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The Interplay of Social Presence and Immersive Experience in Shaping Consumer Purchase Intentions on TikTok Live Streams in China

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Abstract

This research explored the degree of experience of consumers in the TikTok broadcast room and investigated the influence of other people's presence and communication interaction degree on consumers' immersion experience and purchase intention. This paper took immersion experience as the mediating variable, built a research model on the influence of social presence on consumers' purchase intention, and conducted the Delphi method and empirical analysis on 12 experts and 210 samples. The results showed that social presence had a positive impact on immersion experience and consumers' purchase intention; immersion experience had a positive effect on consumers' purchase intention; and immersion experience played a partial mediating role in the influence of social presence on consumers' purchase intention. This study revealed the specific action path of social presence affecting consumers' purchase intention through an immersive experience, providing a theoretical basis and practical guidance for the high-quality development of TikTok e-commerce live broadcasting.

Keywords: Social presence, Immersive experience, Consumer purchase intention, E-commerce, Live streaming

Introduction

The widespread adoption and application of the Internet have significantly propelled the development of e-commerce models, altering consumer behaviour patterns. As of June 2023, the number of online shoppers in China reached 884 million, while the number of e-commerce live-streaming users was 526 million, accounting for 81.9% and 59.5% of internet users, respectively (CNNIC, 2023). E-commerce live streaming, as an emerging commercial marketing strategy, has attracted many users due to its low entry barriers, high interactivity, and vividness, becoming an important force driving social and economic development. Among the platforms, TikTok's live streaming stands out due to its unique advantages, with 89.8% of its monthly active users watching live streams. The ultimate goal of TikTok live streaming is to sell products or services; however, with numerous live streaming platforms and hosts, content homogenisation and intense competition have expanded consumer choices. Therefore, how to attract and retain consumers in live streaming rooms, increase purchase rates, and improve repurchase rates have become focal points for live streaming platforms, hosts, and merchants.

Different from traditional e-commerce shopping platforms, Douyin Live Room creates a highly immersive and real-time interactive social shopping environment. Consumers can interact with anchors and other consumers in real time, as if they are in a natural social scene, and experience social presence (Chen & Mo, 2022). Therefore, social presence has become an important research topic in e-commerce live broadcasts. In such a virtual scene, consumer immersion is an essential factor that platforms, anchors and merchants must consider. Research shows that social presence in e-commerce live broadcasts further enhances consumers' purchase intention by enhancing their immersive experience. Wu (2024) found that social presence has a positive impact on consumer purchase intention, and immersive experience plays a partial mediating role. In addition, Li & Wang (2023) pointed out that social presence, product presence and spatial presence in e-commerce live broadcasts all significantly and positively affect consumers' online trust, immersive experience and purchase intention. These studies highlight the importance of enhancing social presence in e-commerce live-streaming environments to enhance consumers' sense of immersion and purchase intention. This study aims to explore whether enhancing social presence can improve consumer immersion and purchase intention, and how immersion plays a role in the impact of social presence on consumer purchase intention.

Research Objectives

1. To investigate the impact of demographic variables on social presence, purchase intention, and immersive experience.
2. To examine the relationship between purchase intention and other variables.
3. To analyse the mediating role of immersive experience between social presence and purchase intention.

Literature Review

Due to increasing media diversity, social presence (SP) has expanded across various fields. In distance education, social presence indicates online learners' sense of real presence in social, cognitive, and emotional aspects, thereby influencing the effectiveness of their education (Garrison et al., 2000). Human-computer interaction focuses on individuals' awareness of each other in a media environment, particularly during interactions with virtual characters (Lee et al., 2006). In marketing, social presence affects consumers' attitudes toward online shopping, as evidenced by a sense of closeness and social skills exhibited during online shopping experiences (Hassanein & Head, 2007).

Consumer purchase intention (CPI) is a critical indicator for predicting behaviour, with its intensity directly affecting the likelihood of the behaviour occurring (Rehman et al., 2019). It refers to the consumer's inclination when choosing a product, serving as a critical predictor of consumer behaviour. Purchase intention as the subjective probability of a consumer's willingness to take action when purchasing a specific product, highlighting the consumer's psychological state during the decision processs (Wee et al., 2014). Personal characteristics such as gender, age, and education level also lead to varying purchase intentions (Huang, 2023). Psychological variables, such as perceived and emotional experiences, play a significant role, with higher perceived usefulness and positive emotional experiences enhancing purchase intention (Zhao et al., 2024).

Research indicates that social presence significantly impacts consumer purchase intention. Huang et al. (2023) found that the presence of others in a live broadcast room increases consumer trust, subsequently stimulating purchase intention. Xu et al. (2021) reported that social interaction positively influences purchase intention, especially in the current social media-dominated market environment. High social presence fosters positive emotional experiences and enjoyable shopping experiences, thus promoting purchase intention (Huang et al., 2023). Xu et al. (2021) highlighted that consumer interactions with hosts and others in live sales scenarios shorten psychological distance, naturally generating a sense of closeness that positively impacts purchase intention. Media technology significantly influences social presence, with tools enhancing social presence and improving interaction quality and effectiveness (Huang et al., 2023). In e-commerce live broadcasts, social presence enhances consumer trust and purchase intention, promoting herd consumption behaviour (Xu et al., 2021). Social presence positively impacts consumer purchase intention by enhancing emotional and perceived experiences, trust, and group identification, making it a crucial factor in virtual environments.

In communication, the immersive experience (IE) is defined as the pleasurable state induced by human-computer interaction, where users of products or services experience a temporary loss of self-awareness (Nah et al., 2011). This state encourages users to remain engaged to sustain pleasure, characterised by total concentration and an accelerated perception of time (Ahn et al., 2020). Research has shown that immersive experiences positively influence user behaviour patterns, with Skadberg & Kimmel (2004) indicating that users often desire to maintain or enhance this state, driving continued engagement in online activities. Wu et al. (2010) confirm that immersive experiences enhance the behavioural intentions behind instant messaging usage. Key antecedent factors of immersive experience include perceived usefulness, ease of use, and control. Kim & Biocca (1997) highlight the roles of effectiveness, ease of use, and interactivity in forming immersive experiences, while Hsu & Lu (2004) suggest that satisfying perceived enjoyment, purposiveness, and control is essential for creating this temporary psychological feeling, which leads to time perception distortion.

Ranganathan & Ganapathy (2002) note that consumers immersed in an experience may exhibit unplanned purchasing behaviours and engage in repeat purchases. When consumers shop on brand websites, these sites create emotional and cognitive immersive experiences that enhance brand loyalty and facilitate purchasing decisions (Chen & Mo, 2022). Mollen & Wilson (2010) found that a higher quality and stronger immersive experience enhances shopping pleasure, effectively stimulating purchasing intentions. He & Gong. (2011) further confirms that immersive website experiences increase consumers' preference for the site, leading to more frequent visits and longer stays, enhancing engagement and predicting purchasing behaviour. Li & Wang (2023) investigate the impact of online interaction, perceived content quality, and perceived entertainment in live streaming on users' immersive experiences. These factors significantly enhance the immersive experience, positively influencing user interaction and purchasing behaviour.

Methodology

Population and Sample

12 experts have been purposive sampling selected for the Delphi analysis, categorised into three groups: Social Media Experts, E-commerce Experts, and Industry Practitioners (Table 1). Gender and location distribution are balanced within each group. The inclusion of diverse locations (Yang et al., 2024) and gender (Sun et al., 2019) is essential to capture regional perspectives that may influence social presence, immersive experience, and purchase intention in the context of live streams. This selection ensures a comprehensive and well-rounded perspective, covering critical aspects of social media, e-commerce, and industry practices, which are essential for this research on social presence, immersive experience, and purchase intention in TikTok live streams.

Table 1 Sample of Delphi analysis

	Identity	Gender	Location	n
Social Media Experts	Scholars with extensive research experience in social media, particularly on platforms like TikTok. They can provide deep insights into user behaviour and platform characteristics.	Male(2); Female(1)	South(1); Center(1); West(1)	3
E-commerce Experts	Academics or professionals with rich experience in e-commerce, especially those studying online shopping behaviour and purchase intentions.	Male(3); Female(3)	South(3); Center(2); West(1)	6
Industry Practitioners	Including TikTok platform operators or content creators. They can provide frontline operational experience and user feedback, complementing theoretical research.	Male(2); Female(1)	South(1); Center(1); West(1)	3

The main study used convenience sampling to collect data, the demographic information of the survey respondents in this study are shown in Table 2: the gender distribution is balanced, with 93 males and 117 females, accounting for 44.30% and 55.70%, respectively. The age group is predominantly young to middle-aged adults (19-39 years old), with 138 (65.80%) individuals. 133 respondents had a bachelor's degree or higher, accounting for 63.30%. The occupational distribution is diverse, with the majority being students, school staff, and company employees, accounting for 55 (26.20%), 52 (24.80%), and 76 (36.20%) individuals respectively.

Table 2 Demographic characteristics of the sample

Variable		n	%	Variable		n	%
AGE	Under 19	33	15.70	GED	Male	93	44.30
	19-29	69	32.90		Female	117	55.70
	30-39	69	32.90	OCC	Student	55	26.20
	40-49	20	9.50		School Staff	52	24.80
	Over 49	19	9.00		Company Employees	76	36.20
EDU	No College	13	6.20		Government Employees	11	5.20
	College	64	30.50		Freelancers	10	4.80
	Undergraduate	103	49.00		Other	6	2.90
	Graduate	30	14.30				

Research Instrument

The pilot study questionnaire consists of four sections: the basic information of the respondents, including gender (GED), age (AGE), education (EDU), and occupation (OCC). The Social Presence Scale is based on the research by Qiu (2021), consisting of five items; The Immersive Experience Scale is based on the study by Ge (2023), including four items; The Consumer Purchase Intention scale is based on the research by Duan (2023), including of three items. All scales use a five-point Likert scale, where "1" represents strongly disagree, "2" represents disagree, "3" represents neutral, "4" represents agree, and "5" represents strongly agree. The higher the score, the stronger the social presence, immersive experience, and consumer purchase intention.

The first round of the Delphi method questionnaire includes the pilot study questionnaire, rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). A blank space for modification suggestions follows each statement. The second round of the Delphi method questionnaire used the same rating scale as the first round and provided the statistical results from the first round for each question, including the mean and mode.

Data Collection

In early March 2024, this study first invited several experts with extensive experience in related fields to participate in two rounds of questionnaire surveys and data analysis to ensure the appropriateness of the Chinese version and structure of the questionnaire. Each round of expert questionnaires collected 12 responses, with a recovery rate of 100%. Subsequently, to investigate the impact of social presence in TikTok live streaming rooms on consumer purchase intention, in late March 2024, a convenience sampling method was used to send online survey questionnaires via private messages to viewers of the top 50 live streaming rooms on the TikTok live streaming sales leaderboard. 210 valid questionnaires were collected, with an effective recovery rate of 85.37%.

Data Analysis

The Delphi method was used in the research process to conduct an in-depth analysis of the questions. Reliability and validity analyses have been performed on scales. For difference analysis, an independent sample t-test and one-way ANOVA have been conducted for demographic variables to compare whether there are significant differences in social presence, immersive experience, and purchase intention among different categories of variables. Correlation analysis and regression analysis have been conducted, with social presence as the independent variable, immersive experience as the mediating variable, and consumer purchase intention as the dependent variable, to determine the direct effect of social presence on consumer purchase intention and the mediating effect of immersive experience on the impact of social presence on consumer purchase intention.

Results

Delphi analysis

The research conducted three iterative rounds of Delphi surveys to gather expert opinions on the social presence, immersive experience, and consumer purchasing intention scales. In each round, experts from social media experts, e-commerce experts and industry practitioners provided feedback on the importance and clarity of various evaluation items. The results of each round were analysed to determine the level of consensus among experts, aiming to refine and validate the evaluation framework. The two-round results are shown in Table 3.

Table 3 Results of three rounds of Delphi analysis

Item	1st Round					2nd Round				
	M	**SD**	**MO**	**QD**	**CV**	**M**	**SD**	**MO**	**QD**	**CV**
SP1	4.36	0.84	5	1.25	0.19	5.00	0.00	5	0	0.00
SP2	3.86	0.86	3	2	0.22	4.64	0.50	5	1	0.11
SP3	3.64	0.74	3	1	0.20	5.00	0.00	5	0	0.00
SP4	4.43	0.65	5	1	0.15	4.50	0.52	4a	1	0.12
SP5	3.79	0.70	4	1	0.18	4.50	0.52	4a	1	0.12
IE1	4.93	0.27	5	0	0.05	5.00	0.00	5	0	0.00
IE2	3.57	0.85	3	1.25	0.24	5.00	0.00	5	0	0.00
IE3	4.07	0.92	5	2	0.23	4.64	0.50	5	1	0.11
IE4	3.93	0.73	4	1.25	0.19	4.50	0.52	4a	1	0.12
CPI1	4.50	0.85	5	1.25	0.19	5.00	0.00	5	0	0.00
CPI2	4.86	0.36	5	0	0.07	5.00	0.00	5	0	0.00
CPI3	3.79	0.89	3	2	0.24	4.50	0.52	4a	1	0.12
W			0.300					0.335		
x^2			46.24					51.516		
df			11					11		
p			0.000					0.000		

Note: a means that the smaller mode is selected if there are equal numbers of modes.

The results of two rounds of Delphi expert surveys indicated several key findings. The number of questions with an average score above 4 increased from 6 in the first round to all questions in the second round. Both rounds demonstrated a standard deviation of less than 1, suggesting low variability in expert responses. The mode of 5 increased from 6 questions in the first round to all questions in the second round, including ties. The interquartile range (IQR) of less than 0.6 rose from 2 questions in the first round to 6 questions in the second round, indicating a narrowing range of responses and greater consensus. Furthermore, the coefficient of variation was less than 0.25 in both rounds, signifying consistent responses relative to the mean. Additionally, the Kendall's W value, which measures the degree of agreement among experts, increased from 0.300 ($p<0.001$) in the first round to 0.335 ($p<0.001$) in the second round. These results collectively indicate that the consistency and agreement among expert opinions improved significantly in the second round, reflecting a higher level of consensus on the evaluated questions. This improvement in agreement and consistency further validates the reliability and robustness of the survey results, suggesting that the Delphi method effectively refined expert consensus on the topic.

Reliability and validity test

To ensure the robustness and accuracy of the research instrument, reliability and validity tests were conducted (Table 4).

Table 4 Result of reliability and validity test

Component	Loading	Communality	Variance	KMO & Barlett's Test	Cronbach α
Social presence	0.756	0.571	54.944%	KMO=0.875;	0.891
	0.798	0.637		$\chi2$=650.868;	
	0.869	0.755		df=10; p<0.001	
	0.867	0.752			
	0.761	0.579			
Immersive experience	0.867	0.752	68.531%	KMO=0.823;	0.885
	0.783	0.613		$\chi2$=485.308;	
	0.798	0.637		df=6; p<0.001	
	0.860	0.740			
Consumer purchase intention	0.789	0.622	63.523%	KMO=0.712;	0.816
	0.828	0.686		$\chi2$=216.339;	
	0.773	0.598		df=3; p<0.001	

Based on the factor analysis results, the KMO values for the scales of Social Presence, Immersive Experience, and Consumer Purchase Intention are 0.875, 0.823, and 0.712, respectively. The results of Bartlett's test of sphericity are $\chi2$=650.868, df=10, p<0.001; $\chi2$=485.308, df=6, p<0.001; and $\chi2$=216.339, df=3, p<0.001, respectively, indicating that factor analysis is appropriate. The factor loadings for each factor are all greater than 0.7, demonstrating a significant contribution of each variable to the factor and a clear structure. The communalities are all greater than 0.5, indicating that the variance of the variables is well-explained by the factors. The total variance explained rates are 54.944%, 68.525%, and 63.52%, respectively, suggesting that the extracted factors can explain most of the data variance, showing strong explanatory power. The Cronbach's α values for each factor are 0.891, 0.885, and 0.816, respectively, indicating the scales' high internal consistency and reliability. In summary, the measured constructs of social presence, immersive experience, and consumer purchase intention exhibit good reliability and validity.

Difference analysis

This research used difference analysis to analyse the influence of different demographic variables on Social Presence, Immersive Experience, and Consumer Purchase Intention (Table 5). Males (M=2.943, SD=0.748) have significantly lower consumer purchase intention (t=-4.436, p<0.001) compared to females (M=3.456, SD=0.894), indicating that females may be more influenced by social presence and immersive experiences in their purchasing decisions. Secondly, regarding age, different age groups exhibit significant differences in immersive experience, particularly the 19-29 years (M=3.351, SD=0.862) and 30-39 years (M=3.413, SD=0.805) groups, which have significantly higher immersive experience (F=2.765, p<0.05) compared to the under 19 years (M=2.939, SD=1.122) and over 49 years (M=3.711, SD=1.008) groups, indicating that the impact of age on immersive experience has a phased characteristic. In terms of education, different educational groups show significant differences in Social Presence (F=3.467, p<0.05), Immersive Experience (F=4.910, p<0.01), and Consumer Purchase Intention (F=7.257, p<0.001), suggesting that as educational level increases, individual needs and behaviours in experience and purchasing vary. Lastly, regarding occupation, different occupational groups exhibit significant differences in consumer purchase

intention (F=3.767, p<0.01), with freelancers and other categories (including company employees, school staff, etc.) showing higher mean purchase intentions, which may be related to their purchasing power and motivation. Overall, gender, age, education, and occupation all show significant differences in social presence, immersive experience, and consumer purchase intention, with education having the most significant impact on consumer purchase intention, indicating that these demographic variables should be considered when designing marketing strategies.

Table 5 Result of difference analysis

Variables		SP			IE			CPI		
		M	**SD**	***t/F***	**M**	**SD**	***t/F***	**M**	**SD**	***t/F***
Gender	Male	3.13	0.78	1.320	3.23	0.99	1.220	2.94	0.75	4.436***
	Female	3.28	0.79		3.39	0.89		3.46	0.89	
Age	Under 19	2.96	0.88	1.581	2.94	1.12	2.765*	2.90	0.96	2.331
	19-29	3.17	0.78		3.35	0.86		3.23	0.84	
	30-39	3.29	0.72		3.41	0.81		3.28	0.86	
	40-49	3.33	0.83		3.09	1.06		3.20	0.70	
	Over 49	3.42	0.72		3.71	1.01		3.63	0.89	
Degree	No College	2.95	0.70	3.467*	2.58	1.31	4.910**	2.62	1.11	7.257***
	College	3.08	0.83		3.16	0.91		2.98	0.82	
	Undergraduate	3.22	0.78		3.42	0.94		3.34	0.83	
	Graduate	3.59	0.65		3.61	0.57		3.64	0.74	
Occupation	Student	2.99	0.83	1.755	3.07	1.08	1.669	2.92	0.94	3.767**
	School Staff	3.31	0.70		3.40	0.79		3.51	0.84	
	Company Employee	3.31	0.80		3.32	0.97		3.27	0.79	
	Government Employee	2.93	0.83		3.46	0.77		2.79	0.97	
	Freelance	3.36	0.52		3.65	0.62		3.37	0.60	
	Others	3.43	0.79		3.92	0.61		3.72	0.61	

Note: *p<0.05; **p<0.01; ***p<0.001

Correlation analysis

The correlation analysis aims to provide insights into how social presence, immersive experience, and consumer purchase intention interact and influence each other in TikTok live streaming. Table 6 presents the results of the correlation analysis.

Table 6 Correlation analysis results of social presence, immersive experience and consumer purchase intention

	SP	**IE**	**CPI**
SP	1		
IE	0.431**	1	
CPI	0.504**	0.499**	1
M	3.213	3.314	3.275
SD	0.784	0.938	0.773

Note：* p<0.05，** p<0.01

According to the analysis results in Table 6, there is a significant positive correlation between social presence and immersive experience (r=0.431, p<0.01) and consumer purchase intention (r=0.504, p<0.01); immersive experience and consumer purchase intention (r=0.499, p<0.01) also show a significant positive correlation.

Regression analysis

This study used demographic variables (i.e., gender, age, education, occupation) as control variables to establish a relevant model and conduct regression analysis.

Table 7 Regression analysis results of social presence, immersive experience and consumer purchase intention

	Model 1	**Model 2**	**Model 3**
	CPI	**IE**	**CPI**
SP	0.559***	0.516**	0.394***
IE			0.320***
R^2	0.254	0.186	0.351
F	70.892	47.523	56.057

Note：* p<0.05，** p<0.01，*** p<0.001

Model 1 indicates that social presence significantly positively affects consumer purchase intention (β=0.559, p<0.05). Model 2 shows that social presence significantly positively affects immersive experience (β=0.516, p<0.05). Model 3 reveals that immersive experience significantly positively affects consumer purchase intention (β=0.32, p<0.05). In summary, the independent variable, social presence, significantly affects the mediating variable, immersive experience, and the dependent variable, purchase intention. The mediating variable, immersive experience, also significantly affects the dependent variable, purchase intention.

Table 8 Decomposition of the total effect, direct effect and the mediating effect

		Effect	**BootSE**	**BootLLCI**	**BootULCI**
Total effect	X→Y	0.559	0.066	0.428	0.690
Direct effect	X→Y	0.394	0.069	0.258	0.529
Indirect effect	X→M→Y	0.165	0.039	0.095	0.248

Further mediation effect testing was conducted using the PROCESS with the Bootstrap method. The Bootstrap test showed that the 95% confidence interval for the indirect effect did not include 0, indicating a significant mediation effect. According to the results in Table 8, the indirect impact of immersive experience in the relationship between social presence and consumer purchase intention is significant, with a 95% confidence interval of [0.095, 0.248], which does not include 0. This indicates the presence of a partial mediation effect.

Discussions

Empirical results show that social presence positively influences immersive experience. In TikTok live streams, increased interaction between consumers and hosts, merchants, and other consumers enhances product awareness, leading to a strong sense of social presence, similar to the physical sense of face-to-face interaction. This social presence encourages consumers to stay longer in the live stream, fully engage, and seek pleasure and a sense of belonging. The immersive and real-time interactive environment created in the live stream provides consumers with a socialised scene, allowing them to deeply experience the positive emotional state brought by immersion, consistent with the views of Huang et al. (2023). Social presence positively affects consumers' purchase intentions. TikTok live streams form a highly three-dimensional and real-time interactive social shopping scene as participation and interactivity increase. Consumers experience a strong sense of social presence in this scene, as if they are in a natural social environment, feeling the presence of others. This experience enhances consumers' action efficiency, promotes quick decision-making, and increases their willingness to stay in the live stream, deepening interactions with hosts and other consumers. These interactions strengthen emotional connections and enhance user stickiness. Previous studies have shown similar outcomes, where high social presence in online environments leads to increased consumer trust and purchase intention (Ming et al., 2021). In high-social-presence live streams, consumers can fully understand product information and are influenced by host recommendations and other consumers' evaluations, thereby increasing their purchase intention for live-stream products, consistent with Huang et al. (2023).

Immersive experience positively influences consumers' purchase intentions. In TikTok live streams, after experiencing positive emotions from immersion, consumers become more immersed in the live stream, spend more time staying, and respond more actively to the recommendations of the host and other consumers, interacting with them, thereby generating stronger purchase intentions for the recommended products, consistent with the views of Qiu (2021). Immersive experience partially mediates the impact of social presence on consumers' purchase intentions. In TikTok live streams, enhanced social presence through consumer interaction increases immersive experience, strengthening their perception of the live scene's realism, reducing perceived risk, and weakening distrust of the live environment. Simultaneously, constructing social relationships in the live stream promotes positive emotional experiences, generating immersive experiences. When consumers are in a pleasant and immersive state, combined with satisfaction with the live environment, purchase intentions arise. This aligns with the findings of Duan (2023), who noted that immersive experiences could lead to higher engagement and purchasing behaviours. Additionally, consumers fully immersed in the live stream focus on watching and enjoying the process, enhancing purchase intentions. Therefore, the interactions within social presence make consumers more focused on watching the live stream, generating immersive experiences, reducing time perception, and stimulating purchase intentions, consistent with the views of Huang et al. (2023).

The demographic analysis provides additional layers of understanding regarding how different consumer groups interact with social presence and immersive experiences. Gender differences revealed that females tend to have higher purchase intentions than males, which may be attributed to their higher engagement and responsiveness to social interactions in live streams. Age also plays a role, with younger consumers (19-29 years) showing higher levels of immersive experience and purchase intention. This indicates that younger demographics are likelier to be influenced by live streams' interactive and immersive nature. Education level further differentiates consumer behaviour, with higher-educated individuals exhibiting more excellent purchase intentions. This could be due to their ability to process and appreciate the

detailed product information and social interactions in live streams. These demographic insights are consistent with the literature and underscore the need for targeted marketing strategies considering these variables (Zhao & Bacao, 2021), so marketers tailor their strategies by emphasising interactive and immersive elements designed to resonate with female consumers and younger audiences. Additionally, providing in- depth, informative content could be particularly effective for engaging higher- educated viewers who may value more substantive interactions in live streams.

Conclusion and suggestions

Conclusion

This study used the Delphi method and empirical research to investigate the relationship between social presence, immersive experience, and consumer purchase intention in TikTok live streams in China. The findings demonstrate that social presence significantly positively affects consumer purchase intention and that immersive experience partially mediates this relationship. The research confirmed that social presence, characterised by the real-time interactive nature of TikTok live streams, enhances consumers' trust and emotional engagement, increasing their purchase intention. The immersive experience, where users are deeply engaged and lose self-awareness, also positively influences purchase intention by making consumers more focused and reducing perceived risks. The demographic analysis revealed significant differences in social presence, immersive experience, and purchase intention across gender, age, education level, and occupation. Females, younger age groups, and individuals with higher education levels exhibited higher purchase intentions, emphasising the need for targeted marketing strategies. The Delphi method ensured a high level of expert consensus on the importance and impact of social presence and immersive experience on consumer purchase intention, validating the robustness of the study's findings. In summary, this research contributes to understanding how social presence and immersive experience in e-commerce live streaming environments like TikTok can influence consumer behaviour. These insights can guide e-commerce platforms and marketers in designing strategies to enhance consumer engagement and drive purchase intentions.

Suggestion

At the e-commerce livestream platform level, immersive experience significantly impacts consumers' purchase intentions. Therefore, creating an environment conducive to immersive experiences on these platforms is crucial. Non-social platforms should establish effective feedback mechanisms to respond to consumers promptly, support interpersonal interactions, and enhance consumer ownership, fostering an immersive experience. Platforms can offer material incentives to stimulate an immersive experience. As key figures in the livestream rooms, Steamers should actively interact with consumers, pay attention to comments and bullet screens, and respond quickly and accurately to consumer inquiries to achieve effective social interaction. Meeting consumers' reasonable demands and creating a positive interactive atmosphere can encourage a virtuous interaction cycle. E-commerce livestreams provide abundant product information, aiding consumers in making more need-fulfilling purchase decisions. Throughout this process, consumers' perceived social presence, generated through interaction, induces pleasant emotions. To maintain interests and enhance emotional states, consumers should actively participate in livestream interactions and listen to others' opinions. This interaction strengthens social presence, brings enjoyable experiences, and stimulates positive emotional responses.

Due to objective constraints, the small sample size may affect the accuracy and generalizability of the results. The quality of the questionnaires is challenging to ensure, as some respondents may not fill them out seriously, reducing their quality and effectiveness. Moreover, the sample predominantly consists of young people, affecting the results' breadth and persuasiveness. Future research should collect samples through multiple channels to enhance representativeness and comprehensiveness. E-commerce livestreaming is an emerging marketing research direction involving various product types. This study did not detail different product types, and the applicability of the conclusions requires further validation. Future research could include different product types to analyse how social presence deeply affects consumers' purchase intentions.

New knowledge and the effects on society and communities

The research on the relationship between social presence, immersive experience, and consumer purchase intention in TikTok live streams introduces significant new knowledge with profound implications for society and communities. The study underscores the pivotal role of social presence in enhancing consumer engagement and purchase intentions within live-streaming environments, fostering a sense of community and trust among users that mimics face-to-face interactions. The concept of immersive experience as a mediating factor offers new insights into consumer psychology by enhancing purchase intentions through positive emotional states and reducing perceived risks. These findings highlight the transformative potential of digital platforms in shaping consumer behaviours and driving e-commerce growth, with significant societal impacts. Businesses can develop more effective marketing strategies, driving economic growth and customer loyalty, while communities benefit from increased social connection and engagement in virtual settings. The demographic analysis within the study further informs inclusive and targeted marketing approaches, promoting equity and inclusivity in digital commerce. Overall, this research advances our understanding of consumer behaviour in digital environments, offering practical implications for enhancing consumer engagement and driving economic and social benefits, fostering a more connected and dynamic digital society.

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Cooperative Strategies of Higher Education between Beijing and Thailand under the Ideology of the "Belt and Road Initiative"

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Abstract

Beijing was usually greatly respected in Thailand and ensured the alliance of both countries. Thailand is one of the biggest promoters of Chinese language education in Southeast Asia. The objectives of this quality research were 1) to investigate the current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative"; 2) to analyze factors supporting the success of the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative"; and 3) to develop the cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative". The instruments used in this research were a semi-structured interview form, agenda questions for focus group discussion, and analysis issues for connoisseurship. Data were analyzed by content analysis, summarizing, and descriptive analysis. The results of the research revealed as follows: 1) The current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" consisted of nine issues as follows: 1.1) policy and government support; 1.2) cultural exchange and understanding; 1.3) academic collaboration and research; 1.4) student mobility and exchange programs; 1.5) quality assurance; 1.6) academic communication; 1.7) academic communication, and 1.8) sustainability of educational partnerships. 2) The factors supporting the success of the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" consisted of four important agendas. 3) The cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" consisted of one vision, five missions, one goal, and five strategies with twenty-two measures.

Keywords: Cooperative strategies, Higher education, Belt and road initiative

Introduction

Since Chinese President Xi Jinping announced it in 2013, the "Belt and Road Initiative" (BRI), Lim (2022) from Asia Research Institute, has drawn a lot of attention from academics who have studied it from a variety of angles, including economics and geopolitics, formerly known as One Belt, One Road, this expansive development initiative consists of the 21st Century Maritime Silk Road and the Silk Road Economic Belt. Through extensive plans for land and maritime infrastructure development, the goal of the Belt and Road Initiative (BRI) seeks to advance "peace and cooperation, openness and inclusiveness, mutual learning, and mutual benefit" among nations in several regions, including Thailand.

According to Times Higher Education (2024), with more than 21 million residents in Beijing in 2022, and as the nation's capital, Beijing's contemporary structures, like the Capital Museum, China World Trade Headquarters, and China Media Group Headquarters, are equally striking. In addition, there are 91 universities in the city, giving potential students a wide range of options. It is currently more advantageous than ever to think about studying in Beijing because the Chinese government has made significant investments in the higher education industry to attract foreign students.

The comparison to the ASEM Education Secretariat (2023), Thailand is home to 27 universities. One of the most important choices is where to pursue a degree in Thailand. There are 82 public universities, 72 private universities and colleges, and one community college under the Ministry of Education's jurisdiction. Other specialized institutions that are overseen by other ministries and agencies also exist.

The People's Government of Beijing Municipality (2023) reported on September 29, 2017, the 'Beijing Master Plan (2016-2035)' was publicly released, which clearly stated that all work in Beijing must adhere to the city's strategic positioning as the national political center, cultural center, international exchange center, and scientific and technological innovation center, and fulfill its basic duties of serving the work of the central party, government, and military leadership organs, serving the country's international exchanges, serving the development of science and technology and education, and improving the lives of the people.

Beijing is positioned as the national political, cultural, and international exchange center, and scientific and technical innovation centers in terms of urban strategy. This strategic positioning not only reflects Beijing's core role in national development but also points out the direction and focus of Beijing's future development. Specifically, Beijing is an important window for international exchanges. It has hosted many international conferences and activities and has extensive political, economic, cultural, and other exchanges with countries around the world. Furthermore, Beijing plays an important role in scientific and technological innovation. It has many scientific research institutions and high-tech enterprises and is committed to original research and scientific and technological innovation to promote national scientific and technological progress and social development.

As the findings of Chen (2019, p.146), illustrated on Chinese education in Thailand in the context of "one belt and one road," it was found that some problems exist in Chinese education in Thailand. Currently, Chinese education in Thailand was developing at a good momentum. Most of the Chinese teachers engaged in Chinese language education in Thailand were volunteer teachers dispatched by Hanban and teachers of inter-university cooperation. Generally speaking, such teachers teach for 1-2 years. If the teacher turnover was too high, the teaching process would be inconsistent, thus affecting the teaching effect. Students receiving Chinese education in Thailand hope that learning Chinese well will help their future career development. However, based on the analysis of the Office of Chinese Language Council International (Hanban) and the Maritime Silk Road Confucius Institute, Sakulphetaram & Samerchure (2021, p. 11-12) indicated that two institutions supported the teaching of Chinese language and culture. It was the dissemination of culture that was passed along through social activities, Ideas, and cultures to be able to more easily achieve the goals of the One Belt One Road policy.

As a research team, the higher education cooperation between Beijing and Thailand is driven by various factors, including economic and strategic interests, cultural exchange, and educational quality improvement. It aligns with the ideology of the "Belt and Road Initiative", promoting cultural heritage and strengthening diplomatic ties. It also enhances educational quality through joint research projects, faculty exchanges, and student mobility programs. It also expands opportunities for students, addresses global challenges, and strengthens regional integration. This strategic importance of higher education cooperation

is a priority for governments and educational institutions. However, challenges include cultural and linguistic differences, educational system variations, administrative and regulatory issues, financial and resource allocation disparities, quality assurance and standards, and geopolitical factors. Successful collaboration requires strategic planning, mutual understanding, and ongoing dialogue.

Research Objectives

1. To investigate the current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative".

2. To analyze factors supporting the success of the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative".

3. To develop the cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative".

Methodology

The research process was divided into three phases as follows:

Phase 1: Investigate the current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative". Key informants selected by purposive sampling were two educators related to educational policies and two stakeholders in educational policies, two officials from the Ministry of Education, and eight lecturers who conduct research on educational policies, both from Thailand and Peijing, for a total of fourteen informants. The instrument used was a semi-structured interview form. Data were analyzed by classifying them into issues.

Phase 2: Analyze the factors supporting the success of the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative". Key informants consisted of nine experts who were educators, supervisors, provincial educational officers, and stakeholders both from Thailand and Peijing. The instrument used was a record form participating in focus group discussions via Ding Talk through a translator. The research team defined guidelines to ensure that the discussions were within the framework and to obtain the information that we needed. It was divided into four important agendas: 1) encourage participants to think about policy, institutional commitment, cultural understanding, and academic quality; 2) identify the most significant barriers and solutions; 3) focus on actionable steps that can be implemented by universities and governments; and 4) prioritize the recommendations based on their potential impact and feasibility. The data were analyzed by descriptive analysis.

Phase 3: Develop the cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative'. Key informants of eleven experts were selected by purposive sampling who were school administrators, educational administrators who graduated doctoral degree, and faculty lecturers who have conducted research strategies. The instrument used was a draft of strategies. The data were analyzed by content summarizing.

The research framework is shown in Figure 1.

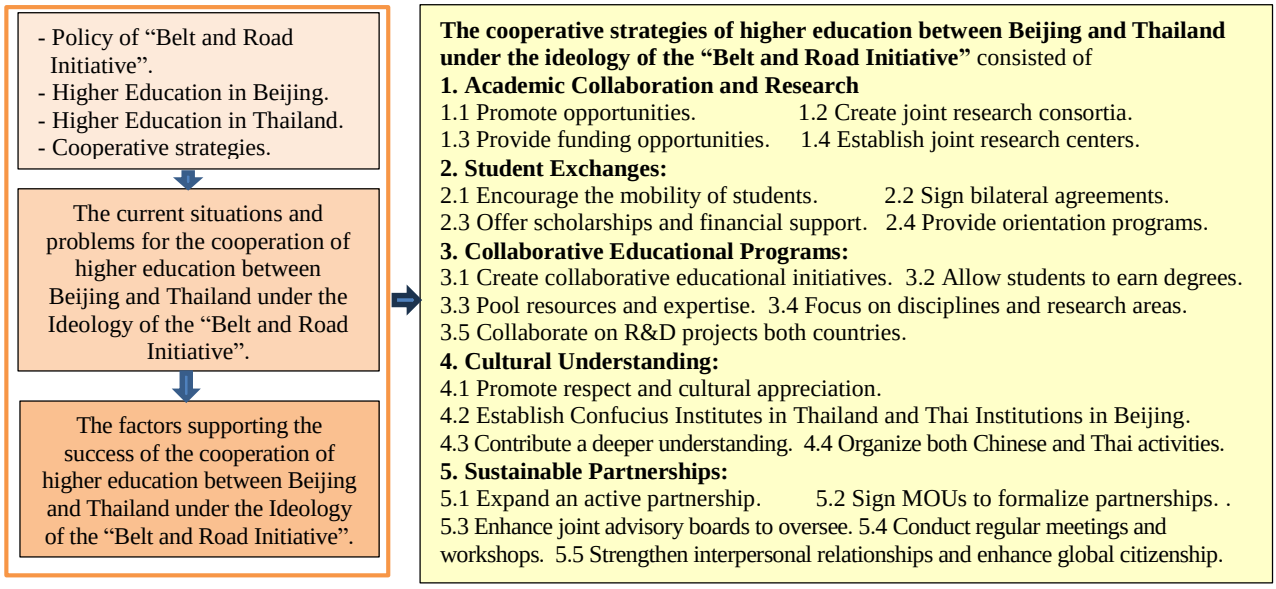

Figure 1 Research framework (Source : Researcher, 2025)

Results

Phase 1: Results of investigation of the current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" consisting of nine important components as follows: 1) policy and government support; 2) cultural exchange and understanding; 3) academic collaboration and research; 4) student mobility and exchange programs; 5) quality assurance; 6) academic communication; 7) academic communication, and 8) sustainability of educational partnerships. The details are shown in Table 1.

Table 1: The current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative".

The current situations	Problems
1. Policy and Government Support	
- Both Beijing and Thailand have expressed strong governmental support for educational collaboration under the BRI. - The Chinese government actively promotes educational exchange as a part of its soft power strategy, and Thailand views cooperation with Beijing as a means to enhance its educational standards and global competitiveness.	- Despite this alignment, there are challenges in policy implementation. Differences in bureaucratic processes and legal frameworks can lead to delays and miscommunication. - Additionally, the lack of a unified strategy for educational cooperation at the ASEAN level, including in Thailand, can hinder the full potential of BRI projects.
2. Cultural Exchange and Understanding	
- Cultural exchange programs, including language courses and student exchanges, have been established to foster mutual understanding. - Chinese language learning has seen increased popularity in Thailand, and Thai cultural studies are gaining attention in Beijing.	- Language barriers and cultural differences still pose significant challenges. While there are initiatives to address these, the depth of mutual understanding remains limited, often leading to superficial engagements rather than deep, meaningful exchanges. - There is also a perception that Chinese culture has a stronger presence in the exchange program, which could potentially cause some feelings of imbalance.
3. Academic Collaboration and Research	
- Joint research initiatives and academic partnerships are in place, focusing on areas such as engineering, technology, and sustainable development. - Universities from both countries have signed MoU, and collaborative research projects are on the rise.	- Academic collaboration faces challenges in funding, research priorities, and intellectual property rights. There is also a disparity in research infrastructure and resources, with Chinese institutions generally being more well-equipped. - This can create an imbalance in contributions to joint projects, leading to tensions and a lack of true partnership.
4. Student Mobility and Exchange Programs	
- There is a growing number of student exchanges, with Thai students studying in Beijing and vice versa. - Scholarships from the Chinese government under the BRI initiative have increased the accessibility of Chinese education for Thai students.	- The quality of the student experience can vary, with issues such as language difficulties, adaptation to different educational systems, and support services for international students. - Additionally, the mobility and the recovery have been slow, affecting the continuity and growth of these programs.
5. Technological Integration and Digital Education	
- Collaborative efforts in digital education, such as online learning platforms and virtual exchange programs, have been initiated, especially in response to the pandemic. - These efforts aim to integrate technological advancements from both countries.	- Technological disparities exist, with Beijing being more advanced in digital infrastructure. - Thailand faces challenges in adopting new technologies at the same pace, leading to difficulties in fully participating in these digital initiatives. Moreover, concerns about data privacy and cybersecurity may arise due to differences in regulatory standards.
6. Quality Assurance	
- Both Beijing and Thailand are working towards mutual recognition of degrees and qualifications. - Collaborative efforts have been made to align quality assurance frameworks to facilitate academic mobility and recognition of academic credentials.	- There are significant differences in the standards and processes of quality assurance between the two countries. - Thailand's higher education system may have concerns about the rigor and compatibility of Chinese accreditation standards. - This disparity can lead to challenges in the mutual recognition of degrees, potentially limiting the effectiveness of student exchanges and joint programs.
7. Academic Communication	
- Efforts have been made to enhance language proficiency among students and faculty, with Mandarin becoming increasingly popular in Thailand, and English serving as a common medium of instruction in many joint programs.	- Despite these efforts, language proficiency remains a barrier to deeper academic collaboration. - The varying levels of English and Mandarin proficiency among students and faculty can lead to misunderstandings, misinterpretations of academic content, and challenges in collaborative research. - This can hinder the overall quality and depth of academic exchanges.

Table 1: The current situations and problems for the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative". (Continue)

The current situations	Problems
8. Sustainability of Educational Partnerships	
- Both governments are committed to sustaining educational partnerships over the long term, with strategic plans and agreements in place to guide future collaboration. - Both countries have shown commitment to long-term educational cooperation, with strategies aligned with the broader BRI goals. - There are ongoing discussions to expand and sustain these efforts.	- The sustainability of these partnerships is challenged by external factors such as geopolitical tensions, economic fluctuations, and shifts in domestic priorities. - Additionally, the long-term success of these partnerships depends on their ability to adapt to changing educational needs and global trends, which requires ongoing dialogue and flexibility from both sides. - The long-term sustainability of these collaborations can be threatened by shifting political landscapes, economic uncertainties, and changing priorities within both countries. - Additionally, there is a need for a more clearly defined and mutually agreed-upon strategic vision to ensure that the cooperation remains beneficial for both sides in the long run.

Phase 2: Results of analyzing the factors supporting the success of the cooperation of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative". The data were analyzed by content summarizing as follows:

1. Encourage participants to think about policy, institutional commitment, cultural understanding, and academic quality is classified as follows:

1.1 Policy

- The success of cooperation is highly dependent on well-defined bilateral agreements between the governments of Beijing and Thailand.

- These agreements should outline mutual goals, frameworks for collaboration, and mechanisms for resolving disputes.

- Strong support from both governments, including funding, scholarships, and policy incentives, is crucial.

- This support ensures that the cooperation is sustained and aligned with broader national strategies, such as Thailand's policy and Beijing's BRI objectives.

- Effective cooperation requires the harmonization of legal and regulatory frameworks to facilitate the mobility of students, faculty, and academic programs.

- Simplified visa processes, recognition of qualifications, and streamlined bureaucratic procedures are essential.

1.2 Institutional Commitment

- The commitment of leading universities and research institutions in both countries is vital.

- Successful cooperation is often driven by strong institutional partnerships that go beyond formal agreements to include shared research agendas, joint degree programs, and collaborative projects.

- University leaders who prioritize international collaboration and are willing to invest resources in developing long-term relationships are more likely to see successful outcomes.

- Long-term success is supported by sustainable funding models that involve both government and private sector investments. Institutions need to have clear financial plans that include provisions for maintaining programs, infrastructure, and faculty development.

1.3 Cultural Understanding

- Programs that promote cultural exchange, such as language courses, student exchanges, and faculty visits, foster mutual understanding and help bridge cultural differences.

- These programs are crucial for building trust and reducing cultural barriers that may hinder collaboration.

- Providing cross-cultural training for students, faculty, and administrative staff can enhance the effectiveness of cooperation by preparing individuals to navigate cultural differences in educational settings.

- Success is also supported by a commitment to mutual respect and the willingness to adapt educational practices to suit the cultural contexts of both countries. This involves integrating diverse perspectives into curricula and fostering an environment of inclusivity.

- Engaging local communities and stakeholders in both countries can enhance the relevance and acceptance of cooperative initiatives. This includes involving local industries, alumni networks, and civil society organizations in educational projects.

1.4 Academic Quality

- The collaboration's success is underpinned by a commitment to maintaining high academic standards.

- This includes ensuring that joint programs and research initiatives meet international quality benchmarks and are recognized globally.

- Providing opportunities for faculty development, including joint training programs, workshops, and research fellowships, supports the continuous improvement of academic quality.

- It also ensures that faculty members are well-equipped to contribute to and benefit from the partnership.

These factors collectively support the success of higher education cooperation between Beijing and Thailand under the BRI. By addressing these areas, both countries can build a robust and mutually beneficial partnership that contributes to their respective educational and developmental goals.

2. Identify the most significant barriers and guidelines for solutions classified and shown in Table 2.

Table 2: Results of the most significant barriers and solutions.

Barriers	Guidelines for Solutions
2.1 Differences in educational policies, legal frameworks, and regulatory standards can create obstacles to collaboration. This includes issues like the recognition of qualifications, visa regulations, and intellectual property rights.	- Establish regular policy dialogues between Chinese and Thai education ministries to align regulations and create joint frameworks for cooperation. - Develop mutual recognition agreements for academic qualifications, ensuring that degrees and certifications are recognized in both countries. - Implement streamlined visa and work permit processes for students, faculty, and researchers involved in joint programs. -Establish regular policy dialogues between Chinese and Thai education ministries to align regulations and create joint frameworks for cooperation. - Develop mutual recognition agreements for academic qualifications, ensuring that degrees and certifications are recognized in both countries. - Implement streamlined visa and work permit processes for students, faculty, and researchers involved in joint programs.
2.2 Language differences between Beijing and Thai students, faculty, and administrators can hinder effective communication, collaboration, and understanding.	- Offer language training programs in both Mandarin and Thai for students and faculty, focusing on improving communication skills and cultural understanding. - Develop bilingual education initiatives and resources, such as joint publications and course materials, to support academic collaboration. - Encourage the use of English as a common medium of instruction and communication in joint programs to facilitate better understanding and collaboration.
2.3 Cultural differences between Beijing and Thailand can lead to misunderstandings, particularly in areas such as academic practices, social norms, and work ethics.	- Organize cross-cultural workshops and training sessions for students, faculty, and staff to enhance their understanding of each other's cultures and reduce the potential for misunderstandings. - Expand cultural exchange programs that allow participants to experience each other's cultures firsthand, fostering mutual respect and understanding. - Develop curricula that reflect and respect the cultural contexts of both countries, incorporating diverse perspectives into the learning experience.
2.4 Differences in academic standards, quality assurance processes, and educational philosophies can lead to challenges in maintaining the quality of joint programs and research initiatives.	- Develop joint quality assurance frameworks that align academic standards and ensure the credibility and recognition of degrees and research outputs. - Establish peer review mechanisms involving faculty from both countries to assess and enhance the quality of joint academic programs and research projects. - Collaboratively develop curricula that meet international standards and are tailored to the needs and contexts of both Chinese and Thai institutions.
2.5 Ensuring the long-term sustainability of educational partnerships can be challenging, particularly in the face of changing political, economic, and social conditions.	- Develop long-term strategic plans that outline clear goals, milestones, and evaluation mechanisms for the cooperation, ensuring that it remains relevant and adaptable to changing circumstances. - Implement continuous monitoring and evaluation processes to assess the progress and impact of joint initiatives, making adjustments as needed to ensure sustainability. - Encourage adaptive partnerships that can evolve, incorporating new technologies, research areas, and educational trends to remain at the forefront of global education.

By addressing these challenges and implementing the proposed solutions, the cooperation of higher education between Beijing and Thailand under the BRI can be strengthened, leading to more successful and sustainable partnerships that benefit both countries.

3. Focus on actionable steps that can be implemented by universities and governments is classified as follows:

3.1 Actionable Steps for Governments

- Create bilateral working groups comprising representatives from the ministries of education, higher education institutions, and regulatory bodies to align policies, streamline visa processes, and facilitate mutual recognition of qualifications.
- Formulate a comprehensive education agreement between Beijing and Thailand, outlining specific goals, responsibilities, and timelines for collaboration in higher education under the BRI framework.
- Offer financial incentives, tax breaks, and grants to institutions that actively participate in BRI-related academic collaborations, joint research projects, and student exchange programs.
- Allocate dedicated funding for joint research initiatives, academic exchanges, and infrastructure projects between Beijing and Thai universities. This could include creating a special fund for BRI-related educational projects.
- Encourage public-private partnerships that involve universities, industry stakeholders, and government agencies in developing educational programs aligned with BRI goals.
- Offer competitive research grants for collaborative projects that align with BRI objectives, encouraging innovation and high-quality research outcomes.
- Work with partner institutions to co-develop curricula that meet international standards and address the educational needs of both Beijing and Thai students.

3.2 Actionable Steps for Universities

- Review and align university policies with national BRI objectives, ensuring that institutional strategies support cross-border educational initiatives.
- Collaborate with other universities and educational associations to advocate for supportive policies and regulations that facilitate international partnerships.
- Set up joint research centers focused on key areas of mutual interest, such as sustainable development, engineering, technology, and public health. These centers can serve as hubs for collaborative research and innovation.
- Create dual-degree programs that allow students to study in both countries, earning degrees recognized by both Beijing and Thai universities. This enhances academic mobility and strengthens institutional ties.
- Implement faculty exchange programs that allow professors and researchers to work and teach at partner institutions. This not only enhances academic collaboration but also builds faculty capacity and cross-cultural understanding.

4. Prioritize the recommendations based on their potential impact and feasibility is arranged as follows:

4.1 Dual-degree programs have a significant impact by fostering academic mobility, enhancing the global competitiveness of graduates, and strengthening ties between institutions. The feasibility is high because many universities already have the frameworks for such programs and can build on existing partnerships.

4.2 Joint research centers can drive innovation, produce high-quality research, and address global challenges, aligning well with BRI objectives. The feasibility is high given existing research collaborations and the availability of funding from both governments and private sectors.

4.3 Offering financial incentives and grants can accelerate collaboration and attract more institutions to participate in BRI-related projects. Governments can readily implement this through policy adjustments, making it feasible with appropriate political will.

4.4 A comprehensive education agreement would align both countries' educational strategies under the BRI, providing a clear framework for collaboration. While impactful, it requires significant diplomatic effort and alignment of interests, making it moderately feasible.

4.5 Jointly developed curricula that meet international standards can significantly enhance the quality and relevance of education in both countries.

4.6 Language programs can significantly reduce communication barriers and improve collaboration. These are relatively easy to implement, with existing resources and frameworks in both countries, making them highly feasible.

4.7 Long-term strategic planning ensures the sustainability of educational partnerships and aligns them with broader BRI goals. However, the feasibility depends on the institutions' commitment to long-term collaboration and adaptability to changing circumstances.

Phase 3 : Results of developing the cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" consisted of one vision, five missions, one goal, and five strategies with twenty-two measures as follows:

3.1 Vision: The "Belt and Road Initiative" aims to establish a comprehensive and mutually beneficial partnership by utilizing research collaboration, cultural understanding, and educational exchange to promote regional development and global connectivity.

3.2 Mission:

3.2.1 To create opportunities for joint research projects and academic partnerships to improve educational quality.

3.2.2 To promote cross-cultural experiences and academic enrichment.

3.2.3 To bridge cultural gaps and foster mutual understanding.

3.2.4 To establish joint degree programs and collaborative educational initiatives.

3.2.5 To build and sustain strong, long-term partnerships between universities and research institutions.

3.3 Goal: The "Belt and Road Initiative" strengthens the partnership between the two countries, enhances educational outcomes, and contributes to mutual development and global progress.

3.4 Strategies/Measures: Five strategies consisting of twenty-two measures were developed. The details are shown in Table 3.

Table 3: Results of developing the cooperative strategies of higher education between Beijing and Thailand under the Ideology of the "Belt and Road Initiative"

Strategies	Measures
1. Academic Collaboration and Research: Develop collaborative research projects that address common challenges and leverage the strengths of institutions in both Beijing and Thailand.	1.1 Promote opportunities for joint research projects and academic partnerships to improve educational quality and innovation. 1.2 Create joint research consortia involving universities and research institutions from both countries to tackle shared issues. 1.3 Provide funding opportunities and grants for joint research projects to support collaborative efforts. 1.4 Establish joint research centers focused on areas of mutual interest, such as technology, sustainable development, and social sciences.
2. Student Exchanges: Increase the number and diversity of exchange programs to facilitate international academic experiences.	2.1 Encourage the mobility of students and faculty to promote cross-cultural experiences and academic enrichment. 2.2 Sign bilateral agreements to facilitate student and faculty exchanges, including short-term and long-term programs. 2.3 Offer scholarships and financial support to students and faculty participating in exchange programs. 2.4 Provide orientation programs and support services to help exchange participants acclimate to their new academic and cultural environments.
3. Collaborative Educational Programs: Establish and promote joint degrees that provide dual qualifications and broaden educational opportunities.	3.1 Create collaborative educational initiatives to provide students with comprehensive qualifications recognized in both countries. 3.2 Allow students to earn degrees recognized by both countries. 3.3 Pool resources and expertise, both countries aim to advance their educational institutions and produce high-quality graduates. 3.4 Focus on disciplines and research areas that directly impact educational quality development. 3.5 Collaborate on R&D projects, and universities in Beijing and Thailand that benefit both countries and contribute to global progress.
4. Cultural Understanding: Foster deeper cultural understanding and appreciation between Beijing and Thailand.	4.1 Promote mutual respect and cultural appreciation through educational programs. 4.2 Establish Confucius Institutes in Thailand and Thai Institutions in Beijing to promote both Thai and Chinese languages and cultures. 4.3 Contribute a deeper understanding among Chinese and Thai students and people. 4.4 Organize both Chinese and Thai activities and invite all educational agencies to join.
5. Sustainable Partnerships: Build and maintain strong, long-term partnerships between universities and research institutions.	5.1 Expand an active partnership with relevant sectors. 5.2 Sign MOU to formalize partnerships and outline areas of collaboration. 5.3 Enhance joint advisory boards to oversee and guide the implementation of collaborative initiatives. 5.4 Conduct regular meetings and workshops to review progress and address any challenges. 5.5 Strengthen interpersonal relationships and enhance global citizenship.

Discussions

The research team summarized and selected the important issues for discussion as follows:

In terms of the current situation, Beijing and Thailand have shown strong support for educational collaboration under the ideology of the "Belt and Road Initiative", with the Chinese government promoting exchange as part of its soft power strategy. Cultural exchange programs have been established to foster mutual understanding, with Chinese language learning becoming more popular in Thailand. Joint research initiatives and academic partnerships are in place, focusing on engineering, technology, and sustainable development. Student mobility and exchange programs have grown, with Chinese government scholarships increasing accessibility for Thai students. Technological integration and digital education have been initiated, with both countries committed to long-term sustainability. Quality assurance efforts are also being made to facilitate academic mobility.

Fang (2018, p. 229) analyzed the challenges faced by foreign students in China's education, highlighting regional differences, inadequate training, poor quality, and weak management systems under the Belt and Road Initiative. In response, strategies were proposed to enhance educational quality, structural improvements, management services, and cultural sensitivity to better cater to international students. Additionally, Nukitrangsan (2024, p. 13-14) noted Thailand's strategic response to China's educational influence, exemplified by collaborations such as the establishment of Confucius Institutes and classrooms, partnerships with the Chinese Ministry of Education, and the adoption of Chinese language textbooks. These efforts have bolstered interest among Thai youth and facilitated recognition of Chinese language proficiency tests.

