มัลดีไฮด์



ภาพที่ 3 กราฟเปรียบเทียบร้อยละการสูญเสียน้ำหนักของไม้อัดไม้ยางพาราที่ใช้กาวฟีนอลฟอร์มัลดีไฮด์

สรุปและอภิปรายผล

จากการทดสอบความทนทานของไม้อัดไม้ยางพาราต่อการเข้าทำลายของปลวกพบว่ามีร้อยละการสูญเสียน้ำหนักเฉลี่ยนลดลงทั้งสิ้น โดยจากการวิเคราะห์สถิติพบว่าไม้อัดที่ผลิตจากกาวฟีนอลฟอร์มัลดีไฮด์มีความแตกต่างทางนัยสำคัญทางสถิติกับไม้อัดควบคุมทั้งสิ้นในทุกอุณหภูมิและระยะเวลาที่ใช้ผลิต จึงสามารถสรุปได้ว่าการผลิตแผ่นไม้อัดเทอร์โมวู้ดโดยใช้กาวฟีนอลฟอร์มัลดีไฮด์มีความทนทานต่อการเข้าทำลายของปลวกสูงกว่าแผ่นไม้อัดที่ผลิตจากกาวยูเรียฟอร์มัลดีไฮด์

ตารางที่ 2 การเปรียบเทียบความทนทานต่อการเข้าทำลายของปลวกต่อไม้อัดไม้ยางพาราที่ใช้กาวยูเรียฟอร์มัลดีไฮด์

		180 °C			200 °C			220 °C		
ตัวอย่าง	Control	10 นาที	15 นาที	20 นาที	10 นาที	15 นาที	20 นาที	10 นาที	15 นาที	20 นาที
1	20.56	18.60	14.52	18.16	18.27	10.47	14.20	13.47	11.75	3.19
2	19.48	15.43	15.32	23.12	16.08	6.16	11.04	9.17	8.58	3.46
3	17.37	17.68	15.31	20.26	17.97	10.93	12.62	12.52	11.75	6.63
4	20.63	14.63	16.16	23.72	16.39	9.42	14.25	10.58	11.37	6.17
5	19.04	15.67	16.63	17.79	18.34	11.88	10.55	7.97	11.19	2.22
6	22.50	16.78	21.66	13.47	13.65	13.42	17.44	11.60	8.37	7.90
7	18.50	8.73	16.90	15.31	11.84	15.51	16.38	11.15	7.77	9.03
8	20.07	18.78	16.67	15.61	13.78	18.65	15.71	13.63	9.08	7.98
9	15.90	15.02	19.31	17.40	14.04	10.37	19.53	12.61	7.37	5.92
10	19.41	17.69	16.82	13.37	14.07	18.63	19.03	10.86	7.64	10.32
11	20.44	12.73	18.49	16.75	15.64	13.73	14.49	11.48	9.77	6.97
12	21.98	13.55	16.71	18.55	16.02	13.68	12.09	12.85	4.84	9.29
13	15.66	14.51	18.51	17.14	15.89	12.29	12.80	14.43	11.73	8.15
14	17.54	15.61	19.63	19.21	15.55	7.98	12.22	16.56	10.41	9.56
15	20.73	16.47	9.65	15.66	16.57	9.76	12.88	14.45	5.72	7.63
mean	19.32	15.46	16.82	17.70	15.61	12.19	14.35	12.22	9.16	6.96
T-test	*	*	*	NS	*	*	*	*	*	*

ตารางที่ 3 การเปรียบเทียบความทนทานต่อการเข้าทำลายของปลวกต่อไม้อัดไม้ยางพาราที่ใช้กาวฟีนอลฟอร์มัลดีไฮด์

ตัวอย่าง	Control	180 °C			200 °C			220 °C		
		10 นาที	15 นาที	20 นาที	10 นาที	15 นาที	20 นาที	10 นาที	15 นาที	20 นาที
1	21.17	4.87	3.72	7.14	17.99	14.10	12.57	10.75	10.29	16.44
2	17.62	5.85	3.15	5.34	20.80	13.86	16.32	10.02	15.43	15.36
3	19.37	7.75	3.38	10.86	21.39	16.42	14.09	12.59	13.43	12.84
4	19.29	7.25	3.28	6.73	19.74	16.93	13.49	12.78	12.20	16.60
5	17.18	6.37	3.99	8.07	18.01	14.98	13.94	11.95	12.25	11.79
6	17.42	6.96	5.32	5.38	15.28	18.73	19.75	12.37	10.97	14.37
7	18.40	3.18	4.89	3.21	9.43	15.60	13.24	11.88	11.70	9.62
8	19.16	5.85	5.21	1.44	15.73	19.03	13.17	12.66	10.50	12.20
9	20.15	5.19	4.35	11.63	10.01	19.53	15.74	12.98	9.85	10.70
10	16.27	3.14	4.78	2.70	10.70	15.95	14.51	10.62	9.40	11.47
11	17.66	2.09	2.65	18.22	14.96	16.85	9.25	16.30	13.07	5.84
12	16.89	7.31	3.59	17.07	13.65	4.36	5.09	14.80	13.98	11.04
13	21.39	3.38	5.32	17.34	14.19	15.27	11.03	13.78	13.62	6.46
14	12.87	3.98	4.52	21.90	12.98	15.18	13.09	12.98	15.88	9.89
15	14.51	3.44	2.15	14.65	12.83	15.69	6.75	13.01	11.30	9.92
mean	17.96	5.11	4.02	10.11	15.18	15.50	12.80	12.63	12.26	11.64
T-test	*	*	*	*	*	*	*	*	*	*

หมายเหตุ : * = แตกต่างอย่างมีนัยสำคัญทางสถิติที่ $P < 0.05$

NS = ไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติ

ข้อเสนอแนะ

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การคัดเลือกแบคทีเรียผลิตสารพอลิไฮดรอกซีบิวทิเรทโดยใช้วัสดุเหลือทิ้งทางการเกษตร

Screening of Polyhydroxybutyrate Producing Bacteria Using Agricultural Waste Substrate

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บทคัดย่อ

พลาสติกชีวภาพเป็นหนึ่งในทางเลือกเพื่อลดปัญหาขยะพลาสติกจากปิโตรเคมี แต่ต้นทุนการผลิตที่สูงยังเป็นข้อจำกัดในการผลิตพลาสติกชีวภาพ ในงานวิจัยนี้มีวัตถุประสงค์เพื่อคัดเลือกแบคทีเรียที่สามารถผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยใช้วัตถุดิบราคาถูกจากชานอ้อยเหลือทิ้งเป็นแหล่งคาร์บอน โดยแยกแบคทีเรียจากตัวอย่างดินในจังหวัดนครปฐม พระนครศรีอยุธยา และปทุมธานี รวม 10 แหล่งได้จำนวนแบคทีเรียรวม 101 ไอโซเลทและทดสอบการสร้างและสะสมพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยวิธีย้อมด้วยสีซูดานแบล็คบี ผลการทดลองพบว่าจากการคัดเลือกแบคทีเรียจำนวน 101 ไอโซเลท แบคทีเรียไอโซเลท S77-3 มีการสร้างและสะสมพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตได้สูงที่สุดที่ 1.68±0.03 กรัมต่อลิตร (คิดเป็นร้อยละ 62.80 ของน้ำหนักเซลล์แห้ง) หลังจากเลี้ยงในอาหารเลี้ยงเชื้อที่มีน้ำตาลจากไฮโดรไลเซทชานอ้อยความเข้มข้นร้อยละ 1.5 เป็นแหล่งคาร์บอน จากการจัดจำแนกสายพันธุ์โดยวิธีวิเคราะห์ลำดับนิวคลีโอไทด์ของยีน 16S rDNA พบว่าเชื้อแบคทีเรียไอโซเลท S77-3

มีความคล้ายคลึงกับเชื้อ *Bacillus cereus* มากที่สุด จากผลการทดลองแสดงให้เห็นถึงความเป็นไปได้ในการผลิตพลาสติกชีวภาพ PHB โดยเชื้อ *B. cereus* S77-3 ด้วยวัตถุดิบราคาถูกจากวัสดุเหลือทิ้งทางการเกษตร

คำสำคัญ: พลาสติกชีวภาพ, พอลิไฮดรอกซีบิวทิเรต, ชานอ้อย, ไฮโดรไลเซท

Abstract

Bioplastics is an alternative way to reduce waste from petroleum-based plastics. However, high production cost is a major limitation of bioplastics. The objective of this work is to screen local bacterial isolates for their ability to produce polyhydroxybutyrate (PHB) bioplastic using low-cost sugarcane bagasse waste as carbon source. A total of 101 bacterial isolates were isolated from ten soil samples from Nakhon Pathom, Phra Nakhon Si Ayutthaya, and Pathum Thani provinces and screened for their biosynthesis and accumulation of PHB granules using Sudan black B staining method. The result showed that among 101 bacterial isolates, the isolate S77-3 accumulated the highest amount of PHB granules in cells (1.68±0.03 g/L, 62.80% of cell dry weight) after cultivation in the medium containing 1.5% sugar from sugarcane bagasse hydrolysate as carbon source. Molecular identification based on 16S rDNA sequence analysis revealed that the isolate 77-3 is closely related with *Bacillus cereus*. Results from this work show the possibility of PHB production using low-cost agricultural waste as substrate by *B. cereus* S77-3.

Keywords: Bioplastic, Polyhydroxybutyrate, Sugarcane bagasse, Hydrolysate

บทนำ

พลาสติกเป็นวัสดุที่ผลิตจากปิโตรเคมีที่ได้รับความนิยมในการใช้งานและมีปริมาณการใช้งานเพิ่มมากขึ้นอย่างต่อเนื่อง ในสถานการณ์ปกติมีปริมาณขยะมูลฝอยที่เกิดขึ้นในประเทศไทยปีละกว่า 27.8 ล้านตัน โดยเป็นขยะพลาสติกประมาณร้อยละ 12-13 แต่ในช่วงสถานการณ์แพร่ระบาดของโรคโควิด-19 (Covid-19) ที่ผ่านมามีรายงานขยะพลาสติกเพิ่มมากขึ้น เช่น รายงานของกรุงเทพมหานครว่ามีปริมาณขยะพลาสติกทั้งหมด 3,440 ตันต่อวันในเดือนเมษายน พ.ศ. 2563 เพิ่มขึ้นจากปี พ.ศ. 2562 ที่มีปริมาณขยะพลาสติก 2,120 ตันต่อวัน พลาสติกเป็นวัสดุที่คงทนต่อการย่อยสลายของจุลินทรีย์ ส่งผลให้การสลายตัวโดยธรรมชาติเกิดขึ้นได้ช้ามาก (Mueller, 2006) จากรายงานของ Ohtake et al. (1998) พบว่าการย่อยสลายพลาสติกชนิดพอลิเอธิลีนต้องใช้เวลามากกว่า 100 ปี การกำจัดขยะพลาสติกจึงต้องการกระบวนการที่ถูกต้อง ปัจจุบันในหลายพื้นที่ยังคงกำจัดขยะพลาสติกไม่ถูกวิธี ก่อให้เกิดปัญหาต่าง ๆ ตามมา เช่น ปัญหาต่อสุขภาพ ปัญหาเศรษฐกิจ และปัญหาสิ่งแวดล้อมทั้งทางตรงและทางอ้อม (ณิชชา

บูรณสิงห์, 2562) ปัญหาขยะพลาสติกเป็นปัญหาระดับโลกที่ประเทศต่าง ๆ ต้องช่วยกันหาทางแก้ไข โดยในหลายประเทศ เช่น สวีเดน เยอรมนี เดนมาร์ก และอังกฤษ ได้ออกกำหนดนโยบายในการจัดการขยะ รวมถึงมาตรการลดเลิกใช้ถุงพลาสติก และการรณรงค์รีไซเคิล (กองบรรณาธิการ Green Network, 2563) โดยอีกหนึ่งในแนวทางแก้ไขปัญหาคือการใช้พลาสติกชีวภาพ

พลาสติกชีวภาพ (Bioplastics) ได้เข้ามามีบทบาทในชีวิตประจำวันมากขึ้นเนื่องจากเป็นพลาสติกที่สามารถย่อยสลายได้ในธรรมชาติโดยอาศัยกิจกรรมของจุลินทรีย์ ใช้เวลาในการย่อยสลายสั้น พลาสติกชีวภาพเป็นผลิตภัณฑ์ที่ไม่เป็นพิษต่อสิ่งแวดล้อมถือว่าเป็นวัสดุที่มีการย่อยสลายอย่างสมบูรณ์ หลังจากสิ้นสุดกระบวนการย่อยสลายจะได้ผลิตภัณฑ์สุดท้ายเป็นก๊าซคาร์บอนไดออกไซด์ น้ำ และวิตามิน แร่ธาตุต่าง ๆ ที่ไม่เป็นพิษต่อสิ่งแวดล้อม ปัจจุบันพลาสติกชีวภาพมีอยู่หลายชนิดทั้งพลาสติกที่ผลิตจากวัตถุดิบทางชีวภาพ (Biobased) และวัตถุดิบจากน้ำมันปิโตรเลียม (Petrobased) โดยการผลิตพลาสติกชีวภาพจากวัตถุดิบทางชีวภาพเป็นที่ได้รับความสนใจเพิ่มมากขึ้นเนื่องจากสามารถผลิตวัตถุดิบได้อย่างต่อเนื่องและยั่งยืน โดยพลาสติกชีวภาพ 2 ชนิดที่เป็นที่สนใจของตลาดทั่วโลกรวมถึงในประเทศไทยคือ พอลิแลคติกแอสิด (Polylactic acid: PLA) และพอลิไฮดรอกซีอัลคาโนเอต (Polyhydroxy alkanoates: PHAs) โดย Akhlaq et al. (2023) รายงานว่า พอลิไฮดรอกซีอัลคาโนเอตและพอลิไฮดรอกซีบิวทิเรต (Polyhydroxybutyrate: PHB) เป็นพลาสติกชีวภาพที่ถูกใช้ทดแทนพลาสติกจากปิโตรเคมีมากที่สุด พอลิไฮดรอกซีบิวทิเรตเป็นพอลิเมอร์ในกลุ่มพอลิไฮดรอกซีอัลคาโนเอตที่มีคุณสมบัติทางกายภาพและเคมีคล้ายกับพอลิเมอร์สังเคราะห์จากปิโตรเคมีคือพอลิโพรพิลีนหรือพอลิเอทิลีนที่สามารถนำมาอัด ปั่น ให้เป็นเส้นสายเพื่อทำเป็นแผ่นฟิล์มได้ โดยพอลิไฮดรอกซีบิวทิเรตถูกค้นพบครั้งแรกในปี ค.ศ. 1926 โดยสกัดได้จากเซลล์ของ *Bacillus megaterium* (Luengo et al., 2003) จากนั้นพบรายงานการผลิตในแบคทีเรียหลายสายพันธุ์ทั้งแบคทีเรียแกรมบวกและแกรมลบ เช่น *Alcaligenes* sp., *Pseudomonas* sp., *Bacilus* sp., *Rhodospirillum* sp., *Halobacterium* sp., *Rhizobium* sp. เป็นต้น (Anderson & Dawes, 1990) เชื้อแบคทีเรียสร้างและสะสมพลาสติกชีวภาพชนิดพอลิไฮดรอกซีบิวทิเรตไว้เป็นแหล่งคาร์บอนและพลังงาน พบเมื่อเชื้อเจริญในสภาวะแวดล้อมไม่เหมาะสมคือมีแหล่งคาร์บอนปริมาณสูงกว่าสารอื่น ๆ เช่น ไนโตรเจน ซัลเฟอร์ ฟอสฟอรัส และออกซิเจน (Kadriye İnan et al., 2023) จึงมักพบรายงานการคัดแยกเชื้อผลิตพลาสติกชีวภาพชนิดพอลิไฮดรอกซีบิวทิเรตได้จากแหล่งตัวอย่างต่าง ๆ ที่มีสารอินทรีย์สูงโดยเฉพาะในดินที่อุดมสมบูรณ์เป็นต้น (Jeevitha et al., 2023; Kadriye İnan et al., 2023; Thammasittirong et al., 2017)

ปัจจัยหลักที่มีผลต่อต้นทุนในการผลิตพลาสติกชีวภาพชนิดพอลิไฮดรอกซีบิวทิเรตจากเชื้อจุลินทรีย์คืออาหารเลี้ยงเชื้อและกระบวนการเก็บเกี่ยวผลผลิต โดยมีรายงานว่าค่าใช้จ่ายสำหรับแหล่งคาร์บอนเพื่อเตรียมอาหารเลี้ยงเชื้อในการหมักเพื่อผลิตพลาสติกชีวภาพในระดับอุตสาหกรรมมีค่าสูงถึงร้อยละ 50 ของค่าใช้จ่ายทั้งหมดในกระบวนการผลิต (Saratale et al., 2021) ส่งผลให้ต้นทุนการผลิตพลาสติกชีวภาพสูงกว่าการผลิตพลาสติกจากปิโตรเคมีถึงประมาณ 6 เท่า (Hassan et al., 2024) จึงมี

ความพยามยามของนักวิจัยที่จะศึกษาวัสดุทดแทนที่มีราคาถูกกกว่าอาหารเลี้ยงเชื้อทางการค้า วัสดุลิกโนเซลลูโลสเป็นอีกหนึ่งในวัตถุดิบที่น่าสนใจเนื่องจากเป็นวัสดุที่ได้จากเศษวัสดุเหลือทิ้งทางการเกษตรที่มีปริมาณมหาศาลและแทบไม่มีมูลค่า วัสดุลิกโนเซลลูโลสประกอบด้วยเซลลูโลส เฮมิเซลลูโลส และลิกนิน ในอัตราส่วนแตกต่างกันขึ้นอยู่กับประเภทของวัสดุลิกโนเซลลูโลส โดยทั่วไปพบเซลลูโลสร้อยละ 40-60 เฮมิเซลลูโลส ร้อยละ 20-30 และ ลิกนิน ร้อยละ 15-30 การนำวัสดุลิกโนเซลลูโลสไปใช้ประโยชน์จำเป็นต้องผ่านกระบวนการปรับสภาพโดยวิธีทางกายภาพ เคมี หรือชีวภาพ (สุภาวดี ผลประเสริฐ, 2557) และใช้เอนไซม์ย่อยโครงสร้างที่ผ่านการปรับสภาพให้ได้หน่วยย่อยคือน้ำตาลที่สามารถนำไปเพาะเลี้ยงจุลินทรีย์ได้ต่อไป

มีงานวิจัยต่าง ๆ ที่ศึกษาการผลิตพลาสติกชีวภาพชนิดพอลิไฮดรอกซีบิวทิเรตโดยใช้ไฮโดรไลเซทจากวัสดุเหลือทิ้งทางการเกษตร เช่น Getachew & Woldesenbet (2016) ศึกษาเกี่ยวกับศักยภาพแบคทีเรียที่ผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยใช้ไฮโดรไลเซทจากวัสดุลิกโนเซลลูโลส 4 ชนิด คือ ชานอ้อย ซังข้าวโพด ฟางข้าว และเปลือกกล้วยเป็นแหล่งคาร์บอน พบว่าเชื้อ *Bacillus* spp. สามารถผลิตพอลิไฮดรอกซีบิวทิเรตได้ดีที่สุดโดยมีการสะสมพลาสติกชีวภาพ ร้อยละ 55.6, 51.6, 37.4 และ 25.0 ของน้ำหนักเซลล์แห้ง เมื่อใช้ชานอ้อย ซังข้าวโพด ฟางข้าว และเปลือกกล้วยเป็นแหล่งคาร์บอน ตามลำดับ Hidayat et al. (2019) ศึกษาเกี่ยวกับความสามารถของแบคทีเรีย *Bacillus cereus* suaeda B-001 ในการสร้างพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรต โดยใช้ไฮโดรไลเซทของผลปาล์มน้ำมันเป็นแหล่งคาร์บอน โดยพบว่า *B. cereus* suaeda B-001 สามารถสะสมพลาสติกชีวภาพได้มากที่สุดร้อยละ 55.44 ของน้ำหนักเซลล์แห้ง เมื่อใช้ไฮโดรไลเซทจากผลปาล์มน้ำมันเปล่าความเข้มข้น 20 กรัมต่อลิตรเป็นแหล่งคาร์บอน เป็นต้น

วัตถุประสงค์ของการวิจัย

เพื่อคัดเลือกแบคทีเรียที่มีความสามารถผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตได้โดยใช้วัตถุดิบราคาถูกจากชานอ้อยเหลือทิ้งเป็นแหล่งคาร์บอน

แนวคิด ทฤษฎี กรอบแนวคิด

จากปัจจัยด้านต้นทุนการผลิตโดยเฉพาะต้นทุนจากแหล่งคาร์บอนยังเป็นข้อจำกัดของการผลิตและใช้พลาสติกชีวภาพเพื่อทดแทนพลาสติกจากปิโตรเคมี หากสามารถหาแหล่งวัตถุดิบที่มีราคาถูกและสามารถค้นหาเชื้อจุลินทรีย์ที่สามารถใช้น้ำตาลจากแหล่งวัตถุดิบราคาถูกดังกล่าวเพื่อใช้ผลิตพลาสติกชีวภาพก็น่าจะส่งผลให้ต้นทุนในการผลิตพลาสติกชีวภาพถูกลงได้ โดยชานอ้อยเป็นหนึ่งในวัสดุลิกโนเซลลูโลสเหลือทิ้งทางการเกษตรภายในประเทศที่น่าสนใจ เนื่องจากประเทศไทยการผลิตอ้อยในลำดับต้น ๆ ของโลกและมีปริมาณวัสดุเหลือทิ้งชานอ้อยในปริมาณสูง การนำวัสดุเหลือทิ้งชานอ้อยมาใช้ประโยชน์โดยใช้เป็นวัตถุดิบตั้งต้นเพื่อผลิตพลาสติกชีวภาพจึงเป็นการเพิ่มมูลค่าของวัสดุเหลือทิ้งอีกทางหนึ่ง

วิธีดำเนินการวิจัย

1. การคัดแยกเชื้อแบคทีเรียผลิตพลาสติกชีวภาพ

เก็บตัวอย่างดินจากบริเวณที่มีแหล่งสารอินทรีย์สมบูรณ์ได้แก่ กองขยะ และแปลงเกษตร ในพื้นที่จังหวัดนครปฐม พระนครศรีอยุธยา และปทุมธานี จำนวน 10 แหล่ง โดยขุดลึก 15 เซนติเมตรจากผิวหน้าดิน นำตัวอย่างดิน 1 กรัม เจือจางด้วยน้ำปราศจากไอออนที่ผ่านการฆ่าเชื้อแล้วให้มีความเจือจาง 10^{-4} ถึง 10^{-6} แล้วดูดสารละลายที่เจือจางปริมาตร 0.1 มิลลิลิตร เกลี่ยบนผิวหน้าอาหาร Nutrient agar (NA) บ่มที่อุณหภูมิ 37 องศาเซลเซียส เป็นเวลา 24 ชั่วโมง คัดเลือกเชื้อที่ผลิตพลาสติกชีวภาพได้ในเบื้องต้นโดยเลือกโคโลนีเดี่ยวที่มีลักษณะโคโลนีต่าง ๆ มาทดสอบการผลิตพลาสติกชีวภาพในอาหารเลี้ยงเชื้อ NA ที่เติมน้ำตาลซูโครสร้อยละ 5 บ่มที่อุณหภูมิ 37 องศาเซลเซียส เป็นเวลา 48 ชั่วโมง จากนั้นย้อมสีพลาสติกชีวภาพภายในเซลล์ ด้วยสารละลายสี Sudan Black B เป็นเวลา 10 นาที ล้างออกด้วย Xylene จนสีย้อม Sudan Black B ออกหมด ล้างด้วยน้ำกลั่นและย้อมสีเซลล์ด้วยสีย้อม Safranin O เป็นเวลา 1 นาที ล้างออกด้วยน้ำกลั่นแล้วนำไปศึกษาใต้กล้องจุลทรรศน์ที่กำลังขยาย 1,000 เท่า

2. การปรับสภาพชานอ้อยและเตรียมไฮโดรไลเซท

นำชานอ้อยปั่นด้วยเครื่องปั่นและกรองผ่านตระแกรงกรองขนาดช่องประมาณ 2 มิลลิเมตร นำชานอ้อยที่ผ่านการกรองอบในตู้อบที่อุณหภูมิ 55 องศาเซลเซียส นาน 24 ชั่วโมง จากนั้นปรับสภาพชานอ้อยด้วยโซเดียมไฮดรอกไซด์ (NaOH) ความเข้มข้นร้อยละ 2 แล้วบ่มในอ่างน้ำควบคุมอุณหูมิที่ 80 องศาเซลเซียส นาน 3 ชั่วโมง นำชานอ้อยมากรองด้วยผ้าขาวบางและล้างด้วยน้ำกลั่นหลายครั้งจนค่าพีเอช (pH) ลดลงมาที่ 7.0 จากนั้นอบชานอ้อยที่ผ่านการปรับสภาพแล้วที่อุณหภูมิ 55 องศาเซลเซียส เป็นเวลา 48 ชั่วโมง ชั่งชานอ้อย 10 กรัมใส่ขวดรูปชมพู่กำจัดเชื้อโดยนึ่งภายใต้ความดันไอน้ำ (Autoclave) ที่อุณหภูมิ 121 องศาเซลเซียส เป็นเวลา 15 นาที จากนั้นเติมบัฟเฟอร์ซิเตรต (Citrate) ความเข้มข้น 0.05 โมลาร์ พีเอช 4.8 ปริมาตร 100 มิลลิลิตร และเติมเอนไซม์ Accellerase ที่มีความเข้มข้น 15 filter paper unit (FPU) ต่อกรัมของซับสเตรท เขย่าให้เข้ากันและนำไปบ่มที่อุณหภูมิ 50 องศาเซลเซียส เป็นเวลา 24 ชั่วโมง แล้วนำมากรองด้วยผ้าขาวบาง นำส่วนไฮโดรไลเซทมาปรับค่าพีเอชให้เท่ากับ 7.0 กรองผ่านกระดาษกรอง Whatman เบอร์ 1 จากนั้นวิเคราะห์ปริมาณน้ำตาลโดยเจือจางไฮโดรไลเซทในน้ำปราศจากไอออน 100 เท่าและดูดสารละลายเจือจางปริมาตร 0.5 มิลลิลิตรใส่หลอดทดลอง เติม Di-nitrosalicylic acid (DNS) ปริมาตร 0.5 มิลลิลิตร ต้มในน้ำเดือดเป็นเวลา 5 นาทีและทำให้เย็นลงทันที เติมน้ำปราศจากไอออนปริมาตร 5 มิลลิลิตร วัดค่าดูดกลืนแสงที่ความยาวคลื่น 540 นาโนเมตร เปรียบเทียบค่าการดูดกลืนแสงกับกราฟมาตรฐานของน้ำตาลกลูโคสความเข้มข้นต่าง ๆ

3. การเตรียมอาหารเลี้ยงเชื้อที่มีแหล่งคาร์บอนจากไฮโดรไลเซทชานอ้อย

เตรียมอาหารเลี้ยงเชื้อ Nitrogen-deficient medium agar ประกอบด้วยน้ำตาลจากไฮโดรไลเซทชานอ้อยร้อยละ 1.5 เปปโตนร้อยละ 0.25 สารสกัดจากยีสต์ร้อยละ 0.25 แมกนีเซียมซัลเฟตร้อยละ 0.02 โซเดียมคลอไรด์ร้อยละ 0.01 และโพแทสเซียมไดไฮโดรเจนฟอสเฟตร้อยละ 0.05 ผงวุ้นร้อยละ 1.5

ปรับค่าพีเอชเท่ากับ 7.0 กำจัดเชื้อโดยการนึ่งภายใต้ความดันไอที่อุณหภูมิ 121 องศาเซลเซียส เป็นเวลา 15 นาที เทอาหารเลี้ยงเชื้อใส่จานอาหาร

เตรียมอาหารเลี้ยงเชื้อ Nitrogen-deficient medium broth โดยมีองค์ประกอบต่าง ๆ ตามด้านบน แต่ไม่เติมผงวุ้น และมีการปรับความเข้มข้นน้ำตาลจากไฮโดรไลเซทเป็นร้อยละ 0.25 0.5 1.0 1.5 และ 2.0 โดยเตรียมอาหารปริมาตร 50 มิลลิลิตร ในขวดรูปชมพู่ขนาด 250 มิลลิลิตร

4. การคัดเลือกแบคทีเรียที่สามารถใช้น้ำตาลจากไฮโดรไลเซทชานอ้อยผลิตพลาสติกชีวภาพ

นำเชื้อที่ผ่านการคัดเลือกเบื้องต้นว่าสามารถผลิตพลาสติกชีวภาพได้มาเลี้ยงในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium agar ที่มีน้ำตาลจากไฮโดรไลเซทร้อยละ 1.5 เป็นแหล่งคาร์บอน บ่มที่อุณหภูมิ 37 องศาเซลเซียส เป็นเวลา 48 ชั่วโมง วิเคราะห์การสร้างและสะสมพลาสติกชีวภาพโดยการย้อมสีเซลล์ด้วยสารละลายสี Sudan Black B ตามวิธีด้านบน แล้วศึกษาใต้กล้องจุลทรรศน์ที่กำลังขยาย 1,000 เท่า

5. ศึกษาผลของความเข้มข้นน้ำตาลจากไฮโดรไลเซทต่อการสร้างพลาสติกชีวภาพ

นำเชื้อที่ผ่านการคัดเลือกว่าสามารถผลิตพลาสติกชีวภาพได้สูงที่สุดในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium agar มาวิเคราะห์การสร้างพลาสติกชีวภาพในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium broth ที่มีน้ำตาลจากไฮโดรไลเซทความเข้มข้นร้อยละ 0.25 0.5 1.0 1.5 และ 2.0 ปริมาตร 50 มิลลิลิตร บ่มแบบเขย่าที่อุณหภูมิ 37 องศาเซลเซียส ความเร็วรอบ 150 รอบต่อนาที เป็นเวลา 48 ชั่วโมง วิเคราะห์การสร้างและสะสมพลาสติกชีวภาพ จากนั้นวิเคราะห์ปริมาณพลาสติกชีวภาพและน้ำหนักเซลล์แห้งตามวิธีของ Thammasittirong et al. (2017)

6. การจัดจำแนกสายพันธุ์เชื้อแบคทีเรีย

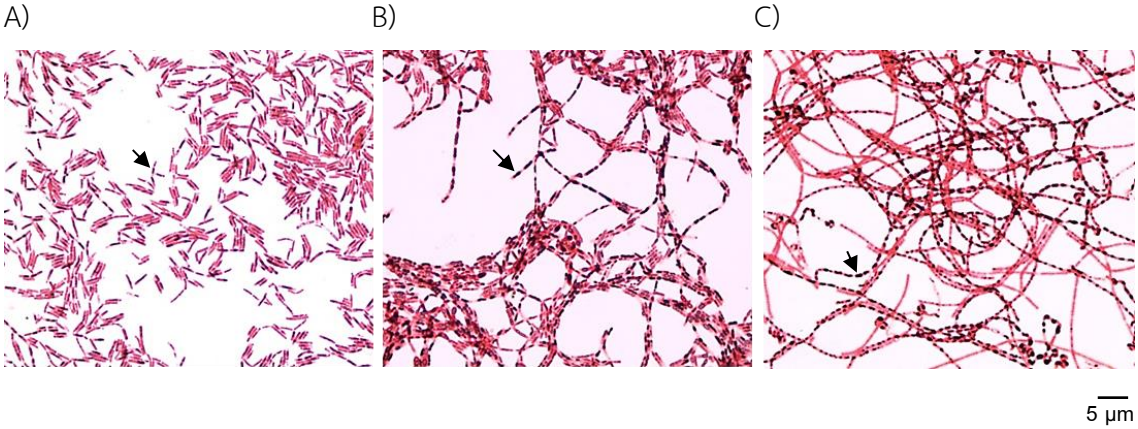
จัดจำแนกสารพันธุ์แบคทีเรียที่สามารถสร้างพลาสติกชีวภาพได้สูงที่สุดในอาหารเลี้ยงเชื้อที่มีน้ำตาลจากไฮโดรไลเซทเป็นแหล่งคาร์บอน โดยเลี้ยงเชื้อในอาหารเลี้ยงเชื้อเหลว Luria-Bertani (LB) ปริมาตร 5 มิลลิลิตร สกัดจีโนมิกดีเอ็นเอโดยใช้ชุดสกัด Biofact genomic DNA extraction kit (Biofact Co. Ltd, South Korea) เพิ่มปริมาณยีน 16S rDNA ด้วยเทคนิค Polymerase Chain Reaction (PCR) ด้วยไพร์เมอร์ 27F (5′-AGAGTTTGATCCTGGCTCAG-3′) และ 1541R (5′-AAGGAGGTGATCCAG CCGCA-3′) จากนั้นส่งผลผลิต PCR ที่เพิ่มจำนวนได้เพื่อวิเคราะห์ลำดับนิวคลีโอไทด์ และนำลำดับนิวคลีโอไทด์ที่ได้เปรียบเทียบกับลำดับนิวคลีโอไทด์ของยีน 16S rDNA ในฐานข้อมูล National Center for Biotechnology Information (NCBI) ด้วยโปรแกรม Basic Local Alignment Search Tool (BLAST) จากนั้นนำลำดับนิวคลีโอไทด์ของยีน 16S rDNA ของเชื้อแบคทีเรีย S77-3 และสายพันธุ์ใกล้เคียงมาวิเคราะห์แผนภูมิต้นไม้วิวัฒนาการ (Phylogenetic tree) โดยใช้โปรแกรม Mega-11

ผลการวิจัย

1. การคัดแยกเชื้อแบคทีเรียผลิตพลาสติกชีวภาพ

จากการแยกเชื้อแบคทีเรียจากตัวอย่างดินบริเวณที่มีแหล่งสารอินทรีย์สมบูรณ์ได้แก่ กองขยะ และ

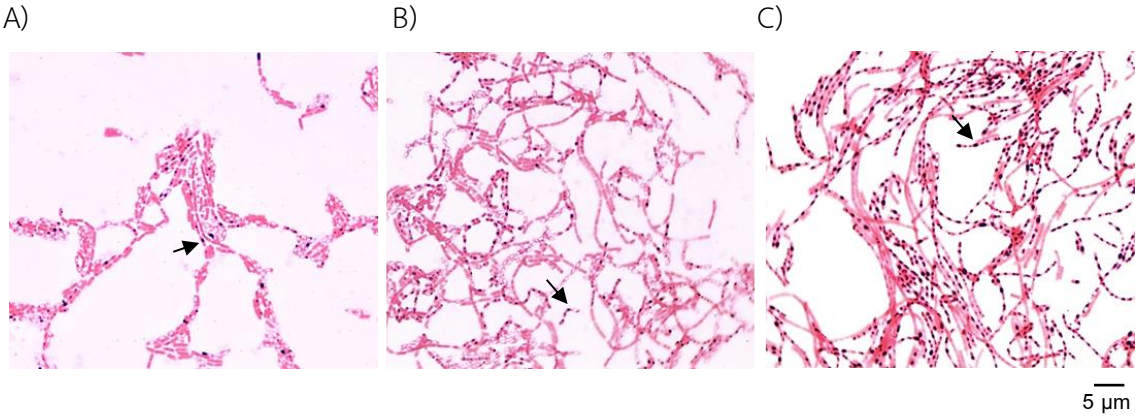
แปลงเกษตร ในพื้นที่จังหวัดนครปฐม พระนครศรีอยุธยา และปทุมธานี จำนวน 10 แหล่ง มาทดสอบการผลิตพลาสติกชีวภาพในอาหารเลี้ยงเชื้อ NA ที่เติมน้ำตาลซูโครสร้อยละ 5 บ่มที่อุณหภูมิ 37 องศาเซลเซียส เป็นเวลา 48 ชั่วโมง และย้อมสีพลาสติกชีวภาพภายในเซลล์ด้วยสารละลายสี Sudan Black B พบเชื้อแบคทีเรียจำนวน 23 ไอโซเลทที่สามารถผลิตพลาสติกชีวภาพสะสมไว้ภายในเซลล์ได้ ดังแสดงตัวอย่างการตรวจพบการสะสมพลาสติกชีวภาพในเซลล์แบคทีเรียดังภาพที่ 1



ภาพที่ 1 ตัวอย่างแบคทีเรียที่มีการสร้างและสะสมพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตไว้ภายในเซลล์เมื่อเลี้ยงในอาหารเลี้ยงเชื้อ NA ที่เติมน้ำตาลซูโครสร้อยละ 5 A) ไอโซเลท S1-2 B) ไอโซเลท S2-1 C) ไอโซเลท S77-3 (ลูกศรชี้ตัวอย่างส่วนอนุภาคพลาสติกที่ติดสีย้อม Sudan Black B)

2. การคัดเลือกแบคทีเรียที่สามารถใช้น้ำตาลจากไฮโดรไลเซทชานอ้อยผลิตพลาสติกชีวภาพ

จากการนำเชื้อที่ผ่านการคัดเลือกเบื้องต้นว่าสามารถผลิตพลาสติกชีวภาพได้บนอาหาร NA ที่เติมน้ำตาลซูโครสร้อยละ 5 จำนวน 23 ไอโซเลท มาเลี้ยงในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium agar ที่มีน้ำตาลจากไฮโดรไลเซทชานอ้อยร้อยละ 1.5 เป็นแหล่งคาร์บอน บ่มที่อุณหภูมิ 37 องศาเซลเซียส เป็นเวลา 48 ชั่วโมง พบว่าเชื้อแบคทีเรียที่สามารถใช้น้ำตาลจากไฮโดรไลเซทชานอ้อยผลิตพลาสติกชีวภาพได้จำนวน 10 ไอโซเลท โดยเชื้อที่มีการสะสมอนุภาคพลาสติกชีวภาพได้สูงที่สุดโดยพิจารณาจากขนาดของอนุภาคพลาสติกภายในเซลล์คือเชื้อแบคทีเรียไอโซเลท S77-3 ดังแสดงตัวอย่างผลการวิเคราะห์การสะสมพลาสติกชีวภาพภายในเซลล์โดยการย้อมด้วยสี Sudan Black B ในภาพที่ 2



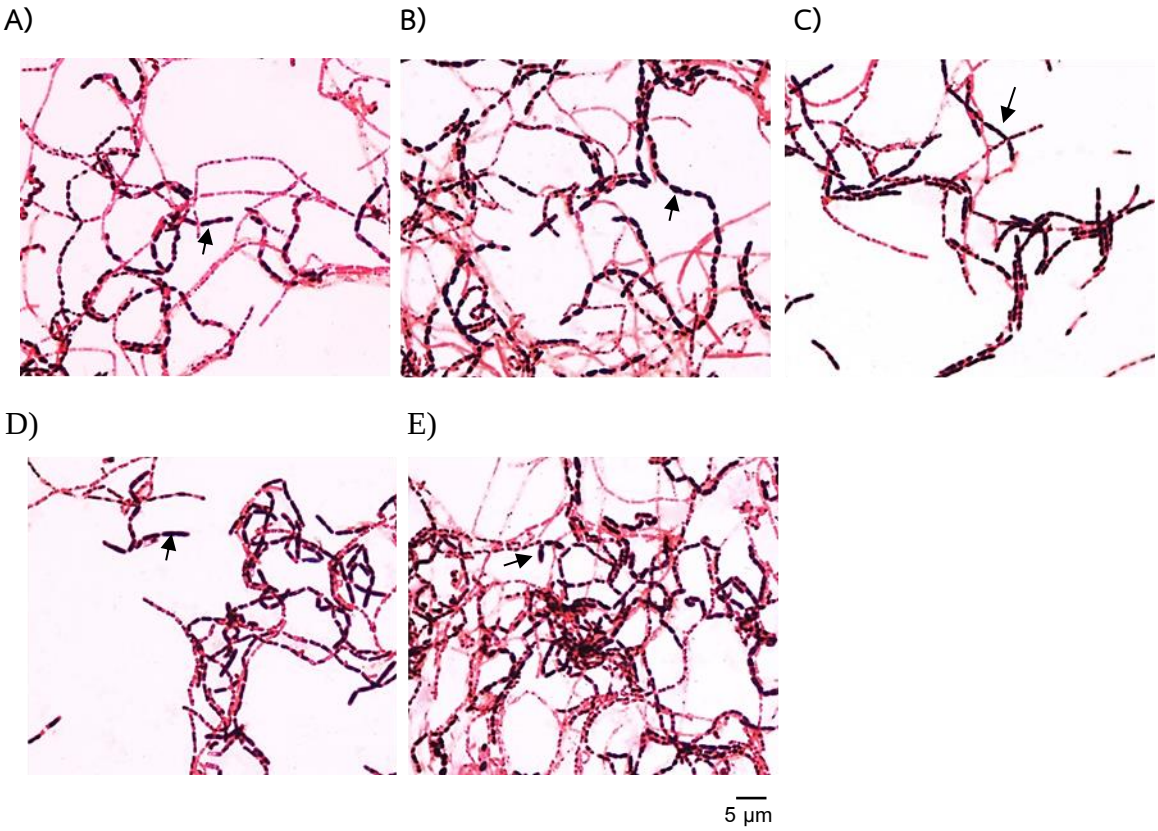
ภาพที่ 2 ตัวอย่างแบคทีเรียที่สามารถใช้น้ำตาลจากไฮโดรไลเซทชานอ้อยผลิตพลาสติกชีวภาพสะสมไว้ภายในเซลล์เมื่อเลี้ยงในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium agar ที่มีน้ำตาลจากไฮโดรไลเซทชานอ้อยร้อยละ 1.5 A) ไอโซเลท S2-1 B) ไอโซเลท S19-4 C) ไอโซเลท S77-3 (ลูกศรชี้ตัวอย่างส่วนอนุภาคพลาสติกที่ติดสีย้อม Sudan Black B)

3. การศึกษาผลของความเข้มข้นน้ำตาลจากไฮโดรไลเซทต่อการสร้างพลาสติกชีวภาพ

จากการนำเชื้อแบคทีเรียไอโซเลท S77-3 ที่สามารถผลิตพลาสติกชีวภาพได้สูงที่สุดในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium agar มาวิเคราะห์การสร้างพลาสติกชีวภาพในอาหารเลี้ยงเชื้อ Nitrogen-deficient medium broth ที่มีน้ำตาลจากไฮโดรไลเซทความเข้มข้นร้อยละ 0.25 0.5 1.0 1.5 และ 2.0 เป็นแหล่งคาร์บอน พบว่าเชื้อแบคทีเรีย S77-3 สามารถสร้างและสะสมพลาสติกชีวภาพภายในเซลล์ได้สูงที่สุดเมื่อใช้น้ำตาลจากไฮโดรไลเซทชานอ้อยที่ความเข้มข้นร้อยละ 1.5 เป็นแหล่งคาร์บอน (ตารางที่ 1) โดยวิเคราะห์ปริมาณพลาสติกชีวภาพได้น้ำหนัก 1.68±0.03 กรัมต่อลิตร คิดเป็นร้อยละ 62.80 ของน้ำหนักเซลล์แห้ง โดยผลจากการย้อมสีเซลล์ด้วยสีย้อม Sudan Black B พบการสะสมพลาสติกภายในเซลล์ที่เลี้ยงโดยใช้น้ำตาลจากไฮโดรไลเซทชานอ้อยที่ความเข้มข้นร้อยละ 1.5 เป็นแหล่งคาร์บอนสูงกว่าที่ความเข้มข้นอื่น (ภาพที่ 3) ซึ่งสอดคล้องกับผลการวิเคราะห์ในเชิงปริมาณ

ตารางที่ 1 ปริมาณพลาสติกชีวภาพที่ผลิตได้โดยเชื้อแบคทีเรีย S77-3 โดยใช้อาหารเลี้ยงเชื้อที่มีน้ำตาลจากไฮโดรไลเซทชานอ้อยความเข้มข้นต่าง ๆ เป็นแหล่งคาร์บอน

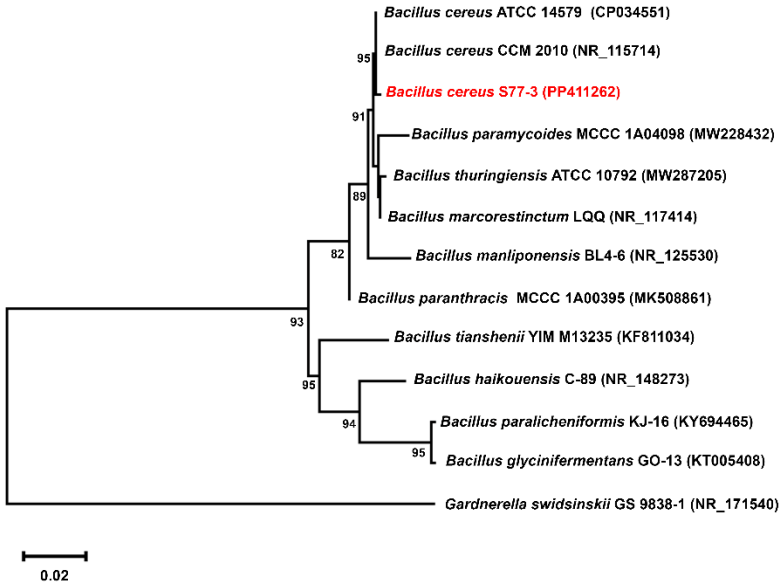
ความเข้มข้นไฮโดรไลเซท	ปริมาณพลาสติกที่ผลิตได้ (กรัมต่อลิตร)	น้ำหนักเซลล์แห้ง (กรัมต่อลิตร)	ร้อยละของการผลิต
0.25	0.69±0.02	2.69±0.14	25.76
0.5	1.04±0.01	2.54±0.02	40.93
1.0	1.29±0.02	4.22±0.01	30.50
1.5	1.68±0.03	2.68±0.02	62.80
2.0	1.53±0.02	2.52±0.01	60.89



ภาพที่ 3 การผลิตและสะสมพลาสติกชีวภาพโดยเชื้อแบคทีเรียไอโซเลท S77-3 ที่เลี้ยงในอาหารเลี้ยงเชื้อที่มีน้ำตาลจากไฮโดรไลเซทชานอ้อยความเข้มข้นต่าง ๆ เป็นแหล่งคาร์บอน A) น้ำตาลร้อยละ 0.25 B) น้ำตาลร้อยละ 0.50 C) น้ำตาลร้อยละ 1.0 D) น้ำตาลร้อยละ 1.5 E) น้ำตาลร้อยละ 2.0 (ลูกศรชี้ตัวอย่างส่วนอนุภาคพลาสติกที่ติดสีย้อม Sudan Black B)

4. การจัดจำแนกสายพันธุ์เชื้อแบคทีเรียไอโซเลท S77-3

จากการวิเคราะห์ลำดับนิวคลีโอไทด์ของยีน 16S rDNA ของแบคทีเรียไอโซเลท S77-3 ที่ได้ฝากลำดับนิวคลีโอไทด์ไว้บนฐานข้อมูล NCBI (Accession number : PP411262) พบว่ามีความใกล้ชิดกับเชื้อแบคทีเรีย *Bacillus cereus* ATCC 14579 (Accession number: CP034551.1) มากที่สุด โดยมีค่าความเหมือนของนิวคลีโอไทด์ (Sequence identity) ที่ร้อยละ 99 และผลการวิเคราะห์ความสัมพันธ์ทางวิวัฒนาการของแบคทีเรียไอโซเลท S77-3 กับแบคทีเรียสายพันธุ์ใกล้เคียงในจีนัสบาซิลัสให้ผลดังภาพที่ 4



ภาพที่ 4 แผนภูมิต้นไม้วิวัฒนาการของเชื้อแบคทีเรียไอโซเลท 77-3 และสายพันธุ์ใกล้เคียง สร้างแผนภูมิโดยวิธี Neighbor-Joining ที่ค่า bootstrap 1000 ด้วยโปรแกรม Mega 11 (Tamuraet et al., 2021)

สรุปและอภิปรายผล

พลาสติกชีวภาพเป็นหนึ่งในวิธีทางเลือกเพื่อช่วยลดปัญหาขยะพลาสติกย่อยสลายได้ยากและมีการใช้งานเพิ่มขึ้นอย่างต่อเนื่อง แต่วัสดุที่จะมาทดแทนพลาสติกที่ใช้อยู่เดิมได้นั้นต้องมีคุณสมบัติในด้านต่าง ๆ ไม่ด้อยไปกว่าเดิม เช่น ราคา ปริมาณ คุณสมบัติทางเคมีด้านต่าง ๆ เช่นความยืดหยุ่นเป็นต้น สำหรับพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตนั้นหนึ่งในข้อจำกัดเพื่อการใช้ทดแทนพลาสติกแบบเดิมคือต้นทุนการผลิตที่ยังสูงอยู่ จึงมีความพยายามศึกษาปัจจัยต่าง ๆ ที่สามารถลดต้นทุนการผลิตได้ เช่น ศึกษาวัตถุดิบที่มีราคาถูกหรือเป็นของเหลือทิ้งจากกระบวนการต่าง ๆ โดยสามารถจัดกลุ่มของวัตถุดิบราคาถูกที่มีการศึกษาเพื่อผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรต ดังนี้ วัสดุเหลือทิ้งทางการเกษตร เช่น วัสดุลิกโนเซลลูโลส กากน้ำตาล วัสดุเหลือทิ้งทางอาหาร เช่น เศษผัก เศษผลไม้ ของเสียในอุตสาหกรรม น้ำทิ้งอุตสาหกรรม เป็นต้น (Akhlaq et al., 2023) โดยวัสดุลิกโนเซลลูโลส เช่น ชานอ้อย ฟางข้าว เป็นที่น่าสนใจในการใช้เป็นวัตถุดิบในการผลิตพลาสติกชีวภาพภายในประเทศ เนื่องจากประเทศไทยเป็นประเทศเกษตรกรรมที่มีปริมาณของวัสดุเหลือทิ้งด้านการเกษตรปริมาณมหาศาล นอกจากแหล่งวัตถุดิบราคาถูกแล้วอีกหนึ่งในปัจจัยที่ส่งผลต่อปริมาณพลาสติกที่ผลิตได้คือสายพันธุ์ของจุลินทรีย์ที่สามารถใช้น้ำตาลและทนต่อสารพิษต่าง ๆ ที่เป็นผลพลอยได้จากการเตรียมไฮโดรไลเซทได้ดี