In terms of the problems, the bilateral education cooperation (BRI) between China and Thailand faces several challenges, including policy and government support, cultural exchange, academic collaboration, student mobility, technological integration, long-term sustainability, quality assurance, academic communication, and the sustainability of educational partnerships. Despite policy alignment, challenges in policy implementation, cultural exchange, and academic collaboration persist, leading to delays and miscommunication. Academic collaboration faces funding, research priorities, and intellectual property rights issues, while student mobility and recovery are affected by language difficulties and slow recovery. Technological integration and digital education also face challenges, with Beijing being more advanced in digital infrastructure and Thailand struggling to adopt new technologies. The long-term sustainability of these partnerships is threatened by shifting political landscapes, economic uncertainties, and changing priorities.

Yue et al. (2022, p. 105) reviewed higher education under the Belt and Road Initiative and emphasized the need for tailored measures to local conditions, addressing cooperation imbalances, promoting cultural engagement, and providing resources to universities in central and western regions. Their findings highlighted the importance of raising academic and cultural voices, fostering foreign student development, and building world-class universities with an inclusive and supportive research environment. Similarly, Yodpet (2023, p. 292) stressed the role of virtual joint committees and foreign policy initiatives in promoting flexible cooperation and mutual accountability. However, to navigate challenges posed by the pandemic and cultivate an open knowledge culture, stronger collaboration and engagement are essential. Higher education institutions must reassess their roles and strategies both before and after the pandemic to effectively plan for future cooperation.

In terms of factors supporting the success of higher education cooperation between Beijing and Thailand under the ideology of the "Belt and Road Initiative", the Belt and Road Initiative (BRI) has led to significant higher education cooperation between Beijing and Thailand. This success relied on well-defined bilateral agreements, strong government support, harmonization of legal and regulatory frameworks, and streamlined bureaucratic procedures. Institutional commitment is crucial, with leading universities investing resources in long-term relationships. To address barriers, regular policy dialogues, mutual recognition agreements, streamlined visa and work permit processes, bilingual education initiatives, and cross-cultural workshops are essential. To ensure long-term sustainability, governments and universities should create bilateral working groups, form comprehensive education agreements, offer financial incentives, allocate funding, and collaborate with other institutions.

Xinhua Silk Road Information Service (2020) outlined the education action plan for the Belt and Road Initiative, emphasizing strengthened cooperation, deeper mutual understanding, and increased educational exchanges among participating countries. The plan aimed to foster people-to-people ties, develop skilled talent for policy coordination, infrastructure connectivity, and financial integration, ultimately contributing to regional educational advancement and a shared future. Similarly, Guo (2019, p.86) highlighted China's commitment to educational development through the 13th Five-Year Plan for the Development of National Education, released in January 2017. This policy emphasized tailoring educational strategies to each country's unique context while advancing an integrated approach to educational opening-up. Key initiatives included expanding the scope and quality of international education, actively engaging in global education governance, and fostering mutually beneficial cooperation through diverse partnerships.

In terms of the cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative", the "Belt and Road Initiative" aims to establish a comprehensive partnership between Beijing and Thailand through research collaboration, cultural understanding, and educational exchange. The mission is to improve educational quality, promote cross-cultural experiences, bridge cultural gaps, establish joint degree programs, and build long-term partnerships between universities and research institutions. Five strategies were developed to achieve this goal in terms of academic collaboration and research, student exchanges, collaborative educational programs, cultural understanding, sustainable partnerships, and cultural understanding. Academic collaboration involves developing collaborative research projects, creating joint research consortia, providing funding, and establishing joint research centers, as well as sustainable partnerships involve expanding active partnerships with relevant sectors, signing MOUs, enhancing joint advisory boards, conducting regular meetings, and strengthening interpersonal relationships to enhance global citizenship.

Zheng & Katasila (2021, p.245) discussed Thailand's response to China's Belt and Road Initiative, emphasizing the mutual benefits and strengthened ties between the two nations. The policy presents opportunities for joint development in the education sector and fosters collaboration between public and private sectors to expand emerging markets, particularly within ASEAN, aligning with China's strategic goals and benefiting both countries. Similarly, Krukowska (2016, p.163-164) analyzed the broader implications of the Belt and Road Initiative on the global order, suggesting that it could position China as the dominant regional power by leveraging its economic influence. However, the initiative's success depends on maintaining a peaceful development policy, eliminating harmful practices, and ensuring mutual profitability for partner nations. If executed effectively, this strategy could reshape global economic dynamics, with Beijing at the center of a new Asian economic core.

Similarly, Lertprakaiseang (2017, p. 7) highlighted Thailand's strategic approach to strengthening ties with Laos, emphasizing the need for cultural adaptation and deeper cooperation due to their shared language and traditions. Strengthening this relationship was crucial for fostering both friendship and business alliances. Similarly, Yang (2023, p.30) discussed the Belt and Road Initiative as a key driver of China's higher education internationalization, advocating for quality-oriented policies, institutional reforms, and increased external participation in governance to enhance regional education collaboration. Expanding on this, Peters et al. (2021, p.16-17) stressed the importance of adapting China's international development strategy to the modern era by promoting cultural understanding, diversity, and shared benefits. To ensure sustainable growth, China must move beyond power politics and foster global cooperation through inclusive education initiatives aligned with the principles of globalization and mutual development.

Conclusion and suggestions

Conclusion : The research on cooperative strategies in higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" has significant implications for the development of education. It can be applied to various aspects, including curriculum development, the establishment of joint degree programs, the enhancement of academic exchange initiatives, and the promotion of language and cultural programs. Additionally, the research supports the construction of educational infrastructure and the integration of cooperative strategies into teacher training programs, ensuring long-term sustainability. Engaging the private sector and monitoring the effectiveness of these educational cooperation strategies further contribute to their success. Ultimately, this research not only

advances academic knowledge but also fosters positive societal and community impacts. By bridging gaps in education, culture, and policy, it strengthens bilateral relations and paves the way for a more interconnected and prosperous future for both nations.

Suggestions from this research.

1. The research on the cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" can be applied to education for developing curricula that reflect cooperative strategies, such as courses on international relations, global trade, and cross-cultural communication.

2. An evaluation of the educational policies and frameworks established under the ideology of the "Belt and Road Initiative" that facilitates cooperation between Beijing and Thailand can analyze how these policies impact higher education collaborations.

3. The research can be used to monitor and evaluate the effectiveness of educational cooperation strategies, ensuring long-term success by applying these strategies that significantly impact the development of educational programs, policies, and collaborations aligned with the goals of the Belt and Road Initiative.

4. The research findings are to design or enhance curricula that reflect the cooperative strategies between Beijing and Thailand, which can involve developing courses on international relations and cross-cultural communication with a focus on the BRI and its implications for education.

Suggestions for Further Research.

1. There should be an investigation of the long-term impact of BRI-driven educational cooperation on students' academic and professional development in both countries.

2. There should be case studies of successful cooperative programs or initiatives between universities in Beijing and Thailand.

3. There should be a comprehensive analysis of cooperative strategies in higher education between Beijing and Thailand under the BRI for policymakers, educators, and researchers involved in international collaborations.

New knowledge and the effects on society and communities

The research on cooperative strategies of higher education between Beijing and Thailand under the ideology of the "Belt and Road Initiative" has provided valuable insights into the development of intercultural educational models, strategic arrangement, innovation in cross-border education, and higher education impacts. The study identifies key strategies for improving educational policies and curricula, such as harmonizing academic standards, developing joint degree programs, and creating standardized quality assurance mechanisms. It also highlights innovative approaches to cross-border education, such as digital platforms for virtual exchanges and joint research initiatives. The research has enhanced educational opportunities, strengthened bilateral relations, promoted community development, promoted regional stability, and emphasized the importance of cultural preservation and exchange. The research supports the understanding of the economic and social impacts of educational cooperation under the "Belt and Road Initiative" and its potential to drive educational growth together.

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Effectiveness of Peer Coaching and Academic Performance in Teaching Internship

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Abstract

This study evaluates the effectiveness of peer coaching as a collaborative professional development practice for prospective teachers at a state university in the Philippines. Utilizing a descriptive- correlational design, the research explores the relationship between the effectiveness of peer coaching and the academic performance of fourth- year teaching interns. A sample of 137 students was selected from 212 total respondents, with data gathered through a validated 20- item researcher- made questionnaire and academic performance records. The findings reveal that peer coaching is highly effective in several key areas, including lesson planning, instructional delivery, feedback provision, and reflective practices. However, aspects such as systematic preparation and self- assessment showed slightly lower effectiveness. Overall, the academic performance of prospective teachers was predominantly high, with most rated as Superior. A weak but significant positive correlation ($r = 0.381$) was observed between peer coaching effectiveness and academic performance, suggesting that while peer coaching has a positive impact, the effect is modest. To maximize the benefits of peer coaching, recommendations include strengthening the components of systematic preparation and self-assessment, offering targeted training for peer coaches, and further enhancing reflective practices. Regular evaluations of peer coaching's impact on academic performance are also suggested.

Keywords: Peer coaching, Teacher professional development, Correlational analysis, Academic performance

Introduction

In the rapidly evolving field of teacher education, professional development practices play a crucial role in equipping prospective teachers with the skills necessary to excel in their future careers. Among various professional development approaches, peer coaching has emerged as a collaborative practice that fosters growth and improvement among educators. As detailed by Liew (2016), the structured and iterative process of teachers observing and learning from one another offers several benefits. This process includes pre-observation planning, peer observations, and post-observation debriefing, all of which are designed to refine pedagogical skills and foster mutual professional development.

In the context of higher education in the Philippines, where teacher preparation programs are continuously evolving, the effectiveness of peer coaching as a professional development practice warrants thorough examination. As educational institutions strive to improve their programs, understanding how peer coaching impacts prospective teachers' development and performance is critical for designing effective training initiatives. At a state university in the Philippines, the College of Teacher Education is committed to preparing its fourth-year students for their Teaching Internship, a pivotal phase in their transition from theory to practice. This program is conducted in partnership with the Department of Education (DepEd) through a Memorandum of Agreement (MOA), ensuring a structured and collaborative approach to teacher training. Under this agreement, student interns are deployed to various schools across different divisions, where they gain hands-on classroom experience. Over the course of 370 hours of internship, they apply pedagogical theories, develop instructional strategies, and engage in real-world teaching under the supervision of mentor teachers. This immersive training equips interns with essential skills in classroom management, lesson planning, and student engagement, strengthening their readiness for professional teaching roles.

A key component of this internship is peer coaching, which has been increasingly emphasized in professional development to enhance instructional skills and overall academic performance (Alonso et al., 2024). As part of the program structure, interns are systematically paired or grouped with fellow interns, ensuring that peer coaching occurs exclusively among them. This setup fosters a collaborative learning environment, allowing interns to observe each other's teaching, exchange constructive feedback, and refine their instructional techniques. Through intern-to-intern coaching, they develop reflective teaching practices, enhance lesson delivery, and improve classroom management skills— critical competencies for future educators.

While existing literature highlights the potential benefits of peer coaching, empirical studies on its effectiveness within the Philippine context remain limited. The research of Terekhin et al. (2023) has predominantly explored peer coaching in broad terms, providing limited insights into its specific applications within teacher education and its direct correlation with academic performance. This study seeks to address this gap by examining the effectiveness of peer coaching as a collaborative professional development practice for prospective teachers within a state university in the Philippines.

Several pressing issues underscore the need for this research. Cortellazzo et al. (2023) emphasize a significant gap in comprehensive studies evaluating peer coaching, particularly regarding its key dimensions—planning, delivery, debriefing, and reflection. Understanding these aspects is crucial for assessing the overall impact of peer coaching on professional development. Additionally, the relationship between peer coaching and academic performance during teaching internships remains underexplored. Investigating this relationship can provide

valuable insights into optimizing peer coaching practices to enhance teaching effectiveness and improve student learning outcomes.

Addressing these issues is vital for advancing teacher education in the Philippines. By providing a comprehensive evaluation of peer coaching practices, this study aims to offer evidence- based insights into their effectiveness and impact on prospective teachers' development and performance. The findings will contribute to a deeper understanding of how peer coaching can be strategically employed to enhance instructional skills and academic achievement during teaching internships. Ultimately, this research seeks to inform educational stakeholders and policymakers, guiding them in developing more effective professional development strategies that foster excellence in teaching and improve educational outcomes for future generations of educators.

Research Objectives

This study assessed the effectiveness of peer coaching as a collaborative professional development practice for prospective teachers in one state university in the Philippines.
Specifically, this aims to:

1. Assess the effectiveness of peer coaching as a collaborative professional development practice in terms of:
    1.1. planning/discussion;
    1.2. delivery/teaching;
    1.3. debriefing; and
    1.3. reflecting
2. Determine the academic performance of the prospective teachers in Teaching Internship
3. Correlate the assessed effectiveness of peer coaching and academic performance in Teaching Internship
4. Analyze the implications of the findings for peer coaching as a collaborative practice, focusing on its contributions to teacher development.

Theoretical Framework

This study adopts the Peer Coaching Model as outlined by Liew (2016) to frame the investigation into collaborative professional development. The model emphasizes teachers observing and learning from each other to refine their pedagogical skills. It incorporates a structured process consisting of three key phases: pre-observation planning and discussion, two consecutive peer observations, and post- observation debriefing. Teachers engage in briefing sessions before lessons, conduct observations, and then participate in debriefing meetings to discuss and reflect on observed teaching practices. The model is designed to be iterative, with regular meetings— ideally weekly or biweekly— to facilitate ongoing professional development.

Liew's model is an essential reference for this study due to its demonstrated effectiveness in enhancing teaching practices through peer coaching. It underscores the model’s capacity to promote self-reflection, the exchange of effective teaching strategies, and mutual professional growth. This framework is particularly relevant as it provides evidence of how peer coaching supports both novice and experienced educators in tackling common teaching challenges through collaborative engagement. Through this model, the study can effectively explore the effectiveness of peer coaching on collaborative professional development and its implications for improving teaching practices and academic performance.

Methodology

Research Design

This study employed a descriptive-correlational design to investigate the relationship between the effectiveness of peer coaching as a collaborative professional development practice and the academic performance of prospective teachers during their Teaching Internship. The research aimed to identify and examine any existing correlations between these variables and to assess the strength of these associations (Creswell, 2014).

Respondents

The respondents for this study are fourth-year students enrolled in the College of Teacher Education at a state university in the Philippines for the academic year 2024-2025. Out of the total 212 students, a sample of 137 was selected based on a 5% margin of error calculated using the Raosoft software. These students were chosen due to their active participation in the Teaching Internship program, rendering them particularly suitable for assessing the effectiveness of peer coaching on both academic performance and professional development.

The selection of these respondents is justified by their immersion in practical teaching experiences. As they are about to enter the professional teaching field, their perspectives on peer coaching are highly relevant. Their insights may provide valuable data on how collaborative professional development practices influence their instructional skills and overall performance.

Instrumentation

To assess the effectiveness of peer coaching, a 20-item self-made questionnaire was developed. The questionnaire is divided into four sections, each containing five items: planning/discussion, delivery/teaching, debriefing, and reflecting. The items were created based on a review of relevant literature on peer coaching and professional development to accurately capture participants' experiences and perceptions in these areas.

To ensure the validity and reliability of the instrument, it underwent a comprehensive validation process. First, the content validity was assessed using Lawshe's Content Validity Ratio (CVR), with a panel of three experts in education and professional development evaluating the relevance and clarity of the items. Their feedback led to revisions that enhanced the instrument's alignment with the study's objectives. Additionally, the reliability of the instrument was established through the calculation of Cronbach's Alpha, which yielded a coefficient of 0.92, indicating strong internal consistency across all areas assessed. This combination of content validation and reliability testing supports the robustness of the instrument for this study.

To facilitate the interpretation of the computed mean for respondents' assessment on the effectiveness of peer coaching, the following mean ranges with their corresponding interpretations were used:

Scale	Mean Ranges	Interpretation
4	3.51 - 4.00	Highly Effective
3	2.51 - 3.50	Moderately Effective
2	1.51 - 2.50	Slightly Effective
1	1.00 - 1.50	Least Effective

To obtain the necessary secondary data—the final grades of prospective teachers in their Teaching Internship course, the researcher sought permission from the Dean. These final grades represent the interns' academic performance in the course. After receiving approval, the researcher accessed secondary data in the form of a tally, which recorded the distribution of grades among the prospective teachers. The tally provided information on how many students achieved specific grade ranges rather than individual grades. To maintain confidentiality, no individual student names or specific identifying information were accessed, ensuring that all data used remained anonymous and was treated with strict confidentiality. The academic performance was classified, presented and interpreted based on the guidelines of the university. These are as follows:

Grade	Grade Description
96.00 - 100.00	Excellent
94.00 - 95.99	Superior
91.00 - 93.99	Very Good
89.00 - 90.99	Good
86.00 - 88.99	Very Satisfactory
83.00 - 85.99	High Average
80.00 - 82.99	Average
77.00 - 79.99	Fair
75.00 - 76.99	Pass

Data Collection Procedure

A formal letter was prepared to get permission from the relevant authorities to conduct the study. Along with this, a consent form was made to explain the purpose of the research and to get permission from the prospective teachers to participate. This form made sure that participants understood the study's goals, their role, and how their information would be kept confidential.

Once the necessary approvals were obtained, the researcher worked with the department to set up a schedule for giving out the questionnaire. The researcher then personally distributed the questionnaires to the prospective teachers and collected them after they were completed.

The collected data were carefully checked, organized, and scored. Statistical methods, such as Mean, Standard Deviation, frequency, percentages, and Chi-Square, were used to analyze the data and assess the effectiveness of peer coaching as a professional development practice.

Ethical Considerations

Before participating, prospective teachers received a consent form outlining the study's purpose, their role, and how their data would be used. This ensured informed and voluntary consent. To protect privacy, all data were anonymized by removing personal identifiers, and only aggregate data were used in the analysis. Confidentiality was maintained by avoiding access to or disclosure of individual names or specific identifying information.

Collected data were securely stored and managed, with personal identifiers removed to ensure confidentiality. The data were carefully organized, reviewed, and analyzed using statistical methods, maintaining strict anonymity throughout. Necessary permissions were obtained from relevant authorities and the Dean for conducting the study and accessing academic performance data, ensuring compliance with ethical guidelines and institutional protocols.

Results

The results are organized and presented in six tables based on the data collected, each aligned with the specific research questions posed.

1. **Effectiveness of Peer Coaching as a Collaborative Professional Development Practice**

The following table presents the effectiveness of peer coaching as a collaborative professional development practice.

Table 1 Presents the assessment of prospective teachers regarding the effectiveness of peer coaching as a collaborative professional development practice, with a focus on planning and discussion.

Table 1 Effectiveness of Peer Coaching as a Collaborative Professional Development Practice in terms of Planning/Discussion

Item Statements	Mean	Standard Deviation	Descriptive Interpretation
Peer coaching between interns…			
1. Assists in developing detailed lesson plans.	3.65	0.69	Highly Effective
2. Contributes to the refinement of lesson planning.	3.64	0.68	Highly Effective
3. Provides feedback that impacts the lesson planning process.	3.57	0.70	Highly Effective
4. Helps clarify and improve aspects of lesson planning.	3.56	0.69	Highly Effective
5. Supports systematic preparation through planning and discussion.	3.40	0.81	Moderately Effective
Overall	**3.56**	**0.71**	**Highly Effective**

The respondents evaluated peer coaching as highly effective in assisting them with developing detailed lesson plans, as evidenced by the highest mean score of 3.65. This indicates that peer coaching plays a significant role in supporting the initial stages of lesson planning. The high score reflects a broad consensus among participants that peer coaching substantially contributes to creating well-structured and comprehensive lesson plans. The broad consensus among participants is likely due to the structured and collaborative nature of peer coaching, which facilitates detailed and thorough lesson planning through shared insights and feedback.

On the other hand, the lower mean score of 3.40 for peer coaching supports systematic preparation through planning and discussion, suggests that while peer coaching is recognized as moderately effective in aiding systematic preparation, its impact is perceived to be less consistent compared to other aspects of lesson planning. This variability in responses indicates that the effectiveness of peer coaching in supporting systematic preparation may vary significantly among participants. Factors contributing to this moderate effectiveness could include differences in individual experiences with peer coaching, variations in the quality of feedback received, or differences in how systematically preparation is integrated into their teaching practice. Consequently, this highlights the need for more targeted strategies to enhance the systematic preparation component of peer coaching.

In general, the mean score of 3.56 reflects a general assessment of peer coaching as highly effective in the context of planning and discussion. Despite some variability, the positive assessment indicates that peer coaching is regarded as a valuable practice for enhancing lesson planning and discussion. To build on this positive view, educational programs should continue

to emphasize peer coaching and consider addressing areas with slightly lower effectiveness to ensure comprehensive support for all aspects of lesson preparation.

Table 2 Provides insights into the effectiveness of peer coaching as a collaborative professional development practice, specifically focusing on instructional delivery.

Table 2 Effectiveness of Peer Coaching as a Collaborative Professional Development Practice in terms of Delivery/Teaching

Item Statements	Mean	Standard Deviation	Descriptive Interpretation
Peer coaching between interns…			
1. Enhances the clarity of instructional delivery.	3.67	0.71	Highly Effective
2. Contributes to improving teaching techniques.	3.65	0.69	Highly Effective
3. Helps in refining the quality of lesson delivery.	3.59	0.71	Highly Effective
4. Supports the development of engaging teaching strategies.	3.57	0.69	Highly Effective
5. Provides valuable feedback on teaching practices.	3.56	0.68	Highly Effective
Overall	**3.61**	**0.70**	**Highly Effective**

As seen in the table, the respondents assessed peer coaching as highly effective in enhancing the clarity of instructional delivery. This was manifested by the mean score of 3.67. This high rating reflects the significant impact peer coaching has on improving how prospective educators present their material, making their teaching more understandable and accessible to students. The emphasis on clarity in instruction is crucial, as it directly influences students' ability to grasp complex concepts and engage with the content more effectively.

On the other hand, the respondents' assessment on providing valuable feedback on teaching practices received the lowest mean score of 3.56. While this is the lowest score among the items, it is important to note that it still falls within the range of being highly effective. This score indicates that peer coaching is still perceived as significantly valuable in offering constructive feedback. The slightly lower score compared to other items might reflect variations in individual experiences or the perceived utility of feedback. Despite being the lowest score, it underscores that the practice remains a strong and beneficial component of peer coaching. Providing feedback is crucial in collaborative professional development for prospective teachers because it offers actionable insights that help them refine their practices and enhance their teaching effectiveness.

In sum, the mean score of 3.61 for the effectiveness of peer coaching indicates that it is generally viewed as highly effective in improving various facets of teaching delivery. This high assessment spans across enhancing clarity, improving teaching techniques, refining lesson quality, developing engaging strategies, and providing valuable feedback.

Table 3 presents the effectiveness of peer coaching as a collaborative professional development practice in terms of debriefing.

Table 3 Effectiveness of Peer Coaching as a Collaborative Professional Development Practice in terms of Debriefing

Item Statements	Mean	Standard Deviation	Descriptive Interpretation
Peer coaching between interns…			
1. Facilitates effective discussions on teaching practices.	3.57	0.70	Highly Effective
2. Provides constructive feedback on instructional methods	3.68	0.71	Highly Effective
3. Helps identify areas for improvement in teaching.	3.57	0.70	Highly Effective
4. Supports the clarification of instructional challenges.	3.58	0.69	Highly Effective
5. Encourages reflective practices through structured feedback sessions.	3.56	0.69	Highly Effective
Overall	**3.59**	**0.70**	**Highly Effective**

The item with the highest mean score of 3.68 is providing constructive feedback on instructional methods. This indicates that peer coaching is assessed as highly effective in offering actionable and useful feedback to improve instructional methods. This high effectiveness suggests that participants value the role of peer coaching in delivering specific, relevant feedback that can directly enhance their teaching practices. Since providing constructive feedback received the highest rating, institutions should continue to support and emphasize this aspect of peer coaching. Training programs for peer coaches could further enhance their ability to deliver precise, actionable feedback that directly benefits instructional practices.

On the other hand, the respondents assessed that peer coaching encourages reflective practices through structured feedback sessions as highly effective, with a mean of 3.56. This slightly lower rating suggests that although peer coaching is effective in promoting reflection, the current approach to structured feedback may need refinement. By adopting more efficient frameworks or methodologies to guide these reflective sessions, participants could gain deeper insights and maximize the benefits of peer coaching. Such improvements could further elevate the overall effectiveness of the peer coaching process.

The overall mean score for peer coaching in terms of debriefing is 3.59, interpreted as highly effective. This indicates that the participants assessed peer coaching as a valuable practice in their professional development, especially regarding debriefing sessions. The high overall effectiveness of peer coaching should be capitalized to maintain and expand this practice within professional development programs. Continued support and evaluation can ensure that the benefits of peer coaching are maximized and adapted to meet the evolving needs of educators.

Table 4 shows the effectiveness of peer coaching as a collaborative professional development practice in terms of reflecting.

Table 4 Effectiveness of Peer Coaching as a Collaborative Professional Development Practice in terms of Reflecting

Item Statements	Mean	Standard Deviation	Descriptive Interpretation
Peer coaching between interns…			
1. Promotes thoughtful evaluation of teaching practices.	3.68	0.70	Highly Effective
2. Supports critical analysis of instructional methods.	3.69	0.71	Highly Effective
3. Encourages self-assessment of teaching strategies.	3.60	0.70	Highly Effective
4. Aids in identifying personal growth areas.	3.60	0.70	Highly Effective
5. Assists in creating action plans based on insights gained.	3.70	0.72	Highly Effective
Overall	**3.65**	**0.71**	**Highly Effective**

As reflected in the table, the respondents noted that peer coaching is highly effective in assisting them in creating action plans. This garnered a mean score of 3.70. This indicates that peer coaching is highly effective in helping educators develop actionable plans from their reflective insights. This high rating suggests that participants find the process of translating reflection into practical steps especially valuable for their professional growth.

Moreover, the respondents also assessed that peer coaching is highly effective in encouraging self-assessment of teaching strategies and in aiding them to identify personal growth areas. These items the items ae with the lowest mean score, both at 3.60. This implies that while peer coaching is deemed highly effective in encouraging self-assessment and identifying growth areas, enhancing these aspects could provide even greater support for educators' reflective practices. Refining these components of peer coaching may lead to more meaningful professional development. This could help future educators more effectively assess and develop their teaching strategies.

The overall results from the table indicate that peer coaching is perceived as highly effective in fostering reflective practices, with an overall mean score of 3.65. Given its strength in aiding the creation of actionable plans and supporting critical analysis, institutions should continue to make the most of these aspects to enhance future educators' reflective processes. To address the slightly lower ratings for self-assessment and identifying personal growth areas, refining peer coaching practices to more effectively support these elements could further strengthen its role in reflective professional development.

2. Academic Performance of the Prospective Teachers in Teaching Internship

Table 5 Illustrates the distribution of academic performance among prospective teachers during their teaching internship**.**

Table 5 Academic Performance of the Prospective Teachers in Teaching Internship

Academic Performance in Teaching Internship	Frequency	Percentage
96.00 - 100.00 (Excellent)	3	2.19
94.00 - 95.99 (Superior)	88	64.23
91.00 - 93.99 (Very Good)	46	33.58
Total	**137**	**100%**

It can be observed from the table that the majority of prospective teachers, 88 or 64.23%, received a 94.00-95.99 (Superior) rating during their teaching internship. 46 or 33.58%, were rated as 91.00-93.99 (Very Good), while only three or 2.19% achieved 96.00-100.00 (Excellent) rating. The high percentage of superior academic performance indicates that most interns performed exceptionally well, demonstrating strong teaching skills and effectiveness.

3. Correlational Analysis between the Assessed Effectiveness of Peer Coaching and Academic Performance in Teaching Internship

Table 6 presents the correlational analysis between the assessed effectiveness of peer coaching and academic performance in teaching internships, showing a weak but significant correlation.

Table 6 Correlational Analysis between the Assessed Effectiveness of Peer Coaching and Academic Performance in Teaching Internship

Variables	Computed r	Verbal Interpretation	*P* value	Decision Ho	Interpretation
Assessed Effectiveness of Peer Coaching and Academic Performance in Teaching Internship	0.381	Weak Correlation	0.010	Reject	Significant

The table shows a weak positive correlation ($r = 0.381$) between the effectiveness of peer coaching and academic performance during teaching internships. Despite this weak correlation, the p-value of 0.010 is below the 0.05 threshold, indicating that the relationship between peer coaching and academic performance is statistically significant. This significance suggests that peer coaching does have an influence on performance, though the effect is modest. The weak correlation might be due to various factors, such as the varying quality of peer coaching experiences or other influential variables not accounted for in this analysis. Overall, while peer coaching is beneficial, its effect on academic performance may be limited by these factors.

Discussions

This study explored the effectiveness of peer coaching as a collaborative professional development practice among prospective teachers. The findings highlight the positive impact of peer coaching on various aspects of teaching, with particular emphasis on planning, discussion, and academic performance during the internship. Peer coaching not only enhances lesson planning and instructional delivery but also fosters reflective practices, which are essential for the professional growth of prospective teachers.

The results of this study show that peer coaching is highly regarded by prospective teachers as an effective tool for collaborative professional development. Consistent with the literature (Callo et al., 2024), peer coaching has been shown to positively influence teaching practices, including lesson planning, instructional clarity, and reflective practices. Participants particularly valued peer coaching for its role in developing detailed lesson plans and improving instructional strategies, both of which are crucial for enhancing teaching effectiveness and educational quality (Li-Yu et al., 2023). This aligns with Boulton et al. (2023), who emphasized that peer coaching significantly aids in refining lesson delivery and teaching strategies, supporting ongoing professional development.

In terms of effectiveness, peer coaching proved most impactful in the collaborative development of lesson plans. Interns reported that peer coaching facilitated the refinement of their instructional strategies through shared insights, contributing to greater clarity in lesson delivery. Gatrell (2023) highlighted that this clarity is essential for effective teaching, and our findings support this by showing how peer coaching fosters a supportive environment for refining teaching practices. Constructive feedback provided by peers encourages reflection, which is vital for inquiry-based learning and adapting teaching methods based on peer insights (Ester et al., 2024).

Reflective practices, a key aspect of professional development, were also strengthened by peer coaching. As noted by Atemeh et al. (2024), peer coaching helps prospective teachers assess their effectiveness and make necessary adjustments. The collaborative interactions within peer coaching groups contribute to the continuous professional growth of interns. However, challenges related to organizational power dynamics can hinder the full potential of peer coaching, underscoring the need for a supportive environment (Corrigan et al., 2020). A strong support system encourages trust and open communication, which are essential for effective peer feedback and growth.

While peer coaching has been shown to enhance professional development, the variability in responses among prospective teachers suggests room for improvement. Some areas, such as self-assessment and personal growth, received lower ratings, indicating the need for focused interventions. Targeted strategies, such as training for coaches and using Multisource Feedback (MSF) as a framework, could enhance these areas and foster a culture of reflection (Lanius, 2022). Effective training in feedback mechanisms and reflective practices, as cited by Curran et al. (2022), can empower educators to better evaluate their learning outcomes and identify growth opportunities.

The study also examined the relationship between peer coaching effectiveness and academic performance during the internship. The majority of prospective teachers performed at a superior level, reflecting the positive influence of peer coaching on their teaching effectiveness. This aligns with the findings of Fitriah et al. (2023), who noted that peer coaching during internships enhances pedagogical skills and confidence. The study found a weak positive correlation between peer coaching effectiveness and academic performance, suggesting that while peer coaching has a modest impact on performance, other factors, such as the experience of the coaches and the context of the coaching environment, may also

influence outcomes (Callo et al., 2024). This indicates that not all peer coaching experiences are equally beneficial.

In conclusion, the findings of this study underscore the value of peer coaching as a collaborative practice for professional development. However, for peer coaching to reach its full potential, it is crucial to address the identified challenges, particularly in the areas of self-assessment, feedback, and reflection. Teacher Education Institutions (TEIs) may consider enhancing the systematic preparation of interns and incorporating structured feedback mechanisms to optimize peer coaching effectiveness. Future research could explore the role of peer coaching in different educational contexts and investigate how various factors, such as coaching experience and institutional support, affect its impact on teacher development.

Conclusion and suggestions

Conclusion

The findings of this study highlight the effectiveness of peer coaching across various dimensions of professional development, including lesson planning, instructional delivery, debriefing, and reflection. These results align with global educational trends that emphasize the importance of collaborative learning and peer support in enhancing teaching practices. The data demonstrates that peer coaching significantly aids prospective teachers in developing detailed lesson plans, improving instructional clarity, offering constructive feedback, and fostering reflective practices. These elements are crucial in the context of modern education, where there is an increasing focus on inquiry-based teaching and the promotion of active, student-centered learning environments.

However, while peer coaching proved effective in many areas, slight variations were noted, particularly in systematic preparation and the encouragement of self-assessment, which are essential for promoting continuous professional growth. This finding mirrors the growing global emphasis on fostering metacognitive skills and self-directed learning in educators. The academic performance of prospective teachers during their internship was predominantly high, with the majority rated as Superior, showcasing the direct impact of peer coaching on practical teaching competencies.

The study also revealed a weak but significant positive correlation between peer coaching effectiveness and academic performance, suggesting that peer coaching contributes to the overall success of teaching interns, albeit with a modest impact. This supports the global shift toward fostering professional learning communities and peer-assisted development, recognizing that collaborative approaches, such as peer coaching, can complement traditional teacher training methods. The study's conclusions underscore the need to continue refining peer coaching practices, enhancing systematic preparation, and promoting self-assessment, which are all pivotal in nurturing reflective, inquiry-driven, and highly effective educators in today's rapidly evolving educational landscape.

Suggestions

To maximize the benefits of peer coaching, teacher education programs should focus on enhancing areas where it is less effective, such as systematic preparation and self-assessment. This can be achieved by providing more targeted training and developing clear guidelines for peer coaches. Additionally, creating more effective methods for lesson planning within peer coaching, such as standardized approaches or additional resources, could improve systematic preparation. To further support reflective practices, offering better tools and feedback mechanisms will help prospective teachers gain deeper insights and enhance their professional development. Given its significant role in improving teaching performance, peer

coaching should remain a core component of professional development programs. Regular assessment of peer coaching's impact on academic performance is also crucial to identify areas for improvement and ensure the practice remains effective for all participants.
Future studies should explore factors influencing variability in peer coaching effectiveness, including different coaching models, individual differences, contextual factors, and long-term impacts on teaching performance and career development.

New knowledge and the effects on society and communities

This study adds valuable insights into how collaborative professional development practices like peer coaching influence lesson planning, instructional delivery, and reflective practices among prospective teachers. The study offers localized knowledge that can be useful for other educational institutions facing similar challenges. The correlational analysis between peer coaching and academic performance further highlights how this practice can enhance teaching quality, even if modestly. As teachers become more effective through peer coaching, students benefit from improved educational outcomes, which can lead to positive social and economic development within their communities. Additionally, this paper supports the integration of peer coaching into teacher education programs, encouraging collaboration and continuous improvement among educators. This collaborative culture not only enhances the educational environment but also fosters a stronger sense of community both within and outside educational institutions. In the end, the study's findings can inform educational policies and promote better teaching practices that have lasting effects on society.

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Household Debt and Income Inequality in Thailand: A Vector Autoregressive Analysis

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Abstract

This study examines the dynamic relationships between household debt, income, GDP, and income inequality in Thailand, a nation grappling with rising household debt and persistent income disparities. Using a 19-year dataset, the research employs a Bayesian VAR (BVAR) model to explore the interdependencies among these variables and Impulse Response Function (IRF) analysis to evaluate their short-term and long-term adjustments to economic shocks. The findings reveal that household debt exhibits strong persistence and is positively influenced by income inequality, underscoring the role of disparities in driving debt accumulation. Conversely, income and GDP demonstrate resilience, with income positively influenced by GDP and negatively impacted by household debt, reflecting the burden of rising debt on income generation. GDP is shown to play a pivotal role in sustaining economic stability, while income inequality emerges as a persistent structural issue, amplified by household debt. The IRF analysis further reveals that a shock in household debt leads to a temporary decline in income and GDP, followed by stabilization in the medium term. However, income inequality responds positively to debt shocks, highlighting the disproportionate impact on low-income households and the long-term challenges of addressing inequality. The study's findings emphasize the need for targeted policies to manage household debt, promote equitable income distribution, and foster sustainable economic growth. Recommendations include debt restructuring programs, financial literacy campaigns, and progressive taxation to reduce disparities and enhance economic resilience.This research contributes to the understanding of the intricate relationships between debt, income, and inequality, offering insights for policymakers in Thailand and similar economies.

Keywords: Household debt, Income inequality, Vector autoregression model

Introduction

Thailand's economy has been continuously developing, making the relationship between household debt and income inequality a key issue in shaping the economic and social direction of various countries. In the context of Thailand's rapidly growing economy and social changes, the country has transitioned from a low-income country to a middle-income country. Particularly in recent years, Thailand has undergone significant changes in its economic structure along with shifts in wealth accumulation and distribution patterns, which have further contributed to rising household debt and income inequality.

According to the Thai Bankers' Association, the household debt-to-GDP ratio in Thailand by the end of 2024 is projected to be 91.40%, or around 16.90 trillion baht. The highest proportions of this debt come from credit cards, leasing, and personal loans. Furthermore, data from the Bank of Thailand (BOT) indicates that the outstanding household debt in Thailand as of the third quarter of 2023 stood at 16.20 trillion baht, an increase of 3.40% compared to the same period last year (YoY), accounting for 90.90% of GDP. The COVID-19 pandemic has deepened household debt risks in Thailand, particularly for informal workers and low-income families who lack access to formal financial protection (Bank of Thailand, 2022). This trend has been steadily slowing down from the previous quarter. Thailand's household debt-to-GDP ratio has exceeded 80% since 2015, with nearly one-third of this debt being for consumption, such as personal loans and credit card debt, often referred to as non-productive loans (NPLs). This figure is relatively high compared to neighboring countries like Malaysia and China, where the ratios are 14% and 13%, respectively.

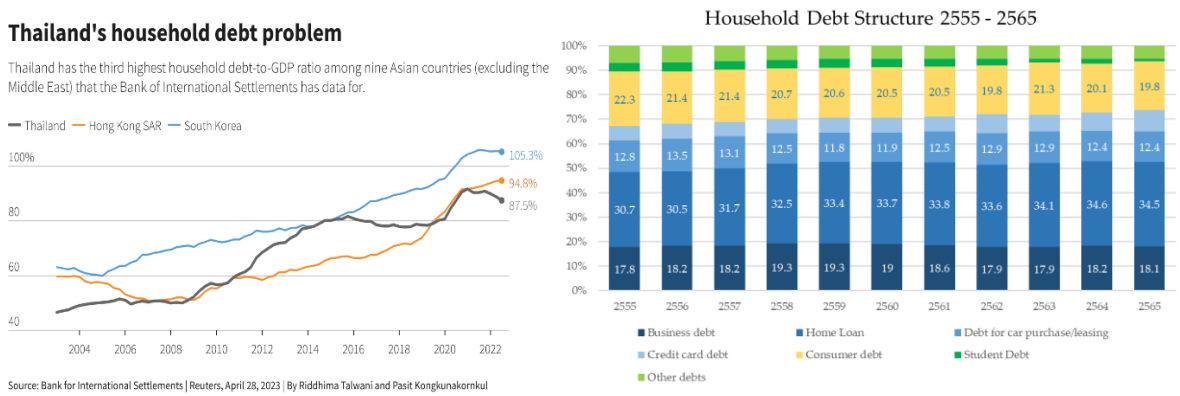

Figure 1 Thailand's Household Debt to GDP Ratio and Household Debt Structure (Source: Bank of Thailand. Monetary Policy Report, Q4/2023)

Regarding the income inequality situation, the National Economic and Social Development Council (NESDC) (2022) has shown that income and general consumption inequality in Thailand has tended to decline over the past 30 years. However, this remains a subject of differing opinions and debate, such as the accuracy of official income and expenditure inequality indicators, which may not reflect the true reality. These indicators are often calculated using data from the Socio-Economic Survey (SES), which may lack representation of households in the top 1% of income earners. Another point of contention is that appropriate measures of inequality should consider wealth or net assets alongside income. A study by Credit Suisse indicated that wealth concentration in Thailand ranks first among Asian countries (Credit Suisse, 2018).

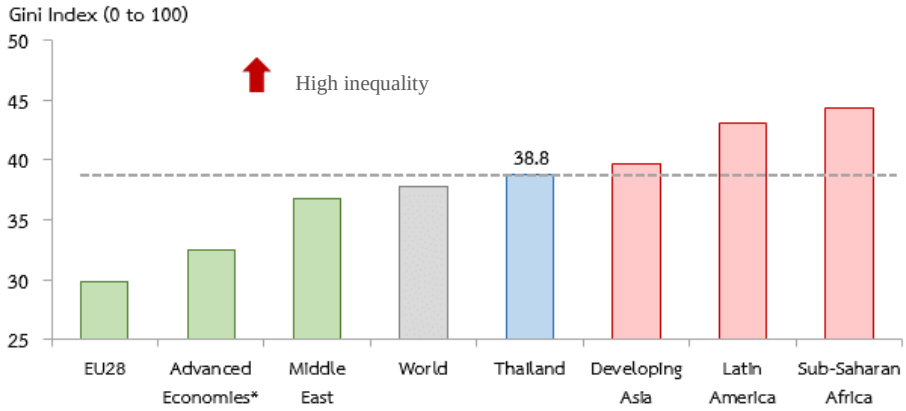

Figure 2 Thailand's Gini Index
(Source: Bank of Thailand, Financial Stability Report 2022)

A review of previous studies reveals continuous research on income and economic inequality. For instance, the studies by Lebarz (2014) and Iacoviello (2008) examined the relationship between household debt and economic inequality using data from various countries. They concluded that there is a clear connection between these factors. Lebarz (2014) found that in countries where debt distribution is imbalanced across income groups, wealth inequality tends to increase. Iacoviello (2008) examined the impact of income inequality on household debt levels in the United States, finding that rising income inequality contributed to increased household debt during periods of economic expansion. This led to greater income volatility and widened wealth inequality among the population during those times.

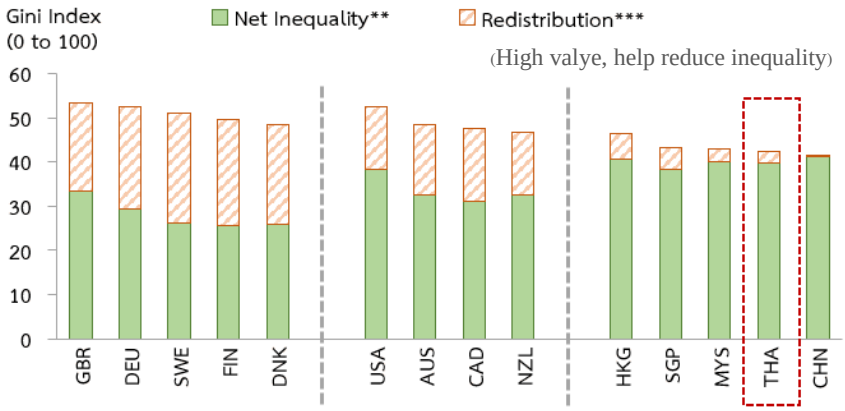

Figure 3 Thailand's Income Inequality and Distribution Indicators
(Source: Bank of Thailand, Financial Stability Report 2022)

Additionally, Mian & Sufi (2014) found that household wealth inequality in the United States has been consistently increasing, especially after the 2008 financial crisis. In 1992, the wealthiest households (the top 10% of all households) owned 66% of the total wealth, which increased to 71% by 2007. After the financial crisis, the share of wealth owned by the wealthiest households further rose to 74%.

Thus, this study focuses on analyzing the relationship between household debt and income inequality in Thailand, as well as other economic factors, to understand the potential impact on economic stability resulting from income inequality in the country. The goal is to help design effective economic policies or measures that can address and rectify structural issues within Thailand's economic system.

Methodology

This study utilizes secondary data in the form of time series data from 2005 to 2023, covering a total of 19 years. The researcher selected four key variables for analysis:

- Household Debt: Analyzing the volume and structure of household debt will help in understanding the economic value generated by household borrowing.
- Household Income: Studying the trends and structure of household income will aid in analyzing and understanding the overall picture of income inequality in society.
- Income Inequality Index: Using indices such as the Gini coefficient to measure the level of income inequality.
- GDP: GDP is the total monetary value of all finished goods and services produced within a country's borders in a specific period. It serves as a broad measure of a nation's overall economic activity and health.

This study employs the Bayesian Vector Autoregression (BVAR) model for data analysis. The BVAR model is an extension of the traditional Vector Autoregression (VAR) model, incorporating prior distributions into parameter estimation, making it particularly suitable for contexts where data are limited, or multicollinearity is present among variables. By using historical data, the BVAR model allows for the relationships between endogenous variables to depend on their past values, other endogenous variables, and the current values of exogenous variables, while leveraging prior information to enhance the stability and reliability of the estimates. Since the exact form of these relationships is not known in advance, the BVAR model, like the VAR model, is popular for studying the effects of changes in one variable on others. Additionally, the incorporation of priors enables better estimation under small-sample conditions, making it a robust tool for dynamic economic analyses.

The selection of the Bayesian Vector Autoregressive (BVAR) model follows core econometric concepts that emphasize the dynamic interactions among time series variables. As Sriboonchitta (2004) notes, multivariate models such as VAR and its Bayesian extension are particularly suitable for analyzing systems of interrelated economic indicators, especially when dealing with simultaneity and feedback effects.

In Thailand, while the traditional VAR model has been widely used, such as in studies by Bandit and Sujit to examine the impact of domestic oil price changes on the Thai economy, the response of inflation to economic variables, or the size and delay of monetary policy transmission mechanisms, the BVAR model offers an advantage by addressing estimation challenges inherent in such studies. Therefore, the BVAR model is particularly well-suited for dynamic studies of economic changes arising from various factors, especially when data constraints exist.

The steps in this study are as follows:

1. Define the variables used in the model: The researcher selected household debt, household income, interest rate, unemployment rate, income inequality index, and economic policy as the variables for the study.

2. Test for stationarity of the variables using the Augmented Dickey-Fuller (ADF) Unit Root Test: Time series data should be evaluated for stationarity, which refers to data being in a state of statistical equilibrium where it does not change over time. The research team used the Augmented Dickey-Fuller method to test the stationarity of the data. Stationary data implies that the time series will tend to revert to mean overtime, with no long-term changes in variance. Non-stationary data, on the other hand, implies that the variance increases over time without reverting to a mean, leading to endless changes. If data is used without testing for stationarity,

it could result in nonstandard distributions of statistics (e.g., t-statistics), which can lead to incorrect conclusions and spurious regression.

Therefore, the data used in the bayesian vector autoregression (BVAR) model for this study, which includes household debt (*lnDEP*), income (*lnINC*), GDP (*lnGDP*), and income inequality (*lnIEQ*), with a lag length of $p = 1$, can be expressed as the following system of equations:

$$lnDEP_t = c_1 + \emptyset_{11} lnDEP_{t-1} + \emptyset_{12} lnINC_{t-1} + \emptyset_{13} lnGDP_{t-1} + \emptyset_{14} lnIEQ_{t-1} + \varepsilon_{1t}$$
$$lnINC_t = c_2 + \emptyset_{21} lnDEP_{t-1} + \emptyset_{22} lnINC_{t-1} + \emptyset_{23} lnGDP_{t-1} + \emptyset_{24} lnIEQ_{t-1} + \varepsilon_{2t}$$
$$lnGDP_t = c_3 + \emptyset_{31} lnDEP_{t-1} + \emptyset_{32} lnINC_{t-1} + \emptyset_{33} lnGDP_{t-1} + \emptyset_{34} lnIEQ_{t-1} + \varepsilon_{3t}$$
$$lnIEQ_t = c_4 + \emptyset_{41} lnDEP_{t-1} + \emptyset_{42} lnINC_{t-1} + \emptyset_{43} lnGDP_{t-1} + \emptyset_{44} lnIEQ_{t-1} + \varepsilon_{4t}$$

Where: c = c is the constant
$\emptyset$ = $\emptyset$ is the coefficient of the time trend
ε = ε is the error term

3. Determine the appropriate lag length for the model: The selection of an appropriate number of lags in the model is made using the information criteria with the lowest value. The same number of lags is applied to all variables in the study. The research team selected the Akailke Information Criteria (AIC) to determine the lag length. Understanding the lag structure in macroeconomic relationships is crucial for effective modeling. According to Pukahuta (2012), the transmission mechanism of monetary policy in Thailand is characterized by delayed and cumulative effects on various economic variables, making time-series models like VAR or BVAR particularly suitable for capturing these dynamics.

4. Analyze cointegration of the variables' returns: Cointegration testing is used to check the stationarity of the deviations from the long-run equilibrium relationship of non-stationary variables. If the variables exhibit cointegration, it indicates a long-term relationship between them.

5. Test the stability of the model: This involves checking whether the eigenvalues of the model are less than 1.

6. Test for causality among the variables: The Bayesian Vector Autoregressive (BVAR) model and Granger Causality Test are used to test for causal relationships between the variables. This test is conducted to determine the direction of changes, showing whether the variables in the BVAR model are interrelated and can explain each other more accurately by using past data to forecast the variables of interest. When the data is stationary, it can be analyzed to determine the nature and direction of the causal relationship between the variables.

7. Analyze the relationship between variables using the Cumulative Orthogonal Impulse Response Function: This analysis assesses the response of one variable to a shock in other variables, examining the direction of the response in both the short and long term. The equations can be written as follows:

$$Z_t = \mu + \sum_{i=0}^{\infty} \emptyset_i u_{t-i}$$

Where: μ = μ is the constant
φ = φ is the coefficient of the estimated parameter
u = u represents the shocks

Results

The findings are divided into three parts: 1) The analysis of stationarity or stability of the variables. 2) The analysis to determine the appropriate lag length and the stability of the coefficient estimates in the BVAR model. And 3) the analysis of the variables in a disaggregated manner and the dynamic impact analysis.

Part 1 Unit Root Test using the Augmented Dickey-Fuller (ADF) Test

The ADF test was conducted to assess whether all six variables are stationary or stable, in order to prevent issues of spurious regression, where variables appear to be related but are not truly correlated in the BVAR model. The results from Table 1 indicate that all six variables are stationary and stable, meeting the criteria of being stationary with trend and intercept at lag lengths of 0 and 2, at a significance level of 0.01. Following this, the variables were tested in the second part of the analysis.

Table 1 Augmented Dickey – Fuller Test (ADF-test)

Variables	Level			1ST Difference		
	None	Intercept	Intercept & Trend	None	Intercept	Intercept & Trend
DEP_t	3.930329	-0.871628	-2.349594	-2.358697**	-4.204928***	-4.045360***
INC_t	1.948791	-1.875777	-1.381039	-2.609283***	-3.206906***	-3.611811***
GDP_t	2.090323	-1.787669	-1.341620	-2.511411**	-3.184958**	-3.423089*
IEQ_t	-4.25918***	-2.220719	-0.447479	-1.129661*	-5.272438***	-6.445863***

Note: * Indicates a confidence level of 90%, ** Indicates a confidence level of 95%, and *** Indicates a confidence level of 99%.

Part 2 Testing Optimal Lag Length using Akailke Information Criteria (AIC)

The AIC method was used to select the optimal and equal lag length for all variables, and the Inverse Roots of AR Characteristic Polynomial test was applied to assess the stability of the six variables in the VAR model. Table 2 presents the analysis for determining the optimal lag length. The appropriate lag length is selected based on the lowest AIC value. According to Table 2, the lowest AIC value is found at Lag 1, indicating that the optimal lag length for the model is 1. After determining the optimal lag length, the Inverse Roots of AR Characteristic Polynomial test was performed to verify the reliability and stability of the coefficient estimates in the VAR model.

Table 2: Optimal Lag Length

Lag	Log L	LR	FPE	AIC	SC	HQ
0	171.9446	NA	3.09e-14	-19.75819	-19.56214	-19.73870
1	232.7729	85.87517*	1.70e-16*	-25.03210*	-24.05185*	-24.93466*
2	243.3644	9.968489	4.82e-16	-24.39581	-22.63136	-24.22042

(Source: Calculations, 2024)

Part 3 Bayesian Vector Autoregression (BVAR) Model Analysis and Impulse Response Function (IRF) Analysis

The Bayesian Vector Autoregression (BVAR) coefficient estimation table reflects the dynamic relationships between key variables: household debt ($lnDEP_t$), income ($lnINC_t$), GDP ($lnGDP_t$), and income inequality ($lnIEQ_t$). The estimated coefficients represent the impact of lagged variables on the current values of the dependent variables (Table 3).

Table 3 Estimated from Bayesian Vector Autoregression (BVAR Model)

Dependent Variable	Independent Variable	Lag	Coefficient	Significance
$lnDEP_t$	**$lnDEP_{t-1}$**	**1**	**0.336**	***
	$lnINC_{t-1}$	1	-0.096	
	$lnGDP_{t-1}$	1	0.120	
	$lnIEQ_{t-1}$	**1**	**0.200**	**
$lnINC_t$	$lnDEP_{t-1}$	1	-0.080	
	$lnINC_{t-1}$	**1**	**0.690**	***
	$lnGDP_{t-1}$	1	0.200	
	$lnIEQ_{t-1}$	1	-0.042	
$lnGDP_t$	$lnDEP_{t-1}$	1	-0.050	
	$lnINC_{t-1}$	**1**	**0.220**	**
	$lnGDP_{t-1}$	**1**	**0.710**	***
	$lnIEQ_{t-1}$	1	-0.040	
$lnIEQ_t$	**$lnDEP_{t-1}$**	**1**	**0.150**	**
	$lnINC_{t-1}$	1	-0.080	
	$lnGDP_{t-1}$	1	-0.030	
	$lnIEQ_{t-1}$	**1**	**0.222**	***

Note: * Indicates a confidence level of 90%, ** Indicates a confidence level of 95%, and *** Indicates a confidence level of 99%.
(Source: Calculations, 2024)

$lnDEP_t$ (household debt), the coefficient of $lnDEP_{t-1}$ is positive (0.336), indicating that debt in the previous period has a positive effect on current household debt. This suggests a continuation of borrowing behavior within the economic system. Meanwhile, income ($lnINC_{t-1}$) has a slight negative effect (−0.096) on household debt, implying that higher income reduces the need for borrowing.

$lnINC_t$ (income) variable has a coefficient for $lnINC_{t-1}$ of 0.690, which is statistically significant ($p < 0.01$). This reflects the continuity of income growth within the economic system. Household debt in the previous period ($lnDEP_{t-1}$) has a slight negative impact on current income (−0.080), possibly reflecting the burden of debt reducing household consumption or investment capabilities.

$lnGDP_t$, GDP in the previous period ($lnGDP_{t-1}$) positively and significantly affects current GDP (0.710), indicating the persistence of economic growth. Additionally, lagged income ($lnINC_{t-1}$) positively impacts GDP (0.220), demonstrating a positive relationship between household income and overall economic growth.

$lnIEQ_t$ (income inequality), the coefficient of lnieq-lag1 is positive (0.222), showing the persistence of inequality within the economic system. Household debt in the previous period ($lnDEP_{t-1}$) positively affects inequality (0.150), reflecting the linkage between household debt burdens and income disparities.