ผลจากการคัดเลือกเชื้อที่ผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตในเบื้องต้นด้วยอาหารเลี้ยงเชื้อ NA ที่เติมน้ำตาลซูโครสร้อยละ 5 นั้นพบแบคทีเรียสามารถผลิตพลาสติกชีวภาพจำนวน 23 ไอโซเลท

แต่เมื่อทำการคัดเลือกเชื้อดังกล่าวในอาหารเลี้ยงเชื้อที่มีไฮโดรไลเซทชานอ้อยเป็นวัตถุดิบพบเชื้อที่สามารถสร้างพลาสติกชีวภาพได้ลดลงเป็น 10 ไอโซเลท ทั้งนี้อาจเนื่องจากองค์ประกอบของไฮโดรไลเซทที่มีสารพิษ เช่น furfural (Thammasittirong et al., 2017) ที่ปนมาจึงอาจเป็นพิษต่อเซลล์ โดยเชื้อแบคทีเรียบางไอโซเลทอาจไม่สามารถทนต่อสารพิษได้ หรือเป็นสภาวะที่ไม่เหมาะสมต่อการเจริญดังจะพบได้จากการสร้างสปอร์ที่เพิ่มสูงขึ้นในเชื้อแบคทีเรียไอโซเลท S2-1 และ S19-4 ในขณะที่ไอโซเลทที่ S77-3 ยังสามารถผลิตและสะสมพลาสติกชีวภาพได้สูงในอาหารเลี้ยงเชื้อไฮโดรไลเซท พบการสร้างสปอร์น้อยกว่า แสดงถึงความสามารถในการทนต่อสารพิษที่พบในไฮโดรไลเซทได้ดีกว่า และจากการศึกษาความเข้มข้นไฮโดรไลเซทชานอ้อยที่เหมาะสมเพื่อใช้เป็นแหล่งคาร์บอนและพลังงานของเชื้อ S77-3 พบว่าที่ทุกความเข้มข้นน้ำตาลจากไฮโดรไลเซทชานอ้อยเชื้อ S77-3 สามารถผลิตพลาสติกสะสมไว้ภายในเซลล์ได้ แต่ขนาดของอนุภาคพลาสติกชีวภาพภายในเซลล์ค่อนข้างใหญ่เมื่อเลี้ยงในอาหารเลี้ยงเชื้อที่น้ำตาลจากไฮโดรไลเซทชานอ้อยความเข้มข้นร้อยละ 0.5 ขึ้นไป

จากการจัดจำแนกสายพันธุ์โดยวิธีทางอณูชีวิทยาของแบคทีเรียไอโซเลท S77-3 ที่พบว่าไอโซเลท S77-3 เป็นแบคทีเรีย *B. cereus* สอดคล้องกับงานวิจัยที่รายงานถึงเชื้อที่สามารถสังเคราะห์พลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยใช้ไฮโดรไลเซทจากชานอ้อยเป็นแหล่งคาร์บอน ส่วนใหญ่เป็นเชื้อในจีนัส *Bacillus* หรือจีนัสใกล้เคียง เช่น Saratale et al. (2021) รายงานถึงเชื้อแบคทีเรีย *Lysinibacillus* sp. ที่สามารถผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยใช้ชานอ้อยเป็นวัตถุดิบ โดยผลิตได้ 5.31 กรัมต่อลิตร ในสภาวะการเลี้ยงที่เหมาะสม Adamu & Bukar. (2022) รายงานถึงการแยกเชื้อ *Bacillus velezensis* จากตัวอย่างดินและพบว่าเชื้อสามาถสร้างพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยใช้ชานอ้อยเป็นวัตถุดิบ โดยผลิตพลาสติกได้สูงสุด 0.737 กรัมต่อลิตรที่ความเข้มข้นไฮโดรไลเซทร้อยละ 3.0 แม้ว่าการผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยเชื้อ *B. cereus* S77-3 ยังอยู่ในระดับไม่สูงมาก เนื่องจากยังคงต้องศึกษาถึงปัจจัยอื่น ๆ ให้เหมาะสมเพิ่มเติม เช่น ผลของแหล่งไนโตรเจน พีเอช หรือระยะเวลาในการเพาะเลี้ยงเชื้อ เป็นต้น

ข้อเสนอแนะ

เนื่องจากการทดลองในครั้งนี้มุ่งเน้นเพื่อคัดกรองเชื้อแบคทีเรียที่มีความสามารถในการผลิตพลาสติกชีวภาพพอลิไฮดรอกซีบิวทิเรตโดยใช้วัสดุเหลือทิ้งการการเกษตรคือชานอ้อยที่จะส่งผลให้ต้นทุนในการผลิตพลาสติกชีวภาพลดลง สภาวะที่เหมาะสมในการเพาะเลี้ยงเชื้อแบคทีเรีย *B. cereus* S77-3 เพื่อให้ผลิตพลาสติกชีวภาพได้ปริมาณสูงยังคงเป็นสิ่งจำเป็นที่จะต้องศึกษาต่อไป

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การวิเคราะห์ทางนิติวิทยาศาสตร์ของลิปสติกด้วยเทคนิค ATR-FTIR และการวัดสี

Forensic Analysis of Lipstick Using ATR-FTIR and Color Measurement

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บทคัดย่อ

ลิปสติกเป็นเครื่องสำอางยอดนิยมที่นำมาใช้ในหมู่ผู้หญิงและผู้ชาย สามารถพบร่องรอยของลิปสติกในการปนเปื้อนบนพื้นผิวต่าง ๆ ได้ ดังนั้นการระบุร่องรอยของลิปสติกในที่เกิดเหตุอาจเป็นหลักฐานสำคัญทางด้านนิติวิทยาศาสตร์ในการนำไประบุตัวคนร้ายได้ ในการศึกษาครั้งนี้วิเคราะห์ลิปสติกที่สามารถพบได้ง่ายในท้องตลาดจำนวน 20 ตัวอย่าง โดยใช้เทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) ในช่วงความยาวคลื่น 400 - 4000 cm^{-1} ทำการทดลองในกรณีที่ไม่มีพื้นผิวและทดลองบนพื้นผิวที่เป็นผ้าดิบ พบว่าลิปสติกแต่ละตัวอย่างมีเลขคลื่นที่แตกต่างกัน จึงส่งผลให้ค่าสถิติอำนาจในการแยก (Discriminating power: DP) มีค่า 100% และในส่วนการทดลองวัดค่าสี (Color Measurement) ของร่องรอยลิปสติกบนผ้าดิบโดยใช้เครื่อง Spectrophotometer พบว่า ในทุกตัวอย่างแสดงผลค่าสีออกมาแตกต่างกัน เมื่อนำมาคำนวณเพื่อหาค่าความแตกต่างของสี (ΔE) สามารถบ่งบอกได้ว่า ลิปสติกทุกตัวอย่างมีค่าเฉดสีที่แตกต่างกันออกไป ซึ่งทำให้ข้อมูลที่ได้จากงานวิจัยนี้สามารถแยกตัวอย่างของลิปสติกเพื่อนำมาประยุกต์ในงานทางนิติวิทยาศาสตร์ได้

คำสำคัญ: ลิปสติก, นิติวิทยาศาสตร์, Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR), Spectrophotometer, อำนาจในการแยก

Abstract

Lipstick is a popular cosmetic product used by both women and men. Traces of lipstick can be found in contaminants on various surfaces. Therefore, identifying traces of lipstick at the crime scene may be important forensic evidence in identifying the criminal. In this study, 20 samples of easily found lipsticks were analyzed using the Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) in the wavelength range of

400-4000 cm^{-1}. The experiment was conducted in the absence of a surface and experiment on a calico surface. It was found that each lipstick sample had a different wavenumber. Therefore, resulting in the discriminating power statistic has a value of 100%. In the experimental part the color measurement of lipstick traces on the calico using Spectrophotometer found that every sample displayed different color values. When calculated to find the color difference (ΔE), it can indicate that every lipstick sample has a different shade value. This allows the information obtained from this research to separate samples of lipstick for application in forensic science.

Keywords : lipstick, forensic science, Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR), Spectrophotometer, discriminating power

บทนำ

ปัจจุบันลิปสติกเป็นผลิตภัณฑ์เครื่องสำอางที่นำมาใช้อย่างแพร่หลายมีส่วนประกอบที่สำคัญคือ น้ำมัน ขี้ผึ้ง และสารให้ความชุ่มชื้น ใช้สำหรับทาปากให้มีสีสันสวยงามและสร้างความชุ่มชื้นให้กับริมฝีปาก โดยส่วนใหญ่ลิปสติกมักนิยมใช้ในหมู่ผู้หญิง แต่ในหมู่ผู้ชายก็สามารถใช้ในการบำรุงริมฝีปากได้ ซึ่งลิปสติกมีสีและประเภทให้เลือกใช้ได้หลากหลายเช่นเดียวกับเครื่องสำอางทั่ว ๆ ไป เช่น ลิปสติกเนื้อแมท (Matte Lipstick) ลิปบาล์ม (Lip balm) ลิปสติกเนื้อครีม (Cream Lipstick) และทินส์ (Tins) เป็นต้น (อุษณา เที่ยงมณี, 2564)

ปัญหาอาชญากรรมในปัจจุบันมีแนวโน้มของความรุนแรง และความซับซ้อนเพิ่มมากขึ้นตามความเจริญก้าวหน้าของเทคโนโลยี และความทันสมัยของการสื่อสารต่าง ๆ สิ่งที่จะยืนยันได้ก็คือ สถิติคดีอาชญากรรมที่เพิ่มขึ้น ไทยรัฐออนไลน์ (2567) เสนอข่าวอาชญากรรมในสื่อต่าง ๆ ของปี 2566 ประเทศไทยมีคดีที่เกี่ยวกับชีวิต ร่างกาย และเพศ โดยมีการแจ้งความ 17,848 คดี จับกุมได้ 16,678 คดี จำนวนคนร้าย 22,045 คน เรียกว่า จับกุมได้ 93.44% โดยคดีที่ก่อเหตุมากที่สุด คือ การทำร้ายร่างกาย 9,616 คดี รองลงมาคือ พยายามฆ่า 2,241 คดี ข่มขืน 1,885 คดี และฆ่าผู้อื่น 1,308 คดี (ข้อมูลจากสำนักงานตำรวจแห่งชาติ เก็บระหว่างวันที่ 1 ต.ค. 65 ถึง 30 ก.ย. 66) ซึ่งมีแนวโน้มเพิ่มขึ้นมาจากปี 2565 ซึ่งภาพรวมในปี 2565 (ข้อมูล วันที่ 1 ต.ค. 64 ถึง 30 ก.ย. 65) คดีความผิดเกี่ยวกับชีวิตและร่างกาย มีแจ้งความ 15,038 คดี จับกุมได้ 14,395 คดี มีผู้กระทำความผิด 17,980 คน แบ่งเป็นคดีทำร้ายร่างกายมากที่สุด 6,985 คดี รองลงมา พยายามฆ่า 1,732 คดี ข่มขืน 1,577 คดี และฆ่าผู้อื่น 1,210 คดี

นิติวิทยาศาสตร์ (Forensic Science) คือ การนำความรู้ทางด้านวิทยาศาสตร์ทุกสาขามาประยุกต์ ใช้ เพื่อประโยชน์ในการคลี่คลายปัญหา และการพิสูจน์ข้อเท็จจริง ซึ่งนิติวิทยาศาสตร์สามารถจำแนกได้ 2 ประเภท คือ นิติวิทยาศาสตร์ที่เป็นวิทยาศาสตร์ธรรมชาติ เช่น การพิสูจน์หลักฐาน การตรวจ

สถานที่เกิดเหตุ รวมถึงการเก็บวัตถุพยานในสถานที่เกิดเหตุ เป็นต้น และนิติวิทยาศาสตร์ที่เป็นวิทยาศาสตร์ประยุกต์ โดยการนำความรู้ทางวิทยาศาสตร์ในสาขาต่าง ๆ มาประยุกต์ให้เป็นประโยชน์ต่อกระบวนการยุติธรรม เช่น การตรวจสถานที่เกิดเหตุ การตรวจลายนิ้วมือฝ่ามือฝ่าเท้า การตรวจร่องรอยการเฉี่ยวชน การตรวจทางนิติเวช และการตรวจทางชีววิทยา เป็นต้น โดยพยานหลักฐานทางนิติวิทยาศาสตร์เป็นที่ยอมรับในหลายประเทศ (ศรันยา สีมา, 2563).

ในด้านนิติวิทยาศาสตร์การเก็บพยานหลักฐานและพยานวัตถุจึงเป็นสิ่งที่มีความจำเป็นอย่างมากสำหรับการนำไปพิสูจน์ข้อเท็จจริงเกี่ยวกับคดีความเพื่อสามารถเชื่อมโยงไปยังตัวผู้กระทำความผิดได้ ผู้วิจัยจึงคาดว่าการตรวจหาคราบร่องรอบลิปสติกถือเป็นพยานหลักฐานที่สำคัญ ในการช่วยไขคดีความได้ เนื่องจากอาจพบร่องรอยคราบลิปสติกในสถานที่เกิดเหตุ เช่น ร่องรอยบนเสื้อผ้า ร่องรอยบนกระดาษทิชชู รวมถึงร่องรอยบนแก้วน้ำได้ ดังนั้นผู้วิจัยจึงสนใจที่จะศึกษาการจำแนกลักษณะพิเศษของลิปสติกโดยใช้เทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) ซึ่งเป็นเทคนิคทางเคมีที่ใช้ในการวิเคราะห์ตรวจสอบถึงหมู่ฟังก์ชันของโมเลกุลของสารได้ นำมาวิเคราะห์ด้วยสถิติอำนาจจำแนก (Discriminating power: DP) และมีการใช้เครื่อง Spectrophotometer ในการหาค่าสีในระบบ CIE เพื่อนำมาแสดงผลในรูปแบบความแตกต่างของสี (ΔE) เพื่อแยกความแตกต่างของแต่ละตัวอย่าง

วัตถุประสงค์ของการวิจัย

1. เพื่อจำแนกลักษณะพิเศษของลิปสติกและร่องรอยลิปสติกแต่ละชนิดที่ติดผ้าดิบด้วยเทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) ได้
2. เพื่อแยกความแตกต่างของสี (ΔE) ในตัวอย่างร่องรอยลิปสติกแต่ละชนิดที่ติดบนผ้าดิบ ด้วยเครื่อง Spectrophotometer ได้

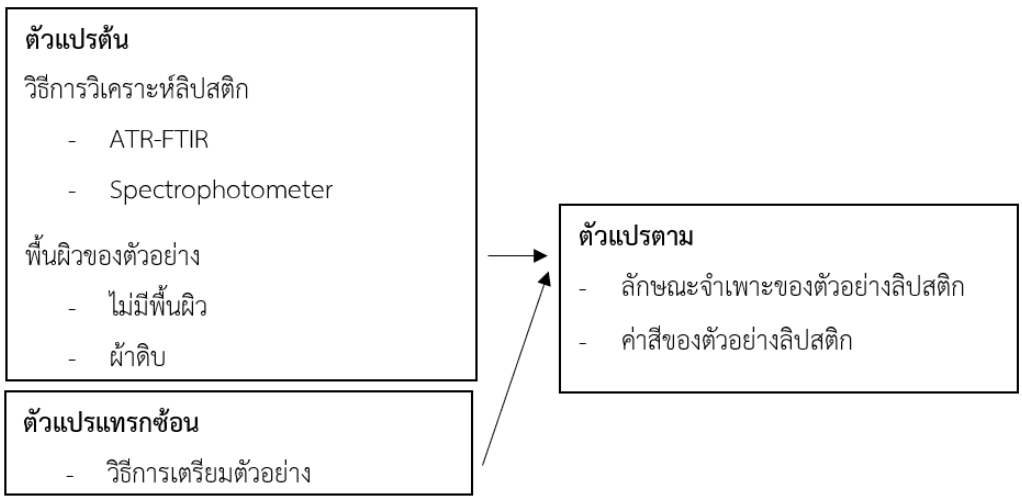
แนวคิด ทฤษฎี กรอบแนวคิด

ลิปสติก (lipstick) เป็นผลิตภัณฑ์เครื่องสำอางที่ประกอบด้วยรงควัตถุ น้ำมัน ขี้ผึ้ง และสารให้ความชุ่มชื้น ใช้สำหรับทาสี ลวดลาย และเกราะป้องกันไว้บนริมฝีปาก เป็นเครื่องสำอางชนิดแรกๆ ที่ผู้หญิงมักนึกถึงและใช้กันอย่างกว้างขวาง จึงถือว่าเป็นของคู่กับผู้หญิงในทุกยุคทุกสมัย นอกจากจะช่วยให้ริมฝีปากชุ่มชื้น ช่วยปกป้องผิวของริมฝีปากแล้ว ยังช่วยแต่งเติมรูปปากให้สวยงามขึ้น แต่งสีให้สะดุดตา ลิปสติกมีหลากหลายรูปแบบและหลากหลายสีสัน โดยทั่วไปลิปสติกมีส่วนประกอบหลักอยู่ 3 ส่วน ดังนี้ แว็กซ์ หรือไขแข็ง (Wax), น้ำมัน (Oil) และ สีย้อม (Dye) (บริษัท มีดี ไซน์ จำกัด, 2565)

เทคนิค Infrared Spectroscopy เป็นเทคนิคที่นิยมใช้ในการวิเคราะห์ตรวจสอบโมเลกุลของสารโดยอาศัยหลักการการสั่น (Vibration) ของโมเลกุล โดยการวัดค่าการดูดกลืนแสงที่อยู่ในช่วงอินฟราเรดอยู่ในช่วงเลขคลื่นประมาณ 12800 ถึง 10 cm^{-1} จำแนกออกเป็น 3 ช่วง คือ ย่านอินฟราเรดใกล้ Near IR

(4,000 – 12,800 cm^{-1}) ย่านอินฟราเรดกลาง Mid IR (200 – 4,000 cm^{-1}) และย่านอินฟราเรดไกล Far IR (10 – 200 cm^{-1}) เมื่อสารอินทรีย์ดูดกลืนรังสีย่านอินฟราเรดกลางหรือเรียกว่า ความถี่ ทำให้เกิดแทรนซิชันการสั่นพร้อมกับแทรนซิชันการหมุน เรียกเทคนิคนี้ว่า อินฟราเรดสเปกโทรสโกปี ซึ่งทรานซิชันการสั่นนี้จะทราบชนิดหมู่ทำหน้าที่ เช่น พันธะคู่ พันธะสาม หมู่คาร์บอนิล หมู่ไฮดรอกซิล หมู่อะมิโน หรือภายในโครงสร้างของสาร เมื่อนำมารวมกับเทคนิควิเคราะห์แบบ Attenuated Total Reflectance (ATR) มีอุปกรณ์สำหรับการวิเคราะห์ตัวอย่างแบบสัมผัสตัวอย่าง (Single Reflection ATR) 2 แบบ คือแบบที่ 1 ส่วนรองรับตัวอย่างเป็นผลึกเจอร์มาเนียม (Germanium Crystal) ให้ช่วงการใช้งานที่ความยาวคลื่นตั้งแต่ 5,500-550 cm^{-1} และแบบที่ 2 ส่วนรองรับตัวอย่างเป็น เพชร (Pure Diamond) ให้ช่วงการใช้งานที่ความยาวคลื่นตั้งแต่ 6,000-80 cm^{-1} เทคนิควิเคราะห์แบบ ATR สามารถตรวจวิเคราะห์ตัวอย่างได้ทั้ง ของแข็ง ของเหลว และแผ่นฟิล์มบางได้ และไม่ต้องเตรียมสารตัวอย่างใช้เวลาในการวิเคราะห์อย่างรวดเร็ว (ศิรินิตย์ ธารธาดา และ ปฐมาพร อำนาจอนันต์, 2561).

การวัดสี (Color Measurement) สีคือ คุณสมบัติเชิงแสงที่บอกลักษณะภายนอกของผลิตภัณฑ์ และถูกนำมาเป็นตัวแปรหนึ่งในการกำหนดมาตรฐานของผลิตภัณฑ์ หลายโรงงานอุตสาหกรรมประสบปัญหาการควบคุมคุณภาพของสีจากกระบวนการตรวจวัดสีด้วยสายตาจากคนธรรมดา ซึ่งมีความคลาดเคลื่อนสูง เกิดจากหลากหลายปัจจัยเช่น แหล่งกำเนิดแสง สายตาบุคคล เป็นต้น หนึ่งในองค์กรสำคัญที่กำหนดหน่วยการวัดสีให้เป็นมาตรฐาน คือ International Commission on Illumination แต่ตัวย่อเป็นภาษาฝรั่งเศส Commission International de l'Eclairage (CIE) เพื่อลดความคลาดเคลื่อนในการตรวจวัดสีเนื่องจากสายตาและแหล่งกำเนิดแสง CIE ได้กำหนดหน่วยวัดสีมีสัญลักษณ์ L*-a*-b* โดยทั้ง 3 ตัวแปรมีรายละเอียดดังนี้ แกน L* บ่งบอกถึง ความสว่าง (lightness) มี ค่าตั้งแต่ 0-100 โดย 0 คือ สีดำ และ 100 คือ สีขาว แกน a* บรรยายแกนสี จากสีเขียว (-a*) จนถึง สีแดง (+a*) แกน b* บรรยายแกนสี จากสีน้ำเงิน (-b*) จนถึงสีเหลือง (+b*) (PT ALL INSTRUMENT, 2562)



ภาพที่ 1 กรอบแนวคิดในการวิจัย

วิธีดำเนินการวิจัย

1. การเตรียมตัวอย่าง

สุ่มตัวอย่างลิปสติกที่วางขายในท้องตลาดที่สามารถหาซื้อง่าย มีราคาไม่แพง และเป็นที่นิยม จำนวน 20 ตัวอย่าง หลังจากนั้นทำการเตรียมตัวอย่างผ้า โดยการตัดผ้าดิบให้มีขนาด 5×5 เซนติเมตร โดยลิปสติกทั้ง 20 ตัวอย่างแสดงดังตารางที่ 1

ตารางที่ 1 ยี่ห้อและรุ่นของตัวอย่างลิปสติก

ตัวอย่าง	ยี่ห้อและรุ่นของตัวอย่าง
1	Merrez'ca glow ink color lip tint 03
2	Merrez'ca glow ink color lip tint 04
3	Sasi jolly sweet lip tint 02
4	Sasi jolly sweet lip tint 01
5	4U2 make love lip glam 02
6	4U2 it's you lip glam vol.2 08
7	Sasi jolly sweet lip tint 05
8	4U2 jelly tint 06 M&M
9	Sasi fruity pop lip balm orange
10	Maybelline New York sensational liquid matte 06
11	Maybelline New York sensational liquid matte 02
12	Cute press superpower silky matte 05
13	4U2 Heart dance velvet lip V59
14	Cute press Heart ID matte lip 13
15	Mamond Creamy Tint color balm intense 11
16	Beauty cottage elegant impressionist semi matte lipstick 09
17	odbo baby tint
18	Sasi Fruity POP Lip Balm Cherry
19	sistar velvet matte mousse lip color 02 Autumn rust
20	Cute Press Nonstop Beauty Matte Lock Liquid Lip 04 Sand Dune

2. การวิเคราะห์ตัวอย่างด้วยเครื่อง ATR-FTIR

2.1 การวิเคราะห์หมู่ฟังก์ชันของลิปสติกโดยตรง (ไม่มีพื้นผิว)

นำตัวอย่างลิปสติกทั้ง 20 ตัวอย่าง วิเคราะห์ด้วยเครื่อง ATR-FTIR โดยมีการตั้งค่าดังนี้ Background ที่ใช้เป็นอากาศที่อยู่ในห้องการทดลอง Wavenumber 4000 ถึง 400 cm^{-1} Resolution 4 cm^{-1} Accumulations 16 scan Force guage 60 แล้วบันทึกผลสเปกตรัมที่ได้

2.2 การวิเคราะห์หมู่ฟังก์ชันของลิปสติกบนพื้นผิวที่เป็นผ้า

นำตัวอย่างลิปสติกทาที่ปากหลังจากนั้นทิ้งไว้ให้แห้งประมาณ 5 นาที (1 ครั้ง / 1 ตัวอย่าง) แล้วนำผ้าดิบที่เตรียมไว้ (1 ตัวอย่าง/ 1 ชนิดของลิปสติก) มาทาบที่บริเวณปากที่ทาลิปสติกไว้ หลังจากนั้นนำ

ผ้าตัวอย่างที่ได้วิเคราะห์ด้วยเครื่อง ATR-FTIR โดยมีการตั้งค่าดังนี้ Background ที่ใช้เป็นอากาศที่อยู่ในห้องการทดลอง Wavenumber 4000 ถึง 400 cm^{-1} Resolution 4 cm^{-1} Accumulations 16 scan Force guage 60 แล้วบันทึกผลสเปกตรัมที่ได้

3. การวิเคราะห์ตัวอย่างด้วยเครื่อง Spectrophotometer

นำตัวอย่างผ้าที่มีร่องรอยของลิปสติกแล้วมาสแกนลงบริเวณกล้องส่องของเครื่อง Spectrophotometer โดยมีการตั้งค่าดังนี้ Blank คือผ้าที่สะอาดไม่มีร่องรอยเปื้อน โดยมีการตั้งค่าความยาวคลื่นช่วง 360-830 nm, Interval 1 nm และ Observer Angle 2 Degrees แล้วบันทึกค่า L*a*b ที่ได้

4. การวิเคราะห์ข้อมูล

4.1 วิเคราะห์ข้อมูลจากเทคนิค ATR-FTIR

เมื่อได้ข้อมูลจากการวิเคราะห์ด้วยเทคนิค ATR-FTIR ในการทดลองทั้งสองคือ การวิเคราะห์หมู่ฟังก์ชันของลิปสติกโดยตรง (ไม่มีพื้นผิว) และการวิเคราะห์หมู่ฟังก์ชันของลิปสติกบนพื้นผิวที่เป็นผ้า นำข้อมูลสเปกตรัมที่ได้มาสร้างตารางเพื่อหาจุดที่แตกต่างของพีคที่ Wavenumber ต่างๆ หลังจากนั้นนำข้อมูลที่ได้มาคำนวณทางสถิติ โดยสถิติที่ใช้คือ สถิติอำนาจจำแนก (Discriminating power: DP) มีสูตรตามการศึกษาก่อนหน้า Vishal S., Anchal B., and Raj K. (2019) กล่าวว่า

อำนาจการจำแนก (DP) = (จำนวนคู่ตัวอย่างที่จำแนกได้/จำนวนคู่ตัวอย่างทั้งหมด) × 100

โดยที่ จำนวนคู่ตัวอย่างที่จำแนกได้ = จำนวนคู่ตัวอย่างทั้งหมด - จำนวนคู่ตัวอย่างที่จำแนกไม่ได้

จำนวนคู่ตัวอย่างทั้งหมด = จำนวนตัวอย่างทั้งหมด × (จำนวนตัวอย่างทั้งหมด - 1) / 2

4.2 วิเคราะห์ข้อมูลจากเครื่อง Spectrophotometer

เมื่อได้ข้อมูลค่า L*a*b ของแต่ละตัวอย่างแล้ว นำค่าที่ได้มาหาค่าความแตกต่างของสี(ΔE) ในทุกตัวอย่างลิปสติก โดยมีสูตรดังนี้

$$\Delta E = \sqrt{(L^*_1 - L^*_2)^2 + (a^*_1 - a^*_2)^2 + (b^*_1 - b^*_2)^2}$$

โดยที่ หมายเลข 1 คือ สีทดสอบที่ 1 หมายเลข 2 คือสีทดสอบที่ 2

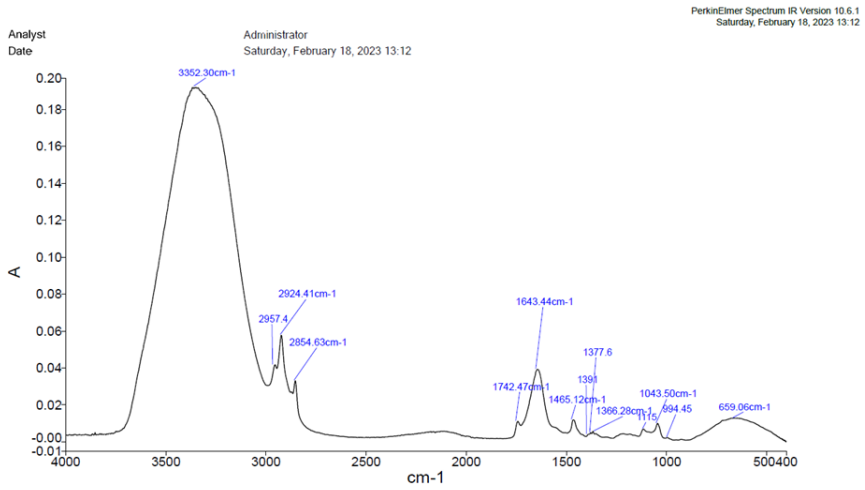
ผลการวิจัย

1. ผลจากการวิเคราะห์ด้วยเทคนิค ATR-FTIR

จากการนำตัวอย่างลิปสติก และตัวอย่างร่องรอยลิปสติกทั้ง 20 ตัวอย่าง มาวิเคราะห์ด้วยเทคนิค ATR-FTIR ที่ช่วงความยาวคลื่น 4000-400 cm^{-1} เพื่อวิเคราะห์จำแนกลักษณะพิเศษของลิปสติกพบว่า

ผลการวิเคราะห์หมู่ฟังก์ชันของลิปสติกโดยตรง (ไม่มีพื้นผิว) ด้วยเทคนิค ATR-FTIR แล้วนำสเปกตรัมที่ได้จากเครื่อง ATR-FTIR ตามภาพที่ 2 มาสรุปว่า แต่ละตัวอย่างมีปรากฏพีคที่เลขคลื่นใดบ้าง พบว่าสเปกตรัมที่ได้ปรากฏพีคของเลขคลื่นหลักที่พบในลิปสติกดังนี้ 3400 cm^{-1}, 2960 cm^{-1}, 1740 cm^{-}

^{1}, 1640 cm^{-1}, 1460 cm^{-1}, 1400 cm^{-1}, 1360 cm^{-1}, 1260 cm^{-1}, 1100 cm^{-1}, 1050 cm^{-1}, 1000 cm^{-1} และ 690 cm^{-1} ซึ่งพีคดังกล่าวเป็นพีคที่พบได้ในเกือบทุกตัวอย่างลิปสติก ซึ่งพีคทั้งหมดที่พบในตัวอย่างลิปสติกแสดงดังตารางที่ 2 และพบว่า หมู่ฟังก์ชันที่คาดว่าพบบนตัวอย่างลิปสติก อย่างเช่นตัวอย่างลิปสติกที่มีเนื้อเป็นน้ำจะพบพีคที่ 3400 cm^{-1} และ 1740 cm^{-1} ซึ่งเป็นพีคของหมู่ฟังก์ชัน O–H stretching และ O-H bending ของน้ำ



ภาพที่ 2 สเปกตรัมของลิปสติกตัวอย่างที่ 1

ตารางที่ 2 พีคของเลขคลื่นที่ทั้งหมดพบในตัวอย่างลิปสติก

Sample	Wavenumber (cm^{-1})												
	3400	2960	1740	1640	1460	1400	1360	1260	1100	1050	1000	670	พีคอื่นๆที่พบ
1	√	√	√	√		√	√		√	√	√	√	2920, 2850
2	√	√	√	√	√				√	√	√	√	2920, 2850, 1360
3	√			√	√				√	√	√		620
4	√			√	√					√			2100
5	√		√	√	√	√	√	√	√	√	√	√	2920, 2850, 1600, 1510, 1160, 790, 720
6	√	√	√		√	√	√	√	√	√	√	√	2920, 2850, 1540, 1160, 790, 720
7	√			√	√				√	√	√	√	1490, 920
8	√	√	√	√	√	√	√	√	√	√	√	√	1190, 920, 790
9	√	√	√	√	√	√	√	√	√	√	√	√	2920, 2850, 1600, 1510, 1160, 820, 720, 470
10		√	√		√	√	√	√	√		√		3600, 2850, 820, 720, 530, 450
11	√	√	√	√	√	√	√	√	√		√	√	3600, 2850, 1790, 1200, 860, 750, 530, 450

ตารางที่ 2 (ต่อ)

Sample	Wavenumber (cm^{-1})												
	3400	2960	1740	1640	1460	1400	1360	1260	1100	1050	1000	670	พีคอื่นๆที่พบ
12	√	√	√		√	√	√	√	√				2920, 2850, 840, 790
13	√	√	√		√	√	√	√		√	√	√	2890, 1600, 1180, 840, 620
14	√	√	√	√	√		√	√	√	√	√		2920, 2850, 1540, 720, 460
15	√	√	√	√	√		√	√			√	√	2920, 2850, 1570, 1160, 840, 790, 750
16	√	√	√	√	√	√	√	√	√	√		√	3070, 2920, 2850, 840, 720, 540, 480
17				√					√	√	√		3300, 2100, 590
18		√	√	√	√	√	√	√	√	√	√	√	2920, 2850, 2730, 1600, 1510, 760, 480
19		√	√		√	√	√	√		√		√	2920, 2850, 1190, 1150, 860, 760, 480
20	√	√	√	√	√	√	√	√	√	√	√	√	2920, 2850, 2160, 1430, 1170, 860, 760, 700, 600, 550, 480

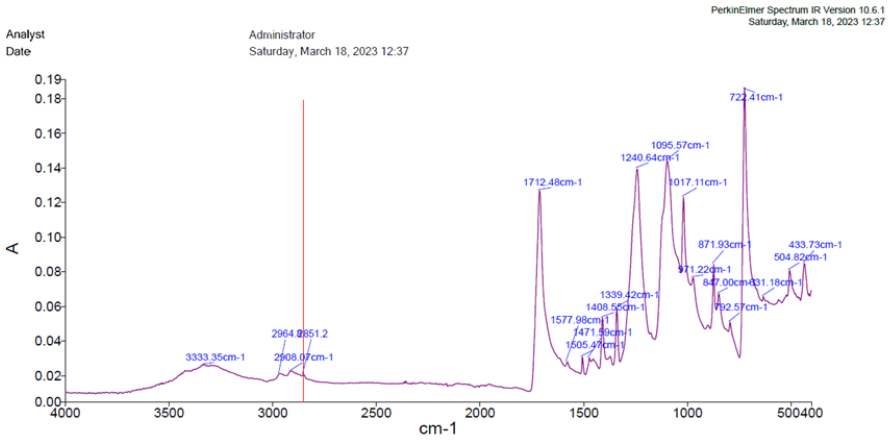
เมื่อนำข้อมูลในตารางที่ได้มาทำการคำนวณทางสถิติด้วยการอธิบายด้วยค่าอำนาจจำแนก (Discriminating power: DP) โดยกำหนดให้พีคที่มีเลขคลื่นต่างกันจำนวน 1 พีคขึ้นไป จึงจะบ่งชี้ได้ว่าตัวอย่างลิปสติกมีความแตกต่างกัน ซึ่งในการศึกษาในครั้งนี้มีจำนวนคู่ตัวอย่างทั้งหมด 190 คู่ตัวอย่าง และเมื่อทำการเปรียบเทียบแต่ละคู่ตัวอย่างพบว่า ทุกคู่ตัวอย่างพีคมีเลขคลื่นต่างกันจำนวน 1 พีคขึ้นไปทั้งหมด จึงส่งผลให้เมื่อนำค่าไปแทนในสูตรเพื่อหาค่าอำนาจจำแนก (DP) มีค่าเท่ากับ 100%

จากสูตร DP = (จำนวนคู่ตัวอย่างที่จำแนกได้/จำนวนคู่ตัวอย่างทั้งหมด) × 100

DP = (190/190) × 100

DP = 100%

ผลการวิเคราะห์หมู่ฟังก์ชันของลิปสติกบนพื้นผิวที่เป็นผ้าด้วยเทคนิค ATR-FTIR แล้วนำสเปกตรัมที่ได้จากเครื่อง ATR-FTIR ตามภาพที่ 3 มาสรุปว่า แต่ละตัวอย่างมีปรากฏพีคที่เลขคลื่นใดบ้าง พบว่าสเปกตรัมที่ได้ปรากฏพีคของเลขคลื่นหลักที่พบในลิปสติกดังนี้ 3330 cm^{-1}, 2960 cm^{-1}, 2920 cm^{-1}, 1710 cm^{-1}, 1580 cm^{-1}, 1500 cm^{-1}, 1460 cm^{-1}, 1400 cm^{-1}, 1240 cm^{-1}, 1090 cm^{-1}, 1010 cm^{-1}, 870 cm^{-1}, 850 cm^{-1}, 790 cm^{-1}, 500 cm^{-1} และ 430 cm^{-1} ซึ่งพีคดังกล่าวเป็นพีคที่พบได้ในทุกตัวอย่างร่องรอยของลิปสติก ดังนั้นพีคที่แสดงในตารางที่ 3 เป็นพีคที่พบในตัวอย่างร่องรอยของลิปสติกเพิ่มเติมจากพีคดังกล่าวด้านบน



ภาพที่ 3 สเปกตรัมของร่องรอยลิปสติกบนผ้าตัวอย่างที่ 7

ตารางที่ 3 พีคของเลขคลื่นเพิ่มเติมที่พบในตัวอย่างร่องรอยลิปสติกบนผ้าดิบ

Sample	Wavenumber (cm^{-1}) ของพีคอื่นที่พบ
1	2850, 1460, 1360, 1330, 970, 890, 720, 630
2	2850, 1460, 1360, 1330, 970, 720
3	2850, 1460, 1370, 1330, 970, 890, 630
4	1460, 1330, 970, 720
5	2850, 1460, 1370, 1330, 970, 720, 630, 550
6	2850, 2100, 1460, 1330, 970, 890, 660, 630
7	2850, 1460, 1330, 970, 720, 630
8	2850, 2360, 1460, 1330, 720, 630, 400
9	2850, 1630, 1600, 1460, 1380, 1360, 1330, 1170, 820, 800, 720, 630
10	2850, 2360, 1460, 1330, 970, 720, 630, 550
11	2850, 2360, 1460, 1360, 1330, 720, 630, 550
12	2850, 2280, 1950, 1460, 1370, 1330, 970, 720, 630
13	1950, 1460, 1360, 1330, 720, 630
14	2850, 1450, 1370, 1330, 890, 720, 630, 550, 400
15	3570, 2850, 2100, 1460, 1370, 1330, 1170, 970, 720, 630, 550
16	3280, 2850, 2280, 1460, 1330, 970, 750, 720, 630, 550
17	3420, 2850, 2160, 1950, 1610, 1460, 1450, 1360, 1330, 1170, 970, 890, 720, 630, 550
18	2870, 2850, 1630, 1600, 1460, 1380, 1360, 1330, 1170, 1030, 980, 970, 890, 820, 800, 760, 720, 630, 550, 520
19	3420, 2850, 2160, 2050, 1950, 1810, 1610, 1460, 1450, 1360, 1330, 1170, 970, 900, 720, 630, 610, 550, 520, 460, 450
20	3420, 3270, 3050, 2870, 2850, 2160, 1950, 1460, 1450, 1370, 1330, 1170, 970, 890, 720, 660, 630, 550, 460, 410

เมื่อนำข้อมูลในตารางที่ได้มาทำการคำนวณทางสถิติด้วยการอธิบายด้วยค่าอำนาจจำแนก (Discriminating power: DP) โดยกำหนดให้พีคที่มีเลขคลื่นต่างกันจำนวน 1 พีคขึ้นไป จึงจะบ่งชี้ได้ว่าตัวอย่างร่องรอยลิปสติกบนผ้ามีความแตกต่างกัน ซึ่งในการศึกษาในครั้งนี้มีจำนวนคู่ตัวอย่างทั้งหมด 190 คู่ตัวอย่าง และเมื่อทำการเปรียบเทียบแต่ละคู่ตัวอย่างพบว่า ทุกคู่ตัวอย่างพีคมีเลขคลื่นต่างกันจำนวน 1 พีคขึ้นไปทั้งหมด จึงส่งผลให้เมื่อนำค่าไปแทนในสูตรเพื่อหาค่าอำนาจจำแนก (DP) มีค่าเท่ากับ 100%

จากสูตร DP = (จำนวนคู่ตัวอย่างที่จำแนกได้/จำนวนคู่ตัวอย่างทั้งหมด) × 100

DP = (190/190) × 100

DP = 100%

2. การวิเคราะห์ด้วยเครื่อง Spectrophotometer

ผลการวิเคราะห์ค่าสีของตัวอย่างร่องรอยลิปสติกบนผ้าด้วยเครื่อง Spectrophotometer พบว่าปรากฏค่า L*a*b ซึ่งเป็นค่าเฉดสีของร่องรอยลิปสติกที่ได้จากการทดลองแต่ละตัวอย่างแตกต่างกัน ซึ่งแสดงค่า L*a*b ของทุกตัวอย่างตามตารางที่ 4

ตารางที่ 4 ค่าสีของตัวอย่างร่องรอยลิปสติกบนผ้าดิบทั้งหมด

Sample	ค่า L*a*b			Sample	ค่า L*a*b		
	L	a	b		L	a	b
1	81.2105	28.8722	22.2222	11	47.4116	39.3428	17.5365
2	84.4826	20.3868	12.8487	12	75.0226	22.8347	17.1596
3	87.9014	23.2715	18.9871	13	83.1316	28.2536	17.7628
4	93.2426	24.9814	6.4920	14	75.5778	32.7523	15.0296
5	89.3704	10.3782	29.3040	15	77.0412	28.5500	13.7592
6	74.0485	30.0911	15.0725	16	59.3405	25.8911	15.3273
7	72.4014	28.0962	9.4445	17	71.2590	44.0444	3.9600
8	88.0019	16.2802	12.7780	18	93.5837	18.8753	1.7179
9	94.4172	17.4505	11.7123	19	74.0412	25.2196	18.7243
10	78.5191	27.6225	10.5609	20	82.3982	30.4011	20.8457

จากนั้นนำค่า L*a*b ที่ได้หาค่าความแตกต่างของสี (ΔE) ในทุกคู่ตัวอย่างร่องรอยของลิปสติกบนผ้า ตามสูตรการคำนวณจะได้ค่าการคำนวณตามตาราง ซึ่งค่า ΔE นี้สามารถบ่งบอกได้ถึงความแตกต่างของสีในทุกตัวอย่างร่องรอยลิปสติกบนผ้าว่ามีความแตกต่างกัน โดยมีค่าตั้งแต่ 2.38 ถึง 52.92 ซึ่งแสดงว่าสามารถแยกความแตกต่างของลิปสติกแต่ละตัวได้

สรุปและอภิปรายผล

จากการวิเคราะห์หมู่ฟังก์ชันของลิปสติกโดยตรง (ไม่มีพื้นผิว) ด้วยเทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) ในช่วงความยาวคลื่น 400-4000 cm^{-1} ของตัวอย่างลิปสติกทั้งหมด 20 ตัวอย่าง พบว่า สเปกตรัมของแต่ละตัวอย่างที่ได้ปรากฏพีคของเลขคลื่นส่วนมากที่พบในตัวอย่างลิปสติกมีดังนี้ 3400 cm^{-1}, 2960 cm^{-1}, 1740 cm^{-1}, 1640 cm^{-1}, 1460 cm^{-1}, 1400 cm^{-1}, 1360 cm^{-1}, 1260 cm^{-1}, 1100 cm^{-1}, 1050 cm^{-1}, 1000 cm^{-1} และ 690 cm^{-1} โดยพีคเหล่านี้เป็นพีคที่บ่งบอกถึง hydroxyl group, hydrogen bonds, aromatic compounds, aliphatic compounds และ silicates ซึ่งเป็นส่วนประกอบที่สำคัญของลิปสติก เมื่อนำสเปกตรัมของแต่ละตัวอย่างมาเปรียบเทียบเป็นคู่ตัวอย่างพบว่า มีคู่ตัวอย่างทั้งหมด 190 คู่ตัวอย่าง สามารถแยกความแตกต่างออกจากกันได้ทุกคู่ตัวอย่าง เมื่อนำมาคำนวณหาค่าสถิติอำนาจในการแยกจึงได้ค่า 100 เปอร์เซ็นต์ แสดงว่าในทุกตัวอย่างลิปสติกมีความแตกต่างกัน

จากการวิเคราะห์หมู่ฟังก์ชันของลิปสติกบนพื้นผิวที่เป็นผ้าดิบด้วยเทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) ในช่วงความยาวคลื่น 400-4000 cm^{-1} ของตัวอย่างร่องรอยลิปสติกทั้งหมด 20 ตัวอย่าง พบว่า สเปกตรัมของแต่ละตัวอย่างที่ได้ปรากฏพีคที่เลขคลื่นในทุกตัวอย่างคือ 3330 cm^{-1}, 2960 cm^{-1}, 2920 cm^{-1}, 1710 cm^{-1}, 1580 cm^{-1}, 1500 cm^{-1}, 1460 cm^{-1}, 1400 cm^{-1}, 1240 cm^{-1}, 1090 cm^{-1}, 1010 cm^{-1}, 870 cm^{-1}, 850 cm^{-1}, 790 $cm^{-1,}$ 500 cm^{-1} และ 430 cm^{-1} เมื่อนำสเปกตรัมของแต่ละตัวอย่างมาเปรียบเทียบเป็นคู่ตัวอย่างพบว่า มีคู่ตัวอย่างทั้งหมด 190 คู่ตัวอย่าง สามารถแยกความแตกต่างออกจากกันได้ทุกคู่ตัวอย่าง เมื่อนำมาคำนวณหาค่าสถิติอำนาจในการแยกจึงได้ค่า 100 เปอร์เซ็นต์ แสดงว่า ในทุกตัวอย่างร่องรอยลิปสติกมีความแตกต่างกัน

จากการวัดค่าสีของตัวอย่างด้วยเครื่อง Spectrophotometer ในช่วงความยาวคลื่น 360-830 nm ของตัวอย่างร่องรอยลิปสติกบนผ้าดิบทั้งหมด 20 ตัวอย่าง พบว่า ปรากฏค่าสีของทุกตัวอย่างออกมาในระบบ CIE Lab scale แตกต่างกัน หลังจากนั้นนำค่าสีที่วัดได้คำนวณหาค่าความแตกต่างของสี (ΔE) ในทุกคู่ตัวอย่างร่องรอยลิปสติกบนผ้าดิบทั้งหมด 190 คู่ตัวอย่าง โดยค่า ΔE นี้สามารถบ่งบอกได้ถึงความแตกต่างของสีในทุกตัวอย่างร่องรอยลิปสติกบนผ้าดิบว่ามีความแตกต่างกัน โดยมีค่าตั้งแต่ 2.38 ถึง 52.92

จากการทดลองในงานวิจัยนี้สามารถสรุปได้ว่าเทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) สามารถจำแนกลักษณะพิเศษของลิปสติกและร่องรอยลิปสติกบนผ้าดิบได้ในทุกตัวอย่าง โดยมีค่าอำนาจในการแยก 100 เปอร์เซ็นต์ และในการทดลองด้วยเครื่อง Spectrophotometer สามารถจำแนกความแตกต่างค่าเฉดสีของร่องรอยลิปสติกบนผ้าดิบได้ในทุกตัวอย่าง จึงสามารถสรุปได้ว่า เทคนิค Attenuated Total Reflection Fourier Transform Infrared Spectroscopy (ATR-FTIR) และ Spectrophotometer สามารถจำแนกลักษณะพิเศษของลิปสติกและร่องรอยลิปสติกบนผ้าดิบได้ และสามารถนำมาประยุกต์ใช้ในงานด้านนิติวิทยาศาสตร์ได้

ข้อเสนอแนะ

ในการศึกษาครั้งต่อไปผู้วิจัยควรทำการศึกษาการเปลี่ยนพื้นผิวของร่องรอยลิปสติกเป็นชนิดอื่น, ระยะเวลาในการจัดเก็บตัวอย่างเมื่อเวลาผ่านไป และทำการทดลองในตัวอย่างลิปสติกที่หลากหลายมากกว่านี้ เพื่อให้ได้ข้อมูลและเพิ่มขอบเขตของข้อมูล

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ประสิทธิภาพของผงก้านบอนและใบบอนต่อการบำบัดสังกะสีในน้ำเสียจากกระบวนการวิเคราะห์ซัลไฟด์

Efficiency of Colocasia Esculenta (L.)Stem and Colocasia Esculenta (L.)Leaf Powder for Treating Zinc in Wastewater from Sulfide Analysis

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บทคัดย่อ

งานวิจัยนี้เป็นการศึกษาเชิงทดลองเพื่อศึกษาประสิทธิภาพของผงก้านบอนและใบบอนต่อการบำบัดสังกะสีในน้ำเสียจากกระบวนการวิเคราะห์ซัลไฟด์ โดยแบ่งชุดการทดลองออกเป็น ชุดควบคุม ชุดที่ใส่ผงก้านบอน 1 กรัม และ 2 กรัม และชุดที่ใส่ผงใบบอน 1 กรัม และ 2 กรัม ชุดที่ใส่ผงก้านบอนและผงใบบอนผสมกันอย่างละ 0.5 กรัม และ 1 กรัม รวมทั้งหมด 7 ชุดการทดลองเริ่มจากนำก้านบอนและใบบอนมาตัดให้มีขนาดเล็ก และอบให้แห้งที่อุณหภูมิ 80-100 ℃ เป็นเวลา 4 วัน จากนั้นบดละเอียดและร่อนด้วยตระแกรงขนาด 30 Mesh ทำการชั่งผงก้านบอนและใบบอนใส่ขวดรูปชมพู่ที่มีน้ำเสียจากการวิเคราะห์ซัลไฟด์ปริมาตร 100 มล. ความเข้มข้นตั้งต้นสังกะสีของน้ำเสียอยู่ในช่วงประมาณ 21.44 – 38.52 mg/L นำไปเข้าเครื่องเขย่าด้วยความเร็ว 150 รอบ/นาที เป็นเวลา 5 นาที จากนั้นนำไปทำการหมุนเหวี่ยงจนเกิดการแยกชั้นของสารละลายและส่วนของผงบอน ตวงส่วนใสจำนวน 50 มล. ไปทำการย่อยด้วยวิธี Wet Acid Digestion ก่อนนำไปตรวจหาสังกะสีด้วยเครื่อง Atomic Absorption Spectrophotometer และวิเคราะห์ประสิทธิภาพการบำบัดของแต่ละชุดการทดลอง นำเสนอข้อมูลด้วย ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และร้อยละ ผลการศึกษาพบว่า การใช้ผงก้านบอนและใบบอนที่ปริมาณ 2 กรัม มีประสิทธิภาพในการบำบัดสังกะสีสูงกว่าการใช้ที่ปริมาณ 1 กรัม โดยชุดผงก้านบอนที่ 2 กรัม ให้ประสิทธิภาพที่ดีที่สุด ร้อยละ 48.27 รองลงมาคือชุดที่ใช้ผงก้านบอนผสมกับใบบอนอย่างละ 0.5 กรัม มีประสิทธิภาพการบำบัดได้ร้อยละ 41.91 สำหรับค่า pH หลังการบำบัดมีค่าสูงขึ้นทุกชุดการทดลอง หากจะนำไปใช้บำบัดจริงควรมีการเพิ่มรอบบำบัดเป็นสองรอบเพื่อจะได้ประสิทธิภาพในการบำบัดที่ดีเพิ่มขึ้น

คำสำคัญ : โลหะหนัก, น้ำเสีย, ต้นบอน

Abstract

This experimental study investigates the efficiency of Colocasia esculenta (L.) stem and Colocasia esculenta (L.) leaf powder for treating zinc in wastewater from sulfide analysis. The experiments were divided into control groups and groups treated with Colocasia esculenta (L.) stem and Colocasia esculenta (L.) leaf powder individually at doses of 1 gram and 2 grams each, and groups treated with a combination of Colocasia esculenta (L.) stem and Colocasia esculenta (L.) leaf powder at doses of 0.5 grams and 1 gram each. In total, there were seven experimental sets. The process started with cutting Colocasia esculenta (L.) stems and leaves into small sizes and then drying them at 80-100 °C for four days. The dried material was then finely ground and sieved through a 30 Mesh sieve. The Colocasia esculenta (L.) stem and Colocasia esculenta (L.) leaf powder were weighed and added to 100 ml bottles containing wastewater with initial zinc concentrations ranging from 21.44 to 38.52 mg/L, as determined by sulfide analysis. The bottles were then placed in a shaker at a speed of 150 rpm for 5 minutes. Subsequently, the mixtures were centrifuged to separate the solution layer from the Colocasia esculenta (L.) powder. A 50 mL portion of the clear solution was taken and subjected to wet acid digestion before analyzing the zinc content using an Atomic Absorption Spectrophotometer. The treatment efficiency of each experimental group was presented as the average value, standard deviation, and percentage. The study found that using 2 grams of Colocasia esculenta (L.) stem and Colocasia esculenta (L.) leaf powder was more effective in treating zinc than using 1 gram. Specifically, the group with 2 grams of Colocasia esculenta (L.) stem powder showed the highest efficiency at 48.27%, followed by a combination of 0.5 grams of Colocasia esculenta (L.) stem powder and 0.5 grams of Colocasia esculenta (L.) leaf powder with an efficiency of 41.91%. The pH values increased in all experimental groups after treatment. For practical treatment applications, it is recommended that two treatment cycles be conducted for improved efficiency in wastewater treatment.

Keywords : Heavy metals, Wastewater, Colocasia esculenta (L.)

บทนำ

ห้องปฏิบัติการสิ่งแวดล้อมของวิทยาลัยแพทยศาสตร์และการสาธารณสุข มหาวิทยาลัยแห่งหนึ่ง มีภารกิจหลักในการเรียนการสอนรายวิชาปฏิบัติการที่เกี่ยวกับการวิเคราะห์คุณภาพน้ำ และยังมีการให้บริการวิเคราะห์คุณภาพน้ำทิ้งจากโรงพยาบาลและสถานประกอบการ ซึ่งมีการให้บริการตรวจวิเคราะห์

ในหลากหลายพารามิเตอร์ ยกตัวอย่างเช่น ค่าบีโอดี (Biological Oxygen Demand; BOD) ค่าไนโตรเจน (Nitrogen) ในรูป ที เค เอ็น (TKN) และ ค่าซัลไฟด์ (Sulfide) เป็นต้น โดยในการวิเคราะห์คุณภาพน้ำเสียตามพารามิเตอร์เหล่านี้ จะทำให้เกิดน้ำเสียที่มีโลหะปนเปื้อน เช่น สารแมงกานีส (Mn) ที่เป็นส่วนประกอบของแมงกานีสซัลเฟตจากขั้นตอนการวิเคราะห์ BOD สารคอปเปอร์ (Cu) ที่เป็นส่วนประกอบของคอปเปอร์ซัลเฟต จากขั้นตอนการวิเคราะห์ TKN และ สารสังกะสี (Zn) เป็นส่วนประกอบของซิงค์อะซิเตทจากขั้นตอนการวิเคราะห์ซัลไฟด์โดยพบว่าในแต่ละปีมีปริมาณของเสียที่ปนเปื้อนโลหะหนักเหล่านี้เกิดขึ้นจำนวนมากทางวิทยาลัยฯ ต้องแบกรับค่าใช้จ่ายในการส่งของเสียไปกำจัดที่บริษัทเอกชนในราคาที่สูง ดังนั้นหากสามารถทำการบำบัดปริมาณโลหะหนักเหล่านี้ในเบื้องต้นก็จะสามารถลดความเป็นพิษของน้ำเสียลงได้ก่อนนำส่งไปบำบัดหรือกำจัดต่อไป

การบำบัดน้ำเสียที่มีองค์ประกอบของโลหะหนักปนเปื้อนอยู่นั้นสามารถทำได้หลายวิธี เช่น การใช้สารดูดซับต่างๆ การตกตะกอนทางเคมี ซึ่งเป็นกระบวนการทางเคมี และเป็นวิธีที่ไม่ซับซ้อน ควบคุมง่าย (สุชาดา ไชยสวัสดิ์, กิตติศักดิ์ หนูสุรา, วราภรณ์ เมธาวิริยะศิลป์, สรเสกข์ กุลมัย, ชาญชัย จิตติพันธ์พรณี, 2544) นอกจากนั้นยังสามารถบำบัดด้วยกระบวนการทางชีวภาพ เช่น การใช้พืชบำบัด (Phytoremediation) จัดเป็นการลดความเป็นพิษทางชีวภาพที่ไม่ต้องมีกระบวนการเติมสารเคมีลงในน้ำเสีย จึงไม่มีสารเคมีตกค้างหลังการบำบัด ซึ่งวิธีการใช้พืชในการบำบัดพืชจะทำหน้าที่ในการเคลื่อนย้ายสารพิษออกจากสิ่งแวดล้อมทั้งในสภาพมีชีวิตและสภาพไม่มีชีวิต จึงเป็นวิธีการหนึ่งที่ได้รับความสนใจในการนำมาใช้ปรับปรุงคุณภาพน้ำ (Eccles, 1999; Alkorta, Hernandez-Allica, &Garbisu, 2004) หนึ่งในพืชน้ำที่มีความน่าสนใจ คือ ต้นบอน โดยมีงานวิจัยพบว่า ส่วนของก้านบอนและใบบอนสามารถดูดซับสารอาหารและดักตะกอนแขวนลอยที่มากับน้ำได้ และมีความทนทานต่อน้ำเสีย โดย ใบบอนสามารถดูดซับสารอาหารประเภทไนโตรเจนและฟอสฟอรัส อย่างไรก็ตามงานวิจัยที่ผ่านมามีการศึกษาการดูดซับโลหะหนักด้วยต้นบอนมาก่อนแล้ว โดยนำส่วนก้านใบและส่วนใบของต้นบอนมาใช้ดูดซับโลหะหนักตะกั่วในน้ำเสียสังเคราะห์ พบว่าประสิทธิภาพการดูดซับโลหะตะกั่วในน้ำเสียสังเคราะห์ของก้านบอนอยู่ที่ ร้อยละ 90.72 ซึ่งมากกว่าใบบอน ซึ่งอยู่ที่ร้อยละ 79.27โดยค่าการดูดซับโลหะบนตัวดูดซับจะมีค่าเพิ่มขึ้นเมื่อเพิ่มความเข้มข้นของโลหะตะกั่ว (วรรณกัษมาฮารน, 2563) แต่ยังไม่มีการศึกษาในการดูดซับสังกะสี

งานวิจัยที่ผ่านมามีการศึกษาการดูดซับแคดเมียม (Cd) และ สังกะสี (Zn) จากตะกอนที่ปนเปื้อนของพืชในพื้นที่ชุ่มน้ำ 2 ชนิด คือ ต้นธูปฤาษี (Typha Angustifolia) และ ต้นบอน (Colocasia Esculenta) พบว่าพืชทั้งสองชนิดมีความเข้มข้นของโลหะ (Cd, Zn) สูงกว่าในส่วนที่อยู่ใต้ดิน ต้นบอนมีการดูดซึมสูงสุดของทั้ง Cd และ Zn (Chayapan, Kruatrachue, Meetam, &Pokethitiyook, 2015) ในงานวิจัยครั้งนี้ผู้วิจัยสนใจที่จะศึกษาการบำบัดโลหะหนักที่เป็นสังกะสี (Zn) ที่เกิดขึ้นจากการตรวจวิเคราะห์ซัลไฟด์ โดยความเป็นพิษของสังกะสี (Zn) ที่เกิดจากการปนเปื้อนในสิ่งแวดล้อม เช่น ในแหล่งน้ำ ดินตะกอน อาหาร พืช จะมีการสะสมในห่วงโซ่อาหาร ทำให้มนุษย์มีโอกาสได้รับสังกะสี (Zn) ปนเปื้อนเข้าสู่ร่างกายผ่านทางสัตว์น้ำและพืชน้ำ หากร่างกายเกิดการสะสมเป็นจำนวนมากเกินกว่าที่ร่างกายต้องการจะรับจะส่งผล

กระทบทำให้ร่างกายเกิดการทำงานผิดปกติและรบกวนระบบการทำงานต่างๆ เกิดการสะสมที่บริเวณตับและไต จนทำให้เกิดการทำลายอวัยวะภายในตับและไต ทำงานล้มเหลวเกิดโรคโลหิตจาง โคมโมโซมผิดปกติ เสี่ยงต่อการเป็นมะเร็ง ร่างกายขาดธาตุทองแดง เนื่องจากถูกยับยั้งการดูดซึม (ธีรนาถ สุวรรณเรือง, 2563) ดังนั้นผู้วิจัยจึงสนใจที่จะศึกษาความสามารถของก้านบอน ใบบอนในรูปแบบของผงในการดูดซับโลหะหนักที่เป็นสังกะสีในน้ำเสียที่ผ่านการวิเคราะห์ซัลไฟด์ เนื่องจากต้นบอนเป็นพืชที่เจริญเติบโตได้ดีในดินที่มีความอุดมสมบูรณ์ อุ้มน้ำได้ดี เพาะปลูกได้ง่าย สามารถหาได้ง่ายในท้องถิ่น พบได้ทุกภาค มักขึ้นเองตามที่ลุ่ม บนดินโคลน บริเวณริมน้ำลำธาร หรือบริเวณที่มีน้ำขังตื้นๆ หากนำมาใช้บำบัดจะมีวิธีการที่ไม่ซับซ้อน มีค่าใช้จ่ายค่อนข้างน้อย ไม่ก่อให้เกิดสารเคมีตกค้างในสิ่งแวดล้อม และในงานวิจัยที่ผ่านมาพบประสิทธิภาพในการดูดซับโลหะหนักตัวอื่น ๆ ได้ดี ผลการศึกษาที่ได้ในครั้งนี้สามารถนำไปใช้ต่อยอดในการประยุกต์ใช้ในการบำบัดน้ำเสียที่มีสาร Zn เกิดจากการวิเคราะห์ซัลไฟด์ของห้องปฏิบัติการ ได้แนวทางในการลดปริมาณโลหะหนัก ในน้ำเสียจากการวิเคราะห์ซัลไฟด์ และได้แนวทางในการบำบัดโลหะหนักโดยใช้ตัวดูดซับที่ทำจากพืช

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาความสามารถในการดูดซับโลหะสังกะสีของผงก้านบอนและใบบอนในตัวอย่างน้ำเสียจากกระบวนการวิเคราะห์ซัลไฟด์

แนวคิด ทฤษฎี กรอบแนวคิด

การบำบัดน้ำเสียโดยใช้พืชน้ำ

หลักการทำงานแต่ละส่วนของพืชน้ำแยกเป็นส่วนของพืชที่อยู่ในน้ำและส่วนของพืชที่อยู่เหนือน้ำดังนี้

1. ราก ก้าน หรือลำต้นที่อยู่ในน้ำ จะทำหน้าที่ดูดซับสารพิษและดูดซับ (Absorption) ตะกอนและของแข็งที่ลอยอยู่ในน้ำ นอกจากนี้ยังช่วยลดความเข้มข้นของแสงแดดที่ส่องตรงสู่ผิวน้ำเป็นการป้องกันการเจริญเติบโตของสาหร่ายในน้ำ

2. ก้าน ลำต้น หรือใบที่อยู่เหนือน้ำจะช่วยลดผลกระทบของลมที่มีต่อน้ำ เช่น การพัดและทำให้ตะกอนที่จมอยู่ขุ่นขึ้นมา และทำการส่งผ่านของก๊าซและความร้อนระหว่างบรรยากาศและน้ำลดลง

คุณสมบัติของพืชน้ำที่เหมาะสมในการนำมาใช้บำบัดน้ำเสีย มีข้อสังเกตในการเลือกใช้พืชน้ำในการปรับปรุงคุณภาพน้ำ ดังนี้

1. สามารถปรับตัวและเจริญเติบโตได้ในท้องถิ่นนั้น ๆ นอกจากนี้ยังสามารถปรับตัวได้ดีในสภาพภูมิอากาศที่เปลี่ยนแปลงไป และต้องเป็นพืชที่ทนต่ออากาศเย็นได้ดี

2. มีอัตราการสังเคราะห์แสงสูงและเจริญเติบโตได้ดี ซึ่งปริมาณสารอาหารในน้ำที่พืชนำไปใช้นั้นจะมีความสัมพันธ์โดยตรงกับอัตราการเจริญเติบโตของพืช และองค์ประกอบภายในเนื้อเยื่อพืช

3. มีความสามารถในการส่งผ่านออกซิเจนได้สูง

4. สามารถทนต่อการเปลี่ยนแปลงปริมาณความเข้มข้นของสารมลพิษได้ค่อนข้างกว้าง

5. มีความสามารถในการดูดซึมและเก็บสะสมสารต่างๆ ได้

6. มีความทนทานต่อโรคและแมลงต่าง ๆ ได้ดี

7. ต้องง่ายต่อการจัดการโดยเฉพาะการนำพืชน้ำออกจากระบบบำบัดน้ำเสียเนื่องจากพืชน้ำจะสามารถลดปริมาณสารอาหารที่มีอยู่ในน้ำให้ได้ผลดีที่สุดนั้น จะต้องมีการนำพืชน้ำนั้นออกจากระบบบ้างเพื่อไม่ให้พืชน้ำอยู่กันหนาแน่นเกินไป (วิศัลย์ ธรรมประสิทธิ์, 2549)

กลไกการดูดซับ

การดูดซับหรือการดูดติดผิว (Adsorption) เป็นกระบวนการกักสารละลายหรือสารแขวนลอยขนาดเล็กซึ่งละลายอยู่ในน้ำให้อยู่บนผิวของสารอีกชนิดหนึ่ง โดยที่สารละลายหรือสารแขวนลอยขนาดเล็กนี้เรียกว่า สารถูกดูดซับ (Adsorbate) ส่วนของแข็งที่มีผิวเป็นที่เกาะจับของสารที่ถูกดูดซับเรียกว่า วัสดุดูดซับ (Adsorbent) การดูดติดผิวนี้จะเป็นการดูดติดแบบระหว่างสถานะ (Phase) ต่าง ๆ ทั้งสามสถานะ คือ ของเหลว (Liquid) ก๊าซ (Gas) และของแข็ง (Solid) ซึ่งมีได้ทั้งแบบของเหลวกับของเหลว ก๊าซกับของเหลว ก๊าซกับของแข็ง และของเหลวกับของแข็ง โดยในที่นี้จะพิจารณาถึงเฉพาะแบบของเหลวกับของแข็ง (Liquid-Solid Interface) ในการดูดติดผิวโมเลกุลของสารละลายหรือสารแขวนลอยถูกกำจัดออกจากน้ำและไปเกาะติดอยู่บนวัสดุดูดซับโมเลกุลของสารส่วนใหญ่จะเกาะจับอยู่กับผิวภายในโพรงของวัสดุดูดซับและมีเพียงส่วนน้อยเท่านั้นที่เกาะอยู่ที่ผิวภายนอก การถ่ายเทโมเลกุลจากน้ำไปหาวัสดุดูดซับเกิดขึ้นได้จนถึงสมดุลจึงหยุด ณ จุดสมดุล ความเข้มข้นของโมเลกุลในน้ำจะเหลือน้อยเพราะโมเลกุลส่วนใหญ่เคลื่อนที่ไปเกาะจับอยู่กับวัสดุดูดซับ โดยในการเกาะติดจะมี Driving Force อยู่ 2 แบบ คือ การดูดซับทางกายภาพ และการดูดซับทางเคมี (เดชา ฉัตรศิริเวช, 2552)

องค์ประกอบของการดูดซับประกอบด้วย

1) ตัวดูดซับ (Adsorbent) เป็นวัตถุที่จัดเก็บสารที่จะถูกดูดซับเอาไว้ที่พื้นผิวของสารที่ทำการดูดซับซึ่งส่วนใหญ่เป็นวัตถุที่มีลักษณะของรูพรุนปกติมีอยู่ตามธรรมชาติแต่ปัจจุบันสามารถสังเคราะห์ตัวดูดซับตามคุณสมบัติที่ต้องการได้

2) สารที่ถูกดูดซับ (Adsorbate) เป็นสารที่จะเข้าไปยึดติดบนพื้นผิวตัวดูดซับ มีคุณสมบัติเป็นได้ทั้งของแข็งของเหลวและก๊าซโดยมีขนาดของอนุภาคเล็กกว่าขนาดของรูพรุนในตัวดูดซับ

3) สารผสมระหว่างที่ถูกดูดซับสารอื่นๆ (Mixture) เป็นสารผสมที่มีสารที่จะถูกดูดซับผสมร่วมอยู่กับสารอื่น (เดชา ฉัตรศิริเวช, 2552)

วิธีดำเนินการวิจัย

การวิจัยครั้งนี้เป็นการวิจัยเชิงทดลอง เริ่มจากการประสานงานกับเจ้าหน้าที่ห้องปฏิบัติการในการเก็บตัวอย่างน้ำเสียจากการวิเคราะห์ซัลไฟด์ (Sulfide) เพื่อใช้ในการทดลองการบำบัดสังกะสี (Zn) ทำการ

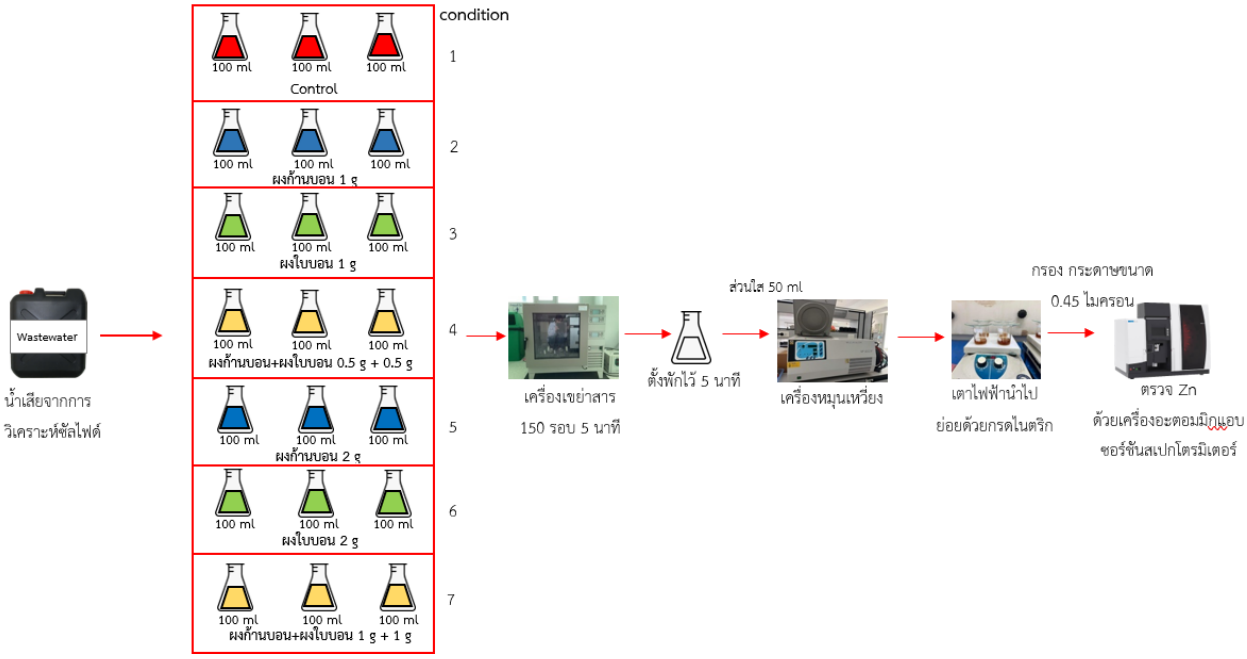
เตรียมผงก้านบอนและใบบอน โดยเริ่มจากการเอาส่วนก้านบอน และใบบอนมาล้างให้สะอาด จากนั้นตัดแบ่งส่วนก้านบอนและใบบอนออกจากกัน นำแต่ละส่วนมาตัดให้มีขนาดเล็ก และนำไปอบในตู้อบลมร้อนที่อุณหภูมิ 80–100 ℃ เป็นเวลา 4 วัน จะได้ตัวอย่างที่เป็นส่วนก้านใบและใบบอนที่แห้งสนิท จากนั้นนำตัวอย่างแต่ละส่วนมาบดให้ละเอียดอีกครั้งด้วย เครื่องบดไฟฟ้าจนได้ตัวอย่างที่เป็นผงละเอียด นำไปร่อนด้วยตะแกรงร่อนขนาด 30 Mesh (0.595 มิลลิเมตร) ดังภาพที่ 1

ภาพที่ 1 ขั้นตอนการเตรียมผงก้านบอนและใบบอน

การวิจัยแบ่งเป็น 7 ชุดการทดลองได้แก่ 1) ชุดควบคุม 2) ชุดที่ใส่ผงก้านบอน 1 กรัม 3) ชุดที่ใส่ผงก้านบอน 2 กรัม 4) ชุดที่ใส่ผงใบบอน 1 กรัม 5) ชุดที่ใส่ผงใบบอน 2 กรัม 6) ชุดที่ใส่ผงก้านบอนและผงใบบอนผสมกันอย่างละ 0.5 กรัม และ 7) ชุดที่ใส่ผงก้านบอนและผงใบบอนผสมกันอย่างละ 1 กรัม เริ่มจากเตรียมขวดรูปชมพู่และใส่ผงตัวดูดซับทั้งสองชนิดตามปริมาณข้างต้น จากนั้นเติมน้ำเสียปริมาตร 100 มิลลิลิตร (หากมีเศษกระดาษให้ทำการกรองออกก่อน) แล้วนำไปเขย่าด้วยเครื่องออร์บิทัลเชกเกอร์ด้วยความเร็ว 150 รอบต่อนาทีเป็นเวลา 5 นาที ภายหลังเขย่าแล้วให้เก็บตัวอย่างส่วนใสในหลอดทดลองปริมาณ 50 มิลลิลิตร และนำไปทำการหมุนเหวี่ยงจนเกิดการแยกชั้นของสารละลายใสและผงตัวอย่างเลือกเฉพาะส่วนสารละลายใสไปทำการวิเคราะห์หาปริมาณโลหะหนักในน้ำ โดยใช้เครื่อง Atomic Absorption Spectrophotometer (AAS) โดยทำการย่อยตัวอย่างก่อนด้วยวิธี Wet Acid Digestion สำหรับชุดควบคุมทำทุกขั้นตอนเหมือนกับตัวอย่าง โดยไม่เติมผงก้านบอนหรือผงใบบอน ขั้นตอนดังแสดงดังภาพที่ 2 การคำนวณหาประสิทธิภาพการบำบัดน้ำเสีย คิดเป็นร้อยละ จากสูตรดังนี้

$$\text{ประสิทธิภาพการบำบัด}(\%) = \frac{\text{ค่าความเข้มข้นของสังกะสี } (Zn)_{\text{ก่อนบำบัด}} - \text{ค่าความเข้มข้นของสังกะสี } (Zn)_{\text{หลังบำบัด}}}{\text{ค่าความเข้มข้นของสังกะสี } (Zn)_{\text{ก่อนบำบัด}}} \times 100$$

ทำการศึกษาลักษณะพื้นผิวของผงใบบอน และผงก้านบอน โดยใช้ เครื่อง Scanning Electron Microscope (SEM) ยี่ห้อ JEOL รุ่น JSM-6010ส่องที่ขนาด 100 เท่า 1,000 เท่า และ 3,000 เท่า



ภาพที่ 2 ขั้นตอนการทดลองประสิทธิภาพในบำบัดสังกะสีด้วยผงก้านบอนและใบบอน

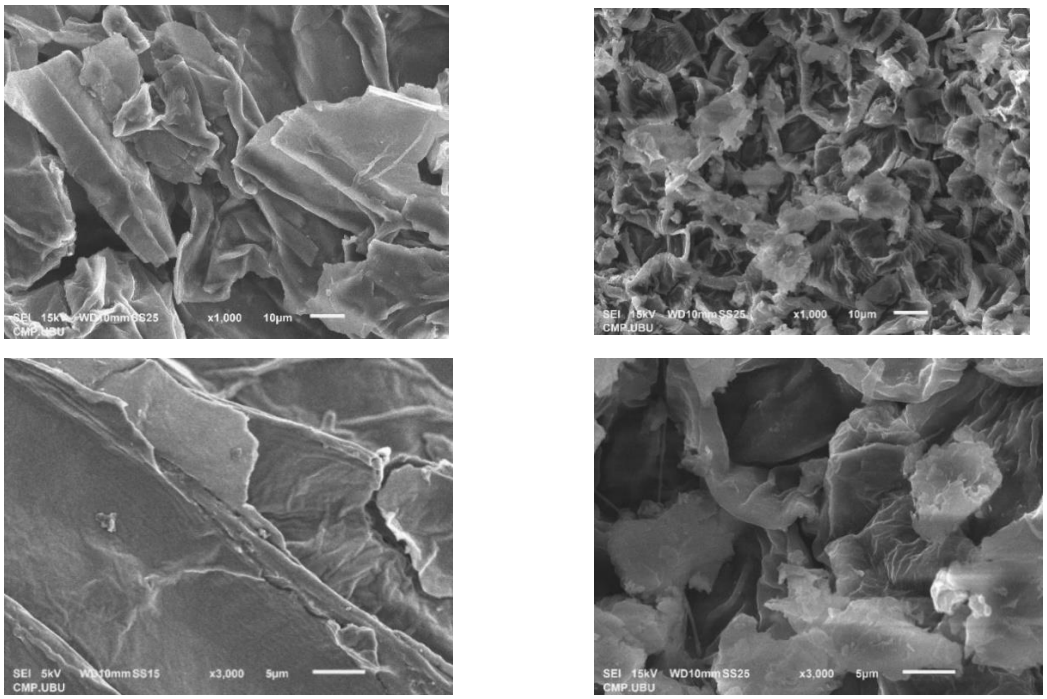
ผลการวิจัย

จากการศึกษาประสิทธิภาพการบำบัดน้ำเสียด้วยผงก้านบอนและใบบอน พบว่าตัวอย่างน้ำเสียจากการวิเคราะห์ซัลไฟด์ภายในห้องปฏิบัติการ มีลักษณะสีใสปนขุ่นเล็กน้อย ไม่มีเศษกระดาษตกค้างเนื่องจากได้ทำการกรองแล้ว มีค่าความเข้มข้นตั้งต้นของสังกะสีอยู่ที่ประมาณ 30 ppm. ภายหลังการบำบัด พบว่าตัวอย่างน้ำเสียมีลักษณะสีใสและมีปริมาณความเข้มข้นของสังกะสีที่ลดลงทุกชุดการทดลอง โดยชุดผงก้านบอนที่ปริมาณ 2 กรัม มีค่าส่วนต่างความเข้มข้นลดลงมากที่สุด คิดเป็นประสิทธิภาพการบำบัดร้อยละ 48.27 รองลงมาคือชุดผงก้านบอนผสมผงใบบอนอย่างละ 0.5 กรัม มีประสิทธิภาพการบำบัดร้อยละ 41.91 นอกจากนั้นยังพบว่า ทุกชุดการทดลองสามารถเพิ่ม pH ให้สูงขึ้น ก่อนบำบัดมีค่าอยู่ระหว่าง 2.27-2.40 และหลังบำบัดอยู่ระหว่าง 4.03-4.90 โดยในชุดการทดลองผงก้านบอน ปริมาณ 2 กรัม สามารถเพิ่ม pH ได้ขึ้นมากที่สุดหลังการบำบัด เป็น 4.90 อย่างไรก็ตามแม้จะไม่มีการใส่ผงบอนหรือก้านบอน (ชุดควบคุม) ขบวนการที่ใช้ในการทดลองครั้งนี้ ได้แก่ การเขย่า และการปั่นเหวี่ยงก็สามารถทำให้ความเข้มข้นของสังกะสีลดลงได้ถึงร้อยละ 23.37 ดังแสดงในตารางที่ 1

ตารางที่ 1ประสิทธิภาพการบำบัดน้ำเสียด้วยผงก้านบอนและใบบอน

ชุดการทดลอง	ก่อนบำบัด		หลังบำบัด		ประสิทธิภาพการบำบัด
	Zn (mg/L)Mean (S.D.)	pH	Zn (mg/L)Mean (S.D.)	pH	
ชุดควบคุม	21.44±4.95	2.36	16.43±12.73	4.03	23.37
ชุดผงก้านบอน 1 g	19.15±0.42	2.37	15.65±1.77	4.42	18.27
ชุดผงใบบอน 1 g	14.35±2.62	2.34	12.62±0.21	4.19	22.83
ชุดผงก้านบอนผสมผงใบบอนอย่างละ 0.5 g	36.98±0.39	2.27	21.48±1.45	4.29	41.91
ชุดผงก้านบอน 2g	33.25±0.07	2.40	17.20±0.99	4.90	48.27
ชุดผงใบบอน 2 g	21.85±2.19	2.29	16.65±0.00	4.32	23.80
ชุดผงก้านบอนผสมผงใบบอนอย่างละ 1 g	28.03±1.24	2.35	20.28±1.31	4.11	27.64

เมื่อนำผงก้านบอนและใบบอนมาศึกษาลักษณะพื้นผิวของเส้นใยโดยใช้กล้องจุลทรรศน์อิเล็คตรอนแบบส่องกราด (Scanning Electron Microscope: SEM) ส่องที่ขนาด 1,000 เท่า และ 3,000 เท่า พบว่าลักษณะพื้นผิวเส้นใยของก้านบอนและใบบอนมีความแตกต่างกัน ซึ่งลักษณะพื้นผิวเส้นใยของก้านบอนมีพื้นผิวที่เรียบ ไม่นูน มีช่องว่างหรือรูพรุนมีปริมาตรที่น้อยเมื่อเปรียบเทียบกับใบบอน ในขณะที่ลักษณะพื้นผิวเส้นใยของใบบอนมีช่องว่างหรือรูพรุนมีปริมาตรที่สูงกว่าก้านบอนและมีโพรงที่กว้างกว่าดังแสดงในภาพที่ 3



a. พื้นผิวผงก้านบอน b. พื้นผิวผงใบบอน

ภาพที่ 3 เปรียบเทียบพื้นผิวของผงก้านบอนและใบบอนด้วยภาพกำลังขยายจาก SEM

สรุปและอภิปรายผล

แหล่งกำเนิดน้ำเสียที่ก่อให้เกิดสารโลหะหนักมากที่สุดในสถานศึกษาคือ ห้องปฏิบัติการ ซึ่งมีน้ำเสียที่เกิดจากปฏิบัติการต่าง ๆ ยกตัวอย่างเช่น การวิเคราะห์ซัลไฟด์ โดยการศึกษาครั้งนี้เป็นการนำตัวอย่างน้ำเสียจากกระบวนการวิเคราะห์ซัลไฟด์ภายในห้องปฏิบัติการมาทำการทดลองบำบัดด้วยวัสดุดูดซับที่ทำจากต้นบอนจากผลการทดลองสังเกตเห็นได้ว่า น้ำเสียที่มีค่าความเข้มข้นตั้งต้นของสังกะสีสูงก่อนบำบัดมีประสิทธิภาพการบำบัดได้ดีกว่าน้ำเสียที่มีความเข้มข้นตั้งต้นต่ำ ซึ่งเป็นไปตามหลักการดูดซับ โดยชุดผงก้านบอนที่ปริมาณ 2 กรัม และชุดผงก้านบอนผสมผงใบบอนอย่างละ 0.5 กรัมมีความเข้มข้นตั้งต้นที่33.25 และ 36.98 มิลลิกรัม/ลิตร ตามลำดับ สอดคล้องกับการศึกษาของ วรรณกัษมา ฮารน (2563) ที่พบว่า ในส่วนของก้านบอนสามารถดูดซับตะกั่วในน้ำเสียสังเคราะห์ได้มากกว่าใบบอน โดยค่าการดูดซับโลหะบนตัวดูดซับจะมีค่าเพิ่มขึ้นเมื่อเพิ่มความเข้มข้นของโลหะตะกั่ว นอกจากนั้นยังพบว่าส่วนลำต้นของบอน (Colocasia Esculenta)มีประสิทธิภาพการดูดซับโลหะโดยบำบัดที่ pH 7.0-4.5 และความเข้มข้นเริ่มต้นที่ 30 มิลลิกรัม/ลิตร เป็นสภาวะที่เหมาะสมสำหรับการกำจัดโลหะหนัก (Maity, Nanda, & Sarkar,. 2021)

เมื่อนำผงก้านบอนและใบบอนมาศึกษาลักษณะพื้นผิวของเส้นใยพบว่า ผงก้านบอนมีรูพรุนน้อยแต่ปากของรูพรุนและโครงสร้างรูพรุนมีขนาดใหญ่ ในส่วนผงใบบอนมีรูพรุนมากแต่ปากรูพรุนและโครงสร้างรูพรุนมีขนาดเล็ก ซึ่งโครงสร้างรูพรุนของตัวกลางดูดซับช่วยให้พื้นที่ผิวสามารถดูดซับสารได้เพิ่มขึ้น หากรูพรุนมีมากแต่มีขนาดเล็กปากรูพรุนมีขนาดเล็กก็ไม่ทำให้ความสามารถในการดูดซับเพิ่มขึ้น นอกจากนั้นการดูดซับจะเกิดได้ดี เมื่อโมเลกุลเล็กกว่ารูพรุนเล็กน้อย ทั้งนี้ลักษณะของสารที่ถูกดูดซับยังเป็นปัจจัยที่ส่งผลต่อการดูดซับ เช่น ขนาดโมเลกุลของสาร หากสารที่ถูกดูดซับมีขนาดโมเลกุลที่ใหญ่กว่ารูพรุนของตัวกลางดูดซับ ทำให้การดูดซับที่เกิดขึ้นเป็นการดูดซับแบบชั้นเดียว เนื่องจากโมเลกุลของสารไม่สามารถเข้าไปเกาะติดภายในรูพรุนของตัวกลางดูดซับได้ จึงมีประสิทธิภาพดูดซับสารจึงลดลง สภาวะในการดูดซับก็มีผลต่อการดูดซับได้ เช่น ความเป็นกรด-ด่าง (pH) ซึ่งเป็นผลมาจากไฮโดรเจนไอออนและไฮดรอกไซด์ไอออน ส่งผลต่อการเปลี่ยนแปลงสมบัติของโมเลกุล และอุณหภูมิ (Temperature) อัตราเร็วในการเกิดปฏิกิริยานั้นจะเพิ่มขึ้นตามอุณหภูมิที่เพิ่มขึ้นและจะลดลงเมื่อทำการลดอุณหภูมิลง เมื่อทำการเพิ่มอุณหภูมิจะทำให้ความสามารถในการละลายสูงขึ้น จึงส่งผลให้ความสามารถในการดูดซับลดลง ด้วยเหตุนี้ทั้งผงก้านบอนและผงใบบอนจึงสามารถดูดซับสังกะสีได้

สาเหตุที่ทำให้ผลการทดลองในชุดการทดลองที่มีการใช้ปริมาณของตัวดูดซับจำนวนน้อยกว่ามีประสิทธิภาพในการบำบัดมากกว่าชุดที่มีการใช้ปริมาณตัวดูดซับที่มากกว่าส่วนหนึ่งอาจเป็นเพราะความเข้มข้นตั้งต้นของแต่ละชุดการทดลองมีความแตกต่าง เนื่องจากน้ำเสียที่นำมาใช้ในการวิเคราะห์ในครั้งนี้เป็นน้ำเสียที่มาจากกระบวนการวิเคราะห์ซัลไฟต์ในห้องปฏิบัติการจริง ดังนั้นเมื่อมีการทดสอบความเข้มข้นตั้งต้นของแต่ละชุดการทดลองจึงมีความแตกต่างกันเล็กน้อย ซึ่งอาจส่งผลต่อประสิทธิภาพการบำบัด เนื่องจากหากน้ำเสียมีความเข้มข้นของโลหะตั้งต้นสูงตัวดูดซับจะมีประสิทธิภาพที่ดีกว่าน้ำเสีย

ที่มีความเข้มข้นต่ำ (วรรณกัษมา ฮารน, 2563)ทั้งนี้แม้จะไม่ใส่ผงก้านบอน หรือผงใบบอนในการทดลอง (ชุดควบคุม) แต่ขบวนการทางกายภาพ เช่น การเขย่าและการปั่นเหวี่ยงก็สามารถบำบัดสังกะสีลดลงได้ถึงร้อยละ 23.37 ส่วนค่าความเป็นกรด-ด่าง (pH) ก่อนบำบัด มีค่าอยู่ระหว่าง 2.27-2.40 และหลังบำบัดอยู่ระหว่าง 4.03-4.90 ซึ่งมีค่าที่เพิ่มขึ้นอย่างเห็นได้ชัดในทุกชุดการทดลอง ดังนั้นจึงควรนำการบำบัดด้วยขบวนการทางกายภาพด้วยการเขย่าและการปั่นเหวี่ยงไปใช้ในกระบวนการ Pre-treatment น้ำเสียในห้องปฏิบัติการเพื่อลดความเข้มข้นของโลหะหนักออกจากน้ำเสียได้ในเบื้องต้นได้

ข้อเสนอแนะ

ผลการวิจัยในครั้งนี้แสดงให้เห็นถึงความเป็นไปได้ในการใช้ผงก้านบอนและใบบอนมาเป็นตัวบำบัดโลหะหนัก แต่อาจต้องมีการปรับสภาวะแวดล้อมให้เหมาะสม เช่น ปริมาณความเข้มข้นตั้งต้น และค่า pH และอาจจะต้องมีการปั่นผงก้านบอนและใบบอนให้ละเอียดกว่าเดิม หรือนำมาร่อนด้วยตระแกรงที่มีขนาดมากกว่า 30 Mesh (0.595 มิลลิเมตร) เพื่อให้มีประสิทธิภาพบำบัดที่ดีขึ้น เนื่องจากหากผงก้านบอนและใบบอนมีขนาดเล็กลงจะทำให้การเคลื่อนที่ของสารที่ถูกดูดซับได้มากขึ้นแทรกตัวผ่านชั้นฟิล์มที่ห่อหุ้มตัวกลางดูดซับแพร่เข้าสู่รูพรุนของตัวดูดซับ (Pore Diffusion) เกิดเป็นการดูดซับขึ้นภายใน

ในงานวิจัยครั้งต่อไปอาจเพิ่มรอบการบำบัดในส่วนน้ำใส เพิ่มเป็น 2-3 รอบ เพื่อเพิ่มประสิทธิภาพการบำบัด เพราะในการทดลองครั้งนี้เป็นการบำบัดแค่รอบเดียว อย่างไรก็ตามน้ำที่ผ่านการบำบัดยังมีสีค่อนข้างเยอะ ซึ่งคาดว่าน่าจะเป็นสีที่มาจากไอโอดีนอาจจะต้องมีการบำบัดสีโดยผ่านตัวกรองหรือด้วยวิธีอื่นๆ ก่อนที่จะปล่อยออกสู่แหล่งน้ำตามธรรมชาติต่อไป

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การเปรียบเทียบประสิทธิภาพวิธีหาความเหมือนของคำอธิบายรายวิชาเพื่อเทียบโอนหน่วยกิตด้วยการแปลงเชิงปริมาณ

Efficiency Comparison of Methods for Finding Similarity of Course Descriptions to Transfer Credits using Word Embedding

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บทคัดย่อ

การเปรียบเทียบประสิทธิภาพวิธีหาความเหมือนของคำอธิบายรายวิชาเพื่อเทียบโอนหน่วยกิตด้วยการแปลงเชิงปริมาณ โดยงานวิจัยนี้ มุ่งเน้นหาวิธีเพิ่มประสิทธิภาพความแม่นยำวิธีหาความเหมือนของคำอธิบายรายวิชา ข้อมูลที่ใช้ในงานวิจัยนี้ รวบรวมจากรายวิชาของหลักสูตรเทคโนโลยีสา รสนเทศ คณะวิทยาศาสตร์ มหาวิทยาลัยราชภัฏบุรีรัมย์ จำนวน 58 รายวิชา ขั้นตอนการเตรียมข้อมูลประกอบด้วย การตัดคำ (Word Tokenize) ให้อยู่ในรูปแบบคำศัพท์ด้วยหลักการประมวลผลภาษาธรรมชาติ (Natural Language Processing) จากนั้นกำจัดคำหยุด (Stop-Word Elimination) เพื่อกำจัดคำที่ไม่เกี่ยวข้องกับเอกสาร และหารากศัพท์ (Stemming) สำหรับงานวิจัยนี้ นำวิธี TF-IDF หรือ Term Frequency Inverse Document Frequency ซึ่งเป็นเทคนิคการคัดแยกคำตามความสำคัญในการสร้างเวกเตอร์คุณลักษณะจากคำ ผลการทดลอง การหาค่าความเหมือนของข้อความด้วยการหาระยะทาง พบว่า วิธีระยะห่างโคไซน์มีค่าต่ำกว่าวิธีระยะห่างยูคลิเดียน และผลการวัดความเหมือนของข้อความด้วยการหาค่าโคไซน์และเคอร์นอล พบว่า วิธีที่มีประสิทธิภาพดีที่สุดโดยเฉลี่ย ได้แก่ rbf kernel 0.97 ลำดับถัดมาเป็นวิธี Laplacian kernel 0.90 ส่วนวิธี Cosine Similarity, Linear Kernel และ Pairwise Kernels ผลการวัดความเหมือนของข้อความโดยเฉลี่ยเท่ากันคือ 0.62

คำสำคัญ : ความเหมือนของคำ, การแปลงเชิงปริมาณ, หลักการประมวลผลภาษาธรรมชาติ

Abstract

Comparing the efficiency of methods for finding similarities in course descriptions for credit transfer using quantitative transformation. This research focuses on improving accuracy and discovering similarities in course descriptions. The information used in this

study is compiled from the subjects of the Information Technology curriculum at the Faculty of Science, Buriram Rajabhat University, comprising 58 courses. The data preparation process involves word tokenization into vocabulary using the principles of Natural Language Processing, followed by the elimination of stop words and stemming. Stemming aims to find the roots of words. For this research, the Term Frequency Inverse Document Frequency (TF-IDF) method is employed. TF-IDF is a technique for ranking words according to their importance in creating feature vectors from words. Experimental results reveal the similarity value of the text and distance. It is found that the cosine distance method yields lower values compared to the Euclidean distance method. Furthermore, the results of measuring text similarity using cosine and kernel values show that the rbf kernel method performs the best on average, achieving a similarity score of 0.97. Following closely is the Laplacian kernel method with a score of 0.90. The Cosine Similarity, Linear Kernel, and Pairwise Kernels yield an average text similarity measurement result of 0.62.