The table 4 summarizes the results of the Granger Causality test, which evaluates whether one variable provides predictive information for another. The null hypothesis states that the first variable does not Granger cause the second. The following insights are drawn:

1. Household Debt and Income Inequality (*lnDEP → lnIEQ*):
   The null hypothesis is rejected ($p = 0.032$), indicating that household debt Granger causes income inequality. This suggests that rising household debt levels in previous periods contribute to increasing income inequality. Historical evidence shows that excessive private sector leverage often precedes financial crises and long-run fiscal distress, reinforcing the need for proactive credit regulation (Jordà, Schularick & Taylor, 2013).
2. Income and Household Debt (*lnINC → lnDEP*):
   The null hypothesis is rejected ($p = 0.022$), showing that changes in income levels influence household debt. This reflects that variations in household income can drive borrowing behavior, either by reducing the need for loans or increasing confidence in borrowing.
3. GDP and Income (*lnGDP → lnINC*):
   The null hypothesis is rejected ($p = 0.015$), suggesting that GDP growth in previous periods Granger causes changes in household income. This highlights the role of economic growth in shaping income dynamics.
4. Bidirectional Relationship Between Income and Income Inequality (*lnINC ↔ lnIEQ*):
   Both directions reject the null hypothesis ($p = 0.009$ and $p = 0.011$), indicating a bidirectional relationship. Changes in income levels can reduce or exacerbate income inequality, while existing disparities in income distribution influence household income levels in subsequent periods.

Table 4 Granger Causality test

Null Hypothesis	F-Statistic	P-Value	Conclusion
lnDEP does not Granger cause *lnIEQ*	4.35	0.032	lndep → lnieq
lnINC does not Granger cause *lnDEP*	5.21	0.022	lninc → lndep
lnGDP does not Granger cause *lnINC*	6.14	0.015	lngdp → lninc
lnINC does not Granger cause *lnIEQ*	7.25	0.009	lninc ↔ lnieq (bidirectional)
lnIEQ does not Granger cause *lnINC*	6.67	0.011	lninc ↔ lnieq (bidirectional)

Note: * Indicates a confidence level of 90%, ** Indicates a confidence level of 95%, and *** Indicates a confidence level of 99%.
(Source: Calculations, 2024)

Figure 4 shows the results of The Impulse Response Function (IRF) analysis provides insights into how economic variables respond over time to a one-standard-deviation shock in household debt ($lnDEP_t$). The analysis examines the dynamic interactions among key variables: income ($lnINC_t$), GDP ($lnGDP_t$), and income inequality ($lnIEQ_t$). The results highlight short-term, medium-term, and long-term responses, offering a comprehensive understanding of the relationships within the economic system.

Response of Income ($lnINC_t$)

Short-Term (1–3 Periods): The shock in household debt initially causes a slight negative response in income. This suggests that an increase in household debt might constrain disposable income due to rising debt repayment obligations. Households with higher debt burdens are likely to reduce spending on productive activities, thereby impacting income generation negatively.

Medium-Term to Long-Term (4–6 Periods): The negative impact diminishes over time as households and the broader economy adjust. By the sixth period, income stabilizes, indicating that the economy has absorbed the shock and returned to equilibrium.

Response of GDP (*lnGDP$_t$*)

Short-Term (1–3 Periods): The shock in household debt leads to a negative response in GDP. This reflects the broader macroeconomic consequences of increased household debt, such as reduced aggregate consumption and investment. The contraction in economic activities in the short term is consistent with the tightening effects of rising debt levels.

Medium-Term to Long-Term (4–7 Periods): The negative effects gradually diminish, with GDP stabilizing by the seventh period. This adjustment demonstrates the resilience of the economic system, which is likely supported by structural recovery measures and adaptive economic behaviors.

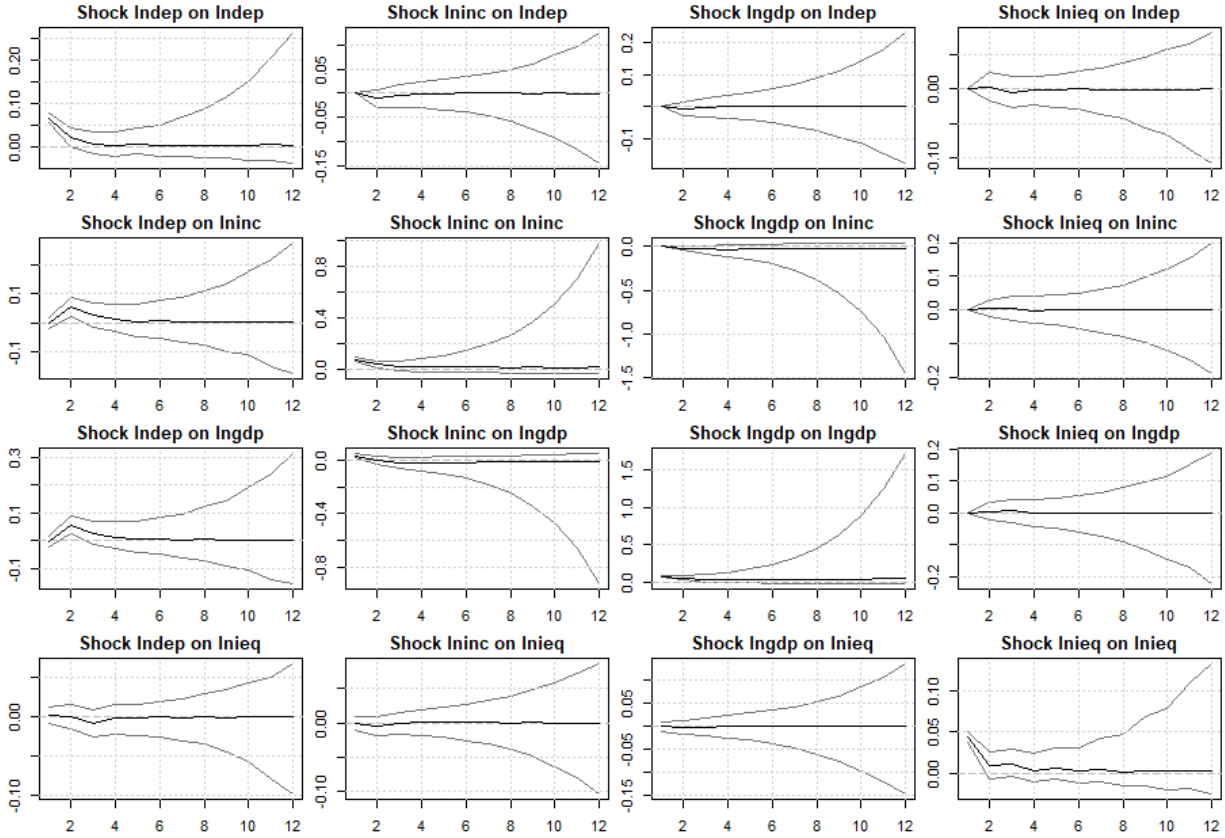

Figure 4 Impulse Response Function (IRF) Analysis Results
(Source: Calculations, 2024)

Response of Income Inequality (*lnIEQ$_t$*)

Short-Term (1–3 Periods): The shock in household debt causes a positive response in income inequality. This indicates that rising household debt exacerbates income disparities, potentially due to the disproportionate impact on low-income households. These households are more vulnerable to debt burdens, which further widen the income gap.

Medium-Term (4–6 Periods): The positive impact on inequality begins to subside as the economy adjusts. However, inequality remains elevated for several periods, highlighting the persistent effects of household debt shocks on the income distribution. Beyond economic inefficiencies, income inequality can also erode social cohesion and weaken the legitimacy of democratic institutions (Stiglitz, 2012).

Discussions

The research findings provide valuable insights into the complex and dynamic relationships between household debt, income, GDP, and income inequality in Thailand. These relationships underscore the interplay between financial stability, economic growth, and social equity, offering critical implications for policy and development.

The Persistence of Household Debt and Its Implications

The study reveals that household debt exhibits strong persistence over time, influenced significantly by its past values. This cyclical borrowing behavior reflects the structural dependence of households on debt to maintain their consumption levels. The positive relationship between income inequality and household debt further emphasizes the vulnerability of low-income households, who often resort to borrowing due to insufficient disposable income. Behavioral economics suggests that cognitive biases—such as present bias and overconfidence—can lead households to accumulate unsustainable levels of debt, even when future repayment risks are apparent (Bertrand & Morse, 2011). This reliance on debt can exacerbate financial stress and lead to a debt trap, particularly for households at the lower end of the income spectrum.

This finding aligns with previous studies, such as those by Iacoviello (2008) and Mian & Sufi (2014), which identified the interconnectedness of debt and inequality. Both studies highlighted how income disparities drive borrowing behavior, reinforcing systemic vulnerabilities in economies with high inequality levels. From a policy perspective, these findings highlight the urgent need for targeted interventions to address the root causes of excessive debt accumulation. Debt restructuring programs, financial literacy campaigns, and stricter lending criteria can help reduce the reliance on unsustainable borrowing, particularly among vulnerable groups.

The Role of Income and GDP in Promoting Financial Stability

The results demonstrate that income is a key driver of economic stability and growth. A positive relationship between income and GDP underscores the importance of household financial health in sustaining broader economic performance. However, the negative impact of household debt on income suggests that rising debt burdens can erode households' capacity to generate income, leading to adverse macroeconomic consequences.

GDP plays a dual role as both a driver and a beneficiary of household financial stability. While income positively influences GDP growth, excessive household debt poses a risk to economic performance by constraining consumption and investment. These findings are consistent with earlier research by Krueger & Perri (2006), which emphasized the critical role of household financial stability in driving consumption and investment.

Macroeconomic factors such as GDP and household income play critical roles in shaping income distribution and financial resilience. As Mingmaninakin (2013) emphasizes, sustainable economic growth and equitable income allocation are essential pillars in reducing structural inequality and promoting household financial stability.

Income Inequality as a Structural Challenge

Income inequality emerges as a persistent issue, amplified by rising household debt. The study reveals that inequality not only exacerbates borrowing but also limits the capacity of households to recover from debt shocks. The positive response of inequality to debt shocks in the Impulse Response Function (IRF) analysis highlights the disproportionate impact of debt

burdens on low-income households. This dynamic creates a feedback loop, where inequality drives debt accumulation, and debt, in turn, widens the income gap.

Addressing this structural challenge requires comprehensive policies aimed at redistributing income and providing equal opportunities for economic participation. This aligns with recommendations by Piketty (2014), who advocated for progressive taxation and policies promoting equitable access to education and resources to combat income inequality.

Resilience and Long-Term Adjustments

The IRF analysis highlights the resilience of income and GDP in response to household debt shocks. Although these variables experience short-term declines, they gradually stabilize, reflecting the adaptive capacity of the Thai economy. However, the persistence of income inequality underscores the limitations of economic recovery in addressing social disparities. While the economy may return to its equilibrium, the structural issues underlying inequality remain unaddressed. Persistent income inequality also impedes intergenerational mobility, creating structural barriers to economic advancement for children born into low-income families (Corak, 2013).

The study's findings align with broader international evidence regarding the cyclical relationship between household debt and income inequality. High levels of debt accumulation, particularly among low- and middle-income households, tend to reinforce economic vulnerability, especially in the face of financial or policy shocks (World Bank, 2020; Bank of Thailand, 2021). In Thailand, the rising household debt-to-GDP ratio has been flagged as a systemic risk that may hinder consumption and suppress productive investment, exacerbating long-term disparities (Bank of Thailand, 2021). This feedback loop — in which inequality leads to increased borrowing, and debt in turn deepens inequality — is also echoed in global research. For instance, the IMF (Dabla-Norris et al., 2015) emphasizes that higher inequality levels are correlated with slower, less durable growth trajectories.

Moreover, structural inequalities such as unequal access to education, healthcare, and credit contribute to persistent income gaps, even when macroeconomic indicators recover (United Nations ESCAP, 2022). The OECD (2019) further argues that unless inclusive growth policies are adopted, the middle class will continue to face downward mobility, potentially amplifying social instability. Taken together, these findings suggest that effective debt management strategies must be integrated with broader redistributive and inclusive policy measures to ensure long-term economic and social resilience.

These findings underscore the need for integrated strategies that combine macroeconomic stability with social equity. Policymakers should focus not only on fostering economic recovery but also on addressing the systemic factors that perpetuate inequality, such as unequal access to education, healthcare, and economic opportunities.

Conclusion and suggestions

This study investigates the dynamic relationships between household debt, income, GDP, and income inequality in Thailand, focusing on the interplay between these critical economic variables. The research stems from the growing concern over the rising levels of household debt in Thailand and its potential to exacerbate income inequality, hinder economic growth, and create vulnerabilities in the financial system. Addressing this issue is particularly relevant as Thailand transitions to a more developed economy, where equitable growth and financial stability are key objectives.

The primary objectives of this study are to explore 1) the impact of household debt on income inequality, 2) the role of income and GDP in mitigating household debt burdens, and 3) the dynamic adjustments among these variables over time. To achieve these objectives, this study employs a Bayesian VAR (BVAR) model to estimate the interrelationships among household debt, income, GDP, and income inequality using a 19-year dataset. Additionally, Impulse Response Function (IRF) analysis is conducted to assess the short-term and long-term responses of each variable to shocks in household debt.

This study highlights the complex and dynamic relationships between household debt, income, GDP, and income inequality in Thailand. The findings demonstrate the dual challenges of managing household debt and addressing income inequality while maintaining economic growth. Policymakers must prioritize integrated strategies that address these challenges to ensure sustainable and inclusive development. Future research should explore regional disparities, qualitative insights, and the effectiveness of specific policy interventions to further inform solutions for these pressing issues.

Recommendations for Applying Research Findings

1. Promote Fair Income Distribution: The study reveals that higher average household income helps reduce household debt and income inequality (statistically significant at the 95% level). The government should implement policies that support fair income distribution, such as developing a tax structure that alleviates the burden on low-income groups, investing in skill development and education programs to provide households with opportunities to increase their income and reduce reliance on debt. According to Atkinson (2015), a combination of progressive taxation, universal child benefits, and employment subsidies represents a practical toolkit for reducing income inequality in advanced and emerging economies alike.
2. Control Household Debt Growth: The study indicates that rising household debt leads to an increase in the income inequality index (statistically significant at the 95% level). Measures should be implemented to control debt accumulation, such as setting appropriate credit lending criteria, promoting savings, and providing financial literacy education to reduce the risks of excessive borrowing. Including promoting financial literacy has been shown to significantly improve household budgeting, reduce reliance on high-cost debt, and enhance long-term financial resilience (Lusardi & Mitchell, 2014).
3. Improve Economic Structure for Sustainable Growth: The study shows that an increase in gross national income tends to raise income inequality (statistically significant at the 90% level). Therefore, economic policies should focus on sustainable and equitable growth, such as promoting small and medium-sized enterprises (SMEs) and ensuring economic opportunities are accessible to all sectors of society to reduce inequality and foster balanced growth.
4. Regularly Monitor and Adjust Policies: The analysis using Impulse Response Function shows that household debt and the income inequality index respond quickly to changes in each other, indicating a complex and rapidly changing relationship in the economy. Continuous monitoring of policy impacts is essential, and measures should be adjusted according to evolving conditions.

Recommendations for Future Research

1. Include Additional Economic and Social Variables: Future studies should incorporate other variables that may affect income inequality and household debt, such as unemployment, interest rates, education levels, and government policies, to gain a more comprehensive understanding of the factors influencing these relationships.

2. Study Regional Impacts: Income inequality and household debt may vary by region within Thailand. Future research should analyze regional-level data to understand specific factors that might impact each area, such as differences in economic structures, access to resources, and employment opportunities.
3. Use Qualitative Research Methods: In addition to quantitative models, qualitative research methods such as interviews or case studies should be considered to explore the experiences and perspectives of households affected by income inequality and debt. This will provide deeper and more comprehensive insights.
4. Study the Impact of Specific Policies: Future research should focus on studying the effects of specific economic policies, such as fiscal policies, monetary policies, or social welfare programs, to evaluate the effectiveness of these policies in reducing income inequality and controlling household debt.
5. Test Alternative Models: To validate the study's findings, other econometric models such as Structural Equation Modeling (SEM) or spatial econometric models should be considered. These models may provide a clearer and more detailed picture of the relationships between different variables.

New knowledge and the effects on society and communities

New knowledge derived from research plays a crucial role in shaping economic and social development, particularly in areas related to household debt, income inequality, and economic growth. The findings from such studies are not merely academic insights but also serve as a foundation for policymaking, financial education, and community-level economic development.

One of the most significant impacts of new knowledge is its ability to help governments formulate more effective policies. Research that analyzes the relationship between household debt and income inequality reveals structural issues affecting the national economy. These insights enable policymakers to implement appropriate measures, such as designing fairer tax structures, promoting debt restructuring programs, and strengthening financial regulations to prevent excessive household debt.

Moreover, new knowledge enhances public financial literacy, enabling individuals to manage their personal finances more effectively. Studies on the effects of household debt on income and economic stability can lead to financial education campaigns, helping households adopt responsible borrowing and saving strategies. Raising awareness about financial planning, investment, and debt management can reduce the risk of falling into chronic debt and contribute to long-term economic security.

At the community level, research findings can guide the design of economic development programs tailored to specific local needs. Analyzing data on income inequality allows local authorities to create policies or initiatives that promote economic opportunities for disadvantaged groups. For example, supporting community enterprises or providing microfinance for low-income entrepreneurs can help reduce disparities and stimulate grassroots economic growth.

In the long run, new economic and social knowledge contributes to overall economic stability. When policymakers can use in-depth research to implement precise economic solutions, individuals make more informed financial decisions, and communities have the tools to develop their local economies, society becomes more resilient. Economic research is not just theoretical but plays a fundamental role in fostering sustainable development and ensuring a more equitable future for all.

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Exploring Students' Attitude Toward Covid-19 Vaccination

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Abstract

This study aimed to investigate students' attitudes toward COVID-19 vaccination measures by evaluating their sociodemographic characteristics, vaccination status, and willingness to be immunized. Conducted at a State College in North Cotabato, Philippines, with a sample of 462 students from various year levels, the research utilized descriptive statistics and Binary Logistic Regression (BLR) for data analysis. The findings revealed that 387 respondents were young adults, predominantly female, and mostly freshmen. While 85% of the students had not been vaccinated, 65% expressed a willingness to receive the vaccine. The study highlighted that student generally perceived themselves as vulnerable to COVID-19 and acknowledged its severe impact. They also demonstrated confidence in the vaccine's ability to prevent the disease and viewed vaccination as a means to protect others and alleviate their fear of COVID-19-related illness. Additionally, it was found that students' beliefs about their susceptibility and the severity of COVID-19 significantly influenced their willingness to be vaccinated, with an effect size of 2.60%. This indicates that those who perceive themselves as more at risk are more likely to be willing to get vaccinated. These findings emphasize the need to address individuals' perceptions of risk and severity in shaping their attitudes toward vaccination. Therefore, it is recommended that the government intensify its information campaigns, focusing on enhancing community understanding of susceptibility and severity to improve public health policies and increase vaccination uptake.

Keywords: COVID-19, Vaccination, Attitude, Health behavior, Risk perceptions, Public health

Introduction

The COVID-19 pandemic brought widespread disruption to societies around the world, with the education sector among the most affected. School closures and the shift to remote learning deeply impacted the academic experience and mental well-being of students. Studies have documented significant psychological effects, including increased anxiety and depression among the student population during this period (Hoofman & Secord, 2021; Tan et al., 2025).

In response to the crisis, vaccination emerged as a key public health strategy in mitigating the spread and severity of the virus. Vaccines have proven effective in reducing transmission and fatality rates, offering a critical line of defense against infectious diseases (Tiwana, 2024). However, the success of vaccination campaigns has been hindered by the proliferation of misinformation, particularly on digital platforms. The rapid spread of false or misleading information has contributed to vaccine hesitancy, resistance to public health measures, and avoidable mortality (Madad et al., 2025). This challenge remains persistent and threatens to undermine public trust in health authorities and future pandemic responses.

Misinformation has been identified as a primary driver of vaccine hesitancy. Research has shown that false beliefs significantly influence individuals' attitudes toward vaccination (Carrieri et al., 2019; Tuckerman et al., 2022). Despite public health efforts, misconceptions about vaccine safety and effectiveness continue to circulate (Eiden et al., 2024). Ebrahimi et al. (2025) noted that vaccine hesitancy—the delay or refusal of vaccines despite availability is one of the top threats to global health. Improving vaccine literacy is thus essential, especially in an era of information overload and digital misinformation (Lu et al., 2023).

Despite the growing literature on vaccine attitudes, a gap remains in understanding the behavioral patterns of young people post-vaccine rollout. Early studies primarily examined willingness to receive vaccines before they were made available to younger demographics, leaving behavioral factors post-distribution underexplored (Atanasova et al, 2025). Additionally, there is a lack of evidence-based interventions that specifically target vaccine-related conspiracy beliefs and their influence on health behaviors (Bayrak, 2025). Brackstone et al. (2022) emphasized that vaccine uptake will likely determine the outcomes of future health crises and advocated for the development of localized strategies to improve vaccination rates and confidence.

These concerns are particularly pressing in rural and remote areas such as Arakan Valley in North Cotabato, Philippines, where access to healthcare and reliable information remains limited. Higher education institutions in these areas are not only tasked with sustaining academic operations but also serve as influential agents in promoting public health awareness and behavior. However, rural institutions often face unique challenges, including infrastructure limitations, healthcare access issues, and heightened vulnerability to misinformation. As Kabagani (2021) reported, by December 2021, the Philippines had recorded over 271 million global cases and more than 5 million deaths, alongside the administration of over 8.3 billion vaccine doses—figures that highlight the global scale of the crisis and the urgency of targeted interventions.

Furthermore, Loreche et al. (2022) stressed that individual vaccination decisions are shaped by perceptions influenced by community narratives, institutional messaging, and media representations. In rural settings, these influences can be particularly strong due to reduced access to verified health information. Despite these challenges, there remains a significant gap in the literature on the psychological and belief-based factors that influence vaccine behavior among students in rural higher education contexts.

Therefore, this study aims to address that gap by examining the factors that shape COVID-19 vaccination compliance among college students in rural areas. Through this research, insights will be generated to support the development of evidence-based, locally relevant public health strategies that promote vaccine uptake, strengthen institutional resilience, and enhance student well-being in the face of ongoing and future public health crises.

Specifically, this study seeks to answer the following questions: 1) What constitutes the socio-demographic profile of the respondents? 2) What are students' attitudes toward COVID-19 vaccination measures in terms of perceived susceptibility, severity, benefits, and barriers? 3) Do students' attitudes toward COVID-19 vaccination measures significantly influence their willingness to be vaccinated?

Methodology

The study utilized a quantitative research design with an online survey method to address the research questions systematically. This method was selected due to the restrictions imposed by the COVID-19 pandemic, which limited face-to-face interactions and prioritized student safety. The survey instrument used in the study was adapted, with permission, from the questionnaire developed by Dr. Giao Huynh (Huynh et al., 2021). To ensure relevance to the current research, minor modifications were made to the instrument. The questionnaire consisted of items measured on a Likert scale ranging from 1 (lowest) to 5 (highest), assessing key constructs such as students' perceived susceptibility to COVID-19, perceived severity of the disease, perceived benefits of vaccination, and perceived barriers to vaccination. A total of 462 Filipino college students voluntarily participated in the study. Participants were randomly selected from the officially enrolled population during the academic year 2020–2021 at the Cotabato Foundation College of Science and Technology (CFCST). CFCST is a state college located in the rural hinterlands of Doroluman, Arakan, Cotabato, Philippines. The demographic characteristics of the respondents were analyzed using descriptive statistics, including frequency, percentage, and mean. To investigate the influence of students' attitudes toward COVID-19 vaccination, Binary Logistic Regression (BLR) was employed as the primary analytical tool. The scope of the study is limited to the perceptions of students officially enrolled at CFCST during the height of the COVID-19 pandemic. The findings are not intended to generalize to other populations or contexts outside the study locale. Despite these limitations, the study provides valuable insights into students' attitudes toward COVID-19 vaccination during a critical period, contributing to the broader understanding of vaccine perceptions in rural educational settings.

Results

The Socio-Demographic Characteristics of the Respondents

This section offers a comprehensive insight into the socio-demographic profile of the respondents, encompassing aspects such as age, sex, year level and vaccination status. It aims to address the research question: ***"What constitutes the socio-demographic profile of the respondents?***

Table 1 Socio-Demographic Profile of the Respondents (N=462)

Age		**f**
	17-21 years old	387
	22-26 years old	64
	27-31 years old	8
	32-36 years old	3
Sex		
	Male	138
	Female	324
Year Level		
	First	335
	Second	36
	Third	62
	Fourth	27
Vaccination Status		
	Vaccinated	69
	Not Vaccinated	393
	Willing to be vaccinated	299
	Unwilling to be vaccinated	155
	Undecided	8

Table 1 data shows that out of 462 respondents, majority are within the age bracket of 17-21 years old. From the sample size, 324 are female and 138 are male. Moreover, it is evident in the table that most of them are freshmen students. A significant disparity of 392 students from the total population were are not vaccinated at the time of data collection while 69 are already vaccinated. The data indicates that 65% of respondents, 299 individuals, are positively inclined to avail the vaccine. Conversely, 155 respondents, comprising 35% of the total sample size of 462, express a negative attitude towards vaccination.

Students Attitude on COVID-19 Measures

This section examines respondents' agreement level regarding statements that assess perceived susceptibility, severity, benefits, and barriers to COVID-19 measures.

Table 2 Mean Distribution on the attitude of students in COVID-19 vaccination measures in terms of perceived susceptibility and severity (N=462)

Indicators	Mean	Description
I have a heightened susceptibility to contractin COVID-19.	2.66	Moderately Agree
I anticipate contracting COVID-19 in the near future.	2.33	Disagree
I am at risk of experiencing severe illness if I contract COVID-19.	3.21	Moderately Agree
I am apprehensive about contemplating the possibility of contracting COVID-19.	3.82	Agree
Grand Mean	**3.00**	**Moderately Agree**

Table 2 illustrates the average distribution of beliefs concerning perceived susceptibility and severity. The results reveal that respondents express significant concern about contracting COVID-19, as shown by an average rating of 3.82. This trend indicates confidence among those who took the survey that they will contract COVID-19, as indicated by their disagreement with this notion and reflected by a mean score of 2.33.

Table 3 Mean Distribution of the Attitude of Students in COVID-19 measures in terms of Perceived Benefits and Barriers (N=462)

Indicators	Mean	Description
I will avoid COVID-19 with vaccination.	3.65	Agree
Immunizing and avoiding COVID-19 will safeguard others.	3.88	Agree
Being inoculated reduces my fear of COVID-19-related sickness.	3.68	Agree
I worry about the side effects of the COVID-19 vaccine.	3.43	Moderately Agree
COVID-19 infection is self-limiting, and immunization is unneeded.	3.10	Moderately Agree
I suppose COVID-19 vaccination will be pricey.	3.30	Moderately Agree
Grand Mean	**3.50**	**Agree**

Table 3 below presents the respondents' beliefs regarding the perceived benefits and barriers associated with COVID-19 immunization. The results reveal a consensus among participants on the effectiveness of immunization in preventing COVID-19 transmission and protecting others. Additionally, respondents indicate decreased concerns about severe illness following immunization. Nonetheless, some participants harbor reservations about the potential adverse effects of the COVID-19 vaccine and express apprehensions about the vaccination costs."

Predictors of Acceptability for Vaccination

This section explains whether or not students' belief in COVID-19 measures significantly affects their willingness to be immunized**.** It shall also determine what factors strongly and significantly predict students' vaccination likelihood**.** It specifically answer the question**:** ***Does students' attitude on COVID-19 vaccination measures significantly influence their willingness to vaccinate?***

Table 4 Binary Logistic Regression (BLR) in Predicting Acceptability for Vaccination

Predictors	Binary Coefficients	Standard Error	Wald	df	Significance	Exp (B)
Perceived susceptibility and severity	2.606	.273	91.582	1	.000	13.578
Perceived Benefits and Barriers	-1.176	.192	37.481	1	.000	.309
Constant	-4.294	.845	25.843	1	.000	.014

The table below displays the Binary Logistic Regression (BLR) analysis results to predict vaccination acceptance. The data illustrates the coefficients, standard errors, Wald values, degrees of freedom, statistical significance levels, and odds ratios associated with the predictors. The analysis indicates that perceived susceptibility and severity significantly impact vaccination acceptance, with an odds ratio of 13.578. Specifically, a substantial increase of 2.606 in vaccination likelihood is attributed to respondents' perceptions of susceptibility and severity. Conversely, perceived benefits and barriers negatively affect vaccination acceptance, with an odds ratio of 0.309. Specifically, a decrease of -1.176 is associated with perceived benefits and barriers related to the COVID-19 vaccine. As a result, the null hypothesis, which posits that attitudes toward COVID-19 measures have no significant impact on vaccination acceptance, is rejected.

Discussions

The COVID-19 pandemic, while seemingly behind us, has left critical lessons on epidemic preparedness. One is that schools need to respond urgently to the challenging environment (Tan et al., 2025). As United Nations Secretary-General António Guterres remarked on the International Day of Epidemic Preparedness (December 24, 2024), "The world is woefully unprepared for the next pandemic" (The Lancet, 2025). WHO Director-General Tedros Adhanom Ghebreyesus echoed this sentiment, acknowledging that while some lessons have been learned, many systemic weaknesses that allowed the pandemic to spread still persist.

The findings of this study align with these observations. Despite the availability of the COVID-19 vaccine and the willingness of respondents to get vaccinated, data show that many students remain unvaccinated. The notable contrast between the proportion of respondents embracing vaccination, as illustrated in Table 2, and those who have already been vaccinated presents an opportunity to delve into the reasons behind the delay in adhering to the government's vaccination program. Exploring this disparity can aid the government in refining its delivery mechanisms to ensure tertiary education students' health and safety.

The Health Belief Model (HBM) reveals that perceived susceptibility, severity, benefits, barriers, and cues to action are significant predictors of vaccination intention (Alyafei & Easton-Carr, 2024; Adiyoso et al., 2023). These factors shape individuals' perceptions of health threats and the value they place on achieving health-related goals, which in turn influences their vaccination decisions. The hesitancy observed among students despite vaccine availability may be attributed to their perceived risks. According to the HBM, when individuals perceive a high probability of getting sick and suffering from a disease, they are more likely to engage in preventive health behaviors, such as vaccination. In this study, students were 13 times more likely to get vaccinated due to their perceived susceptibility. This finding is consistent with research by Khayyam et al. (2022), who found a positive association between perceived susceptibility and COVID-19 vaccination behavior. Similarly, Alshagrawi (2024) emphasized the importance of perceived susceptibility in predicting COVID-19 vaccination intentions. Addressing these perceptions of risk, along with factors like perceived behavioral control and attitudes, is crucial for designing effective public health strategies to encourage vaccination. Giuliani et al. (2021) also highlighted that factors such as trust in science, prior vaccination behavior, and the belief that COVID-19 poses a greater threat than the common flu are linked to positive vaccination intentions.

In addition to perceived susceptibility, perceived severity has been identified as another strong predictor of vaccination intentions. Studies by Ventonen et al. (2024) found that individuals who view COVID-19 as a severe threat are more likely to seek additional doses of the vaccine. This finding aligns with the HBM, which posits that when individuals perceive a health threat as severe, they are more likely to engage in preventive behaviors. Waterschoot et al. (2024) further emphasized the role of perceived severity in motivating adherence to health-protective measures during the COVID-19 pandemic. They found that participants reported higher adherence on days with higher hospitalization rates, likely driven by increased perceptions of severity.

An interesting finding in this study was the negative impact of perceived barriers on vaccine acceptance. The data revealed that when perceived barriers outweigh perceived benefits, the likelihood of vaccination decreases by 30%. Mohamed et al. (2023) identified key perceived barriers contributing to vaccine rejection, including beliefs that COVID-19 vaccines are ineffective, have adverse effects, or may make individuals sick. Additionally, many respondents attributed vaccine rejection to scaremongering. Similarly, Nga et al. (2023) found that perceived access barriers negatively influenced individuals' intentions to get vaccinated.

In conclusion, the findings suggest that both perceived susceptibility and perceived severity are crucial predictors of vaccination intention. However, when individuals perceive barriers—such as the belief that the vaccine is ineffective or harmful—these perceptions can significantly reduce the likelihood of vaccination. Public health campaigns should focus on addressing these barriers by providing clear, evidence-based information about the safety and benefits of the vaccine, while also emphasizing the severity of the disease and the importance of vaccination in reducing health risks. Building trust in healthcare workers and the broader healthcare system, along with addressing fears and misconceptions, can help increase vaccination uptake and improve pandemic preparedness in the future.

Conclusion and suggestions

Drawing from the findings above, several key conclusions can be inferred:

A significant portion of the respondents comprises adolescents, predominantly females, and primarily in their first year of college. The data indicates that a substantial proportion of the respondents have not undergone vaccination, yet a prevalent willingness exists among them to embrace vaccination. Moreover, the respondents are inclined to believe that vaccination can alleviate their susceptibility to and the severity of COVID-19, alongside acknowledging the associated benefits. A predictive pattern emerges wherein respondents' willingness to be vaccinated is notably influenced by their perceptions of susceptibility and severity concerning the virus.

In light of these conclusions, the following recommendations are proposed:

1. Implement targeted educational campaigns to enhance college students' awareness of the importance of COVID-19 vaccination, focusing on addressing misconceptions and fostering informed decision-making.
2. Establish accessible vaccination clinics or campaigns close to educational institutions to facilitate ease of access and uptake among students.
3. Encourage open dialogues and discussions within the college community to address vaccination-related concerns and barriers, fostering a supportive environment conducive to informed decision-making.
4. Collaborate with healthcare professionals and student organizations to organize informational sessions or workshops to address specific concerns and queries regarding COVID-19 vaccination, fostering a culture of health literacy and proactive healthcare engagement among students.

New knowledge and the effects on society and communities

Individuals' inclination to submit themselves to government immunization measures is significantly impacted by their perceptions of their vulnerability and the seriousness of the virus. Therefore, educational interventions in various colleges and universities must prioritize improving knowledge regarding the advantages of vaccination and providing accurate information about the obstacles that lead to students' reluctance to immunization. This can be achieved through disseminating mass media messages and cues, as well as through the active involvement of government healthcare workers in promoting vaccine acceptance.

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The Effects of Extensive Self-directed Listening through English Films on EFL Students' Motivation to Engage in Listening Practice

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Abstract

This research investigated the effects of extensive self-directed listening through English-language films with English subtitles on the motivation to independently practice English listening among Thai EFL students at Sakon Nakhon Rajabhat University, where students rarely use English in everyday life, without evaluation of their comprehension ability. The study, employing a mixed-method design integrating quantitative and qualitative approaches, involved 25 EFL students who watched 2 English films in each week for 4 weeks. A questionnaire was used to elicit participants' opinions on their confidence in understanding and their perceptions of using English-language films to motivate their independent listening practice. The results revealed that participants, despite lacking confidence in their listening comprehension ability, believed that the extensive practice by watching English films helped expose themselves to real-life English usage and engage them in listening practice. Despite challenges from the authentic material, they found the films enjoyable and informative with authentic auditory input and visually demonstrating paralinguistic features. More importantly, the research suggests that extensive listening through films, combined with a non-judgmental learning environment, enhances EFL students' motivation to engage in independent listening practice.

Keywords: Extensive listening, Motivation, EFL, English films

Introduction

English has long been a global language to communicate. In order to promote human potential for national development, English is a common language that is used for communication across nations worldwide to corporate organizations and the exchange of varied information in the fields of science, higher education, and tourism (Rao, 2019). English has become progressively more significant in the daily lives of Thai individuals. Especially for the past few years, the rate of foreign investment has been increasing continuously since foreigners have been allowed to invest and do business in Thailand (Bangkokbiznews, 2022; Amarin TV Spotlight, 2023; The Government Public Relations Department, 2024; Manager Online, 2024). Furthermore, English is considered significantly vital in multinational working settings from the perspectives of executives and employees in Thailand (Karachedee, 2017). Therefore, the importance of communicative English encompasses not only academic like in the past but also non-academic contexts because it could be a supplementary passport for Thai

students for their professional opportunities. In the context of communication within an international workplace, listening skills are recognized as the most important area for improvement among Thai employees when interacting with foreign clients to ensure effective cooperation (Chumporn, 2016). The idea was supported by Gu (2018) arguing that listening skill is a fundamental precursor to foster other macro-levels of communication skills—speaking, reading, and writing.

However, although listening is a primary skill, it involves a complex process (Nguyen, 2020). Listening, as explained by Louis (2022), is a cognitive process that involves the acquisition of skills encompassing the reception, interpretation, recollection, evaluation, and responsive engagement with both verbal and nonverbal messages. Listening, whether in one's native language, a second language, or a foreign language, is a cognitively demanding process aimed at perceiving and comprehending auditory messages, as highlighted by Worthington & Fitch-Hauser (2018). Thus, EFL learners, particularly those whose first language possesses a significantly different sound system from English, often encounter considerable challenges in comprehending spoken English. Gilakjani and Ahmadi (2011) identified seven listening difficulties for EFL learners: fast speech, infrequent word repetition, limited vocabulary, missed signals, lack of contextual knowledge (e.g., cultural differences in body language), negative attitudes towards listening, and habits like trying to understand every word. Consequently, such challenges not only impede the process of listening comprehension but also could have the potential to demotivate and discourage language learners.

In Sakon Nakhon Rajabhat University (SNRU), where the researcher taught English to English major students, the importance of developing communication skills particularly listening was recognized, as it is apparent that students frequently encountered difficulties in listening comprehension. Most of them were from the area and nearby provinces. Sakon Nakhon, unlike other prominent provinces in Thailand, does not have a substantial population of foreign residents. Furthermore, the number of native English lecturers is significantly lower than that of the student population. Similarly, the students, who learned English as a foreign language and are considered EFL students, had limited chances to learn with a native English speaker. Especially, third-year English major students, in preparation for their fourth-year internships, continued to face challenges in face-to-face communication, particularly in listening skills. This limitation, posing challenges for individuals attempting to practice English in order to achieve native-like proficiency, might result in other listening difficulties and ultimately undermine their motivation to persist in learning the language. This issue is deemed a matter of urgent concern requiring immediate attention.

According to the review of previous studies, numerous studies have investigated listening instruction methods to improve Thai EFL students' listening skills. For instance, listening strategies manifested as an effective instrument for substantial enhancement in EFL learners' listening comprehension (Boonkit, 2002; Kettongma & Wasuntarasobhit, 2015; Simasangyaporn, 2016). In addition, synthetic phonics instruction is suggested in listening improvement (Futrakul, 2022). Similarly, explicit instructions of English prosodic features that cooperated with listening strategies revealed the improvement in EFL learners' listening skills (Kettongma & Wasuntarasobhit, 2015). However, the gap from the previous studies indicated insufficient time to practice listening. Despite the prolonged instruction of English at Thailand's educational institutions, where English is not the native language, it is apparent that a significant portion of Thai students still have very low English proficiency (EF English Proficiency Index, 2023). Namely, students in Thailand have yet to attain the expected level of English proficiency required for effective communication. This issue raises concerns about the effectiveness of the English language learning process in Thailand and underscores the hypothesis that, alongside effective classroom techniques, increasing opportunities for extended exposure to listening activities may serve as a crucial factor in improving EFL

learners' listening abilities. (Kettongma & Wasuntarasophit, 2015; Simasangyaporn, 2016; Newton & Nation, 2020).

Given the need for additional practice time, extensive listening seems to enhance listening comprehension skills by providing sustained exposure to listening materials. Simasangyaporn's (2016) study indicated that more practice in listening lessons and well-planned listening tasks significantly increased self-efficacy in listening comprehension of students in both the intervention group who received listening strategy instruction and the comparison group who did not receive the direct instruction. The study also suggests creating a safe learning environment with a shared agreement of no judging in accuracy and no laughing at peers' mistakes is another factor to motivate learners' persistence in completing listening tasks. That is, extensive language learning in a non-judgemental environment not only helps improve language ability, but also contributes to learners' motivation to engage in completing tasks. Consistent with the study of Kampiranon (2021), extensive listening activity was argued to significantly enhance English listening comprehension together with supporting learners' motivation to engage in self-listening practice. Therefore, such practice seems in need to bridge the gap between school instruction and real-life language application and motivate students to practice listening. As noted by Imsa-ard (2020), highly motivated Thai EFL students reported that school instruction did not meet their needs, hindering their ability to develop practical English skills. Furthermore, in an extensive listening process, the focus should be on building "trust" with students, rather than checking whether they are watching the films as instructed. Study by Renandya & Farrell (2011) and Ducker (2013) argued that trust in the learning process fostered intrinsic motivation and promoted long-term language improvement. Therefore, creating a supportive environment where students feel confident to continue their practice is key to sustaining their motivation. In conclusion, promoting self-directed language learning outside the classroom in a supportive environment seems to be essential for enhancing both language proficiency and students' motivation, ultimately helping students bridge the gap between classrrom instruction and real-world English application.

In requiring learners to persist in completing tasks, motivation plays a critical role in language acquisition, as both intrinsic and extrinsic factors influence learners' engagement and proficiency (Dörnyei, 1998; Lamb, 2007). It is argued that motivated learners tend to actively engage with language tasks, which significantly contributes to their language development (Dörnyei, 1998). Therefore, motivation is crucial for teachers to cultivate in language learners, particularly in contexts where English is rarely used in everyday communication, as highlighted by Boonkit (2002). Seven (2020) supported that teachers should prioritize fostering students' motivation to achieve the best learning outcomes in a language learning and teaching environment. In addition, alongside a drive for future academic and professional achievement, Hassan, Hariri, and Khan (2020) highlighted that intrinsic motivation helps maintain focus and deep engagement in tasks, which requires continuous concentration and active participation.

Research Objective

To investigate the effects of extensive self-directed listening practice through watching English-language films with English subtitles on motivation to engage in listening practice of third-year English major students at Sakon Nakhon Rajabhat University

Theoretical Frameworks

The present study draws on Self-Determination Theory (SDT) to encourage students to persist in practicing listening tasks. Additionally, it incorporates the principles of Gratification Factors Reflecting Experiential Qualities of Emotions to guide the selection of appropriate listening materials, as discussed below.

Self-determination Theory (SDT)

This study is based on Self- determination Theory (SDT) , a widely recognized framework that has garnered significant attention in the field of psychology and related disciplines, including motivation to learn a second and foreign language. Developed by Deci and Ryan, SDT provides a comprehensive lens through which to understand human motivation and behavior. Grounded in the fundamental premise that individuals possess innate psychological needs for autonomy, competence, and relatedness, SDT posits that the satisfaction of these needs is essential for fostering optimal functioning, well- being, and sustained engagement in activities.

Generally, the main factors that motivate learners to complete a task are commonly considered to be intrinsic and extrinsic factors. Firstly, intrinsic factors, including intrinsic needs, intrinsic influences, intrinsic values, and intrinsic motivation, denote elements that originate from within an individual. These internal aspects play a crucial role in shaping one's drive and commitment toward a particular task or goal. Intrinsic motivation, for instance, is driven by personal interest, enjoyment, or a sense of purpose, highlighting the internal satisfaction derived from the activity itself rather than external rewards or pressures (Dornyei, 1998; Filgona, Gwany, & Okoronka, 2020). In contrast, extrinsic motivation, extrinsic needs, extrinsic influences, and extrinsic values are factors external to the individual. These external elements often play a pivotal role in driving individuals to complete tasks or pursue goals. Extrinsic motivation, as opposed to intrinsic motivation, is fueled by external rewards, such as recognition, grades, or financial incentives, rather than inherent personal satisfaction (Deci & Ryan, 1985; Vallerand, 1997). Extrinsic needs may include the desire for tangible rewards or the avoidance of punishment, while extrinsic influences can stem from external sources such as social expectations or the prospect of approval from others. Understanding the interplay between intrinsic and extrinsic factors is crucial in comprehending the diverse motivational dynamics that influence learners in their educational pursuits (Dornyei, 1998; Filgona, Gwany, & Okoronka, 2020).

In addition, Skehan (1989, cited in Filgona, Gwany, & Okoronka, 2020) illustrates 4 key motivation factors as follows. Firstly, activities in the teaching/ learning process greatly affect how interested students are in the subject. Secondly, the outcomes of past experiences play a role in influencing their sustained motivation. Students who received positive feedback or high grades in previous tasks are likely to be more motivated in subsequent activities. Conversely, those who received negative feedback or lower grades in previous tasks may experience reduced motivation in future activities. Thirdly, intrinsic motivation is about students being naturally interested in the subject or task because of their experiences and how it connects to their daily lives. Lastly, extrinsic motivation involves external factors like receiving rewards or facing consequences, which can play a role in shaping the level of motivation experienced by students.

Upon evaluating the advantages and disadvantages of utilizing those particular motivations to support learners, studies has demonstrated that each type of motivating factor is appropriate for distinct conditions and objectives of the tasks. According to Noels et al (2000, cited in Yang, 2011), intrinsic motivation generally refers to the drive to participate in an activity based on the inherent pleasure and fulfillment derived from the activity itself. Motivation, as defined by Reeve (2015), is an internal process that emerges as a drive or need within an individual, fostering a desire for change either within oneself or in the external

environment. Motivation serves as a reservoir of energy, empowering individuals with the impetus and direction necessary to interact with their surroundings in an adaptive, open-ended, and problem-solving manner (Souders, 2019). Furthermore, argued by Brown (2000), and Gagne & Deci (2005), intrinsic motivation is deemed more conducive to enduring and self-sustaining endeavors. This approach emphasizes a focus on the task at hand rather than seeking rewards or avoiding punishments. Nevertheless, Cho (2012) indicates that extrinsic motivation proves more effective when educational activities lack inherent interest or enjoyment. As highlighted by Assor, Kaplan & Roth (2002), teachers play a crucial role in fostering learners' engagement by emphasizing the importance of tasks and demonstrating their relevance to the learners' real-life goals and interests.

To motivate language learners, many linguists encourage employing interesting materials to help them overcome listening difficulties together with motivating them to persist in the listening tasks. Moreover, paralinguistic features are considered another potential facilitator to assist listening comprehension. Firstly, paralinguistic cues, such as facial expressions, gestures, and eye contact, play a vital role in facilitating EFL learners' listening comprehension. These cues not only enhance the clarity of spoken messages but also support learners in accurately interpreting and understanding the meaning of spoken language beyond memorization of the sounds (Shams & Elsaadany 2008). Secondly, relevant visual aids aligned with spoken messages have been suggested not only to enhance listeners' comprehension but also to sustain learners' attention, encouraging continued engagement in listening practice (Kettongma & Wasuntarasobhit, 2016; Manurung, Butar-Butar, & Simbolon, 2022; Naknakorn, 2023). Therefore, incorporating relevant visual aids, which include paralinguistic features, into listening materials is likely to significantly enhance EFL learners' comprehension and encourage sustained engagement in listening practice.

Authentic listening media with such features have been recommended as effective tools for training purposes, tailored to suit both the objectives of listening practice and the complexity of the materials relative to the learners' proficiency levels. For instance, BBC news videos texts were employed in Cross's (2009) study to teach listening strategies to advanced EFL learners. Nevertheless, it was emphasized that the inherent complexity of news videotexts, along with the cognitive demands of the listening tasks, could lead to learners being overwhelmed with excessive information. Notably, even high-proficiency learners experienced difficulties, suggesting that such texts may be too challenging and potentially demotivating for learners with lower proficiency. Alternatively, English films and series have been suggested as a means to immerse EFL students in authentic contexts, facilitating their ability to grasp and comprehend auditory content while simultaneously motivating them to continue learning (Kettongma & Wasuntarasobhit, 2016; Ekinci, 2021; Manurung, Butar-Butar, & Simbolon, 2022). Moreover, watching English films has been shown to increase EFL learners' confidence in listening comprehension due to the support provided by paralinguistic cues in conveying the meaning of spoken sounds (Kettongma & Wasuntarasobhit, 2016). Moreover, despite potential challenges related to the authenticity of these materials, it has been argued that exposing learners to authentic language contexts has the potential to increase their motivation to persist in listening practice (Kettongma & Wasuntarasobhit, 2016; Ekinci, 2021). However, it was noted that the films used in the investigation were short, clipped video segments of 5–10 minutes, presented within a controlled classroom setting. In conclusion, appealing and proper listening materials would enhance intrinsic motivation, foster greater focus and engagement with the content, and encourage further listening (Setyawan, Ivone, & Suryati, 2022; Kampiranon, 2021).

Given that SNRU English majors are at a low to intermediate level of competency and that they urgently need to enhance their listening abilities, it is expected that they may encounter a number of difficulties with complex and demanding content videotexts. In

addition, upon informal discussions with the students in SNRU, most of them had tried listening to English from short clips in social media because the period of each clip was quite short, for they did not use much energy to focus on their learning and entertaining at the same time. Nevertheless, they acknowledged that they were still in need of comprehensive examples providing the full context of conversations within a continuous story. After the discussion, the agreement was made to employ English films as the listening material. However, students expressed concerns regarding difficulty in utilizing English films or series to enhance their listening proficiency, attributed to the extended duration of such materials and previously mentioned challenges, which make sustaining focus particularly demanding. Hence, pausing and replaying should be allowed. Furthermore, students who wanted to improve their listening comprehension skills were at different English proficiency levels. It was assumed that if the students study in the same controlled class, it might cause more negative effects because students at different levels require different processes and time for practice in order to facilitate their effective learning (Marie, 2017). Consequently, it brought an interest in exploring self-directed listening practice through extended English video sessions using full-length English films for low to intermediate EFL students at SNRU.

Gratification Factors Reflecting Experiential Qualities of Emotions

The present study relies on 7 criteria to select films as the listening material, aligning with the recommendations of Bartsch & Viehoff (2010)'s gratification factors. Their qualitative and quantitative study emphasizes that the use of entertainment media is frequently motivated by the desire to undergo emotional experiences. Consequently, the selection criteria aim to captivate students' interest and foster engagement in listening tasks. Therefore, a well-chosen material possesses qualities that can motivate individuals to persist in tasks despite some difficulties, driven by their innate desire to experience the emotions embedded in the content. The incorporation of the criteria could serve as a strategic approach to enhancing students' motivation and sustained involvement in the listening practice sessions.

The study employed exploratory and confirmatory factor analyses to identify two categories of gratification factors in individuals' engagement with movies and TV series. It was found that 3 factors—*fun*, *thrill*, and *being moved*—focus on experiential qualities of emotions, connecting to well-established entertainment gratifications like mood-management and sensation-seeking. The other 4 factors address the functional aspects of emotional media experiences, catering to social and cognitive needs such as *thought-provoking experiences*, *vicarious experiences*, *social sharing of emotions*, and *acting out emotions not expressed in everyday life*. Notably, the distinction between the thought-provoking effects of emotions and the experiential gratification of feeling moved is emphasized. The factor of vicarious experience aligns with related concepts like transportation, identification, involvement, and narrative engagement, highlighting their significance in entertainment gratifications, a dimension that has been somewhat overlooked in existing research, which has primarily focused on their role as mediators of persuasion effects. It was recommended to explore the relationship between moving and thought-provoking experiences (Bartsch & Viehoff, 2010).

Methodology

1. Participants and Procedure

This study employed simple random sampling to select 25 volunteers from 59 third-year English major students at Sakon Nakhon Rajabhat University. All participants had completed an English Phonetics course with a Thai lecturer and Listening and Speaking 1 and 2 courses with foreign lecturers (one native and one non-native English speaker). At the time of the study, they were attending a Listening and Speaking 3 course with a native English lecturer for approximately two hours per week. However, their exposure to native-like English communication outside the classroom was minimal, and their listening proficiency levels ranged from low to intermediate levels.

Participants were initially briefed on the research methodology and the questionnaire. They were assured that this was an additional task independent of their standard class grades, but it could potentially improve their listening skills. Over four weeks, they were to watch two English-language films per week at their convenience outside class hours. In addition, they could pause and replay any scenes they wanted. During watching the films, participants were to take notes on key story ideas, vocabulary, and phrases of interest to keep their focus; however, the notes were not reviewed by the teacher in order to encourage their autonomy.

Subsequently, participants engaged in discussions with peers and the researcher over issues such as the storylines and the new expressions and pronunciations acquired from the movies at an online meeting on Monday or Tuesday evening, lasting approximately 20 to 30 minutes. Nonetheless, their comprehension accuracy was not directly evaluated to avoid the anxiety of expressing and sharing ideas, as the primary goal of this study was to build trust with the students. Therefore, comprehension was not assessed directly, to help ensure that students felt comfortable engaging with the tasks and materials. After watching the last film and online discussion, the questionnaire was distributed online to the participants to elicit their perceptions and feelings about watching English-language films.

2. Research Instrument and Data Analysis

The study employed a mixed-methods approach to investigate the impact of utilizing English films as a listening material for EFL students. A meticulously designed 5-Likert-scale questionnaire served as the primary research instrument, capturing participants' opinions and sentiments. Prior to deployment, the questionnaire underwent a rigorous evaluation of its validity by three experts, ensuring its alignment with the research objectives. After ensuring content validity through expert evaluation, the refined questionnaire was piloted with a group of five students to assess reliability. The Cronbach's Alpha score was 0.81, indicating good internal consistency. The questionnaire comprised three distinct parts to comprehensively explore participants' perspectives. Part 1 aimed to verify participants' weekly engagement with English films to determine whether all samples adhered to the assigned tasks. In Part 2, utilizing a 5-Likert scale, The first four questions were designed to gather participants' perspectives on their comprehension of film plots. while the subsequent six questions delved into their perceptions of the benefits associated with various attributes of English films. Part 3 featured two open-ended questions aimed at eliciting participants' feelings about watching English films.

Subsequently, data from Part 2 of the questionnaire underwent statistical analysis to determine the means of participants' opinions regarding their understanding of English films and their perceptions of using English-language films as listening material. The interpretation of the data was facilitated by Table 1, providing a structured Five-Likert-scale Interpretation. This interpretation guide delineated the Likert-scale values, corresponding descriptions, and

the associated intervals, aiding in a nuanced understanding of participants' responses. Meanwhile, descriptive data from the open-ended questions in Part 3 were categorized and analyzed to reveal participants' feelings, ideas, and perspectives, contributing to a more profound interpretation of the study's results. The mean and range of interpretations are shown as follows.

Table 1 5-Likert-scale Interpretation

Likert-scale Description	Value	Likert-scale Interval
Strongly agree	5	4.21 – 5.00
Agree	4	3.41 – 4.20
Moderately agree	3	2.61 – 3.40
Disagree	2	1.81 – 2.60
Strongly disagree	1	1.00 – 1.80

Results

According to the collected data, statistical results are presented in table 2. While, descriptive results are presented in tables 3 and 4 as follows.

1. Participants' perceptions in their listening comprehension through watching English-language films in the extensive self-directed listening practice

Firstly, the participants expressed a moderate level of their comprehension in the films as the means of questions 1. to 4. was 3.20, interpreted as 'moderately agree', shown in Table 2 below.