Keyword : Similarity, Word Embedding, Natural Language Processing

บทนำ

การจัดการเรียนในระดับอุดมศึกษานั้นผู้เรียนสามารถนำรายวิชาจากสถาบันที่ตนเองจบเข้ามาเทียบโอนกับรายวิชาในหลักสูตรที่สอบเข้าได้ และสาขาวิชาเทคโนโลยีสารสนเทศ คณะวิทยาศาสตร์ มหาวิทยาลัยราชภัฏบุรีรัมย์ก็เช่นกัน ได้เปิดรับสมัครโดยกำหนดคุณสมบัติของผู้เรียนที่จบการศึกษาในระดับชั้นมัธยมศึกษาตอนปลายและผู้เรียนที่จบการศึกษาระดับประกาศนียบัตรวิชาชีพชั้นสูง (ปวส.) สามารถสมัครเรียนและเทียบโอนหน่วยกิตรายวิชาที่เรียนมาแล้วได้ โดยกำหนดเกณฑ์ในการเทียบโอนรายวิชาจากคำอธิบายรายวิชาที่ขอเทียบโอนจะต้องมีข้อความที่มีความหมายเหมือนตรงกัน อย่างน้อยร้อยละ 80 และผลการเรียนในรายวิชานั้นต้องเป็นเกรด C หรือ เกรด 2 ขึ้นไป จึงจะสามารถขอเทียบโอนได้

จากการศึกษางานวิจัยด้านการทำเหมืองข้อความ (Text Mining) ที่มีการนำมาประยุกต์ใช้ในการวิเคราะห์คำเพื่อหาความเหมือน (Similarity) และวัดความเหมือนกันของข้อความหรือเอกสาร พบว่ามีงานวิจัยจำนวนมากที่นำเสนอวิธีที่แม่นยำในการตรวจวัดความเหมือนกันของข้อความ ดังเช่น การประยุกต์ใช้เอ็นแกรม (N-Gram) ในการหาความคล้ายคลึงของรายวิชาที่เขียนด้วยภาษาอารบิค ซึ่งพบว่า 3-Grams ให้ผลการวิจัยที่ดีที่สุด (Al-Ramahi & Mustafa, 2012) การเปรียบเทียบความคล้ายคลึงของข้อวามเพื่อจำแนกประเภทข้อความในสื่อโซเชียลออนไลน์ โดยใช้สมการวัดความคล้ายคลึงทั้งหมด 10 แบบด้วยกัน ดังนี้ Euclidean, Chebyshev Bray Curtis, Correlation, Canberra, Minkowski, Cosine, Jaccard, City Block, Roger-Tanimoto และได้ทำการกำหนดน้ำหนักของคำก่อนที่จะนำมาเข้าสู่กระบวนการวัดความคล้ายด้วยค่า TF และ TF-IDF ซึ่งผลวิจัย พบว่า สมการที่สามารถวัดความคล้ายคลึงได้ดีที่สุดคือ

Bray Curtis ร่วมกับการกำหนดคุณลักษณะแบบ TF (Viriyavisuthisakul et al., 2015) นอกจากนี้ยังมีวิธีวัดความเหมือนของข้อความอีกหลายวิธี เช่นการวัดความเหมือนระหว่างออบเจ็กต์หนึ่ง (Object) กับอีกออบเจ็กต์หนึ่งด้วยวิธีการทำสถิติ ซึ่งสามารถนำมาประยุกต์ใช้เพื่อวัดความเหมือนของคำรายวิชาภาษาไทยได้ดี ดังนั้นผู้วิจัยจึงสนใจที่จะศึกษาการเปรียบเทียบประสิทธิภาพวิธีหาความเหมือนของคำอธิบายรายวิชาในภาษาไทย ทั้งนี้เพื่อหาวิธีเพิ่มประสิทธิภาพความแม่นยำในการเทียบโอนหน่วยกิตของสาขาวิชาต่อไป

วัตถุประสงค์ของการวิจัย

เพื่อเปรียบเทียบประสิทธิภาพวิธีหาความเหมือนของคำอธิบายรายวิชาเพื่อเทียบโอนหน่วยกิตด้วยการแปลงเชิงปริมาณ

แนวคิด ทฤษฎี

1. การทำเหมืองข้อความ

การทำเหมืองข้อความ (Text Mining) เป็นเทคนิคเพื่อค้นหารูปแบบ (Pattern) หรือความสัมพันธ์ที่ซ่อนอยู่ในชุดข้อความจำนวนมหาศาล โดยใช้ขั้นตอนวิธีจากวิชาสถิติ การเรียนรู้ของเครื่อง (Machine Learning) การประมวลผลภาษาธรรมชาติ (Natural Language Processing) และการรู้จำแบบ (Pattern Recognition) ซึ่งอาจแบ่งได้ 3 ประเภท ได้แก่ การสรุปเอกสารข้อความ (Document Summarization) การแบ่งประเภทเอกสาร (Document Classification) และการแบ่งกลุ่มเอกสารข้อความ (Document Clustering) ที่รวมไปถึงการวัดความเหมือนและความแตกต่างของเอกสารและข้อความ (สุขุมาลย์ หนกหลัง, 2563)

การประมวลผลภาษาธรรมชาติ (Natural Language Processing: NLP) (พีรพัฒ โชคสุวัฒนสกุล และคณะ, 2566) มีจุดมุ่งหมายให้คอมพิวเตอร์สามารถเข้าใจภาษามนุษย์ได้ดียิ่งขึ้น เนื่องจากคอมพิวเตอร์ถูกออกแบบมาให้เหมาะสมกับการเข้าใจข้อมูลของตัวเลขหรือรหัส ซึ่งไม่ตรงกับวิธีการสื่อสารของมนุษย์ NLP จึงเกิดขึ้นเพื่อลดช่องว่างในการสื่อสารระหว่างมนุษย์กับคอมพิวเตอร์ ซึ่งกระบวนการประมวลผลข้อความเพื่อการทำเหมืองข้อความ ประกอบด้วย การตัดคำ (Word Segmentation) การกำจัด คำหยุด (Stop-Word Elimination) การหารากศัพท์ (Stemming) การคัดเลือกคุณลักษณะ (Feature Selection) เป็นต้น (จักรินทร์ สันติรัตนภักดี และศศิธร อิ่มวุฒิ, 2564)

2. การแปลงเชิงปริมาณ

การแปลงเชิงปริมาณ (Word Embedding) คือ การสร้างเวกเตอร์คุณลักษณะจากคำ ซึ่งเป็นการแปลงชุดของคำให้เป็นตัวเลขที่ไม่ซ้ำกันโดยการคำนวนความน่าจะเป็นของคำ และบริบทภายในประโยค ซึ่งนำเสนอในรูปของเวกเตอร์ จุดเด่นของเวกเตอร์คุณลักษณะที่ได้จาก Word Embedding นั้น คือ สามารถนำไปคำนวนความคล้ายคลึงกับคำอื่น ๆ ในบริบทของคำที่แตกต่างกันได้ (ชาลิสา จิตบุญญาพินิจ

et al., 2565) ปัจจุบันได้มีการพัฒนาตัวแบบจำลองสำหรับการทำ Word Embedding ออกมาให้ใช้งานอย่างสะดวก เช่น 1) Word2Vec เป็นแบบจำลองที่ใช้สร้างการฝังคำ หรือแปลงคำให้อยู่ในรูปแบบของเวกเตอร์ ซึ่งเวกเตอร์ของคำต่าง ๆ ถูกคำนวณจากบริบทรอบข้างโดยใช้เทคนิคโครงข่ายประสาทเทียม (Neural Network) (Mikolov et al., 2013) 2) Glove หรือ Global Vectors for Word Representation เป็นแบบจำลองถดถอยล็อก-ไบลิเนียร์ (Log-bilinear Regression) ที่รวม 2 ตัวแบบเข้าด้วยกัน คือ โกลบอลเมตริกซ์แฟคเตอร์ไรเซชัน (Global Matrix Factorization) และโลคอลคอนเท็กซ์วินโดว์ (Local Context Window) และเป็นการเรียนรู้แบบไม่มีผู้สอน (Unsupervised Learning) (Pennington et al., 2014) 3) TF-IDF หรือ Term Frequency Inverse Document Frequency เป็นเทคนิคการคัดแยกคำตามความสำคัญที่ถูกใช้ในการสร้างเวกเตอร์ (สราธิป เตชาวิวัฒนบูลย์, 2560) และปัจจุบันวิธีที่ได้รับความนิยม คือ LLM (Large Language Model) เป็นเทคนิคด้านปัญญาประดิษฐ์ที่ใช้เทคโนโลยีการเรียนรู้ของเครื่อง (Machine Learning) และการประมวลผลภาษาธรรมชาติ (Natural Language Processing) เพื่อสร้างโมเดลภาษาขนาดใหญ่ที่สามารถเข้าใจและสร้างข้อความภาษาธรรมชาติได้โดยอัตโนมัติ และมีหลักการทำงานคือการใช้โครงข่ายประสาทเทียม (Neural Networks) ที่มีโครงสร้างซับซ้อนในการประมวลผลข้อมูลภาษา โดยมีชั้นการเรียนรู้หลายชั้น (Deep Learning) ที่ช่วยให้โมเดลสามารถเรียนรู้และเข้าใจลักษณะเฉพาะของภาษา รวมถึงความสัมพันธ์และรูปแบบของข้อมูลที่มีอยู่ในภาษาต่าง ๆ (Brown et al., 2020; Chen et al., 2021) แต่มีข้อจำกัดด้านความน่าเชื่อถือในกรณีที่มีข้อมูล (Training data) ไม่เพียงพอต่อการเรียนรู้ (Training)

3. Term Frequency - Inverse Document Frequency

Term Frequency - Inverse Document Frequency หรือ TF-IDF เป็นการสกัดคุณลักษณะของเอกสาร เพื่อหาลักษณะของตัวแทนของเอกสารนั้น ๆ โดยพิจารณาจากความถี่ของคำที่ปรากฏในเอกสาร (Term Frequency :TF) และการหาน้ำหนักของคำที่ปรากฏในเอกสารด้วยค่า TF-IDF ซึ่งเป็นการวัดค่าน้ำหนักที่เอาไว้ประเมินค่าความสำคัญของคำนั้น ๆ ในกลุ่มของเอกสาร ที่คำนวณได้จากสมการ (1) และ (2) (Al-Obaydy et al., 2022)

$$Weight = tf \times idf \quad (1)$$

โดย tf แทนด้วยจำนวนที่มีการปรากฏ term t ในเอกสาร d และ idf ได้มาจากการคำนวณด้วยสมการ

$$idf(t, D) = log \frac{N}{|\{d \epsilon D : t \epsilon d\}|} \quad (2)$$

โดย N แทนจำนวนเอกสารทั้งหมด และ $|\{d \epsilon D: t \epsilon d\}|$ คือจำนวนเอกสาร (d) ที่มี term t ปรากฏอยู่

4. การวัดความเหมือนของข้อความ

การวัดค่าความเหมือน (Cosine Similarity) เป็นการเลือกคุณลักษณะแบบกรอง เป็นการหาค่าความเหมือนหรือความคล้ายคลึงคงที่ได้จากค่าความต่างของมุมของวัตถุ 2 อย่างที่เกิดขึ้นบนพื้นที่เว็กเตอร์ โดยความคล้ายคลึงกันในแบบของ Cosine นั้น จะมีค่าอยู่ระหว่าง 0 ถึง 1 เท่านั้น จึงเป็นวิธีการที่นิยมและมีประสิทธิภาพสูง (Christopher D. Manning et al., 2008) ดังสมการ (3)

$$similarity = \cos(\theta) = \frac{A}{\|A\|\|B\|} \quad (3)$$

โดย A คือ คุณลักษณะแต่ละตัวของข้อมูลทั้งหมด

B คือ ประเภทของกลุ่มในการจำแนกของแต่ละตัวอย่าง

งานวิจัยที่เกี่ยวข้อง

สราธิป เตชาวิวัฒนบูลย์ (2560) ได้ทำวิจัยเรื่องการเปรียบเทียบวิธีวัดคล้ายคลึงของข้อความบนฐานเวกเตอร์เพื่อการเทียบโอนหน่วยกิตของรายวิชาระดับมหาวิทยาลัย โดยมีวัตถุประสงค์เพื่อวิเคราะห์และเปรียบเทียบประสิทธิภาพของวิธีวัดความคล้ายคลึงของข้อความที่แทนด้วยเวกเตอร์ในการเปรียบเทียบคำอธิบายรายวิชาของมหาวิทยาลัย เพื่อการเทียบโอนหน่วยกิต โดยวิธีวัดความคล้ายคลึง 3 วิธี ได้แก่ วิธีวัดระยะทางแบบเบร์-เคอร์ทิส (Bray-Curtis Distance) วิธีวัดระยะทางเชิงมุม (Cosine Distance) วิธีวัดระยะทางแบบยูคลิด (Euclidean Distance) ข้อมูลที่ใช้ในการทดลองเป็นข้อมูลคำอธิบายรายวิชาที่เขียนด้วยภาษาไทย จากคณะวิทยาศาสตร์ มหาวิทยาลัยอุบลราชธานี จำนวน 33 รายวิชา ซึ่งผ่านการตัดคำด้วยโปรแกรมทีเล็กส์ (TLex) แล้วแปลงอยู่ในรูปแบบเวกเตอร์ของความถี่ของเทอม (TF) และการให้น้ำหนักของเทอม (IT-IDF) ผลการวิจัยพบว่า วิธีวัดความคล้ายคลึงของข้อมูลที่แทนด้วยเวกเตอร์ของความถี่ของเทอม (TF) ร่วมกับวิธีวัดระยะทางเชิงมุม (Cosine Distance) ได้ค่าความคล้ายคลึงสูงที่สุดที่ระดับร้อยละ 71.71 ซึ่งสามารถนำไปประยุกต์ใช้ในการตรวจสอบความคล้ายคลึงของคำอธิบายรายวิชาเพื่อการเทียบโอนหน่วยกิตได้

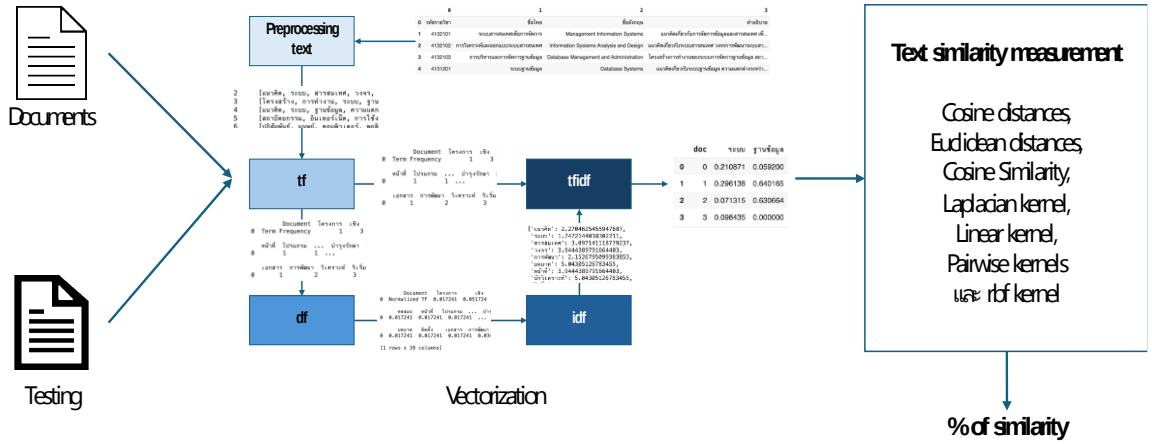
Zoupanos et al. (2022) ทำการเปรียบเทียบความคล้ายคลึงกันของคำอธิบายหลักสูตรระหว่างเทคนิค FAISS และ Elasticsearch กับชุดข้อมูลขนาดใหญ่ โดยเทคนิค FAISS (Facebook AI Similarity Search) เป็นเครื่องมือที่พัฒนาโดย Facebook AI Research เพื่อใช้ในการค้นหาข้อมูลที่คล้ายคลึงกันอย่างรวดเร็วในชุดข้อมูลขนาดใหญ่ โดยเฉพาะสำหรับการค้นหาแบบเวกเตอร์ (Vector search) ส่วนเทคนิค Elasticsearch เป็นเครื่องมือในการค้นหาข้อมูลที่มีความยืดหยุ่นสูง ซึ่งสามารถใช้สำหรับการจัดเก็บข้อมูล

ที่มีโครงสร้างและไม่มีโครงสร้างได้ นอกจากนี้ยังมีความสามารถในการค้นหาข้อมูลโดยอัตโนมัติและการทำความเข้าใจภาษาธรรมชาติ (NLP) มีความสามรถในการค้นหาและการจัดการข้อมูลที่มีประสิทธิภาพในระดับข้อมูลขนาดใหญ่ จากการประเมินประสิทธิภาพของวิธีการเปรียบเทียบเวกเตอร์สองวิธีคือ FAISS และ Elasticsearch พบว่า FAISS มีประสิทธิภาพเหนือกว่า Elasticsearch ในสภาพแวดล้อมแบบรวมศูนย์ด้วยชุดข้อมูลขนาดใหญ่ และ FAISS จัดทำดัชนีสำหรับคำตอบได้อย่างรวดเร็วในการเปรียบเทียบเวกเตอร์

Sitikhu et al. (2019) ได้ศึกษาเรื่องการเปรียบเทียบความคล้ายคลึงกันทางความหมายเพื่อเพิ่มความสามารถในการตีความของมนุษย์ โดยนำเสนอวิธีการที่แตกต่างกันสามวิธี ได้แก่ 1) Cosine Similarity ด้วย TF-IDF 2) Cosine Similarity ด้วย Word Embedding และ 3) Soft Cosine Similarity ด้วย Word Embedding ผลการวิจัย พบว่า วิธีของ Cosine Similarity ด้วย TF-IDF มีประสิทธิภาพดีที่สุดในการค้นหาความคล้ายคลึงระหว่างข้อความ อีกทั้งง่ายต่อการตีความและสามารถนำไปใช้งานในแอปพลิเคชันด้านการค้นคืน

ผลการศึกษาและอภิปรายผล

ในการเปรียบเทียบวิธีวัดความเหมือนของคำอธิบายรายวิชาเพื่อการเทียบโอนหน่วยกิต ผู้วิจัยได้ดำเนินการเป็นไปตามขั้นตอนการวิจัยดังภาพที่ 1 กรอบแนวคิดขั้นตอนที่ใช้ในการดำเนินการวิจัย ซึ่งมีรายละเอียด ดังนี้



ภาพที่ 1 กรอบแนวคิดขั้นตอนที่ใช้ในการดำเนินการวิจัย

1. การรวบรวมข้อมูล (Data Collection)

ผู้วิจัยได้รวบรวมข้อมูลเพื่อการเทียบโอนหน่วยกิตของสาขาวิชาเทคโนโลยีสารสนเทศ คณะวิทยาศาสตร์ มหาวิทยาลัยราชภัฏบุรีรัมย์ จำนวน 58 รายวิชา และมีจำนวนรายวิชาที่นักศึกษายื่นคำร้อง

ขอเทียบโอนหน่วยกิต ประจำปีการศึกษา 2565 จำนวนทั้งสิ้น 14 รายวิชา ทำการบันทึกสร้างเก็บเป็นไฟล์ Microsoft Excel

2. การเตรียมข้อมูล (Pre-Processing)

เนื่องจากภาษาไทยไม่ใช้อักขระช่องว่าง (White Space) เพื่อบ่งชี้ขอบเขตของแต่ละคำเหมือนภาษาอังกฤษ อีกทั้งคอมพิวเตอร์ยังแยกคำภาษาไทยแต่ละคำเป็นประโยคไม่ได้ เพราะไม่รู้จักแต่ละคำเหมือนมนุษย์ ดังนั้นผู้วิจัยจึงได้ดำเนินการดังนี้

2.1 การตัดคำ (Word Tokenize) ตัดคำออกจากข้อความให้อยู่ในรูปแบบคำศัพท์ด้วยหลักการประมวลผลภาษาธรรมชาติ (Natural Language Processing) ซึ่งงานวิจัยนี้ ผู้วิจัยใช้ไลบรารีของ pythainlp ที่ชื่อ tokenze ซึ่งสามารถแสดงตัวอย่างคำอธิบายรายวิชา 4132103 “โครงสร้างการทำงานของระบบการจัดการฐานข้อมูล สถาปัตยกรรมระบบ ฐานข้อมูล ระบบฐานข้อมูลเชิงสัมพันธ์ ระบบฐานข้อมูลแบบกระจาย ระบบฐานข้อมูล แบบอ็อบเจ็กต์ ระบบฐานข้อมูลบนเว็บ การสร้างระบบฐานข้อมูล” และทำการตัดคำได้ผลดังนี้

'โครงสร้าง', 'การทำงาน', 'ของ', 'ระบบ', 'การ', 'จัดการ', 'ฐานข้อมูล', ' ', 'สถาปัตยกรรม', 'ระบบ', ' ', 'ฐานข้อมูล', ' ', 'ระบบ', 'ฐานข้อมูล', 'เชิง', 'สัมพันธ์', ' ', 'ระบบ', 'ฐานข้อมูล', 'แบบ', 'กระจาย', ' ', 'ระบบ', 'ฐานข้อมูล', ' ', 'แบบ', 'อ็อบเจ็กต์', ' ', 'ระบบ', 'ฐานข้อมูล', 'บน', 'เว็บ', ' ', 'การ', 'สร้าง', 'ระบบ', 'ฐานข้อมูล', ' ', 'การ', 'สร้าง', 'พจนานุกรม', ' ', 'ฐานข้อมูล', ' ', 'การ', 'จัดการ', 'ดัชนี', 'ข้อมูล', ' ', 'การ', 'จัดการ', 'บูรณภาพ', 'ของ', 'ข้อมูล', ' ', 'การ', 'จัดการ', 'ความมั่นคง', 'ของ', 'ฐานข้อมูล', ' ', 'การ', 'กำหนด', 'ผู้ใช้', ' ', 'การ', 'จัดการ', 'สิทธิ์', 'ใน', 'การใช้งาน', 'ฐานข้อมูล', 'ระบบ', 'ความปลอดภัย', ' ', 'การ', 'ถ่ายโอน', 'ข้อมูล', 'ระหว่าง', 'ฐานข้อมูล', ' ', 'การ', 'กำหนด', 'กลยุทธ์', 'ใน', 'การสำรอง', 'ข้อมูล', ' ', 'การกู้', 'คืน', 'เมื่อ', 'ระบบ', 'ล้มเหลว', ' ', 'การประมวลผลข้อมูล', 'แบบ', 'รายการ', ' ', 'และ', 'ปัญหา', 'และ', 'วิธี', 'แก้ปัญหา', 'การ', 'เข้าถึง', ' ', 'ข้อมูล', 'พร้อมกัน', ' ', 'รวมถึง', 'การ', 'ปรับ', 'ระบบ', 'ให้', 'มีประสิทธิภาพ', 'การใช้งาน', 'ดี', 'ที่สุด

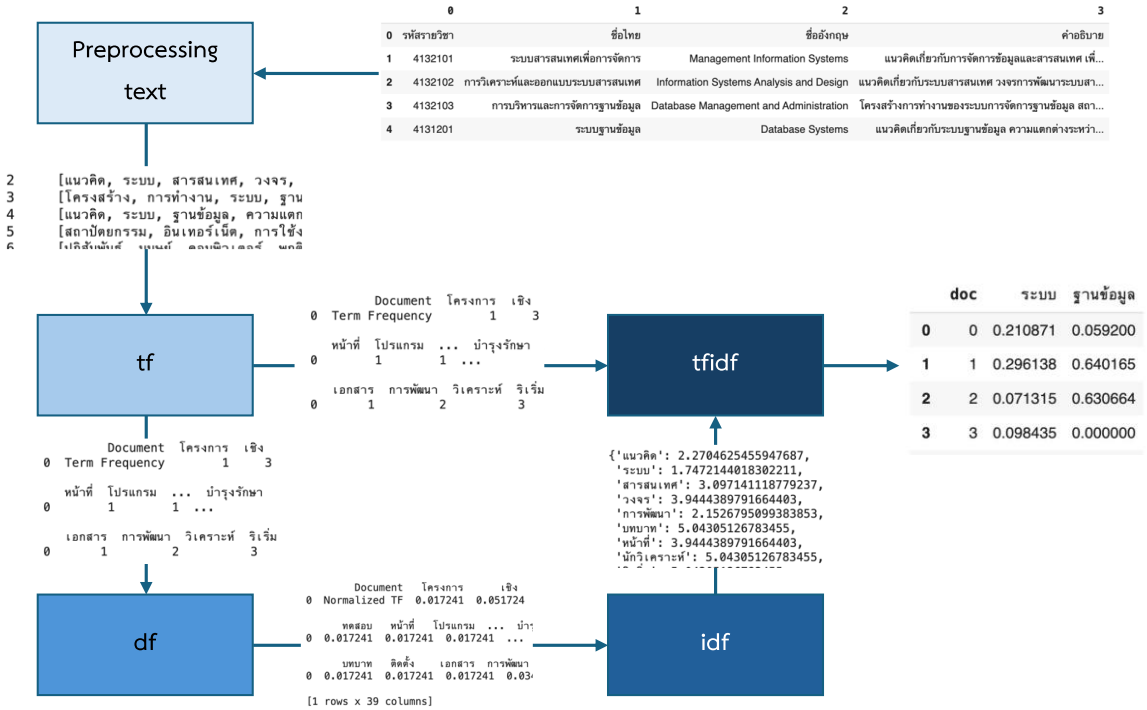
2.2 การกำจัดคำหยุด (Stop-Word Elimination) เป็นการนำคำที่ไม่เกี่ยวข้องกับเอกสารหรือคำที่ปรากฏบ่อยครั้งในเอกสารแต่ไม่ได้บ่งบอกคุณลักษณะของเอกสารนั้น เป็นคำขยายให้แก่คำอื่น เช่น คำเชื่อม คำสันธาน คำบุพบท หรือคำที่มักจุถูกใช้บ่อย ๆ เช่น “การ” “ความ” “ที่” “จะ” “ใช้” เป็นต้น คำเหล่านี้จะถูกตัดทิ้งโดยที่ไม่ทำให้ความหมายของเอกสารเปลี่ยนไป ดังตัวอย่าง

['โครงสร้าง', 'การทำงาน', '~~ของ~~', 'ระบบ', '~~การ~~', '~~จัดการ~~', 'ฐานข้อมูล', ' ', 'สถาปัตยกรรม', 'ระบบ', ' ', 'ฐานข้อมูล', ' ', 'ระบบ', 'ฐานข้อมูล', 'เชิง', 'สัมพันธ์', ' ', 'ระบบ', 'ฐานข้อมูล', '~~แบบ~~', 'กระจาย', ' ', 'ระบบ', 'ฐานข้อมูล', ' ', '~~แบบ~~', 'อ็อบเจ็กต์', ' ', 'ระบบ', 'ฐานข้อมูล', '~~บน~~', 'เว็บ', ' ', '~~การ~~', 'สร้าง', 'ระบบ', 'ฐานข้อมูล', ' ', 'การ', 'สร้าง', 'พจนานุกรม', ' ', 'ฐานข้อมูล', ' ', '~~การ~~', '~~จัดการ~~', 'ดัชนี', 'ข้อมูล', ' ', '~~การ~~', '~~จัดการ~~', 'บูรณภาพ', '~~ของ~~', 'ข้อมูล', ' ', '~~การ~~', '~~จัดการ~~', 'ความมั่นคง', '~~ของ~~', 'ฐานข้อมูล', ' ', 'การกำ', '~~หน~~', 'ด', 'ผู้ใช้', ' ', 'การ', 'จัดการ', 'สิทธิ์', 'ใน', 'การใช้งาน', 'ฐานข้อมูล', 'ระบบ', 'ความปลอดภัย', ' ', '~~การ~~', 'ถ่ายโอน', 'ข้อมูล', '~~ระหว่าง~~', 'ฐานข้อมูล', ' ', 'การกำ', 'หน', 'ดก', 'ล', 'ยุทธ์', 'ใน', 'การสำรอง', 'ข้อมูล', ' ', 'การกู้', 'คืน', '~~เมื่อ~~', 'ระบบ', 'ล้มเหลว', ' ', 'การประมวลผลข้อมูล', '~~แบบ~~', 'รายการ', ' ', '~~และ~~', 'ปัญหา', '~~และ~~', 'วิธี', 'แก้ปัญหา', '~~การ~~', 'เข้าถึง', ' ', 'ข้อมูล', '~~พร้อมกัน~~', ' ', '~~รวมถึง~~', '~~การ~~', '~~ปรับ~~', 'ระบบ', '~~ให้~~', 'มีประสิทธิภาพ', 'การใช้งาน', 'ดี', '~~ที่สุด~~']

2.3 การหารากศัพท์ (Stemming) เป็นการหา Stem หมายถึงรากศัพท์ คำหลัก หรือต้นตอของศัพท์ เพื่อให้การอธิบายเป็นไปในทางเดียวกัน ซึ่งจะได้ผลลัพธ์การเตรียมข้อมูลดังนี้

['โครงสร้าง', 'การทำงาน', 'ระบบ', 'ฐานข้อมูล', ' ', 'สถาปัตยกรรม', 'ระบบ', ' ', 'ฐานข้อมูล', ' ', 'ระบบ', 'ฐานข้อมูล', 'เชิง', 'สัมพันธ์', ' ', 'ระบบ', 'ฐานข้อมูล', 'กระจาย', ' ', 'ระบบ', 'ฐานข้อมูล', ' ', 'อ็อบเจ็กต์', ' ', 'ระบบ', 'ฐานข้อมูล', 'เว็บ', ' ', 'สร้าง', 'ระบบ', 'ฐานข้อมูล', ' ', 'สร้าง', 'พจนานุกรม', ' ', 'ฐานข้อมูล', ' ', 'ดัชนี', 'ข้อมูล', ' ', 'บูรณภาพ',

3. การหาค่าน้ำหนักของคำ (Term Weighting) การหาค่าน้ำหนักของคำหรือเทอม (Term) เพื่อสกัดคุณลักษณะของเอกสาร ด้วยการคำนวณหา TF-IDF แปลงให้อยู่ในรูปแบบของเวกเตอร์ที่แสดงขั้นตอนได้ตามภาพที่ 2 ทั้งนี้ผู้วิจัยได้ทดสอบพร้อมกำหนดค่าขั้นต่ำ Document Frequency ของ Term อยู่ระหว่าง 2-21 จึงจะทำให้ได้ค่าที่เหมาะสม และสามารถแสดงตัวอย่างค่าน้ำหนักของคำอธิบายวิชาที่คำนวณได้ดังตารางที่ 1



ภาพที่ 2 แสดงขั้นตอนการหาค่าน้ำหนักของคำ เพื่อแปลงให้อยู่ในรูปของเวกเตอร์

ตารางที่ 1 ตัวอย่างค่าน้ำหนักของการคำนวณหา TF-IDF ของคำอธิบายรายวิชา

รายวิชา	แนวคิด	ข้อมูล	สารสนเทศ	ระบบ	การพัฒนา
4132101	18	1	10	7	0
4132102	18	2	-	8	0
4132103	18	2	-	8	-
SC312003	-	2	-	9	-

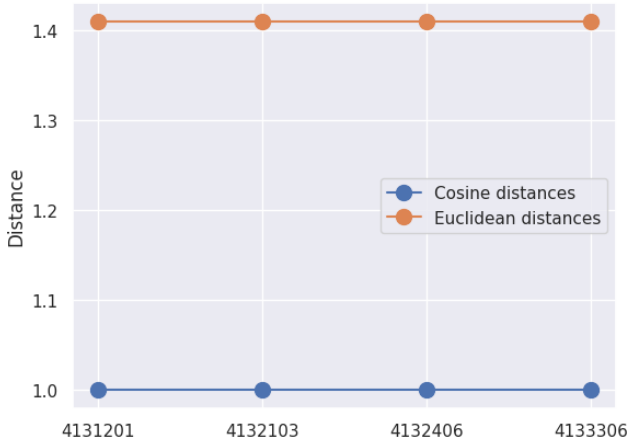
4. การวัดความเหมือนของข้อความ (Text Similarity Measurement)

หลังจากคำนวณค่าน้ำหนักของคำในเอกสารด้วยวิธี TF และTF-IDF แล้ว ผู้วิจัยได้ทำการทดสอบหาประสิทธิภาพการวัดความเหมือนของข้อความด้วยเมตริกแบบคู่ 7 วิธี ได้แก่ Cosine Similarity, Cosine distances, Euclidean distances, Laplacian kernel, Linear kernel, Pairwise kernels และ rbf kernel โดยคำนวณในแต่ละคู่เวกเตอร์ของคำอธิบายรายวิชาที่ขอเทียบโอน การทดลองนี้ใช้รายวิชา sc12003 เปรียบเทียบความเหมือนกับอีก 4 รายวิชาได้แก่ 4131201, 4132103, 4134206, และ 4133306 ประกอบด้วยขั้นตอนในการวัดความเหมือนของข้อความ ดังนี้

4.1 ผลการวัดความเหมือนของข้อความด้วยการหาระยะทาง

ในการทดลองนี้เป็นการวัดความเหมือนของข้อความด้วยการหาระยะทางจาก 2 วิธี ระยะห่างโคไซน์ (Cosine distances) และระยะห่างยูคลิเดียน (Euclidean distances) โดยวิธีระยะห่างโคไซน์

เน้นการหาค่าจากเวกเตอร์สองเวกเตอร์มีทิศทางที่ตรงกันหรือมุมระหว่างทั้งสองเวกเตอร์เป็นมุมมุ่งอยู่ในทิศทางเดียวกัน ส่วนระยะห่างยูคลิเดียนเน้นพิจารณาทั้งทิศทางและความยาวของเวกเตอร์ ดังนั้น เมื่อเทียบรายวิชา sc12003 กับอีก 4 รายวิชา 4131201, 4132103, 4134206, และ 4133306 พบว่า วิธีระยะห่างยูคลิเดียน มีความห่างจากกันและมีความยาวของเวกเตอร์เท่ากัน คือ 1.4 หน่วย และส่วนวิธีระยะห่างโคไซน์ เมื่อเทียบรายวิชา sc12003 กับอีก 4 รายวิชา 4131201, 4132103, 4134206, และ 4133306 พบว่า เวกเตอร์สองเวกเตอร์มีทิศทางที่ตรงกันเท่ากับ 1.0 เท่ากันทั้ง 4 รายวิชา ดังภาพที่ 3



ภาพที่ 3 ค่าความเหมือนของข้อความด้วยการหาระยะทางด้วยวิธีระยะห่างโคไซน์ และระยะห่างยูคลิเดียน

4.2 ผลการวัดความเหมือนของข้อความด้วยการหาค่าโคไซน์และเคอร์นอล

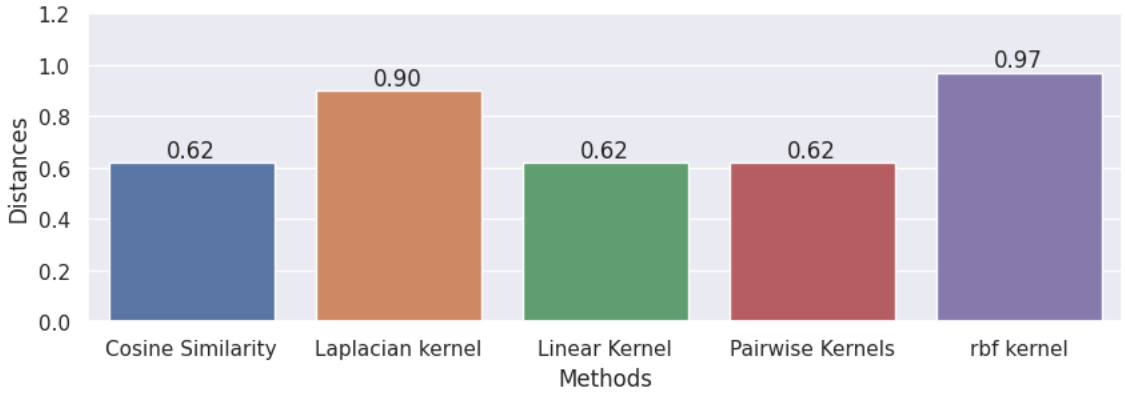
ในการทดลองนี้เป็นการวัดความเหมือนของข้อความด้วยการหาค่าโคไซน์และเคอร์นอล 5 วิธีได้แก่ Cosine Similarity, Laplacian kernel, Linear Kernel, Pairwise Kernels, และ rbf kernel ตารางที่ 2 ค่าความเหมือนของข้อความระหว่าง sc12003 กับ 4 รายวิชา 4131201, 4132103, 4134206, และ 4133306 ในแต่ละวิธี พบว่า 1) ค่าความเหมือนของข้อความด้วย Cosine Similarity ที่ดีที่สุดเท่ากับ 0.82 จากการเทียบความเหมือนระหว่าง sc12003 กับ 4131201 2) ค่าความเหมือนของข้อความด้วย Laplacian kernel ที่ดีที่สุดเท่ากับ 0.91 เท่ากัน 2 รายวิชาจากการเทียบความเหมือนระหว่าง sc12003 กับ 4131201 และ 4132103 3) ค่าความเหมือนของข้อความด้วย Linear Kernel ที่ดีที่สุดเท่ากับ 0.82 จากการเทียบความเหมือนระหว่าง sc12003 กับ 4131201 4) ค่าความเหมือนของข้อความด้วย Pairwise Kernels ที่ดีที่สุดเท่ากับ 0.82 จากการเทียบความเหมือนระหว่าง sc12003 กับ 4131201 และ 5) ค่าความเหมือนของข้อความด้วย rbf kernel ที่ดีที่สุดเท่ากับ 0.98 เท่ากัน 2 รายวิชาจากการเทียบความเหมือนระหว่าง sc12003 กับ 4131201 และ 4132103

ภาพที่ 4 พบว่า ค่าความเหมือนของข้อความระหว่าง sc12003 กับ 4 รายวิชา 4131201, 4132103, 4134206, และ 4133306 วิธีที่มีค่าความเหมือนเฉลี่ยอยู่ในระดับกลางได้แก่วิธี

Cosine Similarity, Linear Kernel และ Pairwise Kernel โดยมีค่าความเหมือนเท่ากับ 0.62 ทั้ง 3 วิธี และวิธีที่มีค่าความเหมือนเฉลี่ยอยู่ในระดับสูงได้แก่วิธี Laplacian Kernel และ RDF Kernel โดยมีค่าความเหมือนเท่ากับ 0.90 และ 0.97 ตามลำดับ

ตารางที่ 2 ตัวอย่างผลการคำนวณค่าความเหมือนของรายวิชา

รายวิชาที่นำมาเทียบ	รายวิชาที่ถูกเทียบ	วิธีการวัดความเหมือนของข้อความ (Text Similarity Measurement)				
		Cosine Similarity	Laplacian kernel	Linear Kernel	Pairwise Kernels	rbf kernel
sc312003	4131201	0.82	0.91	0.82	0.82	**0.98**
	4132103	0.76	0.91	0.76	0.76	**0.98**
	4134206	0.54	0.90	0.54	0.54	0.96
	4133306	0.34	0.89	0.34	0.34	0.94



ภาพที่ 4 ค่าความเหมือนของข้อความเฉลี่ยด้วยการหาค่าโคไซน์และเคอร์นอล

สรุปผลและข้อเสนอแนะ

จากการวิเคราะห์และเปรียบเทียบประสิทธิภาพวิธีหาความเหมือนด้วยเมตริกแบบคู่ (Pairwise Metrics) ในการเทียบโอนคำอธิบายรายวิชาของสาขาวิชาเทคโนโลยีสารสนเทศ ซึ่งมีขั้นตอนการทำงานในการเตรียมข้อมูลโดยการตัดคำภาษาไทย การกำจัดคำหยุด การคำนวณน้ำหนักของคำเพื่อสกัดคุณลักษณะของข้อความแปลงให้อยู่ในรูปเวกเตอร์และคำนวณความเหมือนเพื่อเปรียบเทียบประสิทธิภาพด้วยวิธีเมตริกแบบคู่ 7 วิธี การหาค่าความเหมือนของข้อความด้วยการหาระยะทางด้วยวิธีระยะห่างโคไซน์มีค่าต่ำกว่าวิธีระยะห่างยูคลิเดียน และผลการวัดความเหมือนของข้อความด้วยการหาค่าโคไซน์และเคอร์นอล พบว่า วิธีที่มีประสิทธิภาพดีที่สุดโดยเฉลี่ย ได้แก่ rbf kernel 0.97 ลำดับถัดมาเป็นวิธี Laplacian kernel 0.90 ส่วนวิธี Cosine Similarity, Linear Kernel และ Pairwise Kernels ผลการวัดความเหมือน

ของข้อความโดยเฉลี่ยเท่ากันคือ 0.62 ดังนั้น งานวิจัยนี้สามารถนำมาใช้ในการเพิ่มประสิทธิภาพความแม่นยำในการเทียบโอนหน่วยกิตได้ ซึ่งสอดคล้องกับงานวิจัยของ สราธิป เตชาวิวัฒนบูลย์ (2560) อย่างไรก็ตามวิธีหาความเหมือนของข้อความด้วยอัลกอริทึมแบบต่าง ๆ กันนั้น การเตรียมข้อมูลเป็นสิ่งสำคัญ ควรทำความสะอาดข้อมูลและวิเคราะห์อย่างละเอียดก่อนนำมาใช้งาน

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ความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา

Diversity and Morphological Characteristics of Sapodilla (Manikara sapota (L.)) in Koh Yor Subdistrict, Mueang District, Songkhla Province.

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บทคัดย่อ

การศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุด (Manikara sapota (L.)) ในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา ดำเนินการตั้งแต่เดือนตุลาคม 2565-กันยายน 2566 มีวัตถุประสงค์เพื่อศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา ดำเนินการเก็บข้อมูลด้านสัณฐานวิทยาของละมุด จากแปลงปลูกละมุด จำนวน 20 แปลง ผลการศึกษา พบว่า ละมุดที่ปลูกในพื้นที่ตำบลเกาะยอ มีจำนวน 5 พันธุ์ ได้แก่ พันธุ์ไข่ห่าน พันธุ์ลูกแขก พันธุ์สาลี่ พันธุ์บ่อทรัพย์ และพันธุ์พื้นเมือง จัดแบ่งตามขนาดเป็น 3 ประเภท คือ ผลขนาดใหญ่ คือ พันธุ์สาลี่และพันธุ์บ่อทรัพย์ ผลขนาดกลาง คือ พันธุ์ไข่ห่าน และพันธุ์พื้นเมือง และผลขนาดเล็ก คือ พันธุ์ลูกแขก ละมุดทั้ง 5 พันธุ์ มีลักษณะใบ เนื้อผล และเมล็ดที่ต่างกัน มีอายุเก็บเกี่ยวเฉลี่ยที่ 8.0-8.5 เดือนหลังดอกบาน แมลงศัตรูที่สำคัญ คือ หนอนเจาะลำต้น หนอนเจาะผล และแมลงวันทอง ปริมาณของแข็งที่ละลายน้ำได้ (TSS) มีความใกล้เคียงกันในทุกพันธุ์ (17.25-18.05 °Brix) โดยพันธุ์ไข่ห่าน มีปริมาณ TSS มากที่สุด (18.05 °Brix) และพันธุ์สาลี่มีปริมาณ TSS น้อยที่สุด (17.25 °Brix)

คำสำคัญ : ละมุด, ลักษณะทางสัณฐานวิทยา, ความหลากหลาย

Abstract

The study on the diversity and morphological characteristics of sapodilla (Manikara sapota (L.)) in Koh Yor Subdistrict, Mueang District, Songkhla Province. This project was studied in October 2022-September 2023. The objective was to study on

the diversity and morphological characteristics of sapodilla in Koh Yor Subdistrict, Mueang District, Songkhla Province. The morphological characteristics data was collected on 20 farms of sapodilla. It was found that there were 5 varieties of sapodilla in Koh Yor subdistrict, such as Khai Han, Look Khaek, Sali, Boh Sap and Native. It was divided by fruits size into 3 types: 1) The large fruits size were Sali, Boh Sap, the medium fruits sized were Khai Han and Native and the small fruit size was Look Khaek. The morphological characteristics of 5 varieties such as; leaves, flesh and seeds were different. The harvest index of sapodilla was 8.0-8.5 months after blooming. The insect pests were stem borers, fruit borers and fruit flies. The total soluble solids (TSS) was similar in all varieties (17.25-18.05 °Brix). Khai Han variety was the most TSS (18.05 °Brix) and Sali variety was the least (17.25 °Brix)

Keywords : Sapodilla Fruits, Manikara sapota (L.), Morphological Characteristics, Diversity

บทนำ

พื้นที่ภาคใต้ตอนล่าง ได้แก่ จังหวัดตรัง พัทลุง สงขลา สตูล ปัตตานี ยะลา และนราธิวาส เป็นพื้นที่ที่มีความหลากหลายของพันธุ์พืชที่มีเอกลักษณ์ประจำถิ่น ทั้งพืชผัก ไม้ผล ไม้ยืนต้น ล้วนมีความหลากหลายของพันธุ์พืชพื้นถิ่น ในการปรับปรุงพันธุ์พืชความหลากหลายของพันธุ์พืชถือว่ามีความสำคัญมากเพราะทำให้สามารถเลือกลักษณะพันธุกรรมของพืชในด้านที่ดีมาใช้สำหรับการปรับปรุงพันธุ์ได้ง่ายและได้พืชพันธุ์ใหม่ที่มีคุณภาพที่ดี สำหรับในด้านการคัดเลือกพันธุ์พืชที่มีความเป็นเอกลักษณ์ และมีอัตลักษณ์ของพื้นที่ความหลากหลายของพันธุ์พืชก็มีความจำเป็นในการคัดเลือกพันธุ์พืชที่มีคุณภาพและเหมาะสมกับสภาพพื้นที่นั้น ๆ ซึ่งในปัจจุบันได้มีการยกระดับผลผลิตหรือผลิตภัณฑ์ในระดับพื้นที่ โดยมีการขึ้นทะเบียนสินค้าหรือผลผลิตที่ได้มาจากความหลากหลายของพันธุ์พืชในพื้นที่ และมีการคัดเลือกเพื่อขึ้นทะเบียนเป็นสินค้าหรือสิ่งบ่งชี้ทางภูมิศาสตร์ (Geographical Indications; GI) เช่น ส้มจุกจะนะ (สงขลา) ส้มโอหอมควนลัง (สงขลา) มะม่วงเบาสงขลา (สงขลา) กล้วยหินบันนังสตา (ยะลา) เป็นต้น เกษตรกรได้ใช้ประโยชน์จากความหลากหลายของพันธุ์พืชมาใช้เพื่อการบริโภค อุปโภค และการสร้างรายได้ให้กับตนเองมากขึ้น จังหวัดสงขลาเป็นจังหวัดที่มีพื้นที่ติดกับทะเลฝั่งอ่าวไทย และทะเลสาบสงขลา และยังมีพื้นที่ที่เป็นเกาะตั้งอยู่กลางทะเลสาบสงขลาตอนล่าง คือ พื้นที่ตำบลเกาะยอ ตัวเกาะมีพื้นที่ทั้งหมด 15 ตารางกิโลเมตร หรือ 9,375 ไร่ มีน้ำล้อมรอบกลางทะเลสาบสงขลา ลักษณะภูมิประเทศเป็นภูเขา เนินเขา ลักษณะภูมิอากาศมีลมทะเลพัดผ่านตลอดปี ประชากรรวมทั้งสิ้น 4,920 คน ประชากรส่วนใหญ่ประกอบอาชีพเกษตรกรรม เช่น ประมง และการทำสวนผลไม้ โดยผลไม้ที่มีชื่อเสียงมากที่สุดของเกาะยอ คือ จำปาดะ และละมุด สำหรับละมุด มีชื่อวิทยาศาสตร์ *Manikara sapota* (L.) P. Royen จัดอยู่ในวงศ์ Sapotaceae ละมุด มีชื่อ

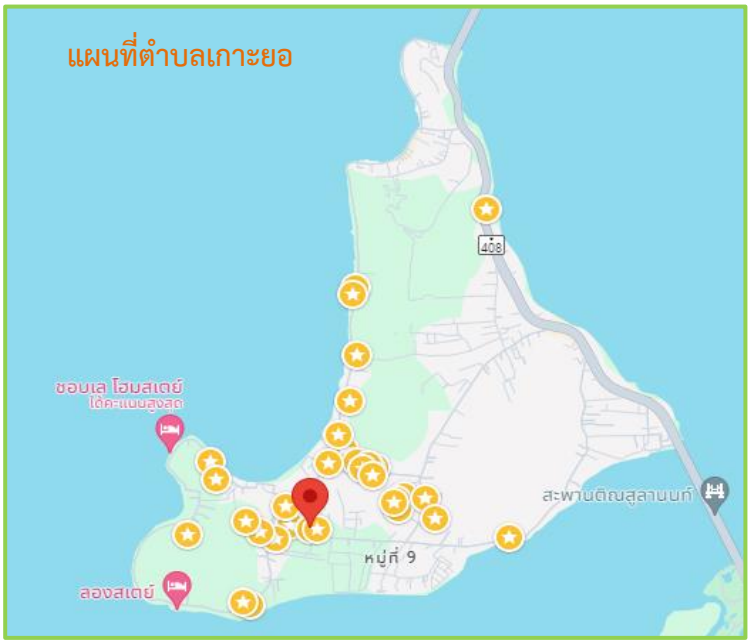
เรียกท้องถิ่นที่หลากหลาย เช่น ละมุดฝรั่ง ชวานิลอ (ปัตตานี มลายู ยะลา) และสวา (สงขลา) เป็นต้น ละมุดจัดเป็นไม้ผลขนาดกลางมีเส้นผ่าศูนย์กลางพุ่ม อยู่ระหว่าง 4-8 เมตร ไม่ผลัดใบ ความสูงของต้นอยู่ระหว่าง 9-15 เมตร ออกดอกติดผลตลอดทั้งปี ละมุดที่ปลูกในประเทศไทยมีหลากหลายสายพันธุ์ มีทั้งพันธุ์ที่มาจากต่างประเทศ พันธุ์ที่ได้รับการปรับปรุงพันธุ์ รวมถึงพันธุ์พื้นเมืองในแต่ละพื้นที่ (สุรศักดิ์ วัฒนพันธุ์สอน และคณะ, 2558) กล่าวว่า ในจังหวัดสุโขทัยละมุดมีความหลากหลายของพันธุ์ จำนวน 11 พันธุ์ ได้แก่ พันธุ์นมแพะ พันธุ์กำนัน พันธุ์มะกอก พันธุ์ดำเนิน พันธุ์ปราจีน พันธุ์สาลี่เวียดนาม พันธุ์กระสวยมาเล พันธุ์สีดา พันธุ์ทช01 พันธุ์CM19 และพันธุ์ตาขวัญ เช่นเดียวกับละมุดในพื้นที่ตำบลเกาะยอก็มีความหลากหลายของพันธุ์ โดยตำบลเกาะยอจัดเป็นแหล่งปลูกละมุดที่สำคัญของจังหวัดสงขลา มีพื้นที่ปลูก 260 ไร่ (สำนักงานเกษตรอำเภอเมืองจังหวัดสงขลา, 2563) แหล่งปลูกละมุดในพื้นที่ตำบลเกาะยอนั้นมีจุดเด่น คือ รสชาติหวานเข้มเนื้อแน่น เนื่องจากพื้นที่ปลูกมีลักษณะเป็นเกาะที่มีน้ำเค็มล้อมรอบ จึงทำให้ละมุดมีรสชาติหวานเข้มแตกต่างจากแหล่งปลูกอื่น อีกทั้งละมุดเป็นผลไม้ที่มีคุณค่าทางโภชนาการสูง ทั้งคาร์โบไฮเดรต ไขมัน และโปรตีน นอกจากนี้ยังมีแร่ธาตุและวิตามินที่จำเป็นต่อร่างกายหลายชนิด เช่น แคลเซียม เหล็ก แมกนีเซียม ฟอสฟอรัส โพแทสเซียม โซเดียม สังกะสี วิตามินเอ บี และซี แต่ทั้งนี้พบว่าละมุดที่ปลูกในพื้นที่ตำบลเกาะยอนั้นมีความแปรปรวนของสายพันธุ์ค่อนข้างสูง มีทั้งที่เป็นลูกเล็ก ลูกใหญ่ ลูกกลม ลูกรี และพันธุ์ที่เป็นพันธุ์ดั้งเดิม ซึ่งในส่วนของคุณภาพนั้นก็มีความแตกต่างกัน ทำให้รสชาติ เนื้อสัมผัสที่แตกต่างกัน ดังนั้นจึงควรมีการศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในพื้นที่เกาะยอเพื่อใช้เป็นฐานข้อมูลและฐานพันธุกรรมในการส่งเสริมการผลิตละมุดให้มีเอกลักษณ์ของท้องถิ่นนำไปสู่การขึ้นทะเบียนเป็นพืช GI และวางแผนการอนุรักษ์และการปรับปรุงพันธุ์ได้อย่างเหมาะสมต่อไปในอนาคต

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา

วิธีดำเนินการวิจัย

ดำเนินการศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา จากจำนวนแปลงลูกละมุด จำนวน 20 แปลง (ภาพที่ 1) โดยการสัมภาษณ์และการเก็บตัวอย่างละมุดเพื่อศึกษาข้อมูลด้านความหลากหลาย และลักษณะทางสัณฐานวิทยาของละมุดในแต่ละพันธุ์ในพื้นที่ตำบลเกาะยอที่มีอายุเฉลี่ยมากกว่า 5 ปี โดยสุ่มเก็บตัวอย่างใบ ผล จำนวน 5 ต้น/แปลง บันทึกข้อมูลการระบาดของศัตรูพืช พัฒนาการของผล รูปร่างและขนาดผล ลักษณะใบ ลักษณะเนื้อผล ลักษณะเมล็ด และปริมาณของแข็งที่ละลายน้ำได้ จากจำนวนผลละมุด จำนวน 20 ผล/ต้น



ภาพที่ 1 พื้นที่ปลูกละมุดใน ตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา (จำนวน 20 แปลง)
ที่มา: https://www.google.com/maps/place/เกาะยอ

ผลการวิจัย

จากการศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุด บนพื้นที่ตำบลเกาะยอ พบว่า พื้นที่ตำบลเกาะยอมีการปลูกละมุดกระจายทั่วทั้งพื้นที่ มีการปลูกมากที่สุดในหมู่ที่ 4 และ หมู่ที่ 9 เกษตรกรผู้ปลูกละมุดส่วนใหญ่เป็นรายย่อย มีพื้นที่ปลูกระหว่าง 0.5-2 ไร่/แปลง แต่สามารถทำรายได้ให้กับเกษตรกรได้ตลอดทั้งปี เนื่องจากผลละมุดจะทยอยออกดอกติดผลตลอดปี สำหรับฤดูเก็บเกี่ยวที่มีการออกดอกติดผลมากที่สุดจะอยู่ในช่วงเดือนพฤศจิกายน - เดือนมกราคม แต่ทั้งนี้ขึ้นอยู่กับสภาพอากาศในปีนั้น ๆ ด้วย จากการสำรวจและศึกษาต้นละมุดที่ปลูกในเกาะยอนั้น จะมีอายุตั้งแต่เริ่มปลูกใหม่จนถึงอายุมากกว่า 100 ปี ซึ่งต้นละมุดจะทนต่อสภาพอากาศที่เปลี่ยนแปลง ทนต่อความแห้งแล้ง แต่จะมีแมลงศัตรูที่เข้าทำลายในลำต้น คือ หนอนเจาะลำต้น ซึ่งเป็นตัวอ่อนของด้วงหนวดยาวที่เข้าทำลายต้นละมุดโดยการเจาะลำต้น ทำให้ต้นละมุดเกิดความเสียหายและตายได้ (ภาพที่ 2) สำหรับแมลงศัตรูที่สำคัญในระยะผล ได้แก่ หนอนเจาะผล ซึ่งเป็นตัวอ่อนของผีเสื้อกลางคืนที่เข้ามาวางไข่บนผลละมุดและเข้าทำลายตั้งแต่ระยะผลอ่อน (ภาพที่ 3) เช่นเดียวกับแมลงวันทองที่เข้าทำลายได้ทั้งในระยะผลอ่อนและผลแก่จัด ซึ่งทำความเสียหายเป็นอย่างมากต่อการผลิตละมุด (ภาพที่ 4)