Table 2 Participants' opinions toward their understanding of 8 English film stories

Questions	$\bar{x}$	S.D.	Results
1. I understood the essence of the film's storyline through listening and watching them.	3.37	0.67	Moderately agree
2. I was able to understand the general meaning of the dialogue the characters communicate in the film through listening.	3.41	0.68	Moderately agree
3. I can interpret the sentences that the characters said through listening.	3.22	0.64	Moderately agree
4. I understand the story of the film 100% through listening.	2.81	0.56	Moderately agree
Total	**3.20**	**0.64**	**Moderately agree**

2. Participants' Positive perceptions toward English Films with English subtitle as a Listening Material

Secondly, participants' opinions on the benefits associated with attributes of the English films revealed a mean score of 3.94, indicating unanimous agreement. Participants showed general agreement with the benefits of watching English-language films in various aspects, including facilitating the learning, motivating and increasing opportunities to learn English in a native context. Moreover, the simultaneous display of English subtitles alongside authentic speech in the films were appreciated in helping them acquire new vocabulary and phrases. The

statistical results of participants' opinions on the benefits associated with attributes of the English films are detailed in Table 3 below.

Table 3 Participants' perceptions of the benefits associated with attributes of the English films

Questions	$\bar{x}$	S.D.	Results
1. Watching English-Language films makes learning English easier.	3.89	0.77	Agree
2. Watching English-Language films allowed me to be exposed to listening to English spoken in real-life situations more.	3.81	0.76	Agree
3. Watching English-Language films helps me become more familiar with native English.	3.96	0.79	Agree
4. Watching English-Language films gave me more motivation to learn to listen to English.	4.04	0.80	Agree
5. Watching English-Language films and reading English subtitles at the same time gave me a better understanding of the story of the films.	3.85	0.77	Agree
6. Watching English-Language films and reading English subtitles allow me to learn English words at the same time.	4.11	0.82	Agree
Total	**3.94**	**0.78**	**Agree**

3. Motivation from Using English language films with English subtitles as a listening material

The results in the questionnaire Part 3, participants' perceptions about watching English films, showed that 23 out of 25 participants, equivalent to 92%, expressed a positive inclination towards watching English-language films. Furthermore, 25 participants, equivalent to 100%, suggested recommending EFL learners to enhance their listening skills by watching English-language films. In addition, the open-ended results also showed that the English films motivated them to engage in further practice. The descriptive results revealed positive and negative feelings of watching the films. Positive results included the ease, non-boring nature, and self-practice aspect of this learning method. The sample group highly supported recommending the method, emphasizing that it is a valuable practice for improving English listening skills on their own and applying language skills in real-life situations. They also highlighted consistent listening to English films as an effective way to become more familiar with various spoken English accents. On the other hand, some of them expressed difficulties in watching and listening to English films. The descriptive results obtained were categorized in Table 4 below.

Table 4 Descriptive results of participants' feeling of using films to practice their listening to English

Negative feelings
1. I didn't understand what the characters said.
2. I couldn't translate the characters' speech even though I saw its subtitle.
3. The characters spoke too fast that I could not catch up what they said.
Positive feelings
1. The English films were useful to develop my listening skills.
2. The English films were fun and informative for listening to English on my own.
3. The English films helped me know new words.
4. After watching the films, it made me get used to listening to English.
5. I feel like I want to practice listening to English more when watching movies.
6. I could expose more to native speakers' accent, rhythm, and pronunciation through the English films.
Neutral feelings
1. I should have practiced a lot more so that I could have listened and understood better.
2. This is a very good method to practice, but learners should have more time to practice

In summary, since the research objective is to investigate the EFL participants perceptions of watching English-language films on the motivation for extensive self-directed English listening practice, the results indicate moderate level of listening comprehension and reflect some challenges like the fast speed of the utterances which is the common characteristics of the authentic text. In addition, despite being able to pause and read the subtitles, the participants did not understand the meaning.

However, English subtitles were appreciated to be a good supporting tool to allow them to learn new things such as matching words and their pronunciation, other kinds of speech pronunciation, and the real language use in the native context. Furthermore, the findings regarding students' motivation reveal both positive and negative aspects, but they also indicate a tendency to continue practicing this method.

Discussions

The present study explores the perceptions of extensive self-directed listening practice through watching English-language films with English subtitles on motivation to engage in listening practice of third-year English major students at Sakon Nakhon Rajabhat University. The overall findings revealed both positive and negative effects of using English films on students' motivation for self-directed listening practice. The discussion is presented as follows.

1. Perceived benefits of extensive listening practice and English films on EFL Learners' motivation

To begin with the effects on motivation in a positive aspect. Participants identified notable benefits associated with watching English films. The films were found to facilitate easier learning of English listening skills, providing exposure to real-life English, and fostering familiarity with native accents. English subtitles were particularly beneficial, supporting comprehension of the film's story and introducing new English vocabulary and expressions.

Based on Self- determination Theory, extensive self- directed listening can be considered as the participants' intrinsic motivation. Since the participants expressed their eagerness to continue practicing with this method, reflecting the potential of the process to motivate them. Firstly, they were motivated by being informed that the extensive practice could improve their listening skills. This motivated them to set their goal of improvement from the

beginning. Namely, the method contained certain elements that attracted the participants' interest. All the participants were English-majored students. It is possible that they had first aimed to enhance their English communicative listening skills. Extending the hours of exposure to authentic material also motivated the EFL students who were rarely exposed to native English speakers to be eager to engage in the activity. The finding is consistent with Boonkit's (2002) study. In addition their disclosure of appreciation of the English subtitles–giving them new words and native accents implies that they were interested in improving their skills conforming to the major they were studying. Their improved skill or even the acknowledgement of perceiving that they were in the process of learning to improve can be counted as motivation to learn despite their perception of the difficulty of the authentic material.

Furthermore, during the period of the extensive listening practice, the participants could pause and replay the films until their satisfaction. So, they had the autonomy, which is an innate psychological need for humans and plays a crucial role in promoting optimal performance and maintaining long-term engagement in activities. In the session of reviewing the films each week, they were put at ease by the absence of judgment regarding the accuracy of their listening comprehension. Instead, they were encouraged to share what they learned from watching the films. This process helps avoid the experience of feeling humiliated, instead building their confidence in their participation and comprehension. This notion confirms the study by Simasangyaporn (2016). Hence, their positive experience fosters a motivation to continue engaging with the task in the future, similar to the study by Skehan (1989, cited in Filgona, Gwany, & Okoronka, 2020). The most important process during the overall extensive listening and sharing is 'building the trust' of their honesty whether they had finished watching the films each week, so that they felt secure to engage in the activity even further on their own, despite their perception of moderate level of comprehension.

Move on to the benefits from the films. The films are considered as the EFL learners' drive of intrinsic motivation to attract the participants because the 'film' itself inherently evokes a sense of relaxation and amusement, together with its authentic contexts such as real native speech–despite the challenges, it is a bridge to their target language proficiency. Also, the film genres were carefully chosen to fulfill the participants' needs and delight which motivated learners to continue practicing. In addition, the informative characteristics of the material is also considered as intrinsic motivation. In other words, the films provided paralinguistic features alongside the speech which facilitated the learners with context such as gestures of the interlocutors together with the scenes in the situations. This advantage helps clarify the speech context, enabling listeners to understand and interpret speech more accurately. Furthermore, participants indicated that English subtitles facilitated their learning of new concepts, which can be inferred as a positive experience. This aligns with the notion that pleasant experiences play a crucial role in sustaining motivation (Skehan, 1989, as cited in Filgona, Gwany, & Okoronka, 2020). The positive perception of using English films as a listening material is consistent with previous studies by Tuncay (2014), Safranj (2015), Kettongma and Wasuntarasobhit (2016), and Manurung, Butar-Butar, and Simbolon (2022).

2. Challenges in understanding spoken English and the impact on participants' motivation during the extensive listening practice

Concerning the negative aspect from the participants' perceptions, some of them expressed the experience of facing challenges in listening comprehension. Despite the availability of English subtitles and the ability to pause and replay video texts, they struggled to understand some parts of the speech.

Firstly, the difficulty might arise from the different cultural contexts presented in the films, as they had limited background knowledge of certain cultural and linguistic practices,

such as idioms, along with the feeling of not being able to catch up words or grasp the meanings in the first time but having to listen to it many times. Such cause and impact aligned with previous studies (Gilakjani and Ahmadi, 2011; Kettongma & Wasuntarasobhit, 2016). Such challenges could undermine their sense of competence, which is a key element of motivation as described by self-determination theory (SDT) (Ryan & Deci, 2000). However, neutral descriptive responses suggested a constructive perspective, with participants acknowledging the need for more practice and time to improve their skills. This reflects the autonomy component of SDT, as students expressed a willingness to self-regulate and continue engaging in extensive listening practice despite difficulties.

Secondly, the lack of preparation in the practicing process contributes to insufficient confidence in listening comprehension. That is, participants were assigned independent listening practice in their free time without pre-listening activities, such as introducing new vocabulary from the films or engaging in predictive story-related tasks. Consequently, participants lacked background knowledge in both vocabulary and story prediction, making it challenging for them to confirm information while watching the films. Much of the information encountered was entirely new to them. The result is similar to Zulfikar, Aulia, & Akmal (2020) study that unfamiliar topics and unknown vocabulary in authentic listening materials cause listening difficulties in EFL learners' listening comprehension. In addition, the present study did not provide a post-listening comprehension test to judge whether the participants correctly understood the stories, which contributed to both advantages and disadvantages. That is, it alleviated the pressure if they misunderstood the stories, yet caused insufficient confirmation regarding their good comprehension. In connection with the response to question 8 of the questionnaire, where students exhibited high motivation to practice listening through watching movies, it suggests that while the relaxed activity did not significantly enhance their self-confidence, it did contribute to reducing stress. This reduction in stress positively influenced their motivation to persist with the task.

Conclusion and suggestions

The process of extensive self-directed listening practice using English-language films as authentic listening materials positively impacts EFL learners' motivation. The self-study approach plays a crucial role for language learners who have limited opportunities to interact with native speakers in their daily lives but still need to improve their listening skills. It allows learners to increase their exposure to native speech within interactions in a continuous storyline, providing them with the new linguistic knowledge together with the entertainment at the same time. In addition, autonomy of the ability to control the films running and the absence of direct judgment on their listening comprehension, despite not reflecting their actual level of understanding, fosters a more supportive and stress-free learning environment, further enhancing their motivation. autonomy to practice. The key of motivation to sustain in self-practice is to build trust both in the teacher on their students' honesty and in the students on teacher' attitudes on their self learning behavior. On the other hand, the absence of pre-listening activities may contribute to language learners' difficulty in navigating different cultural contexts. This is evident in the participants' struggles to understand certain parts of the stories, even when they could recognize the spoken words.

New knowledge and the effects on society and communities

This study contributes to English teaching and learning by emphasizing the practical value of authentic materials, such as English-language films, in fostering extensive self-directed listening practice with the feeling of a secure learning environment. While focused on practical rather than theoretical insights, it provides useful guidance for educators and curriculum developers attempting to enhance language exposure. These findings support the integration of self study and real-world materials to improve learners' communication skills, benefiting both individuals and their communities.

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Development of Practical Teacher Competencies Through Social Engineer Process in a School Lunch Program

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Abstract

This study explores service-learning pedagogy in higher education, focusing on three components: university, community, and students. The research centers on improving safe and nutritious school lunches in Thai schools. Two main objectives were pursued: first, integrating service-learning with social engineer to examine the community food system, and second, identifying competencies of practical teachers after engaging in social engineer to enhance the school lunch supply chain's safety and nutrition. The study involved 30 practical teachers (ages 17-19) from the disciplines of elementary education and agriculture at Chiang Mai Rajabhat University (CMRU), spanning academic years 2021-2023. The research proceeded in three stages: 1) understanding community agriculture related to school lunches, 2) service delivery using social engineer tools to survey and improve the lunch supply chain, and 3) reflecting on teacher competencies in managing school lunches. Descriptive statistics were used for analysis. Results showed that the practical teachers gained knowledge of community food systems, safe agriculture, and food safety, achieving an average score of 80% in assessments. The study identified several issues in school lunch management, such as pesticide contamination, poor sanitation, improper food storage, and lack of alignment between lunch menus and seasonal vegetable availability. A fishbone diagram revealed five main risks in the supply chain: unsafe farming practices, uninspected food ingredients and water, poor food storage and transportation, improper cooking, and inadequate hygiene. These risks were addressed by creating a safer supply chain through social engineer. The study's outcomes highlighted teacher competencies in three areas: understanding community food systems, managing safe and nutritious lunches, and fostering social awareness. This service-learning project contributes to CMRU's model, ensuring that graduates are equipped to manage safe and quality school lunches for elementary students.

Keywords: Service-learning, Social engineer, Safe agriculture, School lunch, CMRU Model, Practice teacher competencies

Introduction

Service-learning is a high impact learning in 21st century supporting lifelong learning of all ages. In 2007, The academic approach was given the conceptualisation by the Association of American Colleges and Universities (AACU) (Center of Engaged Learning, Elon University, 2024). The 3 components in Figure 1 are acidemia, community and students. An academia combines multidisciplinary to apply knowledge and academic expertise through active learning while carrying out community service. The community is an academia partner to establish social needs and to fulfill the students' learning objectives. The service-minded students are the most significant component that have a critical refection. after service-learning, the students will gain further understanding of diverse contents in real life, an appreciation in their major discipline along with other disciplines, an enhancement the sense of civic responsibility, and a commitment to the community (The Hang Seng University of Hong Kong, 2024). The service-learning is a learner centre approach, where the learner gains the learning experience from a balance in academic learning and community service. The hyphen "-" in service-learning implies both are equally important element that interacts with each other to spark meaningful learning. The service-learning process is generally divided into three steps, namely: Pre-service- selecting courses that align with student' needs, setting objectives, understanding the principles of citizenship, leadership, and professional readiness, developing personal goals, and planning for community learning, *Service delivery*- carrying out activities according to the objectives set and monitoring the impact, and *Post-service*- reflection the service-learning experience, evaluating the new experience and demonstrating a deeper understanding in community partner (Matijević, Tomašević & Begić, 2019). In short, service-Learning consists of five key components, namely connecting theory and practice, engagement, community needs, work-related skills, and community learning (Resch & Schrittesser, 2023).

A social engineer is widely applied in current Thailand higher education. The active person has a role and responsibility to analyze the potential of the community, evaluate the level of knowledge within the community, create innovation for problem-solving, and establish sustainability in addressing local issues using community-generated data. The social engineer's role is following service-learning. The social engineer programme is a multidisciplinary active learning using 4 skills. 1) reasoning skills (proficiency in analytical thinking and reasoning), 2) communication skills (effective communication abilities) , 3) collaboration skills (competence in working collaboratively with others), and 4) innovation skills (aptitude for generating innovative solutions) (Phukamchanode, 2024). The 4 skills of social engineer require a basic learning skill of 21st-century skills as follows, 3Rs (Reading, Writing, Arithmetic), 8Cs (Critical thinking and problem-solving), Creativity and innovation, Cross-cultural understanding, Collaboration, teamwork & leadership, Communications, information and media literacy, Computing and ICT literacy, Career and learning skills, and Change) and 2Ls (learning and leadership). Therefore, service-learning, aimed at developing students into social engineers, utilizes local communities as a social lab-based learning. The pragmatic and progressive learning process involves coaching by university members and local experts to enable students from diverse disciplines to apply fundamental skills and social engineer skills collaboratively. Throughout the developmental process, students take the lead in actively addressing area-based problems fostering a hands-on approach to their skill development (World Economic Forum, 2016).

Rajabhat Universities are a group of public universities in Thailand that were originally founded as teacher training colleges. According to Article 7 of the Law on Rajabhat Universities B.E. 2547 (2004), Rajabhat University is obligated to educate children and youth to become competent and virtuous individuals, instilling a sense of altruism for the common good. It should encourage reflection on society, culture, and local wisdom, and produce developers and educators who are proficient in academic and professional disciplines. Therefore, the production and development of teachers who graduated from Rajabhat University emphasize excellence in identity and competency. The outstanding characteristic is to cultivate professional skills, being a social engineer and adept at managing service-learning for the community. CMRU is one of Rajabhat universities in collaboration with the Ministry of Higher Education, Science, Research, and Innovation. There is an initiative "CMRU model" to engage in activities under the social engineer framework to create resilient communities through research and innovation. This initiative aligns with the principles of King Rama X, Thailand, aiming to enhance local development through social engineer processes and promote service- learning between universities and communities. The university has incorporated the process of being a social engineer into the general education curriculum, allowing all students throughout the university to study and undertake community service projects. Examples of such courses include GEN 1306 Citizenship and Local Development. Additionally, practical students implement service-learning as a part of a credit-bearing educational experience.

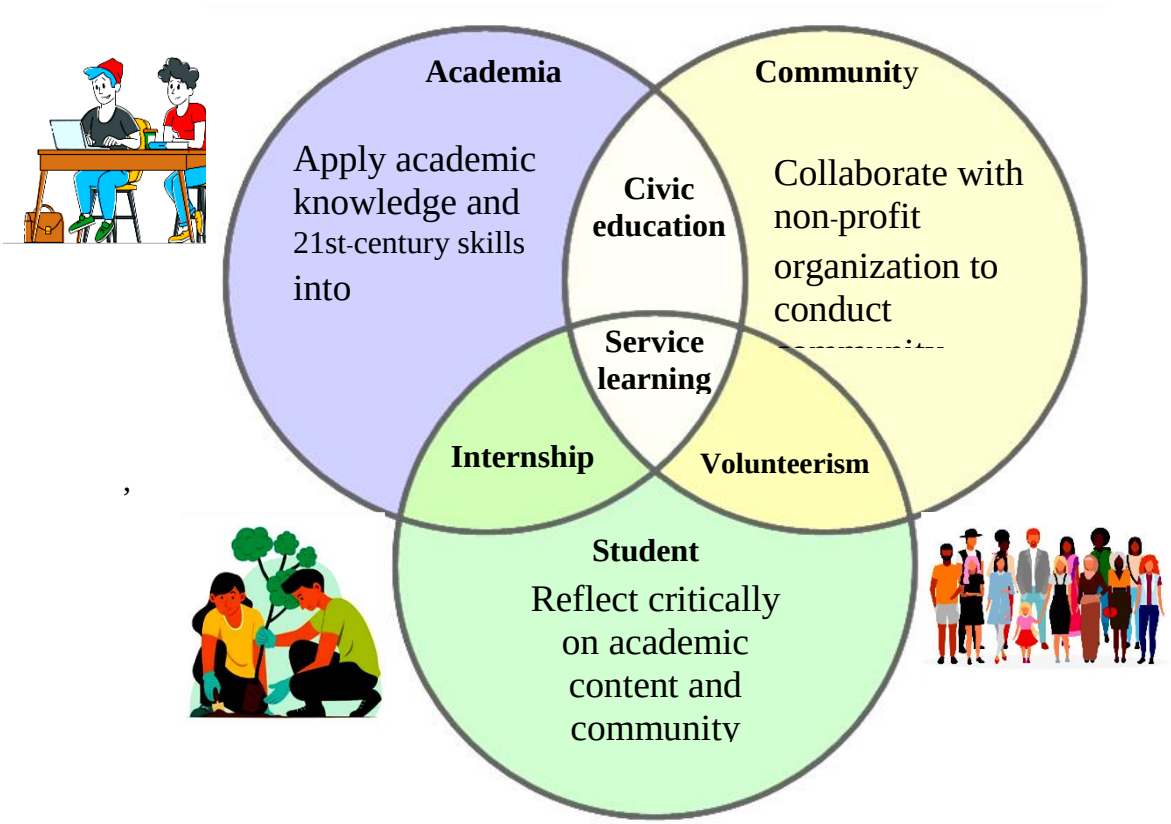

Figure 1 Conceptual of service-learning model
(**Source:** Adapted from Center of Engaged Learning, Elon University, 2024; Matijević, Tomašević, and Begić, 2019)

The CMRU model is an extracurricular activity that enhances the curriculum for practical teachers, empowering them in the teaching profession. CMRU stands for C-competency for work, M-management skills, R-resilience activities, and U-universal idea. The CMRU model activities are divided into 6 groups, 1) pre-university, 2) dormitory student, 3) Faculty of education activities, 4) core curriculum activities, 5) student club activities, and 6) extracurricular activities. In extracurricular activities, students can explore career options beyond the teaching profession. These options include community technology, industrial technology, community tourism, community health, home economics, arts and culture, community technician, and community agriculture. Each activity in the extracurricular activities is assigned credit units. All these activities are designed to integrate the concept of social engineer to align with the context of the specific field, such as community agriculture. The agricultural activities at the CMRU include environmental agriculture system management, agriculture for food security, organic vegetable production, layer farming, processing of food products, beverages, and herbal products, establishing community agricultural market systems, and presenting farm projects (Maneekosol et al., 2021).

The food system in the community is the system involving agricultural production, the collection of produce, and the distribution of food for consumption within the community. This system is crucial for food security. Food availability in communities needs to produce enough food to meet the population's needs. Factors related to food production include climate conditions, transportation, market access, storage, distribution, and food production policies. Food Accessibility community members should have access to nutritious food by considering factors such as income and food prices. They involve the ability of community members to purchase nutritious food. Food utilization says proper utilization of food involving meal preparation that maintains a nutritional value, ensures food safety, distributes food within households, and derives health benefits from food consumption. Sustainability is sustainable practices that involve maintaining a stable food source, ensuring access, and utilizing food resources while minimizing the risk of nutritional deficiencies and addressing sudden shortages (Forrestal et al., 2021).

Thai school lunch and safe agriculture are integral parts of the community food system because the agricultural production, collection, and distribution of food are the key components that supply food to schools. The school obtains food, which is then provided to students, either as ready-made meals prepared and served in the school cafeteria or through the hiring of cooks to prepare and serve meals on-site. The school lunch in Thai elementary schools has received support from the government for over 40 years, involving various agencies such as the Ministry of Education, the Ministry of Agriculture and Cooperatives, the Ministry of Public Health, the Ministry of Interior and local administrative organizations (Potchoo, Kaewchotima & Taugsuphoom, 2022). This support includes budget allocations for school lunches and milk from local authorities, the School Lunch Program Fund for Primary Education, nutrition training programs for Thai school lunches provided to education personnel, toxic substance testing in food products sold in school, vegetable cultivation, fish and frog farming for school lunches promoting self-sufficiency economy. Additionally, private sectors support the use of smart farm technology for egg farming. There's also the utilization of leftover school lunches for compost and organic fertilizer. However, there are still challenges in the school lunch system, categorized into, National and local policies-related issues the school lunch budget with economic conditions, Quality of school lunch- ensuring safety, nutritional value, and appropriate quantities based on age. Shareholder issues*:* addressing the skills gap in managing quality school lunch services that meet budget constraints and student needs (Bauru of Nutrition, Thailand, 2021)

This research has a challenge to link agricultural and food issues in the community to school lunches, aligning with the central role of teachers. It serves as an ignition point for practical teachers to understand the service-learning process, gain knowledge and skills from agricultural and food activities at the university, understand problems, meet needs, and develop community food systems through social engineer processes. That ensures that new generations of practical teachers have competencies in line with the CMRU Model and the desired characteristics of Rajabhat University students, ready to contribute to Thai society in the future. Therefore, there are two objectives of this action research.

The first objective is to implement a social engineer approach to drive service-learning for practical teachers at CMRU in community agriculture, with a focus on safe and nutritious school lunches.

The second one is to define the CMRU competencies of practical teachers in developing safe agriculture and nutritious school lunch programs.

As a result of this research, the benefits for all educational shareholders, in particular, new generations of practical teachers will be realized in the CMRU model to develop their desired CMRU characteristics. It is expected that the competencies of student teachers through social engineering and the CMRU Model will include C - the ability to work with the community, M - management skills throughout the food supply chain, R - activities to restore capabilities in agricultural production, food, nutrition, and health, and U - universal concepts related to the service-learning concept.

Methodology

Population and sample group*:* in the academic years 2021-2023, a group of practical teachers enrolled in the CMRU model activity as an optional extra curriculum activity, 425 students' total. The agriculture activity group, consisting of 30 students, was divided into two fields: 15 students specializing in primary education and 15 in agriculture. These students, enrolled in the first-to-third year study, were aged 17-19. Throughout the academic years, they engaged in active agricultural and food learning activities within the CMRU area. The CMRU learning farm served as an educational space for the university students, focusing on organic farming systems. The key practical training included soil fertility, soil microbiology, composting, liquid fertilizers, pest control, vegetable cultivation, harvesting, sales, egg-laying chicken farming, and the preparation of fermented feed for chickens. Additionally, there was an emphasis on processing agricultural products, such as lunch boxes, healthy snacks, herbal beverages, and bakery items.

Research method: The research project aims to conduct operational research to enhance the competence of practical teachers in agriculture and food safety in schools. It utilizes the community as a learning base through the social engineer process and reflects key competencies from the practical teachers and community shareholders involved in the community food system. The approach gathers information from community surveys, interviewing shareholders in the school lunch chain, hands-on agricultural and food activities, analyzing and synthesizing data of school lunch shareholders, and systematically developing practical operational guidelines for implementing a safe school lunch system.

Data collection from a combination concept of service learning and social engineer*:* The major concept is community and university collaboration through service-learning for practical teachers, focusing on safe agriculture and nutritious school lunches. The learning process is divided into three stages.

Pre- service stage*:* social learning readiness is established in content and skills, encompassing 5 modules: community food systems, food security, safe agriculture systems in the community and schools, nutritional needs of school-age children, and food safety. The preparation involves theoretical components utilizing lectures and case studies from online platforms. The practical aspect includes hands-on training, such as kitchen gardens for school meals, school meal programs, and testing for toxic chemical residues in vegetables, fruits, and food products. Each module involves a one-month duration for both theoretical study and practical training. Performance-based assessment includes evaluating their abilities in the creation of community food system media, planning and execution of organic vegetable cultivation and postharvest, and monthly planning and preparation of nutritious meals for elementary students. Food safety inspections and report the test results (Maneekosol, *et al.*, 2021)

Service-delivery: At this stage, the research team adjusted the social engineer tool with 5 items to fit the context of the community food system. The Practical teachers could proceed with the following actions.

1) Situation analysis of community food system: This modified from *"*Fa Pra Tan*"* the first social engineer tool that involves practicing observation and collecting data on natural elements, as well as interpreting the data in a way that aligns with the most accurate representation of the community's reality. The tool enhanced the critical thinking of social engineers.

Practical students were divided into 5 groups to survey agricultural chemical suppliers, totaling 50 stores in 5 districts that supplied vegetables to the central food market in Chiang Mai, namely, Mae Taeng, Mae Rim, Samoeng, Chom Thong, and Mae Chaem. The questions for agricultural chemical suppliers were about the seasons for selling the chemicals, the types of chemicals they sold, advice provided to farmers on usage, and confidence in farmers. Additionally, 10 farmers who used such agricultural chemicals were interviewed about their age, farming experience, and the use of agricultural chemicals. Specifically, the questions cover the types of agriculture chemicals they preferred, the frequency of usage, training on proper usage, and adherence to recommended practices for the use of agricultural chemicals. After one month of data collection, each group summarized statistical information and stated the first issue of cultivating food raw materials in the fishbone diagram.

2) Community food supply for school lunch: The second tool was inspired by a social engineer tool called "the development timeline". It was used to study the history of a community, to improve the communication skills of the practical teacher and to allow them an understanding of its past to appreciate its present and plan. Therefore, the research was adapted to focus on collecting data on vegetable and fruit cultivation in the community within the 5 specified areas over a period of one year. The use of residue test kits for analysis of vegetables and fruits. The use of safety test kits for food ingredients and processed food distributed in schools. Subsequently, the data was utilized to complete the third tool, the bio clock.

3) School lunch planning: The *"*bio clock*"* tool was utilized by social engineers to study and understand the lifestyles of colleagues and people in the community. The selection of appropriate times and participation points is crucial, as said put the right man to the right job. This approach was adopted by the operational research to investigate the school lunch schedule for one year in 5 elementary schools, examining and analyzing the correlation between vegetables and fruits in the lunch menu and the seasonal cultivation of vegetables and fruits in the community. The questioning skill of social engineers was developed.

4) Process analysis of farm to lunch tray: Originally, the process timeline tool was developed to train social engineers in innovation skills. The key principle is to understand every step genuinely, enabling the selection of targeted community development opportunities. In the research project, practical students and the schoolteachers in charge of school lunches gathered lunch data and traced the entire process of obtaining raw materials. They then created a school lunch chain. Researchers, teachers and practical teachers provided the most detailed verification and analyzed risks related to food and water inspection, storage and transportation, kitchen preparation, and adherence to sanitation practices for canteens. Then, each group summarized statistical information and stated the second issue of school lunch management in the fishbone diagram.

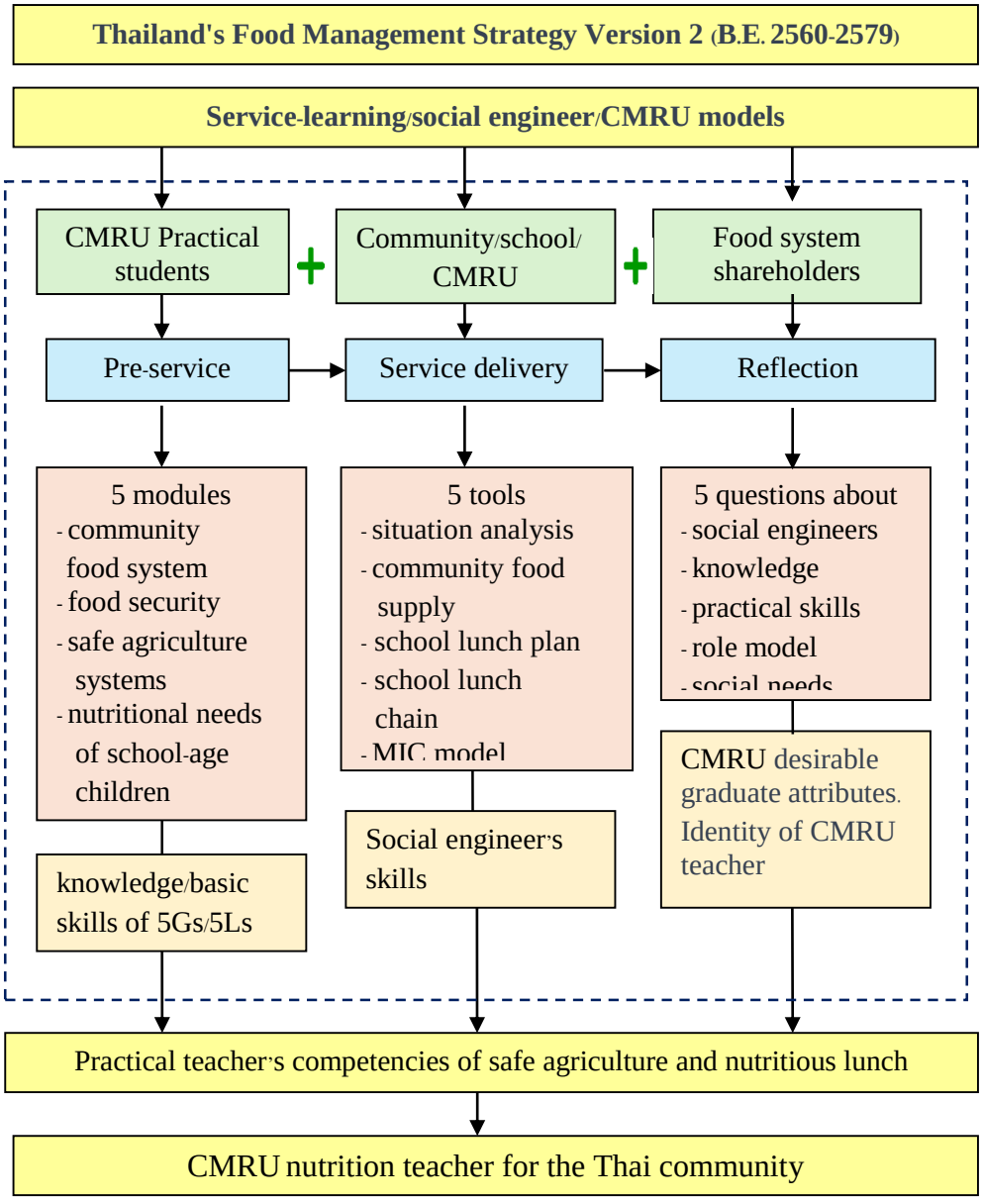

Figure 2 Research framework of service-learning model
in development of safe agriculture and nutritious school lunch (Source : Researcher, 2025)

5) MIC model of safe agriculture and nutritious school lunch: The most important tool for training social engineers in coordination and innovation skills, with the core principle being the M.I.C. model (Modify, Improve, and Create). This model allows for the appropriate modification, improvement, and creation of any process to enhance valuable outcomes. In this context, practical teachers were encouraged to apply the M.I.C. model to the school food chain, aiming to adjust the school lunch for better nutritional value and safety. " The research framework of the service-learning model is briefed in Figure 2.

Post-service reflection: The practical teachers involved in social engineer activities learn about community food systems connected to school lunch. They were given four questions related to:

Q1 How do the social engineering activities increase your knowledge, skills and social attitude toward school lunch?

Q2 What knowledge should you have about the nutritional and safe school lunches, and why?

Q3 What practical teacher skills are necessary for managing school lunches, and why?

Q4 How does a practical teacher role relate to the school lunch programme, and in what way?

Following this, each student was instructed to write their reflection on paper. The students were then divided into small groups, and each group exchanged their opinions and summarized the reflection information. Finally, the group summary and individual answers were analyzed to assess the competencies reflected after the students' service- learning.

The researchers posed a question regarding the expectations of the roles of nutrition teachers in schools. The question revolves around understanding what these different shareholders expect from the role of nutrition/ agriculture teachers in the context of the school lunch program. The interview answers may provide insights into the diverse perspectives and needs of those involved in the safe agriculture and school lunch programme.

Q5 What is your expectation of a practical teacher's role concerning the school lunch management, and in what way?

The inquiry was directed towards four groups of 47 shareholders in the school lunch program. The researcher and student teachers inquired about this with individuals involved in the school lunch system in the Phai Lek/ Saluang Subdistrictst, Mae Rim District, Chiang Mai Province, where there are two schools: Ban Nam Rin School and Ban San Kham Yom School, Muang Ka School, Kad Haew School, and Ban Saluang Nok School which provide lunch for primary school students. They also have sufficient agricultural areas to support activities promoting school lunch programs: 1) Management and administration group, local government entities responsible for allocating budgets for school lunches (2 respondents), elementary school administrators who oversee and manage the budget (3 respondents) 2) Operational group, school teachers responsible for coordinating the school lunch program (3 respondents), school cooks involved in preparing school lunches (3 respondents), community contractors responsible for procuring lunch ingredients (2 respondents), community farmers supplying raw materials for school lunches (2 respondents) 3) Elementary student group (30 respondents), there are 5 randomly selected students from each grade (Grade 1 to Grade 6) from 3 different schools. and 4) Representatives from a non-profit organization (2 respondents), play a role in developing agricultural and school lunch systems in elementary schools. Their responsibilities include ensuring safety and nutritional value in the school meals. They can transfer the results of their operations to the National Food Committee to contribute to the empowerment of Thai educational food policies.

Data analysis: In a quantitative aspect, data was collected through a survey of practical teachers, focusing on the routine use of legal pesticides in vegetables and fruits that pose risks of residue contamination. The vegetables and fruits are grown in the community according to seasonal cycles and are then possibly used in school lunches. Statistical data, including numbers and percentages, were reported. Additionally, descriptive data was collected from qualitative data from observations, interviews with shareholders in the school lunch chain, and reflections on service-learning activities from the practical teachers.

The combination of quantitative and qualitative data is utilized to allow practical teachers to analyze issues within the community food system that impact school lunches. This information is then used to develop *"*Good School Lunch Practices*"* for monitoring the quality of school lunches and enhancing the competencies of future nutrition teachers involved in managing the school lunch program in agreement with the community and national expectations.

Results

Service-learning for the Development of CMRU practical teachers' competencies in safe agriculture and nutritious lunches in Thai schools consists of three steps: pre-service, service delivery, and post-service reflection. The study yielded the following results.

Pre-service stage

The practical teachers attained preparation for agriculture and food activities in the CMRU area, which is divided into 5 modules: community food system, food security, safe agriculture systems in the community and schools, nutritional needs of school-age children, and food safety. The authentic assessment results by the practical teachers are shown in Table 1. Overall learning across all 5 modules, the average score falls within the range of 81.76-85.20. Modules 1 and 2 specifically guide learners to connect the community food system through the food chain, promoting a sustainable food chain and anticipating the impacts on food insecurity, nutrition, and the growth of children. Assessment involves measuring practical teachers' understanding from food producers to consumers, through writing or storytelling based on case studies in communities experiencing malnutrition and providing learners with preventive strategies for addressing these issues.

Table 1 Summary of authentic assessment obtained from practical teachers' pre service-learning in agriculture and food aspects

Module	Objective	Evaluation	Score distribution Mean± SD			Average score
			75.00-80.00	80.01-85.00	85.01 above	
1. Community food systems	1.1 explain the role of farmers, market, school and cook in the community	1.1 story telling	77.00 ±2.13 (5)	82.48 ±1.06 (21)	88.50 ±3.25 (4)	82.66 ±1.88
	1. 2 explain food supply chain	1.2 draw and present food supply chain	76.80 ±2.16 (7)	82.20 ±3.26 (21)	87.33 ±1.26 (2)	82.11 ±2.44
2. Food security	2.2 explain the impact of food insecurity for lifestyle and community.	2.2 case studyanalysis	76.40 ±2.55 (10)	84.30 ±1.69 (28)	87.50 ±2.45 (2)	82.07 ±
3. Safe agriculture systems in the community and schools	3.1 explain and produce organic compost/biofertilizers	3.1 good quality organic ompost/ biofertilizers	75.00 ±1.26 (3)	81.30 ±3.25 (20)	88.57 ±2.88 (7)	82.13 ±2.16
	3.2 explain and cultivate indigenous microorganisms	3.2 active indigenous microorganisms	76.50 ±2.22 (8)	83.30 ±3.15 (21)	88.00 ±1.44 (1)	82.60 ±2.58
	3.3 plan for growing organic vegetables	3.3 good quality/safe organic vegetables	76.40 ±2.58 (5)	82.20 ±2.14 (18)	91.00 ±1.56 (2)	83.20 ±2.86
	3.4 write a project proposal regarding safe agriculture in school	3.4 a complete project proposal	76.60 ±1.26 (15)	81.70 ±3.22 (14)	88.00 ±2.69 (1)	83.05 ±2.44
4. Nutritional needs of school-age children	4.1 explain the principles of managing lunch for elementary school children	4.1 online presentation	75.40 ±2.56 (5)	82.30 ±3.25 (15)	87.90 ±4.10 (10)	85.20 ±3.12
	4.2 select and storing food ingredients for school lunch	4.2 students' demonstration	76.00 ±2.11 (1)	81.80 ±1.56 (19)	88.57 ±2.87 (10)	82.12 ±2.01
	4.3 cooking for school lunch	4.3 school lunch for elementary students	76.60 ±3.12 (15)	81.80 ±2.57 (13)	94.50 ±2.44 (2)	84.30 ±2.16
5. Food safety	5.1 identify risks and dangers in food	5.1 tell good sanitation for midday meals	75.70 ±1.26 (3)	81.00 ±3.22 (20)	88.57 ±1.14 (7)	81.76 ±2.33
	5.2 use food test kits	5.2 interpret and report results and assessing food risks	76.00 ±2.54 (5)	81.70 ±3.12 (23)	92.00 ±2.77 (2)	83.23 ±2.79

Note: 1. The number of practical teachers was 30 persons.
2. The numbers on the blankets present the number of practical teachers.
3. If the average score for each objective is 80% or above, it is considered that the most practical teachers are ready for service-learning.

Module 3 focuses on organic farming and learning the principles of the "*5Gs*", including "Green producer" (beneficial environmental vegetable producers with skills in making organic fertilizers), "Green farm" (chemical-free agricultural learning areas), "Green products" (safe vegetables), "Green market" (emphasis on selling in the organic vegetable market), and "Green consumer" (vegetables that are good for consumer health). The evaluation assesses learners in planning vegetable cultivation, caring for vegetable plants, and training them in writing projects for growing vegetables for school activities. The next two modules focused on evaluating the safety and quality of vegetables from the university farm compared to market ingredients using chemical residue test kits in vegetables and fruits. It also covered organizing the menu for students and preparing ingredients, such as washing, cutting, trimming, storing, and cooking to minimize nutritional loss. In terms of food presentation for children, this section emphasizes planning, practical training in maintaining good hygiene in the kitchen, meal decoration, and efficiently managing midday meals to ensure an adequate quantity of nutritious and appetizing food served on time.

Service delivery

The CMRU practical teachers proceeded with service-learning using 5 social engineer tools to gather survey information from the communities, including agricultural chemical sellers, farmers, markets, and schools. The plan is to create a safe agriculture and nutritious lunch for elementary school students, and the results are as follows:

Situation analysis of community food system: As seen in Figure 3, the practical teachers found that agricultural chemical sellers perceived that farmer, with an average age of 48 years, had 23 years of farming experience and had been using chemicals for 21 years.

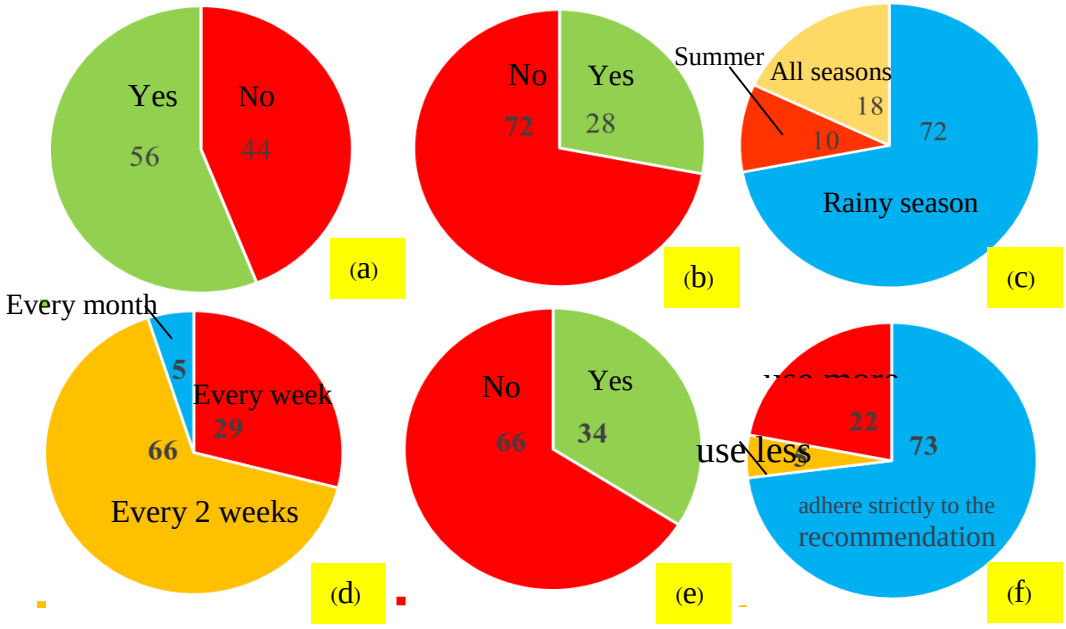

Figure 3 Situation analysis of community food system collected from 5 districts: Mae Taeng, Mae Rim, Samoeng, Chom Thong, and Mae Chaem in Chiang Mai province focusing on agricultural chemicals (Data shown in a percentage) (Source : Researcher, 2025)

(a) Agricultural chemical sellers provided guidance to farmers on the use of their chemicals sold.
(b) The seller believed that farmers used chemicals according to the recommendations on the label.
(c) The season in which the chemical sellers provided a lot to farmers.
(d) The frequency at which farmers use agricultural chemicals of all types.
(e) Farmers participated in training on the use of agricultural chemicals.
(f) Farmers adhered to the recommended quantity of agricultural chemical usage.

They used chemicals for insect prevention, weed control, and plant disease management in vegetables and fruits. Despite the seller's recommendations, farmers did not strictly follow the guidelines. For example, they exceeded the recommended chemical quantity and used chemicals every week resulting in a chemical cost of up to 70 US Dollars per person. Importantly, most farmers have never received proper training on the correct use of chemicals.

Table 2 Example of elementary school lunch planning and seasonal analysis with vegetables and fruits in community offered to the lunches

Menu	Month											
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
	Semester 2 (winter)			Summer			Semester 1 (Rainy season)				Semester2 (winter)	
1. White rice with Steamed pumpkin with grated coconut												
2. Boiled pig's blood, minced pork, with ivy gourd												
3. Fried rice with pork, egg, Chinese kale												
4. Stir-fried Chinese mustard greens with minced pork												
One-dish meal												
1.Red pork with rice, *radish* soup												
2.Nam Ngiao rice noodle and *tomato*												
Vegetable												
1.cucumber												
2.carrot												
3.yard long bean												
4.bean sprout												
5.cabbage												
6.baby corn												
7.Chinese cabbage												
8.Onion												
9.Shallot												
Fruit												
1.banana												
2.papaya												
3.guava												
4.pineapple												
5.orange												
6.grape												
7.dragon fruit												
8.watermelon												
9.mango												
10.rambutan												
11.rose apple												

Community food supply for school lunch: Table 2 summarizes the seasonal data from practical students regarding vegetable and fruit cultivation in Chiang Mai. This reveals that various types of vegetables and fruits are yielded produced during the rainy season from June to October. The period was susceptible to disruptions caused by plant pests, weeds, and plant diseases. Consequently, most farmers, 72% (Figure 3), employed agricultural chemicals to control the quality of their produce. Without chemical treatment, allowing losses to occur would result in a shortage of community vegetables and fruits during this season. This contrasts with the period from November to March, when the quantity of vegetables and fruits entering the provincial market is higher, and the agricultural chemical risk is possibly lower than in the rainy season.

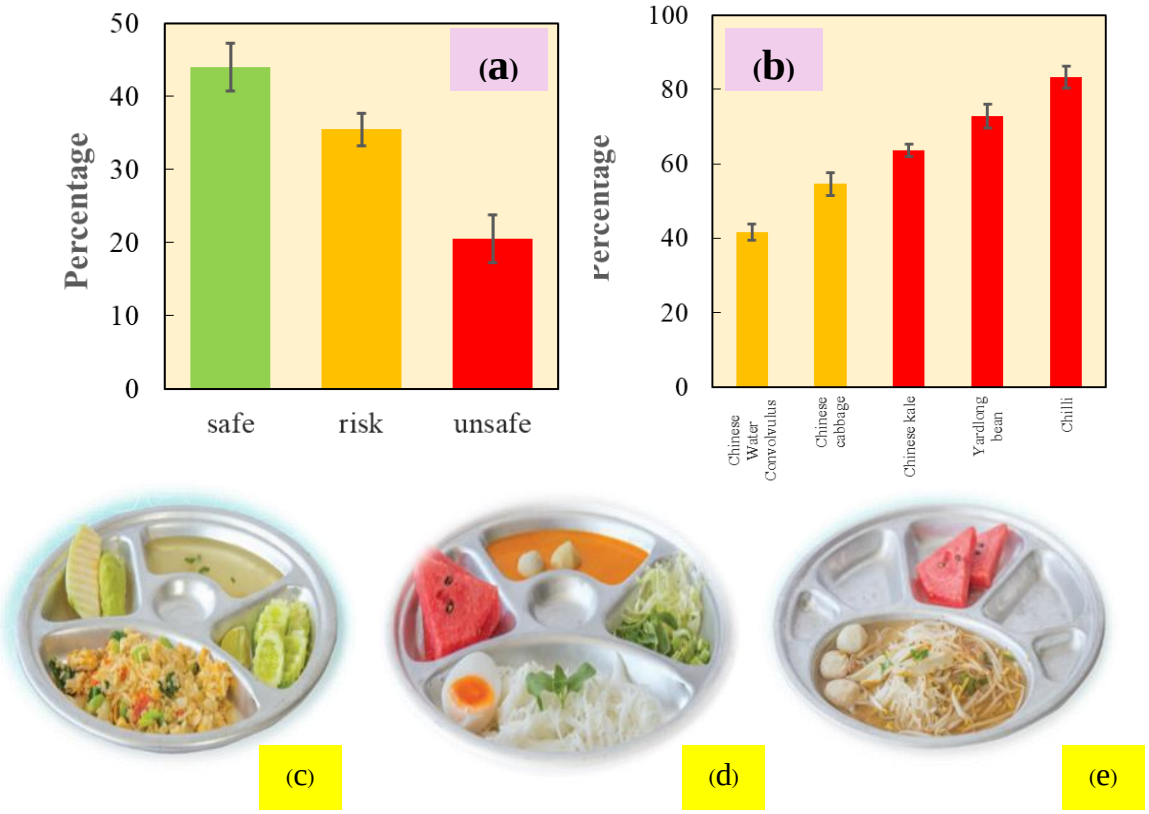

Figure 4 (a) The risk levels of vegetables and fruits purchased by the school for lunches in the 5 educational zones, (b) types of vegetables and fruits with high levels of agricultural chemical residues and samples of lunch meals for Thai elementary school students (c) fried rice with cabbage, clear soup cucumber, and guava (d) Thai rice noodle with coconut curry, boiled egg, bean sprout, and watermelon (e) rice noodles with meatballs and watermelon (Pictures c-e adapted from Bauru of Nutrition, Thailand, 2021)

School lunch planning: The survey results of 52 lunch menus for elementary school students revealed that during the first semester in the rainy season, there were 20 menu items. Upon random inspection of the safety of vegetables and fruits served in the school lunch program at 3 schools, it was found that 20% were unsafe (Figure 4a). Cabbage and fruits such as watermelon and guava were found to be contaminated with agricultural chemicals at a rate exceeding 50% (Figure 4b). These contaminated ingredients were used in lunch items such as fried rice with cabbage, clear soup with cucumber, and guava (Figure 4c). Therefore, it can be concluded that raw materials such as vegetables and fruits used in the school lunch program are at risk of agricultural chemical contamination from the production stage in the fields, especially those received during the first semester.

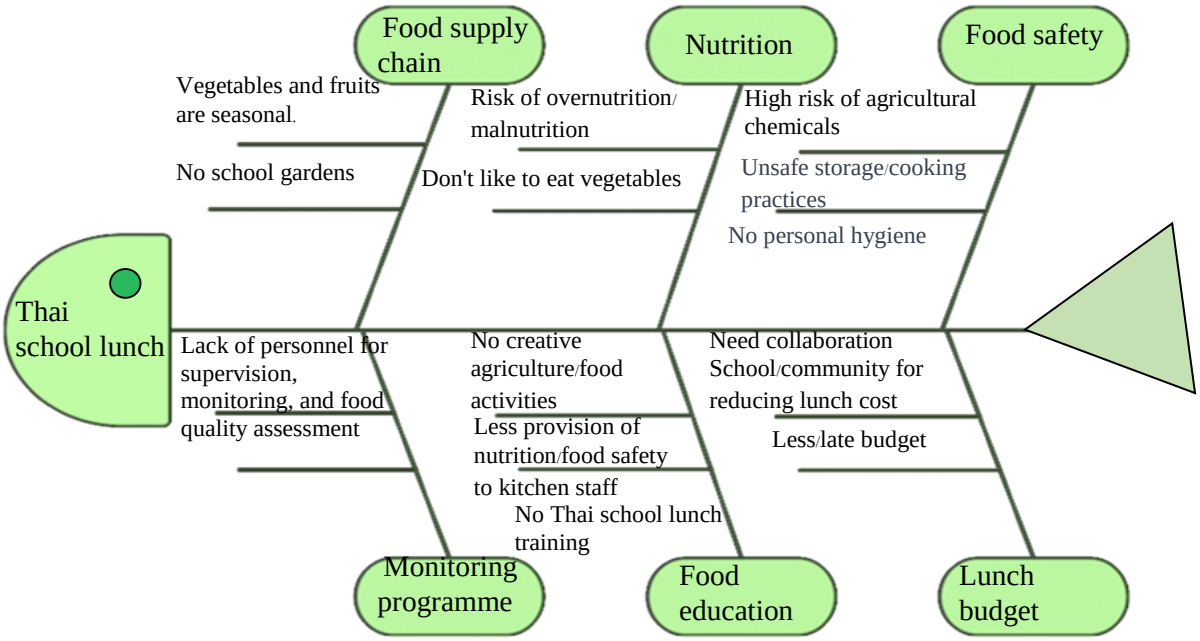

Figure 5 Fishbone diagram summarizing the risks and limitations of various aspects of lunch services for Thai elementary school (Source : Researcher, 2025)

From Table 2, the shortage of food ingredients such as vegetables and fruits during the harvest season and the risk of crop loss led farmers to decide to use chemical pesticides. If these vegetables and fruits contaminated with agricultural chemicals are passed on to the school kitchen, it will increase the long-term health risks for the students. The risk of food ingredients contaminated with agricultural chemicals is one factor that compromises the quality of elementary school students' midday meals (Figure 5). This is like nutritional deficiencies (protein, vitamin C, vitamin A, calcium, iodine, and iron), inadequate budget allocation, lack of monitoring and evaluation of the quality of midday meals, and the provision of accurate knowledge in managing midday meals, as the practical teachers concluded in fishbone diagram above.

The practical teachers used the social engineer concept to gather ideas and analyze the process 'From Farm to Lunch Tray,' illustrating the production and delivery of food ingredients to elementary students as depicted in Figure 6. The important sources of lunch ingredients are within the community, either in the community where the school is located or from other communities. Additionally, some schools have agricultural projects for vegetable cultivation and egg-laying chickens to supplement food ingredients. Ingredients from outside the school are transported and collected in large quantities for distribution, such as from community markets or wholesale stores. The school purchases from these sources must ensure an adequate quantity for the number of elementary school students before processing the ingredients. The acquired food items are stored in the school kitchen, such as meat, vegetables, and fresh fruits kept in refrigerators. When the lunch schedule is designed through the Thai School Lunch Program, the food service providers prepare and cook the meals before noon to serve the students. Leftover materials from food preparation, such as peels, vegetable roots, or food scraps, are used to create compost for the school or sent back to community farmers for agricultural purposes. This creates a circular food system within the community and the school.

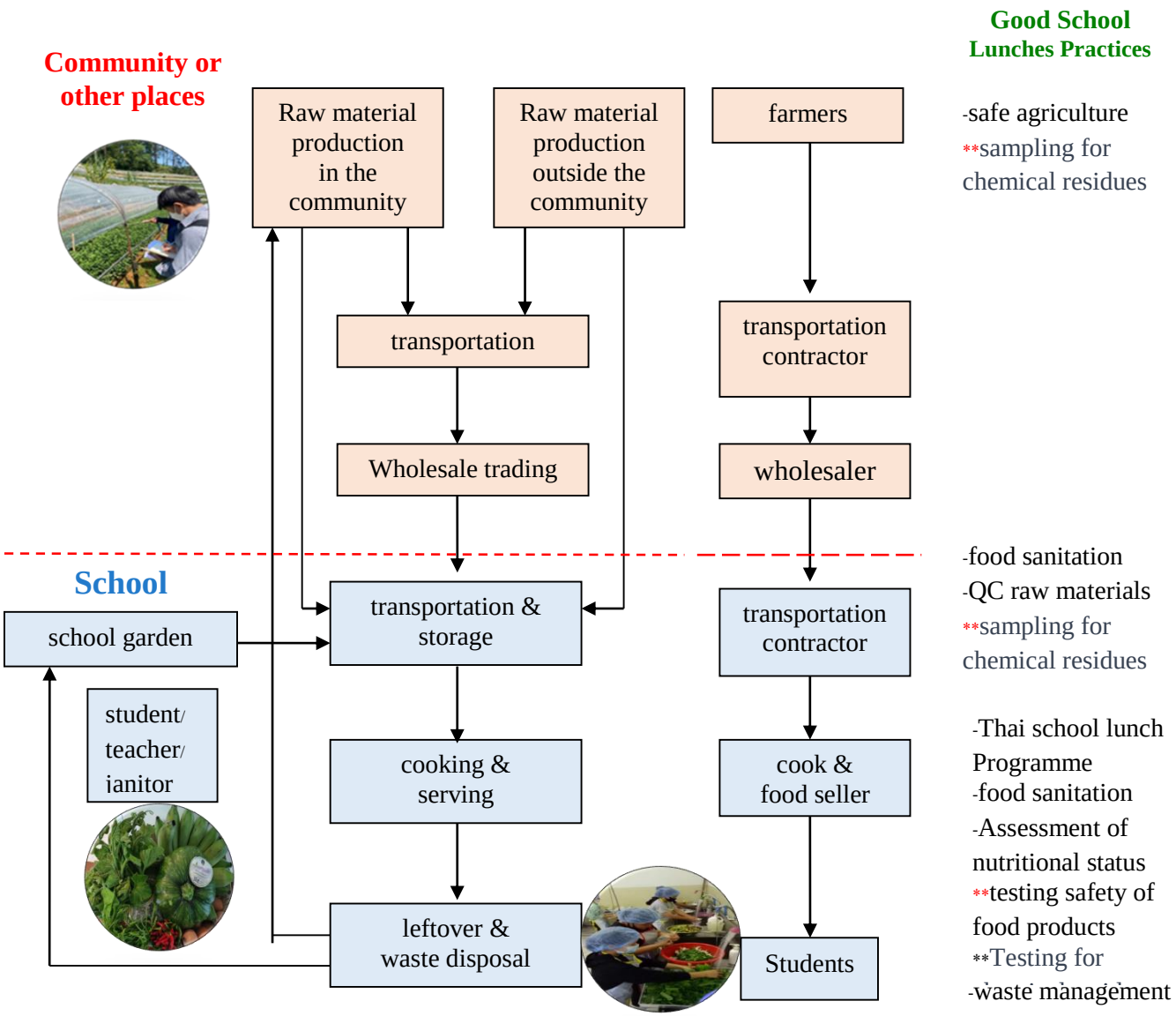

Figure 6 The creative concept of "Good School lunch Practices"
from community farm to safe and nutritious lunch tray (Source : Researcher, 2025)

M. I. C. model of safe agriculture and nutritious school lunch was proceeded by brainstorming of the practical teachers. They propose "Good School Lunch Practices" (Figure 6) by using pre-service-learning in agriculture and food aspects, which are implemented as follows: chemical inspection of agricultural products by farmers before delivering vegetables and fruits to schools, rechecking raw materials safety/ quality before using them in food preparation, training in inspecting and monitoring food preparation and quality, checking the menu from Thai School Lunch that aligns with seasonal local ingredients, ensuring the safety of food products distributed in school cooperatives, monitoring nutritional status, and promoting environmental conservation awareness. The Good School Lunch Practices involve various shareholders, including farmers, transporters, wholesalers, retailers, kitchen staff, and students. These practices aim to ensure the quality, safety, and nutritional value of school meals, creating a chain of responsibility and accountability throughout the entire process from production to consumption. By engaging all these shareholders, the initiative can contribute to a more systematic school lunch system, food safety, and the overall well-being of students (Galli et al., 2014).

Post-service reflection

Post-service reflection is a crucial step for practical teachers to provide information on how they apply knowledge and various skills in community contexts and connect with the desired characteristics of graduates. This reflective process allows teachers to analyze and evaluate their experiences, identify areas of improvement, and gain insights into how to better integrate their learning into community settings. It serves as a tool for continuous professional development, helping educators refine their teaching practices and enhance their effectiveness in preparing students for real-world applications (Daugherty, 2015).

From Table 2, the analysis of the content from the reflection indicates that the social engineer tools enhanced skills in reasoning the risk of fresh vegetables in meals. Skills are communicating and collecting information from participants in community research, collaborating within a research team, and innovating in monitoring the quality of midday meals for students (Kelemen, Cartmell & Sitton, 2009) . Moreover, these skills, particularly in managing the quantity, quality, and safety of school lunches, are developed. To acquire these skills, students need knowledge from the pre- service stage, covering the five modules: community food system, food security, safe agricultural systems in the community and schools, nutritional needs of school- age children, and food safety, as mentioned earlier. In addition, elementary education students have a crucial role in integrating this content into various subject areas such as health education, vocational studies, social studies, science, language, and more.

Table 2 Practical teachers' reflections on the principles of learning service in safe agriculture and nutritious school lunch

Question	Some reflection	Competency summary
1. How do social engineer activities increase your knowledge, skills and social attitude toward school lunch?	**R1** " I have practiced using various social engineer tools to study the issue of school lunch from multiple perspectives." **R2 "** We have talked to people in the community and at school, getting to know them and gathering information to plan solutions for the school lunch issue." **R3** "We should have a learning plan and media to make school lunch a topic that everyone is involved in, emphasizing responsibility in the chain for the children's health"	4 skills of social engineer - reasoning skills - communication skills - collaboration skills - innovation skills
2. What knowledge should you have about the nutritional and safe school lunches, and why?	**R1** Nutrition, food hygiene, and health for elementary school students communicate this issue with students, parents, kitchen staff, food providers, and distributors.	

Table 2 Practical teachers' reflections on the principles of learning service in safe agriculture and nutritious school lunch (cont.)

Question	Some reflection	Competency summary
2.What knowledge should you have about the nutritional and safe school lunches, and why?	**R1** Nutrition, food hygiene, and health for elementary school students communicate this issue with students, parents, kitchen staff, food providers, and distributors. **R2** Promoting service- learning activities for students, such as rice cultivation, kitchen garden cultivation, chicken farming, basic food quality inspection, and preparing simple and nutritious meals, with the participation of parents. **R3** Integrate content, such as Thai school lunches, and snacks and milk for children, clean water to learning subjects.	2. integration of school lunch content and practical activities related to other knowledge areas.
3.What practical teacher skills are necessary for managing school lunches, and why?	**R1** "I think planning a menu with all 5 food groups and adequate quantities for children within the budget is important." **R2** "We need to train to check the quality and safety of the food ingredients used for preparing lunches. If we grow vegetables in school and raise egg-laying hens, it can help reduce expenses." **R3** "We want to provide a program for Thai school lunch, allowing kitchen staff to find local seasonal ingredients for cooking."	1. Skills in managing the quantity, quality, and safety of school lunch for students. 2. Skills in sourcing and inspecting food ingredients both externally and within the school.
4.How does a practical teacher role relate to the school lunch programme, and in what way?	**R1** I can manage school lunch to be nutritionally sound, clean, safe, budget-friendly, and appealing to students. **R2** I will do safe agricultural activities and beneficial cooking practices for students to practice.	The teachers participate in lunch planning, implementing systems, managing learning, monitoring, and reporting results.

Practical teachers' reflections align with the diverse expectations of shareholders in Table 3, including being a model of good health, providing quality nutritional education for students, communicating effectively the guidelines for the quality of midday meals that are suitable for the budget allocated to the kitchen staff, suppliers, and parents. Additionally, developing potential in food education through learning, practical training, and implementation in schools. In line with CMRU's expectations, it is anticipated that graduates in primary education and agriculture will have knowledge in their respective fields of agriculture and food safety. They are expected to have good health and consume food based on nutritional principles, possess a good personality to serve as role models for students, be responsible citizens, and be individuals who contribute to social engineer. They should be teachers who develop the quality of their own lives and that of students

Table 3 Social expectation of a practical teacher's role in relation to school lunch management

Shareholder	Some reflection	Competency summary
1. Elementary student	1. "I want a clean, adequate, and diverse midday meal." 2. "I would like to have some traditional or ethnic food included in the meal schedule." 3. "I would like the teachers to ask students in the classroom about what they would like to eat, but it should be beneficial." 4. "The teacher teaches that we should reduce sweets and brush our teeth regularly." 6. "The teacher teaches to eat rice and vegetables without leaving any leftovers."	Being a role model teacher with good dietary habits for students and listening to students' feedback to develop school lunch.
2. Local government	The nutrition teacher helps inspect and assess the results of the school lunch project.	Responsibility for checking the nutritional value of school lunch within the national budget.
3. Elementary school administrator	"I would like the new teachers to establish a mini learning centre about vegetable cultivation, creating an agricultural garden that is appropriate. We have a budget for it and would prefer a practical teacher with a background in agriculture to serve as an example."	Skills in managing agricultural and food learning through active learning
4. School teacher	The teacher closely monitors and supervises the student food consumption, inspecting menus that include vegetables and fruits that students enjoy eating.	Skills in recommending beneficial food consumption.
5. Kitchen staff	"I would like the teachers to help in training on proper food quality management and nutrition. The meal schedule should be in line with the budget, seasons, and storage."	Collaborate with training in nutrition, meal planning, and food sanitation.
7. Farmer	"I would like teachers to choose some agricultural produce from the community. We are confident that the vegetables and fruits are safe, using natural insect repellents."	Knowledge about community food systems and the distribution of the food in schools
8. Students' parent	I want to donate vegetable seeds and help other parents establish vegetable gardens in schools. There should be community activities and school relationships.	Providing opportunities for the community to participate in managing learning for students.
9. Representatives from a non-profit organization	1.Promote the adoption of the Thai School Lunch program in menu planning. 2.Nutrition teachers have knowledge, skills, and awareness in preparing and planning nutritious menus.	Applying national food policies and strategic plans in practice, along with providing feedback for development.

Table 4 Analyzing the competencies of practical teachers in the field of safe agriculture for nutritional lunches for Thai elementary school students

Knowledge	Skill	Attitude
1. School lunch programme 2. Nutrition and food safety for kids 3. Community food system	1. Management skills for quality and safety of school lunches with a standard budget according to national standards. 2. Proper management of nutritional learning for students and individuals involved in the midday meal food chain 3. Collaborative working skills with relevant organizations in the development of quality and safety of school lunches.	Learning towards a lifelong good health

As seen in Table 4, the competencies of practical teachers about safe and nutritious school lunches from Table 4 were reflected in the CMRU model as follows: "C-competency for work" in the context of working with both internal and external organizations, leading to "M-management skill" or quality management of lunch meals that are safe, nutritious, and of high quality. It also mentions "R-resilience activities" as an example of self-recovery towards good nutrition, positive emotions, and a socially balanced and happy life through a lifelong commitment to good health, and a "U-universal idea," which involves broad and diverse perspectives on food through learning, practice, and adaptation to the changing societal norms in Thailand and the global community.

Discussions

The preparation of practical teachers for professional certification requires organizing experience in learning both in managing classroom diversity and within diverse communities. This is to ensure that they acquire knowledge, work skills, and attitudes ready to be part of teacher professionalisation (Resch, & Schrittesser, 2023). The practice-oriented teaching method called the "Service-Learning approach" has been applied in teacher education in the United States, South America, Asia, and Europe (Gregorová, Heinz ova, & Chovancová, 2016). Therefore, service-learning is one of smart teaching, which connects theory and practice in an organised service activity to support a process that transforms a practical teacher into a professional teacher. This research has brought the safety issues and the nutritional value of midday meals to the forefront as a central concern that elementary school practical teachers in all academic disciplines can collaborate on. This is because it is a matter that teachers emphasize, like academic subjects, in terms of health. The social engineer tools are crucial, allowing the practical teachers to see the overall picture of the food production system in the community, particularly focusing on lunch meals (Bureau of Nutrition, 2021).

The service-learning process is divided into three stages: the pre-service stage, which serves as the foundational step according to the "revised Bloom's taxonomy" (Anderson & Krathwohl, 2001; Bloom et al., 1956). that learners memorize relevant content and improve agriculture and food skills. It involves describing the characteristics of quality midday meals in terms of nutritional content and safe agricultural ingredients. This includes understanding and explaining systemically, such as the community food ingredient production system. If managed with enough, nutritional value, and safety, it contributes to food security. Preparing content and practical training in agriculture will allow students to integrate their prior experiences at home and school with experiences at the university and apply them in the

service-delivery stage. While working with a community, the learners construct knowledge, skills, and attitudes about safe agriculture and nutritious school lunches by applying their experiences from the pre-service stage, aligning with the "Experiential Learning Theory" (Kolb & Kolb, 2005). They utilize social engineer tools to investigate safety information and types of food ingredients in both the community and school, comparing them with the agricultural area within the university. Subsequently, they enhance their experiences, such as quality and safety checks on fresh vegetables, examination of midday meal listings, and implementation of chemical reduction methods in agriculture, to reinforce their deeper understanding of the community context. The experience of practical teachers who were once elementary school students in having lunch with nutritional value is another factor in designing the current school lunch menu for children. The survey and data collection from local farmers, questioning agricultural practices, and observing midday meal operations in schools enable learners to analyze the food supply components and connections within the community food production system. This starts with farm cultivation to the school students who consume the food in school. Bundy, Drake & Burbano (2012) illustrated that the food supply chain, connecting food production to food distribution in schools, comprises four crucial components: the agriculture sector and food production, food procurement, logistics and processing, and food preparation and feeding. They classified and assessed the significant risks of midday meals in schools based on the survey data (Figure5). Finally, the practical teachers used the M.I.C model of social engineer to crate "Good School lunch Practices" by indicating safety and nutrition control points in the school lunch chain. This represents a new perspective on controlling the quality of midday meals in schools (Rojas et al., 2011).

The competencies of practical teachers arise from knowledge, skills, and attitudes that are reflected after the service-delivery stage. In this research, the competencies specifically focus on managing school lunches for elementary school students (Table 4). It encompasses the integration of co-learning content related to agriculture and food in the community (CAFE-Community, Agriculture, Food, Engagement). This operation aligns with the research that emphasizes the collaborative plant cultivation of garden laboratories between communities and universities, classified as sustainability education and sustainable food systems. The objective is to foster behavioral changes towards the food safety mindset (Burns & Miller, 2012). Practical teachers who underwent continuous service-learning, starting from extracurricular activities to integration with various subject curricula, aim to develop themselves to meet the needs of both them and society (Stavrianeas, 2018). University plays a crucial role in enhancing CMRU's capabilities through the 5Ls approach that aligns with O' Neil & Lima (2013): Learning Space: Utilizing knowledge resources in educational institutions and communities. Learning Style: Employing various learning formats, such as service-learning, to develop students and educators. Learning Skill: Enhancing social engineer skills *Learning to Shar*e: Taking what is learned from the university and exchanging it with communities and schools. Learning to Shine*:* Learning and developing their teaching competencies to meet social and professional standards. DiBenedetto, Willis, & Bamck (2018) and Harder (2009) highlight in their research that the crucial competencies of agricultural teachers involve working on specific agricultural issues to enhance societal quality, as well as possessing skills in sustainable production and inspection of food. However, this research has limitations in selecting practical students, as they are required to cover all 8 subject areas, namely mathematics, Thai language, foreign languages, science, social studies, vocational education, health education, and performing arts. The integration of these subjects will lead to the creation of school lunch programs in schools. The practical students will gain this experience through exchanging and collaborating with schools based on their expertise, contributing to diverse and integrative outcomes for the schools involved.

Conclusion and suggestions

This research has two objectives. The first focuses on service-learning for practical teachers at CMRU, using social engineer to promote safe agriculture and nutritious school lunches. The learning process involved five key tools: 1) a fishbone diagram to analyze food safety and agricultural chemicals in vegetables; 2) assessing the community's vegetable supply for school lunches by matching seasonal crops with school demand; 3) tracking the school lunch schedule to ensure proper vegetable use; 4) creating a supply chain from farm to lunch tray; and 5)using the M.I.C. model to ensure the safety, nutritional value, and cost-effectiveness of the lunch program.

The second objective is achieved through reflections from practical teachers and community partners, summarizing the competencies developed in creating safe and nutritious school lunch programs. These competencies include: 1) agricultural and food knowledge in school lunch programs, nutrition, food safety, and community food systems; 2) practical skills in managing safe and quality school lunches, nutritional learning, and collaborating with relevant organizations; and 3) a desirable attitude of "learning towards lifelong good health."

The results of this research have the following suggestions:

1. Design criteria for measuring the knowledge, skills, and attitude of practical teachers in service-learning for the development of community food systems.

2. The expansion of community food systems with various core subject areas (Food, Agriculture, Nutrition, Environment, Science, Technology, Energy, Economics and Mathematics, FANESTEEM) or extracurricular activities in schools to enhance service-learning activities and further drive Thailand's food education.

3. Create a foundational learning set on elementary school meals to be used to enhance the quality of practical students, teachers, nutrition teachers, and school food preparers in schools.

New knowledge and the effects on society and communities

This research examines the use of service-learning as a social concept, where learners apply academic knowledge and 21st-century skills to address societal needs, particularly in agriculture and nutrition. In Thailand, the social engineer approach in higher education effectively coordinates service-learning by involving both community and educational institutions as learning bases for practical teachers. Through extracurricular programs, practical teachers use social engineer tools to gather and analyze information, identify community needs, and connect food systems with educational institutions. What makes this research particularly interesting is its application of social engineer tools to develop the quality and safety of school lunches in elementary schools.

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Evidence-Based Analysis of Mental Health Challenges Among LGBTQ+ Youths

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Abstract

This research entitled "Evidence-Based Analysis of Mental Health Challenges Among LGBTQ+ Youths" studied the definitions of mental health problems, definitions and key components of protective factors, and prevention guidelines to resolve mental health problems among LGBTQ+ youths. This qualitative study involved focus groups with LGBTQ+ youths and expert interviews. A semi-structured interview was used as the research instrument. Data were subjected to content analysis, with data reliability assessed using triangulation. Results revealed that mental health status problems among LGBTQ+ youths included stress, anxiety, and depression. The characteristics of mental health problems among LGBTQ+ youths and heterosexuals were similar. The key components of protective factors of mental health problems among LGBTQ+ youths included resilience, self-esteem, and positive psychology. Prevention guidelines of mental health status problems among LGBTQ+ youths should consist of knowledge transfer through various attractive activities to increase skills that can be utilized in their daily lives. In conclusion, this study aims to understand mental health problems, protective factors, and guidelines for care in LGBTQ+ youths through direct research with them. Furthermore, the research shows findings have interesting implications for developing interventions for preventing mental health problems among LGBTQ+ youths with special needs.

Keywords: LGBTQ+ youths, Psychological well-being, Emotional wellness, Sexual minorities, Gender diversity

Introduction

Human rights are a key tool to create social justice as part of the necessary development to search for a good life free from insurgencies, violence, and conflicts in society (Mongkhonsuebsakul, 2019). In Thailand, LGBTQ+ people have not yet been widely enough accepted to live their lives happily; they still undergo sexual orientation problems, leading to difficulties in study and work and problems of access to wellness care. These obstacles impact their mental, physical, and intellectual states to lead a normal social life (Tinnam et al., 2020).

A report by the Department of Mental Health in Thailand stated that 14.6% of youths aged between 11 and 19 enrolled for mental health counseling (Department of Mental Health, 2019). Generally, youths 15-19 years old suffer from mental health problems (Davison et al., 2015). LGBTQ+ people experience greater mental health problems than heterosexuals (Marshal et al., 2013). The most common mental health problems found in LGBTQ+ were stress, anxiety, and depression (Hall, 2018; Witcomb et al., 2019). Thus, mental health problems experienced by LGBTQ+ youths aged between 15 and 19 should be focused on and solved.

Mental health problems in LGBTQ+ youths can result from victimization such as rejection, bullying, discrimination, stigma, and social exclusion from their families, teachers, or friends (Hall, 2018; Witcomb et al., 2019) Previous studies found that resilience, self-esteem, and positive psychology can reduce mental health status problems in LGBTQ+ individuals (Hall, 2018; Smith et al., 2017). Practicing positive psychology can improve self-esteem and resilience (Wang & Kong, 2020). This research educated of protective factors for mental health problems among LGBTQ+ youths that included the resilience scale based on the concept of Grotberg (1995), the self-esteem scale based on the concept of Coopersmith (1981), and the positive psychology scale based on the concept of Seligman (2011)

Many studies have addressed LGBTQ+ youths, but the knowledge and availability of primary care systems in Thailand do not meet the needs of LGBTQ+ youths. Furthermore, the study of protective factors for mental health problems, such as resilience, self-esteem, and positive psychology, are psychological variables whose definitions and components vary depending on the educational context. No research has been conducted to define the meaning and components of protective factors for mental health problems in the context of LGBTQ+ youth in Thailand. As a result, if existing definitions and components of protective factors for mental health problems are applied, they may be incompatible with the context of LGBTQ+ children because the contexts of LGBTQ+ and cisgender youths differ. Therefore, this research studied the definitions of mental health problems, the definitions and key components of protective factors, and prevention guidelines of mental health problems according to the direct viewpoints of LGBTQ+ youths and experts in LGBTQ+ to obtain specific data that met the context of LGBTQ+ individuals. Guidelines for precise development of life quality for LGBTQ+ youths are required to fill the research lacuna and address the causes of mental health status problems among LGBTQ+ youths.

Research objectives

To study the definitions of mental health problems, the definitions and key components of protective factors, and provide tailored prevention guidelines to resolve mental health problems among LGBTQ+ youths.

Methodology

This research is part of the development of a psychoeducation program for mental health among LGBTQ+ youths, which consists of three phases. This research will focus on Phase 1: To study the definitions of mental health problems, the definitions and key components of protective factors, and present prevention guidelines to resolve mental health problems among LGBTQ+ youths.

This study used qualitative research to formulate the definitions of mental health problems, the definitions and key components of protective factors, and prevention guidelines to resolve mental health problems among LGBTQ+ youths.

Participants

The key informants were divided into two groups as LGBTQ+ youths and experts in LGBTQ+. Participants in each sample group were selected as follows.

1. Fifteen LGBTQ+ youths were divided into two groups of seven and eight students (Nastasi & Schensul, 2005). The samples were selected by purposive sampling using snowball selection with the following inclusion criteria. (1) They must be LGBTQ+. (2) Their family members acknowledged and gave consent to participation. (3) They must be between 15 and 18 years old and study in a high school in Chiang Mai. (4) They must have perfect consciousness. (5) They must be able to communicate and understand the Thai language. (6) They must be willing and give their consent to participate in the research.

2. Eight experts in LGBTQ+ (Nastasi & Schensul, 2005) were selected by purposive sampling using snowball selection with the following inclusion criteria. (1) They must be physicians, nurses, psychologists, and scholars who have worked with LGBTQ+ people for not less than 5 years, or LGBTQ+ people with honest livelihoods and the ability to take care of themselves. (2) They must have perfect consciousness. (3) They must be able to read and speak in Thai. (4) They must be willing to participate in the research.

Exclusion criteria of LGBTQ+ youths and experts in LGBTQ+ included: the sample group had limited time to give the researcher, and they were unable to meet to explain the study participation instructions or hold focus group talks within the timeframe stated in the research framework.

Instrument

The research instrument was divided into 1) in-depth interviews and 2) focus group discussions for data collection, That was a semi-structured interview divided into three parts (1) questions about the definitions of mental health problems among LGBTQ+ youths (stress, anxiety, and depression), (2) questions about the definitions and key components of protective factors among LGBTQ+ youths (resilience, self-esteem, and positive psychology), and (3) questions about prevention guidelines to resolve mental health problems among LGBTQ+ youths.

The instrument was tested by five experts and contained the same questions for the focus group discussions and in-depth interviews. Experts evaluated the questionnaire's content validity to check the IOC (Index of Item-Objective Congruence) values. Questions with an IOC value greater than 0.5 passed the selection criteria. Questions with an IOC value of less than 0.5 were removed or improved following the advice of the five experts.

Data collection

Data collection was divided into two parts, with details as follows.

1. The two focus groups comprised LGBTQ+ youths. Research data were prepared for the high schools involved in the study with the announcement of applications for interested participants. The details were clarified and consent forms were prepared for signature by the key informants as LGBTQ+ youths and parents of the samples. Next, the samples were

assigned to a focus group. The consent forms were collected by the researcher on the day of the focus group discussion which took around 90 minutes.

2. In-depth interviews were conducted with experts in LGBTQ+. The details and consent forms were prepared for the key informants. All participants signed a consent form before participation. The consent forms were collected on the day of the in-depth interviews. The key informants made appointments for the in-depth interviews which were conducted by the researcher via the online platform Zoom as per their convenience. The interviews lasted between 60 and 90 minutes.

Data Analysis

The data were analyzed using content analysis, a method that can provide a framework to categorize words or content of the data to help select and eliminate unnecessary content and make the content consistent with the research objectives. The QDA Miner Lite, a content analysis program, is used to extract the main ideas by decoding and organizing into groups. Results from the in-depth interviews and focus groups were then analyzed. The transcribed interviews were interpreted, and data from the in-depth interviews and focus group discussions were reverified. Data were compared to identify the key issues raised in the literature review, in-depth interviews, and focus group discussions, and then redundancy of the data was synthesized, and the results were summarized according to the research objectives. Reliability was analyzed by triangulation of sources (Jirawatkul, 2010). The synthesized data were sorted into a table of topics containing the main ideas that were relevant to the key issues of the research objectives. Finally, the researcher verified the conclusions with the research team to ensure accuracy.

Ethical Approval Statement

This research was approved by Chiang Mai University Research Ethics Committee, CMUREC No. 65/046.

Results

Qualitative results were obtained from focus group discussions with 15 LGBTQ+ youths and also from in-depth interviews with 8 experts in LGBTQ+ (1 psychiatrist worked with LGBTQ+, 1 expert was a heterosexual with LGBTQ+ research publications, 3 LGBTQ+ lecturers, 2 LGBTQ+ teachers, 1 LGBTQ+ businessperson)

Data synthesized from the literature review, in-depth interviews, and focus group discussions identified three key issues as (1) definitions of mental health problems among LGBTQ+ youths, (2) definitions and key components of protective factors among LGBTQ+ youths, and (3) prevention guidelines to resolve mental health problems among LGBTQ+ youths.

(1) Definitions of mental health problems among LGBTQ+ youths

Data from the literature review, combined with data obtained by qualitative research from the focus group discussions and in-depth interviews, identified 1) stress, 2) anxiety, 3) depression, and 4) characteristics of mental health problems among LGBTQ+ youths and cisgender youths. These issues, along with their characteristics are discussed below.

1) Stress

Stress is a constant occurrence in people's daily lives, and it can cause physical and emotional imbalances, including melancholy, pressure, and unexpected effects.

"Stress is a daily physical and mental imbalance caused by preparing for situations or self-imposed pressures, causing emotional and physical changes that impact work, study, and quality of life." (Data from literature review).

"Stress is a natural human state, regardless of whether LGBTQ+ individuals are involved or not." (Expert 2, in-depth interview).

"Stress arises from high expectations, which lead to high intentions, but when things don't go as expected, stress occurs." (An LGBTQ+ youth from Group 1, focus group).

"Stress is caused by pressures, different factors, teachers, families, and school. And it keeps accumulating" (An LGBTQ+ youth from Group 2, focus group).

Therefore, the meaning of stress among LGBTQ+ youths is a common daily occurrence among LGBTQ+ youths and can lead to physical and mental imbalances, causing depression, pressure, and unexpected outcomes, resulting in emotional and physical changes.

2) Anxiety

Anxiety is a mental state that can occur in daily life, often by trying to predict what will happen by using too much negative thinking or feelings.

"Anxiety is a mental state characterized by frustration and uncontrollable nervousness, often triggered by predicting future situations, which can be harmful or threatening to one's well-being." (Data from literature review).

"Anxiety is a form of thinking or feeling that involves predicting negative outcomes in the future, often leading to persistent anxiety" (Expert 2, in-depth interview).

" Anxiety arises from excessive concern for others' opinions, particularly LGBTQ+ individuals, who worry about how others perceive them and whether their expressions are considered good or bad." (An LGBTQ+ youth from Group 1, focus group).

"…I am worried that my family has high expectations about me but I am different to what they expect..." (An LGBTQ+ youth from Group 2, focus group).

Therefore, the meaning of anxiety among LGBTQ+ youths refers to a mental state that can occur in daily life among LGBTQ+ youths, often by trying to predict what will happen by using too much negative thinking or feelings.

3) Depression

Depression is an emotional state that can occur in daily life when undergoing violent situations, resulting in negative feelings as sad, discouraged, weary, hopeless, and unhappy. Long- term depression can cause physical, emotional, mental, and behavioral changes in negative ways.

"Mental health issues, including depression, can lead to negative emotions, thoughts, and behaviors, causing unhappiness, sadness, and decreased productivity, affecting daily life and livelihood efficiency" (Data from literature review).

"Depression is a feeling that everybody experiences. Violent situations can cause depression. If depression does not last long, it will not be classified as an illness" (Expert 2, in-depth interview).

"…The problem of being LGBTQ+ is not only having to prove oneself as good or not but also to be accepted. This can cause depression because we think that we will be rejected" (An LGBTQ+ youth from Group 1, focus group).

"For me, life is terrible. What used to be good turns bad and we think that everything is against us. We become constantly obsessed with these negative thoughts" (An LGBTQ+ youth from Group 2, focus group).

Therefore, the meaning of depression among LGBTQ+ youths is an emotional condition that results from extreme circumstances, resulting in negative feelings and long-term physical, emotional, mental, and behavioral changes for LGBTQ+ youth.

4) Characteristics of mental health problems among LGBTQ+ youths and cisgender youths

The study results indicated that the characteristics of mental health problems among LGBTQ+ youths and cisgender youths were similar, with only the factors that caused mental health status problems showing as different.

"The symptoms of stress, anxiety, and depression are not different…Common stress can impact everybody, both LGBTQ+ and cisgender. However, LGBTQ+ individuals

undergo particular stress caused by how other people view them, such as discrimination. Stress, caused by expectations and rejection occurs because we are afraid that if we reveal that we are LGBTQ+, we may be rejected or hated by our parents. Stress is caused by hiding our 'real' self all the time..." (Expert 5, in-depth interview).

"Mental problems symptoms in cisgender youths and LGBTQ+ youths are similar, but the causes may differ. LGBTQ+ youths face family issues, while cisgender youths can solve problems more easily. LGBTQ+ youths often face rejection and lack understanding." (An LGBTQ+ youth from Group 2, focus group).

"The symptoms of both groups are the same…but differences in stress, anxiety, and depression among LGBTQ+ individuals occur because this group is abused by the society, people around them, and those who treat LGBTQ+ people as if they are not humans but clowns. Such abuse causes distress, sadness, and anxiety. We have to carry on like normal as if nothing had happened" (An LGBTQ+ youth from Group 2, focus group).

The study found similar mental health problems among LGBTQ+ and cisgender youths, but the factors causing them differ, with LGBTQ+ youths experiencing social discrimination, rejection, and lack of understanding, while cisgender youths do not face such issues.

(2) Definitions and key components of protective factors among LGBTQ+ youths

The analysis of the definitions and key components of protective factors among LGBTQ+ youths obtained from the literature review and combined with data obtained from the qualitative research using focus group discussions and in-depth interviews identified 1) the definitions of resilience, 2) the components of resilience, 3) the definitions of self-esteem, 4) the components of self-esteem, 5) the definitions of positive psychology, and 6) the components of positive psychology, with details presented as follows.

1) The definitions of resilience

Resilience is a characteristic of capable and competent people to deal with problems and bad situations that affect their life, either physical, mental, or social effects; along with stress. These people have suitable adaptation process and can resume their normal life within a short time after they pull through

"Resilience is a trait possessed by capable individuals who can quickly recover from physical, mental, or social stressors, enabling them to resume their normal life." (Data from literature review).

"It is like patience with situations at hand, which may be either bad or not quite good. These people can endure and adapt to these situations…They can pull through and finally resume their normal life" (Expert 6, in-depth interview).

"…Definitely, there must be positive rather than negative thinking. We must also love ourselves and who we are. We are the way we are. That is because I think we are not wrong to be LGBTQ+" (An LGBTQ+ youth from Group 1, focus group).

"We must cultivate resilience and handle challenges independently, as we must live independently in the future. Focus on the present and acknowledge our efforts." (An LGBTQ+ youth from Group 2, focus group).

Therefore, the meaning of resilience in LGBTQ+ is the ability of LGBTQ+ youths to deal with bad situations or crises that can affect their lives. Resilience can reduce negative conditions by suitable adaptation and return to normal life.

2) The components of resilience

The synthesized components of resilience among LGBTQ+ youths obtained from the literature review and the qualitative research using two focus groups and in-depth interviews were congruent in three components including I am, I can, and I have, as presented in Figure 1.

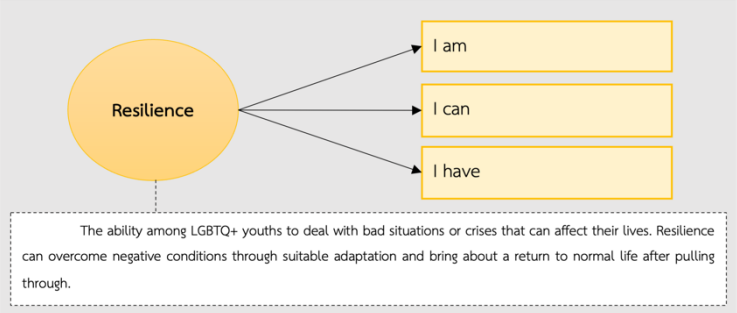

Figure 1 The definitions and key components of resilience (source: Researcher, 2024)

3) The definitions of self-esteem

Self-esteem is the feeling about themselves as a result of self-evaluation about what they do and who they are. They believe that they are valuable, capable, important, successful in work, confident, and have good attitudes toward themselves.

"Self-esteem is a person's self-evaluation of their worth, capabilities, and achievements, influenced by self-belief and external experiences. It includes self-confidence, respect, and acceptance, with varying levels exhibited through various behaviors." (Data from literature review).

" . . . When LGBTQ+ individuals are aware of their advantages and disadvantages, they can still live with respect and the right to live their own life… including pride to be like this. They are not only proud of their advantages but can also accept their disadvantages" (Expert 2, in-depth interview).

"It is like we love ourselves and what we are. We accept ourselves the way we are…We can do everything like others" (An LGBTQ+ youth from Group 2, focus group)

Therefore, the meaning of self-esteem in LGBTQ+ youths is how LGBTQ+ youths perceive themselves as a result of self-evaluation about who they are and what they do. Self-esteem promotes a feeling of confidence that they are valuable, with perceived abilities, self-efficacy, self-acceptance, pride, loving themselves, and the ability to live happily in the society the way they are.

4) The components of self-esteem

The synthesized components of self-esteem among LGBTQ+ youths obtained from the literature review and the qualitative research were congruent in six components including 1) general capacity, ability, and performance, 2) affective states, 3) parenting style, 4) school, 5) social status, and 6) peer group, as presented in Figure 2.

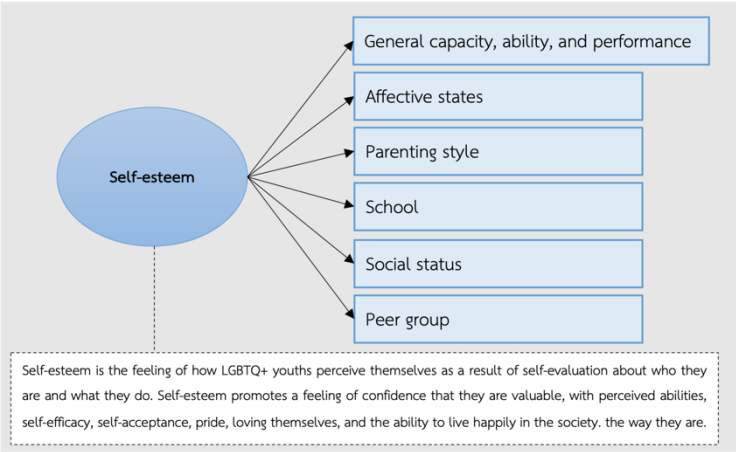

Figure 2 The definitions and key components of self-esteem (source: Researcher, 2024)

5) The definitions of positive psychology

Positive psychology studies and explores strengths by giving precedence to searching for human promotion and development guidelines; it helps people to perceive their strengths and self-efficacy. Positive psychology also mainly focuses on promoting experiences and positive ideas rather than dwelling on negative aspects, thereby facilitating happy.

"Positive psychology focuses on promoting human development and strengths, fostering self-efficacy, and promoting positive experiences, rather than dwelling on negative aspects, to promote happiness and meaningful living." (Data from literature review).

"...It refers to positive feelings. People who have positive feelings and thinking toward something will also express or do things in life in a positive way (Expert 6, in-depth interview).

" I think it is positive thinking. Because we are LGBTQ+ , we are always mentioned negatively. However, we keep thinking positively and disregard negative words or any negative things." (An LGBTQ+ youth from Group 2, focus group).

Therefore, the definition of positive psychology in LGBTQ+ youths refers to an applied approach to optimal functioning that helps to perceive strengths, advantages, or abilities. Positive psychology promotes positive experiences through the creative use of skills to further develop these abilities in a good way for happy living.

6) The components of positive psychology

The synthesized components of positive psychology among LGBTQ+ youths obtained from the literature review and the qualitative research were congruent in five components including 1) positive emotions, 2) engagement, 3) relationships, 4) meaning, and 5) accomplishment, as presented in Figure 3

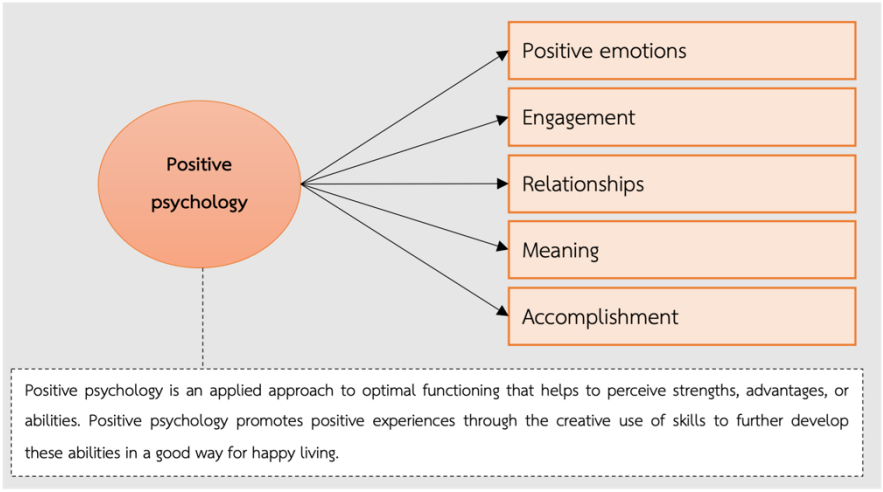

Figure 3 The definitions and key components of positive psychology (source: Researcher, 2024)

(3) Prevention guidelines to resolve mental health problems among LGBTQ+ youths

Data obtained by the qualitative research using focus group discussions and in-depth interviews included 1) the significance and necessity of knowledge transfer to promote mental health among LGBTQ+ youths, 2) the required content of knowledge to promote mental health among LGBTQ+ youths, 3) activities to promote mental health among LGBTQ+ youths, and 4) activity modes to promote mental health among LGBTQ+ youths.

1) Significance and necessity of knowledge transfer to promote mental health among LGBTQ+ youths

Results revealed that knowledge transfer to promote mental health among LGBTQ+ youths was significant and indispensable. Knowledge transfer also helped to develop resilient

mental efficiency, promote mental health, and mitigate problems that may occur among LGBTQ+ youths.

"…Focusing on LGBTQ+ youths, knowledge transfer about mental health is a significant guideline to reduce future mental health problems, and also to strengthen the good points/advantages they already have. Knowledge transfer also develops mental efficiency and resilience" (Expert 3, in-depth interview).

" I view knowledge transfer regarding this as a must because LGBTQ+ individuals are accepted more widely nowadays. Knowledge of LGBTQ+ in high schools will motivate teenagers to realize what they will do in the future. (Expert 4, in-depth interview).

"I think it is necessary, not only for LGBTQ+ individuals but also for people of all genders. Everybody should have knowledge regarding this matter because sometimes the society is not that nice to us. LGBTQ+ people have no ideas how to resolve stress and often end up with depression" (An LGBTQ+ youth from Group 1, focus group).

2) The required content of knowledge to promote mental health among LGBTQ+ youths

The qualitative results revealed that LGBTQ+ youths should obtain knowledge and skills for useful utilization in their daily lives including basic knowledge of sexual health, knowledge of basic mental health, literacy skills and management skills toward their emotions, basic skills to deal with and solve problems in daily life by setting goals to achieve them, and basic social skills to live efficiently with other people in the society.

"Self-esteem resilience and positive thinking are also required, particularly self-acceptance, self-understanding, loving themselves and others" (Expert 1, in-depth interview).

"…Knowledge transfer regarding LGBTQ+ youths should also include … matters about physical changes, possible health risks in daily life and effects on their life, emotional management practice, problem management practice; for example, stress management, sad mood management, and anxiety management. Simple approaches should be followed that may be effective at a certain level…" (Expert 2, in-depth interview).

" LGBTQ+ youths should realize that mental health or mental state is significant, and understand how to evaluate themselves at a primary level. Stress or anxiety will cause no desire to go to school, to eat, or to talk. They will become isolated. LGBTQ+ people must evaluate themselves and learn how to change. Before self-evaluation, they must have knowledge regarding which mental signs/symptoms are normal and which are not normal"(Expert 8, in-depth interview).

"We must have positive perspectives and positive thinking. Because if we can, then things will get better. We must be self-centered in the right things, not in everything, which is not good. For example, if we are self-centered within a group assignment to solve a problem and ignore the voices of other members, the assignment result will be inefficient. We should be self-centered in matters that discourage our mental state or any matters that make us sad" (An LGBTQ+ youth from Group 2, focus group).

3) Activities to promote mental health among LGBTQ+ youths

Results revealed that activities for LGBTQ+ youths should be varied to make them more attractive such as giving lectures to parallel activities, scenarios, and discussions exchanging experiences, perspectives, and opinions through group counseling. Those activities should provide knowledge, skills, perspectives, ideas, and experiences for LGBTQ+ youths that can be utilized creatively in their lives.

"…Get LGBTQ+ youths to talk about their problems and help them through group processes. It is possible" (Expert 1, in-depth interview).

"...It can be actions, if possible such as meditation and other activities because these will help them to put knowledge from lecturers into practice and lead to thinking,

analysis, better understanding, and vivid images of what they do…" (Expert 6, in-depth interview).

"Activities should be divided into two parts as giving lectures and activities. Lectures only are boring, while activities are tiring…" (An LGBTQ+ youth from Group 2, focus group).

"Apart from scenarios, there should also be reality-based situations. I also think that if we give participants warmth and the feeling of safety, they will be more assertive" (An LGBTQ+ youth from Group 1, focus group).

4) Activity modes to promote mental health among LGBTQ+ youths

Activity modes to promote mental health status problems among LGBTQ+ youths should include on-site activities to promote responses and interactions between groups. Their reactions will be clearly observed. By contrast, online activities may include several limitations such as readiness of devices or internet signal, which may disrupt the activities and direct interactions. Thus, on-site activities can be more efficient than online activities.

"...When teaching skills, each student may respond differently and ask different questions. On-site activities create fresh and new information. We will see their reactions more clearly and may have an easier chance to support one another in case of any situations" (Expert 2, in-depth interview).

"Because of factors or the society, on-site activities create better relationships, while online activities seem to have a mirror in the middle, which makes it more difficult to send feelings to one another than on-site" (An LGBTQ+ youth from Group 1, focus group).

"Online and on-site modes are very different. To clarify, sometimes there is a problem with the signal. Some students are far away. Some may come into the online system but do something else behind the camera. However, students do on-site activities together to the end and can learn at their best" (An LGBTQ+ youth from Group 2, focus group).

The overall research results include (1) definitions of mental health status problems among LGBTQ+ youths, (2) definitions and key components of protective factors among LGBTQ+ youths, and (3) prevention guidelines to resolve mental health problems among LGBTQ+ youths, as shown in Figure 4

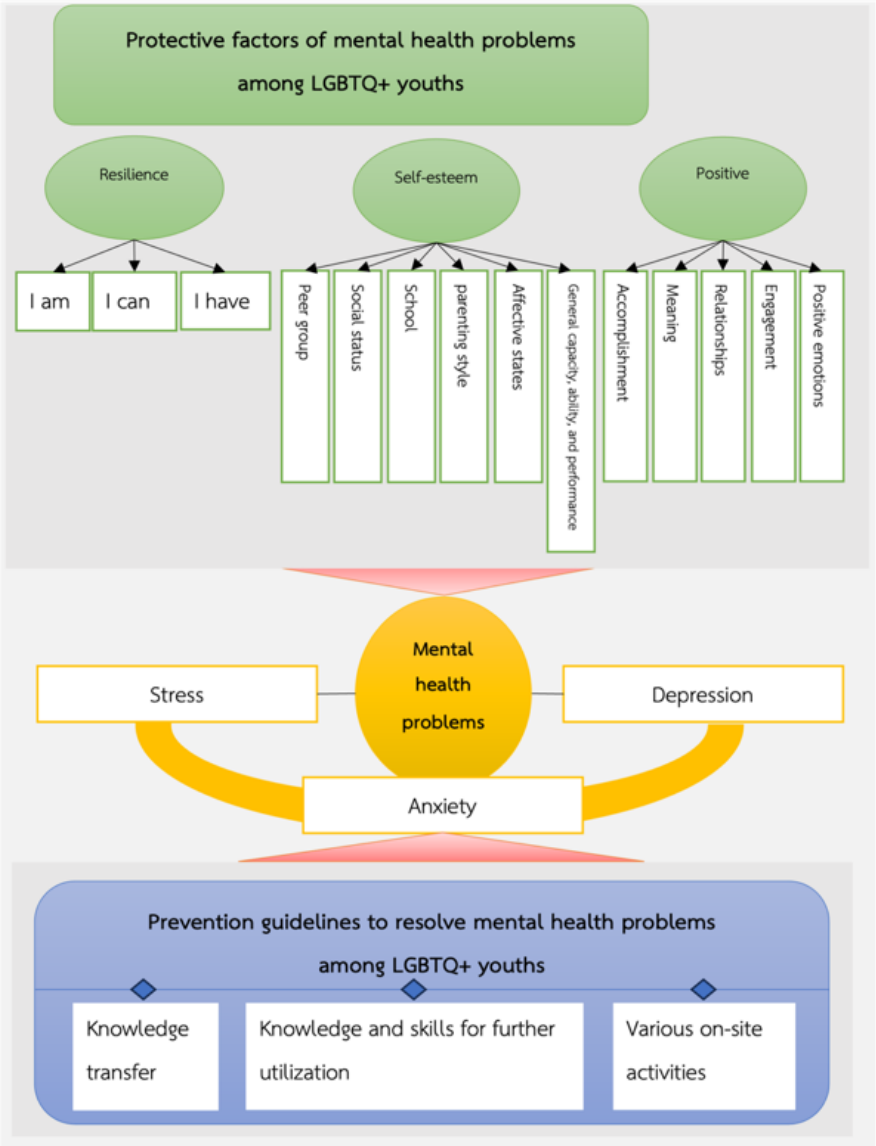

Figure 4: Overall research results of mental health problems among LGBTQ+ youths (source: Researcher, 2024)

Discussions

Definitions of mental health problems among LGBTQ+ youths

Results revealed that the definitions of mental health status problems among LGBTQ+ youths were similar to those of mental health status problems among heterosexuals. Stress is a reaction caused by pressures in daily life, possibly derived from one's self or surroundings. Stress can affect work and daily life (Department of Mental Health, 2012; Lazarus & Folkman, 1984). The definitions and characteristics of anxiety among LGBTQ+ youths were also similar to anxiety among heterosexuals. Anxiety is a mental state that can occur in daily life, usually to predict something that will happen in the future. Anxiety causes physical, emotional, mental, and behavioral changes (Saiphanit & Hiranyatheb, 2012). Similar definitions of depression

were also recorded between LGBTQ+ high school students and heterosexuals. Depression is a negative emotional state encompassing feelings such as sad, downhearted, lonely, discouraged, hopeless and unhappy, which are all caused by negative self-interpretation or the surroundings. Long-term depression can adversely impact daily living (Bhowmik et al., 2012)

Results also revealed that despite similar definitions of mental health status problems between LGBTQ+ youths and cisgender youths, the factors causing such problems were both similar and different. Similar factors included low self-esteem, low achievement, and no social support (Ignatavicius, 2013). Different factors that motivated mental health status problems among LGBTQ+ high school students included victimization, bullying, sexual discrimination, and stigma. These problems all arose from gender differences (Hafeez et al., 2017; Hall, 2018; Witcomb et al., 2019).

Definitions and key components of protective factors of mental health problems among LGBTQ+ youths

This research studied the protective factors of mental health problems among LGBTQ+ youths, including resilience, self-esteem, and positive psychology. The results showed that the protective factors for mental health problems are a positive movement toward reducing mental health problems among LGBTQ+ youths (Puckett et al., 2019; Woodford et al., 2018). In addition, the research findings demonstrate the specific meanings and components of resilience, self-esteem, and positive psychology in the context of LGBTQ+ youth. The definitions and key components were studied by combining data from documentary research, focus group discussions with LGBTQ+ youths, and in-depth interviews with experts in LGBTQ+. The results are described below.

Results revealed similar synthesized definitions of resilience among LGBTQ+ youths to those of Grotberg (1995) who described resilience as the ability to deal with problems, bad situations, or crises affecting life. Resilience creates suitable adaptation to pull through and get back to normal life. However, the study reveals that resilience in LGBTQ+ youths is defined as accepting themselves without guilt, disregarding past negative experiences, and focusing on living joyfully in the present, adding to Grotberg's (1995) concept. Moreover, the components components of resilience among LGBTQ+ youths were identified as (1) I am, (2) I can, and (3) I have. These components were summarized by combining data from specific qualitative research and synthesized components with the literature reviews.

Additionally, results revealed that the summarized definitions of self-esteem among LGBTQ+ youths were similar to Coopersmith (1981) who described self-esteem as self-perception by self-evaluation, and then expressed as self-acceptance. However, the study reveals that self-esteem in LGBTQ+ youths is influenced by their acceptance and love for themselves, as well as their belief in their potential as humans with abilities comparable to those of cisgender youth, which expands on Coopersmith's (1981) theory. Moreover, the components of self-esteem among LGBTQ+ youths were identified as (1) general capacity, ability, and performance, (2) affective states, (3) parenting style, (4) school, (5) social status, and (6) peer group. These components were similar with the literature reviews.

The study found that LGBTQ+ youths feel that positive psychology is a positive attribute of individuals, such as the ability to think positively, which will assist LGBTQ+ youths in ignoring the negative remarks they hear from others who do not accept their sexual orientation. That is similar to those of Seligman & Csikszentmihalyi (2000). Positive psychology is an applied approach to optimal functioning to perceive self-efficacy and ability, while also promoting these abilities for happy living. Moreover, the components of positive psychology among LGBTQ+ youths were identified as (1) positive emotions, (2) engagement, (3) relationships, (4) meaning, and (5) accomplishment. These components were summarized by combining data from specific qualitative research and synthesized components from the literature review.

Prevention guidelines to resolve mental health problems among LGBTQ+ youths

Results revealed that knowledge transfer to promote mental health among LGBTQ+ youths is significant and indispensable to help them achieve a better quality of life. Heck et al., (2014) also suggested that LGBTQ+ youths should adjust their lifestyles to meet different cultural needs and mitigate mental health problems. The results also conformed with Rungreangkulkij & Kittirattanapaiboon (2021) who found that mental health promotion together with integrated gender issues should be encouraged to promote gender equality to make the society more aware and accept such differences, thereby mitigating the risk factors of mental health problems.

Results also revealed that knowledge of sexual health, mental health, literacy skills, and management skills helped to deal with and solve problems in daily life. Setting life goals to achieve and basic social skills are important to help LGBTQ+ youths effectively live with other people in the society. Various activities should be provided including giving lectures to parallel the activities, and talks to exchange experiences and perspectives. LGBTQ+ youths can then integrate creatively into their lives. These ideas conformed to studies by Craig et al. (2013), Pinciotti et al. (2022), and Smith et al. (2017), who stated that LGBTQ+ individuals should be aware of their sexual and mental health to help overcome anxiety and depression and create resilience and self-esteem by promoting positive emotions and positive thinking. Activities can be provided as mental health education through knowledge transfer and activity-based practices (Sarkhel et al., 2019). Therapeutic techniques are also used to facilitate mental, emotional, and behavioral changes (Craig et al., 2013). Other attractive activities such as stress modeling scenarios, setting goals, and facing problems with positive emotions can also promote good mental health among LGBTQ+ individuals (Smith et al., 2017).

Results also revealed that on-site activities were better than online activities because the latter may include limitations such as the readiness of devices or poor internet signal, which may disrupt activities and direct interactions. Sukwin & Soontorntanaphol (2022) stated that despite the high significance of online learning management, problems with this learning mode including lack of access to media still remain due to lack of support from the public sector and financial aspects. Wonginchan et al. (2022) also found that long-term online learning management caused more severe holistic health problems involving eye pain, headaches, frustration, sentimental feelings, lack of concentration, learning boredom, and lower learning abilities. Thus, on-site activities are often more efficient than online activities.

Conclusion and suggestions

The results of evidence-based practice about mental health status problems among LGBTQ+ youths will improve general understanding of the facts and contexts of mental health. Current mental health status problems among this group of teenagers as stress, anxiety, and depression can be prevented by applying the psychological variables of resilience, self-esteem, and positive psychology through various attractive activities. This will assist LGBTQ+ youths to obtain the required knowledge and skills to promote their mental health. Basic knowledge will help LGBTQ+ youths to recognize and better understand their emotions and the behaviors of people around them by developing mental efficiency to promote good mental health.

However, this research involved two groups of key informants as experts in LGBTQ+ and LGBTQ+ youths. Nevertheless, this results in incomplete data coverage due to the LGBTQ+ expert's sample lacking diversity in other occupations related to LGBTQ+ youth, including makeup artists and influencers. Moreover, the LGBTQ+ youth group in this study may not be representative of all LGBTQ+ youths, as they are the only group accepted by their family, and study in Mueang District, Chiang Mai. Thus, this study's samples may not represent

the total LGBTQ+ population. The results obtained are related to a specific group's experiences, which may differ from other groups with different domiciles. Research among LGBTQ+ youths with different social contexts, rural vs. urban areas, may help to better understand mental health problems, together with more complicated and more varied protective factors.

New knowledge and the effects on society and communities

The study reveals that the resilience, self-esteem, and positive psychology of cisgender youth differ from those of LGBTQ+ youth. Issues of acceptance of sexual orientation and respect for human dignity significantly impact these traits. LGBTQ+ youth face discrimination, bullying, or stigmatization based on their gender. These are situations that cisgender youths do not experience. Therefore, acceptance and equal treatment will likely build resilience, self-esteem, and positive psychology in LGBTQ+ youth. Thus, this research may guide healthcare professionals, including teachers, educational staff, doctors, nurses, and parents, in promoting mental health among LGBTQ+ adolescents. It suggests developing mental health care programs and raising awareness about sexual diversity among educational personnel, friends, and families. This will ensure equal treatment and acceptance of LGBTQ+ adolescents, ultimately improving their mental health. Moreover, the results can also be extended to study other particular LGBTQ+ groups and widen the research knowledge in this understudied area.