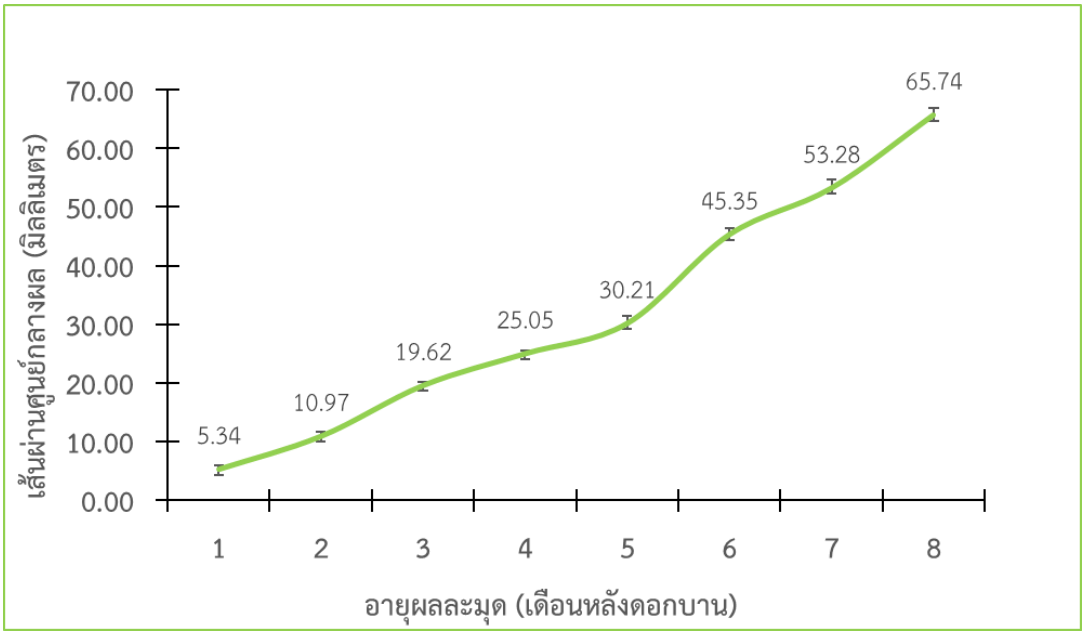
ภาพที่ 2 ลักษณะการทำลายของหนอนเจาะลำต้น และตัวเต็มวัย (ด้วงหนวดยาว)

ภาพที่ 3 ลักษณะการทำลายผล และลักษณะหนอนเจาะผลละมุด

ภาพที่ 4 ลักษณะการทำลายผล และลักษณะตัวเต็มวัยแมลงวันทอง

จากการสัมภาษณ์และการเก็บข้อมูลลักษณะทางสัณฐานวิทยาของละมุด จากเกษตรกรผู้ปลูกละมุด จำนวน 20 ราย (20 แปลง) พบว่า ละมุดที่ปลูกในพื้นที่ตำบลเกาะยอ มี 5 พันธุ์ ได้แก่ พันธุ์ไข่ห่าน พันธุ์ลูกแขก พันธุ์สาลี่ (แอปเปิล) พันธุ์บ่อทรัพย์ และพันธุ์พื้นเมือง เกษตรกรส่วนใหญ่จะขายผลผลิตแบบเหมาเกรดและจำหน่ายให้กับพ่อค้าคนกลาง โดยการเก็บผลผลิตละมุด ล้างทำความสะอาด ผึ่งลมให้แห้ง แล้วให้พ่อค้ามารับไปบ่มเอง ราคาจำหน่าย คือ 40-60 บาท/กิโลกรัม จะมีเพียงบางสวนเท่านั้นที่จำหน่ายเองและคัดเกรดจำหน่าย ราคาจำหน่าย คือ 60-100 บาท/กิโลกรัม ตามขนาดของผล อายุเก็บเกี่ยวผลผลิตละมุด

โดยเฉลี่ยจะอยู่ที่ 8.0-8.5 เดือน หลังดอกบาน โดยจะมีอัตราการเจริญเติบโตสูงที่สุดในช่วงพัฒนาการของผลตั้งแต่ 6 เดือนขึ้นไป โดยเก็บข้อมูลการพัฒนาการของผลจาก 10 ผล/ต้น/แปลง (ภาพที่ 5)



ภาพที่ 5 พัฒนาการของผลละมุดในพื้นที่ตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา

ลักษณะทางสัณฐานวิทยาของละมุด

ละมุดแต่ละสายพันธุ์จะมีลักษณะทางสัณฐานวิทยา เช่น ขนาดผล ความกว้างผล ความยาวผล รูปทรงผล ลักษณะใบ ลักษณะเมล็ด รสชาติที่แตกต่างกัน (ตารางที่ 1)

ผล (Fruit size) ละมุดพันธุ์ไข่ห่านผลมีขนาดใหญ่ปานกลาง ผลกลมรีท้ายป้าน พันธุ์ลูกแขกจะมีผลขนาดเล็ก ผลกลมรีคล้ายพันธุ์ไข่ห่านแต่มีขนาดผลเล็กกว่าคล้ายไข่ไก่ ทำให้มีราคาจำหน่ายน้อยกว่าพันธุ์ไข่ห่าน พันธุ์สาลี่จะมีผลที่มีขนาดกลมใหญ่คล้ายผลสาลี่หรือแอปเปิล เป็นพันธุ์ที่เกษตรกรเริ่มซื้อต้นพันธุ์เข้ามาปลูกในพื้นที่ แต่ยังเป็นต้นละมุดที่มีอายุน้อย พันธุ์บ่อทรัพย์เป็นละมุดพันธุ์ดั้งเดิมของเกาะยอ ผลมีขนาดใหญ่ท้ายแหลมมีเกษตรกรปลูกน้อย ส่วนใหญ่ต้นละมุดมีอายุมากกว่า 50 ปี พันธุ์พื้นเมือง เป็นพันธุ์ดั้งเดิมของละมุดที่ปลูกในพื้นที่เกาะยอ ผลจะมีขนาดกลาง เมื่อสุกแก่เต็มที่เนื้อผลจะเป็นเนื้อทราย รสชาติหวาน และมีลักษณะที่แตกต่างจากพันธุ์อื่น ๆ คือ ผิวผลจะไม่มีไคลทำให้สามารถทำความสะอาดได้ง่ายกว่า

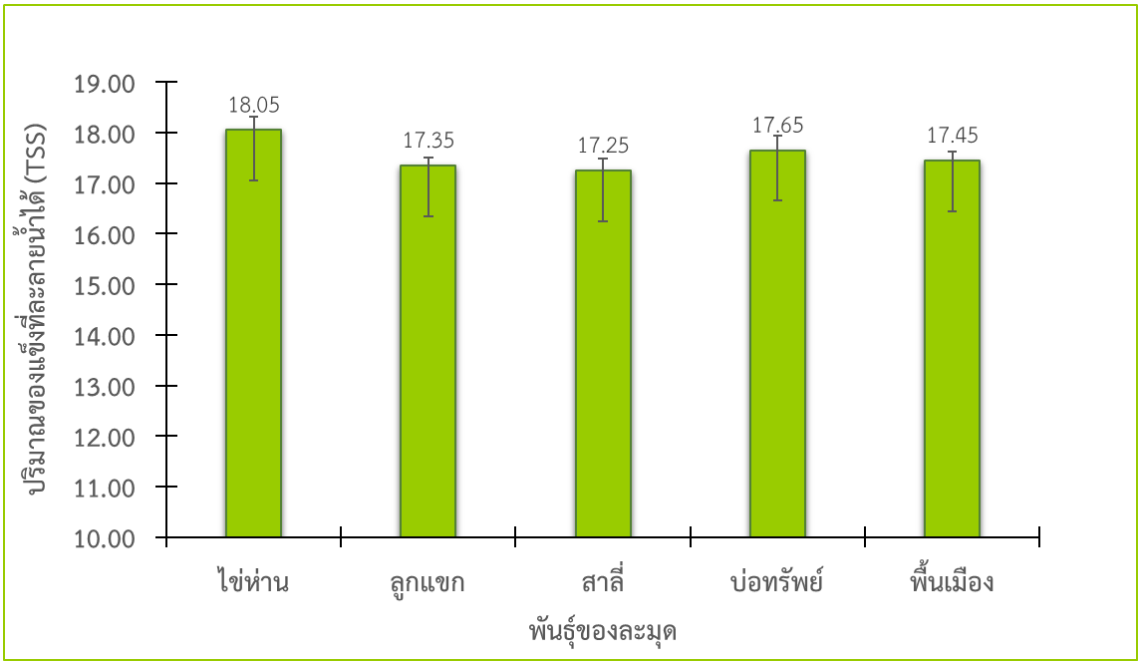
ใบ (Leaf) ใบของละมุดแต่ละพันธุ์จะมีลักษณะและขนาดใกล้เคียงกัน จะมีความแตกต่างกันบ้างเพียงเล็กน้อย โดยพันธุ์ไข่ห่านและพันธุ์บ่อทรัพย์ ใบจะมีขนาดใกล้เคียงกัน ปลายใบแหลม แต่พันธุ์ไข่ห่านใบเรียวเล็กกว่า โคนใบจะแหลมกว่าพันธุ์บ่อทรัพย์ พันธุ์ลูกแขกใบจะมีขนาดเล็กและสั้นกว่าพันธุ์อื่น ๆ ใบจะป้อม ปลายใบโค้งมน สำหรับใบของพันธุ์สาลี่ปลายใบจะเป็นหยักเหมือนพันธุ์พื้นเมือง แต่แผ่นใบจะมีขนาดใหญ่กว่า

เนื้อผล (Flesh) ลักษณะเนื้อผลของละมุดจะมีความใกล้เคียงกัน เมื่อสุกแก่เต็มที่ สีของเนื้อผลจะใกล้เคียงกัน รสชาติหวาน เนื้อผลนิ่มเมื่อสุกแก่เต็มที่พันธุ์พื้นเมืองและพันธุ์สาลี่เนื้อผลจะมีลักษณะเป็นเนื้อทรายมีรสหวานฉ่ำ พันธุ์ลูกแขกเนื้อผลหวานกรอบ พันธุ์บ่อทรัพย์เนื้อผลเนียนหวานกรอบ และพันธุ์ไข่ห่านเนื้อผลเนียนหวานกรอบ

เมล็ด (Seed) ลักษณะเมล็ดของละมุดแต่ละสายพันธุ์จะมีความแตกต่างกัน อย่างเห็นได้ชัด โดยละมุดพันธุ์ไข่ห่านเมล็ดจะมีขนาดเล็กหัวแหลม ท้ายป้าน เปลือกเมล็ดเป็นมันวาว พันธุ์ลูกแขกเมล็ดจะมีขนาดเล็ก เรียวหัวแหลม ท้ายค่อนข้างแหลมเปลือกเมล็ดเป็นมันวาว พันธุ์สาลี่เมล็ดจะมีขนาดเล็กหัวแหลมท้ายป้าน เปลือกเมล็ดเป็นมันวาวคล้ายพันธุ์ไข่ห่าน พันธุ์บ่อทรัพย์เมล็ดเรียว หัวแหลมท้ายป้านเปลือกเมล็ดด้านไม่เป็นมันวาว เช่นเดียวกับเมล็ดละมุดพันธุ์พื้นเมือง ซึ่งเมล็ดของพันธุ์พื้นเมืองมีลักษณะมนกว่า

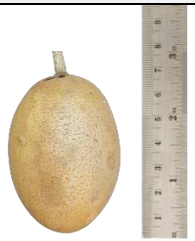
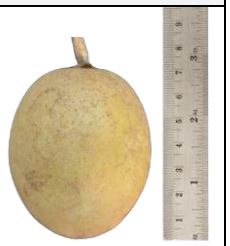
ปริมาณของแข็งที่ละลายน้ำได้ (Total Soluble Solid: °Brix)

ปริมาณของแข็งที่ละลายน้ำได้ของละมุดทั้ง 5 พันธุ์ พบว่า มีค่าใกล้เคียงกัน มีค่า TSS อยู่ระหว่าง 17.25-18.05 °Brix โดยละมุดพันธุ์ไข่ห่านมีค่า TSS สูงที่สุด คือ 18.05 °Brix รองลงมา คือ พันธุ์บ่อทรัพย์ มีค่า TSS คือ 17.65 °Brix และพันธุ์สาลี่ มีค่า TSS ต่ำที่สุด คือ 17.25 °Brix ความแตกต่างนี้ถือว่าไม่มีความแตกต่างกันทางสถิติ นั่นคือ ละมุดทั้ง 5 พันธุ์นั้นมีค่าความหวานที่ใกล้เคียงกัน (ภาพที่ 6) ทั้งนี้ TSS ของละมุดนอกจากจะขึ้นกับพันธุ์แล้ว ยังขึ้นกับฤดูกาลเก็บเกี่ยว ซึ่งละมุดที่เก็บเกี่ยวในฤดูร้อนจะมีค่า TSS สูงกว่าละมุดที่เก็บเกี่ยวในฤดูฝน อายุเก็บเกี่ยวที่เหมาะสมก็ทำให้ค่า TSS มีความแตกต่างกันอีกด้วย



ภาพที่ 6 ปริมาณของแข็งที่ละลายน้ำได้ของละมุด 5 พันธุ์ที่ปลูกในตำบลเกาะยอ จังหวัดสงขลา

ตารางที่ 1 ลักษณะทางสัณฐานวิทยาของละมุด 5 สายพันธุ์

ลักษณะ	ไข่ห่าน	ลูกแขก	สาลี่	บ่อทรัพย์	พื้นเมือง
ผล					
ใบ					
เนื้อ					
เมล็ด					

สรุปและอภิปรายผล

จากการศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในตำบลเกาะยอ อำเภอเมือง จังหวัดสงขลา จำนวน 20 แปลง พบว่า แปลงปลูกละมุดจะเป็นแปลงดั้งเดิม ต้นละมุดมีอายุเฉลี่ยตั้งแต่เริ่มปลูกใหม่จนถึงมากกว่า 100 ปี ส่วนใหญ่จะเป็นเกษตรกรรายย่อย มีพื้นที่ปลูกเฉลี่ย 0.5-2.0 ไร่ ส่วนใหญ่จะจำหน่ายผลผลิตละมุดแบบเหมาเกรดจำหน่าย แมลงศัตรูที่สำคัญของละมุด คือ หนอนเจาะลำต้น แมลงศัตรูที่ทำลายระยะผล ได้แก่ หนอนเจาะผล และแมลงวันทอง ซึ่งจะเข้าทำลายในระยะผลอ่อนและผลแก่จัดทำให้เกิดผลเน่าเสีย ทำความเสียหายกับผลผลิตละมุด ละมุดที่ปลูกในพื้นที่ตำบลเกาะยอมีจำนวน 5 พันธุ์ ได้แก่ พันธุ์ไข่ห่าน พันธุ์ลูกแขก พันธุ์สาลี่ พันธุ์บ่อทรัพย์ และพันธุ์พื้นเมือง ละมุดทั้ง 5 พันธุ์ มีลักษณะทางสัณฐานวิทยาที่ต่างกัน คือ ผลละมุดพันธุ์ไข่ห่าน มีขนาดใหญ่ผลกลมรีท้ายป้าน พันธุ์ลูกแขก มีผลขนาดเล็ก ผลกลมรีคล้ายพันธุ์ไข่ห่านแต่มีขนาดเล็กกว่า พันธุ์สาลี่ผลมีขนาดกลมใหญ่คล้ายผลสาลี่หรือแอปเปิล พันธุ์บ่อทรัพย์เป็นละมุดพันธุ์ดั้งเดิมของเกาะยอ ผลมีขนาดใหญ่ท้ายแหลม พันธุ์พื้นเมืองเป็นพันธุ์ดั้งเดิมของละมุดที่ปลูกในพื้นที่เกาะยอ ผิวผลจะไม่มีไคลทำให้สามารถทำความสะอาดได้ง่ายกว่า เช่นเดียวกับความหลากหลายของละมุดในจังหวัดสุโขทัย (สุรศักดิ์ วัฒนพันธุ์สอน และคณะ , 2558) พบว่า จังหวัดสุโขทัยซึ่งเป็นแหล่งปลูกละมุดที่สำคัญของประเทศไทย ก็มีความหลากหลายของพันธุ์ละมุด จำนวน 11 พันธุ์ แต่ทั้งนี้การใช้ลักษณะผลเพียงอย่างเดียวในการจำแนกพันธุ์ อาจจะทำให้ไม่สามารถบ่งบอกได้ว่าเป็นพันธุ์ที่ต่างกัน เพราะลักษณะผลละมุดที่มาจากต้นเดียวกัน พันธุ์เดียวกันก็อาจมีลักษณะรูปร่างของผลต่างกันได้ (ลักษมี สุภัทรา, 2565) ดังนั้นหากต้องการจำแนกพันธุ์ละมุดต้องใช้ลักษณะอื่น ๆ ในการจำแนก เช่น ลักษณะใบ ลักษณะเนื้อผล ลักษณะเมล็ด ความหวาน ความแน่นเนื้อ เป็นต้น ละมุดที่ผลิตในตำบลเกาะยอนั้น มีพันธุ์ที่เป็นพันธุ์พื้นเมืองและพันธุ์ดั้งเดิมของชุมชน จำนวน 2 พันธุ์ คือพันธุ์บ่อทรัพย์และพันธุ์พื้นเมือง ซึ่งมีการปลูกมาอย่างยาวนานมากกว่า 50 ปี โดยพันธุ์บ่อทรัพย์มีลักษณะผลใหญ่และมีคุณภาพผลดี เกษตรกรสามารถจำหน่ายได้ในราคาสูง จึงควรมีการส่งเสริมให้มีการผลิตละมุดพันธุ์บ่อทรัพย์ ทำให้เกษตรกรมีรายได้เพิ่มขึ้นและอาจจะนำไปสู่การขึ้นทะเบียนเพื่อคัดเลือกและรับรองพันธุ์บ่อทรัพย์ให้เป็นพันธุ์รับรองของชุมชนต่อไป

ข้อเสนอแนะ

จากการศึกษาความหลากหลายและลักษณะทางสัณฐานวิทยาของละมุดในพื้นที่ตำบลเกาะยอ จังหวัดสงขลา ผู้วิจัยมีข้อเสนอแนะสำหรับนักวิจัย นักศึกษา ผู้ที่สนใจ หรือผู้ที่เกี่ยวข้องดังนี้

1. ควรมีการนำเอาผลการศึกษาไปพัฒนาต่อยอดงานวิจัยในการพัฒนาองค์ความรู้ในการจัดการสวนละมุดเพื่อให้เกิดการผลิตละมุดที่มีคุณภาพ การคัดเลือกและการพัฒนาพันธุ์ละมุดที่เหมาะสมต่อการผลิตและตรงกับความต้องการของผู้บริโภค ทำให้เกษตรกรมีรายได้เพิ่มขึ้น

2. ควรมีการส่งเสริมให้เกิดการยกระดับการผลิตนำไปสู่การผลิตผลิตสินค้าอัตลักษณ์ของชุมชนเกาะยอ และสามารถขึ้นทะเบียนสิ่งบ่งชี้ทางภูมิศาสตร์ (GI) ในระดับจังหวัด ส่งเสริมให้เกิดการท่องเที่ยวในชุมชนมากขึ้น

3. ควรมีการให้ความรู้กับเกษตรกรเพื่อให้เกิดการอนุรักษ์ทรัพยากรและความหลากหลายของละมุดเกาะยอต่อไป

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การพัฒนากรรมวิธีตรวจหาสารพันธุกรรมไวรัสอหิวาต์แอฟริกาในสุกรด้วยเทคนิคลูปมิเดเอเตดไอโซเทอร์มอลแอมพลิฟิเคชั่นเปลี่ยนสี

Development of African Swine Fever Virus Detection Methods by Colorimetric Loop-Mediated Isothermal Amplification

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บทคัดย่อ

ไวรัสโรคอหิวาต์แอฟริกาในสุกร (African swine fever virus, ASFV) เป็นสาเหตุของโรคอหิวาต์แอฟริกาในสุกร (African swine fever, ASF) โดยมีการเสียชีวิตในอัตราที่สูงและพบการระบาดของโรคนี้ทั่วโลก ซึ่งก่อให้เกิดความสูญเสียทางเศรษฐกิจอย่างมหาศาลต่ออุตสาหกรรมสุกรทั่วโลก เนื่องจากยังไม่มีวัคซีนที่มีประสิทธิภาพในการป้องกันและเชื้อไวรัสกำจัดได้ยากและเชื้อรุนแรงในการก่อโรค นอกจากนี้ยังพบการกลายพันธุ์ของไวรัสทำให้มีการตรวจไม่พบในบางครั้ง การตรวจหาเชื้อไวรัสได้อย่างสะดวกให้ผลรวดเร็วและประสิทธิภาพแม่นยำจึงมีบทบาทสำคัญในการจัดการปัญหาโรคอหิวาต์แอฟริกาในสุกรได้ จึงพัฒนาวิธีการตรวจโดยเทคนิค Loop Mediated Isothermal Amplification (LAMP) ที่ออกแบบให้จำเพาะต่อ 3 ยีน คือยีน B646L (p72) ที่เป็นโปรตีนหลักของไวรัสและนิยมใช้ในการตรวจ ยีน E183L (p52 หรือ p54) ที่ถูกออกแบบให้ครอบคลุมสายพันธุ์มากขึ้น และยีน CP204L (p30) เป็นยีนที่มีการ

แสดงออกตั้งแต่ระยะแรกที่สัตว์ติดเชื้อ โดยการใช้สี Hydroxynaphthol blue (HNB) บ่งชี้ซึ่งจะเปลี่ยนสีจากสีม่วง (ผลลบ) เป็นสีน้ำเงิน (ผลบวก) ดังนั้น ASFV multiplex LAMP (mLAMP) ที่พัฒนาขึ้นมีความจำเพาะกับเชื้อ ASFV โดยเหมาะสมในการทำปฏิกิริยาคือ 64 องศาเซลเซียส เป็นเวลา 25-30 นาที สามารถอ่านผลได้ด้วยตาเปล่า มีขีดจำกัดความไวในการตรวจหาเชื้อที่ 5 สำเนา จึงเป็นชุดตรวจที่เหมาะกับการคัดกรองเพื่อการป้องกันภาคสนามและห้องปฏิบัติการระดับท้องถิ่นในการเลี้ยงสุกร

คำสำคัญ : ไวรัสอหิวาต์แอฟริกาในสุกร, ลูปมิเดเอเตดไอโซเทอร์มอลแอมพลิฟิเคชั่น

Abstract

African swine fever virus (ASFV) is the causative agent of African swine fever (ASF), with high mortality and outbreaks of the disease worldwide. This has caused enormous economic losses to the pig industry around the world because there is no effective vaccine for protection and the virus is difficult to eradicate and Virulent pathogens in causing disease. In addition, mutations in the virus have been found causing it to sometimes go undetected. Convenient virus testing with rapid and accurate results plays an important role in managing the African swine fever problem. Therefore, we developed a method for testing using the loop mediated isothermal amplification (LAMP) technique that was designed to be specific to three genes. The B646L (p72) gene is the main protein of the virus and commonly used for testing. The E183L (p52 or p54) gene was designed to cover more strains and the CP204L (p30) gene is a gene that will be expressed during the early stages of infection. By using hydroxy naphthol blue (HNB) dye, the color of the LAMP reaction shifts from purple (negative) to blue (positive). The results of the ASFV multiplex LAMP (mLAMP) developed indicate its specificity to ASFV. The optimum temperature is 64 ℃ for 40 minutes, it and can be interpreted with naked eye. Our mLAMP has a limit of detection of 5 copies making it, an ideal test kit for screening and prevention in field and local laboratories.

Keywords : African swine fever virus, Loop mediated isothermal amplification

บทนำ

โรคอหิวาต์แอฟริกาในสุกร (African Swine Fever, ASF) มีสาเหตุมาจากไวรัสอหิวาต์แอฟริกาในสุกร (African Swine Fever Virus, ASFV) จัดเป็นโรคตามพระราชบัญญัติโรคระบาดสัตว์ (เพิ่มเติม) พ.ศ. 2558 (สำนักควบคุม ป้องกัน และบำบัดโรคสัตว์, 2019) โดยมีการเสียชีวิตในอัตราที่สูงโดยสามารถพบได้ทั้งสุกรบ้านและสุกรป่าในทุกช่วงอายุ ซึ่งมีสุกรป่าเป็นแหล่งรังโรคและมีเห็บอ่อนเป็นพาหะนำโรคแต่

ไม่ติดต่อสู่มนุษย์ มีรายงานการค้นพบโรคอหิวาต์แอฟริกาในสุกรเป็นครั้งแรกในปีค.ศ. 1921 ในประเทศเคนยา (Montgomery, 1921) และการระบาดของโรคมีการกระจายอย่างต่อเนื่องทั่วโลก เช่น ยุโรป อเมริกาใต้ และเอเชีย (Wang, et al. 2021) มีรายงานการระบาดของโรคครั้งแรกในเอเชียที่ประเทศจีน ในปี ค.ศ. 2018 ซึ่งก่อให้เกิดความสูญเสียทางเศรษฐกิจสะสมกว่า 20 ล้านเหรียญสหรัฐอเมริกา และแพร่กระจายไปยังประเทศในเอเชีย ได้แก่ เวียดนาม กัมพูชา ลาว และพม่า การระบาดของโรคแพร่กระจายอย่างต่อเนื่องก่อให้เกิดความสูญเสียทางเศรษฐกิจอย่างมหาศาลต่ออุตสาหกรรมสุกรทั่วโลก เนื่องจากยังไม่มีวัคซีนที่มีประสิทธิภาพในการป้องกัน (Galindo, & Alonso, 2017) และเชื้อไวรัสกำจัดได้ยากเพราะมีความเสถียรสูงในสภาพแวดล้อมที่เย็นชื้นและอุดมด้วยโปรตีนเอื้อต่อการอยู่รอดโดยสามารถปนเปื้อนอยู่ในผลิตภัณฑ์อาหารหรือซากสัตว์ทำให้เป็นพาหะของโรคได้ (Blome, Franzke, & Beer, 2020) ส่วนสุกรที่หายป่วยแล้วยังสามารถแพร่โรคได้ทำให้เกิดการแพร่กระจายได้อย่างง่ายและรวดเร็ว ในขณะนี้มีการระบาดของโรคอหิวาต์แอฟริกาในสุกรในประเทศไทยจึงถือว่าเป็นโรคต่างถิ่นที่จำเป็นต้องมีมาตรการในป้องกันและการรับความเสี่ยงเพื่อลดความเสียหายที่จะเกิดขึ้นได้

ไวรัสอหิวาต์แอฟริกาในสุกรเป็นไวรัสดีเอ็นเอสายคู่ที่มีจีโนมขนาดใหญ่ตั้งแต่ขนาด 170-194 กิโลเบส (Alonso et al., 2018) โดยมีความแปรปรวนทางพันธุกรรมในตำแหน่งที่ C-terminal ของยีน B646L ที่ผลิตโปรตีน p72 ทำให้มี 24 จีโนไทป์ที่แตกต่างกัน (Quembo, et al. 2018) โดยโปรตีน p72 เป็นโปรตีนหลักทั้งหมดของไวรัสและมีบริเวณที่เป็นอนุรักษ์ (Luo et al., 2017) จึงมักถูกใช้เป็นยีนเป้าหมายในการตรวจหาไวรัสอหิวาต์แอฟริกาในสุกร แต่เนื่องจากยีนนี้มีการแสดงออกในช่วงหลังของการติดเชื้อ จึงอาจทำให้การตรวจหาเชื้อเป็นไปได้ล่าช้ากว่าที่น่าจะสามารถทำได้ การตรวจเชื้อไวรัสจึงควรครอบคลุมหลายยีนในทั้งช่วงต้นและปลายของวงจรชีวิตการแสดงออกของยีนของไวรัสเพื่อเพิ่มประสิทธิภาพในการตรวจ โดยยีนที่แสดงออกในช่วงต้นที่น่าสนใจคือยีน CP204L ที่ผลิตโปรตีน p30 ซึ่งจะแสดงออกในระยะเริ่มต้นของการติดเชื้อและมักใช้เพื่อตรวจหาแอนติบอดีในระยะเริ่มต้นของการติดเชื้อ (Petrovan et al., 2020) และยีน E183L ที่ผลิตโปรตีน p54 ซึ่งเป็นหนึ่งในโปรตีนโครงสร้างหลักของเชื้อไวรัสและมีบทบาทสำคัญในการบุกรุกเซลล์เจ้าบ้าน (Cao et al., 2021) โดยโปรตีน p72, p30 และ p54 เป็นโปรตีนไวรัสที่มีแอนติเจนมากที่สุดสามชนิดตามลำดับ (Netherton et al., 2019) โดยการแสดงออกของโปรตีน p30 จะสามารถสังเกตได้ตั้งแต่ 2-4 ชั่วโมงหลังการติดเชื้อ (Wu et al., 2020) ส่วนโปรตีน p72 และ p54 จะแสดงออกช้าและมีความสำคัญต่อการจำลองแบบของไวรัส ยีน B646L (p72) มีอัตราการเปลี่ยนแปลงต่ำจึงนิยมใช้เป็นตัวบ่งชี้หลักในการตรวจหาการติดเชื้อไวรัส (Wang et al., 2019)

ดังนั้นงานวิจัยนี้จึงพัฒนาต้นแบบกรรมวิธีเพื่อตรวจหาเชื้อไวรัสอหิวาต์แอฟริกาในสุกรโดยเทคนิค Multiplex Loop Mediated Isothermal Amplification (mLAMP) ซึ่งเป็นวิธีการเพิ่มจำนวนสารพันธุกรรมที่ความจำเพาะและความไวสูงเทียบเคียงเทคนิค Polymerase chain reaction (PCR) โดยสามารถดำเนินการอย่างสะดวกได้ในระดับท้องถิ่นหรือภาคสนามและมีต้นทุนต่ำและมีความจำเพาะต่อยีนเป้าหมาย ซึ่งสามารถดำเนินการทดสอบโดยบ่มในอุณหภูมิคงที่ด้วยอุปกรณ์อย่างง่าย โดยได้มีการออกแบบ

ไพรเมอร์ให้ครอบคลุม 3 ยีน ได้แก่ B646L (p72), E183L (p54) และ CP204L (p30) เพื่อให้ครอบคลุมการตรวจจับได้มากขึ้นซึ่งเป็นการป้องกันจัดและการควบคุมโรคอหิวาต์แอฟริกาในสุกรในอนาคตได้อย่างมีประสิทธิภาพ

วัตถุประสงค์ของการวิจัย

เพื่อพัฒนากรรมวิธีตรวจแบบรวดเร็วของไวรัสอหิวาต์แอฟริกาในสุกร (African Swine Fever Virus, ASFV) ที่ครอบคลุมหลายยีนในทั้งช่วงต้นและปลายการแสดงออกของยีนของไวรัสเพื่อเพิ่มประสิทธิภาพและความรวดเร็วในการตรวจ โดยใช้เทคนิคลูปมิเดเอเตดไอโซเทอร์มอลแอมพลิฟิเคชั่น (Loop Mediated Isothermal Amplification, LAMP) ที่สามารถตรวจหาสารพันธุกรรมได้แม่นยำใกล้เคียงกับวิธีพีซีอาร์ ซึ่งสามารถใช้ได้ในภาคสนามและห้องปฏิบัติการระดับท้องถิ่น

แนวคิด ทฤษฎี กรอบแนวคิด

โรคอหิวาต์แอฟริกาในสุกรยังไม่มีวัคซีนที่มีประสิทธิภาพในการป้องกันและการเชื้อไวรัส ASFV กำจัดได้ยาก การป้องกันที่มีประสิทธิภาพที่สุดในการควบคุมโรคจึงต้องอาศัยการตรวจหา ASFV ที่มีประสิทธิภาพ โดยวิธีการตรวจที่พบด้วยการตรวจหาโปรตีนจะมีขีดจำกัดความไวในการตรวจน้อยกว่าการตรวจแบบเพิ่มปริมาณสารพันธุกรรมและไม่สามารถตรวจได้ตั้งแต่ระยะแรก ทำให้การตรวจในระดับมาตรฐานยึดเทคนิคการตรวจแบบเพิ่มปริมาณสารพันธุกรรม เช่น Polymerase Chain Reaction (PCR) และ Real-time Quantitative Polymerase Chain Reaction (qPCR) เป็นวิธีการที่ใช้อย่างแพร่หลาย เนื่องจากมีความไวและความจำเพาะสูง เป็นวิธีการตรวจสอบที่แนะนำโดยองค์การโรคระบาดสัตว์ระหว่างประเทศ (OIE) (OIE Terrestrial Manual, 2019) แต่วิธีการนี้ต้องใช้เครื่องมืออุปกรณ์ที่ราคาสูงและดำเนินการโดยบุคคลากรที่มีความเชี่ยวชาญ โดยระยะเวลาในการดำเนินการจะอยู่ที่ประมาณ 3 - 4 ชั่วโมง และไม่สามารถดำเนินการได้ในระดับภาคสนามต้องเก็บตัวอย่างไปทำการทดสอบในห้องปฏิบัติการ จึงอาจจะก่อให้เกิดความเสี่ยงด้านความปลอดภัยทางชีวภาพและให้ผลลัพธ์ที่ค่อนข้างช้า การระบาดของโรคมีการกระจายอย่างต่อเนื่องทั่วโลกทำให้เชื้อไวรัสมีการเปลี่ยนแปลง จึงทำให้บางครั้งวิธีการตรวจแบบเก่าไม่สามารถตรวจหาเชื้อไวรัสได้ นอกจากนี้จากตรวจหาไวรัส ASF ที่นิยมใช้ในปัจจุบันยังเป็นการตรวจ หายีน B646L (p72) ซึ่งเป็น late gene หรือยีนที่แสดงออกในช่วงหลัง ซึ่งจะสามารถตรวจได้เมื่อติดเชื้อไประยะนึงแล้ว

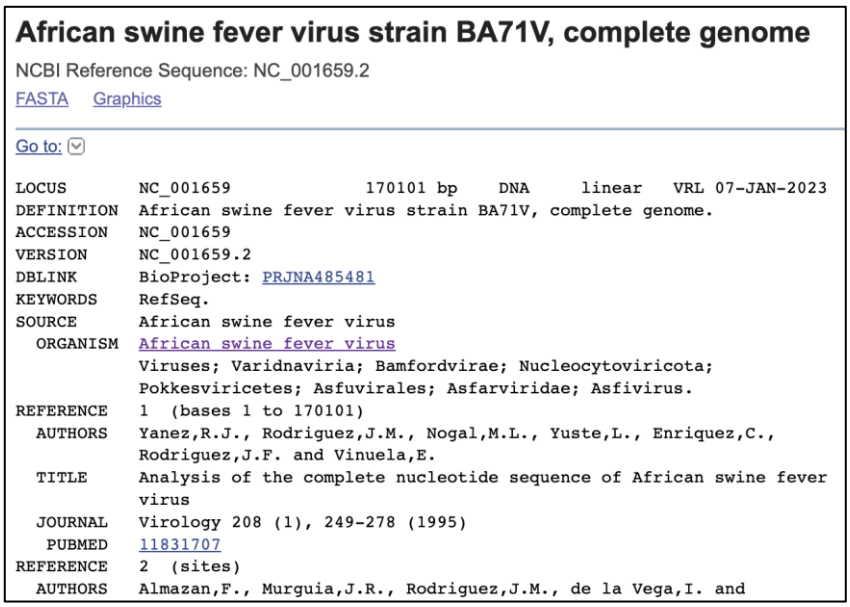
ในงานวิจัยนี้จึงได้พัฒนาวิธีเพื่อตรวจหาเชื้อไวรัสอหิวาต์แอฟริกาในสุกรด้วยเทคนิค Loop Mediated Isothermal Amplification (LAMP) ซึ่งเป็นวิธีการเพิ่มจำนวนสารพันธุกรรมที่ความจำเพาะและความไวสูงเมื่อเทียบเคียงเทคนิค PCR โดยสามารถดำเนินการสะดวกได้ในระดับท้องถิ่น-ภาคสนามมีต้นทุนต่ำและใช้ระยะเวลาดำเนินอยู่ที่ประมาณ 1 ชั่วโมง โดยใช้ไพรเมอร์จำนวน 4 - 6 เส้นต่อยีน และมีความจำเพาะถึง 6 - 8 ตำแหน่งบนแต่ละยีนเป้าหมาย โดยมีการออกแบบไพรเมอร์ให้ครอบคลุม 3 ยีน ได้แก่ ยีน p72

เป็นยีนที่ใช้ตรวจหา ASFV ตามมาตรฐานองค์การโรคระบาดสัตว์ระหว่างประเทศ เป็นยีนที่นิยมในการตรวจหา ASFV มีการสดงออกมาก เพราะถอดรหัสให้เป็นโปรตีนแคปซิดที่มีมากถึง 1 ใน 3 ของไวรัสยีน p54 ที่ถูกออกแบบให้ครอบคลุมสายพันธุ์ของ ASFV ที่ยีน p72 ยังขาด (เช่น African Swine Fever Virus Hinde II, African swine fever virus strain MOZ/1979 และ African swine fever virus strain ZAM/15/Lusaka เป็นต้น) และยีน p30 ซึ่งเป็นยีนที่จะมีการแสดงออกในช่วงแรกของการติดเชื้อ เป็นต้น ซึ่งดำเนินการทดสอบโดยบ่มอุณหภูมิคงที่ด้วยอุปกรณ์อย่างง่าย เช่น Water Bath หรือ Heat Block (Notomi et al., 2000) และการตรวจสอบผลของ LAMP สามารถทำได้หลายวิธีได้แก่ เทคนิค Agarose Gel Electrophoresis เพื่อตรวจสอบผลิตภัณฑ์ที่เกิดขึ้นโดยแยกตามขนาด แต่เนื่องจากวิธีข้างต้นมีข้อจำกัดด้านอุปกรณ์ที่ไม่อำนวยต่อการตรวจสอบในภาคสนามทำให้งานวิจัยนี้จึงรวมถึงการพัฒนารูปแบบในการวิเคราะห์ผลโดยการอ่านผลด้วยตาเปล่าซึ่งเป็นวิธีที่ดำเนินการได้ง่ายและสะดวก ซึ่งผลลัพธ์ในการเปลี่ยนแปลงของสีจะปรับให้ชัดเจนพอที่จะแยกความแตกต่างระหว่างปฏิกิริยาเชิงบวกและเชิงลบ อย่างเห็นได้ชัด โดยการใช้สี Hydroxy naphthol blue (HNB) เป็นตัวบ่งชี้ที่ไม่เป็นอันตรายสำหรับปฏิกิริยา LAMP โดยเกิดจากการเปลี่ยนแปลงความเข้มข้นของแมกนีเซียมไอออน (Mg^{2+}) ปฏิกิริยาเชิงลบจะเป็นสีม่วงและเมื่อไอออนของแมกนีเซียมทำปฏิกิริยากับไพโรฟอสเฟต (Pyrophosphate) ที่ได้จาก dNTP ทำให้ความเข้มข้นของแมกนีเซียมไอออนในสารละลายลดลงจึงเปลี่ยนเป็นสีฟ้าในปฏิกิริยาเชิงบวก จึงสามารถสังเกตเห็นได้ง่ายด้วยตาเปล่าโดยไม่ต้องใช้อุปกรณ์เพิ่มเติม (Goto, Honda, Ogura, Nomoto, & Hanaki, 2009)

วิธีดำเนินการวิจัย

1. การออกแบบไพรเมอร์

ทำการทบทวนวรรณกรรมสำหรับออกแบบไพรเมอร์ที่จำเพาะต่อยีน B646L (p72), CP204L (p30) และ E183L (p54) ของไวรัสอหิวาต์แอฟริกาในสุกร โดยใช้ Complete Genome Sequence ของ ASFV strain BA71V (NC_001659.2) อ้างอิงจากฐานข้อมูลใน National Center for Biotechnology Information (NCBI) รายละเอียดดังภาพที่ 1



African swine fever virus strain BA71V, complete genome

NCBI Reference Sequence: NC_001659.2

FASTA Graphics

Go to:

```
LOCUS       NC_001659             170101 bp    DNA     linear   VRL 07-JAN-2023
DEFINITION  African swine fever virus strain BA71V, complete genome.
ACCESSION   NC_001659
VERSION     NC_001659.2
DBLINK      BioProject: PRJNA485481
KEYWORDS    RefSeq.
SOURCE      African swine fever virus
  ORGANISM  African swine fever virus
            Viruses; Varidnaviria; Bamfordvirae; Nucleocytoviricota;
            Pokkesviricetes; Asfuvirales; Asfarviridae; Asfivirus.
REFERENCE   1  (bases 1 to 170101)
  AUTHORS   Yanez,R.J., Rodriguez,J.M., Nogal,M.L., Yuste,L., Enriquez,C.,
            Rodriguez,J.F. and Vinuela,E.
  TITLE     Analysis of the complete nucleotide sequence of African swine fever
            virus
  JOURNAL   Virology 208 (1), 249-278 (1995)
   PUBMED   11831707
REFERENCE   2  (sites)
  AUTHORS   Almazan,F., Murguia,J.R., Rodriguez,J.M., de la Vega,I. and
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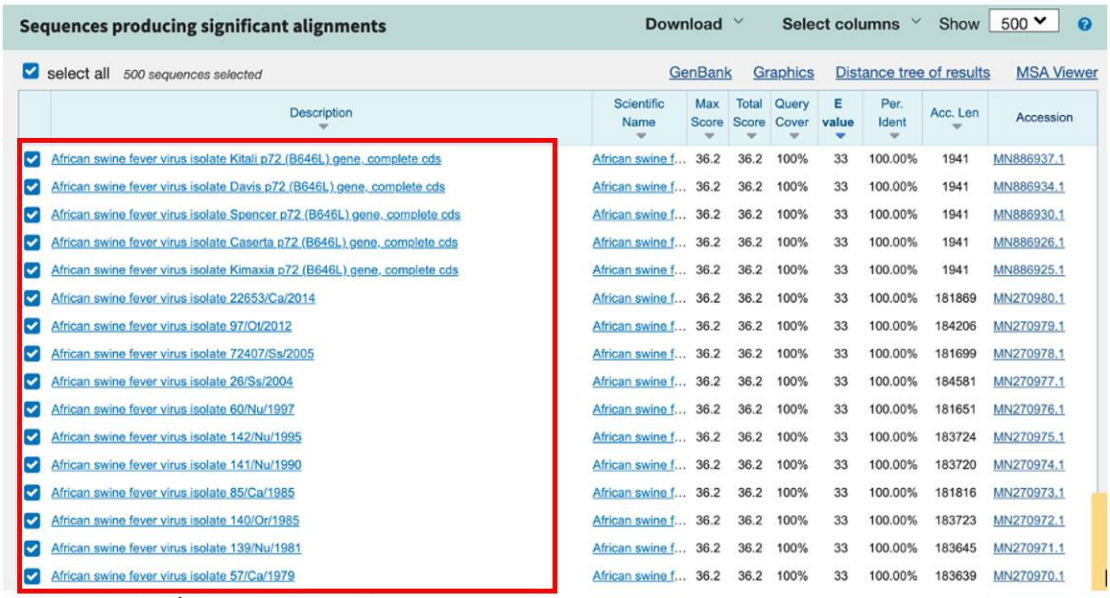
ภาพที่ 1 Complete Genome Sequence ของ ASFV strain BA71V (NC_001659.2)

ที่มา: ฐานข้อมูลใน National Center for Biotechnology Information (NCBI)

จากนั้นหาบริเวณอนุรักษ์บนยีนสำหรับการตรวจจับให้มีความจำเพาะ ด้วย Multiple Sequence Alignment โดยการใช้ BLAST (Basic Local Alignment Search Tool) และออกแบบไพรเมอร์ของแต่ละยีนเป้าหมายโดยใช้โปรแกรม Primer Explorer V5 (Fujitsu, Tokyo, Japan) จากนั้นวิเคราะห์ความจำเพาะของแต่ละไพรเมอร์ในระดับคอมพิวเตอร์ด้วยเทคนิคชีวสารสนเทศ BLASTN vs. GenBank Non-Redundant Database เพื่อเลือกไพรเมอร์ที่จำเพาะต่อ ASFV ซึ่งครอบคลุมตำแหน่งอ้างอิงและสายพันธุ์ที่อาจระบาดในไทยโดยอ้างอิงจากสายพันธุ์หลักและแพร่ระบาดในทวีปเอเชีย ได้แก่ BA71V, SY18, Georgia 2007, China 2018 และ VNUA 2020 (Ito, Satoshi, et al. 2023)

ตัวอย่างผลการ BLASTN เพื่อดูความจำเพาะของไพรเมอร์ F3 ของยีน p72 พบว่า มีความจำเพาะกับ African Swine Fever Virus สายพันธุ์ต่าง ๆ และสายพันธุ์ที่อาจระบาดในไทย แสดงดังภาพที่ 2



Sequences producing significant alignments — Download — Select columns — Show 500

select all 500 sequences selected — GenBank — Graphics — Distance tree of results — MSA Viewer

Description	Scientific Name	Max Score	Total Score	Query Cover	E value	Per. Ident	Acc. Len	Accession
African swine fever virus isolate Kitali p72 (B646L) gene, complete cds	African swine f...	36.2	36.2	100%	33	100.00%	1941	MN886937.1
African swine fever virus isolate Davis p72 (B646L) gene, complete cds	African swine f...	36.2	36.2	100%	33	100.00%	1941	MN886934.1
African swine fever virus isolate Spencer p72 (B646L) gene, complete cds	African swine f...	36.2	36.2	100%	33	100.00%	1941	MN886930.1
African swine fever virus isolate Caserta p72 (B646L) gene, complete cds	African swine f...	36.2	36.2	100%	33	100.00%	1941	MN886926.1
African swine fever virus isolate Kimaxia p72 (B646L) gene, complete cds	African swine f...	36.2	36.2	100%	33	100.00%	1941	MN886925.1
African swine fever virus isolate 22653/Ca/2014	African swine f...	36.2	36.2	100%	33	100.00%	181869	MN270980.1
African swine fever virus isolate 97/Ot/2012	African swine f...	36.2	36.2	100%	33	100.00%	184206	MN270979.1
African swine fever virus isolate 72407/Ss/2005	African swine f...	36.2	36.2	100%	33	100.00%	181699	MN270978.1
African swine fever virus isolate 26/Ss/2004	African swine f...	36.2	36.2	100%	33	100.00%	184581	MN270977.1
African swine fever virus isolate 60/Nu/1997	African swine f...	36.2	36.2	100%	33	100.00%	181651	MN270976.1
African swine fever virus isolate 142/Nu/1995	African swine f...	36.2	36.2	100%	33	100.00%	183724	MN270975.1
African swine fever virus isolate 141/Nu/1990	African swine f...	36.2	36.2	100%	33	100.00%	183720	MN270974.1
African swine fever virus isolate 85/Ca/1985	African swine f...	36.2	36.2	100%	33	100.00%	181816	MN270973.1
African swine fever virus isolate 140/Or/1985	African swine f...	36.2	36.2	100%	33	100.00%	183723	MN270972.1
African swine fever virus isolate 139/Nu/1981	African swine f...	36.2	36.2	100%	33	100.00%	183645	MN270971.1
African swine fever virus isolate 57/Ca/1979	African swine f...	36.2	36.2	100%	33	100.00%	183639	MN270970.1

ตัวอย่างที่จำเพาะต่อไพรเมอร์

ภาพที่ 2 ผล BLASTN ที่แสดงความจำเพาะของไพรเมอร์ F3 ของยีน p72

ที่มา: ฐานข้อมูลใน National Center for Biotechnology Information (NCBI)

2. การเตรียมสารพันธุกรรมแม่แบบ

ตัวอย่างสารพันธุกรรมได้มาจากคณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัยและสถาบันสุขภาพสัตว์แห่งชาติโดยอ้างอิงตามตารางที่ 1 นำตัวอย่างมาเพิ่มจำนวนสารพันธุกรรมด้วยวิธี Polymerase Chain Reaction ตัวอย่างทดสอบปริมาตร 25 µL 0.5 µM F3 และ B3, 1x EmeraldAmp PCR Master Mix และเชื้อแม่แบบ 1 µL โดยตัวควบคุมเชิงลบใช้น้ำปราศจากเชื้อ ปริมาตรที่เหลือของปฏิกิริยาถูกเติมด้วยน้ำปราศจากเชื้อ ทำปฏิกิริยาโดยใช้สภาวะอ้างอิงดังนี้

Thermal cycling

Initial denaturation		95°C	3 min
10 cycles of	- denaturation	95°C	15 s
	- annealing	52°C	40 s
	- extension	72°C	40 s
13 cycles of	- denaturation	95°C	15 s
	- annealing	49°C	40 s
	- extension	72°C	40 s
12 cycles of	- denaturation	95°C	15 s
	- annealing	46°C	40 s
	- extension	72°C	40 s
Final extension		72°C	5 min

โดยทำการตรวจสอบผลที่ได้ด้วย Agarose Gel Electrophoresis 2% และสกัดตัวอย่างด้วย GF-1 Nucleic Acid Extraction Kits (Vivantis, Malaysia) จากนั้นทำการวัดความเข้มข้นของผลิตภัณฑ์ด้วยการวัดค่าดูดกลืนของแสง (A260, A260/A280) โดยตัวอย่างจะถูกจัดเก็บที่อุณหภูมิ -20°C

3. การหาสภาวะเหมาะสมของของปฏิกิริยา LAMP

การทดสอบของปฏิกิริยาให้ได้สภาวะที่เหมาะสม ตัวอย่างทดสอบปริมาตร 25 µL ประกอบด้วย 0.8 µM FIP และ BIP, 0.1 µM F3 และ B3, 0.8 µM Loop Forward Primer, 1x Isothermal Amplification Buffer II, 8 U *Bst* 3.0 DNA Polymerase, 1.4 mM dNTPs, 4 mM $MgSO_4$, , 0.5 M Betaine, 4 mM HNB และเชื้อแม่แบบ 1 µL โดยตัวควบคุมเชิงลบใช้น้ำปราศจากเชื้อ ปริมาตรที่เหลือของปฏิกิริยาถูกเติมด้วยน้ำปราศจากเชื้อ จากนั้นปฏิกิริยาถูกบ่มที่อุณหภูมิ 64°C เป็นเวลา 30 จึงตรวจสอบด้วยสายตาและยืนยันโดยใช้ Agarose Gel Electrophoresis 2%

4. การวิเคราะห์ความจำเพาะในการตรวจ

การตรวจความจำเพาะจะใช้ตัวอย่างไวรัสอหิวาต์แอฟริกาในสุกรเป็นตัวควบคุมเชิงบวกและตัวควบคุมเชิงลบอ้างอิงดังตารางที่ 1 โดยดำเนินการทดสอบด้วยวิธี mLAMP ในสภาวะที่เหมาะสม สังเกตผลลัพธ์ด้วยตาเปล่าและวิเคราะห์ผลด้วยวิธี Agarose Gel Electrophoresis 2%

ตารางที่ 1 สารพันธุกรรมจากเชื้อก่อโรคในหมู

เชื้อไวรัส	ประเภทของสารพันธุกรรม
African Swine Fever Virus (DNA _ASFV/GII/Thailand/NIAH-CR2022)	DNA
Porcine Circovirus Type2 (DNA_PCV2 Thai-NIAH2022 isolate)	DNA
Classical Swine Fever Virus (RNA_CSFV ALD strain)	RNA
Porcine Reproductive and Respiratory Syndrome Virus (PRRSV NIAH-2023 isolate)	RNA
Porcine Reproductive and Respiratory Syndrome Virus NA strain (RNA _PRRSV-NA VR-2332)	RNA
Porcine Reproductive and Respiratory Syndrome Virus EU Strain (RNA _PRRSV-EU Lelystad)	RNA

5. การวิเคราะห์ขีดจำกัดความไวในการตรวจ

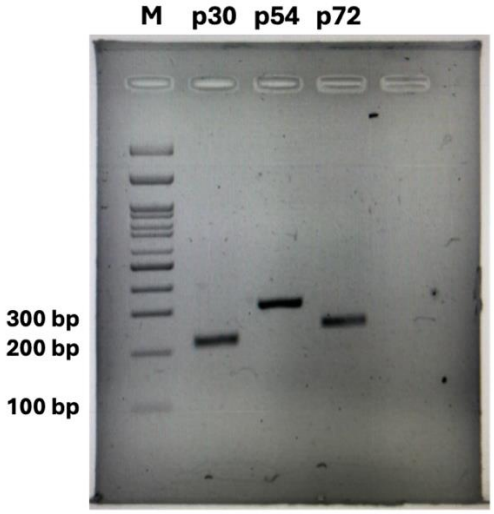
การหาขีดจำกัดความไวในการตรวจจับเชื้อ ASFV ใช้ยีนเป้าหมาย 3 ยีนจำนวน 1000, 100, 10, 5, 1 และ 0 สำเนาต่อยีน ซึ่งจำนวนสำเนาคิดจากสมการด้านล่างนี้ โดยความเข้มข้นวัดจาก Qubit™ dsDNA HS Assay Kit (Thermo Fisher Scientific) โดยดำเนินการทดสอบด้วยวิธี LAMP ในสภาวะที่เหมาะสม สังเกตุผลลัพธ์ด้วยตาเปล่าและวิเคราะห์ผลด้วยวิธี Agarose Gel Electrophoresis 2%

$$\text{Copy number (copy/µL)} = \frac{[\text{concentration (ng/µL) x } 6.0221 \text{ x} 10^{23}]}{[\text{PCR product length (bp) x } 6.6 \text{ x } 10^{11}]}$$

ผลการวิจัย

1. การเตรียมสารพันธุกรรมแม่แบบ

ตัวอย่างสารพันธุกรรมทำการเพิ่มจำนวนสารพันธุกรรมด้วยวิธี Polymerase Chain Reaction และทำการตรวจสอบผลที่ได้ด้วย Agarose Gel Electrophoresis 2% เป็นเวลา 30 นาที ในงานวิจัยนี้ประกอบด้วยสารพันธุกรรมแม่แบบ 3 ยีนคือ p30, p54 และ p72 โดย Amplicon ที่ได้มีขนาด 195 bp, 288 bp และ 248 bp ตามลำดับ ผลลัพธ์แสดงดังภาพที่ 3

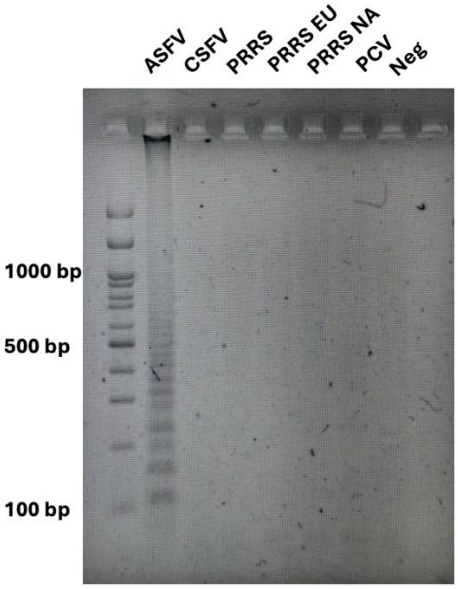


ภาพที่ 3 ผลของตัวอย่างสารพันธุกรรมแม่แบบ p30, p54 และ p72

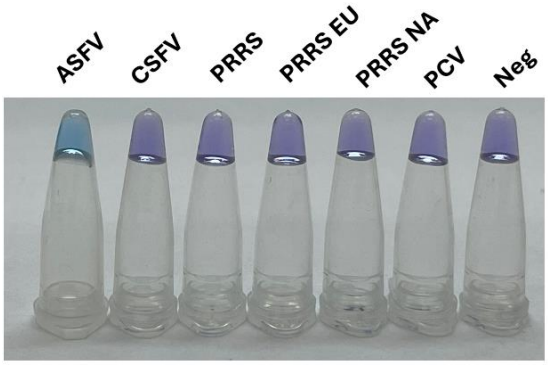
2. การวิเคราะห์ความจำเพาะในการตรวจ

การทดสอบเพื่อตรวจสอบความจำเพาะของไพรเมอร์ที่ออกแบบต่อไวรัสอหิวาต์แอฟริกาในสุกรร่วมกับเชื้อไวรัสก่อโรคอื่นในสุกรด้วยปฏิกิริยา PCR โดยอ้างอิงวิธีการจากข้อ 1 และปฏิกิริยา LAMP โดยใช้ไพรเมอร์ทั้ง 3 ยีนกับสารพันธุกรรมแม่แบบที่เตรียมไว้ พบว่า ปฏิกิริยาให้ผลในเชิงบวกเฉพาะไวรัสอหิวาต์แอฟริกาในสุกรโดยตรวจสอบด้วย Agarose Gel Electrophoresis 2% เป็นเวลา 30 นาที และสีของสารในหลอดทดลองที่มีการเปลี่ยนแปลงจากสีม่วง (เชิงลบ) เป็นสีน้ำเงิน (เชิงบวก) ในขณะที่เชื้อไวรัสก่อโรคอื่นในสุกรไม่มีการเปลี่ยนแปลงผลหลังจากการทดสอบ ผลลัพธ์แสดงดังภาพที่ 4

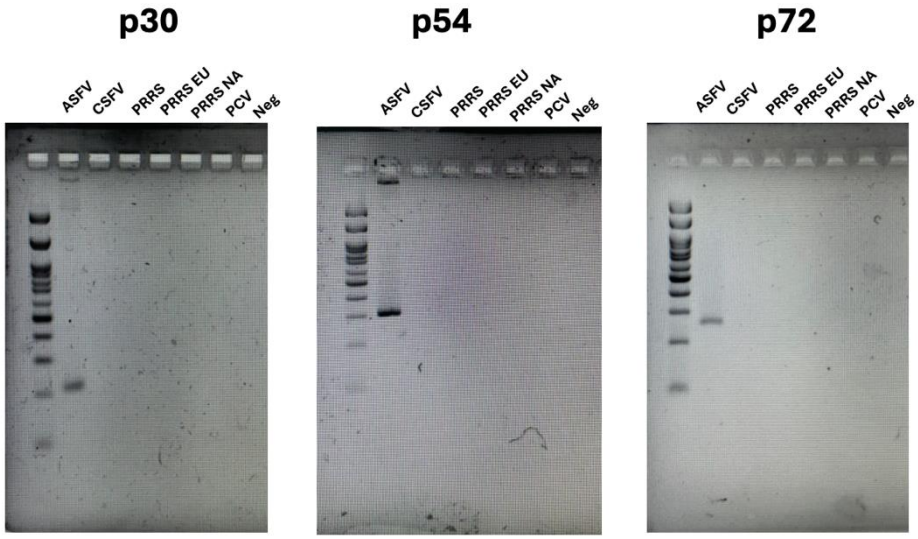
(ก)



(ข)



(ค)



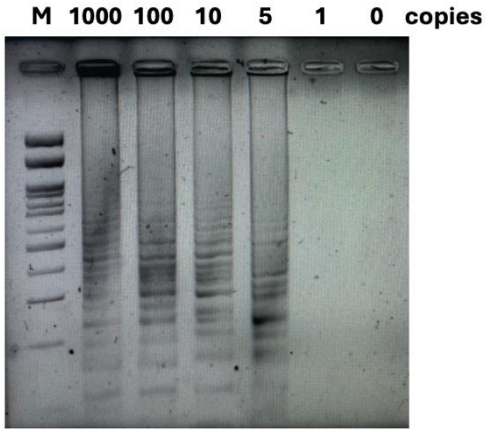
ภาพที่ 4 ผลของการวิเคราะห์ความจำเพาะ (ก) แสดงผลโดย Agarose Gel Electrophoresis (ข) แสดงผลโดยสีย้อม Hydroxynaphthol Blue (HNB) (ค) แสดงผล Agarose Gel Electrophoresis จากวิธี PCR

3. การวิเคราะห์ขีดจำกัดความไวในการตรวจ

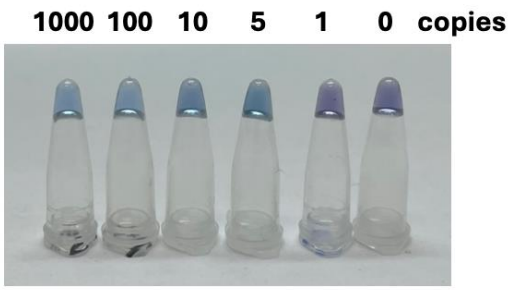
การทดสอบหาขีดจำกัดความไวในการตรวจจับไวรัสอหิวาต์แอฟริกาในสุกร ซึ่งใช้ยีนเป้าหมายจำนวน 1000, 100, 10, 5, 1 และ 0 สำเนา โดยดำเนินการทดสอบด้วยวิธี PCR และ LAMP ในสภาวะที่

เหมาะสม จากนั้นวิเคราะห์ผลด้วยวิธี Agarose Gel Electrophoresis 2% และสังเกตุผลลัพธ์ด้วยตาเปล่าพบว่าปริมาณเชื้อต่ำสุดที่ตรวจพบได้คือ 5 สำเนา ผลลัพธ์แสดงดังภาพที่ 5

(ก)



(ข)



(ค)

ภาพที่ 5 ผลของการวิเคราะห์ขีดจำกัดความไว (ก) แสดงผลโดย Agarose gel electrophoresis (ข) แสดงผลโดยสีย้อม Hydroxynaphthol blue (HNB) (ค) แสดงผล Agarose Gel Electrophoresis จากวิธี PCR

สรุปและอภิปรายผล

งานวิจัยนี้มีจุดมุ่งหมายเพื่อพัฒนาชุดตรวจเชื้อไวรัสโรคอหิวาต์แอฟริกาในสุกร (African Swine Fever Virus (ASFV) ที่เป็นโรคติดต่อร้ายแรงในหมูและยังไม่มีวิธีการป้องกันเนื่องจากยังไม่มีวัคซีนที่มีประสิทธิภาพ ซึ่งก่อให้เกิดความสูญเสียทางเศรษฐกิจต่ออุตสาหกรรมสุกรท้องถิ่นและทั่วโลก การตรวจหาโรคตามวิธีมาตรฐานคือวิธี Polymerase Chain Reaction (PCR) โดยใช้ไพรเมอร์ที่แนะนำโดยองค์การโรคระบาดสัตว์ระหว่างประเทศ (OIE) ทำให้บางครั้งเกิดผลลบปลอมเนื่องจากยีนเป้าหมาย (B646L (p72) ไม่สามารถตรวจจับได้ จึงได้มีการพัฒนาชุดตรวจโดยเพิ่มจำนวนยีนในการตรวจจับเพิ่มขึ้นเพื่อประสิทธิภาพดีขึ้นซึ่งเป็นส่วนสำคัญในการป้องกันและควบคุมปัญหาโรคอหิวาต์แอฟริกาในสุกร โดยพัฒนาร่วมกับเทคนิค

Loop Mediated Isothermal Amplification (LAMP) ซึ่งเป็นวิธีที่มีความจำเพาะและแสดงผลที่ไวเมื่อเปรียบเทียบกับวิธี PCR ซึ่งมีการออกแบบให้จำเพาะต่อ 3 ยีน คือยีน B646L (p72) ที่เป็นโปรตีนหลักของไวรัสและนิยมใช้ในการตรวจ ยีน E183L (p52 หรือ p54) ที่ถูกออกแบบให้ครอบคลุมสายพันธุ์มากขึ้น และยีน CP204L (p30) เป็นยีนที่มีการแสดงออกตั้งแต่ระยะแรกที่สัตว์ติดเชื้อ จากการทดลองด้วยวิธี Multiplex LAMP พบว่า มีความจำเพาะกับไวรัสโรคอหิวาต์แอฟริกาในสุกร โดยสภาวะที่เหมาะสมในการทำปฏิกิริยาคือ 64 องศาเซลเซียส เป็นเวลา 25-30 นาที โดยการใช้สี Hydroxynaphthol Blue (HNB) บ่งชี้ซึ่งสามารถอ่านผลได้ด้วยตาเปล่าคือผลเชิงลบเป็นสีม่วงและผลเชิงบวกเป็นสีน้ำเงิน และการทดสอบขีดจำกัดความไวในการตรวจหาเชื้อคือ 5 สำเนา โดยชุดตรวจมีประสิทธิภาพดีขึ้นเมื่อเปรียบเทียบกับงานวิจัยก่อนหน้าที่สามารถตรวจจับได้เพียง 368 สำเนา และใช้เวลาถึง 90 นาที ในการทดสอบ (Dokphut, Arphaphorn, et al. 2020) จึงเป็นชุดตรวจที่เหมาะกับการคัดกรองเพื่อการป้องกันภาคสนามและห้องปฏิบัติการระดับท้องถิ่นในการเลี้ยงสุกร เพื่อป้องกันและการจัดการควบคุมโรคอหิวาต์แอฟริกาในสุกรในอนาคตได้อย่างมีประสิทธิภาพ

ข้อเสนอแนะ

ตัวอย่างสารพันธุกรรมแม่แบบที่ใช้ในการทดลองอยู่ในรูปแบบ Amplicon ที่สกัดได้จากการทำ PCR จึงควรมีการพัฒนาวิธีการทดลองร่วมกับตัวอย่างจริงของสุกรเพื่อดูประสิทธิภาพของชุดตรวจและสามารถใช้งานในภาคสนามได้

เอกสารอ้างอิง

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ความสัมพันธ์ของค่าปริมาณเมฆกับค่ารังสีอาทิตย์รวมในจังหวัดชุมพร

Estimation of the Cloud Cover from Global Solar Radiation in Chumphon Province, Thailand

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บทคัดย่อ

ในการวิจัยครั้งนี้ได้พัฒนาแบบจำลองความสัมพันธ์ของค่าปริมาณเมฆรายวันเฉลี่ยรายเดือนกับข้อมูลรังสีอาทิตย์รวมรายวันเฉลี่ยรายเดือนในจังหวัดชุมพร ระหว่างปี พ.ศ. 2549 – 2558 และทดสอบแบบจำลองด้วยข้อมูลของปี พ.ศ. 2559 – 2563 โดยใช้แบบจำลองในรูปของสมการเอ็มพิริคัล 10 รูปแบบที่พัฒนามาจากสมการถดถอยเชิงเส้นของ Angström-Prescott และรูปแบบสมการอื่นๆ ได้แก่ สมการเชิงเส้น สมการกำลังสอง สมการกำลังสาม ลอการิทึม เอ็กโพเนนเชียล และยกกำลัง เป็นต้น ผลการศึกษาพบว่า แบบจำลองที่ให้ผลทดสอบสมรรถนะดีที่สุดอยู่ในรูปสมการกำลังสาม ด้วยความสัมพันธ์ระหว่างอัตราส่วนปริมาณเมฆรายวันเฉลี่ยรายเดือนต่อค่าปริมาณเมฆสูงสุดของการวัด (C/C_0) และค่ารังสีอาทิตย์รวมต่อรังสีอาทิตย์นอกบรรยากาศโลกรายวันเฉลี่ยรายเดือน (H/H_0) เป็น $C = C_0\left(5.656 - 35.07(1-H/H_0) + 74.17(1-H/H_0)^2 - 48.91(1-H/H_0)^3\right)$ ที่ให้ผลการวิเคราะห์ทางสถิติด้วยค่าสัมประสิทธิ์สหสัมพันธ์ (R) ค่าสัมประสิทธิ์ Nash-Sutcliffe (NS) ความคลาดเคลื่อนยกกำลังสองเฉลี่ยรากที่สอง (RMSE) ความคลาดเคลื่อนในรูปความเอนเอียงเฉลี่ย (MBE) ความคลาดเคลื่อนในรูปความเอนเอียงสมบูรณ์เฉลี่ย (MABE) ร้อยละความคลาดเคลื่อนเฉลี่ย (MPE) ร้อยละความคลาดเคลื่อนสมบูรณ์เฉลี่ย (MAPE) และค่าสถิติแบบที (*t*-stat) เท่ากับ 0.968 0.744 0.674 deca - 0.513 deca 0.557 deca - 11.4% 12.0% และ 3.89 ตามลำดับ โดยได้ค่าประเมินตัวบ่งชี้สมรรถนะทั้งหมด (GPI) เท่ากับ 0.405 แสดงว่าค่าที่ได้จากแบบจำลองแบบสมการกำลังสามและจากการวัดมีความสอดคล้องกัน และสามารถนำไปใช้กับพื้นที่อื่นๆ ที่มีสภาพภูมิอากาศใกล้เคียงกันได้

คำสำคัญ : ปริมาณเมฆ, ค่ารังสีอาทิตย์รวม, สมการเอ็มพิริคัล, จังหวัดชุมพร

Abstract

In this research, the relation model between monthly average daily cloud amount and the monthly average daily global solar radiation data in Chumphon province between 2006 -2015 was developed, and the model was tested with data from 2016-2020. In this study, ten empirical models were derived from the Angström-Prescott linear regression model and its derivatives such as linear, quadratic, cubic, logarithmic, exponential and power. The results show that the best fit model was correlated with cubic equation between the ratio of monthly average daily cloud amount to maximum cloud volume of measurement (C/C_0), and the monthly average daily global solar radiation per daily extraterrestrial radiation (H/H_0) as $C = C_0\left(5.656 - 35.07(1-H/H_0) + 74.17(1-H/H_0)^2 - 48.91(1-H/H_0)^3\right)$. Statistical analysis results base on the correlation coefficient (R), the Nash-Sutcliffe coefficient (NS), root mean square error (RMSE), mean bias error (MBE), mean absolute bias error (MABE), mean percentage error (MPE), mean absolute percentage error (MAPE) and *t*-statistic (*t*-stat) are 0.968, 0.744, 0.674 deca, - 0.513 deca, 0.557 deca, - 11.4%, 12.0% and 3.89, respectively. This received a global performance indicator (GPI) assignment of 0.405. According to the results, the predicted cubic model and the measurements are consistent and can be applied to the other a similar climate area.

Keywords : cloud amount, global solar radiation, empirical equation, Chumphon province

บทนำ

แหล่งพลังงานที่สำคัญต่อมนุษย์และสิ่งมีชีวิตบนโลกของเรา ก็คือ ดวงอาทิตย์ พลังงานที่แผ่ออกมาจากดวงอาทิตย์จะอยู่ในรูปของคลื่นแม่เหล็กไฟฟ้าที่ความยาวคลื่นต่าง ๆ ตั้งแต่รังสีแกมมาไปจนถึงคลื่นวิทยุ ซึ่งเรียกกันโดยทั่วไปว่า รังสีอาทิตย์ (Solar Radiation) รังสีอาทิตย์นอกบรรยากาศโลกเป็นปริมาณที่เราสามารถหาได้อย่างแม่นยำโดยอาศัยการตรวจวัดด้วยดาวเทียม หรือคำนวณทางทฤษฎี ทั้งนี้ปริมาณของรังสีอาทิตย์ที่ตกกระทบ ณ ตำแหน่งใด ๆ ที่ส่วนบนของชั้นบรรยากาศ (Top of Atmosphere, TOA) จะมีค่ามากหรือน้อยก็ขึ้นอยู่กับระยะทางระหว่างโลกกับดวงอาทิตย์ และมุมตกกระทบ ซึ่งเราสามารถคำนวณตัวแปรต่าง ๆ ดังกล่าวนี้ได้อย่างแม่นยำ โดยอาศัยทฤษฎีฟิสิกส์ดาราศาสตร์ ข้อมูลรังสีอาทิตย์นอกบรรยากาศโลกมีความสำคัญต่อการออกแบบอุปกรณ์ที่ใช้งานในอวกาศต่าง ๆ อาทิเช่น เซลล์สุริยะของดาวเทียมหรือยานอวกาศต่าง ๆ ในอดีตที่ผ่านมานักวิทยาศาสตร์ได้ทำการวัดและศึกษาความเข้มรังสีดวงอาทิตย์นอกบรรยากาศโลกกันมาอย่างต่อเนื่อง หากพิจารณาพลังงานแสงอาทิตย์รวมทุกความยาวคลื่นที่เดินทางจากดวงอาทิตย์มาตกกระทบตั้งฉากบนพื้นที่ 1 ตารางเมตร จากระยะทางเฉลี่ย 1 AU จะมีความเข้มของรังสีประมาณ 1,367 W/m2 เรียกว่า ค่าคงที่สุริยะ (solar constant) (เสริม จันทร์ฉาย, 2557)

สำหรับจังหวัดชุมพร เป็นจังหวัดหนึ่งทางภาคใต้ของประเทศไทยที่มีพื้นที่ส่วนใหญ่ทำการเกษตร โดยเฉพาะสวนผลไม้และพืชพลังงานปาล์มน้ำมันที่ต้องอาศัยปริมาณฝนและแสงแดดมาก ดังนั้น ความสัมพันธ์ของปริมาณเมฆที่สามารถบ่งชี้ถึงปริมาณฝน และรังสีอาทิตย์ที่สูงสามารถบ่งชี้ถึงปริมาณแสงแดดสูงในแต่ละเดือนของรอบปี

วัตถุประสงค์ของการวิจัย

เพื่อวิเคราะห์หาแบบจำลองที่อยู่ในรูปสมการเอ็มพิริคัลที่เหมาะสมของความสัมพันธ์ระหว่างปริมาณเมฆกับค่ารังสีอาทิตย์รวม ในจังหวัดชุมพร

แนวคิด ทฤษฎี กรอบแนวคิด

รังสีอาทิตย์นอกบรรยากาศโลก เมื่อเดินทางผ่านชั้นบรรยากาศลงมายังพื้นโลกของเรา จะถูกลดทอนความเข้ม ในรูปของการกระเจิงและดูดกลืนโดยเมฆและองค์ประกอบต่าง ๆ ในบรรยากาศ เช่น ฝุ่นละออง โอโซน ไอน้ำ และโมเลกุลก๊าซต่าง ๆ ของอากาศ ทั้งนี้เราสามารถจำแนกส่วนของรังสีอาทิตย์ที่ตกกระทบพื้นโลกได้เป็น 2 ส่วน คือ รังสีตรง (Direct Radiation) และรังสีกระจาย (Diffuse Radiation) ซึ่งผลรวมของรังสีทั้ง 2 ส่วนนี้ เรียกว่า รังสีรวม (Global Radiation) ดังนั้นการวัดรังสีอาทิตย์บนพื้นโลกสามารถกระทำได้หลากหลายวิธีการด้วยกัน (เสริม จันทร์ฉาย, 2557) ดังนั้นเมื่อวัดรังสีอาทิตย์ที่ถูกลดทอนและผ่านลงมาถึงพื้นผิวโลกก็จะสามารถหาปริมาณเมฆที่ครอบคลุมในพื้นที่นั้น ๆ ได้

วิธีดำเนินการวิจัย

1. ทำการคำนวณและวิเคราะห์ข้อมูลค่ารังสีอาทิตย์นอกบรรยากาศโลกรายวัน (H_0) แล้วนำมาเฉลี่ยรายเดือนของสถานีอุตุนิยมวิทยาจังหวัดชุมพร ซึ่งตั้งอยู่ที่ละติจูด 10.49°N และลองจิจูด 99.18°E โดยใช้สมการความสัมพันธ์ (Nage, 2018)

$$H_0 = \frac{24\times 3,600 I_{SC}}{\pi}\left(1+0.033\cos\left[\frac{360\,d}{365}\right]\right)\left(\cos\varphi\cos\delta\sin\omega_s + \frac{\pi\omega_s}{180}\sin\varphi\sin\delta\right) \quad (1)$$

เมื่อ H_0 คือ ค่ารังสีอาทิตย์นอกบรรยากาศโลกรายวันเฉลี่ยรายเดือน $(MJm^{-2}day^{-1})$ I_{SC} คือ ค่าคงที่รังสีอาทิตย์ $(1,367\,Wm^{-2})$ φ คือ มุมละติจูดของสถานีอุตุนิยมวิทยาจังหวัดชุมพร δ คือ ค่ามุม declination ของดวงอาทิตย์

$$\delta = 23.45\sin\left(\frac{360}{365}[284+d]\right) \quad (2)$$

เมื่อ d คือ ลำดับที่ของวันในรอบปี และ ω_s คือ ค่ามุมชั่วโมงดวงอาทิตย์ ซึ่งหาได้จาก

$$\omega_s = \cos^{-1}(-\tan\varphi\tan\delta) \quad (3)$$

2. รวบรวมข้อมูลพื้นฐานของปริมาณเมฆรายวันเฉลี่ยรายเดือน (C) และค่ารังสีอาทิตย์รายวันเฉลี่ยรายเดือน (H) ในพื้นที่จังหวัดชุมพร ที่ทำการวัดโดยสถานีอุตุนิยมวิทยาจังหวัดชุมพร ในช่วงปี พ.ศ. 2549 - 2563 โดยที่ค่าปริมาณเมฆสูงสุดของการวัด (C_0) เท่ากับ 10 ดังตารางที่ 1 และ 2

3. แยกข้อมูลออกเป็นสองส่วน ส่วนที่หนึ่ง ตั้งแต่ปี พ.ศ. 2549 - 2558 รวมเวลาเป็น 10 ปี แล้วนำมาเฉลี่ยเป็นข้อมูลสำหรับสร้างสมการเอ็มพิริคัล ส่วนข้อมูลส่วนที่ 2 ตั้งแต่ปี พ.ศ. 2559 - 2563 นำมาเฉลี่ยเป็นข้อมูลทดสอบสมการเอ็มพิริคัล ดังตารางที่ 3

4. สร้างสมการเอ็มพิริคัลของความสัมพันธ์ระหว่างความยาวนานแสงแดดและปริมาณเมฆ ด้วยสมการ 10 รูปแบบ ที่ปรับปรุงมาจากรูปแบบสมการต่าง ๆ ได้แก่ สมการถดถอยเชิงเส้น สมการกำลังสอง สมการกำลังสาม ลอการิทึม เอ็กโพเนนเชียล และยกกำลัง เป็นต้น

5. ทดสอบแบบจำลองสมการที่ได้ในข้อ 4 และวิเคราะห์ผลการทดสอบด้วยค่าทางสถิติ ประกอบด้วย ค่าสัมประสิทธิ์สหสัมพันธ์ (Correlation Coefficient, R) (Slavica, & Tuka, 2018) ค่าสัมประสิทธิ์ Nash-Sutcliffe (Nash-Sutcliffe coefficient, NS) (Zhang, et al., 2018). ความคลาดเคลื่อนในรูปความเอนเอียงเฉลี่ย (mean bias error, MBE) ความคลาดเคลื่อนในรูปความเอนเอียงสมบูรณ์เฉลี่ย (Mean Absolute Bias Error, MABE) ความคลาดเคลื่อนยกกำลังสองเฉลี่ยรากที่สอง (Root Mean Square Error, RMSE) ร้อยละความคลาดเคลื่อนเฉลี่ย (Mean Percentage Error, MPE) ร้อยละความคลาดเคลื่อนสมบูรณ์เฉลี่ย (Mean Absolute Percentage Error, MAPE) และค่าสถิติแบบที (*t*-statistic, *t*-stat) (Ekici, 2019). ด้วยสมการ

ตารางที่ 1 ค่ารังสีอาทิตย์นอกบรรยากาศโลก (H_0) และค่ารังสีอาทิตย์รายวันเฉลี่ยรายเดือน (H) ของจังหวัดชุมพร

Year	Monthly Mean Daily of Extraterestrial / Global Solar Radiation (MJ/m^2-day)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
H_o	31.73	34.19	36.72	37.92	37.64	37.13	37.21	37.57	36.86	34.57	31.94	30.74
2006	17.13	17.82	20.75	20.26	15.51	17.79	13.16	13.67	15.43	15.92	17.46	15.76
2007	16.10	21.54	21.94	21.41	16.68	17.63	13.84	16.66	16.71	11.68	15.06	16.62
2008	16.75	16.59	21.35	19.04	13.35	13.91	13.65	15.55	15.16	11.47	17.20	
2009	18.36	20.48	21.14	19.23	14.81	19.70	13.98	17.78	13.83	15.97	17.34	16.90
2010	17.43	21.36	21.95	23.37	17.61	15.80	15.69	15.50	17.92	13.19	10.26	15.77
2011	14.00	19.60	15.30	22.82	17.62	13.10		16.26	14.96	15.38	16.37	14.27
2012	16.11	19.92	20.74	18.59	15.49	15.08	15.90	17.76	15.45	18.92	13.77	15.36
2013	16.07	17.53	22.78	19.75	17.53	14.15	13.94	17.46	15.41	15.69	14.01	16.61
2014	19.16	21.14	22.64	20.94	18.27	12.50	13.00	17.23	15.86	15.06	15.12	15.48
2015	19.71	20.80	22.03	20.88	18.86	14.95	15.37	15.70	16.55	15.72	13.48	14.93
2016	17.43	18.70	22.73	23.78	18.06	14.92	14.61	16.20	15.23	13.82	16.12	12.10
2017	12.25	20.04	20.69	18.75	15.32	15.48	13.35	17.21	17.27	16.06	12.72	14.31
2018	17.01	19.20	21.63	18.46	17.46	17.38	15.31	13.20	18.54	18.09	18.59	15.89
2019	14.03	16.60	18.30	16.14	14.83	12.94	15.76	10.30	13.16	14.71	11.43	15.79
2020	15.97	15.87	17.93	17.28	16.99	12.78	16.73	15.91	14.94	13.68	11.99	16.57

ตารางที่ 2 ค่าปริมาณเมฆรายวันเฉลี่ยรายเดือน (C) ของจังหวัดชุมพร

Year	Monthly Average Daily of Cloud Amount (deca)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	4	5	4	5	6	6	8	8	7	6	4	4
2007	4	2	3	4	7	6	8	8	7	8	6	4
2008	4	5	4	5	7	7	7	6	7	6	7	4
2009	3	2	4	5	7	6	7	6	8	6	5	5
2010	4	3	3	3	6	7	7	8	7	8	8	6
2011	6	4	7	5	6	8	8	7	8	6	5	6
2012	6	5	4	6	7	7	7	7	8	6	6	5
2013	5	6	4	6	7	7	8	7	8	7	6	5
2014	3	2	3	4	5	8	7	7	7	7	7	6
2015	4	3	3	4	5	7	7	7	7	7	6	5
2016	4	4	3	2	6	7	8	7	8	8	5	7
2017	7	4	4	5	7	6	8	7	6	7	7	5
2018	5	4	4	6	6	7	8	8	6	6	6	6
2019	5	3	3	4	6	7	6	8	8	5	5	4
2020	3	4	2	5	6	7	6	6	7	8	5	5

ตารางที่ 3 ค่ารังสีอาทิตย์นอกบรรยากาศโลก (H_0) ค่ารังสีอาทิตย์รวมสำหรับสร้างสมการ (H) และทดสอบสมการ (H_m) และค่าปริมาณเมฆสำหรับสร้างสมการ (C) และทดสอบสมการ (C_m) ของข้อมูลรายวันเฉลี่ยรายเดือนของจังหวัดชุมพร

Month	H_o ($MJm^{-2}day^{-1}$)	H ($MJm^{-2}day^{-1}$)	H_m ($MJm^{-2}day^{-1}$)	C (deca)	C_m (deca)
January	31.73	17.08	15.34	4.30	4.80
February	34.19	19.68	18.08	3.70	3.80
March	36.72	21.06	20.26	3.90	3.20
April	37.92	20.63	18.88	4.70	4.40
May	37.64	16.57	16.53	6.30	6.20
June	37.13	15.46	14.70	6.90	6.80
July	37.21	14.28	15.15	7.40	7.20
August	37.57	16.36	14.56	7.10	7.20
September	36.86	15.73	15.83	7.40	7.00
October	34.57	14.90	15.27	6.70	6.80
November	31.94	15.01	14.17	6.00	5.60
December	30.74	15.74	14.93	5.00	5.40

$$R = \frac{\sum_{i=1}^{n}\left[(C_{i,c} - \bar{C}_c)(C_{i,m} - \bar{C}_m)\right]}{\sqrt{\left[\sum_{i=1}^{n}(C_{i,m} - \bar{C}_m)^2 \sum_{i=1}^{n}(C_{i,c} - \bar{C}_c)^2\right]}} \quad (4)$$

$$NS = 1 - \frac{\sum_{i=1}^{n}(C_{i,m} - C_{i,c})^2}{\sum_{i=1}^{n}(C_{i,m} - \bar{C}_m)^2} \quad (5)$$

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(C_{i,m} - C_{i,c})^2} \quad (6)$$

$$MBE = \frac{1}{n}\sum_{i=1}^{n}(C_{i,m} - C_{i,c}) \quad (7)$$

$$MABE = \frac{1}{n}\sum_{i=1}^{n}\left|(C_{i,m} - C_{i,c})\right| \quad (8)$$

$$MPE = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{C_{i,m} - C_{i,c}}{C_{i,m}}\right)\times 100 \quad (9)$$

$$MAPE = \frac{1}{n}\sum_{i=1}^{n}\left|\left(\frac{C_{i,m} - C_{i,c}}{C_{i,m}}\right)\right|\times 100 \quad (10)$$

$$t\text{-stat} = \sqrt{\frac{(n-1)MBE^2}{RMSE^2 - MBE^2}} \quad (11)$$

เมื่อ $C_{i,c}$ คือ ค่าปริมาณเมฆรายวันเฉลี่ยรายเดือนที่ได้จากการคำนวณด้วยสมการเอ็มพิริคัล $\bar{C}_c$ คือ ค่าปริมาณเมฆรายวันเฉลี่ยรายปีที่ได้จากการคำนวณเอ็มพิริคัล $C_{i,m}$ คือ ค่าปริมาณเมฆรายวันเฉลี่ยรายเดือนที่ได้จากการวัด $\bar{C}_m$ คือ ค่าปริมาณเมฆรายวันเฉลี่ยรายปีที่ได้จากการวัด และ n คือ ลำดับที่ของเดือนในรอบปี โดยที่ค่า RMSE MBE และ MABE มีหน่วยเป็น deca

6. ทำการวิเคราะห์หาสมการที่เหมาะสมที่สุดสำหรับค่าปริมาณเมฆรายวันเฉลี่ยรายเดือนของจังหวัดชุมพร จากค่าทางสถิติในข้อที่ 5 ด้วยค่าประเมินตัวบ่งชี้สมรรถนะทั้งหมด (global performance indicator, GPI) ซึ่งค่า GPI ทีมีค่ามากที่สุดจะเป็นแบบจำลองที่มีสมรรถนะดีที่สุด ด้วยสมการ (Zhang, et al., 2018).

$$GPI = \sum_{j=1}^{7}\left[\alpha_j(y_j - y_{ij})\right] \quad (12)$$

เมื่อ α_j มีค่าเท่ากับ -1 สำหรับค่าทางสถิติ R และ NS ส่วนค่าทางสถิติตัวอื่นๆ ทีเหลือ α_j มีค่าเท่ากับ +1 ส่วนค่า y_j เป็นค่ามัธยฐานของค่าทางสถิติแต่ละตัวของแบบจำลองทั้งหมด และค่า y_{ij} เป็นค่าทางสถิติของแต่ละตัวแบบจำลอง

ผลการวิจัย

ได้การสร้างสมการเอ็มพิริคัลทั้ง 10 รูปแบบ ที่เป็นสมการพื้นฐานทางคณิตศาสตร์ประกอบด้วย สมการถดถอยเชิงเส้น กำลังสอง กำลังสาม ลอการิทึม เอ็กโพเนนเชียล (2 สมการ) ยกกำลัง ผสมถดถอยเชิงเส้นและลอการิทึม ผสมถดถอยเชิงเส้นและเอ็กโพเนนเชียล และสมการผสมถดถอยเชิงเส้น ลอการิทึม และเอ็กโพเนนเชียล ดังตารางที่ 4 และได้ค่าสัมประสิทธิ์เอ็มพิริคัล ดังในตารางที่ 5

ตารางที่ 4 รูปแบบสมการเอ็มพิริคัลทั้ง 10 สมการ ที่ใช้ในการศึกษาครั้งนี้

Model No.	Model type	Regression equation modified	Source
1	Linear	$C = C_0\left[a + b(1 - H/H_0)\right]$	(Sarkar, & Sifat, 2016).
2	Quadratic	$C = C_0\left[a + b(1 - H/H_0) + c(1 - H/H_0)^2\right]$	
3	Cubic	$C = C_0\left[\begin{matrix} a + b(1 - H/H_0) + c(1 - H/H_0)^2 \\ +d(1 - H/H_0)^3 \end{matrix}\right]$	
4	Logarithmic	$C = C_0\left[a + b\ln(1 - H/H_0)\right]$	
5	Exponential	$C = C_0\left(a\exp\left[b\left(1 - H/H_0\right)\right]\right)$	
6	Power	$C = C_0\left[a(1 - H/H_0)^b\right]$	
7	Exponential	$C = C_0\left[a + b\exp(1 - H/H_0)\right]$	Muzathik, et al.,2011)
8	Linear logarithmic	$C = C_0\left[a + b(1 - H/H_0) + c\ln(1 - H/H_0)\right]$	
9	Linear exponential	$C = C_0\left[a + b(1 - H/H_0) + c\exp(1 - H/H_0)\right]$	
10	Linear logarithmic exponential	$C = C_0\left[\begin{matrix} a + b(1 - H/H_0) + c\ln(1 - H/H_0) \\ +d\exp(1 - H/H_0) \end{matrix}\right]$	

ตารางที่ 5 แสดงค่าสัมประสิทธิ์ถดถอยและค่าทางสถิติที่ใช้ทดสอบสมการทั้ง 10 รูปแบบ

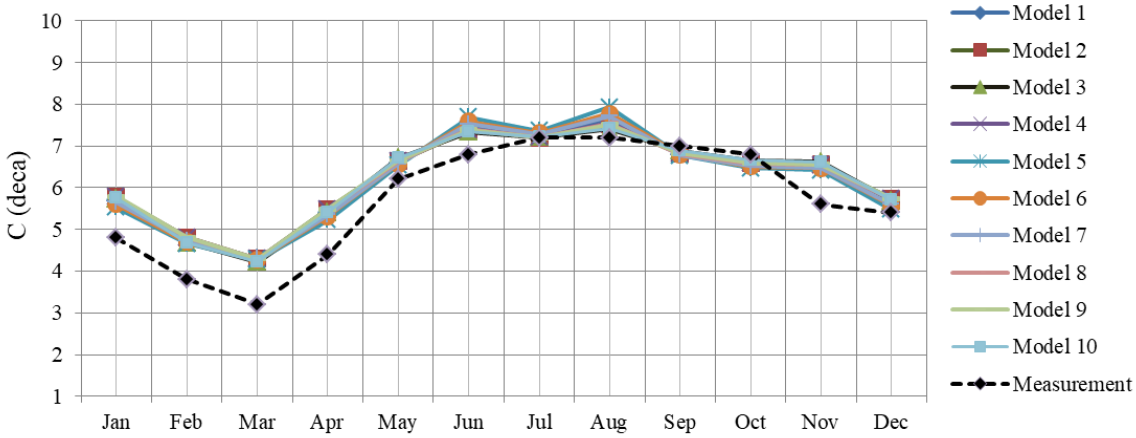
Model	Regression Coefficient				R	NS	RMSE	MBE	MABE	MPE	MAPE	*t*-state	GPI	Rank