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Creating a conducive learning environment for overweight students: Department of Community Development, Faculty of Humanities and Social Sciences, Nakhon Si Thammarat Rajabhat University, Thailand

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Abstract

Overweight students face challenges due to specific needs and physical constraints, impacting their learning environment. This research investigates: 1) The level and necessity of creating a learning environment that supports overweight students, and 2) guidelines to improve the learning environment for overweight students. Using a mixed-methods approach, for quantitative research, a questionnaire- based survey was conducted on 42 overweight students. The data were analyzed to determine frequency, percentage, mean, and standard deviation. For the qualitative research, an interview form and an observation record form were used. Key informants were conducted for the 10 overweight students with the highest BMI values. The data were analyzed, summarized, and presented through a qualitative analysis. The findings of the study were as follows: 1) The level and necessity of creating a learning environment that supports overweight students in all aspects was high. 2) Guidelines to improve the learning environment for overweight students: Nutrition and weight management to improve health knowledge. Overweight conditions can lead to health issues and reduced self-confidence, making proper eating and sleeping habits crucial. Selecting nutritious foods and engaging in physical activities can enhance learning interest, efficiency, and social skills. Psychological support through Q&A sessions and cognitive development games fosters analytical thinking. Group activities and technology integration in teaching boost participation and relationship building, while expert counselors address psychological and emotional issues.

Keywords: Learning environment, Overweight students, Community development

Introduction

In recent years, the prevalence of overweight and obesity among students in Thailand has steadily increased, reflecting global public health concerns. According to Bureau of Nutrition (2024), and the rate of overweight among Thai adolescents rose by approximately 12.90% over the past three years. Similarly, internal data from the Faculty of Humanities and Social Sciences at Nakhon Si Thammarat Rajabhat University indicates that 12–15% of students enrolled in the Community Development Program between 2022 and 2024 are classified as overweight. This trend presents a pressing issue for higher education institutions, especially in terms of creating a learning environment that is inclusive and supportive of all learners.

Overweight students often encounter challenges in educational settings due to specific needs and physical limitations. Classroom furniture, learning tools, and physical layouts are frequently not designed with diverse body types in mind. For example, standard desks and chairs may not accommodate overweight students comfortably, leading to decreased classroom participation, reduced self-confidence, and increased physical discomfort. These barriers not only affect students' engagement but can also limit their academic performance and social interaction (Ceresnova, Rollova & Koncekova, 2017; World Health Organization, 2018).

The situation has been further complicated by the COVID-19 pandemic, which significantly disrupted learning worldwide and reduced opportunities for physical activity among students (Hodges et al., 2020; Saechang, 2024). Post-pandemic recovery has intensified the demand for inclusive learning spaces, as universities must now reconsider how to design environments that promote both academic success and physical well-being.

To effectively address these issues, it is essential to understand the current status of learning environments for overweight students and identify appropriate improvement strategies. This is particularly important in professional training programs, such as Community Development, where fieldwork and practical engagement with communities are central to the curriculum. Students must be equipped not only with theoretical knowledge but also with a supportive environment that enables them to fully participate in all aspects of their academic journey. Therefore, this study aims to explore the creation of a conducive learning environment for overweight students in the Community Development Program, Faculty of Humanities and Social Sciences, Nakhon Si Thammarat Rajabhat University. The study seeks to inform institutional policy on educational equity, raise awareness of the needs of overweight students, and promote the development of inclusive and supportive learning environments. This effort can serve as a model for other academic programs aiming to improve student well-being and learning outcomes.

Objectives

This research investigates: 1) The level and necessity of creating a learning environment that supports overweight students, and 2) guidelines to improve the learning environment for overweight students.

Literature Review

Concepts and Theories on Human Needs: The Royal Institute Dictionary (1982) defines "need" as a feeling of wanting something, with the body remaining out of balance until the need is fulfilled. Saksiri (1991) noted that needs decrease when satisfaction is achieved but resurface when circumstances change. Maslow (1943) proposed a hierarchy of human needs, ranging from basic to higher levels such as esteem and social acceptance, emphasizing the importance of spiritual growth. He indicated that these needs arise from both internal and external motivations, encompassing physical, mental, and social conditions (Henry, 1938; Sansanyuth, 1987). Phra Dhammapitaka (P.A. Payutto) (1995) identified three types of needs in Buddhism: craving for sensual pleasure, craving for existence, and craving for nonexistence.

Luangaram (1976) highlighted four elements: wealth, status, praise, and happiness. Additionally, human needs include respect, acceptance, and love (Maslow, 1943; Saksiri, 1991).

Concepts on Creating a Learning-Friendly Environment: Creating a learning-friendly environment is crucial for developing and managing a classroom that supports and promotes effective learning. This involves fostering an enthusiastic and motivating atmosphere, utilizing engaging teaching materials, and ensuring that the learning experience is enjoyable. A warm and clean classroom environment helps students feel comfortable and remain focused on their learning (Phetthong, 2011). An effective learning environment enhances education and student skill development, which includes maintaining an adequately sized classroom that is not overcrowded (Marzano, Pickering & Pollock, 2001). Additionally, having instructors who are understanding and supportive contributes to a positive attitude toward learning and school attendance (Weimer, 2013). Therefore, a well-organized learning environment positively affects teaching and student learning outcomes. Key principles for creating a learning-friendly environment include having a suitably sized classroom with well-arranged equipment, fostering a positive physical atmosphere, promoting emotional and social development through group work and student leadership (Cassidy et al., 2024), and supporting mental and physical health by providing knowledge about nutrition and appropriate physical activities (Tanaree & Hunnirun, 2021). These elements are essential for enhancing learning and skill development.

Concepts on Promoting Learning Support Media: Malithong (2000) defines media as any tool that learning support media transmit information from sender to receiver for specific educational purposes. They include any elements that aid self-directed learning, whether created by instructors or learners. These media enhance teaching and learning efficiency, aligning with the content and learning process to support effective, personalized education.

Concepts and Theories on Constructivist Learning: Constructivist learning enables students to develop independent thinking skills, with teachers acting as advisors and guides. This theory emphasizes learning through personal experience. However, some Thai students face constraints due to rigid curricula, which limit opportunities for self-directed problem-solving. Consequently, constructivist learning is employed to enhance self-learning opportunities, with teachers supporting this process. This approach strengthens the relationship between teachers and students and effectively develops students' thinking and problem-solving abilities (Papert, 1980).

Concepts on Education Management and Essential Skills for the 21st Century: Living and working in the 21st century necessitates three key skills: technological and innovative learning skills; information, media, and technology literacy skills; and life and career skills (Partnership for 21st Century Skills, 2007; Wagner, 2008). Additionally, emotional and social learning skills, including emotional management, social understanding, relationship skills, and decision-making responsibility, are essential (Jones & Bouffard, 2012). These skills enable individuals to adapt effectively and collaborate harmoniously with others in society.

General Knowledge on Overweight: Overweight is a condition characterized by the accumulation of excess body fat resulting from an energy intake that exceeds energy expenditure. It adversely affects both physical and mental health and is measured using body mass index (BMI), which is calculated by dividing weight (kg) by height (m) squared (Sikaow et al., 2018; Phyathai Hospital, 2022). This condition increases the risk of chronic diseases such as diabetes, heart disease, and cancer (Sikarin Hospital, 2024). The Thai Health Promotion Foundation (2012) has identified overweight as a risk factor for several noncommunicable chronic diseases. It typically results from an imbalance between energy intake from food and energy expenditure, such as consuming high-energy foods and insufficient physical activity. Additionally, hormonal imbalances or the use of certain medications may contribute to overweight. Addressing this issue involves identifying the underlying causes and implementing lifestyle changes, including regular exercise (Phyathai Hospital, 2022; Sikarin Hospital, 2024).

Context of Community Development Field: The Committee for the Administration of the Bachelor of Arts Program in Community Development (2022) highlights the importance of integrating knowledge and skills in community development to produce graduates with both theoretical and practical expertise, along with ethical values. The program is designed to respond to societal changes and local community needs. Its goals include deepening understanding of economic, social, and political systems, improving management of community development, and fostering leadership skills and knowledge integration.

Related Research: Creating a learning-friendly environment significantly impacts student development and educational quality. Research by Samahito (2019) demonstrated that engaging with real-life phenomena and interactions with the environment boosts problem-solving and critical thinking skills, with teachers playing a key role in fostering supportive learning settings. Chumchong et al. (2017) found that effective management of teaching and learning environments positively influences student quality and behavior, aligning with the philosophy of the sufficiency economy. Another study by Janrayaek, Jitjirachan & Chuanchom (2017) recommended employing various development guidelines to manage learning and establish a learning community. Additionally, Wongsawat & Klaimanee (2023) and Kaewurai, & Chaimin, (2019) discovered that a well-organized environment in the digital era enhances learning efficiency, despite challenges such as internet connectivity. Thus, creating a supportive learning environment is essential for improving educational quality and developing student skills.

Methodology

Research type:

This study utilizes a mixed-methods approach, integrating both quantitative and qualitative research techniques. The research will be conducted over a period of 12 months, from January 1 to December 31, 2024. The study will focus on the Community Development Program at the Faculty of Humanities and Social Sciences, Nakhon Si Thammarat Rajabhat University.

Population, sample group, and key informants:

1) The population consists of 168 s-year students in the Community Development Program (Office of Academic Promotion and Registration, 2024). Overweight is assessed via body mass index (BMI), which is calculated with the following formula: BMI = weight (kg)/height (m)2. If the calculated BMI is equal to or greater than 23.0 (Sikaow et al., 2018), The researcher specifically selected all individuals with a calculated BMI equal to or greater than 23.0. The population includes second-year students in the Community Development Program with overweight, totaling 42 individuals (Anegasukha, 2021).

2) Key Informants: The key informants were 10 second-year students in the Community Development Program who were identified as overweight and were selected on the basis of the top 10 highest BMI values. Key informants were purposively selected (Kijkuakul, 2018).

The researcher applied the following inclusion and exclusion criteria: Inclusion Criteria: Participants must meet specific qualifications to be included in the study. For the quantitative component, the participants were second-year students in the Community Development Program who are classified as overweight. For the qualitative component, the participants were also second-year students in the Community Development Program who are overweight, selected based on the top 10 highest Body Mass Index (BMI) scores and their willingness to participate in the study. All participants were between the ages of 18 and 25. Exclusion Criteria: Participants were excluded if they were unable to participate in activities during the specified timeframe, felt uncomfortable or distressed and chose to withdraw from the study at any point for example, during interviews or group activities or if they passed away during the study period. Additionally, individuals were excluded if they were unable to provide

information throughout the interview due to urgent obligations, physical limitations, or inability to participate for extended periods.

Research Instrument:

1) Instruments for quantitative research: To study the level and necessity of creating a learning environment that supports overweight students, the research employs a questionnaire developed by the researcher based on a review of relevant literature and studies. The development process includes the following steps: Questionnaire Development:

1. 1) Concepts and theories related to creating a learning environment for overweight students were reviewed from books, documents, and related research to establish a comprehensive conceptual framework.

1. 2) The questionnaire was created according to the defined framework and theories, consisting of three sections:

Section 1: General information about the respondents, such as gender and age.

Section 2: The level and necessity of creating a learning environment that supports overweight students, measured using a 5- point numerical rating scale: 5 for " most," 4 for "high," 3 for "moderate," 2 for "low," and 1 for "least." Average scores for levels and necessity are categorized as follows: 4.51–5.00 for "most," 3.51–4.50 for "high," 2.51–3.50 for "moderate," 1.51–2.50 for "low," and 1.00–1.50 for "least" (Bunmak, 2021).

Section 3: Problems and suggestions, presented through open-ended questions.

1.3) The questionnaire's quality was assessed by experts for content and structure. Five experts reviewed the questions, and those with an item-objective congruence (IOC) index between 0.80 and 1.00 were selected and revised accordingly. The revised questionnaire was pilot-tested with a sample of 30 individuals similar to the research population but not included in it. Reliability was measured using Cronbach's alpha (Cronbach, 1990), yielding a coefficient of 0.902.

1. 4) The finalized questionnaire was revised for accuracy and prepared for distribution to the research population of overweight students.

2) Instruments for Qualitative Research:

2.1) Interview Guide: In-depth interviews were conducted with key informants to guidelines to improve the learning environment for overweight students. The guide, developed from reviewed concepts and theories, includes:

Section 1: General information about the interviewees.

Section 2: Guidelines to improve the learning environment for overweight students.

Section 3: Problems and suggestions.

The interview guide was reviewed by advisors and experts for validity, and the revised guide was used in interviews, featuring flexible and convenient questions for data analysis.

2.2) Observation Records: Participant observation involved engaging in activities with the group being studied, while nonparticipant observation involved observing from the outside without joining certain activities, such as classes and meals.

Collection of Data:

1) Quantitative research: To study the level and necessity of creating a learning environment that supports overweight students, the data collection process was conducted as follows:

1. 1) The researcher initially approached participants personally to outline the research objectives, benefits, and procedures, and to request their cooperation. Participants were given a copy of the questionnaire beforehand to prepare.

1.2) Arrangements for data collection, including the date, time, and location, were scheduled by the researcher.

1. 3) The researcher secured official permission to collect data and provided this authorization to the overweight students.

1.4) Data collection was conducted as planned, with each session taking 10–15 min between 1: 00 PM and 6: 00 PM in dormitories or student accommodations. Participants completed the questionnaire independently, with written consent and cooperation requested. Accuracy checks were performed, and any data that participants chose not to provide were respected. Any issues or irregularities encountered during participation were reported to the researcher.

1. 5) Questionnaires were distributed to 42 overweight students, and completed responses were received from all 42, achieving a 100% response rate. The data were subsequently verified for accuracy.

2) Qualitative research: guidelines to improve the learning environment for overweight students, data collection involved the following steps:

2. 1) The researcher personally contacted participants to explain the research objectives, benefits, and procedures, and requested their cooperation. Preparation materials for the interviews were provided, and the dates, times, and locations of the interviews were scheduled.

2.2) Official approval for data collection was obtained from Nakhon Si Thammarat Rajabhat University and presented to the key informants. The researcher reviewed the interview questions and prepared recording equipment, notebooks, and other necessary materials before conducting the interviews.

2. 3) Data collection occurred as scheduled, with interviews conducted with third-year students from the Community Development program who were respected by the target group and served as class leaders. In- depth interviews were held over weekends or holidays, lasting between 1 and 4 h from 1:00 PM to 6:00 PM, in university dormitory common areas or the informants' homes. Participants were asked questions based on the pre-prepared interview guide. Written consent was obtained, and informants were informed about the confidentiality of their data, including recorded audio and video. Data requested not to be recorded were omitted, and informants were instructed to follow the researcher's guidelines and report any issues or irregularities encountered during the process.

Data Analysis:

1) Quantitative Research: To study the level and necessity of creating a learning environment that supports overweight students, the data analysis was carried out as follows:

1.1) General information from the first section of the questionnaire, such as gender and age, was analyzed using statistical software to determine frequencies and percentages.

1. 2) Data from the second section of the questionnaire, regarding the level and necessity of creating a supportive learning environment for overweight students, were analyzed using statistical software to calculate means and standard deviations.

2) Qualitative Research: guidelines to improve the learning environment for overweight students to enhance nutritional awareness, physical activity, psychological support, and participation, content analysis was conducted on in- depth interviews with 10 key informants, especially the coding process for qualitative data (P1-P10). The insights from these interviews were summarized and presented through descriptive analysis.

Results

1) The level and necessity of creating a learning environment that supports overweight students:

1.1) Understanding Nutrition and Overweight: The findings indicate a high level of understanding ($\mu = 3.91, \sigma = 0.88$). The item with the highest average is the understanding of the importance of maintaining health and preventing obesity or overweight, which is rated high ($\mu = 4.14, \sigma = 0.52$). This is followed by the selection of healthy and beneficial foods, which also rates highly ($\mu = 3.93, \sigma = 0.95$). Awareness of the impacts of overweight on both

physical and mental health is high ($\mu = 3.88, \sigma = 0.74$). The effects of environmental factors and behaviors related to overweight, such as an imbalanced diet or insufficient sleep, are also rated high ($\mu = 3.83, \sigma = 1.10$). The item with the lowest average is related to factors causing overweight, such as eating behaviors and genetics, which is still rated high ($\mu = 3.79, \sigma = 0.95$).

1.2) Physical Activity: The activity was rated highly overall ($\mu = 3.80, \sigma = 0.70$). The highest-rated item is promoting knowledge and understanding of physical activity and health, with a high rating ($\mu = 3.88, \sigma = 0.59$). This is followed by creating learning spaces that encourage physical activity, also rated high ($\mu = 3.86, \sigma = 0.72$). The arrangement of classrooms to include areas for movement, such as configuring desks and chairs for both sitting and standing, is rated high ($\mu = 3.83, \sigma = 0.62$). Providing opportunities for students to engage in enjoyable physical activities in the classroom is similarly rated high ($\mu = 3.81, \sigma = 0.74$). The lowest-rated item is organizing physical activities suitable for all students, including those who are overweight, such as dancing or other exercises, which still maintain a high rating ($\mu = 3.60, \sigma = 0.80$).

1.3) Emotional Support: Emotional support was rated highly overall ($\mu = 4.02, \sigma = 0.83$). The item with the highest average is the use of modern and engaging learning materials, such as instructional videos, charts, and clear illustrations, which is rated high ($\mu = 4.21, \sigma = 0.72$). This is followed by organizing activities and teaching methods that promote analytical thinking and deep understanding in the classroom, also rated high ($\mu = 4.14, \sigma = 0.78$). Creating an environment full of intellectual stimulation and creativity is rated high ($\mu = 4.05, \sigma = 0.76$). The availability of expert consultants in psychology and personality development, who provide support for psychological or emotional issues, is high ($\mu = 3.88, \sigma = 1.06$). The item with the lowest average is creating opportunities for students to share their feelings and experiences during class or extracurricular activities, which remains high ($\mu = 3.83, \sigma = 0.73$).

1.4) Participation and Collaboration: This variable was rated high overall ($\mu = 3.93, \sigma = 0.76$). The item with the highest average is promoting collaboration and behaviors that enhance learning, which is rated high ($\mu = 4.12, \sigma = 0.67$). This is followed by creating mechanisms for teamwork and problem-solving to build experiences and learn from collaboration, also rated high ($\mu = 4.05, \sigma = 0.58$). Providing opportunities for students to learn through collaboration, with a focus on sharing opinions and experiences, is high ($\mu = 3.95, \sigma = 0.66$). The level of learning activities that emphasize group work, allowing students to tackle complex problems or tasks, is high ($\mu = 3.90, \sigma = 0.79$). The availability of opportunities for students to engage in learning activities and teamwork is high ($\mu = 3.86, \sigma = 0.72$). The item with the lowest average is creating opportunities for students to engage in projects or activities that involve teamwork, such as planning and presenting joint research projects, which remains high ($\mu = 3.71, \sigma = 1.02$).

1.5) Overall: in all aspects, the sample group had a high level of the level and necessity of creating a learning environment that supports overweight students ($\mu = 3.92, \sigma = 0.79$). When considering each aspect individually, the aspect with the highest average score corresponded to emotional support was rated high overall ($\mu = 4.02, \sigma = 0.83$). Following this, participation and collaboration was rated high overall ($\mu = 3.93, \sigma = 0.76$). Understanding nutrition and overweight was rated high overall ($\mu = 3.91, \sigma = 0.88$). The aspect with the lowest average score corresponded to physical activity was rated highly overall ($\mu = 3.80, \sigma = 0.70$).

Table 1 The level and necessity of creating a learning environment that supports overweight students (Researcher, 2025)

Creating a conducive learning environment for overweight students	The level and necessity		
	μ	**σ**	**Interpreting the average**
Understanding Nutrition and Overweight			
- The understanding of the importance of maintaining health and preventing obesity or overweight.	4.14	0.52	High
- The selection of healthy and beneficial foods.	3.93	0.95	High
- Awareness of the impacts of overweight on both physical and mental health.	3.88	0.74	High
- The effects of environmental factors and behaviors related to overweight, such as an imbalanced diet or insufficient sleep.	3.83	1.10	High
- Factors causing overweight, such as eating behaviors and genetics.	3.79	0.95	High
Overall	**3.91**	**0.88**	**High**
Physical Activity			
- Promoting knowledge and understanding of physical activity and health, with a high rating.	3.88	0.59	High
- Creating learning spaces that encourage physical activity.	3.86	0.72	High
- The arrangement of classrooms to include areas for movement, such as configuring desks and chairs for both sitting and standing.	3.83	0.62	High
- Providing opportunities for students to engage in enjoyable physical activities in the classroom.	3.81	0.74	High
- Organizing physical activities suitable for all students, including those who are overweight, such as dancing or other exercises.	3.60	0.80	High
Overall	**3.80**	**0.70**	**High**
Emotional Support			
- The use of modern and engaging learning materials, such as instructional videos, charts, and clear illustrations.	4.21	0.72	High
- Organizing activities and teaching methods that promote analytical thinking and deep understanding in the classroom.	4.14	0.78	High
- Creating an environment full of intellectual stimulation and creativity.	4.05	0.76	High
- The availability of expert consultants in psychology and personality development, who provide support for psychological or emotional.	3.88	1.06	High
- Creating opportunities for students to share their feelings and experiences during class or extracurricular activities.	3.83	0.73	High
Overall	**4.02**	**0.83**	**High**
Participation and Collaboration			
- Promoting collaboration and behaviors that enhance learning.	4.12	0.67	High
- Creating mechanisms for teamwork and problem-solving to build experiences and learn from collaboration.	4.05	0.58	High
- Providing opportunities for students to learn through collaboration, with a focus on sharing opinions and experiences.	3.95	0.66	High
- Learning activities that emphasize group work, allowing students to tackle complex problems or tasks.	3.90	0.79	High
- The availability of opportunities for students to engage in learning activities and teamwork is high.	3.86	0.72	High
- Creating opportunities for students to engage in projects or activities that involve teamwork, such as planning and presenting joint research projects.	3.71	1.02	High
Overall	**3.93**	**0.76**	**High**
Overall, in every aspect	**3.92**	**0.79**	High

2) Guidelines to improve the learning environment for overweight students:

2.1) Understanding Nutrition and Overweight:

Understanding the importance of maintaining health and preventing obesity or overweight: Individuals with direct experience in managing their health frequently utilize resources such as the internet and books to identify effective methods. They often make adjustments to their eating habits and engage in regular physical activity. Online research aids in comprehending the value of nutritious eating and exercise for preventing overweight. Recognizing the significance of selecting healthy foods and moderating intake helps in obesity prevention. Efforts to maintain health result in improved well-being, increased physical activity, and enhanced confidence. Self-education and proactive measures are essential. Overweight contributes to both physical and mental health problems, making regular dietary and exercise adjustments crucial for prevention. Consistent health maintenance also leads to a more manageable and fulfilling daily life.

Understanding the impact of overweight on physical and mental health: Excess weight significantly affects daily activities by causing both physical and mental health issues, which can lead to dissatisfaction and decreased self-confidence. Challenges include difficulties with stair climbing, finding well-fitting clothing, and participating in physically demanding tasks. Physical problems such as knee pain, fatigue, and a compromised immune system, as well as psychological issues like low self-esteem, stress, and social bullying, are common. Recognizing and understanding these impacts is essential for developing effective prevention and intervention guidelines for individuals with overweight.

Choosing Nutritious and Healthy Foods: Key guidelines include consuming a balanced diet and avoiding foods high in fats and sugars. Opting for vegetables and fruits instead of high-fat foods helps reduce body fat accumulation. Incorporating all five food groups while limiting high-starch and sugary foods is essential for preventing overweight and associated health issues. Reducing the intake of carbonated drinks, fried foods, and fatty foods promotes digestive health, which aids in weight loss and overall well-being. Consuming healthy fats, such as unsaturated fats from nuts and fish, supports health and weight management. Timely meals and adequate water intake contribute to good digestion. Additionally, selecting fewer sugary fruits and avoiding high-fat foods are effective guidelines for preventing overweight and enhancing health.

Understanding the factors contributing to overweight: Overweight results from multiple factors. Consuming large and frequent amounts of high-sugar foods is a primary cause of excess weight. Genetics also plays a significant role. Irregular eating habits, frequent snacking, and poor appetite control contribute to overweight. The intake of sweets and sugary drinks can rapidly increase weight. Late-night eating and going to bed immediately after meals disrupt digestion, while overeating in early childhood can cause stomach expansion, making it difficult to regulate eating later. Excessive consumption beyond the body's needs ultimately leads to weight gain. Understanding the Impact of Environmental

Factors and Related Behaviors: Consuming high-fat and sugary foods significantly contributes to rapid weight gain. These calorie-dense foods are often staples in daily diets, and their appealing colors and aromas can lead to overeating. Easy access to food further exacerbates the issue. A preference for highly flavored and fatty foods results in excessive calorie intake, exceeding the energy needed for daily activities. Poor sleep quality, often caused by excess weight, impairs rest and affects daily movement and activities. Overweight can also lead to breathing difficulties and inadequate sleep, disrupting overall rest. Additionally, irregular eating patterns, frequent snacking, and eating right before bed can disrupt digestion, cause acid reflux, and increase the risk of overweight, negatively impacting health and daily life.

2.2) Physical Activity:

Creating Opportunities for Students to Engage in Appropriate and Enjoyable Physical Activities: Encouraging physical activity in the classroom is essential for boosting

student engagement and learning effectiveness. Allowing students to stand and participate in movement-based activities can reduce boredom and enhance lesson interest. Emphasizing collaborative learning activities fosters social skills and problem-solving abilities. Incorporating enjoyable recreational activities into the classroom environment promotes a positive atmosphere. Engaging in activities before class, such as warm-ups, helps students relax and prepare for learning. Simple, time-efficient activities provide benefits from physical movement, reduce stress, and alleviate boredom. Light exercises, like gentle jogging, can be integrated into classroom routines to improve physical health.

Organizing Suitable Physical Activities for All Students: Promoting physical activities supports students in improving their health, developing social skills, and reducing stress. Engaging in movement-based games with peers offers significant benefits. Activities that involve slow movements and minimal exertion are ideal for individuals with physical limitations. Incorporating daily physical tasks, such as sweeping, washing dishes, or doing laundry, along with leisure activities like playing badminton or running with a pet, helps maintain physical health and makes productive use of free time. Outdoor activities such as aerobics, walking, and using exercise equipment enhance health, foster a connection with nature, and alleviate stress. Utilizing campus spaces for activities such as evening bike rides, sports, and badminton provides effective exercise opportunities within a familiar environment.

Creating Learning Spaces that Promote Physical Activity: Creating a learning environment that fosters physical activity is crucial for enhancing students' health and learning abilities. Incorporating exercise equipment at various locations and providing access to fitness centers emphasize the value of accessible exercise facilities. Utilizing online resources to promote physical activity can effectively encourage engagement and offer educational content. Allocating space in front of dormitories for sports and physical activities, along with readily available exercise equipment, supports effective physical development. Incorporating activities such as stair climbing and recreational activities with friends into daily routines promotes health. Organizing dance activities in the classroom is an excellent way to encourage physical movement and improve teamwork skills.

Arranging Classrooms to Facilitate Movement: Arranging classrooms to facilitate movement contributes to a learning environment that supports students' health and comfort, especially for those who are overweight. Proper classroom design boosts confidence and participation in learning activities. Configuring desks and chairs in a U shape allows for free movement and space for activities during lessons. Ensuring ample space between desks reduces discomfort for overweight students, while a well-organized classroom with appropriate spacing enhances the learning atmosphere, alleviates discomfort, and improves concentration. Attention to classroom arrangement details fosters a relaxed and enjoyable learning environment, promoting better focus and confidence among students.

Promoting Knowledge and Understanding of Physical Activity and Health: Understanding physical activity and health is essential for students as it influences their behavior and choice of health care practices. Regular physical activity enhances health, strengthens the body, and lowers the risk of various diseases. Access to up-to-date health information and education empowers students to effectively manage their health and prevent illnesses. Knowledge about health supports students in promoting overall well-being and making informed decisions about their health.

2.3) Emotional Support:

Creating an environment that stimulates intellectual and creative engagement: An environment rich in intellectual stimulation and creativity significantly influences student learning and skill development. Modifying the learning environment can boost cognitive and creative thinking. Various activities, such as classroom questioning, stimulate thinking and encourage student engagement, while skill-building games, like counting and matching games,

enhance problem-solving abilities. Self-motivation, a positive outlook, and internal drive are crucial for handling challenges effectively. Group activities, including discussions and collaborative exercises, promote camaraderie, foster relationships, and stimulate intellectual growth. Engaging in these activities together supports physical movement, strengthens connections, and improves teamwork.

Organizing Activities and Teaching Methods that Promote Analytical Thinking and Deep Understanding: Organizing activities and employing teaching methods that foster analytical thinking and deep understanding are essential for equipping students with the skills to apply knowledge in practical situations. This includes prioritizing questioning techniques and implementing comprehensive learning activities that encourage analytical thought and promote meaningful learning. Engaging in activities that demand analytical reasoning enables students to tackle complex problems, develop problem-solving guidelines, and cultivate creativity. Training students to formulate questions is a critical aspect of enhancing their analytical skills, which is vital for effective learning and knowledge application. Moreover, understanding course content and integrating technology into teaching are crucial for creating an engaging and accessible learning environment. Organizing stimulating activities, such as developing instructional videos with clear visuals, improves teaching effectiveness, while the use of engaging media boosts interest and minimizes boredom.

Creating and Using Modern and Engaging Learning Resources: Incorporating modern learning resources into the classroom enhances the learning environment and stimulates student engagement. The use of advanced teaching tools, such as digital media and new technologies, revitalizes the classroom and makes learning more enjoyable. This approach increases student participation and interest in their studies. Modern media can also improve comprehension of health topics, such as by creating visual aids on obesity trends. Clear and accessible presentation of information helps students connect new knowledge with existing understanding. Furthermore, modern media facilitates quicker and more efficient learning. Online platforms, such as Classroom and Word, provide students with easy access to information and assignments, boosting convenience and learning speed. Additionally, interactive media positively influences students' attitudes toward education, making learning more enjoyable, reducing stress, and enhancing overall engagement.

Having Experts in Psychology and Personal Development Available for Consultation: Access to psychology and personal development experts provides significant benefits for addressing mental and emotional challenges. Experts assist students with issues such as obesity and self-confidence, in several ways: (1) Increasing self-understanding and self-control. Consulting experts helps students gain a deeper insight into their mental and emotional issues, improve emotional regulation, and develop personal growth guidelines. This leads to a better understanding of their problems and the identification of effective solutions. (2) Developing personality and confidence. Experts support students in recognizing their strengths and weaknesses. Clear advice on managing obesity and related concerns can boost self-confidence and self-awareness. (3) Creating a Supportive Environment: A safe and open environment for discussing personal issues helps alleviate stress and mental health challenges, allowing students to express their concerns freely. (4) Utilizing Modern Learning Resources: Incorporating contemporary learning tools and technologies into education increases student engagement and facilitates easier comprehension of content. This approach enhances learning experiences and encourages student collaboration.

Opportunities to share feelings and experiences during class or extracurricular activities: Promoting learning and relationship development among students includes: (1) Exchanging knowledge and ideas through group discussions with classmates or peers from different classes facilitates the sharing of knowledge and experiences. This process allows students to acquire new information, benefit from others' insights, and deepen their

understanding of various topics. (2) Sharing Feelings and Experiences: Allowing students to share their experiences and emotions helps reduce stress and fosters a sense of being understood. This practice enables students to express their feelings, receive support, and gain clarity on their own thoughts and emotions. (3) Building Unity and Teamwork: Fostering group cohesion and teamwork improves students' collaborative skills and problem-solving abilities. It helps students understand their roles within a team, work together effectively, and enhance their analytical thinking through shared experiences and cooperative learning.

2.4) Participation and Collaboration:

Creating opportunities for student participation and collaboration: Creating opportunities for students to participate in learning activities and engage in collaboration is essential for the development of teamwork skills, the establishment of positive peer relationships, and the enhancement of collaborative abilities. Conducting training or self-development programs centered on teamwork is vital for fostering cohesion and collaboration among students. Such programs enable students to practice teamwork and gain insights into group dynamics. Collaborative learning promotes familiarity and the advancement of collective thinking skills. For instance, involvement in a university community service club aids students in forming positive relationships, gaining a deeper understanding of others, and cultivating teamwork and responsibility. Implementing training or educational activities on unfamiliar subjects allows students to exchange ideas and experiences, work effectively together, and establish constructive group relationships.

Organizing Group-Based Learning Activities: Organizing learning activities that emphasize group work, where students collaboratively address complex problems or tasks, promotes various skills and fosters an engaging learning environment. This approach involves the following steps: (1) Enhancing group work skills through the joint resolution of complex problems, which aids students in improving communication, teamwork, analytical thinking, and problem-solving abilities. The exchange of diverse opinions and perspectives can facilitate the discovery of novel solutions. (2) Creating an enjoyable learning environment increases engagement and mitigates boredom, while physical activities can enhance interest in learning. (3) Developing confidence and problem-solving skills as students practice thinking and decision-making to tackle complex issues, thereby improving communication and teamwork skills critical for professional life. Analytical thinking and self-development techniques, such as weight management or personal improvement, are also learned and applicable to daily life.

Opportunities for Teamwork in Projects or Activities: Providing opportunities for students to engage in projects or activities that require teamwork emphasizes the development of teamwork skills, self-confidence, and analytical thinking. Collaborative projects or activities enable students to practice communication, management, and teamwork skills, fostering the exchange of opinions, knowledge sharing, and mutual support. This process aids in demonstrating creativity and personal opinions, thereby enhancing courage and self-confidence. Furthermore, collaborative projects facilitate learning from others' abilities and experiences, contributing to personal growth. Through collaborative problem-solving, students apply knowledge and skills to real-life situations.

Promoting Cooperation and Beneficial Learning Behaviors: Promoting cooperation between students and teachers and cultivating behaviors that enhance learning and self-development involves providing accurate and comprehensive knowledge. Students benefit from correct information, which aids in the development of skills and leads to beneficial behaviors such as attentive listening, active participation in group activities, and problem solving. Attentive listening to lectures and active engagement in group activities contribute to deep learning and teamwork skills. Moreover, personal development through good habits, such as exercise, healthy eating, and effective use of free time, supports essential life skills applicable beyond the classroom. Learning extends beyond academic settings to include self-care, time management, and decision-making, fostering positive learning behaviors and future leadership.

Learning through collaboration and sharing opinions and experiences: Learning through collaboration and the sharing of opinions and experiences is an effective approach for developing social and academic skills. Emphasizing the exchange of opinions and experiences in activities or projects leads to profound and beneficial learning outcomes. Mutual respect and collaboration are essential for effective learning. Providing opportunities for students to work together on activities or projects allows them to share opinions and experiences with peers, respect differing viewpoints, and apply valuable knowledge to everyday situations. Specific skills enable students to learn detailed and accurate work processes while supporting one another. Collaborative activities can also motivate students to assist peers with specific challenges, such as obesity, by encouraging exercise and sharing weight loss experiences, thus fostering self-improvement through cooperative learning.

Creating Mechanisms for Collaborative Problem Solving: Creating mechanisms for collaborative problem solving enables students to gain experience and learn from teamwork. Systematic collaboration and problem solving improve work efficiency. Tackling problems within a team fosters analytical thinking skills and teaches team members to work together and adapt to unforeseen situations. Students exchange opinions, understand different perspectives, and manage problem-solving processes collaboratively to identify optimal solutions. Listening to and learning from feedback enhances problem comprehension and resolution, promoting effective collaborative learning. Establishing joint goals and respecting differing opinions contribute to a positive work environment, strengthening unity and cooperation.

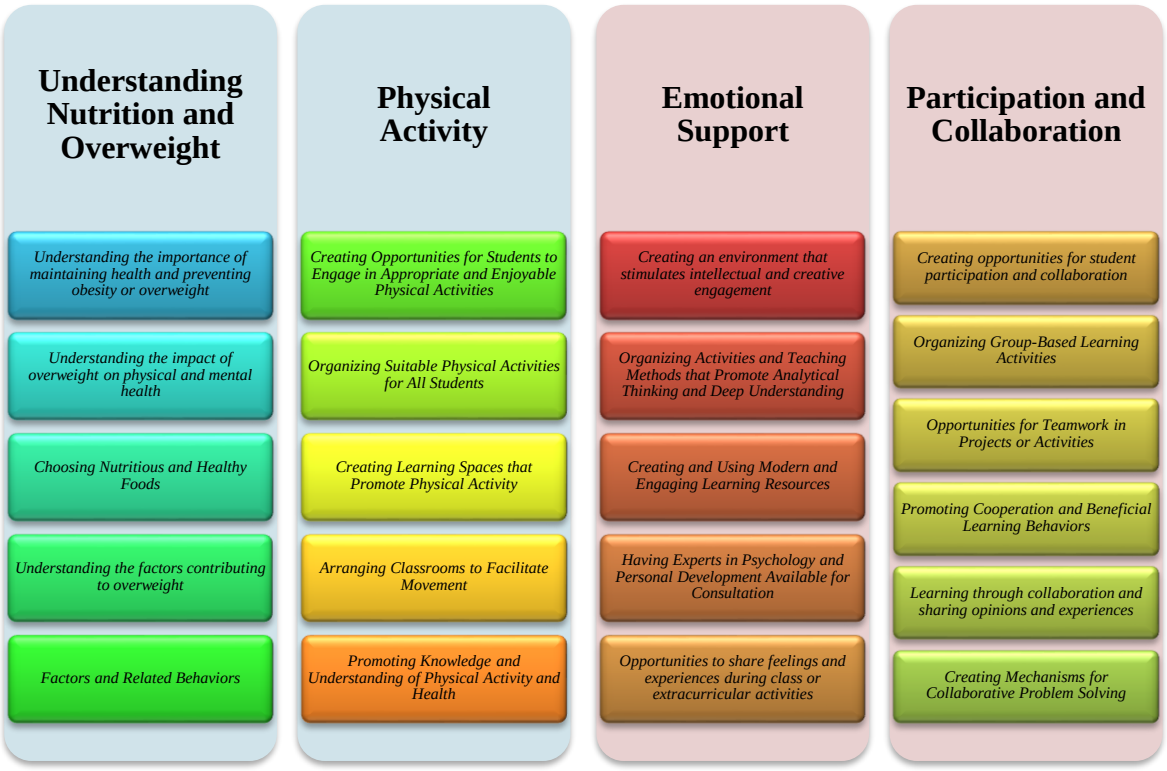

Figure 1 Guidelines to improve the learning environment for overweight students (Researcher, 2025)

Discussions

1. The level and necessity of creating a learning environment that supports overweight students: This study revealed that organizing the overall environment is necessary, with a high average score. This finding is consistent with the research of Wongsawat, & Klaimanee (2023), who reported that creating a conducive learning environment was highly rated. Additionally, the study revealed that psychological support is the most important aspect, which aligns with the findings of No-in's study (2017), which revealed that addressing risk factors associated with overweight and related physical and mental complications is crucial for providing psychological support. This support helps students build confidence and alleviate stress and anxiety, which are crucial for enhancing learning effectiveness. The study results are generally positive, highlighting the importance of environment and psychological support. However, the high scores may reflect perceived needs rather than actual outcomes. Without concrete evidence of effectiveness, it is unclear whether these factors truly enhance student well-being or academic performance in practical, measurable ways.

Participation and collaboration were also rated highly. Providing students with opportunities for collaboration improves communication skills, teamwork, and problem-solving abilities, which are essential for personal development and learning (Johnson & Johnson, 2009). Conversely, awareness of nutrition and overweight issues was rated high, consistent with Setthamas's study (2023), which found that students possessed a high level of knowledge. Providing accurate nutritional information and addressing overweight through knowledge and learning resources assists students in improving eating habits for better health (Samahito, 2019; Janrayaek, Jitjirachan, & Chuanchom, 2017). The study results are generally positive, showing high ratings in both collaboration and nutritional awareness. However, this awareness translates into consistent healthy practices or meaningful improvements in teamwork and communication skills.

Physical activity was rated the lowest among the factors but remained high, which contrasts with Khuneepong's study (2017) that reported moderate levels of behaviors for preventing overweight. Although less emphasized, appropriate physical activity can enhance physical health and reduce overweight (Hackman, 2002). For students with overweight, creating an effective learning environment should prioritize psychological support, participation and collaboration, nutrition awareness, and physical activity to ensure positive impacts on both physical and mental health.

2. Guidelines to improve the learning environment for overweight students: Nutrition and overweight awareness: Understanding the significance of maintaining health and preventing obesity through information from the internet and books aids students in acquiring knowledge about health care, modifying eating habits, and engaging in regular exercise. Selecting nutritious foods in appropriate quantities leads to improved health, increased physical activity, and enhanced confidence (World Health Organization, 2018; Tanaree & Hunnirun, 2021). Awareness of the effects of overweight on physical and mental health reveals issues such as knee pain, fatigue, and a weakened immune system (Djalalinia et al., 2015). It also impacts mental health, causing reduced self-confidence, stress, and bullying (Kokka, Mourikis & Bacopoulou, 2023). Therefore, avoiding foods heavy in fat and selecting foods that are full of nutrients helps prevent the accumulation of fat. Good digestion is encouraged by prioritizing fruits and vegetables over diets heavy in fat. Overall health is improved by eating a balanced diet and avoiding meals heavy in sugar and carbohydrate. Factors contributing to overweight include overeating, genetics, irregular eating patterns, snacking, and poor eating control. Late-night eating and sleeping immediately after meals can lead to digestive issues (National

Institute of Diabetes and Digestive and Kidney Diseases, 2020). Additionally, environmental factors and behaviors related to overweight, such as easy access to food, a preference for high-fat and flavorful foods leading to excessive calorie intake, and insufficient sleep or sleep problems due to excess weight, affect movement and daily activities. Irregular eating patterns impact health and daily life.

Physical Activity: Creating opportunities for students to participate in suitable and enjoyable physical activities enhances interest and learning effectiveness. Incorporating physical activities, such as standing up and moving around, reduces boredom and increases engagement in lessons. Participation in group activities fosters social skills and problem-solving abilities, while enjoyable recreational activities in the classroom contribute to a positive learning environment (Tomporowski et al., 2008). Preclass activities, such as light warm-ups, help students relax and prepare for learning. Simple and quick activities, such as light jogging in the classroom, reduce stress and boredom and promote physical health (Ratey & Hagerman, 2008). Providing appropriate physical activities for all students improves health, builds social skills, and alleviates stress. Activities with friends, such as playing pool and engaging in low-intensity exercises, are suitable for those with physical limitations (Biddle & Asare, 2011). Daily activities like cleaning, washing dishes, mopping, and exercising, such as playing badminton or running with pets, contribute to physical strength and effective use of free time. Outdoor activities, such as aerobics and walking, enhance health and reduce stress (Piercy et al., 2018). Creating learning environments that encourage physical activity, utilizing exercise equipment, and taking advantage of outdoor areas for sports or activities, such as climbing stairs or recreational play with friends, promote health. Online platforms that support physical activities are also beneficial (Owen et al., 2010). Arranging classrooms to facilitate movement, particularly for overweight students, and setting up desks in a U shape supports activity and interaction during lessons. Proper spacing between desks reduces discomfort and increases focus on learning. Attention to classroom arrangements fosters confidence and concentration (Rumberger, 2011). Promoting knowledge and understanding of physical activity and health helps students adjust behaviors and select appropriate health care methods. Regular physical activity strengthens the body and reduces disease risk. Access to health information and education enables students to effectively develop and manage their health (Warburton, Nicol & Bredin, 2006). The study presents a highly favorable view of physical activity's role in enhancing learning, health, and social skills. While the results are positive, they may overstate generalizability without considering individual differences in motivation, physical limitations, or classroom constraints. Practical implementation may also face challenges, such as limited space, time, or teacher capacity.

Psychological Support: Creating an environment that stimulates intellect and creativity is essential for enhancing learning and fostering various activities, such as classroom discussions and games that promote critical thinking (Chotratanakamol et al., 2024), like counting and matching games, which enhance analytical abilities (Dweck, 2006; Choosang, Chai-ngam & Pongkiatchai, 2023). Self-motivation and a positive outlook enable students to better manage problems. Group activities, including discussions and collaborative exercises, build relationships and stimulate intellectual growth (Seligman, 2011). In-depth learning activities develop analytical thinking and problem-solving skills. Encouraging students to ask questions improves their analytical skills, which are vital for learning and applying knowledge. Integrating engaging technology and media into teaching increases interest and accessibility. Instructional videos with illustrations and clear information support learning. Modern educational media create an engaging learning environment and stimulate student interest (Mayer, 2009). The author believes that digital media and new technology serve as effective teaching aids that enhance student interest and engagement. Clearly presented information helps students identify problems and connect new knowledge with previously learned material. Online

learning platforms accelerate the learning process and offer greater convenience. Students facing mental and emotional challenges benefit from professional psychological and personality development support. With professional guidance, students gain greater self-awareness and self-regulation, enabling them to address problems more effectively. As a result of developing their personality and confidence, students are better able to recognize their strengths and weaknesses. Creating a safe and trusting environment reduces stress and mental health issues. Opportunities to share feelings and experiences alleviate stress and help students feel understood and heard. Discussions and exchanges of opinions enable students to process their thoughts and emotions. Collaborative work enhances group cohesion and teamwork skills (Cassidy et al., 2024).

Participation and Collaboration: Organizing training or self-development activities, such as participating in community development committees, enhances teamwork and responsibility skills. Students gain and share experiences, improving group work skills that are beneficial in the future (Johnson & Johnson, 2009; Alcoba, La-ongsri, & La-ongsri, 2024). Group learning activities where students engage in solving complex problems or tasks enhance communication, analytical thinking, and problem-solving skills. Students exchange opinions and perspectives, discovering new approaches. A stimulating and participatory learning environment increases interest in learning (Slavin, 1996). Practicing complex problem-solving builds confidence and life skills. Providing opportunities for students to participate in collaborative projects or activities improves communication, management, and teamwork skills. Students express creativity and personal opinions, boosting confidence. Exchanging opinions and assisting each other allows students to learn from others' experiences and apply skills in daily life. Learning and life skills are strengthened when teachers and students collaborate and support cooperative and learning-oriented behaviors. Learning is improved when participants in activities or projects share their thoughts and experiences. Students can acquire important knowledge and put it to use practically when they collaborate and respect the ideas of others. Working together encourages creativity and social acceptability. Collaborative learning increases productivity and fosters the growth of analytical abilities. Students can find practical answers by regulating their problem-solving processes and exchanging ideas. Joint decision-making establishes a framework for collaboration and teamwork while fostering a positive work environment and increasing cohesiveness

Conclusion and suggestions

A study on creating a learning-friendly environment for overweight students highlighted that awareness of nutrition and overweight is crucial for understanding the importance of maintaining health. Education on choosing nutritious foods and regularly updating eating and exercise habits is essential to prevent overweight. Overweight impacts include physical issues such as knee pain and mental issues like stress and reduced self-confidence. Selecting nutritious foods and minimizing high-fat intake can help in weight reduction and health promotion. Contributing factors to overweight include high sugar consumption and eating at inappropriate times. Environments that facilitate easy access to food and poor sleep habits also affect fat accumulation and overall health. For physical activity, providing opportunities for students to engage in suitable and enjoyable activities, such as light jogging or playing sports, enhances interest in learning and reduces stress. Appropriate physical activities strengthen the body and alleviate stress. Utilizing learning spaces and online platforms for exercise improves convenience in health management. Psychological support involves creating an environment that stimulates creativity through activities such as games or group tasks that enhance analytical thinking skills. Modern educational media and consultations with psychological experts help

reduce stress and boost confidence. Participation and collaboration foster teamwork skills. Group work and the sharing of opinions enhance communication and analytical thinking. Establishing mechanisms for collaboration and opinion exchange within teams improves efficiency and cohesion at work.

Suggestions:

The research offers targeted recommendations to improve the learning environment and well-being of overweight students. Although physical activity levels are relatively high, there is room for improvement. Department of Community Development should enhance both classroom and extracurricular activities to ensure consistent physical engagement, which supports better health outcomes. Creating a supportive learning environment for overweight students should be ongoing, focusing on health-promoting spaces and activities.

Practical measures include establishing psychological support services, offering motivational programs featuring successful individuals, and organizing teamwork-based activities that foster community development and problem-solving. Students should be encouraged to take part in managing health-related initiatives. Educational programs on nutrition and weight management should be implemented through training sessions and accessible media like videos and apps. Physical activities such as walking and aerobics should be tailored to suit overweight students, and campuses should provide adequate exercise facilities.

For future research, in-depth studies on factors affecting the mental health of overweight students are recommended. Researchers should evaluate the impact of learning environments and activities, explore digital tools to support health and education, and conduct comparative studies between overweight and non-overweight students. These insights can inform the development of inclusive educational policies and practices that support all learners effectively.

New knowledge and the effects on society and communities

From Guidelines to improve the learning environment for overweight students: “K-D-L-C” Clarified as follows:

1) K: Knowledge: Recognizing the significance of sustaining health and preventing obesity entails acknowledging the effects of excess weight on both physical and mental well-being. It encompasses understanding the factors contributing to obesity, along with the influence of environmental conditions and behaviors associated with it. This awareness promotes a preference for selecting foods that benefit overall health.

2) D: Dance: Emphasizing physical activity entails providing opportunities for students to participate in appropriate and enjoyable exercises. This involves arranging suitable physical activities for all students and creating environments that encourage movement, including arranging classrooms to facilitate physical activity. Furthermore, promoting awareness and understanding of physical activity and health is crucial.

3) L: Love involves psychological support by fostering an environment that encourages intellectual and creative thinking. This includes designing activities and instructional methods that enhance analytical thinking and utilizing modern, engaging learning materials. Access to psychological and personality development experts is essential, as is providing opportunities for expressing feelings and sharing experiences.

4) C: Collaboration entails teamwork to provide opportunities for students to participate in learning activities and cooperative tasks. It emphasizes group-based learning with active involvement in solving complex problems or completing tasks, where students work on projects or activities requiring collective effort. Encouraging cooperative behaviors that enhance learning and establishing opportunities for students to engage in collaborative learning and develop teamwork and problem-solving skills are essential.

It offers a culturally adaptable, holistic approach to inclusive education that aligns with regional goals of equity, student well-being, and 21st century learning skills. Its emphasis on physical and emotional health can inform national educational frameworks, teacher training curricula, school infrastructure planning, and student support policies. By incorporating such multidimensional inclusivity, education systems in Southeast Asia can more effectively address the diverse needs of learners especially those affected by rising obesity rates and move toward more resilient, equitable schooling.

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Developing a Model to Enhance Customer Loyalty in the Restaurant Business through Digital Transformation, Focusing on Risk and Image

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Abstract

Digital transformation reshapes the restaurant industry by altering customer engagement and operational practices. This study critically examines how digital innovations—such as online ordering systems, mobile applications, and automated services—affect customer loyalty, focusing on the mediating roles of perceived risks and restaurant image. Targeting Thai consumers in Bangkok, this study adopts a mixed-methods approach to gain both breadth and depth of understanding. A structured survey (405 valid responses) was analyzed using Structural Equation Modeling (SEM) to test hypothesized relationships. To complement the quantitative findings, 12 semi-structured interviews with restaurant owners, managers, and digital experts provided contextual insights and practical perspectives, enhancing the study's validity through methodological triangulation. Findings reveal that digital transformation enhances customer loyalty by strengthening the restaurant's image and mitigating perceived risks. However, challenges such as technological failures, data security concerns, and diminished personal interaction continue to pose significant barriers. The study reveals that effective digital strategies enhance customer satisfaction, but managing technological risks is crucial for maintaining trust and loyalty in the digital dining environment.

Keywords: Digital transformation, Customer loyalty, Restaurant industry, Perceived risk, Restaurant image

Introduction

The accelerating pace of digital transformation has fundamentally reshaped how businesses operate, communicate, and deliver value. This phenomenon, driven by rapid technological advancements, is particularly pronounced in the hospitality sector—a vital component of the global tourism industry (Pantano et al., 2017). Within this sector, restaurants have witnessed a profound evolution in their operational and customer engagement strategies, largely due to the integration of digital technologies. The advent of digital tools such as online ordering systems, mobile applications, and automated services has not only streamlined service delivery but also redefined customer experience in significant ways. The outbreak of COVID-19 served as an unprecedented catalyst for change, compelling restaurants worldwide to pivot from traditional business models to digitally enabled operations almost overnight (Gursoy & Chi, 2020). Faced with the dual challenges of maintaining service continuity and ensuring public safety, restaurants rapidly embraced online ordering platforms, contactless payment systems, and automated services to minimize physical contact (Discover Global Network, 2023). This swift digital adoption not only helped safeguard public health but also opened new avenues for customer engagement by facilitating personalized interactions that strengthen customer relationships and drive loyalty (Breugelmans & Liu-Thompkins, 2017).

Despite the numerous opportunities presented by digital transformation, several challenges have emerged. Digitalization enables restaurants to harness customer data to create tailored experiences that enhance satisfaction and foster loyalty (Vo-Thanh et al., 2022). However, this data-driven approach is fraught with challenges. Concerns regarding data privacy, system reliability, and a potential reduction in personal interaction have surfaced as significant barriers to establishing trust among customers (Dinev et al., 2015). In an environment where digital tools are central to service delivery, any lapse in data security or technological performance can undermine customer confidence. Thus, restaurant managers are compelled to strike a delicate balance between embracing innovative digital solutions and implementing robust measures to mitigate these inherent risks. Additionally, the positive correlation between digital transformation and customer loyalty has been documented in various studies, which highlight the role of technological conveniences such as mobile applications and digital loyalty programs in promoting repeat business. These digital tools not only streamline service processes but also facilitate the collection of real-time customer feedback, enabling restaurants to refine marketing strategies and service offerings continuously. Yet, while these benefits are well recognized, the literature reveals a notable gap in understanding how perceived risks and the overall digital image of a restaurant mediate the relationship between technology adoption and customer loyalty. In other words, even though digital innovations are known to enhance customer experiences, there is less clarity regarding how potential risks and a restaurant's online reputation influence consumer attitudes and long-term loyalty.

In today's competitive digital landscape, a restaurant's digital presence extends far beyond its menu or physical ambiance. The reputation that a restaurant cultivates online—through its website, social media engagement, and customer reviews—plays a pivotal role in shaping consumer perceptions (Vermeulen & Seegers, 2009). A robust and positive digital image, bolstered by consistent and reliable technological interactions, can attract new customers while reinforcing loyalty among existing patrons. Conversely, perceived deficiencies in managing digital risks, such as insecure payment processes or unreliable systems, can erode customer trust and deter repeat business (Choi & Cheng, 2020). This is particularly relevant in Thailand, where the food and beverage (F&B) industry is not only a major contributor to the economy but also increasingly influenced by digital engagement.

According to the Ministry of Commerce (2023), digital channels such as food delivery apps, social media platforms, and online review sites now play a central role in consumer decision-making in Thailand's urban areas, especially Bangkok. Thai consumers show high responsiveness to digital convenience and trust signals, including mobile payment security and responsive online communication (Kasikorn Research Center, 2022). Consequently, understanding the interplay between digital transformation, perceived risks, and restaurant image is essential for developing effective strategies that not only attract but also retain customers over the long term in the Thai context.