No.	a	b	c	d			(deca)	(deca)	(deca)	(%)	(%)			
1	-0.489	2.048			0.959	0.732	0.691	-0.518	0.595	-11.51	12.624	3.763	-0.016	7
2	-1.075	4.369	-2.262		0.963	0.713	0.714	-0.536	0.602	-12.00	12.947	3.767	0.113	4
3	5.66	-35.07	74.12	-48.91	0.968	0.744	0.674	-0.513	0.557	-11.36	12.000	3.886	0.405	1
4	1.266	1.042			0.962	0.714	0.713	-0.535	0.603	-11.96	12.947	3.761	0.079	6
5	0.079	3.772			0.946	0.748	0.669	-0.493	0.587	-10.70	12.066	3.607	-0.111	10
6	2.002	1.926			0.954	0.745	0.674	-0.506	0.588	-11.09	12.287	3.773	-0.095	9
7	-1.484	1.222			0.957	0.738	0.682	-0.509	0.592	-11.29	12.486	3.717	-0.048	8
8	1.311	-0.053	1.069		0.962	0.714	0.713	-0.535	0.603	-11.97	12.956	3.760	0.083	5
9	1.763	6.66	-2.76		0.963	0.713	0.714	-0.536	0.601	-11.99	12.935	3.765	0.124	3
10	3.832	93.51	-15.26	-36.77	0.968	0.743	0.676	-0.514	0.559	-11.39	12.041	3.878	0.396	2
Median					0.962	0.735	0.687	-0.516	0.593	-11.45	12.555	3.764		

เมื่อทดสอบสมการที่ได้ พบว่า ค่าปริมาณเมฆรายวันเฉลี่ยรายเดือนของจังหวัดชุมพรไม่ได้แตกต่างกัน โดยแต่ละสมการให้ค่าทางสถิติที่ใกล้เคียงกัน ซึ่งค่า R มีค่าอยู่ในช่วง 0.946 – 0.968 ค่า NS มีค่าอยู่ในช่วง 0.713 – 0.748 ค่า RMSE มีค่าอยู่ในช่วง 0.669 – 0.714 deca โดยที่ค่า MBE มีค่าอยู่ในช่วง (- 0.536) – (- 0.493) deca ค่า MABE มีค่าอยู่ในช่วง 0.557 – 0.603 deca สำหรับค่า MPE มีค่าอยู่ระหว่าง (-12.00) – (- 10.70) % ส่วน MAPE มีค่าอยู่ระหว่าง 12.000 – 12.956 % และค่า *t*-stat มีค่าอยู่ระหว่าง 3.607 – 3.886 ตามลำดับ ดังตารางที่ 5 โดยที่ค่า R และค่า NS ให้ค่าดีที่สุดเมื่อมีค่าเท่ากับ 1 ส่วนค่า RMSE MBE MPE MAPE และ *t*-stat จะให้ค่าดีที่สุดเมื่อเข้าใกล้ศูนย์

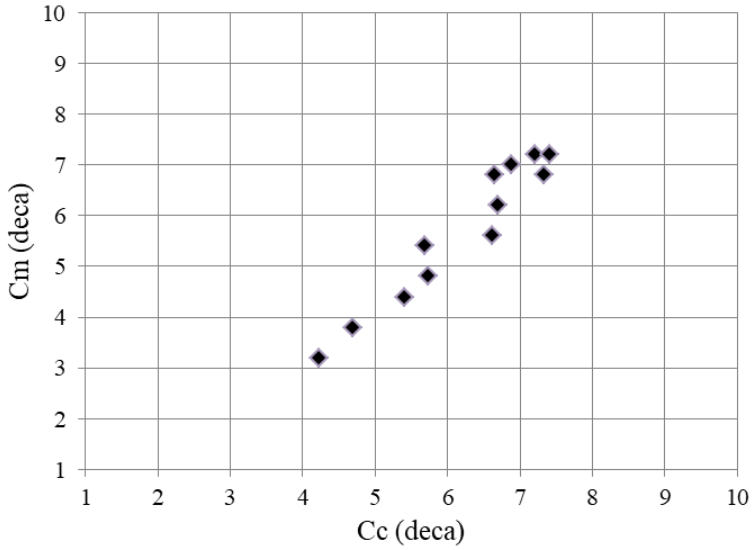
สำหรับผลการวิเคราะห์หาแบบจำลองที่เหมาะสมที่สุดที่ได้จากภาพที่ 1 พบว่า ทุกแบบจำลองให้ผลที่ใกล้เคียงกันมาก โดยแบบจำลองที่ 3 แบบสมการกำลังสาม ที่ให้ค่า GPI สูงสุดเท่ากับ 0.405 จึงมีความเหมาะสมที่สุด ด้วยสมการความสัมพันธ์

$$C = C_0\left(5.656 - 35.07(1 - H/H_0) + 74.17(1 - H/H_0)^2 - 48.91(1 - H/H_0)^3\right) \quad (13)$$

โดยให้ค่า R NS RMSE MBE MABE MPE MAPE และ *t*-stat เป็น 0.968 0.744 0.674 deca - 0.513 deca 0.557 deca - 11.4% 12.0% และ 3.89 ตามลำดับ และเมื่อเปรียบเทียบกับค่าปริมาณเมฆเฉลี่ยที่วัดได้ในปี พ.ศ. 2559 – 2563 จะให้ผลที่สอดคล้องกันดังภาพที่ 2



ภาพที่ 1 แสดงผลการทดสอบแบบจำลองทั้ง 10 รูปแบบ เปรียบเทียบกับค่าที่ได้จากการวัด



ภาพที่ 2 แสดงผลการเปรียบเทียบค่าปริมาณเมฆที่คำนวณได้ (C_c) ตามแบบจำลองที่ 3 กับค่าปริมาณเมฆเฉลี่ยที่วัดได้ (C_m)

สรุปและอภิปรายผล

การศึกษาครั้งนี้ได้สร้างแบบจำลองสมการเอ็มพิริคัลของความสัมพันธ์ที่ได้จากปริมาณเมฆรายวันเฉลี่ยรายเดือน (C) และค่ารังสีอาทิตย์รวมรายวันเฉลี่ยรายเดือน (H) ที่มีรูปแบบสมการที่เหมาะสมที่สุดของจังหวัดชุมพร เป็น

$$C = C_0\left(5.656 - 35.07(1 - H/H_0) + 74.17(1 - H/H_0)^2 - 48.91(1 - H/H_0)^3\right)$$

ด้วยค่า R NS RMSE MBE MABE MPE MAPE และ *t*-stat เป็น 0.968 0.744 0.674 deca - 0.513 deca 0.557 deca - 11.4% 12.0% และ 3.89 ตามลำดับ แสดงว่าค่าที่ได้จากแบบจำลองแบบสมการกำลังสามหรือแบบ Cubic และจากการวัดมีความสอดคล้องกัน ทั้งนี้ค่าปริมาณเมฆที่วัดได้มีค่าต่ำกว่าค่าที่ได้จากแบบจำลองลองเล็กน้อย เนื่องจากในปีที่ใช้ปริมาณรังสีทดสอบตามแบบจำลองและสมการข้างต้นมีปริมาณค่อนข้างต่ำจึงส่งผลให้ค่าปริมาณเมฆที่ได้จากแบบจำลองส่วนใหญ่มีค่าสูง โดยเฉพาะในช่วงครึ่งปีแรก ซึ่งแบบจำลองในรูปแบบ Cubic เป็นแบบจำลองที่เหมาะสมที่สุดสำหรับจังหวัดชุมพรและพื้นที่ใกล้เคียง

ข้อเสนอแนะ

แบบจำลองที่ได้นี้สามารถนำไปใช้กับพื้นที่อื่นๆ ที่มีสภาพภูมิอากาศใกล้เคียงกันได้

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การวิเคราะห์การเปลี่ยนแปลงสีของคราบเลือดในสถานที่เกิดเหตุเพื่อประยุกต์ใช้ทางนิติวิทยาศาสตร์

Colorimetric Analysis of Bloodstains in Crime Scene for Forensic Application

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บทคัดย่อ

คราบเลือดถือเป็นหลักฐานทางนิติวิทยาศาสตร์ที่สำคัญ มักพบในคดีอาชญากรรมที่รุนแรง โดยการศึกษานี้มีวัตถุประสงค์เพื่อศึกษาการใช้การวิเคราะห์สีในการประมาณอายุของคราบเลือดจากภาพถ่ายคราบเลือดโดยใช้แอปพลิเคชัน RGB Color Detector ในการทดลองเตรียมตัวอย่างเลือดโดยการหยดตัวอย่างเลือดลงบนผ้าฝ้ายสีต่าง ๆ และเก็บไว้ที่อุณหภูมิห้องที่ระยะเวลาต่าง ๆ ก่อนที่นำมาวิเคราะห์ข้อมูลที่ได้ถูกนำมาใช้เพื่อสร้างกราฟค่าสีอ่านได้ของคราบเลือดเทียบกับอายุของคราบเลือด สมการที่ใช้ในการทำนายอายุของคราบเลือดโดยแบ่งเป็น 2 สมการ: สมการช่วงระยะเวลาสั้น (1-4 ชั่วโมง) และสมการช่วงระยะเวลายาว (5-720 ชั่วโมง) ได้รับการพัฒนาขึ้นเพื่อทำนายอายุของคราบเลือด จากการเตรียมตัวอย่างเลือด 18 ตัวอย่าง พบว่า มีความสัมพันธ์ที่ดีระหว่างอายุที่ทำนายได้กับอายุจริงของกลุ่มตัวอย่าง โดยมีค่าสัมประสิทธิ์สหสัมพันธ์ ≥ 0.8031 ผลการทดลองได้พิสูจน์แล้วว่าการวิเคราะห์สีอาจใช้ทำนายอายุของคราบเลือดบนผ้าฝ้ายสีต่าง ๆ ได้

คำสำคัญ : คราบเลือด, ฮีโมโกลบิน, การตรวจวัดค่าสี

Abstract

The bloodstains are important forensic evidence often found in the serious crime case. The purpose of this study was to explore the use of colors analysis in the estimation

of the age of bloodstains from bloodstain images by RGB Color Detector application. In the experiment, the bloodstain samples were prepared by dropping the blood samples on different colors of cotton fabrics and kept at ambient temperature for various periods of time. The data were employed to construct calibration graphs of color values of the bloodstain colors and the bloodstain ages. Two bloodstain age prediction equations: a short-term (1-4 hours) and a long-term (5-720 hours) equations were developed to determine the ages of bloodstains prepared from eighteen blood samples. A good correlation between the estimated ages and the actual ages of the samples were obtained correlation coefficient of ≥ 0.8031. The experimental results have proved that the colorimetric analysis may be used to predict the age of bloodstains on the different colors of the cotton cloth.

Keywords : Blood stains, Hemoglobin, Color Detector

บทนำ

ในปัจจุบันพบการก่อเหตุอาชญากรรมหลากหลายรูปแบบ เช่น การทำร้ายร่างกาย การล่วงละเมิดทางเพศ การก่อเหตุฆาตกรรม เป็นต้น ซึ่งกระบวนการสืบสวนเพื่อทราบผู้กระทำความผิดต้องอาศัยการรวบรวมพยานหลักฐานเพื่อยืนยันการพิสูจน์ความผิด ทั้งนี้สถานที่เกิดเหตุจึงมีความสำคัญในการสืบสวนเป็นอย่างมาก เนื่องจากสถานที่เกิดเหตุสามารถบอกได้ว่ามีการกระทำความผิดเกิดขึ้นจริง (Corpus Delicti) ซึ่งอาจมีร่องรอยหรือพยานหลักฐานที่ทำให้สามารถเชื่อมโยงไปถึงผู้กระทำความผิดได้ตามหลักการแลกเปลี่ยนของโลคาร์ด (Locard's Exchange Principle) ดังที่ เอดมง โลคาร์ด (Edmond Locard) ได้กล่าวไว้ว่า "ทุกการสัมผัสย่อมทิ้งร่องรอย (Every Contact Leaves a Trance)" (กุลนิดา ผาตินาวิน, 2564) โดยพยานหลักฐานที่อาจพบประกอบไปด้วย พยานบุคคล พยานเอกสาร พยานวัตถุ และพยานผู้ชำนาญการพิเศษ ซึ่งพยานวัตถุจัดเป็นหลักฐานที่แท้จริง (Real Evidence) และเป็นพยานหลักฐานที่มีความสำคัญอย่างหนึ่งเนื่องจากพยานวัตถุมีความชัดแจ้งของตัวเองที่สามารถนำไปเชื่อมโยงเหตุการณ์ร่วมกับพยานหลักฐานประเภทอื่นเพื่อยืนยันการกระทำความผิดที่เกิดขึ้น พยานวัตถุที่มักพบในสถานที่เกิดเหตุ อาทิ ลายนิ้วมือ (Fingerprint) เส้นผม (Hair) เนื้อเยื่อ (Tissue) รวมถึงคราบเลือด (Bloodstain) เป็นต้น (ชิดชนก ขวัญพรม, สาริสา ปิ่นคำ และณรงค์ กุลนิเทศ, 2564).

คราบเลือดมักพบในสถานที่เกิดเหตุในลักษณะเป็นหยดหรือเป็นคราบที่แห้งแล้ว ซึ่งในงานด้านนิติวิทยาศาสตร์คราบเลือดที่ได้จากสถานที่เกิดเหตุคราบเลือดมักถูกนำมาใช้ในการวิเคราะห์ DNA Profiling เพื่อสืบหาตัวบุคคล หรือการวิเคราะห์ทิศทางและการกระจายตัวของเลือด รวมไปถึงการประมาณระยะเวลาของคราบเลือด (Thanakiatkrai, Yaodam, & Kitpipit, 2013) นักนิติวิทยาศาสตร์พยายามพัฒนาวิธีการประมาณระยะเวลาของคราบเลือดที่ตรวจพบในสถานที่เกิดเหตุมาเป็นเวลานาน

เพื่อให้มีความแม่นยำและรวดเร็วมากยิ่งขึ้น (Shin et al., 2017) โดยในการประมาณอายุของคราบเลือดต้องอาศัยกลไกการเปลี่ยนแปลงของคราบเลือดที่สำคัญคือ Hemoglobin Reaction Kinetic ซึ่งเป็นกระบวนการเปลี่ยนแปลงของ Hemoglobin เมื่อเลือดออกจากร่างกาย ฮีโมโกลบินจะผ่านกระบวนการสลายตัวที่ไม่สามารถย้อนกลับได้ (Non-reversible Decay Process) โดย Oxyhemoglobin (HbO_2) คือ ฮีโมโกลบินที่จับกับออกซิเจนเกิด Autooxydation ให้เปลี่ยนเป็น Methemoglobin (MetHb) จากนั้นจะเสื่อมสภาพแล้วถูกเปลี่ยนเป็น Hemichrome (HC) กระบวนการเปลี่ยนแปลงของฮีโมโกลบินยังส่งผลต่อการเปลี่ยนแปลงสีของคราบเลือดซึ่งเปลี่ยนจากสีแดงเป็นสีน้ำตาลเข้ม (Thanakiatkrai et al., 2013)

การวิเคราะห์คราบเลือดที่พบในสถานที่เกิดเหตุไม่สามารถสังเกตหรือแยกได้ด้วยตาเปล่าได้ว่าคราบเลือดที่พบมีระยะเวลานานเท่าใด และคราบเลือดบริเวณไหนเกิดก่อนหรือเกิดหลัง ในงานด้านนิติวิทยาศาสตร์จึงมีการใช้ทฤษฎีระบบของสี RGB ได้แก่ สีแดง สีเขียว และสีน้ำเงิน ซึ่งเป็นระบบสีที่ใช้กันอย่างแพร่หลาย (Hassan et al., 2017) เนื่องจากระบบสี RGB เป็นระบบปริภูมิสี คือสีที่ปรากฏขึ้นตามการรับรู้ของมนุษย์ ซึ่งถูกสร้างขึ้นโดยนักวิจัยของ Hewlett Packard เป็นการกำหนดค่าสีภาพที่ได้จากกล้องถ่ายภาพ ทั้งนี้ในปัจจุบันจึงมีการนำค่าสี RGB ของภาพถ่ายมาประยุกต์ใช้ในการประมาณระยะเวลาของคราบเลือดที่พบในสถานที่เกิดเหตุ (Vmountandtrim, 2022)

การประมาณระยะเวลาของคราบเลือดสามารถใช้เทคนิคในการวิเคราะห์หลายประเภท อาทิ เทคนิคการถ่ายภาพไฮเปอร์สเปกตรัมที่สามารถทำงานในช่วงคลื่นอินฟราเรดที่สามารถมองเห็นได้ (400-1,000 นาโนเมตร) เพื่อการประมาณอายุของคราบเลือด โดยพิจารณาจากสเปกตรัมที่ได้จากการสะท้อนแสงเพื่อสังเกตสัดส่วนของอนุพันธ์ของฮีโมโกลบินที่เปลี่ยนแปลง จากการเปรียบเทียบสัดส่วนอนุพันธ์ของฮีโมโกลบินกับข้อมูลอ้างอิง พบว่า สามารถประมาณอายุของคราบเลือดได้นานถึง 200 วัน โดยมีค่าความคลาดเคลื่อนอยู่ที่ 13.4% และยังสามารถทำนายอายุของคราบเลือดได้ภายใต้สภาพแวดล้อมที่แตกต่างกัน (Edelman, Van Leeuwen, & Aalders, 2012)

(Shin et al., 2017) ได้ศึกษาการประมาณอายุของคราบเลือดจากการพัฒนาระบบตรวจจับทางโทรศัพท์ที่ชื่อว่า Smart Forensic Phone จากการหยดเลือดลงบนวัสดุที่แตกต่างกัน 5 ชนิด ได้แก่ วอลเปเปอร์ ผ้า กระจก ไม้ และกระดาษ A4 โดยตรวจสอบค่า RGB (สีแดง สีเขียว และสีน้ำเงิน) จากภาพถ่ายของคราบเลือด พบว่า ในช่วงระยะเวลา 42 ชั่วโมงแรก ค่าสี RGB มีค่าลดลงอย่างรวดเร็ว หลังจากนั้นค่าสีจะไม่ค่อยเปลี่ยนแปลง ซึ่งวิธีนี้สามารถประมาณอายุของคราบเลือดได้หากอายุของคราบเลือดน้อยกว่า 42 ชั่วโมง

(Choi, Shin, Hyun, Song, & Jung, 2019) ได้ศึกษาเรื่องการวัดค่าสีจากภาพถ่ายสำหรับการประมาณอายุของคราบเลือดโดยการหยดเลือดปริมาตร 700 ไมโครลิตร ลงบนวัสดุ 4 ชนิดที่แตกต่างกัน ได้แก่ ไม้ กระดาษ กระจก และผ้า และใช้สมาร์ทโฟนในการถ่ายภาพเป็นเวลา 72 ชั่วโมง พบว่า สามารถ

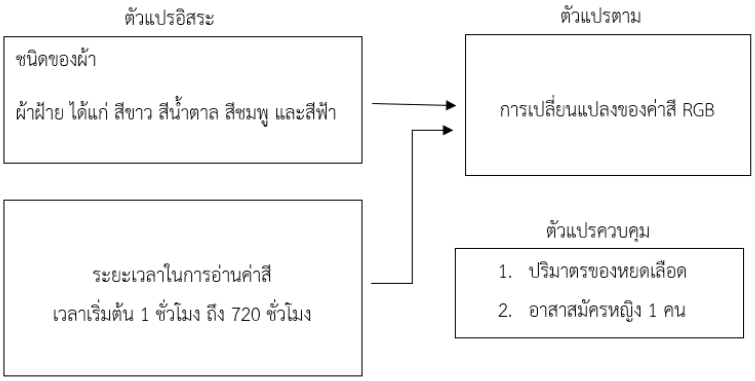
แยกความแตกต่างของภาพถ่ายคราบเลือดได้ชัดเจนทุกชั่วโมงจนถึง 48 ชั่วโมง ส่งผลให้สามารถนำมาใช้ประมาณอายุของคราบเลือดแบบเรียลไทม์ในงานด้านนิติวิทยาศาสตร์ได้

(จิณห์นิภา จิปาวะภินันท์, 2564) ได้ศึกษาการใช้เทคนิค Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR-FTIR) โดยอาศัยหลักการการดูดกลืนช่วงคลื่นอินฟราเรดในการวิเคราะห์หมู่ฟังก์ชันโมเลกุลของสาร โดยวิเคราะห์องค์ประกอบของคราบเลือดบนผ้าฝ้ายสีขาวในช่วงคลื่น 4000-6000 cm^{-1} ที่ช่วงระยะเวลาต่าง ๆ เป็นเวลา 720 ชั่วโมง จากการทดลองพบสเปกตรัมที่เป็นองค์ประกอบของคราบเลือดของพีค Amide I และ Amide II ซึ่งจะลดลงเมื่อเวลาผ่านไปจนครบระยะเวลา 720 ชั่วโมง และเทคนิควัดค่าสีด้วย Spectrophotometer เพื่อประเมินอายุของคราบเลือดจากตัวอย่างเลือด 12 ตัวอย่าง พบว่า สามารถทำนายอายุของคราบเลือดได้ประมาณ 1 ชั่วโมง จนถึง 4ชั่วโมงแรก โดยมีค่าสัมประสิทธิ์สหสัมพันธ์เท่ากับ 0.9565 และช่วงความคลาดเคลื่อนประมาณ 10 – 16%

จากเทคนิคที่กล่าวในข้างต้นอาจมีเทคนิคที่ใช้ระยะเวลาในการวิเคราะห์ค่อนข้างนาน ค่าใช้จ่ายสูง และไม่สามารถนำไปใช้ได้ในที่เกิดเหตุ ในการศึกษางานวิจัยนี้จึงได้ทำการศึกษาการประมาณระยะเวลาของคราบเลือด จากการสังเกตค่าการเปลี่ยนแปลงของสีคราบเลือดในแต่ละช่วงเวลาด้วยแอปพลิเคชัน RGB Color Detector ที่ถูกพัฒนาโดย Raimon Gaspar Fernadez ซึ่งสามารถอ่านค่าสี RGB ของภาพถ่ายในระยะเวลาต่าง ๆ ภายหลังการหยดเลือด เพื่อหาความสัมพันธ์ระหว่างค่าสีที่อ่านได้เทียบกับระยะเวลา และแสดงให้เห็นว่า เทคนิคนี้สามารถประมาณระยะเวลาของคราบเลือดได้อย่างรวดเร็ว มีค่าใช้จ่ายน้อย รวมถึงแสดงประสิทธิภาพในการประมาณระยะเวลาของคราบเลือดเพื่อนำไปประยุกต์ใช้ในสถานที่เกิดเหตุและงานทางด้านนิติวิทยาศาสตร์ได้

วัตถุประสงค์ของการวิจัย

เพื่อศึกษาการหาระยะเวลาของคราบเลือดบนผ้าฝ้าย ได้แก่ สีขาว สีน้ำตาล สีชมพู และสีฟ้า โดยการวิเคราะห์ค่าสี



ภาพที่ 1 กรอบแนวคิดการวิจัย

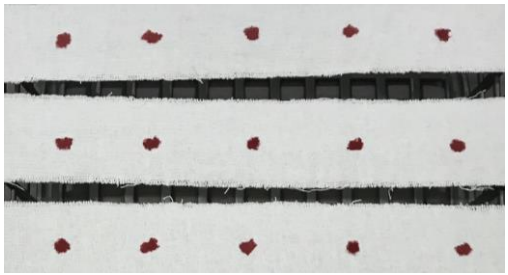
วิธีดำเนินการวิจัย

1. ขั้นตอนการเตรียมผ้าที่ใช้ในการหยดเลือด

ผ้าที่ใช้ในการทดลองได้แก่ ผ้าฝ้าย 4 สี ได้แก่ สีขาว สีน้ำตาล สีชมพู และสีฟ้า โดยตัดผ้าให้มีขนาดกว้าง 5 cm. ยาว 10 cm. สีละ 3 ผืน ทั้งหมด 12 ผืน จากนั้นทำความสะอาดผ้าด้วยน้ำยาทำความสะอาดผ้า และชะล้างด้วยน้ำสะอาด เพื่อกำจัดฝุ่นหรือคราบสิ่งสกปรกต่าง ๆ ออก จากนั้นขึงผ้ากับฐานยึดผ้าให้มีลักษณะตึง

2. ขั้นตอนการเตรียมตัวอย่างเลือด

ปิเปตเลือดที่อยู่ในหลอดบรรจุชนิดที่มีสารป้องกันการแข็งตัวของเลือดปริมาตร 20 µl. หยดลงบนผ้าที่ขึงอยู่บนฐานยึดจำนวน 5 หยด เรียงตามลำดับ ระยะความสูงในการหยด 2 cm. โดยหยดเลือดลงบนผ้าแต่ละผืนให้ครบตามจำนวน จากนั้นเก็บไว้ที่อุณหภูมิห้อง ยกตัวอย่างการหยดเลือดลงบนผ้าฝ้ายสีขาวดังภาพที่ 2



ภาพที่ 2 ตัวอย่างการหยดเลือดลงบนผ้าฝ้ายสีขาว

3. ขั้นตอนการถ่ายภาพ

นำคราบเลือดที่หยดลงบนผ้าสีต่าง ๆ ใช้สมาร์ทโฟนรุ่น iPhone 7 plus โหมดการถ่ายภาพอัตโนมัติ กำลังขยายภาพ 1X โดยการถ่ายภาพระยะของกล้องจะอยู่สูงจากผ้า 15 cm. และใช้แอปพลิเคชัน RGB Color Detector ในการวิเคราะห์ค่าสี RGB ซึ่งกำหนดระยะเวลาในการถ่ายภาพทั้งหมด 720 ชั่วโมงโดยเริ่มถ่ายภาพและอ่านค่าสีภายหลังการหยดเลือดที่เวลา 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 15, 18, 21, 24, 30, 36, 42, 48, 72, 96, 120, 144, 168, 216, 384, 552, 720 ชั่วโมง ตามลำดับ

4. ขั้นตอนการวิเคราะห์

นำค่าสี RGB ที่อ่านได้ในระยะเวลาต่าง ๆ มาบันทึกลงตารางค่าสีและระยะเวลาของคราบเลือดจากนั้นนำค่าสีที่อ่านได้มาหาค่าเฉลี่ย ค่าส่วนเบี่ยงเบนมาตรฐาน และนำมาสร้างกราฟความสัมพันธ์ระหว่างค่าสีกับระยะเวลาต่าง ๆ ของคราบเลือด เพื่อหาสมการที่ใช้ในการทำนายอายุของคราบเลือดจากค่าสีที่อ่านได้

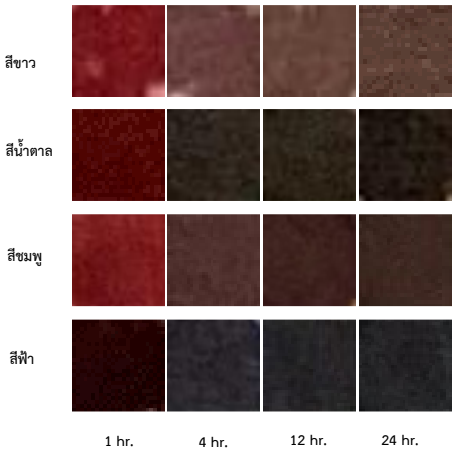
5. ขั้นตอนการทำนายอายุของคราบเลือดตัวอย่าง

ปิเปตตัวอย่างเลือดที่อยู่ในหลอดบรรจุชนิดที่มีสารป้องกันการแข็งตัวของเลือดปริมาตร 20 µl. หยดลงบนผ้าฝ้ายทั้งหมด 4 สี ได้แก่ สีขาว สีน้ำตาล สีชมพู และสีฟ้า จากนั้นทำการถ่ายภาพที่ระยะเวลา

ต่าง ๆ ในระยะเวลา 24 ชั่วโมง โดยมีขั้นตอนการถ่ายภาพและอ่านค่าสีด้วยด้วยแอปพลิเคชันRGB Color Detector เช่นเดียวกับข้อ 3 และนำค่าสีที่อ่านได้แทนค่าลงในสมการความสัมพันธ์ระหว่างค่าสีกับระยะเวลาต่าง ๆ ของคราบเลือด เพื่อนำอายุของคราบเลือดที่ทำนายได้จากสมการมาสร้างกราฟเทียบกับอายุจริงของคราบเลือดเพื่อดูความสัมพันธ์ของกราฟที่ได้ และนำไปวิเคราะห์ผลการทดลองต่อไป

ผลการวิจัย

จากการนำตัวอย่างเลือดปริมาตร 20 µl. หยดลงบนผ้าฝ้ายทั้งหมด 4 สี ได้แก่ สีขาว สีน้ำตาล สีชมพู และสีฟ้า นำผ้าที่หยดเลือดแล้วเก็บไว้ที่อุณหภูมิห้อง และถ่ายภาพภายหลังจากการหยดเลือดที่ระยะเวลาต่าง ๆ จากการใช้สมาร์ทโฟน พบว่า ในช่วงระยะเวลา 1 ชั่วโมง ถึง 720 ชั่วโมง คราบเลือดบนผ้าฝ้ายสีขาวและสีชมพู มีการเปลี่ยนแปลงจากสีแดงสดเป็นสีน้ำตาลเข้มในช่วง 24 ชั่วโมงแรก และผ้าฝ้ายสีน้ำตาลและสีฟ้าภายหลังจากการหยดเลือดไป 4 ชั่วโมง ไม่สามารถสังเกตการเปลี่ยนแปลงของสีได้ด้วยตาเปล่าได้ ดังภาพที่ 3



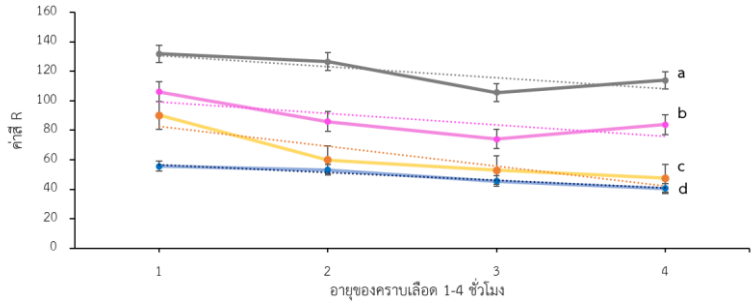
ภาพที่ 3 คราบเลือดบนผ้าฝ้ายสีขาว สีน้ำตาล สีชมพู และสีฟ้า ถ่ายภาพที่เวลา 1 ชั่วโมง 4 ชั่วโมง 12 ชั่วโมง และ 24 ชั่วโมง ภายหลังการหยดเลือด

จากการหยดเลือดบนผ้าฝ้ายสีขาว สีน้ำตาล สีชมพู และสีฟ้า สามารถสังเกตการเปลี่ยนแปลงค่าสีของคราบเลือดจากการอ่านค่าสี RGB ที่ระยะเวลาต่าง ๆ เป็นเวลา 720 ชั่วโมง พบว่า ค่าสีแดงของคราบเลือดลดลงอย่างชัดเจนในช่วงระยะเวลา 24 ชั่วโมงแรกภายหลังการหยดเลือด จากนั้นเมื่อวิเคราะห์ค่าสีเขียว และค่าสีน้ำเงิน พบว่า มีการเปลี่ยนแปลงเพียงช่วงเวลา 3 ชั่วโมง ถึง 4 ชั่วโมงเท่านั้น และเมื่อระยะเวลาผ่านไปค่าสีเขียวและสีน้ำเงินมีค่าการเปลี่ยนแปลงน้อยมาก หรือแทบจะคงที่ ดังนั้นจึงเลือกทำการศึกษาการเปลี่ยนแปลงของค่าสีแดงเพียงอย่างเดียวดังตางรางที่ 1

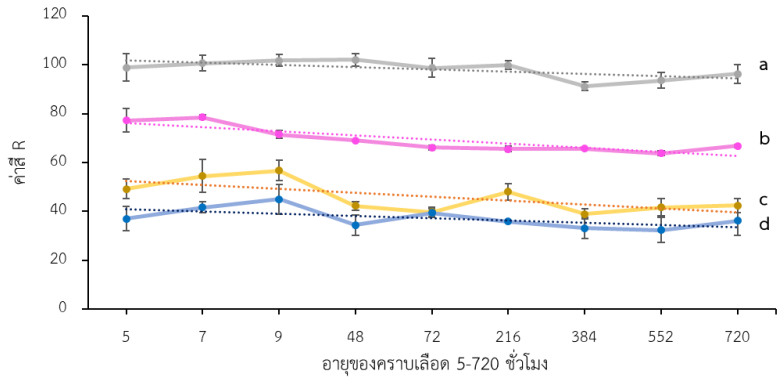
ตารางที่ 1 ค่าเฉลี่ยสีแดงของคราบเลือดบนผ้าฝ้ายสีขาว สีน้ำตาล สีชมพู และสีฟ้า

ระยะเวลา (ชั่วโมง)	สีขาว		สีน้ำตาล		สีชมพู		สีฟ้า	
	R	S.D.	R	S.D.	R	S.D.	R	S.D.
1	131.89	2.22	90.19	2.96	106.15	1.25	55.75	2.89
2	126.55	3.16	59.92	6.78	86.01	0.91	53.22	2.34
3	105.61	3.38	53.03	0.37	74.16	0.91	45.57	1.50
4	113.91	2.40	47.59	4.17	83.95	1.58	40.55	6.15
5	98.89	3.26	49.25	1.49	77.31	1.61	37.06	6.74
6	109.61	3.67	45.47	3.42	70.85	0.83	44.26	0.80
7	100.66	3.19	54.55	0.34	78.51	0.56	41.69	6.03
8	110.97	1.74	51.90	3.32	74.96	0.44	46.54	1.68
9	101.72	1.98	56.79	2.61	71.41	0.31	45.03	0.87
12	108.07	1.41	47.28	3.27	68.28	1.12	40.57	1.60
15	102.01	2.05	59.06	3.16	80.65	4.04	35.46	5.22
18	113.35	3.02	51.76	3.99	76.63	2.26	46.77	2.11
21	98.63	2.63	50.31	1.77	73.61	0.22	34.63	4.16
24	89.73	3.88	38.04	1.93	67.82	0.90	39.78	1.69
30	92.61	3.18	46.98	1.72	70.88	1.49	33.78	5.38
36	83.03	0.57	46.09	2.15	66.66	0.94	38.96	1.05
42	103.09	4.43	42.61	4.77	64.70	0.71	39.53	0.48
48	102.02	2.58	42.30	3.39	69.01	0.86	34.40	4.86
72	98.69	1.66	39.75	3.38	66.19	1.18	39.39	0.61
96	92.19	1.83	46.67	2.05	66.57	0.54	32.11	4.38
120	98.87	3.27	41.84	3.41	65.87	0.90	31.96	5.15
144	101.84	3.96	45.15	2.86	74.52	0.54	36.68	5.87
168	88.54	3.40	52.11	4.30	63.09	0.89	42.45	1.62
216	99.89	1.81	48.08	3.10	65.53	2.03	35.84	5.01
384	91.21	2.37	38.91	0.95	65.65	1.08	33.17	3.13
552	93.55	1.29	41.74	2.22	63.81	2.40	32.43	3.19
720	96.23	2.65	42.49	3.74	66.75	1.26	36.17	4.21

จากการศึกษาการเปลี่ยนแปลงของค่าสีแดงที่ระยะเวลาต่าง ๆ เป็นเวลา 720 ชั่วโมง ได้นำค่าสีแดงมาสร้างกราฟความสัมพันธ์ระหว่างค่าสีแดงกับระยะเวลาของคราบเลือด โดยแบ่งกราฟออกเป็น 2 ช่วง ได้แก่ ช่วงระยะเวลาสั้น (1 - 4 ชั่วโมง) และช่วงระยะเวลายาว (5 - 720 ชั่วโมง) ดังภาพที่ 6 และ 7



ภาพที่ 6 กราฟความสัมพันธ์ระหว่างค่าสีแดงกับระยะเวลาของคราบเลือดตั้งแต่เวลา 1 ชั่วโมงถึง 4 ชั่วโมง โดยผ้าฝ้ายสีขาว (a) สีชมพู (b) สีน้ำตาล (c) และสีฟ้า (d)



ภาพที่ 7 กราฟความสัมพันธ์ค่าสีแดงกับระยะเวลาของคราบเลือดตั้งแต่เวลา 5 ชั่วโมงถึง 720 ชั่วโมง โดยผ้าฝ้ายสีขาว (a) สีชมพู(b) สีน้ำตาล (c) และสีฟ้า (d)

จากภาพที่ 6 และ 7 จะเห็นได้ว่า เมื่อแบ่งกราฟความสัมพันธ์ของค่าสีแดงกับระยะเวลาของคราบเลือดออกเป็น 2 ช่วง จะสามารถหาสมการความสัมพันธ์ และค่าสัมประสิทธิ์สหสัมพันธ์ (R) ได้ดังตารางที่ 2

ตารางที่ 2 สมการความสัมพันธ์ของค่าสีแดงกับระยะเวลาช่วง 1 ชั่วโมง ถึง 4 ชั่วโมง และช่วงเวลา 5 ชั่วโมง ถึง 720 ชั่วโมง

สีผ้าฝ้าย	ระยะเวลา 1-4 ชั่วโมง		ระยะเวลา 5-720 ชั่วโมง	
	สมการ	R	สมการ	R
สีขาว	y = -7.4873x + 138.21	0.6561	y = -0.9187x + 102.69	0.4567
สีน้ำตาล	y = -13.471x + 96.36	0.8358	y = -1.5903x + 53.937	0.4493
สีชมพู	y = -7.8453x + 107.18	0.5694	y = -1.6887x + 77.797	0.7532
สีฟ้า	y = -5.3267x + 62.09	0.9690	y = -0.894x + 41.712	0.3523

จากตารางที่ 2 พบว่า สมการความสัมพันธ์ของค่าสีแดงกับระยะเวลาของคราบเลือดของผ้าฝ้ายสีฟ้า และสีน้ำตาล ที่ระยะเวลา 1 ชั่วโมง ถึง 4 ชั่วโมง และผ้าฝ้ายสีชมพูที่ระยะเวลา 5 ชั่วโมง ถึง 720

ชั่วโมง มีค่าสัมประสิทธิ์สหสัมพันธ์ที่ดีจนเข้าใกล้ 1 เป็นตัวชี้วัดว่าเมื่อนำสมการดังกล่าวมาใช้ในการประมาณระยะเวลาของคราบเลือด จะทำให้ได้ระยะเวลาของคราบเลือดที่ทำนายได้มีความใกล้เคียงระยะเวลาจริงของคราบเลือดมากที่สุด

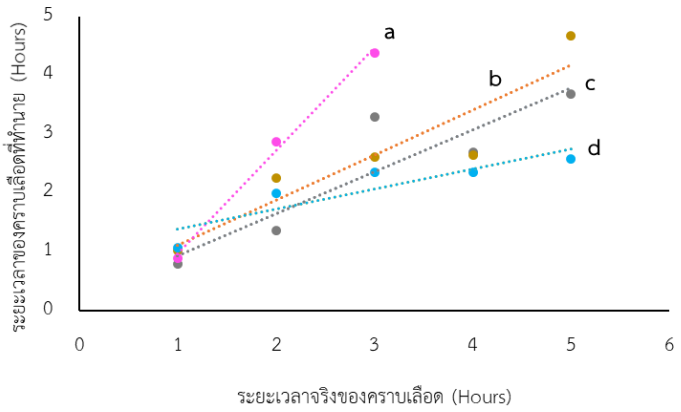
จากนั้นนำสมการความสัมพันธ์ระหว่างค่าสีแดงกับระยะเวลาของคราบเลือดมาใช้ประมาณระยะเวลาของคราบเลือดตัวอย่างเป็นระยะเวลา 1 ชั่วโมง ถึง 24 ชั่วโมง โดยการนำค่าสีแดงที่วัดได้แทนลงในสมการตารางที่ 2 และนำมาเปรียบเทียบกับระยะเวลาจริงของคราบเลือดว่ามีความใกล้เคียงหรือไม่ ดังตารางที่ 3

ตารางที่ 3 ระยะเวลาจริงของคราบเลือดกับระยะเวลาของคราบเลือดที่ทำนายได้จากสมการความสัมพันธ์ระหว่างค่าสีแดงกับระยะเวลาของคราบเลือด

ระยะเวลา (ชั่วโมง)	ระยะเวลาของคราบเลือดที่ทำนายได้							
	สีขาว	% error	สีน้ำตาล	% error	สีชมพู	%error	สีฟ้า	% error
1	0.7893	21.0700	1.0288	2.8800	0.8897	11.0300	1.0682	6.8200
2	1.3636	31.8200	2.2610	13.0500	2.8787	43.9350	1.9960	0.2000
3	3.2868	9.5600	2.6100	13.0000	4.3822	46.0730	2.3448	21.8400
4	2.6999	32.5020	2.6471	33.8250	2.4702	38.2450	2.3448	41.3800
5	3.6899	26.2020	4.6764	6.4720	3.9657	20.6860	2.5861	48.2780
6			6.0554	0.9233	5.5646	7.2560	7.2841	21.4010
7	5.2138	25.5170	0.2703	96.10000	0.0574	99.1800	1.2438	82.2310
8			0.8363	89.5460	2.7814	65.2325		
9	3.3634	62.6280	0.9620	89.3110	4.7356	47.3822		
12			4.9864	58.4460	6.5713	45.2391	2.3624	80.3133
15	3.2545	78.3030	0.3961	97.3590	1.2417	91.7220	9.6331	35.7793
18			1.7795	90.1140	0.6496	96.3910		
21	7.4997	64.287	4.7349	77.4528	3.3144	84.2170	8.2908	60.5200
24	18.602	22.491	10.9601	54.3320	6.5121	72.8662	2.1387	91.0887

จากตารางที่ 3 พบว่าสมการที่ได้จากค่าสีกับระยะเวลาของคราบเลือดที่ใช้ในการแทนค่าเพื่อทำนายระยะเวลาของคราบเลือด สามารถทำนายระยะเวลาของคราบเลือดบนผ้าฝ้ายสีขาว สีน้ำตาล สีชมพู และสีฟ้าได้ประมาณ 1 ชั่วโมง ถึง 5 ชั่วโมงแรก โดยมีช่วงความคลาดเคลื่อนประมาณ 0.2 – 48 % ซึ่งความคลาดเคลื่อนจะเพิ่มขึ้นเมื่อเวลาผ่านไป

จากนั้นนำระยะเวลาของคราบเลือดที่ทำนายได้กับระยะเวลาจริงของคราบเลือดมาสร้างกราฟเพื่อดูความสัมพันธ์ระหว่างระยะเวลาของคราบเลือดที่ทำนายได้จากสมการกับระยะเวลาจริงของคราบเลือดดังภาพที่ 8



ภาพที่ 8 กราฟความสัมพันธ์ระหว่างระยะเวลาของคราบเลือดที่ทำนายได้จากสมการกับระยะเวลาจริงของคราบเลือด (Hours) ของผ้าฝ้ายสีชมพู (a) ที่ระยะเวลา 1 ชั่วโมง ถึง 3 ชั่วโมง สีน้ำตาล (b) สีขาว (c) และสีฟ้า (d) ที่ช่วงระยะเวลา 1 ชั่วโมงถึง 5 ชั่วโมง

จากภาพที่ 8 เมื่อสร้างกราฟความสัมพันธ์ระหว่างระยะเวลาของคราบเลือดที่ทำนายได้จากสมการกับระยะเวลาจริงของคราบเลือด พบว่าผ้าฝ้ายสีขาว สีน้ำตาล และสีฟ้า สามารถทำนายระยะเวลาของคราบเลือดได้ประมาณ 1 ชั่วโมง ถึง 5 ชั่วโมงแรก และผ้าฝ้ายสีชมพูสามารถประมาณระยะเวลาของคราบเลือดได้ประมาณ 1 - 3 ชั่วโมงแรก และหาสมการความสัมพันธ์ระหว่างระยะเวลาของคราบเลือดที่ทำนายได้จากสมการกับระยะเวลาจริงของคราบเลือดดังตารางที่ 4

ตารางที่ 4 สมการความสัมพันธ์ระหว่างระยะเวลาของคราบเลือดที่ทำนายได้จากสมการกับระยะเวลาของจริงของคราบเลือด

ระยะเวลา (ชั่วโมง)	สีผ้าฝ้าย	สมการ	R
1 - 3	สีชมพู	y = 1.7463x - 0.7756	0.9936
1 - 5	สีขาว	y = 0.7138x + 0.2246	0.8213
	สีน้ำตาล	y = 0.7681x + 0.3403	0.8567
	สีฟ้า	y = 0.3385x + 1.0526	0.8031

จากตารางที่ 4 สมการความสัมพันธ์ระหว่างระยะเวลาของคราบเลือดที่ทำนายได้กับระยะเวลาจริงของคราบเลือด 18 ตัวอย่าง พบว่าสมการที่ได้มีความสัมพันธ์ที่ดี เนื่องจากมีค่าสัมประสิทธิ์สหสัมพันธ์เข้าใกล้ 1 แสดงให้เห็นว่าสามารถนำการวิเคราะห์สีไปใช้ในการทำนายระยะเวลาของคราบเลือดบนผ้าฝ้ายสีต่าง ๆ ได้จริง

สรุปและอภิปรายผล

งานวิจัยนี้เป็นการศึกษาการหาระยะเวลาของของคราบเลือดบนตัวอย่างผ้าฝ้ายโดยการหยดเลือดลงบนผ้าฝ้ายทั้งหมด 4 สี ได้แก่ สีขาว สีน้ำตาล สีชมพู และสีฟ้า และวิเคราะห์การเปลี่ยนแปลงค่าสี RGB จากภาพถ่ายโดยใช้แอปพลิเคชัน RGB Color Detector พบว่า สามารถทำนายระยะเวลาของคราบเลือดได้ตั้งแต่ระยะเวลา 1 ชั่วโมง จนถึง 5 ชั่วโมง และพบว่า มีความสัมพันธ์ที่ดีระหว่างระยะเวลาของคราบเลือดที่ทำนายได้กับระยะเวลาจริงของกลุ่มตัวอย่าง ซึ่งสอดคล้องกับงานวิจัยของ ภัทราธิป เลาหบุตร. (2559) ที่ได้ทำการศึกษาการประมาณระยะเวลาของคราบเลือดบนผ้าฝ้ายสีขาวโดยวิธีวิเคราะห์ภาพ และสามารถทำนายระยะเวลาของคราบเลือดได้ใกล้เคียงกับระยะเวลาจริงในช่วง 2 ชั่วโมงแรกเท่านั้น ซึ่งจากผลการทดลองอาจมีหลายปัจจัยที่ส่งผลต่อการเปลี่ยนแปลงสีของคราบเลือด ทำให้เกิดความคลาดเคลื่อนในการอ่านค่าสีได้ อาทิ ปัจจัยทางด้านอุณหภูมิ เนื่องจากปัจจัยทางสภาพแวดล้อมสามารถส่งผลต่อกระบวนการเกิดออกซิเดชันของฮีโมโกลบินได้ ซึ่งเลือดจะเกิดกระบวนการออกซิเดชันได้เร็วมากขึ้นเมื่ออยู่ในอุณหภูมิที่สูงขึ้น

ปัจจัยทางด้านความชื้น เมื่อความชื้นเพิ่มมากขึ้นจะส่งผลทำให้ค่าสีน้ำเงินจะลดลง แต่อุณหภูมิที่สูงขึ้นจะช่วยลดผลกระทบทางปัจจัยด้านความชื้นได้ (Hanson & Ballantyne, 2010)

ปัจจัยทางด้านการถ่ายภาพ จากงานวิจัยนี้ถ่ายภาพโดยการใช้สมาร์ทโฟน เป็นโหมดการถ่ายภาพอัตโนมัติ และไม่สามารถปรับความเร็วของชัตเตอร์ได้ อาจส่งผลต่อสี และความสว่างของภาพถ่ายคราบเลือด อย่างไรก็ตามขึ้นอยู่กับประสิทธิภาพของสมาร์ทโฟนแต่ละรุ่น ซึ่งในการทดลองนี้มีความละเอียดของกล้องอยู่ที่ 12 Megapixel ซึ่งมีประสิทธิภาพต่ำเมื่อเทียบกับสมาร์ทโฟนในปัจจุบันที่มีความละเอียดของกล้องอยู่ที่ 48 Megapixel ซึ่งเมื่อนำมาอ่านค่าสีจากภาพถ่ายอาจส่งผลทำให้เกิดความคลาดเคลื่อนได้

ปัจจัยทางด้านวัสดุที่ใช้ในการหยดเลือด จากงานวิจัยนี้ทำการทดลองตัวอย่างคราบเลือดบนผ้าฝ้ายสีขาว สีน้ำตาล สีชมพู และสีฟ้า ที่มีการดูดซับของเหลวต่าง ๆ ได้ดี ทำให้ชนิดของฝ้าฝ้าย รวมถึงสีของผ้าฝ้ายไม่ส่งผลกระทบต่อการอ่านค่าสี ซึ่งสอดคล้องกับงานวิจัยของ (Andrasko, 1997) ที่ได้ศึกษาการประมาณระยะเวลาของคราบเลือดโดยเปรียบเทียบระหว่างกระดาษและผ้าพบว่าไม่มีความแตกต่างกันอย่างมีนัยสำคัญ

ข้อเสนอแนะ

ควรมีการทดสอบประสิทธิภาพกล้องสมาร์ทโฟนที่ใช้ในงานวิจัยโดยการเปรียบเทียบกับค่าสีด้วยเครื่องมือมาตรฐานก่อนเริ่มทำการวิจัย และศึกษาการเปรียบเทียบระหว่างปัจจัยด้านอื่นที่มีผลต่อการวัดค่าสีของคราบเลือด เช่น อุณหภูมิที่แต่งกัน ปริมาตรของเลือดที่ใช้หยดลงบนผ้า และวัสดุที่ใช้ในการทดลอง

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ผลของชนิดวัสดุที่ใช้ทำคู่อิเลคโตรดต่อการผลิตไฟฟ้าชีวภาพในเซลล์เชื้อเพลิงจุลินทรีย์แบบห้องคู่ของแบคทีเรียสังเคราะห์แสง

Effect of materials for electrode couples making on bio-electricity production in the two-chamber microbial fuel cell of photosynthesis bacteria

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บทคัดย่อ

พลังงานไฟฟ้าเป็นอีกหนึ่งผลิตภัณฑ์เพิ่มเติมที่น่าสนใจนอกเหนือจากสารชีวภัณฑ์ที่แบคทีเรียสร้างขึ้น งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษา ผลชนิดของวัสดุที่ใช้ทำคู่อิเลกโตรดแอโนด-คาโทดและช่วงการให้แสง (photosynthesis fermentation) และไม่ให้แสง (Dark fermentation) ต่อการผลิตไฟฟ้าของ *Rhodobacter sphereroides* ในเซลล์เชื้อเพลิงจุลินทรีย์ชนิดห้องคู่ (Two Chamber-Photo-Microbial Fuel Cell: TCP-MFC) โดยใช้อาหารสูตรน้ำเสียสังเคราะห์ พบว่า คู่อิเลกโตรดแอโนด-แคโทดที่ทำจากสังกะสี-ทองแดง (Zn-Cu) ได้ผลดีกว่าการใช้วัสดุชนิดอื่น ให้ค่ากระแสไฟฟ้าสูงสุด 0.11 mA (0.035 mA/cm^2) เมื่อหมักได้ 180 ชั่วโมง และช่วงการใช้แสงให้ค่าไฟฟ้าดีกว่าช่วงไม่ให้แสง 3-5 เท่า โดยช่วงเวลาให้แสงสลับช่วงไม่ได้รับแสงช่วงละ 12 ชั่วโมงให้ผลดีที่สุด โดยระหว่างการผลิตกระแสไฟฟ้าใน TCP-MFC แบคทีเรียยังเจริญเติบโตได้ดีพบผลผลิตมวลชีวภาพของเซลล์ (3.31 กรัมน้ำหนักแห้งต่อลิตร) และปริมาณโปรตีนได้ เท่ากับ 0.52 กรัมต่อกรัมเซลล์แห้ง (58%) ไม่แตกต่างจากการหมักปกติในขวดหมัก พลังงานไฟฟ้าจากการใช้ประโยชน์น้ำเสียของแบคทีเรียสังเคราะห์นี้จึงเป็นอีกหนึ่งผลิตภัณฑ์ที่น่าสนใจนอกจากสารชีวภัณฑ์ที่มีประโยชน์อื่นได้

คำสำคัญ : แบคทีเรียสังเคราะห์แสงสีแดง, ผลของแสง, เซลล์เชื้อเพลิงจุลินทรีย์, ไฟฟ้าชีวภาพ

Abstract

This research aims to study the effects of the material type for making the anode-cathode electrode pair and the photosynthesis fermentation and dark fermentation on the electricity production of *Rhodobacter sphaeroides* in a Two Chamber-Photo-Microbial Fuel Cell (TCP-MFC) using a synthetic wastewater medium. It was found that the anode-cathode electrode pair made of zinc coupled with copper (Zn-Cu) was more effective than using other materials and provided a maximum electrical current value of 0.11 mA (0.035 mA/cm^2) when fermented for 180 hours. During the light exposure period, the electricity value is 3-5 times higher than the no light period, but the periods of light exposure and non-light at 12 interval periods gave the best results. During electricity generation in TCP-MFC, it still grew very well and gave the highest cell biomass yield (3.31 grams dry weight per liter), and protein content (0.52 grams per gram dry cell, 58%), which were not different from that of normal fermentation in a fermentation bottle. Electrical energy from the use of wastewater by this bacterium is another interesting product in addition to other useful products.

Keywords: photosynthetic bacteria, light effect, microbial fuel cells, bioelectricity

บทนำ

แบคทีเรียสังเคราะห์แสง (Photosybthetic Bacteria; PSB) พบในแหล่งน้ำธรรมชาติ เจริญเติบโตได้ในสภาวะมีแสง เนื่องจากมีแบคเทอริโอคลอโรฟิลล์เอหรือบี และแคโรทีนอยด์ โดยใช้แหล่งคาร์บอนอินทรีย์ทั้งน้ำตาลต่าง ๆ และกรดอินทรีย์ ผลิตสารชีวภัณฑ์ต่าง ๆ ได้ เช่น การสะสมโปรตีนในเซลล์ (Single Cell Protein) (Cai et al., 2019) มีรายงานการใช้แบคทีเรียสังเคราะห์แสงมากมายในการบำบัดน้ำเสียได้ผลดี (Lu et. al., 2019) โดย *Rhodopseudomonas spp*. และ *Rhodospirillum spp*. ช่วยบำบัดน้ำทิ้งที่มีสารอินทรีย์สูงได้มวลชีวภาพน้ำหนักแห้งของเซลล์ 2.89 ± 0.23 กรัมต่อลิตร และมีปริมาณโปรตีนเฉลี่ยร้อยละ 34.86 ± 2.85 กรัมต่อลิตร ลดปริมาณ COD ร้อยละ 80.84 ± 4.35 กรัมต่อลิตร (Chen, Zhang, & Wang, 2020) *Rhodopseudomonas* spp. บางสายพันธุ์ให้โปรตีนในเซลล์สูงถึงร้อยละ 60 - 65 ที่ประกอบด้วยกรดอะมิโนที่จำเป็นต่อสัตว์ คือ Methionine, Tryptophane และ Cystine ซึ่งไม่ค่อยพบในราและยีสต์ (Yang et al., 2017) บางสายพันธุ์สามารถผลิตกรดไขมันไม่อิ่มตัวเป็นส่วนใหญ่ (C16-C18) และกรดไขมันโอเมก้า 3, 6 และ 7 ใช้ทำอาหารเสริมรักษาสุขภาพของผิวหนัง (Zhou, Zhang, Zhang, & Peng, 2015) บางสายพันธุ์ให้วิตามินและแร่ธาตุ เช่น กรดฟอลิค วิตามินบี วิตามินซี ดี และอี เป็นต้น ถูกใช้ทำอาหารเสริมผสมในอาหารสัตว์ (Feed Additive) ได้มีรายงานช่วยเพิ่มสีของไข่แดงของไข่ไก่และเพิ่มจำนวนไข่ในปลา ยังใช้เป็นโปรไบโอติกเสริมอาหาร ลดกลิ่นมูลสุนัขและแมว และผลิตปุ๋ยอินทรีย์ชีวภาพได้ (Cai & Wang, 2012)

PSB เป็นแบคทีเรียที่ใช้พลังงานแสงในการย่อยสลายสารอาหารผ่านกระบวนการสังเคราะห์แสง (Photocatalysis) โดยใช้เม็ดสีภายในเซลล์เป็นตัวสังเคราะห์แสง และยังสามารถหมักแบบไม่ใช้แสง (Dark-fermentation) โดยทั้งสองแบบแบคทีเรียสามารถย่อยสลายสารอินทรีย์คาร์บอนได้อิเลกตรอนออกมาเพื่อใช้ในปฏิกิริยารีดอกซ์ผ่านสารรับ-ส่งอิเลคตรอนต่างๆภายในเซลล์ เช่น NADH FADH ควิโนน สารไซโทโครม เป็นต้น เพื่อให้เกิดพลังงานใช้ในกิจกรรมของเซลล์ได้ (Cai & Wang, 2012) อิเลคตรอนเหล่านี้ยังสามารถส่งผ่านออกมานอกเซลล์ผ่านด้วยปฏิกิริยารีดอกซ์จากในเซลล์ออกมาภายนอกเซลล์ได้ จึงมีในการใช้ประโยชน์จากอิเล็คตรอนที่วิ่งปลดปล่อยพลังงานออกมาผลิตเป็นกระแสไฟฟ้าได้ (Abbas, Rafatullah, Ismail, & Syakir, 2017)

เซลล์เชื้อเพลิงจุลินทรีย์แบบใช้แสง (Photo-MFC) เป็นอุปกรณ์ที่ใช้เพาะเลี้ยง PSB ให้แปลงพลังงานแสงเป็นพลังงานเคมีและไฟฟ้าโดยตรง ในกระบวนการสังเคราะห์ด้วยแสง (Abbas, Rafatullah, Ismail, & Syakir, 2017) เซลล์เชื้อเพลิงจุลินทรีย์สังเคราะห์แสง (Photo-MFC) เป็นเทคโนโลยีเกี่ยวกับสร้างชีวพลังงานที่ใช้ในช่วงไม่นานนี้ Hülsen, Sander, Jensen, and Butstone, (2020) นำเสนอ photo-MFC แบบห้องคู่ (Two-chamber) ประกอบด้วยห้องแอโนดและแคโทดที่ติดตั้งอิเล็กโทรดแอโนดและแคโทด เชื่อมระหว่างห้องด้วยเมมเบรนแลกเปลี่ยนโปรตรอน (H^+) เคลื่อนที่ผ่านไปได้เท่านั้น เพาะเลี้ยงแบคทีเรียในกลุ่มให้อิเลกตรอนได้ (Exoelectrogenic Bacteria) ในห้องแอโนด เมื่อแบคทีเรียย่อยสลายสารอินทรีย์จะได้อิเล็กตรอน (e^-), โปรตอน (H^+) และ CO_2 ออกมา โดยอิเล็กตรอนจะเคลื่อนที่จากขั้วแอโนดไปยังขั้วแคโทดผ่านวงจรภายนอก ทำให้เกิดกระแสไฟฟ้าเกิดขึ้น อิเลคตรอนเคลื่อนที่ออกจากเซลล์จุลินทรีย์เข้าสู่ขั้วแอโนดเคลื่อนที่ผ่านวงจรภายนอกไปยังขั้วแคโทดสู่ตัวรับอิเล็กตรอนตัวสุดท้าย เช่น ออกซิเจน การเคลื่อนที่ของอิเล็กตรอนปลดปล่อยพลังงานผ่านวงจรภายนอกเกิดกระแสไฟฟ้าได้ (Xiang, Yiwei, Peng, & Xingzu, 2018) จัดเป็นพลังงานทดแทนที่เป็นมิตรต่อสิ่งแวดล้อม

มีรายงานว่า PSB ชนิด Anoxygenic Phototrophic Bacteria (APB) ใน Photo-MFC ให้พลังงานไฟฟ้าสูงกว่า Oxygenic Phototrophic Bacteria (OPB) โดย APB มีเม็ดสีช่วยในการสังเคราะห์แสงภายใต้สภาพไร้ออกซิเจนได้ดีกว่า ซึ่งในแบคทีเรียสีม่วง มี BChl a และ b แบคทีเรียสีเขียว มี BChl c และ d และเฮลิโอแบคทีเรียมี BChl g (Liang, Zhai, Liu, Ji, & Li, 2020) โดยในการเพาะเลี้ยง *Rhodopseudomonas palustris* DX-1 ที่เป็น APB ใน photo-MFC จากการบำบัดน้ำเสีย ได้ค่าความหนาแน่นพลังงานที่สูงขึ้น 2,780 mW/m^2 (Xing, Zuo, Cheng, Regan, & Logan, 2008) Tatinclaux et al. (2018) รายงานการผลิตไฟฟ้าจาก *Rhodobacter sphaerorides* ใน Photo-MFC ขนาด 200 มิลลิลิตรโดยใช้อะซิเตตเป็นแหล่งคาร์บอนในห้องแอโนดที่มีอิเล็กโทรดแพลตินัม ส่วนห้องแคโทดมีอิเล็กโทรดกราไฟต์ ได้ค่ากระแสไฟฟ้าสูงสุดที่ 851.8 µA หลังหมัก 72 ชั่วโมง เซลล์เชื้อเพลิงแบคทีเรียสังเคราะห์แสง (PSB-Fuel Cell หรือ PSB-FC) แบบห้องคู่มีเมมเบรนเลือกผ่านโปรตรอน Nafion® ใช้ *Rhodobacter sphaeroides* ใช้คู่อิเล็กโทรดแพลตินัม ผลิตไฟฟ้าได้ถึง 6.9 W/m^2 ที่ค่าแรงดันไฟฟ้าอยู่ที่ 0.1-0.3 โวลต์ (Zheng, Cai, Huang, & Chen, 2017)

ปัจจัยด้านแสงที่มีผลต่อการเจริญเติบโตของแบคทีเรียสังเคราะห์แสงสีแดง แสงที่นิยมใช้ในการเพาะเลี้ยง PSB มี 2 แหล่ง คือแสงจากธรรมชาติและแสงจากหลอดไฟ โดยความเข้มแสงส่งผลกระทบต่อการสะสมมวลชีวภาพ การผลิตสารชีวภัณฑ์ เช่น แคโรทีนอยด์และแบคทีเรียคลอโรฟิลล์ร่วมกับการกำจัดมลพิษของ PSB ในน้ำเสีย รวมถึงค่าการผลิตกระแสไฟฟ้าชีวภาพของ PSB ใน Photo-MFC ตัวอย่างเช่น Kuo, Chien, and Chen, (2012) ศึกษาผลของแหล่งกำเนิดแสง (หลอดไส้, หลอดฮาโลเจน, หลอดฟลูออเรสเซนซ์ ,หลอด LED สีขาว, สีหลือง, สีแดง, สีน้ำเงิน และสีเขียว) ที่ความเข้มแสง 2,000 ลักซ์ มีความมืดเป็นตัวควบคุม พบว่า หลอดไส้ให้ผลดีที่สุดต่อการเจริญของ *Rhodopseudomonas palustris* และปริมาณแคโรทีนอยด์ Zhou et al. (2015) ศึกษาผลของความเข้มแสงต่อการบำบัดน้ำเสียของ PSB พบว่า ความเข้มแสง 2,000-4,000 ลักซ์ เหมาะสมที่สุดสำหรับการผลิตชีวมวลและการกำจัด COD แต่ความเข้มแสง 8,000 ลักซ์เหมาะกับการผลิตแคโรทีนอยด์ Zheng et al. (2017) พบ แบคทีเรียสีม่วง *Rhodopseudomonas palustris DX-1* ใน MFC ห้องคู่ที่ใช้อิเล็กโทรดกราไฟท์และคาร์บอนไฟเบอร์แท่ง ได้ค่าความหนาแน่นพลังงาน 2,720 mW/m^2 (ที่ความเข้มแสง 1,000 ลักซ์) ขณะที่แบบไม่ใช้แสงเท่ากับ 1,130 mW/m^2

การผลิตกระแสไฟฟ้าของ PSB ที่ได้จาก Photo-MFC ยังเป็นที่น่าสนใจและอยู่ในระหว่างการพัฒนาด้วยความต้องการหาแหล่งพลังงานทดแทนที่เป็นมิตรต่อสิ่งแวดล้อมและราคาถูก นักวิจัยพยายามปรับปรุงและเพิ่มประสิทธิภาพการผลิตไฟฟ้าให้ดีขึ้นหลากหลายวิธี เช่น การพัฒนาตัวเชื้อจุลินทรีย์ลักษณะและองค์ประกอบของ Photo-MFC สภาวะในการหมัก นักวิจัยนิยมใช้น้ำเสียที่มีสารอินทรีย์มากมายในการเลี้ยง PSB ให้ได้ดีขึ้น ช่วยลดมลพิษ ช่วยบำบัดให้สิ่งแวดล้อม และลดต้นทุนในการผลิตกระแสไฟฟ้าลงได้ สำหรับงานวิจัยนี้ มีจุดประสงค์เพื่อศึกษา การหมัก PSB (*Rhodobacter spheroides*) ในเซลล์เชื้อเพลิงจุลินทรีย์ชนิดห้องคู่ (Two Chamber-photo Microbial Fuel Cell, TCP-MFC) ในอาหารน้ำเสียสังเคราะห์ โดยศึกษาผลของวัสดุที่ใช้ทำคู่อิเลคโตรดและการหมักแบบให้แสง (Photosynthesis Fermentation) และไม่ให้แสง (Dark Fermentation) ต่อการผลิตกระแสไฟฟ้านอกเหนือจากการสร้างสารชีวภัณฑ์ปกติได้

วิธีดำเนินการวิจัย

จุลินทรีย์

Rhodobacter sphereroides สั่งซื้อจากศูนย์จุลินทรีย์ สถาบันวิจัยวิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย นำมาเพาะเลี้ยงในขวดปิดฝาแบบไร้อากาศในอาหารสังเคราะห์ตามที่สถาบันแนะนำให้แสงธรรมชาติ จนเชื้อเป็นสีแดง

อาหารเลี้ยงเชื้อสูตรน้ำเสียสังเคราะห์

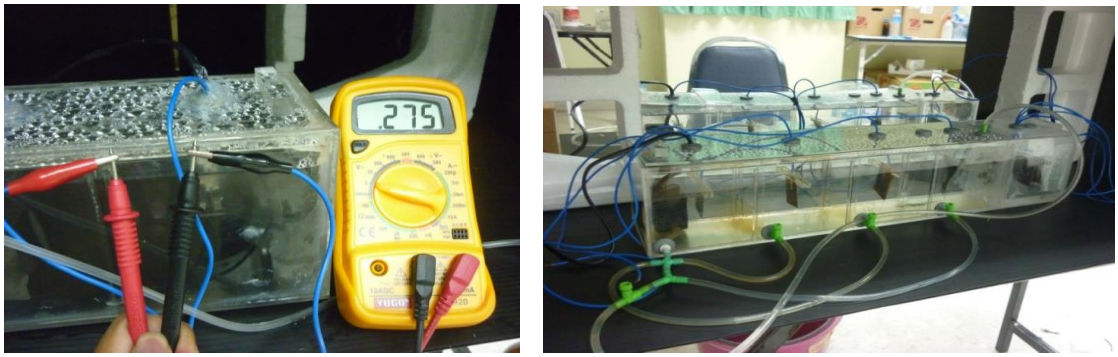
อาหารเลี้ยงเชื้อสูตรน้ำเสียสังเคราะห์ ประกอบด้วย 0.1 g/L Ammonium Chloride, 0.5 g/L Sodium Chloride, 0.5 g/L Sodium Bicarbonate, 3.0 g/L Sodium Acetate, 0.1 g/L Magnesium Sulfate Heptahydrate, 0.1 g/L Calcium Chloride Dehydrate, 0.2 g/L Dipotassium Phosphate, 0.5 g/L Yeast Extract และ 0.5 g/L Peptone ปรับ pH 7 ในน้ำกลั่น 1 ลิตร (Lu et al., 2019)

การเตรียมกล้าเชื้อและการหมักแบคทีเรียสังเคราะห์แสง

นำมาเตรียมกล้าเชื้อโดยหมักแบคทีเรียสังเคราะห์แสงในน้ำเสียสังเคราะห์ โดยใช้ขวดขนาด 600 มล. แล้วขยายการหมักลงในขวดพลาสติกขนาดใหญ่ขึ้น 2.5 ลิตร ปริมาตรที่ใช้งาน 2.3 ลิตร พร้อมใส่หัวเชื้อ 20% (v) หมักภายใต้สภาวะไร้ออกซิเจน ที่อุณหภูมิห้อง การหมักให้โดยแสงธรรมชาติ หมักจนเชื้อมีอายุ 48 ชม. นำไปใช้ต่อไป

ลักษณะของ TCP-MFC และวิธีการหมัก

เซลล์เชื้อเพลิงจุลินทรีย์ชนิดห้องคู่ (Two chamber Photo-MFC) สำหรับการเพาะเลี้ยงแบคทีเรียสังเคราะห์แสงโดยมีขนาดและส่วนประกอบต่าง ๆ ดังรูปที่ 1 ปริมาตรห้องแอโนดที่ใช้หมักแบคทีเรีย 1,000 มิลลิลิตร ติดตั้งขั้วอิเล็กโทรดแอโนดและแคโทดขนาด 4 x 4 ซม. (32 ตารางเซนติเมตร) ที่ทำจากวัสดุต่าง ๆ โดยมีแผ่นเยื่อเลือกผ่านโปรตอน (Nafion®) กั้นระหว่างห้องแอโนดและห้องแคโทดห้องแคโทดเติมน้ำสะอาดมีการพ่นอากาศผ่านปั๊มอากาศ เพื่อใช้ออกซิเจนเป็นตัวรับอิเลกตรอน การเพาะเลี้ยงแบคทีเรียในแอโนดของ TCP-MFC โดยใช้อาหารสูตรน้ำเสียสังเคราะห์เติมด้วยหัวเชื้อ 20% ภายใต้สภาวะไร้อากาศโดยใช้ สภาวะการให้แสงจากฟลูออเรสเซนต์ความเข้ม 4,000 ลักซ์ แบบช่วงรับแสงและไม่รับแสงเลียนแบบช่วงเวลากลางวันและกลางคืน โดยตั้งเวลาเปิดปิดช่วงละ 12 ชั่วโมง



ภาพที่ 1 ลักษณะของเซลล์เชื้อเพลิงชนิดห้องคู่ (TCB-MFC) ที่ใช้ในการเพาะเลี้ยง *R. sphereoides*

การศึกษาผลของชนิดวัสดุใช้ทำคู่อิเลกโตรดต่างๆ ต่อการผลิตกระแสไฟฟ้าใน TCP-MFC

วัสดุที่ใช้ทำอิเล็กโทรดเป็นสิ่งสำคัญใน MFC ในงานนี้มีการศึกษาคู่อิเลกโตรดที่ทำจากวัสดุที่แตกต่างกัน ได้แก่ ทองแดง สแตนเลส เหล็ก สังกะสี เป็นต้น โดยนำอิเล็กโทรดวัสดุมาสลับจับคู่แอโนด-แคโทด จากวัดค่าความต่างศักย์ ดังแสดงในตารางที่ 3 เลือก 3 คู่ที่เหมาะสม ทดสอบใช้ในการผลิตกระแสไฟฟ้าใน TCP-MFC ใช้เครื่องมัลติมิเตอร์รุ่น MU39C วัดค่าทางไฟฟ้าต่าง ๆ (ความต่างศักย์ ค่ากระแสไฟฟ้าและแรงดันไฟฟ้า) เก็บตัวอย่าง วิเคราะห์การเจริญเติบโตโดยหาน้ำหนักแห้งของแบคทีเรียและวิเคราะห์ปริมาณโปรตีน แล้วนำไปใช้เป็นกล้าเชื้อหมักใน TCP-MFC

การศึกษาการผลิตกระแสไฟฟ้าใน TCP-MFC ในช่วงเวลาได้รับแสงเปรียบเทียบกับช่วงที่ไม่ได้แสง

ในการผลิตกระแสไฟฟ้าจากการเพาะเลี้ยงแบคทีเรียสังเคราะห์แสงในแอโนดของ TCP-MFC โดยใช้อาหารสูตรน้ำเสียสังเคราะห์เติมด้วยหัวเชื้อ 20% ภายใต้สภาวะให้แสงจากฟลูออเรสเซนต์ความเข้ม 4,000 ลักซ์ เปรียบเทียบผลช่วงได้รับแสง (Photosynthesis Fermentation) และช่วงไม่ได้รับแสง (Dark Fermentation) ช่วงละ 12 ชั่วโมง เปรียบเทียบกับช่วงให้แสง 16 ชั่วโมงสลับช่วงมืด 8 ชั่วโมง และช่วงสว่าง 8 ชั่วโมงสลับช่วงมืด 16 ชั่วโมง วัดค่าไฟฟ้าเก็บผลที่เกิดขึ้น

วิธีวิเคราะห์

การวัดค่าทางไฟฟ้า ทำโดยใช้มัลติมิเตอร์รุ่น MU39C และวัดค่าทางไฟฟ้า ได้แก่ ค่ากระแสไฟฟ้า(I, mA) แรงดันไฟฟ้า (V, mV) ใช้คำนวณค่าทางไฟฟ้าต่าง ๆ ได้แก่ ค่าความหนาแน่นของกระแสไฟฟ้าต่อพื้นที่ผิวขั้วแอโนด (mA/cm^2) = I / A, ค่าความหนาแน่นของกำลังไฟฟ้าต่อพื้นที่ผิวขั้วแอโนด (mA/cm^2) = P / A โดยที่ P = กำลังไฟฟ้า (Watt) = I/V, A = พื้นที่ผิวอิเล็กโทรดแอโนด (cm^2)

ระหว่างการเพาะเลี้ยง มีการเก็บตัวอย่างวิเคราะห์การเจริญเติบโตในรูปน้ำหนักแห้งของเซลล์ โดยปั่นเหวี่ยงแยกเซลล์ที่ 10,000 rpm ล้างเซลล์สองรอบด้วยน้ำกลั่น นำตะกอนไปอบแห้งในตู้อบแล้วชั่งหาน้ำหนักแห้ง และการวิเคราะห์หาโปรตีนภายในเซลล์ (Crude Protein) โดยนำน้ำหมัก 5 มล. ปั่นเหวี่ยงที่ 10,000 รอบ/นาที เป็นเวลา 10 นาที ล้างด้วยน้ำกลั่นและปั่นเหวี่ยงอีกสองครั้ง ด้วย Tris-HCl buffer pH 8.0 (10 มิลลิโมล/ลิตร) แล้วย่อยทำลายผนังเซลล์ด้วยสารละลายผสมของเมธานอลและโซเดียมคลอไรด์ (0.1 โมล/ลิตร) 5 มล. แล้วเติม 1% Triton-X100 ทำให้เกิดปฏิกิริยาการย่อยใน Sonicator เป็นเวลา 15 นาที จากนั้นนำสารละลายปั่นเหวี่ยงที่ 10,000 รอบต่อนาทีเป็นเวลา 30 นาที จะได้สารละลาย Crude Protein วิเคราะห์ปริมาณโปรตีนด้วยวิธี Lowry Method (Patthawarol & Saejung, 2019)

ผลการวิจัย

การศึกษาการผลิตกระแสไฟฟ้าจากการย่อยสลายสารอาหารระหว่างการเพาะเลี้ยงแบคทีเรียสังเคราะห์แสง (Photosynthetic Bacteria, PSB) ชนิด *Rhodobacter sphereroides* มีปัจจัยที่ส่งผลต่อการผลิตกระแสไฟฟ้าจาก PSB ในเซลล์เชื้อเพลิงจุลินทรีย์ เช่น สูตรอาหาร วัสดุที่นำมาเป็นอิเล็กโทรดขนาดของเซลล์เชื้อเพลิงจุลินทรีย์ ชนิดคู่อิเล็กโทรด สภาวะการหมักทั้งแบบใช้แสงและไม่ใช้แสง (Photosynthesis และ Dark Fermentation) ในงานวิจัยนี้ เริ่มจากการศึกษาผลของวัสดุที่ใช้ทำคู่อิเลคโตรดแอโนดค่าโทดใน TCP-MFC และช่วงเวลาการได้รับแสงและไม่ได้รับแสง การทดลองเริ่มจากเพาะเลี้ยง PSB ในขวดหมักขนาด 600 มิลลิลิตรสูตรอาหารสังเคราะห์ สู่การหมักในเซลล์เชื้อเพลิงจุลินทรีย์แบบห้องคู่ (TCP-MFC) ใช้เมมเบรนแลกเปลี่ยนโปรตอน ขนาด 1.5 ลิตร โดยใช้คู่อิเล็กโทรดที่เหมาะสมจากการทดลอง จากนั้นจึงไปศึกษาผลของการหมักแบบให้แสง (Photosynthesis Fermentation) และช่วงไม่ได้รับแสง (Dark Fermentation)

ผลการจับคู่อิเลกโตรดแอโนด-แคโทด ที่ทำจากวัสดุต่างๆ วัดค่าความต่างศักย์พบ ผลที่ให้ค่าความต่างศักย์สูง 5 คู่ ที่น่าสนใจ ดังแสดงในตารางที่ 1 เลือกคู่ที่ดีที่สุด 3 คู่ ได้แก่ เหล็ก-สแตนเลส (Fe-SS), สังกะสี-เหล็ก (Zn-Fe) และ สังกะสี-ทองแดง (Zn-Cu) มาทดสอบใช้ในการผลิตกระแสไฟฟ้าใน TCP-MFC ของแบคทีเรียสังเคราะห์แสงต่อไป

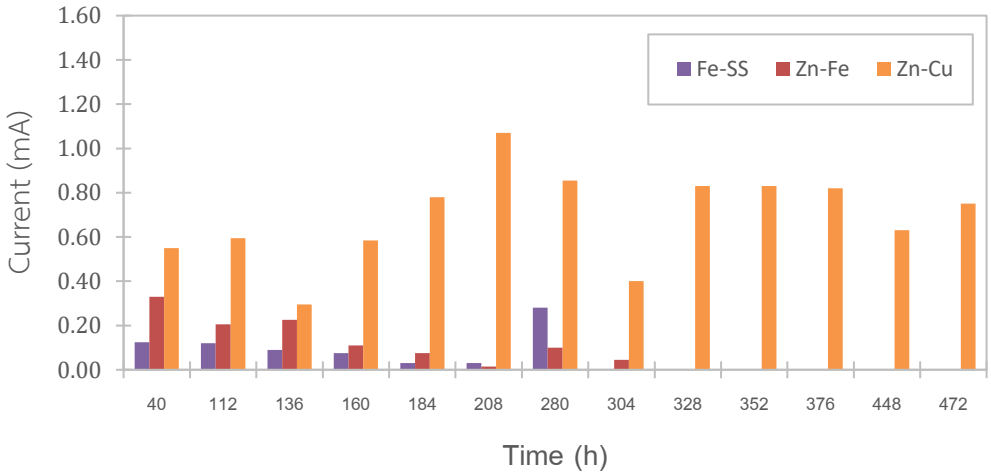
ตารางที่ 1 ผลของค่าความต่างศักย์ไฟฟ้าของการจับคู่อิเล็กโทรดแอโนดและแคโทดที่ทำจากวัสดุต่าง ๆ

No.	Anodic Electrode–Cathodic Electrode	Voltage (mV)
1	Copper-Iron (Cu-Fe)	10.00
2	Iron-Stainless steel (Fe-SS)	18.00
3	Copper-Stainless steel (Cu-SS)	14.00
4	Zinc-Iron (Zn-Fe)	17.00
5	Zinc-Copper (Zn-Cu)	16.00
6	Zinc-Stainless steel (Zn-SS)	14.00

ผลการศึกษาการผลิตกระแสไฟฟ้าของแบคทีเรียสังเคราะห์แสงสีแดง *R. sphereroides* ใน TCP-MFC ภายใต้สภาวะการให้แสงตามช่วงเวลาปกติที่มีทั้งช่วงรับแสงเวลากลางวันและไม่รับแสงช่วงเวลากลางคืน แสดงดังภาพที่ 2 การหมักในแอโนดของ TCP-MFC ของคู่อิเล็กโทรด พบว่า Zn-Cu มีค่าการผลิตกระแสไฟฟ้าเพิ่มขึ้นสูงสุดในชั่วโมงที่ 208 วัดค่าได้ 1.13 mA ขณะที่คู่อิเล็กโทรดอื่นพบว่า ให้ค่าการผลิตกระแสไฟฟ้าได้สูงที่สุดค่าสูงสุดที่พบใน Zn-Fe (0.31 mA ในชั่วโมงที่ 44) และ Fe-SS (0.22 mA ในชั่วโมงที่ 116) ทั้งนี้ผลการใช้คู่อิเลคโตรด Zn-Fe และ Fe-SS ให้ผลไม่ดี มีค่ากระแสไฟฟ้าต่ำมากหลังการหมักในช่วงหลังโดยหมักได้เพียง 1 สัปดาห์ ขณะที่การใช้ Zn-Cu ยังผลิตค่ากระแสไฟฟ้าได้ตลอด 2 สัปดาห์ของการหมัก

แม้ว่าค่าความต่างศักย์ของคู่อิเลกโตรดโลหะก่อนการหมักจะมีค่าสูง เช่น ในคู่อิเลคโตรด Fe-SS และ Zn-Fe จะมีค่าสูงกว่า Zn-Cu แต่ผลที่เกิดขึ้นในระหว่างการหมัก Zn-Cu จะให้ผลค่ากระแสไฟฟ้าดีที่สุด เป็นไปได้ว่า เมื่อเติมอาหารเลี้ยงเชื้อและแบคทีเรียหมักเกิดการเจริญเติบโตของฟิล์มชีวภาพของแบคทีเรียที่เคลือบบนผิวอิเลกโตรดแอโนด เกิดการเปลี่ยนแปลงสภาวะในน้ำหมัก สภาวะในระหว่างหมักการสร้างสารผลิตภัณฑ์ต่างๆ ละการใช้แสงของแบคทีเรีย ที่อาจเกิดจากการเปลี่ยนแปลงของการนำไฟฟ้าของโลหะที่ใช้ทำอิเลกโตรด ได้ทั้งในแง่ของการเพิ่มการทำงานเช่นในคู่อิเลกโตรด Zn-Cu ทำให้ได้ค่ากระแสมากขึ้น หรือลดประสิทธิภาพการทำงานเช่น ความเป็นพิษของโลหะผลต่อแบคทีเรียหรือกระแสไฟฟ้าไปมีผลต่อการเจริญหรือยับยั้งเมตาบอลิสมและไบโอฟิล์มระหว่างการผลิตไฟฟ้าทำให้การผลิตกระแสไฟฟ้า

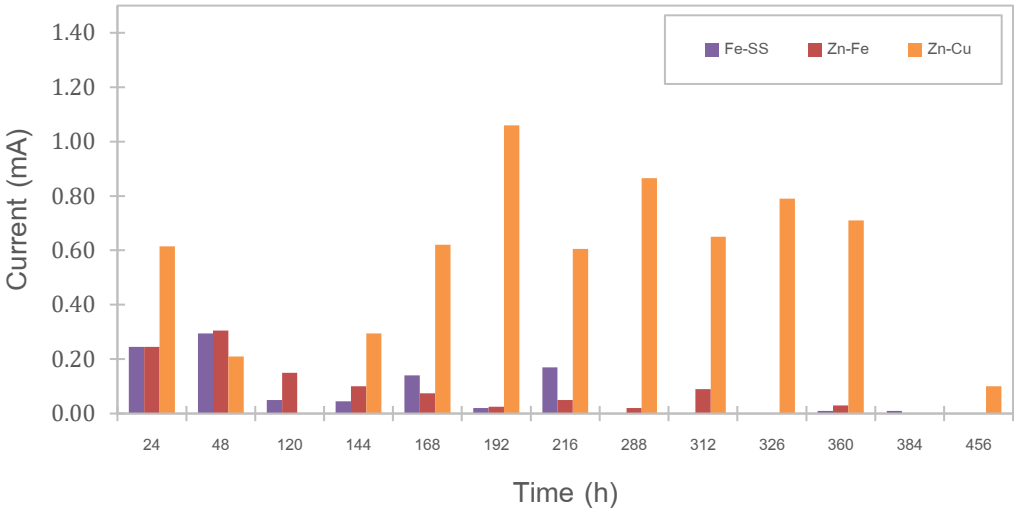
ลดลงไม่เป็นไปตามที่คาดไว้ ซึ่งต้องมีการพิสูจน์ต่อไป อย่างไรก็ดี ผลการหมักในช่วงนี้ คู่อิเลกโตรด Zn-Cu เป็นคู่อิเลกโตรดที่ให้ประสิทธิภาพดีที่สุดใน TCP-MFC รูปแบบนี้



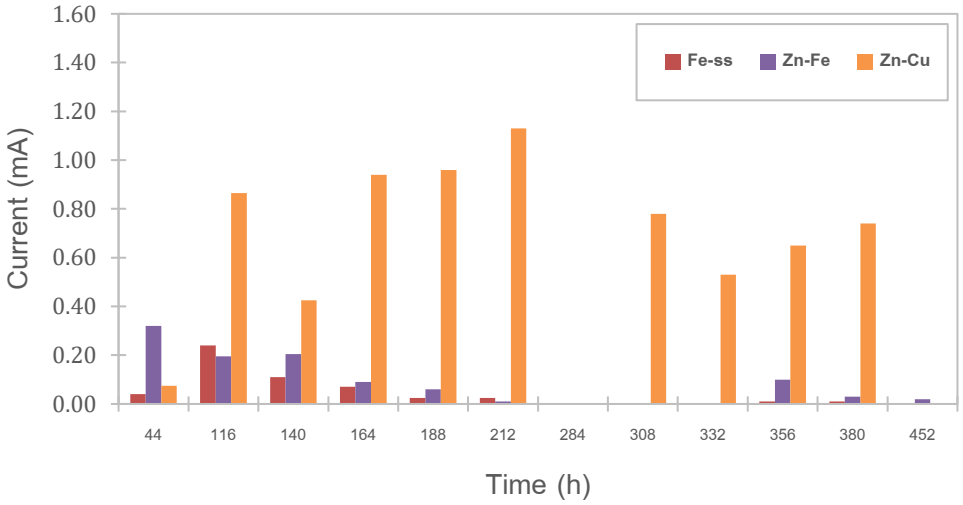
ภาพที่ 2 ค่าการผลิตกระแสไฟฟ้า (mA) ของแบคทีเรียสังเคราะห์แสงในเซลล์เชื้อเพลิงจุลินทรีย์ชนิดห้องคู่ โดยใช้คู่อิเล็กโทรดแอโนด-คาโทด ที่ทำจากวัสดุ 3 แบบ คือ เหล็ก และสแตนเลส (Fe-SS), สังกะสี-เหล็ก (Zn–Fe) และสังกะสี-ทองแดง (Zn–Cu) โดยให้แสง ฟลูออเรสเซนต์ (4,000 ลักซ์) โดยใช้ช่วงสว่าง (Photosynthesis Fermentation) สลับกับช่วงมืด (Dark Fermentation) ช่วงละ 12 ชั่วโมง

ภาพที่ 3 แสดงการผลิตกระแสไฟฟ้าใน TCP-MFC ในการหมักแบบช่วงให้แสง (Photosynthesis Fermentation) 16 ช่วโมงสลับช่วงมืด (Dark Fermentation) 8 ชั่วโมง เมื่อใช้คู่อิเล็กโทรด Zn-Cu พบว่ามีค่าการผลิตกระแสไฟฟ้าเพิ่มขึ้นสูงสุดในชั่วโมงที่ 190 วัดค่าได้ 1.24 mA ขณะที่คู่อิเล็กโทรด Zn-Fe พบว่า มีค่าการผลิตกระแสไฟฟ้าสูงสุดใน 48 ชั่วโมงแรก วัดค่าได้ 0.25 mA และคู่อิเล็กโทรด Fe-SS ให้ค่ากระแสไฟฟ้าน้อยสุดวัดค่าได้สูงสุดในชั่วโมงที่ 48 ได้ค่า 0.27 mA ในเซลล์เชื้อเพลิงจุลินทรีย์แบบห้องคู่ที่มีคู่อิเลกโตรด Zn-Cu ให้ผลดีที่สุด และพบระยะเวลาการผลิตกระแสฟ้าได้ตลอดการหมัก 500 ชั่วโมง ขณะที่การใช้คู่อิเลคโตรด Zn-Fe และ Fe-SS ปริมาณกระแสไฟฟ้าลดลงและมีค่าน้อยมากตลอดระยะเวลาการหมัก

ภาพที่ 4 แสดงการหมักเพื่อผลิตกระแสไฟฟ้าใน TCP-MFC ช่วงสว่าง ในการหมักแบบช่วงให้แสง (Photosynthesis Fermentation) 8 ชั่วโมงสลับช่วงมืด (Dark Fermentation) 16 ชั่วโมง เมื่อใช้คู่อิเล็กโทรด Zn-Cu ยังคงให้ค่ากระแสไฟฟ้าเพิ่มขึ้นสูงสุดในชั่วโมงที่ 212 วัดค่าได้ 1.44 mA ในส่วนของคู่



ภาพที่ 3 ค่าการผลิตกระแสไฟฟ้า (mA) ของแบคทีเรียสังเคราะห์แสงในเซลล์เชื้อเพลิง จุลินทรีย์ชนิดห้องคู่ โดยใช้คู่อิเล็กโทรดแอโนด-คาโทดที่ทำจากวัสดุ 3 แบบ คือ เหล็ก และสแตนเลส (Fe-SS), สังกะสี-เหล็ก (Zn–Fe) และสังกะสี-ทองแดง (Zn–Cu) โดยใช้ช่วงสว่าง (Photosynthesis Fermentation) 16 ชั่วโมงสลับช่วงมืด (Dark fermentation) 8 ชั่วโมง



ภาพที่ 4 ค่าการผลิตกระแสไฟฟ้า (mA) ของแบคทีเรียสังเคราะห์แสงในเซลล์เชื้อเพลิง จุลินทรีย์ชนิดห้องคู่ขนาด 1.5 ลิตร โดยใช้คู่อิเล็กโทรดแอโนด-คาโทด 3 แบบ คือ เหล็กและสแตนเลส (Fe-SS), สังกะสี-เหล็ก (Zn – Fe) และสังกะสี-ทองแดง (Zn – Cu) โดยใช้ช่วงสว่าง (photosynthesis fermentation) 8 ชั่วโมงสลับช่วงมืด (Dark fermentation) 16 ชั่วโมง

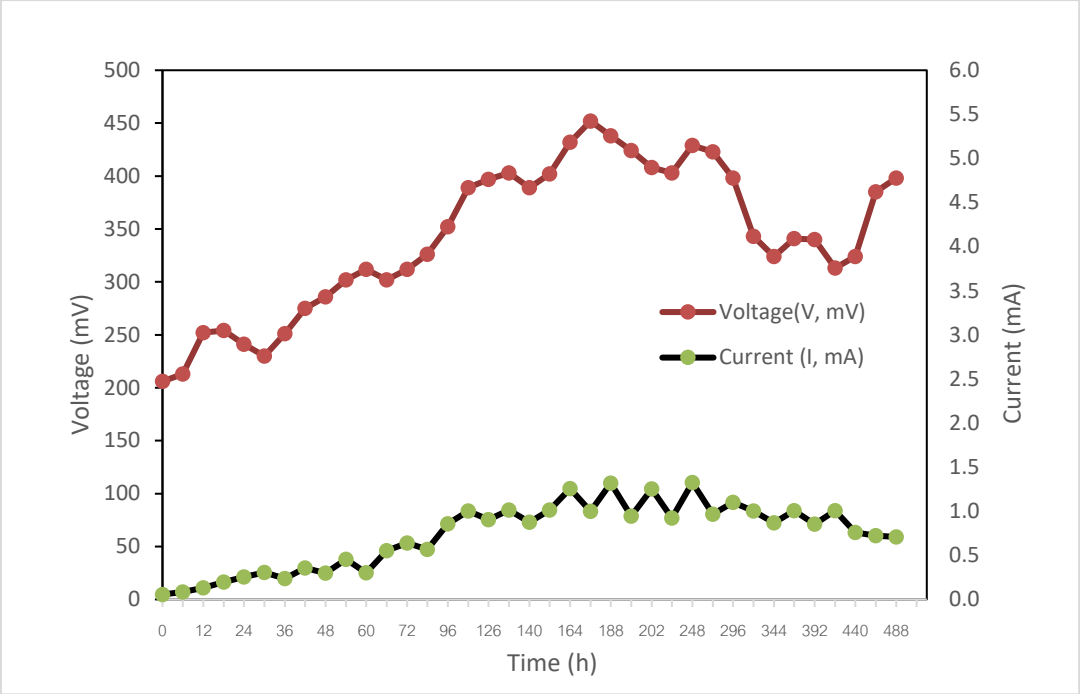
อิเล็กโทรด Zn-Fe พบว่า มีค่าการผลิตกระแสไฟฟ้าสูงสุดใน 24 ชั่วโมงแรก วัดค่าได้ 0.32 mA คู่อิเล็กโทรด Fe-SS วัดค่าได้สูงสุด 0.23 mA ในชั่วโมงที่ 118 และคู่อิเลกโตรด Zn-Cu ยังคงให้ผลดีที่สุดและสามารถพบ การผลิตกระแสฟ้าได้ตลอดการหมัก 500 ชั่วโมง ขณะที่การใช้คู่อิเลคโตรด Zn-Fe และ Fe-SS ปริมาณกระแสไฟฟ้าลดลงมีค่าน้อยตลอดระยะเวลาการหมัก

จากผลการทดลองพบว่า การหมักโดยใช้คู่อิเลกโตรด Zn-Fe และ Fe-SS ให้ค่ากระแสไฟฟ้าที่ดีในช่วงต้นของการหมัก แต่ค่ากระแสไฟฟ้าลดลงตามระยะเวลาหมัก ขณะที่การใช้คู่อิเลกโตรด Zn-Cu ให้ค่ากระแสไฟฟ้าสูงกว่า Zn-Fe และ Fe-SS ประมาณ 3-5 เท่า และค่ากระแสไฟฟ้ายืนระยะเวลานานกว่า โดยค่าศักย์ไฟฟ้าของคู่อิเลกโตรดตามค่าในตารางที่ 1 มีค่าใกล้เคียงกัน ดังนั้นสิ่งที่เกิดขึ้นน่าจะเป็นผลมาจากวัสดุโลหะที่ใช้ทำอิเลกโตรด นอกจากค่าศักย์ไฟฟ้าที่ดีแล้ว อาจเป็นผลมาจากค่าการนำไฟฟ้าของคู่อิเลกโตรดด้วย ตลอดจนผลของอาหารซึ่งเป็นส่วนประกอบที่เป็นสารละลาย อาจส่งผลยับยั้งต่อการส่งผ่านอิเลคตรอนได้ด้วย ทั้งนี้ความคิดเห็นส่วนของทีมงานวิจัย อาจเป็นผลจากความเป็นพิษของโลหะที่ใช้ทำอิเลคโตรดต่อการเจริญเติบโตของเชื้อแบคทีเรียชนิดนี้ได้ ซึ่งต้องมีการตรวจสอบต่อไป

ผลของช่วงให้แสงและไม่ให้แสง ในการผลิตกระแสไฟฟ้า (mA) และความต่างศักย์ (mV) ในเซลล์เชื้อเพลิงจุลินทรีย์ชนิดห้องคู่ (TCP-MFC) ที่ใช้คู่อิเล็กโทรดแอโนด-คาโทดที่ดีที่สุด ที่ทำจากสังกะสี-ทองแดง (Zn–Cu) ที่ใช้หมักแบคทีเรียสังเคราะห์แสง โดยให้แสงฟลูออเรสเซนต์ (4,000 ลักซ์) ภายใต้ช่วงสว่าง (Photosynthesis Fermentation) สลับช่วงมืด (Dark Fermentation) ช่วงละ 12 ชั่วโมงที่ดีที่สุดจากการทดลองที่ผ่านมา แสดงในภาพที่ 5

จากภาพที่ 5 ผลการหมักเมื่อใช้คู่อิเล็กโทรด Zn-Cu ยังคงให้ค่ากระแสไฟฟ้าเพิ่มขึ้นและมีค่าสูงสุดในชั่วโมงที่ 160-200 วัดค่าได้ 1.44 mA ที่น่าสนใจพบว่า เส้นกราฟกระแสไฟฟ้ามีค่าสลับขึ้นลงตลอดการหมัก โดยพบว่า ช่วงวัดกระแสในเวลาเช้า (ที่ผ่านช่วงไม่ให้แสงมา เลียนแบบเวลากลางคืนในการหมักแบบ Dark fermentation ได้ค่ากระแสไฟฟ้าต่ำกว่า การวัดในช่วงเย็น (เลียนแบบการให้แสงในตอนกลางวัน) ช่วงการหมักแบบได้รับแสงจะมีค่ากระแสไฟฟ้าสูงกว่า 1.00 mA ขณะที่ช่วงยังไม่ได้รับแสงค่ากระแสจะอยู่ในต่ำกว่า 1.00 อยู่ในช่วง 0.70–1.00 mA น้อยกว่าช่วงให้แสงประมาณ 0.3 mA โดยประมาณ

ขณะที่ค่าความต่างศักย์ของขั้วอิเลกโตรด Zn-Cu ให้ค่าสูงขึ้นในช่วงการหมักจนถึงชั่วโมงที่ 270 หลังจากนั้นค่าความต่างศักย์จะมีค่าลดลงในขณะที่ยังคงมีการผลิตกระแสไฟฟ้าอยู่แต่มีค่าลดลง ความต่างศักย์ที่ผิดปกตินี้แสดงให้เห็นว่า ระบบน่าจะเกิดความต้านทานขึ้นชัดเจนในช่วงท้ายของการหมัก จุดนี้น่าจะมีหลายสาเหตุ ทีมผู้วิจัยให้ความเห็นว่า น่าจะเกิดจากการที่อาหารหมด แบคทีเรียลดลง หรืออยู่ในช่วง Stationary Phase ก่อนเข้าสู่ช่วง Death Phase ได้ นอกจากนี้ช่วงหลังของการหมักยังคงพบว่าแบคทีเรียมีสีซีดลงกว่าต้องเริ่มต้น และพบการตกตะกอนของแบคทีเรียด้วย



ภาพที่ 5 ค่าการผลิตกระแสไฟฟ้า (mA) และความต่างศักย์เซลล์เชื้อเพลิงจุลินทรีย์ชนิดห้องคู่ (TCP-MFC) ที่ใช้อิเล็กโทรดแอโนด-คาโทดที่ทำจากแผ่นสังกะสี-ทองแดง (Zn–Cu) หมักแบคทีเรียสังเคราะห์แสงโดยให้แสงฟลูออเรสเซนต์ (4,000 ลักซ์) ภายใต้ช่วงสว่าง (Photosynthesis Fermentation) สลับช่วงมืด (Dark Fermentation) ช่วงละ 12 ชั่วโมง

กลไกการหมักแบบไม่ใช้แสง (Dark Fermentation) และการหมักแบบใช้แสง (Photo Fermentation) เป็นการย่อยสลายสารคาร์บอนอินทรีย์ทำให้เกิดปฏิกิริยารีดอกซ์ในระบบส่งผ่านอิเลคตรอนที่มีพลังงานสูงผ่านสารตัวกลาง เช่น NADH ควิโนน ไซโทโครม เป็นต้น Cai et al. (2019) ในกรณีการหมักแบบใช้แสง แสงช่วยเร่งการเกิดปฏิกิริยาด้วยการทำงานของเอนไซม์ไนโตรจีเนสและไฮโดรจีเนส (Nitrogenase and Hydrogenase enzymes) ผลการใช้กลูโคสเป็นสารตั้งต้นในกระบวนการสังเคราะห์แสงแสดงดังสมการ

$$C_6H_{12}O_6 + 6H_2O + \text{Light energy} \longrightarrow 12H_2 + 6CO_2 \quad \Delta G_\circ = +3.2\ kJ$$

ส่วนการหมักแบบไม่ใช้แสง (Dark-fermentation) PSB ย่อยสลายสารอินทรีย์คาร์บอนภายใต้สภาวะที่ไม่มีแสงและไม่ใช้ออกซิเจน แสดงดังสมการ

$$C_6H_{12}O_6 + 2H_2O \longrightarrow 4H_2 + 2CO_2 + 2CH_3COOH \quad \Delta G^\circ = -206\ kJ$$

ผลิตก๊าซไฮโดรเจนน้อยกว่าการหมักแบบใช้แสง ผลได้ของอิเลกตรอนจึงน้อยกว่าด้วย (Cai et al., 2019)

ค่าความหนาแน่นของกระแสไฟฟ้า (Current Density) เป็นค่าที่บอกถึงประสิทธิภาพในการผลิตไฟฟ้าโดยดูที่การส่งผ่านอิเลกตรอนที่ห้องแอโนด ซึ่งจะสะท้อนถึงประสิทธิภาพของการส่งผ่านอิเลกตรอนที่อิเลคโตรทแอโนด (Fabian, 2018). ผลการศึกษาการผลิตกระแสไฟฟ้าของแบคทีเรียสังเคราะห์แสงสีแดง *R. sphereroides* ใน TCP-MFC นี้ (ภาพที่ 3) โดยใช้คู่อิเล็กโทรด พบว่า Zn-Cu มีค่าการผลิตกระแสไฟฟ้าเพิ่มขึ้นสูงสุดในชั่วโมงที่ 208 วัดค่าได้ 1.13 mA ได้ค่าความหนาแน่นของกระแสไฟฟ้าเมื่อเทียบกับพื้นที่อิเลกโตรทแอโนดเท่ากับ 0.035 mA/cm^2 มีค่ามากกว่าช่วงการหมักแบบไร้แสงที่ค่าเฉลี่ยอยู่ที่ 0.85 mA เท่ากับ 0.027 mA/cm^2

มีรายงานผลวิจัยการเพาะเลี้ยงแบคทีเรียสังเคราะห์แสงใน photo-MFC อื่น ดังแสดงในตารางที่ 2 (Hülsen et al., 2020) นอกจากนั้น Tatinclaux et al. (2018) รายงานผลการหมัก *R. Sphereoides* ใน Photo-MFC แบบห้องคู่ ขนาด 200 มิลลิลิตรที่มีขั้วแอโนดมีอิเล็กโทรดแพลตตินัมและขั้วแคโทดมีอิเล็กโทรดกราไฟต์ โดยใช้อะซิเตตเป็นแหล่งคาร์บอน ได้ค่ากระแสไฟฟ้าสูงสุดที่ 851.8 µA ที่ 72 ชั่วโมง ทั้งนี้งานวิจัยนำมาเทียบอ้างอิงมานี้มีรูปแบบและสภาวะที่แตกต่างกัน จึงอาจทำให้ไม่สามารถเทียบเคียงได้ชัดเจน ซึ่งทีมผู้วิจัยไม่สามารถเปรียบเทียบได้เนื่องจากรูปแบบและลักษณะของ MFC แตกต่างกัน แต่การผลิตกระแสไฟฟ้าในรูปแบบ TCP-MFC นี้มีค่ากระแสไฟฟ้าไม่มาก แต่ค่าการผลิตกระแสไฟฟ้าสะสม ซึ่งถ้าสามารถจัดเก็บประจุอิเลกตรอนไว้ได้ จะช่วยให้ได้ค่ากระแสไฟฟ้าสูงในระดับหนึ่งที่น่าสนใจ

ผลการผลิตไฟฟ้าของ *R. sphereroides* ใน TCP-MFC ต่อเจริญเติบโตและผลิตโปรตีน แสดงในตารางที่ 3 พบว่า น้ำหมัก PSB เมื่อเปรียบเทียบในช่วงการให้แสงและไม่ได้รับแสง 3 แบบ ค่าผลผลิตมวลชีวภาพที่ให้ค่ามวลชีวภาพสูงที่สุดคือ ช่วงสลับการให้แสงและไม่ให้แสงช่วงละ 12 ชั่วโมง (ได้ค่าเฉลี่ย 3.31 กรัมน้ำหนักแห้งต่อลิตร) ปริมาณโปรตีนเท่ากับ 0.52 (คิดเป็น 52% กรัมน้ำหนักแห้งต่อกรัมเซลล์) ซึ่งน้อยกว่าผลของมวลชีวภาพในขวดหมักขนาด 600 mL ซึ่งมีค่ามวลชีวภาพ 3.56 กรัมน้ำหนักแห้งต่อลิตรและปริมาณโปรตีนเท่ากับ 0.55 กรัมต่อกรัมน้ำหนักแห้ง อาจพอบอกได้ว่า ไม่พบความผิดปกติของค่ามวลชีวภาพและปริมาณโปรตีนที่พบใน TSC-MFC ซึ่งมีค่าใกล้เคียงกับการหมักในขวดหมัก กระแสไฟฟ้าและการหมักใน TCP-MFC ไม่ส่งผลกระทบต่อการเจริญเติบโตได้ อย่างไรก็ดี เชื้อนี้ยังสามารถสร้างสารชีวภัณฑ์ตัวอื่นที่ที่เป็นประโยชน์ได้ด้วยเช่น เบต้าคาโรทีน คาโรทีนอยด์ เป็นต้น (Kuo et al., 2012) ซึ่งต้องมีการศึกษาว่า ได้รับผลกระทบจากการหมักในเซลล์เชื้อเพลิงจุลินทรีย์ระหว่างผลิตกระแสไฟฟ้าหรือไม่ต่อไป

สรุปผลการทดลองและวิจารณ์

จากการเพาะเลี้ยง *R. sphereroides* ใน TCP-MFC นี้ ภายใต้การหมักแอโนดไร้ออกซิเจนและแคโทดมีการเติมอากาศให้ออกซิเจนเป็นตัวรับอิเลกตรอน โดยใช้คู่อิเลกโตรดแอโนด-แคโทดที่ทำจากสังกะสี-ทองแดง (Zn-Cu) ได้ผลดีกว่าการใช้วัสดุชนิดอื่น โดยให้ค่ากระแสไฟฟ้าสูงสุด 0.11 mA (0.035

ตารางที่ 2 การเปรียบเทียบกระแสไฟฟ้าและค่าการผลิตไฟฟ้าของแบคทีเรียสังเคราะห์ในเซลล์เชื้อเพลิงจุลินทรีย์ใช้แสงแบบห้องคู่ (Dual Photo-MFC) รูปแบบต่าง ๆ ที่ได้จากการรายงานของ Hülsen et al. (2020) เปรียบเทียบกับการทดลองนี้

PSB	Power output	Dual Photo-MFC with membrane
Rhodospirillum rubrum	750 mA/m^2	CDM[a]
Rhodospirillum rubrum	1.25 W/m^2	CEM[b]
Rhodobacter sphereroides	7.3 mW/L	Nafion 117
Rhodospeudomonas palustris	2,780 mW/m^2	-
Rhodospeudomonas palustris	10.4 mW/m^3	Nafion 115
Rhodospseudomonas sp.	2.7 μA/cm^2	Nafion
Rhodospseudomonas sp.	221 mW/m^2	-
Rhodovulum sulfidephilum	25.9 μW	Nafion
Chlorobium	Near zero	AEM[c]
Rhodobacter sphereroides (this work)	0.035 mA/cm^2	Nafion 117

หมายเหตุ “-“ Unknown a=Cellophane dialysis membrane b=Cation exchange membrane
c=Anion exchange membrane

ตารางที่ 3 การผลิตมวลชีวภาพของ *R. sphereoides* และปริมาณโปรตีน ใน TSC-MFC

Operation Time (hr) (Photosynthesis - Dark fermentation periods) in TCP-MFC	Average Biomass in TCP-MFC (g DW/L)	Average Crude Protein in TCP-MFC (g/g DW)	Average Biomass in 600 ml in fermentation bottle (g DW/L)	Average Crude Protein In fermentation bottle (g/g DW)
12 - 12	3.31	0.52	3.56	0.55
16 - 8	3.13	0.48	3.28	0.49
8 - 16	2.72	0.36	3.06	0.38

mA/cm^2) เมื่อหมักได้ 180 ชั่วโมง และช่วงการใช้แสง (Photosynthesis Fermentation) ผลิตกระแสไฟฟ้าได้ดีกว่าช่วงการหมักแบบไร้แสง (Dark fermentation) 3-5 เท่า โดยระหว่างการผลิตกระแสไฟฟ้าใน

TCP-MFC แบคทีเรียยังเจริญเติบโตได้ดีพบ ปริมาณโปรตีนไม่ต่างจากการหมักในขวด พบผลผลิตมวลชีวภาพของเซลล์ (3.31 กรัมน้ำหนักแห้งต่อลิตร) และปริมาณโปรตีนได้ เท่ากับ 0.52 กรัมต่อกรัมเซลล์แห้ง (58%) เซลล์เชื้อเพลิง TCP-MFC ของ *R. sphereoides* นี้ จึงมีประสิทธิภาพสามารถผลิตพลังงานไฟฟ้าได้ จัดเป็นอีกหนึ่งผลิตภัณฑ์ที่น่าสนใจ นอกเหนือจากการหมักเพื่อสร้างสารชีวภัณฑ์ที่มีประโยชน์อื่นซึ่งเป็นสารมูลค่าสูงเพิ่มเติม

กิตติกรรมประกาศ

งานวิจัยนี้ได้รับทุนอุดหนุนการวิจัยจากกองทุนสนับสนุนการวิจัย นวัตกรรมและการสร้างสรรค์ มหาวิทยาลัยศิลปากร (Silpakorn University Research, Innovation and Creative Fund) ขอขอบคุณภาควิชาเทคโนโลยีชีวภาพและภาควิชาเทคโนโลยีอาหาร คณะวิศวกรรมศาสตร์และเทคโนโลยีอุตสาหกรรม มหาวิทยาลัยศิลปากร ที่ให้ความอนุเคราะห์สถานที่ทำวิจัยและสนับสนุนการทำงานวิจัยนี้และภาควิชาชีววิทยาประยุกต์ คณะวิทยาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ ที่สนับสนุนการวิจัยนี้

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