This study therefore attempts to address the critical gap in the current literature by examining the complex relationships among digital transformation, perceived risks, restaurant image, and customer loyalty within the restaurant industry. This study aims to examine how digital innovations shape consumer behavior in Bangkok's restaurant industry. It focuses on both the benefits—such as improved service quality and personalized experiences that foster customer loyalty—and the challenges, including potential risks that could erode customer trust if not effectively managed. To achieve this aim, the research sets out the following objective:

1. To examine customer perceptions of digital transformation, risk factors, and image in the context of the restaurant industry.
2. To investigate the level of destination loyalty towards restaurants with digital transformation from the perspective of Thai customers in Bangkok province.
3. To explore the relationships between digital transformation in restaurants, risk factors, image perception, and customer loyalty by formulating and validating a conceptual model.

Conceptual Model and Hypothesis Development

The proposed conceptual model, as presented in Figure 1, serves as the foundation for investigating the study's third objective: to explore the complex interplay between digital transformation in the restaurant industry, customers' perceived risk, restaurant image, and customer loyalty. By developing and empirically validating this model, the study seeks to unravel how digital innovations influence consumer behavior and overall brand perception, ultimately affecting loyalty outcomes. Digital transformation in restaurants entails the adoption of various technological tools, such as mobile applications, online ordering systems, digital menus, and contactless payment methods. These technologies are not solely about operational efficiency; they also signal a modern, innovative, and customer-centric approach. For instance, Esposito et al. (2022) demonstrated that digital technology can enhance service innovation by reducing physical interactions and promoting hygiene, which in turn lowers customer-perceived risk. Complementary findings by Zeng et al. (2020) and Shin & Kang (2020) have established a strong link between the adoption of digitalization initiatives in the hospitality industry and increased consumer footfall. Together, these studies highlight that digital transformation not only attracts new customers but also reshapes their perceptions regarding risk and overall dining experience.

While digital transformation is often associated with enhanced efficiency, convenience, and reduced physical contact—particularly relevant during the COVID-19 pandemic—it can simultaneously introduce new dimensions of perceived risk. These risks may stem from uncertainties regarding the reliability of digital systems, concerns about data privacy, lack of human interaction, and potential service failures (Shin & Kang, 2020). For example, when customers interact with self-service kiosks, mobile ordering apps, or AI-based service platforms, they may question the system's accuracy, security, and responsiveness (Kim et al., 2010). This aligns with Esposito et al. (2022), who found that while digital initiatives reduce traditional health-related risks, they may increase perceived technological and psychological risks, such as trust in automation and fear of digital errors. Therefore, Hypothesis 1, which

posits that digital transformation is positively related to customers' perceived risk, is grounded in the recognition that the adoption of new technology, while beneficial, can evoke anxieties related to technological reliability, information security, and depersonalized service encounters. These evolving risk perceptions underscore the importance of balancing innovation with robust trust-building mechanisms. Thus, the following hypothesis is posited:

Hypothesis 1 There is a positive relationship between digital transformation in restaurants and Thai customers' perceived risk.

In parallel, Hypothesis 2 contends that digital transformation enhances the overall image of a restaurant. The integration of technologies such as digital menus and mobile ordering systems improves the efficiency and convenience of service delivery. These innovations, when effectively communicated through digital channels like social media and email marketing, build a reputation for modernity and customer focus. Customers are likely to perceive technologically advanced restaurants as more innovative and responsive, thereby strengthening the restaurant's brand image. This perspective is supported by empirical studies that underscore the role of digital tools in enhancing customer experience and operational transparency (Zeng et al., 2020; Shin & Kang, 2020). Therefore, the hypothesis is proposed:

Hypothesis 2 There is a positive relationship between digital transformation in restaurants and image.

Following these direct relationships, Hypothesis 3 argues that digital transformation directly boosts customer loyalty. When restaurants successfully integrate digital technologies into their operations, they not only improve service efficiency but also build customer trust and satisfaction. This leads to higher levels of repeat patronage, positive word-of-mouth, and an overall willingness among customers to engage more deeply with the brand. The direct link between technological innovation and enhanced customer loyalty has been well documented in hospitality research (Esposito et al., 2022). Thus, the following hypothesis is followed:

Hypothesis 3 There is a positive relationship between digital transformation in restaurants and customer loyalty.

Hypothesis 4 posits that perceived risk significantly influences the overall brand image of a restaurant. In contemporary hospitality settings, digital transformation initiatives that proactively mitigate perceived risks—such as implementing transparent safety protocols, ensuring seamless and secure digital interactions, and maintaining system reliability—play a critical role in shaping customers' cognitive and emotional evaluations of a brand. Recent studies affirm that minimizing technological and health-related uncertainties fosters stronger brand trust and more favorable image perceptions (Helal, 2023). Research by Frontiers in Psychology (2022) further highlights that customer awareness of digital safety and hygiene measures enhances perceived brand credibility and engagement. This aligns with earlier findings in tourism literature, where perceived risk was shown to mediate destination image and consumer decision-making. Accordingly, when restaurants effectively address digital concerns, they not only enhance customer confidence but also elevate brand image. Based on this rationale, the following hypothesis is posited:

Hypothesis 4 There is a positive relationship between Thai customers' perceived risk towards restaurant with digital transformation and image.

Hypothesis 5 addresses the direct effect of perceived risk on customer loyalty. When digital tools diminish uncertainty— by safeguarding data privacy, improving service consistency, or enhancing convenience—customers feel more secure and valued, which fosters greater loyalty. Reduced perceived risk thus minimizes hesitation and promotes repeat patronage. Furthermore, a favorable brand image, nurtured through digital transformation, further reinforces loyalty (Hypothesis 6). As Chen & Kerstetter (1999) and Chew &Jahari (2014) assert, brand image—encompassing both cognitive beliefs and affective feelings—plays a critical role in driving consumers' behavioral intentions, including their willingness to return and recommend. Together, these hypotheses highlight how managing perceived risks through digital innovation is essential not only for protecting customers but also for strengthening the restaurant's reputation and fostering enduring loyalty. Thus, the following hypotheses are as follows:

Hypothesis 5 There is a positive relationship between Thai customers' perceived risk towards restaurant with digital transformation and their loyalty.

Hypothesis 6 There is a positive relationship between image of restaurant with digital transformation and their loyalty.

In summary, the conceptual model critically examines how digital transformation influences consumer perceptions in the restaurant industry. By testing these six hypotheses, the study provides a comprehensive analysis of how technological innovation shapes perceived risk, enhances brand image, and ultimately drives customer loyalty. This framework is underpinned by robust empirical evidence (Esposito et al., 2022; Zeng et al., 2020; Shin & Kang, 2020; Lepp & Gibson, 2003; Chen & Kerstetter, 1999; Chew & Jahari, 2014) and offers significant insights for both academic research and practical applications in a competitive, digitally evolving landscape.

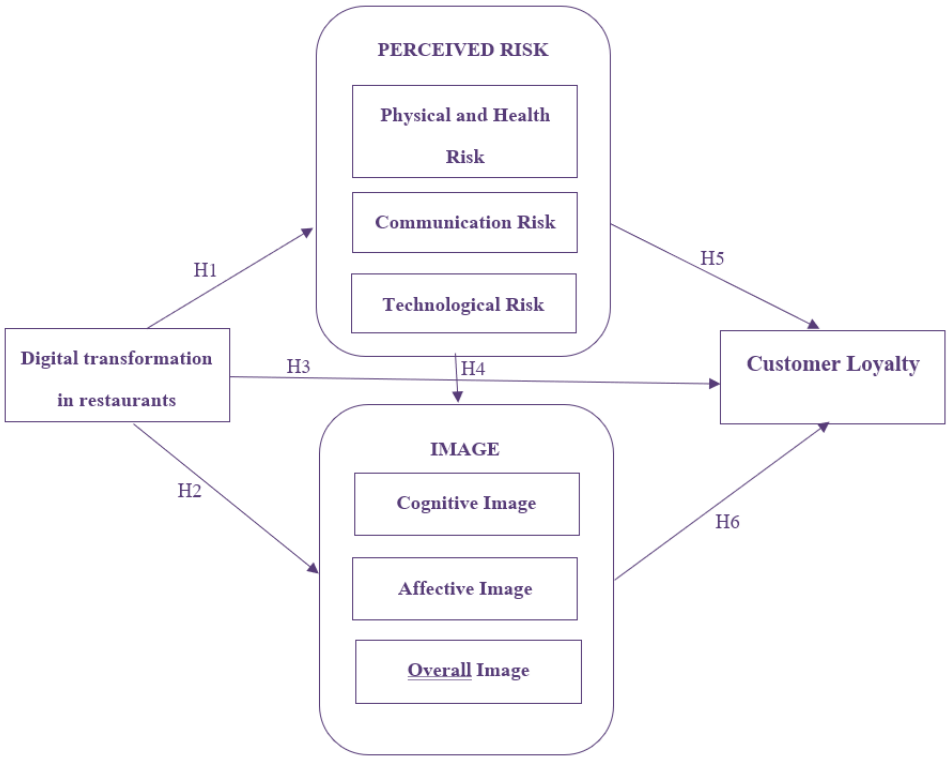

Figure 1 The Conceptual Model (Source: Developed by the researchers, 2025)

Methodology

This study adopted a mixed-methods design, integrating quantitative and qualitative approaches to gain a comprehensive understanding of the impacts of digital transformation in the restaurant industry. The research design was informed by contemporary methodological frameworks (Creswell & Plano Clark, 2018; Fetters, 2019), which emphasize the value of methodological triangulation for enhancing validity and depth of insight. Additionally, the case-based structure aligns with Yin's (2018) principles of mixed-methods case study research, enabling a robust exploration of contextual factors and experiential nuances.

Phase 1: Quantitative Approach

The quantitative component was designed to test hypotheses and uncover statistically significant relationships among key constructs. The specific objectives were to: 1) explore customer perceptions of digital transformation, perceived risk, and restaurant image; 2) investigate customer loyalty in the context of digitally transformed restaurants in Bangkok and 3) test the relationships among these variables.

Population and Sample

The target population for this study comprised Thai customers who had prior experience dining at restaurants that had implemented digital service technologies—such as QR code menus, digital ordering systems, contactless payments, or loyalty apps. Given the study's focus on understanding consumer perceptions of digital transformation, it was essential to select respondents who were meaningfully exposed to such technologies. To ensure the relevance and depth of responses, a purposive sampling strategy was employed (Palinkas et al., 2015). This non-probability sampling approach is suitable for studies requiring participants with specific knowledge or experience, particularly in exploratory or explanatory research designs (Etikan, Musa & Alkassim, 2016). Participants were screened to confirm their exposure to digital dining experiences within the past 12 months. To determine the appropriate sample size, Cochran's (1997) formula was applied, assuming a 95% confidence level and a 5% margin of error. In total, 445 responses were gathered. After screening for missing data and outliers, 405 valid responses remained—meeting and exceeding SEM recommendations. According to Hair et al. (2006) and Bentler & Chou (1987), an ideal SEM sample ranges from 100–200 or 5–10 cases per estimated parameter. Therefore, the final sample size ensured both model adequacy and analytical rigor.

Instrument Development

This study employed a structured questionnaire as the primary instrument for hypothesis testing and data collection. Grounded in validated constructs from prior research, the instrument was designed to capture consumer responses related to digital transformation, perceived risk, restaurant image, and customer loyalty—key variables relevant to behavior in digitally transformed restaurant environments (Nunnally & Bernstein, 1994; Creswell, 2014). The questionnaire comprised five sections: 1) demographics; 2) digital transformation (e.g., mobile ordering, digital payments); 3) perceived risks, including technological, communication, and health-related concerns; 4) restaurant image, covering cognitive, affective, and overall perceptions; and 5) customer loyalty, including revisit intention, word-of-mouth and willing to pay more behaviors.

To enhance construct validity, items were adapted from established literature. Digital transformation was measured using a nine-item scale adapted from foundational information systems and service research (Davis, 1989; DeLone & McLean, 2003; Bitner et al., 2000), and further refined to capture contemporary hospitality contexts. Items were updated and validated following recent industry-specific frameworks (Nikopoulou et al., 2023; Somera & Petrova, 2024), which emphasize cloud-based systems, IoT integration, and real-time guest experience

metrics in hotels and restaurants. Perceived risk was measured with 14 items based on the frameworks of Yeung & Morris (2001) and Chen & Wang (2016), covering multidimensional risk perceptions. The perceived restaurant image was evaluated through 15 items adapted from Kwortnik & Ross (2007) and Parasuraman et al. (2005), while customer loyalty was captured using nine items from Oliver (1999), Zeithaml et al. (1996), and related studies. Each construct included at least three indicators, as recommended by Hair et al. (2011), to improve internal consistency and minimize measurement error (DeVellis, 2017). A 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree") was used for all scaled items. This format is widely recognized for its simplicity and ability to quantify subjective attitudes effectively (Likert, 1932; Allen & Seaman, 2007). An optional open-ended section was also included to gather qualitative insights, providing contextual depth to complement quantitative findings (Patton, 2015). Overall, the instrument was carefully structured to ensure methodological rigor, conceptual clarity, and relevance to the research objectives.

Data Analysis

This study employed a rigorous quantitative approach using SPSS Statistics 20 and AMOS 23 to analyze the collected data. SPSS was used to perform descriptive statistics, including means, standard deviations, and percentages, offering an overview of the demographic profile and distributional properties of the dataset (Field, 2018). Following this, the study adopted Anderson and Gerbing's (1988) two-step approach to Structural Equation Modeling (SEM), which emphasizes the separation of measurement and structural models to ensure validity and reliability.

In the first step, Confirmatory Factor Analysis (CFA) was conducted using AMOS 23 to validate the measurement model. This involved assessing the relationships between observed variables and their respective latent constructs to ensure alignment with theoretical definitions. Convergent and discriminant validity were examined through standardized factor loadings, Average Variance Extracted (AVE), and inter-construct correlations, while reliability was assessed via composite reliability and Cronbach's alpha (Hair et al., 2014; Nunnally & Bernstein, 1994; Byrne, 2016). Once the measurement model was confirmed, the structural model was analyzed to test the hypothesized relationships among digital transformation, perceived risk, restaurant image, and customer loyalty. SEM was employed for this purpose due to its strength in evaluating complex, multi-path relationships simultaneously, including mediating effects (Kline, 2015). Model fit was assessed using several indices: Chi-square (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), in accordance with best practices (Schumacker & Lomax, 2016). A satisfactory model fit provided empirical support for the proposed theoretical framework. Overall, the integration of descriptive analysis, CFA, and SEM ensured a robust and comprehensive examination of the data, reinforcing the validity of the study's conclusions regarding customer loyalty in digitally transformed restaurants.

Phase 2: Qualitative Phrase

Qualitative research aims to understand complex phenomena through non-statistical means, emphasizing depth and context over numerical measurement (Creswell, 2013). Rooted in a naturalistic approach, it explores how individuals construct meaning within real-life settings, capturing motivations, perceptions, and lived experiences that are often overlooked in quantitative studies (Patton, 2001; Merriam & Tisdell, 2016). By embracing the complexity of social phenomena, qualitative research offers interpretive insights and identifies patterns that enrich understanding (Denzin & Lincoln, 2011; Miles et al., 2014). When combined with quantitative methods, it contributes to a more comprehensive and nuanced view of the research problem.

Research Design: Semi-Structured Interviews

To obtain in-depth perspectives on the impact of digital transformation in Bangkok's restaurant sector, this study employed semi-structured interviews with Thai tourists and local stakeholders from both public and private sectors. This qualitative method was selected for its ability to balance structure with flexibility, enabling the researcher to maintain consistency across interviews while allowing respondents to articulate their personal experiences and viewpoints (Creswell & Plano Clark, 2011; Flick, 2002). Semi-structured interviews are particularly well-suited for exploring complex and subjective constructs such as digital transformation, perceived image, perceived risk, and customer loyalty. This approach supports both thematic comparability and the emergence of nuanced, context-specific insights that may not surface through more rigid research instruments (Fontana & Frey, 2000; Smithson, 2008). To ensure methodological rigor, the interview process followed a structured protocol adapted from Lenggogeni (2014), which guided the flow of dialogue while providing sufficient flexibility to accommodate unanticipated but relevant themes. This design choice enhanced the depth and validity of the qualitative findings, aligning them closely with the study's broader research objectives.

Population and Sample

Determining an appropriate sample size in qualitative research is inherently context-dependent, influenced by the study's objectives, the depth of inquiry, and the complexity of the phenomenon being explored. As Mason (2010) highlights, there is no universally accepted standard for qualitative sample sizes; instead, researchers must rely on achieving data saturation—the point at which additional participants yield no new information. Mason further provides practical benchmarks for sample sizes in comparable qualitative studies (see Table 3.5), offering useful guidance for researchers navigating these decisions. Similarly, Guest, Bunce, and Johnson (2006) emphasize that while qualitative research typically requires fewer participants than quantitative studies, rigorous planning is essential to estimate a sample size sufficient to comprehensively explore the research questions. In mixed-methods research, a common practice is to adopt a smaller, purposively selected sample for the qualitative phase, complementing a larger quantitative sample to balance depth and breadth of analysis (Creswell & Plano Clark, 2011). Reflecting these principles, this study engaged twelve participants—including restaurant owners, managers, and digital transformation experts—consistent with Creswell (1998) and Morse's (1994) recommended range of five to twenty-five participants for qualitative inquiries. Purposive sampling was employed to ensure inclusion of individuals with relevant expertise and lived experience, enabling rich, nuanced insights into digital transformation within Bangkok's restaurant industry (Palinkas et al., 2015). This carefully selected sample size facilitates the collection of in-depth, contextually grounded data while aligning with the study's mixed-methods design, ultimately supporting a comprehensive understanding of the complex dynamics at play.

Data Collection

The qualitative phase of this study aims to gather rich, in-depth data from strategically selected key informants, including restaurant entrepreneurs, government officials, and private sector representatives, whose experiences and insights into digital transformation in the restaurant industry are particularly relevant. Data collection will be conducted through semi-structured interviews, a method chosen for its ability to balance flexibility with systematic coverage of core research questions (Kvale & Brinkmann, 2009). The recruitment process begins with clear communication to potential participants, providing detailed information about the study's objectives, the expected role of informants, and the significance of their contributions, thereby fostering trust and informed consent (Ritchie, Lewis, Nicholls, & Ormston, 2013). Eligibility will be confirmed through an initial screening to ensure participants possess relevant experience or involvement in digital transformation initiatives within the

restaurant sector (Bryman, 2016). Interview scheduling will be coordinated to accommodate participants' availability and conducted in settings conducive to candid and comfortable dialogue (Opdenakker, 2006). Prior to commencing, participants will provide written consent acknowledging their understanding of the interview process, including recording procedures and data usage, in adherence to ethical research standards (Wiles, Crow, Heath, & Charles, 2008). Interviews are expected to last between 40 and 60 minutes, allowing sufficient depth while respecting participants' time constraints (Rubin & Rubin, 2012). Utilizing a semi-structured interview guide, the researcher will ensure comprehensive coverage of key topics while remaining responsive to emergent themes and unexpected insights (Creswell & Poth, 2018). All interviews will be audio-recorded with permission to support accurate transcription and rigorous analysis. This carefully designed data collection approach is intended to yield nuanced, contextually grounded insights, enriching understanding of the multifaceted digital transformation processes within the restaurant industry.

Data Analysis

This study employs the qualitative data analysis framework proposed by Miles and Huberman (1994) to systematically process and interpret data collected from semi-structured interviews. Renowned for its structured yet adaptable approach, this methodology facilitates rigorous and insightful analysis through four interconnected stages: data reduction, data display, conclusion drawing, and verification. Data analysis begins immediately after each interview, with the researcher manually transcribing audio recordings to preserve the richness and nuances of participant responses. Supplementary field notes capturing non-verbal cues and contextual observations further enrich the dataset (Miles, Huberman, & Saldaña, 2014). During data reduction, the researcher condenses and refines the transcriptions by coding and categorizing relevant information aligned with the study's objectives, thereby focusing the analysis on meaningful themes while filtering out extraneous content (Saldaña, 2021). The subsequent data display stage organizes these condensed data through visual formats such as matrices, charts, and diagrams, enabling clearer identification of patterns and relationships that textual data alone may obscure (Miles & Huberman, 1994). Drawing conclusions follows, where emerging themes are interpreted within the context of the research questions and theoretical frameworks, while also considering alternative explanations to ensure analytical depth (Creswell & Poth, 2018). Crucially, the final verification phase involves iterative cross-checking and triangulation to confirm the validity and reliability of findings, enhancing the study's trustworthiness and credibility (Lincoln & Guba, 1985; Miles & Huberman, 1994). Collectively, this comprehensive analytical process supports the generation of robust and nuanced insights into the dynamics of digital transformation in the restaurant industry and its influence on customer loyalty.

This study adopts mixed methods design to capture both the breadth and depth of digital transformation in the restaurant industry. The quantitative phase enables hypothesis testing and generalization of findings across a broader population (Creswell & Creswell, 2018), while the qualitative phase offers contextual insights into stakeholder experiences often missed in numeric data (Patton, 2015; Denzin & Lincoln, 2018). This integration enhances both the validity and practical relevance of the research, particularly in dynamic service environments where technology and human behavior interact (Tashakkori & Teddlie, 2010). Aligned with current best practices in digital innovation research (Venkatesh et al., 2013), the approach provides a robust foundation for both academic exploration and strategic decision-making.

Results

Phase 1: Quantitative Phrase

The quantitative phase of this study yielded 405 valid responses from Thai customers who frequented digitally transformed restaurants in Bangkok. The demographic analysis indicates a balanced gender distribution (51.85% male, 48.15% female) and a predominant age group of 31–40 years (46.42%). Most respondents were single (70.37%), possessed a bachelor's degree (71.85%), and reported a monthly income predominantly in the range of 25,001–35,000 Baht (48.15%). Regarding their experiences with digital transformation, 38.02% of participants reported visiting these establishments four times, while 28.64% had visited five or more times.

This section aims to achieve two primary objectives: 1) to investigate customer perceptions related to digital transformation, perceived risks, and brand image within the restaurant industry, and 2) to assess destination loyalty toward digitally transformed restaurants from the perspective of Thai consumers residing in Bangkok. The findings reveal a generally positive perception of digital transformation in the restaurant sector, with an overall high satisfaction level (Mean = 4.01). The perceived image of restaurants was analyzed across three dimensions: cognitive, affective, and overall image. The cognitive image, reflecting customers' evaluation of a restaurant's technological competence and operational integration, scored a high mean of 4.13 (S.D. = 0.68), suggesting strong customer approval of digital initiatives. In terms of perceived risks, the analysis was categorized into three key dimensions: physical and health risk (Mean = 3.99), communication risk (Mean = 4.16), and technological risk (Mean = 4.36). Notably, communication and technological risks scored higher, indicating that while customers recognize potential challenges, they still maintain a positive outlook on digital systems. Physical and health risk, while slightly lower, reflects ongoing concerns about hygiene and safety in digitally operated environments—particularly relevant in the post-pandemic context.

Customer loyalty was measured through three indicators: revisit intention, word-of-mouth behavior, and willingness to pay more. Among these, customer loyalty scored the highest (Mean = 4.37, S.D. = 0.52), demonstrating a strong intent among consumers to return to restaurants that effectively leverage digital technologies. These findings collectively underscore the value of digital transformation in enhancing customer satisfaction, mitigating perceived risks, and fostering strong loyalty behaviors in the competitive restaurant landscape.

Structural Model and Analysis of Hypotheses Test

This section addresses the research objective of exploring the relationships among digital transformation in restaurants, perceived risk, image perception, and customer loyalty through the development and validation of a conceptual model using Structural Equation Modeling (SEM). The results demonstrated an acceptable model fit based on a range of fit indices. Specifically, the Adjusted Goodness of Fit Index (AGFI = 0.96) and the Normed Fit Index (NFI = 0.93) surpassed the conventional cutoff of 0.90, indicating a good model fit (Kline, 2016). Other indices—such as the Chi-square (χ^2 = 1023.519), Goodness of Fit Index (GFI = 0.93), Comparative Fit Index (CFI = 0.94), and Root Mean Square Error of Approximation (RMSEA = 0.09)—further support the adequacy of the model. Although the RMSEA slightly exceeds the ideal threshold of 0.08, it remains within acceptable bounds for complex models involving multiple latent constructs (Hair et al., 2010), confirming the model's overall fit and theoretical robustness.

All hypothesized relationships, except for one, exceeded the critical t-value threshold of 1.96, thereby supporting five out of six proposed hypotheses. Detailed statistical outcomes are presented in Table 1. The empirical findings provide nuanced insights into the complex

interplay between digital transformation and customer loyalty. Hypothesis 1 (H1), which posited that digital transformation increases perceived risk, was supported with a standardized estimate of 0.071 and a t-value of 5.786 ($p < 0.01$). This indicates that customers may initially associate digital innovations with heightened concerns, particularly regarding data privacy, system reliability, and unfamiliar technologies. Hypothesis 2 (H2), asserting a positive relationship between digital transformation and perceived image, was also confirmed ($\beta = 0.084$, $t = 5.435$, $p < 0.01$). The adoption of digital tools—such as online ordering systems, digital menus, and personalized recommendations—contributes to a modern and innovative brand image, resonating positively with consumers. Hypothesis 3 (H3) proposed that digital transformation would directly enhance customer loyalty, and the results supported this claim ($\beta = 0.078$, $t = 5.109$, $p < 0.01$). These findings highlight how digital capabilities contribute to improved service quality, convenience, and overall satisfaction, fostering greater loyalty. In contrast, Hypothesis 4 (H4), which suggested that perceived risk would positively influence perceived image, was not supported ($\beta = 0.050$, $t = 0.627$), indicating that heightened risk perceptions do not enhance customer impressions of the restaurant. This underscores the importance for businesses to manage digital-related risks proactively to prevent negative impacts on brand image. Hypotheses 5 and 6 examined the effects of perceived risk and perceived image on customer loyalty. Hypothesis 5 was supported ($\beta = 0.064$, $t = 2.599$, $p < 0.05$), demonstrating a modest but statistically significant relationship. However, Hypothesis 6 was not supported ($\beta = 0.092$, $t = 3.725$, $p < 0.05$), suggesting complexity in the mediating role of image that warrants further investigation. Collectively, the findings suggest that while perceived risk can affect loyalty to some extent, it is the perceived image—encompassing trust, innovation, and professionalism—that plays a more influential role in fostering customer loyalty in digitally transformed restaurants.

A supplemental analysis was conducted to examine the mediating roles of perceived risk and image in the relationship between digital transformation and customer loyalty. The results revealed a significant indirect effect of digital transformation on loyalty through perceived risk (indirect effect = 0.341), suggesting that customers' risk perceptions partially mediate this relationship. More notably, the indirect effect through perceived image was stronger (indirect effect = 0.582), affirming that digital transformation substantially enhances loyalty by positively shaping brand image. These findings emphasize that while digital transformation directly influences loyalty, its full impact is best understood through the dual mediating pathways of perceived risk and image.

Table 1 Results

Hypotheses	**Structural paths**	**Std. Estimate**	**T-value**	**Hypothesis result**
Hypothesis 1	DTR → PR	0.071	5.786**	Supported
Hypothesis 2	DTR → PI	0.084	5.435*	Supported
Hypothesis 3	DTR → CL	0.078	5.109**	Supported
Hypothesis 4	PR → PI	0.050	0.627	Not Supported
Hypothesis 5	PR → CL	0.064	2.599*	Supported
Hypothesis 6	PI → CL	0.092	3.725*	Not Supported
Variance explained R^2 (DTR) = 0.579 R^2 (PI) = 0.523 R^2 (PR) = 0.641		Indirect effect: βDTR → PR → CL =.341** βDTR → PI → CL = 582**		

Note 1. ** p< 0.01; *p<0.05
Note 2. DTR= Digital transformation in restaurants, PR= Perceived risk, PI= Perceived image and CL= Customer loyalty

Phase 2: Qualitative Phrase

The primary aim of this study is to gain a deeper understanding of the perspectives of multiple stakeholders on digital transformation in the restaurant industry, particularly concerning customer loyalty, risk, and brand image. The qualitative phase draws on insights from 12 key informants, including restaurant owners, managers, and digital transformation experts, with interviews ranging from 29 to 84 minutes. Participants consistently acknowledged that digital integration has transformed operations and customer interactions. For instance,

Interviewee II stated, "*Our online reservation system has streamlined our front-of-house management and significantly reduced customer wait times."*

Similarly, Interviewee III noted, " *Mobile ordering platforms have become indispensable—they reduce errors and boost service speed."*

Interviewee IV added, " *We see digital tools as core to improving the customer journey—from booking to feedback.*"

Interviewee VI emphasized that, "*Guests today expect convenience. Mobile and online systems are now part of their baseline expectation*."

Interviewee VIII shared, "*We've upgraded all touchpoints to digital—from QR menus to online payments—to meet evolving customer behaviors*."

Interviewee X observed, "*Customers are more satisfied when they can manage their orders and reservations on their own devices.*"

Echoing this, Interviewee XI said, "*Digital platforms allow us to personalize service—what we offer today is not just food, but a seamless experience."*

Operational improvements were also emphasized. Interviewee III explained,

"Our kitchen display system integrates with ordering to avoid delays and minimize errors."

Interviewee IX stated, *"Inventory tracking is now automated, which cuts down waste and improves planning.*"

Interviewee X confirmed, "*Digital tools in the back end have helped us reduce manual work and increase accuracy."*

COVID-19 accelerated some innovations. Interviewee I remarked,

"*Contactless payment was vital during the pandemic—it wasn't just about convenience, it was about safety."*

Interviewee VII stated, *"We had to adapt quickly, and contactless became a must-have overnight*."

Interviewee XII added, "*Digital solutions allowed us to stay open while keeping both staff and customers safe."*

Participants also identified a strong link between digital innovation and customer loyalty. Interviewee II commented,

"Customers appreciate efficiency—if they have a smooth experience, they'll come back."

Interviewee VII agreed: "*Convenience is key. It's what keeps people coming back, especially busy professionals."*

Interviewee IX reflected, *"We've seen word-of-mouth improve as a direct result of offering seamless digital services."*

Interviewee VI echoed, *" Personalized digital experiences make our guests feel valued—that drives loyalty."*

Others discussed revenue impacts. Interviewee V remarked,

"We can charge a bit more because people are willing to pay for convenience."

Interviewee XI added, "*When systems work flawlessly, guests associate that with higher quality—it justifies the premium."*

Forward- looking perspectives also emerged. Interviewee I mentioned plans to *"experiment with AI to tailor promotions in real time."*

Interviewee IV expressed interest in *"using VR to enhance our storytelling and dining themes."*

Interviewee VI emphasized the need to *"stay ahead by integrating smart tech into the customer experience."* Interviewee XII concluded, *"Digital isn't a trend—it's the future of the dining experience."*

Thus, stakeholders consistently acknowledged significant progress in digital integration within the restaurant industry. Core technologies—such as online reservation systems, mobile ordering platforms, digital inventory tools, and kitchen display systems—were credited with enhancing both operational efficiency and customer convenience. Contactless payment methods emerged as a particularly crucial innovation during the pandemic, meeting heightened safety expectations. Interviewees emphasized that digital tools not only streamline operations but also play a vital role in fostering customer satisfaction and loyalty. Features like CRM systems, self- service kiosks, and digital feedback platforms support personalized engagement and service quality. Furthermore, many informants highlighted future plans to adopt advanced technologies, including AI and VR, to deliver more immersive and tailored dining experiences. Overall, digital transformation was viewed as a key enabler of repeat visits, positive word- of-mouth, and the ability to command premium pricing in competitive markets.

Despite the evident advantages of digital transformation, key informants voiced a range of critical concerns. Data security and privacy emerged as a recurring theme, with Interviewee I stating,

"The more data we collect, the more we need to protect it—one breach could ruin customer trust."

Interviewee V similarly cautioned, "*Customers are becoming increasingly aware of how their data is used. We must ensure transparency and compliance."* This concern was echoed by Interviewees VII, IX, X, and XI, who highlighted the need for secure systems to prevent data leaks and regulatory violations.

Operational disruptions and cost-related issues were also frequently cited. Interviewee II explained,

"*Tech upgrades are expensive—not just in terms of hardware, but also in training and maintenance."*

Interviewee IV added, *"Even a short downtime in a digital system can create major service delays."* These sentiments were echoed by Interviewees V, VII, X, XI, and XII, underscoring the financial and logistical challenges of implementing new technologies.

Another widely expressed concern was the potential erosion of the human touch in customer service. As Interviewee II put it,

"Automation speeds things up, but sometimes it makes the experience feel cold."

Interviewee III noted, *"People still want to feel acknowledged, not just served by a screen."* Interviewees VI, VIII, X, and XI echoed this sentiment, warning that excessive reliance on technology may alienate guests who value personal interaction.

In addition, several participants highlighted customer adaptation and technological dependency as major hurdles. Interviewee I remarked,

"Not all customers are tech-savvy—some still prefer face-to-face ordering."

Interviewee IV added, "*If the system crashes, we're stuck unless we have a manual fallback.*" Interviewees VI and XII supported these concerns, citing the operational risk of over-reliance on digital tools.

To mitigate such risks, participants proposed robust cybersecurity frameworks as essential. Interviewee III emphasized,

"Encryption and clear data governance are non-negotiable."

Interviewee VIII reinforced this by stating, "*Investing in security is as important as investing in the technology itself."* Others, including Interviewees II, IV, V, X, XI, and XII, stressed the importance of compliance with data protection laws and building customer confidence.

Moreover, redundant systems and staff training were repeatedly advocated as critical components of digital readiness. Interviewee I suggested,

"Every digital process should have a manual backup—we can't afford to be paralyzed."

Interviewee IV added, *"Staff need continuous training to adapt to updates and avoid errors."* Interviewees II, III, VI, IX, and XII also emphasized that well-prepared teams are crucial for seamless operations.

Finally, transparent communication during tech disruptions was considered vital to maintaining customer trust. Interviewee III remarked,

"*When something fails, honesty is better than silence—customers appreciate that."*

Interviewee VII added, "*Letting guests know we're working on a solution builds goodwill."* This was supported by Interviewees IV, VIII, and XI, who believed that proactive communication could reduce frustration and preserve brand loyalty.

Thus, acknowledging the benefits of digital transformation, key informants expressed concerns regarding data security, privacy, operational disruptions, and high implementation costs. Many also noted the potential loss of personal interaction in automated environments and challenges related to customer adaptation and technological dependency. To address these risks, participants emphasized the need for robust cybersecurity, backup systems, and ongoing staff training. Transparent communication with customers during technological disruptions was also viewed as essential for sustaining trust and loyalty.

Digital transformation was found to enhance brand image by positioning restaurants as innovative and customer focused. The integration of digital tools, such as mobile apps and social media engagement, contributes to a modernized and dynamic brand identity. Stakeholders also stressed the importance of aligning digital innovation with customer expectations to sustain a positive image. Looking ahead, future plans include further leveraging AI and VR, upgrading mobile applications, and adopting omnichannel platforms to not only enhance customer experience but also improve operational efficiency and resilience.

Together, the quantitative and qualitative results provide a robust, multi-faceted understanding of how digital transformation influences customer perceptions and loyalty in the restaurant industry. Quantitative data confirms that digital transformation directly and indirectly impacts customer loyalty—mediated by enhanced perceived image and managed risk—while the qualitative insights offer a rich contextual backdrop, emphasizing the need for balancing technological innovation with effective risk management and personalized customer engagement. These integrated findings underscore the importance of continuous innovation and strategic planning to maintain competitiveness in a rapidly evolving digital landscape.

Discussions

The restaurant industry is at a transformative crossroads where innovation and tradition converge. This study, employing a mixed-methods approach, has illuminated the multifaceted impact of digital transformation on customer loyalty, risk perception, and brand image. By integrating quantitative data from 405 customers with qualitative insights from 12 key informants, including restaurant owners, managers, and digital transformation experts—this research provides a comprehensive narrative of the evolving digital landscape in restaurants.

Quantitative findings reveal that Thai diners in Bangkok are largely enthusiastic about digital innovations such as digital menus, mobile applications, self-service kiosks, and contactless payments. These tools are credited with enhancing operational efficiency, reducing wait times, and simplifying the dining process (Pantano et al., 2017). Recent local studies corroborate this trend, noting that urban Thai consumers, particularly in Bangkok, increasingly favor tech-enhanced dining due to the city's fast-paced lifestyle and growing tech-savviness. However, the data also suggests that while these technologies improve convenience, they may inadvertently reduce personal interaction—a key element of traditional dining experiences. This concern is particularly relevant in Thai dining culture, where hospitality and interpersonal warmth—often conveyed through human service—are integral to customer satisfaction. In many Thai restaurants, especially those emphasizing authenticity, digital ordering may be perceived as impersonal, potentially diminishing the emotional connection that diners expect.

Hypothesis 1 was supported (standardized estimate = 0.071, t = 5.786, $p < 0.01$), confirming that digital transformation in restaurants heightens perceived risk. This aligns with recent studies showing that while digital tools enhance efficiency and personalization, they also raise concerns about data privacy, system reliability, and unfamiliar technologies. Public trust in digital platforms is crucial in moderating these risks, especially in customer-facing environments. Additionally, rapid technological changes can outpace consumer adaptability, increasing feelings of vulnerability. To mitigate these risks, businesses should promote transparency and data protection, as well as enhance customer control through clear communication and education. Addressing these concerns is essential for fostering trust and sustaining customer loyalty amid digital transformation.

The results supported Hypothesis 2, confirming a significant positive relationship between digital transformation and perceived image ($\beta = 0.084$, $t = 5.435$, $p < 0.01$). The use of technologies like online ordering, digital menus, and personalized services enhances brand image by portraying restaurants as modern, efficient, and customer-focused (Sivarajah et al., 2017). In hospitality, digital tools such as mobile apps and AI-driven recommendations contribute to perceptions of professionalism and innovation. These effects are especially salient among tech-savvy consumers who equate digital capabilities with brand quality. However, as caution, poor implementation can negatively impact customer perceptions, highlighting the need for seamless integration to maximize image benefits.

The support for Hypothesis 3 ($\beta = 0.078$, $t = 5.109$, $p < 0.01$) underscores the pivotal role of digital transformation in enhancing customer loyalty. This aligns with recent literature emphasizing that digital capabilities improve service quality and convenience, which are critical determinants of customer satisfaction and loyalty (Lemon & Verhoef, 2016; though slightly older, foundational; more recent studies confirm this trend). For instance, demonstrated that firms leveraging digital tools effectively streamline customer interactions, leading to superior service experiences that strengthen loyalty bonds. Similarly, digital transformation enables personalized and seamless services, which are increasingly demanded by customers in competitive markets. However, the relatively modest effect size ($\beta = 0.078$) suggests that while digital transformation is a significant driver, it functions alongside other factors such as brand

reputation and emotional engagement. Therefore, organizations should integrate digital initiatives with broader customer relationship strategies to maximize loyalty outcomes.

In contrast to the initial expectation, Hypothesis 4 ($\beta = 0.050$, $t = 0.627$) was not supported, indicating that perceived risk does not positively influence perceived image. This finding aligns with recent research suggesting that heightened risk perceptions typically undermine rather than enhance brand image, particularly in digital contexts where trust is critical. Elevated perceived risk can erode customer confidence and deter engagement, negatively affecting brand reputation and loyalty. The absence of a positive relationship emphasizes the necessity for businesses to implement robust risk management strategies in digital services to safeguard their brand image. Moreover, consumers tend to associate risk with uncertainty and potential losses, which are detrimental to favorable brand perceptions. Thus, proactive risk mitigation and transparent communication are essential to maintain a positive image and competitive advantage in the digital marketplace.

Hypotheses 5 and 6 explored the influence of perceived risk and perceived image on customer loyalty, yielding mixed results. Hypothesis 5 was supported ($\beta = 0.064$, $t = 2.599$, $p < 0.05$), indicating that perceived risk, although modest, has a statistically significant impact on loyalty. This finding aligns with studies showing that risk perception can directly affect customer retention by influencing trust and decision- making processes. Conversely, Hypothesis 6 was not supported despite a significant beta ($\beta = 0.092$, $t = 3.725$, $p < 0.05$), suggesting a more nuanced relationship between perceived image and loyalty than initially assumed. Prior research emphasizes that while a strong brand image typically fosters loyalty, its mediating effects may vary depending on contextual factors such as service quality and customer expectations. These findings collectively highlight that perceived image—encompassing trustworthiness, innovation, and professionalism—exerts a stronger, more direct influence on loyalty in digitally transformed restaurant settings. Thus, restaurants must strategically enhance their brand image alongside managing risks to build sustainable customer loyalty.

A supplemental analysis investigating the mediating effects of perceived risk and perceived image in the digital transformation– customer loyalty relationship revealed compelling insights. The significant indirect effect through perceived risk (0.341) aligns with recent findings that digital transformation can alter customers' risk assessments, which in turn influence loyalty decisions. This partial mediation highlights that risk perceptions remain a critical factor moderating how digital initiatives affect customer retention. More prominently, the stronger indirect effect through perceived image (0.582) underscores the central role of brand image as a conduit through which digital transformation fosters loyalty. This supports prior research emphasizing that digital capabilities not only reduce perceived uncertainties but also enhance customer perceptions of innovation, trustworthiness, and professionalism—key drivers of loyalty. Collectively, these findings suggest that the impact of digital transformation on loyalty is complex and best captured by considering both cognitive risk evaluations and affective brand impressions, providing a more holistic understanding for practitioners aiming to optimize customer relationships.

The qualitative findings from key stakeholders—restaurant owners, managers, and digital experts—offer rich insights into the multifaceted impact of digital transformation on operations, customer loyalty, risk, and brand image. Consistent with prior research, participants emphasized that digital integration significantly enhances operational efficiency and customer convenience through technologies such as online reservations, mobile ordering, and digital inventory systems. These tools not only reduce errors and wait times but also align with evolving customer expectations for seamless, self- service experiences, reinforcing on the centrality of convenience in driving loyalty in digital service settings.

The acceleration of contactless payment adoption during the COVID-19 pandemic highlights digital transformation as both a safety measure and a customer experience enhancer, echoing observation that pandemic conditions catalyzed rapid technological shifts in hospitality to meet health and convenience demands. Stakeholders further linked digital innovation directly to improved customer loyalty, noting that personalized digital experiences and flawless system performance enhance perceived service quality, fostering repeat visits and positive word-of-mouth.

Despite these advantages, informants raised critical concerns aligned with recent literature on digital risks. Data security and privacy were recurrent themes, with fears of breaches undermining customer trust—issues echoed in work emphasizing transparency and compliance as vital for sustaining brand image in digitally intensive operations. Additionally, operational disruptions due to technology failures and high implementation costs reflect challenges documented, who argue that financial and logistical barriers remain key hurdles to full digital adoption.

Notably, participants expressed apprehension about the potential erosion of human touch, highlighting a tension between automation efficiency and the desire for personalized interpersonal interactions. The risk of alienating less tech-savvy customers and over-reliance on digital systems further illustrates the complex dynamics digital transformation introduces to service delivery.

To mitigate these risks, stakeholders emphasized robust cybersecurity measures, redundant systems, comprehensive staff training, and transparent communication during system failures. These strategies align with best practices advocated in recent research underscoring the importance of risk management frameworks and customer engagement to maintain trust and loyalty in digital environments.

Finally, digital transformation was broadly perceived as instrumental in enhancing brand image by signaling innovation and customer-centricity. This resonates who argue that digital capabilities contribute to dynamic brand identities that attract and retain customers. The stakeholders' forward-looking intentions to adopt advanced technologies such as AI and VR for personalized and immersive experiences reflect the ongoing evolution of digital strategies in hospitality aimed at strengthening competitive advantage. In summary, the qualitative phase corroborates and deepens understanding of digital transformation as a double-edged sword in restaurants—driving operational and experiential benefits while introducing risks that require proactive management. The findings advocate for a balanced approach that integrates technological innovation with human-centric service, risk mitigation, and strategic communication to maximize customer loyalty and brand equity in the digital era.

The study's findings highlight the necessity for a balanced strategy that integrates innovative digital tools with robust risk management practices. On the one hand, digital transformation offers significant benefits by enhancing operational efficiency, streamlining customer interactions, and creating a modern brand image. On the other hand, risks related to data security, technical disruptions, and the loss of personal touch pose serious challenges that must be proactively addressed. Restaurants are encouraged to invest in reliable technological infrastructures, implement stringent cybersecurity protocols, and maintain transparent communication with customers regarding data protection and operational contingencies (Dinev et al., 2015; Verhoef et al., 2017).

Conclusion and suggestions

This study examined the transformative impact of digital technologies on customer loyalty, risk perception, and brand image in the restaurant industry. Utilizing a mixed-methods approach, the research integrated quantitative data from 405 customers with qualitative insights from 12 industry stakeholders. The findings indicate that digital tools—such as digital menus, mobile applications, self-service kiosks, and contactless payments—significantly enhance operational efficiency and customer convenience. At the same time, these innovations introduce challenges, notably heightened perceived risks and diminished personal interaction, which may affect customer trust and overall satisfaction. The structural analysis confirmed that while digital transformation directly fosters customer loyalty, its benefits are mediated by an enhanced brand image and effective risk management. These results underscore the critical need for restaurants to adopt a balanced strategy: leveraging digital innovation while proactively addressing concerns related to data security, system reliability, and the human touch. In doing so, restaurants can not only elevate their competitive edge but also ensure long-term customer retention and satisfaction.

The findings of this study, while centered on Bangkok, offer broader implications for other prominent tourist destinations in Thailand that share similar socio-economic and tourism-driven characteristics, such as Chiang Mai, Hat Yai, and Koh Samui. These regions exhibit vibrant hospitality ecosystems and increasing levels of digital engagement, suggesting that insights into consumer behavior, digital adoption, and service innovation in Bangkok may be transferable to these locales. However, to enhance the generalizability and contextual depth of the research, future studies should expand the current scope by incorporating diverse geographic areas, including rural provinces and international destinations. Such expansion would help capture the effects of disparate digital infrastructures, local cultures, and consumer readiness levels. A longitudinal research design is recommended to trace the dynamic evolution of customer perceptions and technology adoption, especially in light of emerging innovations such as artificial intelligence, virtual reality, and augmented reality. Moreover, future research should broaden the conceptualization of risk by addressing not only consumer-related uncertainties but also operational disruptions, health concerns tied to shared digital devices, and psychological phenomena such as digital fatigue. The integration of qualitative methods, such as in-depth interviews and focus groups, would yield nuanced insights into the emotional and cognitive dimensions of digital interactions. Further, exploring brand image through the lenses of sustainability, ethical practices, and cultural authenticity may uncover deeper layers of consumer loyalty. Comparative studies across restaurant types (e.g., fine dining vs. casual dining) and cross-sector analyses with retail and hospitality industries would also help distill best practices and inform more context-sensitive digital strategies tailored to specific market segments.

New knowledge and the effects on society and communities

New knowledge emerging from this study reveals that digital transformation in the restaurant industry significantly enhances operational efficiency, customer satisfaction, and brand image through the adoption of digital tools such as digital menus, mobile applications, and contactless payment systems. At the same time, these advancements introduce challenges—including data privacy concerns and diminished personal interactions—that necessitate a balanced, human-centric approach. The effects of these technological changes extend beyond individual establishments to impact society and local communities. Locally, restaurants that integrate digital innovations contribute to economic growth and service quality

improvements, stimulating community vibrancy and fostering a culture of innovation. However, this shift also risks deepening the digital divide, as segments of the population with limited access or lower digital literacy may be left behind. Consequently, the study highlights the need for policies and strategies that promote inclusivity and mitigate potential negative impacts, ensuring that technological progress translates into sustainable development and broad-based benefits for society as a whole.

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The Project Evaluation of the Sustainable Economic and Social Enhancement: The Case Study of Wiang Mok Subdistrict Northern of Thailand

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Abstract

This research employed a mix-method. The purpose of the case study of Wiang Mok sub-district, Lampang province of Thailand was to: 1) Evaluation of the Subdistrict Economic and Social Upliftment and Sustainable Subdistrict Development Potential Promotion Project (CIPPI Model) 2) Analysis of Successes, Problems, and Obstacles in the Implementation of the Subdistrict Economic and Social Upliftment and Sustainable Subdistrict Development Potential Promotion Project (Case Study: Wiang Mok Subdistrict) 3) Formulating Policy Recommendations for Improvement. The population groups were community leaders and relevant government officials, and 200 people in Wiang Mok sub-district. The tools were recording synthesis documents, questions for Brainstorming, questions for intervicommunity student leadersate the project. The researcher analysed data using percentage, frequency, mean, standard deviation, and content. The research finding results were as follows: 1) The results of evaluating the sustainable Economic and social enhancement: the case study of Wiang Mok sub-district with CIPPI model were found to be greater than or equal to the criteria for all indicators. 2) The analysis of successes, problems, and obstacles revealed 5 factors significantly contributed to the project's success 3 primary problems or obstacles were encountered during implementation 3 sustainable development approaches emerged from the project. The model for solving poverty problems within the project incorporated 9 key factors 3) Based on these findings, 4 policy recommendations were formulated for future improvements.

Keywords: Evaluate, CIPP model, Social enhancing, Sustainable, Thailand

Introduction

The Coronavirus Disease 2019 (COVID-19) outbreak has caused global economic problem. Unemployed people and new graduates in Thailand are unable to find work. Furthermore, many unemployed people relocate, resulting in social problems. Thailand's economic and social rehabilitation policy, therefore, focus on economic recovery at the community level both job creation Community Career Development so that the community can be self-reliant according to the Sufficiency Economy Philosophy (Ministry of Higher Education, Science, Research and Innovation of Thailand (MHESI), 2020; Eko et al., 2021). It is a project that creates the future for 3,000 sub-districts across the country, including creating opportunities, generating income for student. The 60,000 employments are divided into 30,000 graduateswithin 3 years) 15,000 3rd year students, and 15,000 people (The Ministry of Higher Education, Science, Research and Innovation of Thailand (MHESI), 2020). The sustainable development of rural territories involves not only an increase in efficiency of the rural economy but, above all, increasing and improving the quality of life of the rural population, On a system of complementarities, the evaluation of the sustainability of livelihood strategies should take into account the economic, environmental, social and institutional factors. (Tretyakova & Larikova, 2012)

According to the Cabinet resolution on October 6, 2020, the Ministry of Higher Education, Science, Research and Innovation of Thailand (MHESI) has been approved by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation Implement. The integrated sub-district socio-economic upgraded project (University to Sub-district building a glass root for the country: U2T) aims to enhance the economy and society in each sub-district integrated with universities in the area with a system integrator, employment, economic and social rehabilitation by covering various issues according to the problems and needs of the community and the preparation of community big data. (Laothamatas, 2021)

The objectives of the project to elevate the economy and society at the sub-district level and promote sustainable sub-district development potential: a case study of Wiang Mok Sub-district 1)create a database of the sub-district (Community Data) to be used as data for analysis and decision making in solving problems with a clear goal, 2) raise the economic and social level of the sub-district by identifying issues and needs of the community, 3) integrate the project (System Integrator) of the sub-district by coordinating and working with local government organizations in implementing projects within the sub-district area, 4) integrate and support the various agencies that undertake projects within the sub-district in terms of knowledge, science, technology and innovation to enhance the economy and society of the sub-district, and 5) develop skills for project participants. “Employment according to various missions of the university for the general public, new graduates, and students” which project management guidelines are as follows; 1) implementing projects/activities in accordance with the forms of activities that will be carried out in the areas responsible for the project in the form of academic services (Higher Education 9 networks 9 (Regional System Integrator)), 2) appointing a committee to supervise, monitor, and evaluate projects. and integrate the operations of Higher education institutions under the responsible network, 3) Requesting the higher education institutions to take responsibility for the operation of each sub-district (System Integrator). The projectwas devided into 3 parts; 1) 20 employment rates per 1 sub-district, 2) implementing projects/activities in accordance with the activities that will be carried out in the area of responsibility, and 3) project management.

Wiang Mok sub-district is one of the target areas of the Sub-District's Economic and Social Uplift Project. It has an area of approximately 592 square kilometres or approximately

394,232 rai. The Wiang Mok municipality is mostly mountains, forests, and some plains fields with most areas in the national park area, wildlife sanctuary, and forest reserves. About the general climatic conditions, Wiang Mok is located in a tropical area with rather high temperature during the summer. The highest average temperature is 43.2 degrees Celsius between March-May, whereas the winter is quite cold. The lowest average temperature is 13.2 degrees Celsius during November - February and the rainy season with abundant rainfall. The average annual rainfall is about 1,075.60 mm. The average number of rainy days for the year is approximately 61.60 days. The tourist attraction is Mae Mok Reservoir, a large reservoir that could keep water for use throughout the year, especially at the end of the rainy season. It has beautiful scenery surrounded by strange and complex mountains where tourists can admire the atmosphere in all directions at the viewpoint over the reservoir and fishing rafts for tourists. Recently, the reservoir is still a fishing ground for villagers. However, it is still not widely known. Therefore it is necessary to develop tourism, environment, and professional development.

Wiang Mok Sub-District in Lampang Province, Northern Thailand, faces significant challenges including underdeveloped local raw materials and products, a growing elderly population, and environmental issues impacting community health. Recognizing these pressing needs, Lampang Rajabhat University's "College to the District: U2T" project selected Wiang Mok for local development. This initiative focuses on fostering lifelong learning activities to create new tourism-related careers, transfer knowledge to the community, promote environmental well-being, strengthen local networks, and unlock the community's full potential.

The project's success is evident in its effectiveness, efficiency, and organizational development, achieving its broader goals of building accountability and trust within the community. Given the lessons learned from past project management, including both successes and challenges, a comprehensive performance assessment is crucial. This assessment will summarize the project's achievements, provide vital feedback for operational improvements, and offer essential information to guide future policy-making.

The research objectives :

1) Evaluation of the subdistrict economic and social upliftment and sustainable subdistrict development potential promotion project (CIPPI Model).

2) Analysis of successes, problems and obstacles in the implementation of the subdistrict economic and social upliftment and sustainable subdistrict development potential promotion project (Case study: Wiang Mok Subdistrict).

3) Formulating Policy Recommendations for Improvement.

Methodology

This research employed a mixed-methods approach using the CIPPI model (Context-Input-Process-Product-Impact). This model, widely used and developed from Stufflebeam’s CIPP Model, was utilized to evaluate the project's performance across five dimensions throughout its duration. The objectives were: Context evaluation: To assess the project's context or environment. Input evaluation: To evaluate the readiness, sufficiency (quantity), and suitability (quality) of resources used in project implementation. Process evaluation: To assess the project's activities, examining the appropriateness of operations according to the plan, progress, strengths, weaknesses, problems, and obstacles. Product evaluation: To determine if the project's outputs achieved the planned objectives and goals. Impact evaluation: To assess the long-term effects resulting from the project's outputs, which may not have been explicitly defined in the project's objectives or goals (Padthayawad et al., 2020).

Population

Population included community leaders, relevant government officials, and 200 residents from Wiang Mok Subdistrict and farmers must have a house registration in Wiang Mok District, Lampang Province.

Tool of Research

The tools were recording synthesis documents, questions for Brainstorming, questions for intervicommunity student leadersate the project. The instruments and tool quality values as following.

Table 1 The research instruments and tool quality values

Target group	Tool used in research	Result and suggestion
1. 3 Experts for checking content validity (Target group) including experts on research and evaluation, Management of education, and Agricultural technology With 5 years of experience required.	1. Synthesis Record of the Evaluation Framework Documents	0.67≤ IOC≤1.00
	2. Questionnaire on the Quality of the Evaluation Framework	0.67≤ IOC≤1.00
	3. Brainstorming Session Record	0.67≤ IOC≤1.00
	4. Project Evaluation Questionnaire	0.67≤ IOC≤1.00 Reliability (Cronbach's Alpha)= 0.987
2. 30 non-target sample group from the general public	5. Project Evaluation Interview Form	0.67≤ IOC≤1.00
	6. Group Discussion Record on Development Approaches, Problems, and Policy Recommendations (AAR)	0.67≤ IOC≤1.00

Data analysis

The researcher analyzed the data using percentages, frequencies, means, standard deviations, and content analysis. The evaluation criteria used a 5-level rating scale based on Srisaad's research statistics (2013, p.121), defined as follows: Mean 4.51 - 5.00: Highest Mean 3.51 - 4.50: High Mean 2.51 - 3.50: Moderate Mean 1.51 - 2.50: Low Mean 1.00 - 1.50: Lowest Here's the translation: And uses content analysis from interviews and After Action Reviews (AARs).

Data collection

This section outlines the methodology for assessing the Wiang Mok project, focusing on how lessons learned and recommendations were derived, aligning with the research objectives. The assessment framework is built upon the CIPPI (Context, Input, Process, Product, Impact) assessment concept, which analyzes the relationships between inputs, processes, outputs, outcomes, and project impacts.

To ensure accuracy, the researchers employed multiple sources and data collection methods. The evaluation process was divided into four distinct phases:

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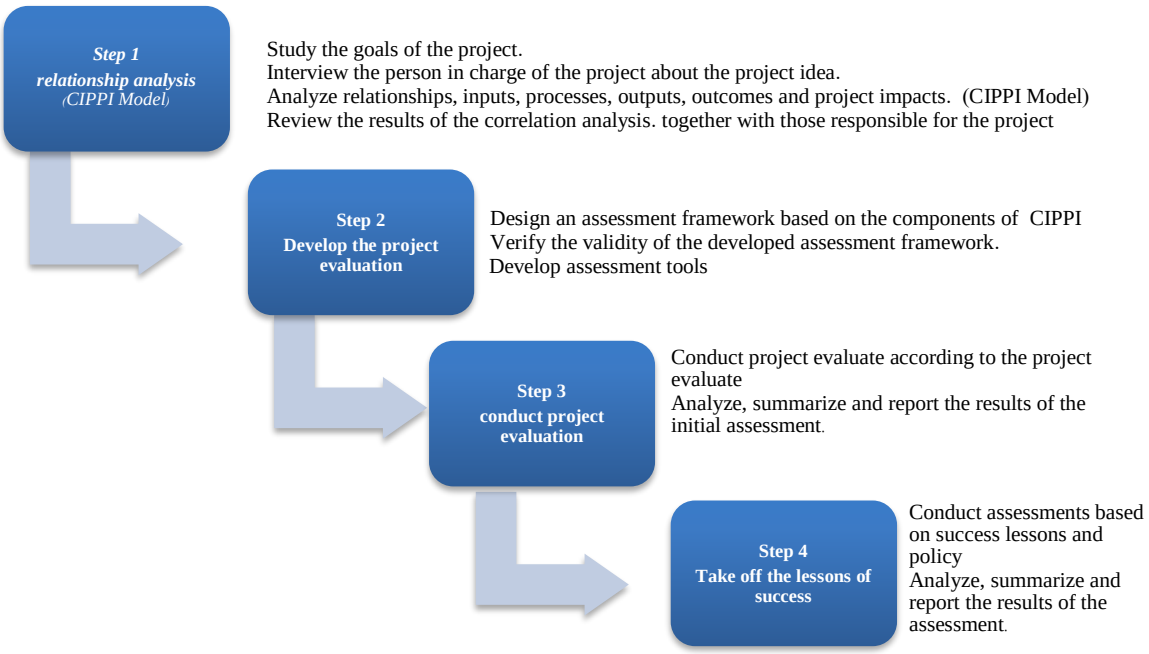

Figure 1 Assessment implementation procedures (Source : Researcher, 2024)

Phase 1 Analyze the relationships, inputs, processes, outputs, outcomes, and impacts of the project (CIPPI Model) of the project.

This phase focused on understanding the interconnectedness of project elements based on the CIPPI model.

1. Studying Project Goals: The initial step involved a thorough review of the project's objectives.
2. Synthesizing Theoretical Concepts: Theoretical concepts were integrated to develop a chart illustrating the relationships between project inputs, processes, outputs, outcomes, and their overall impact.
3. Checking Suitability of Relationship Structure: The research team, in collaboration with assessment project experts, critically reviewed the proposed relationship structure for:
   - Detail and Coherence: Ensuring each element was sufficiently detailed and clearly illustrated its relationship to others.
   - Completeness: Verifying that all components of the relationship structure were present.
   - Consistency and Connection: Confirming that all components were consistent and logically connected.
   - External Factors: Identifying and explaining the influence of any external factors.
4. Proposing to Project Stakeholders: The proposed project relationship structure was presented to project leads for their review and suitability assessment.
5. Refining and Guiding: The relationship structure was refined based on feedback and then used as a guiding framework for developing the assessment framework in the subsequent phase.

Phase 2 Developing the CIPPI-Based Assessment Framework

This phase focused on creating and refining the specific tools for assessment.

1. Drafting the Assessment Framework: An initial draft of the assessment framework was created based on the CIPPI components.
2. Expert Review: Experts reviewed the quality and appropriateness of the drafted assessment framework.
3. Quality Analysis and Improvement: The framework was refined and improved based on expert recommendations and a thorough quality analysis.

Resources Utilized:

- Project documents for "Project to raise the economy and society by sub-district and promote sustainable development potential of the sub-district: Case study of Wiang Mok Subdistrict."
- "Project Management Manual for Sub-District Economic and Social Upgrading and promoting Sustainable Development Potential in Sub-Districts."
- Data from JHCIS, TPMAP, AGRIMAP, and GISTDA.
- Clear identification of target groups (e.g., farmer groups, occupational groups, financial institutions, community savings groups, community enterprises).
- Engagement with local government organizations, social groups, community organizations, government agencies, and private sectors.
- Input from community developers, village heads, and local residents.

Phase 3 Conduct an assessment

This phase involved the practical application of the developed framework to collect and analyze data.

1. Data Sources**:** Information was gathered from community developers, village leaders, local residents, and relevant project documents**.**
2. Data Collection Tools**:** The tools used included document analysis record forms, questionnaires, interview forms, and field visit records**.**
3. Data Collection and Analysis Methods**:** Relevant documents were reviewed, and all project stakeholders were interviewed**.** Recordings from field visits were also utilized**.** The content from document studies, questionnaires, and interviews was then analyzed to compare the actual implementation of activities against the activities outlined in the project's operational relationship structure.

Phase 4 Deriving Lessons Learned and Recommendations

This crucial final phase specifically extracted insights from the Wiang Mok sub-district case study to inform future initiatives.

1. Data Sources for Lessons Learned: Key insights were gathered directly from community developers, village heads, and local residents, who provided first-hand accounts and perspectives.
2. Tools for Data Collection: After Action Review (AAR) record forms were specifically utilized to systematically capture reflections and insights.
3. Methods of Data Collection and Analysis: The primary method involved analyzing the data collected through the AAR process, allowing for the identification of successes, challenges, and areas for improvement. This structured analysis directly informed the lessons learned and subsequent recommendations for the sustainable economic and social enhancement of Wiang Mok sub-district

Results

This section presents the evaluation results of the sustainable economic and social enhancement project in Wiang Mok sub-district, analyzed using the CIPPI (Context, Input, Process, Product, Impact) model.

Context (C) The project's context demonstrated 100% consistency with its objectives, goals, and expected outcomes, aligning perfectly with relevant government policies and the project approval framework.

Input (I)The project exhibited cost-effective resource utilization, saving both money and time while successfully achieving its goals. Key inputs included:

- Four University-to-Sub-district Development Projects:
  - OTOP Product Upgrade
  - Creative Economy (Tourism Upgrading)
  - Circular Economy (Environmental Promotion)
  - Knowledge Transfer to Community
- Project Output Alignment: The resulting outputs aligned with project indicators set by the committee, specifically:
  - 200 target beneficiaries across all activities.
  - High success rate in implementing research projects as planned.
  - Agreement on project-based activities, including planning, venue, and public relations to inform villagers.
- 21 Jointly Developed Activities were successfully initiated.

Process (P)

The project's work plan, procedures, and processes were highly appropriate, enabling effective control and management. This resulted in project completion and output utilization faster than, or at least within, the targeted timeline. Key process achievements included:

- Alignment with Project Indicators: The project successfully linked and transferred knowledge from research to develop and promote various initiatives, achieving planned goals at a high level.
- High Participation Rates: There was a high percentage and level of involvement from people engaged in the project and planned development activities.

Product (P)

The project's implementation yielded significant productivity and impact across various levels, demonstrating goal achievement, positive outcome indicators, and the potential for sustained benefits.

- 100% Community Participation: Villagers showed full participation, engagement, collaborative thinking, and cooperation.
- 17 Outstanding Activities/Products: (Details in Tables 3-6)
- 4 Outstanding "Champions": Individuals developed through the four projects and 17 activities (Details in Tables 3-6).
- 100% Information Dissemination: People received accurate, complete, and timely information, including a 2019 Coronavirus Disease Surveillance and Prevention Survey and economic and social improvement updates.
- 2 Beneficial Business Groups Established:
  1. Community Enterprise, Saliam Wan Group (Earthworm Fertilizer): Focused on solving social and environmental problems.
  2. Good Mood Chicken Egg Group: Also aimed at addressing social and environmental issues.

- High Participant Satisfaction**:** Table 7 illustrates the high satisfaction levels among participants in activities, particularly within the OTOP product upgrade project**.**
- **"**Wiang Mok Model**"** for Poverty Alleviation**:** This model for solving poverty and resource mobilization within the sub**-**district comprises nine interconnected elements across three levels **(**government, community, and personal**):**
    1. Government Measures
    2. Community Guidelines
    3. Community Future Planning
    4. Community's Economic Strength
    5. Personal and Household Behaviors
    6. Creating Internal Motivation
    7. Increased Opportunities and Farmer Potential Development
    8. Modified Learning and Applied Implementation
    9. Improved Quality of Life and Social Services
- **(**Refer to Figure 2 for visual representation of the Wiang Mok Model**).**
- Establishment of Learning Resources**:** One learning resource and course on poverty alleviation, specifically **"**Feeding earthworms for composting vermicomposting,**"** emerged from outstanding stories and prominent individuals, gaining acceptance as a learning center**.**

Impact (I)

The project yielded policy recommendations for improving and developing future initiatives to enhance the economy and society and promote sustainable development in Wiang Mok sub**-**district**.** These recommendations include**:**

- Training Workshops for Local Leaders**:** Developing local community leaders to act as catalysts and coordinators for implementing government policies for sustainable community development**.**
- Fostering Local Ownership**:** Strategies to engage community members beyond mere participation, encouraging a strong sense of belonging and ownership in projects**.**
- Providing Training Support**:** Promoting and increasing the community's capacity to manage projects independently**.**
- Facilitating Funding Sources**:** Promoting and recommending local funding sources for project implementation, such as support from local government organizations, and measuring their success.

Table 2 Satisfaction of participants in the activities of each project (OTOP product upgrade project)

Activity	Satisfaction of people			Product/Output	People (Champions)
	Mean	S.D.	Level		
1. Soil and fertilizer management for sustainable peanut production	4.30	0.65	High	1. Herbal pork chili paste 2. Baking cake 3. Thai desserts	3 persons
2. Making Thai desserts to increase income	4.45	0.68	High		
3. Processing of peanut products increases income.	4.28	0.63	High		
4. Management and accounting for various professional groups	4.67	0.6	Highest		
5. Processing of herbal pork chili paste	4.29	0.67	High		
6. Baking cake without oven	4.55	0.53	High		
Total	**4.42**	**0.62**	**High**		

Table 3 Satisfaction of participants in the activities of each project (Projects to create and develop (Creative Economy) in the aspect of upgrading tourism)

Activity	Satisfaction of people			Product/Output	People (Champions)
	Mean	S.D.	Level		
1. Little guide	4.40	0.64	High	1 content that tells the story of Wiang Mok through social media with a single mobile 2. little guide	1 person
2. Creating content that tells the story of Wiang Mok through social media with a single mobile device.	4.39	0.62	High		
Total	**4.40**	**0.63**	**High**		

Table 4 Satisfaction of participants in the activities of each project (Environmental romotion Project (Circular Economy))

Activity	Satisfaction of people			Product/Output	People (Champions)
	Mean	S.D.	Level		
1. Making herbal mosquito repellents	4.48	0.70	High	1. Community Enterprise, Saliam Wan Group, Earthworm Fertilizer	8 persons
2. on training and campaigns to prevent dengue fever	4.33	0.70	High		
3. Anti-disease cooking with traditional herbs for the elderly	4.50	0.70	High		
4. Environmentally friendly household waste management	4.22	0.58	High		
5. Feeding earthworms with waste to make vermicomposting	4.39	0.6	High		
Total	**4.38**	**0.68**	**High**		

Table 5 Satisfaction of participants in the activities of each project (Projects to bring knowledge to help the community)

Activity	Satisfaction of people			Product/Output	People (Champions)
	Mean	S.D.	Level		
1. Feeding earthworms for composting vermicomposting	4.55	0.64	Highest	1. Group of chicken eggs in a good mood	3 persons
2. Household accounting	4.06	0.88	High		
3. Cultivation of mouse ear mushrooms, log mushrooms, wind mushrooms	4.32	0.57	High		
4. Raising good mood laying hens	4.65	0.58	Highest		
Total	**4.40**	**0.65**	**High**		

The project developed the "Wiang Mok Model" for solving poverty problems and managing resource mobilization within the sub-district. This comprehensive model, comprising nine interconnected elements, directly embodies the lessons learned and recommendations derived from the project's implementation. It offers a practical framework for sustainable development, addressing the research objective of providing explicit insights for future initiatives. The nine elements are:

- Government measures
- Community guidelines
- Community future planning
- Community's economic strength
- Personal and household behaviors
- Creating internal motivation
- Increasing opportunities and developing farmers' potential
- Modifying learning and applied implementation of methods and practices
- Improving the quality of life and social services

These nine elements are interconnected and operate across three distinct levels: governmental, community, and personal, providing a holistic approach that reflects the project's successful strategies and informs future sustainable development efforts.

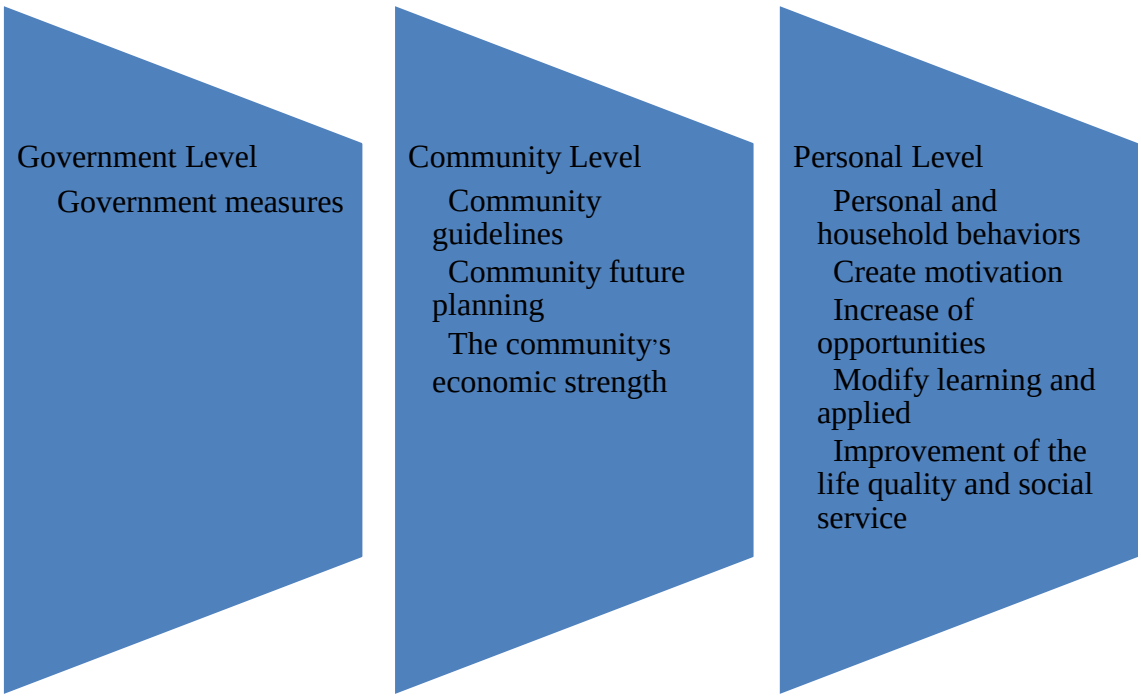

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Figure 2 The model on solving poverty problems and management and organizations within the sub-district to solve poverty problems (Resource mobilization)

Learning Resources and Centers

Based on outstanding stories and prominent local individuals, a learning resource and course on poverty alleviation was established and accepted as a community learning center. A notable example is the curriculum on feeding earthworms for composting (vermicomposting).
Project Impact: Policy Recommendations

The project yielded several key policy recommendations aimed at improving and developing future initiatives for economic and social enhancement and promoting sustainable development in Wiang Mok sub-district:

1. Local Community Leader Development: Implement training workshops to cultivate local community leaders who can serve as effective leaders and coordinators in translating government policies into sustainable community development.
2. Fostering Local Ownership: Develop strategies to engage community members more deeply, encouraging a sense of belonging that goes beyond mere participation.
3. Strengthening Community Capacity: Promote and enhance the community's ability to manage projects independently through targeted training and support.
4. Identifying Local Funding: Promote and recommend local sources of funding for project implementation, such as support from local government organizations, and establish methods to measure the success of these funding efforts.

Lessons Learned from Sustainable Economic and Social Enhancement
The project's implementation offered valuable insights into factors contributing to success and common challenges encountered, leading to practical lessons for sustainable development.

Factors Affecting Success:

- Consistent Meetings: Holding weekly meetings proved crucial for continuous improvement of operational plans.
- Participatory Process: Utilizing a participatory approach (joint thinking, shared action, shared responsibility) significantly fostered collective ownership and effectiveness.
- Empowering Villagers: Actively promoting leadership roles for villagers, with researchers serving as supporters, empowered local communities.
- Diverse Occupational Groups: The involvement of diverse occupational groups enriched the project's scope and impact.

Problems and Obstacles:

- Raw Material Prices: Fluctuations in raw material prices presented a challenge.
- Lack of Trust in Distribution: Some target groups hesitated to participate due to a lack of confidence in product distribution channels.
- Limited Digital Literacy: The target group's limited knowledge of Internet media resulted in missed opportunities for online product sales.

Sustainable Development Approach:

- Networking with Local Officials: Building and maintaining a strong network with local officials is essential for long-term collaboration and support.
- Sustained Support Programs: Implementing support programs that continue until beneficiaries secure stable careers and income ensures lasting impact.
- Technology Promotion: Educating and promoting the use of technology for communication and income generation is critical for future growth and opportunities.

Discussions

Wiang Mok Sub-District in Lampang Province, Northern Thailand, faces significant challenges including underdeveloped local raw materials and products, a growing elderly population, and environmental issues impacting community health. The evaluation of the sustainable economic and social enhancement project in Wiang Mok sub-district, meticulously conducted using the CIPPI (Context, Input, Process, Product, Impact model), provided profound insights into its effectiveness. This systematic application allowed for a granular assessment of the project's performance across its entire lifecycle, from its foundational alignment to its tangible and intangible outcomes. Here's the translated and slightly rephrased text for clarity and flow:

Context analysis revealed exceptional alignment, showing 100% consistency among the project's objectives, goals, expected results, and relevant government policies. This highlights a well-conceived initiative that was strategically positioned within the broader development agenda. This perfectly aligns with the CIPPI framework, which provides a comprehensive evaluation model. It covers everything from contextual analysis and resource preparation to process monitoring, initial outcome measurement, and long-term impact confirmation. This comprehensive approach ensures that policy decisions and project management are supported by more thorough and accurate information (Aziz et al., 2018).

In terms of Input, the project demonstrated remarkable resource efficiency, achieving its goals cost-effectively and within optimal timeframes. This efficiency in resource utilization underscored effective planning and diligent management. The Process proved to be robust and well-managed, facilitating timely completion and the swift utilization of project outputs. Such streamlined execution significantly contributed to the project's overall success. According to Stufflebeam (1971), “the CIPP approach is the view-based, the main purpose of the assessment is not to prove but to improve.” Based on the above quotation, the main purpose of CIPP is not to prove but to improve. The Product dimension showcased substantial and multifaceted

achievements. Critically, there was 100% participation, engagement, collaborative thinking, and cooperation from the local population because this model is designed for improvement and decision-making related to a course, program, or curriculum (Stufflebeam & Shinkfield, 1985). This exceptional level of community involvement is a testament to the project's relevance and the effectiveness of its engagement strategies. Furthermore, the project generated 17 activities that garnered a high level of satisfaction and fostered the emergence of "champions" among beneficiaries across the four main project initiatives. Two significant business groups, the Community Enterprise, Saliam Wan Group (Earthworm Fertilizer), and the Good Mood Chicken Egg Group, were successfully established, both specifically aimed at addressing local social and environmental challenges. The profound interest and enthusiastic cooperation from villagers in Wiang Mok, an area newly targeted for development by Rajabhat University, played a pivotal role in these positive outcomes. This strong community engagement resonates with the observations of Kibria et al. (2022) on the critical importance of modeling complex human well-being dimensions in marginalized communities, where local buy-in is paramount.

A particularly salient outcome was the development of the "Wiang Mok Model" for solving poverty problems and enhancing resource mobilization within the sub-district. This comprehensive model, which we will elaborate on, integrates nine interconnected elements across governmental, community, and personal levels. Its empirical derivation from a successful, real-world project underscores its practical utility. This framework's multi-layered approach to poverty alleviation aligns with established research. For instance, Kaewthip's "CMPAC MODEL" (2020) and Hanphichai's farmer poverty strategies (2020) offer valuable insights into poverty eradication, emphasizing the importance of internal motivation, learning modification, and community planning. Similarly, Rattanaphonwong et al. (2020) highlighted key variables in community poverty models, including government measures, personal behaviors, and community guidelines. These consistent findings across different studies underscore the multi-faceted nature of poverty and the need for integrated solutions, as also suggested by Tretyakova &Larikova (2012) on the holistic view of rural sustainable development, which must extend beyond mere economic efficiency to enhance the quality of life through complementary systems.

Conclusion and suggestions

The comprehensive evaluation of the sustainable economic and social enhancement project in Wiang Mok sub-district, rigorously conducted using the CIPPI model, affirmed its profound positive impact across all assessed dimensions. The project consistently met or exceeded established criteria for context alignment, efficient resource input, effective process management, and beneficial product outcomes.

A pivotal outcome of this project is the **"**Wiang Mok Model**"** for poverty alleviation and resource mobilization within the sub**-**district**.** This empirically derived model offers a holistic framework for community development, comprising nine interconnected elements**:**

1. Government Measures**:** Strategic support and policy alignment from governmental bodies**.**
2. Community Guidelines**:** Locally developed principles and norms for collective action**.**
3. Community Future Planning**:** Collaborative envisioning and strategizing for long**-**term development**.**
4. Community**'**s Economic Strength**:** Initiatives focused on building local economic resilience and prosperity**.**

5. Personal and Household Behaviors**:** Promoting positive individual and family practices contributing to well**-**being**.**
6. Creating Internal Motivation**:** Fostering intrinsic drive and enthusiasm among community members**.**
7. Increasing Opportunities and Development of Farmers' Potential**:** Enhancing skills and access to resources for agricultural advancement**.**
8. Modifying Learning and Applied Implementation**:** Encouraging adaptive learning and practical application of knowledge**.**
9. Improvement of the Life Quality and Social Service**:** Enhancing overall well**-**being and access to essential services**.**

These nine elements are intricately linked and operate synergistically across three distinct levels**:** governmental, community, and personal, highlighting the multi**-**layered approach required for sustainable development**.**

New knowledge and the effects on society and communities

This study contributes significant new knowledge to the field of sustainable economic and social enhancement, particularly within the context of grassroots community development in Thailand.

Novel Insights from CIPPI Model Application:

While the CIPPI model is a widely recognized framework for program evaluation, its application in this specific, multi-faceted, university-led community development project in Wiang Mok sub-district provides novel insights into its versatility and depth. This study showcases CIPPI's effectiveness not just for assessing large-scale programs, but for deeply understanding the nuanced interdependencies within localized, integrated development efforts. The model enabled us to precisely identify *how* the project achieved its success: from its cost-efficiency (Input) and high community participation (Process) to the successful establishment of new social enterprises (Product) and the generation of actionable policy recommendations (Impact). This granular analysis reveals that the CIPPI model can serve as a robust diagnostic tool, moving beyond merely confirming project success to articulating *why* and *how* such success was achieved across diverse interventions like OTOP upgrades, environmental initiatives, and knowledge transfer. This detailed understanding of the causal links within the CIPPI framework offers a valuable blueprint for future university-community partnerships aiming for holistic sustainable development.

The Outstanding Contribution of the Wiang Mok Model:

The "Wiang Mok Model" for poverty alleviation and resource mobilization stands as a significant new contribution, distinguishing itself from existing models of community development in Thailand. While prior studies, such as Kaewthip's "CMPAC MODEL" (2020) and Hanphichai's farmer poverty strategies (2020), offer valuable insights into specific aspects of poverty eradication, the Wiang Mok Model is unique due to its:

- Integrated Multi-Level Approach: It uniquely synthesizes elements from governmental policies, community-level actions, and individual behaviors into a cohesive framework, explicitly acknowledging their interconnections across three levels. This holistic view provides a more comprehensive and sustainable pathway to development.
- Empirical Validation and Practical Derivation: Unlike purely theoretical constructs, the Wiang Mok Model was directly derived from and validated through the successful implementation of a real-world community enhancement project, offering a practical and proven framework.

- Emphasis on Resource Mobilization: Beyond addressing symptoms of poverty, the model specifically emphasizes strategies for resource mobilization, which is fundamental for fostering genuine community self-reliance and long-term sustainability, a critical element for successful rural development (Tretyakova & Larikova, 2012).
- Contextual Relevance for Emerging Development Areas: As Wiang Mok was a "new area" for Rajabhat University's intervention, the model's success highlights its applicability in catalyzing engagement and building capacity in communities not previously extensively targeted by similar initiatives.

The demonstrated 100% community participation, the establishment of two successful social-environmental business groups, and the emergence of local "champions" underscore the practical efficacy of the Wiang Mok Model. It offers a validated, integrated, and actionable framework that can serve as a benchmark for sustainable economic and social enhancement in similar contexts across Thailand and potentially beyond, providing a clear pathway for communities to achieve lasting prosperity and well-being.

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Factors Affecting the Political Culture of First-Time Voters in the General Election of 2023 A.D. in Upper North of Thailand

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Abstract

This article revisits the traditional political culture framework established by Gabriel Almond and Sidney Verba, which has been a cornerstone in the study of political culture for over five decades. By incorporating both traditional approaches and the political culture frameworks developed by Ronald Inglehart, Terry Clark, and Vincent Hoffmann-Martinot, which examines political culture in the context of economic and social changes, which are factors influencing the new political culture. Specifically, this study examines how economic, social, and political factors influence the political culture of first-time voters in the upper north of Thailand during the 2023 general election. The study sample size of 400 first-time voters from three provinces—Lamphun, Phrae, and Mae Hong Son. Quantitative research methods, including inferential statistics and multiple linear regression analysis, were employed to analyze the data.

The findings reveal that social factors related to social media significantly influenced the political culture of first-time voters (β = .340). Economic factors, specifically the family's financial status, also played a significant role (β = .211), as did social factors concerning social trust (β = .139). However, economic factors such as state welfare and political factors, including political trust and the leadership of political leaders, were found to have no impact on the political culture of first-time voters in the upper north of Thailand.

Future research should incorporate sociological and psychological dimensions to examine the motivations and obstacles influencing political participation among voters and its effects on political culture. Additionally, employing mixed-methods research for deeper analysis, including comparative studies of political generations, would help assess the impact of economic, social, and political factors on political culture.

Keywords: Political culture, First-Time voters, General election 2023, Upper North of Thailand

Introduction

The study of political culture began with the seminal work of Almond &Verba (1963) in their book The Civic Culture: Political Attitudes and Democracy in Five Nations, which examined political culture in the United States, the United Kingdom, Germany, Italy, and Mexico. Almond and Verba categorized political culture into three types—parochial, subject, and participant—to explain the variations in individuals' political expressions. They identified key factors influencing these cultural differences, including beliefs, attitudes, political orientations, and political behavior. Political science widely regards this work as a foundational and highly influential contribution, laying the groundwork for subsequent studies on political culture.

The impact of Almond and Verba's research has driven the continued evolution of political culture studies. For instance, Sidney Verba (1965) described political culture as the integration of political systems into the beliefs and values of society. Lucian Pye (1968) further expanded the scope of political culture research to include ideals, norms, and historical political outputs.

From the literature review, it was found that the study of political culture in the late 1980s began to be challenged again by the research of Ronald Inglehart (1988; 1990; 2005), who studied political culture in the context of economic and social changes in Europe during the years 1973 – 1987. He discovered a significant main proposition: that economic and social changes might be influential variables that shape and lead to changes in political culture. The study of political culture within the framework proposed by Almond and Verba may not be able to comprehensively explain political culture due to changes in economic, social, and political contexts occurring in the modern world. Additionally, social changes have led to members of society having materialistic desires, the need for acceptance, self-esteem, higher education, as well as political experiences of both older and newer generations. There is a growing desire for political participation and an effort to question traditional governance, demanding more opportunities for political involvement, which can lead to changes in political culture.

Additionally, in the study by Terry Nichols Clark and Vincent Hoffmann-Martinot (1998), there are proposals consistent with Inglehart's work. The two scholars emphasized the importance of economic and social changes that lead to the emergence of new political cultures in various societies. Clark and Martinot explained that the study of new political culture in an era of economic and social changes is a factor influencing the new political culture. This study has broadened the scope of political culture research, providing a framework for examining political culture to understand changes brought about by economic, social, and political factors, leading to the emergence of new political cultures, similar to Inglehart's study.

In Thailand, economic and social changes over the past two to three decades have given rise to the "New Citizens" group, a politically influential generation with clear demands for structural reforms in society and governance. Emerging as a significant political force, particularly as first-time voters in the 2023 general election, these young individuals have been shaped by profound economic, social, political, and technological transformations. (Sathitniramai, 2023; Wongsatjachock, 2024) Their distinct attitudes, values, and political beliefs are deeply influenced by their digital upbringing, exposure to online platforms, and experiences of political conflict, including two military coups between 2014 and 2019. Unlike previous generations, their political understanding and expectations have evolved, driving them to actively engage in protests, leverage digital technology for political discourse, and push for systemic change. Their rise coincides with a politically charged environment marked by intense

debates and struggles leading up to the election, highlighting their aspirations to reshape society and the future. Additionally, their experiences with Thailand's economic development and social transformation have further influenced their worldview, setting them apart from older generations. (Lertchoosakul, 2021)

The First-Time Voters in the 2023 election serve as a crucial indicator of changes in Thailand's political culture. Having grown up in an era shaped by digital technology, economic and social shifts, and political conflicts from 2014 to 2019, this group exhibits values, attitudes, and political beliefs distinct from previous generations. This study aims to contribute new insights into Thai political culture, aligning with the evolving economic, social, and technological landscape.

This study proposes a new approach to examining Thai political culture through the concept of Political Generation**,** emphasizing that younger generations possess different values, thoughts, and political experiences compared to previous generations due to economic, social, and technological changes. Political, economics, society and technology transformations over the past two decades have led to the emergence of a group of "new citizens" who hold higher expectations of the government and advocate for structural changes. (Sathitniramai, Mukdawijitra, & Phawakran**,** 2013) Meanwhile, highlights that traditional frameworks for studying political culture are no longer sufficient to explain Thailand's current political landscape. (Sathitniramai, 2023)

The area in the upper northern region of Thailand consists of 8 provinces: Chiang Mai, Chiang Rai, Mae Hong Son, Phayao, Lampang, Lamphun, Phrae, and Nan. This area was chosen for the study because it has the highest Human Achievement Index in terms of participation in the country. It is also a region with diversity in various dimensions of the population, including economic, social, and political factors. The Human Achievement Index, as reported by the National Economic and Social Development Council for 2022, indicates that this area has the highest participation index in the country. The researcher selected these provinces for the study, with Lamphun showing a very high level of participation, Phrae showing a high level, and Mae Hong Son showing a moderate level. Provinces with a high Human Achievement Index in terms of participation include Phrae, while Mae Hong Son has a moderate level of participation.

The main argument of this article is the debate on whether economic, social, and political factors influence the political culture of first-time voters in the general election of 2023, and whether these factors can lead to a transformation of Thai political culture into a new political culture. Previous explanations or studies of Thai political culture may no longer be able to understand the present context, and this research may lead to new explanations or understandings of Thai political culture arising from economic, social, and political changes. These changes affect the adaptation of important political institutions, such as political parties, or the policies of political parties that may need to adjust their policies to gain more votes from this group in the future under the context of economic, social, and political changes in Thailand.

Therefore, this article presents the influence of economic, social, and political factors on the political culture of first-time voters in the 2023 general election in the context of Upper Northern Thailand. Additionally, this new study on political culture has not been previously documented or researched. Over the past five decades, research on Thai political culture has continued to rely on the conceptual framework of Almond and Verba, revealing variations in political culture across different target groups. However, it has lacked a connection to changes in economic, social, and political contexts, which significantly influence individual attitudes, values, and needs. Therefore, this study aims to expand knowledge for a more comprehensive understanding of political culture by incorporating new conceptual approaches to systematically enhance the understanding of political culture in Thailand. It aims to expand knowledge about first-time voters, who represent a new generation that will play a significant

role in Thailand's future politics. Furthermore, this study may clarify whether Thailand's political culture is trending toward a new direction and whether economic, social, and political factors influence the political culture of the new generation, especially among first-time voters. This group may determine the future direction of Thai politics, a topic that has not been studied in-depth in Thailand, contributing to the development of Thailand's political landscape in the future.

Research Objective

The objective of the research aims to study the influence of economic, social, and political factors on the political culture of first-time voters in the general election of 2023 in the upper north of Thailand.

Literature Review

Background Political Culture Theory

The study of political science in the 1960s and 1970s increasingly focused on behavioral approaches, particularly the expansion of democratic regimes and the development of political systems worldwide. This included research on democracy, political development, political institutions, and political culture. Almond & Verba (1963) published The Civic Culture: Political Attitudes and Democracy in Five Nations, a seminal work that examined political systems, governance, and political participation across societies. Their study aimed to understand individuals' attitudes, beliefs, political preferences, ideologies, and inclinations, identifying patterns to explain political culture across different societies. This work became a foundational contribution to the study of political culture in early political science. The study found that individuals' beliefs, attitudes, and political expressions shape political culture and significantly impact the development of democracy in their respective countries.

Almond & Verba (1963) divided political culture into three main types: Parochial Political Culture, which is found in traditional societies where people lack knowledge and understanding of politics, show little interest or participation in the political process, and are often influenced by traditional structures such as local leaders or religion; Subject Political Culture, found in societies where people understand the political system and government policies but lack enthusiasm for political participation. Although they recognize the role of the state and accept the government's authority, most people feel they have little influence over political decisions; and Participant Political Culture, found in societies with political and economic development, where people are educated about politics, aware of their roles in the democratic process, and eager to participate in activities such as elections, government criticism, or political movements.

Additionally, Almond and Verba proposed that no society possesses a single, pure form of political culture; instead, societies exhibit a mix of different types at varying levels, a concept they refer to as mixed political culture. For example, a society with a predominantly parochial political culture may begin to develop characteristics of a subject political culture, while a society with a subject political culture may have groups of people displaying traits of a participant political culture. This concept highlights how social, economic, and political changes influence people's behaviors and attitudes, making political culture diverse and dynamic depending on the context of each society.

The challenge to traditional political culture studies, as seen in Inglehart's numerous writings—including The Silent Revolution (1977), The Renaissance of Political Culture (1988), and Culture Shift in Advanced Industrial Society (1990)—reflects an effort to explain the economic, technological, and political changes that have led to the emergence of industrial societies. The cultural transformation accompanying the shift toward advanced industrial society is particularly significant. Inglehart proposed that changes in economic and social

contexts, driven by high levels of economic development and the rise of advanced industrial and democratic societies, may lead to transformations in political culture. These shifts result in generational differences in value systems, where younger generations develop distinct political orientations compared to their predecessors. In advanced industrial societies, these generational shifts inevitably reshape political culture. Furthermore, Inglehart emphasized that as younger generations replace older ones, their evolving political values will play a crucial role in shaping the future of political society.

In 1998, Clack and Martinot (1998) conducted a study on the New Political Culture to establish a conceptual framework for understanding how economic, social, and political changes influence political culture. They sought to explain the factors contributing to the formation of this new political culture and found that, in advanced industrial societies in the Western world, political culture had undergone significant transformations. Clack and Martinot proposed a framework for analyzing these changes, offering insights into the evolution of political culture in response to modern societal developments.

Economic Factors and Political Culture

The study of political culture is linked to the economic development of a country, which will lead to the development of democracy. Political scientists such as Inglehart (1990) and Putnam (1993; 1995), who were prominent in the 1980s, pointed out that economic development affects political culture and can lead to the development of democracy. This is not only because the people in the country will have a better quality of life, but it also results in changes in political culture. Particularly, Putnam emphasized issues related to social capital.

Public welfare is one of the key factors that influence the creation and shaping of political culture. Providing comprehensive and quality welfare services helps build confidence in the government and fosters trust in the political system. When the state can offer fair and inclusive welfare, such as education, health care, and economic security, it contributes to a positive public perception of government performance, which in turn affects political participation and support (Rothstein, 1998; Hetherington, 2005).

The financial status of a family plays a crucial role in shaping political attitudes and behaviors, as it affects access to educational opportunities, political knowledge, and political participation. Families with stable financial status often encourage their members to be aware of their rights and responsibilities, leading to higher political participation (Verba, Schlozman, & Brady, 1995).

While families in poverty often lack access to resources, resulting in a political culture characterized by apathy and distrust in the political system (Dalton, 2004). Additionally, a family's financial status affects social trust and democratic attitudes, with individuals from financially stable families often having more confidence in the political system. This helps to foster a political culture that supports democracy (Inglehart & Welzel, 2005). This concept is also supported by the study of Clack and Martinot (1998), which proposed that political culture is a result of economic changes.

Social Factors and Political Culture

Social trust is a crucial factor that influences political culture and the stability of democratic regimes. It refers to the level of confidence individuals have in each other and in society, which helps promote cooperation and reduce conflicts within the community (Putnam, 2000; Newton, 2007). Soltz and Lubell (1998, as cited in Kanjanakij, 2002) categorize social trust into three levels: interpersonal trust, community trust, and trust in modern society. This aligns with the work of Almond & Verba (1963), who pointed out that interpersonal trust is a crucial condition for forming political associations and effective political participation. Meanwhile, Inglehart (1988) noted that trust in political institutions and leaders is a secondary factor compared to interpersonal trust in creating the stability of democracy. Additionally, Putnam (2001) and Seligson (2002) proposed that social trust directly affects social capital and

citizen participation, which are related to the development of democracy at the macro level. Therefore, social trust is considered a fundamental foundation that helps strengthen political culture and supports political development in a democratic regime (Putnam, 1995).

Social media has become an important tool in creating and transforming political culture by providing opportunities for the public to access information and participate in political debates on a broader scale. This has resulted in a more democratic and open political culture (Loader et al., 2014). Economic and social changes in societies that develop economically and politically have increased the use of social media in politics, which influences political behavior and the transformation of political culture (Shirky, 2011). the youth in Thailand are increasingly using social media to gather information and engage in political activities. explained that first-time voters use social media to access political information, which influences their political decisions and participation in various forms of political engagement (Pankaew, 2019).

Political Factors and Political Culture

Political trust refers to the level of confidence that the public has in political institutions and government leaders, which affects the stability of democracy and public participation in political activities such as elections and support for state policies (Hetherington, 2005; Levi & Stoker, 2000; Norris, 2011). This trust is a crucial factor that helps reduce political conflict, as when the public feels that the government is transparent and capable of governing the country, they are more likely to support the political system (Chanley, Rudolph & Rahn, 2000; Dalton, 2004). However, the decline in political trust may lead to protests, government opposition, and non-participation in political activities, which pose a challenge to the stability of the democratic system (Inglehart & Welzel, 2005; Dalton & Welzel, 2014).

Moreover, political trust is linked to political culture, which encompasses the attitudes and behaviors of the public towards the political system (Newton, 1997; Norris, 1999). This level of trust reflects the public's assessment of the government's efficiency and integrity, as well as external factors such as the economic situation and corruption issues (Miller, Goldenberg & Erbring, 1979). The decline in trust in the government may lead the public to turn to other means of participation, such as political movements through online media (Dalton & Welzel, 2014). Therefore, building and maintaining political trust is crucial for the stability of democracy and public participation in the political system (Hetherington, 2005; Norris, 2011).

Political leadership is the ability of a leader to successfully carry out political actions, requiring acceptance and trust from the people. This differs from general leadership, which may not need the same level of public acceptance. Political leaders can coordinate political values and influence the sentiments of the people, which requires an understanding of the people's values and the ability to build trust in the leader (Sukontharangsri, 1973).

Additionally, Mohammed (2007) conducted a study on Leadership and Political Culture: A Brief Look at the Malaysian Political Landscape. The study found that changes in political leadership affect public trust. Various factors, such as the leader's personality and behavior, influence the creation of political culture in each era, which can stimulate trust or distrust in the political system.

The study of political culture focuses on the attitudes, values, and political behaviors of the people. Several studies have been influenced by the work of Almond and Verba in explaining political culture in Thailand (Almond & Verba, 1963). However, recent studies have proposed that economic, social, and political factors are crucial in shaping a new political culture. Ronald Inglehart's work (1988, 1990, 2005) found that economic and social changes in Europe have influenced the transformation of political culture. Additionally, Clark and Martinot emphasized the economic and social changes that affect the development of political

culture in modern times, expanding the scope of political culture studies to include the analysis of external factors influencing these changes (Clark & Martinot, 1998).

Therefore, in this research article study, the economic, social, and political factors will be used as independent variables to serve as a framework for studying the new political culture as the dependent variable.

Hypothesis

Economic, social, and political factors affecting the political culture of first-time voters in the general election of 2023 in upper north of Thailand.

Methodology

Population

This research article focuses on the population of first-time voters in the general election of 2023, held on May 14, 2023, in the upper northern region of Thailand. This region consists of eight provinces: Chiang Rai, Chiang Mai, Mae Hong Son, Lamphun, Lampang, Phayao, Phrae, and Nan. The criteria for selecting the sample group were based on the Human Achievement Index (HAI), a significant social data set for Thailand that presents human progress along with analysis and evaluation at the national, regional, and provincial levels. Specifically, the study considered the HAI index related to participation in these 8 provinces, as reported by the National Economic and Social Development Council for the year 2022.

When the researcher considered the human progress index in terms of participation specifically in 8 northern provinces in 2022, along with the number of first-time voters, they then selected provinces based on the grouping of the human achievement index in terms of participation. After that, researcher chose from provinces with a similar number of first-time voters and the context of the area from the general election in 2023, thus selecting the following areas.

1) Areas with a very high human achievement index (HAI) in terms of participation include Lamphun Province.

2) Areas with a high human achievement index (HAI) in terms of participation include Phrae Province.

3) Areas with a moderate human achievement index (HAI) in terms of participation include Mae Hong Son Province.

The population of first-time voters is defined as individuals who are registered in the household registry of Lamphun, Phrae, and Mae Hong Son. Additionally, individuals who have relocated to these provinces must have been registered in the household registry for a minimum of 90 days.

Sampling Methods

The researcher determined the sample size using Taro Yamane's formula, (Yamane, 1973) ensuring a 95% confidence level and a .05 margin of error. Quota Sampling was employed to select a proportionate sample based on the population distribution in each province. After calculating the sample size, the researcher compiled lists of first-time voters, researcher obtained the area for sampling, the researcher proceeded to determine the sample size categorized by province, specifically Lamphun Province, Phrae Province, and Mae Hong Son Province, to achieve the specified sample size. The researcher calculated the sample size of first-time voters in proportion to each province, resulting in a total sample size of 400 sampling. (see Table 1)

Table 1 Sample Selection Details

Province	HAI	Populations	Calculation Method	Calculated Value	Sample Size
Lamphun	very high	18,358	$n = \frac{18,358 \times 398}{58,317}$	125.29	126
Phare	high	21,319	$n = \frac{21,319 \times 398}{58,317}$	145.50	146
Mae Hong Son	moderate	18,640	$n = \frac{18,640 \times 398}{58,317}$	127.21	128
Total Population		**58,317**	**Total Sample**		**400**

(**Source:** Office of Registration Administration, Department of Provincial Administration, 2022)

The researcher has calculated the sample size. The researcher used probability sampling to determine the likelihood of each sample unit being selected, ensuring that each unit in the population has a chance of being chosen. This method of sample selection allows the results to be generalized to the population. The technique for sampling groups using the multi-stage sampling method begins with clustering, which can divide a large population that does not reside in the same area. (Suksawas, 2021)

Research Tool

The instruments utilized in this study consist of questionnaires developed by the researcher, derived from a thorough review of pertinent documents and research studies. These questionnaires comprehensively address the study's objectives and relevant issues. Structured into three parts aligned with the study's objectives, Part 1 The questionnaire will include personal information of the respondents. Closed-ended, Part 2 questionnaire on factors influencing the political culture of first-time voters in the general election of 2023. Closed-ended, Part 3 questionnaire on the political culture of first-time voters in the 2023 general election. Closed-ended, the researcher has formulated multiple-choice questions on specific topics using a rating scale based on the Likert's Scale. Validity testing the researcher took the completed questionnaire and presented it to experts to assign weights to each aspect of the questionnaire. Content Validity Check the consistency of the content with the objectives and the appropriateness of the language. Construct Validity The researcher used a questionnaire that had passed the validity test and adjusted the questions according to the experts' suggestions, then conducted a tryout with a group of 53 samples who part of the study sample were not. The reliability of the questionnaire was analyzed using SPSS Statistic Version 29.0 by calculating the alpha coefficient from Cronbach's Alpha, which used questions measuring feelings or attitudes. The test results showed a reliability value of 0.943, which is considered to be above 0.70, indicating high reliability and suitability for data collection.

Data Collection

Data collection for research from a sample group in the area designated by the researcher is an important step in conducting research. The researcher will request information from the provincial election commission, obtained through random sampling, to acquire the names of voters who participated in the first election of members of the House of Representatives in the general election of 2023. The sampling process will ensure that every unit has an equal chance of being selected as a representative of the population until a total of 400 individuals is reached. The researcher has already completed the sampling at the district and sub-district levels and has used the data of eligible voters from the provincial election commission to randomly select the sample group, ensuring the data is accurate and reliable, until a total of 400 sets is completed.

This research was approved by the Human Research Ethics Committee of Naresuan University, IRB No. P2-0028/2567, on March 5, 2024

Data Analysis

Data analysis in research studies Once the researchers have completed data collection, they check the completeness of the questionnaires after data collection and conduct a data review. Code the data and analyze the statistical data using a ready-made program for statistical data analysis for social sciences, or IBM SPSS Statistics version 29.0 (IBM Corp, 2023). REF ID: TH-03-0224

The use of inferential statistics to analyze the influence of economic, social, and political factors on political culture. By using Multiple Linear Regression Analysis to find the multiple regression coefficients and Pearson Correlation.

Basic Assumption test

Normal distribution test the researcher conducted the Kolmogorov- Smirnov and Shapiro-Wilk tests, with the test results showing a significance level or Sig. = <.001, which is less than .05, indicating that the sample variables have a non- normal distribution. The researcher conducted tests for skewness and kurtosis before hypothesis testing of the questions from the data collection and the variables used in the hypothesis testing. It was found that the skewness and kurtosis values from the tests did not exceed -2 and +2, indicating that they were not significantly skewed or kurtotic at the .05 level. Therefore, these values can be used in inferential statistical tests for multiple linear regression analysis. (Cramer, 1997; Kline, 2016) and Geoff Norman (2010), it is explained that parametric statistical analysis can be used for testing in cases where the data have unequal variances, and the data distribution is not normal. The test regarding the problem of Multicollinearity, which affects the estimation of regression coefficients, found that the Tolerance values ranged from 0.196 to 0.556, which are greater than 0, and the results of the Variance Inflation Factor (VIF) test ranged from 1.797 to 5.113, which are less than 10. It can be explained that the Tolerance test results are greater than 0 and the Variance Inflation Factor (VIF) values are less than 10, indicating that all independent variables have low correlations with other independent variables. Therefore, it can be concluded that all independent variables are independent of each other and there is no Multicollinearity problem. They can be used for inferential statistical testing in Multiple Linear Regression analysis.

Results

General Characteristics of the Sample Group

The analysis of general data from respondents who are first-time voters in the general election of 2023 can be summarized as follows: Most respondents are female and 20 years old, primarily pursuing a bachelor's degree in higher education institutions. During their studies, they do not engage in employment or work. The highest educational qualification most have attained is high school/Vocational Certificate. They practice Buddhism, are single, and most families have 4-6 members. They have lived in the electoral district for 16-20 years. In terms of income, since most are still studying, they receive less than 3,000 baht per month from parents or work. Most families have a household income of 10,000-20,000 baht and have expenses exceeding their income each month. Additionally, in terms of political information tracking through social media, most primarily use Facebook and spend 1-2 hours per day on it.

Testing Research Hypothesis 1: Economic factors, social factors, and political factors influence the political culture of first-time voters in the general election of 2023 in the upper north of Thailand. This can be formulated into a statistical hypothesis as follows:

H_0 = Economic factors, social factors, and political factors do not influence the political culture of first-time voters in the general election of 2023 in the upper north of Thailand.

H_1 = Economic factors, social factors, and political factors influence the political culture of first-time voters in the 2023 general election in the upper north of Thailand.

The statistics used for hypothesis testing is Multiple Regression Analysis, where independent variables are entered into the regression equation using the Enter method. A confidence level of 95% is used, so the null hypothesis (H_0) will be rejected only if the obtained Sig. value is less than .05, as shown in the following table 2

Table 2 Results of the multiple regression analysis with political culture

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	53238.843	6	8873.141	22.883**	.001[b]
Residual	152389.997	393	387.761		
Total	205628.840	399			

*p < .05, **p < .01

From Table 2, it can be explained that political culture has a statistically significant linear relationship with the independent variables at the .05 level and can create a linear prediction equation. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. From the multiple regression calculation, the multiple correlation coefficient can be computed. as shown in the following table 3

Table 3 The results of the Multiple Linear Regression Analysis in forecasting the relationship between economic factors, social factors, and political factors (X_1-X_6) and the political culture of first-time voters in 2023 in the upper north of Thailand (Y)

Variables	Beta	Std. Error	β	t	Sig.
Constant	2.293	5.161		.444	.657
EONWL (X_1)	-.428	.261	-.112	-1.636	.103
ECONFS (X_2)	1.153	.359	.211	3.214**	.001
SOCTRS (X_3)	.604	.282	.139	2.142*	.033
SOCMDA (X_4)	1.481	.254	.340	5.838**	<.001
POLTRS (X_5)	.021	.239	.009	.089	.929
POLLED (X_6)	-.273	.297	-.079	-.919	.359

Multiple R = .509[a] R Square = .259
Adjusted R Square= .248 Std. Error = 19.69164
*p < .05, **p < .01

From Table 3, can be explained in the following order.

1) The social factor in social media has the highest coefficient (β = .340, t = 5.838) and a p-value less than .001, indicating that this variable has a significant influence and is a crucial factor with a significantly positive impact on the political culture outcomes of the studied population group, ranking first.

2) The economic factor regarding the financial status of the family has a coefficient (β = .211, t = 3.214) and a p-value of .001, indicating a statistically significant positive relationship with the dependent variable. The increase in the family's financial status leads to a significant change in the political culture of the studied population group as the second order.

3) The social factor of social trust has a coefficient (β = .139, t = 2.142) and a p-value of .033, which is statistically significant at the .05 level. This indicates a positive relationship between social trust and significant changes in the political culture of the studied population, ranking third.

It was found that various factors influence the political culture of first-time voters in the 2023 general election in the upper northern region, with a predictive power of 25.9% (R^2 = .259) affecting the political culture.

The analyzing data from multiple linear regression between economic factors, social factors, and political factors on the political culture of first-time voters in 2023 in the upper northern region, influential factors and sub-variables influencing political culture will be found, as shown in Figure 1.

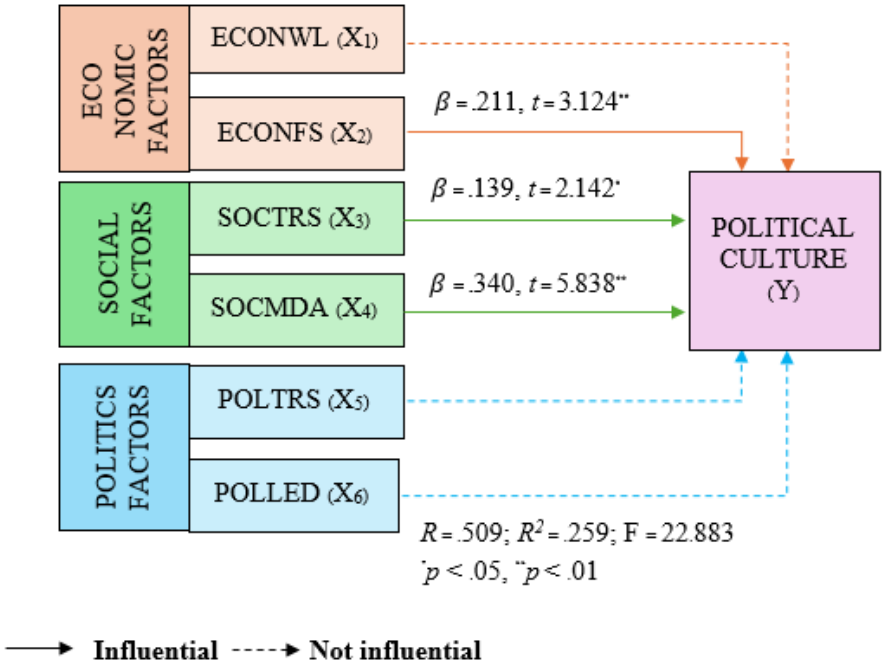

Figure 1 Factors impacting the political culture of first-time voters in the 2023 elections in the upper north of Thailand (Source: Researcher, 2025)

From Figure 1, it is found that when considering the regression coefficients of the independent variables, the social factor in the online social media variable (X_4) can predict the relationship with the political culture of first-time voters in the 2023 general election in the upper northern region at the highest level. The statistical significance level is (Sig.) = < .001, with a regression coefficient in raw score (Beta) equal to 1.481 and a value of = .340, indicating a positive relationship.

Social media significantly influences political culture by shaping public opinion, promoting political participation, and serving as a primary channel for disseminating information. It enables users to express their opinions and engage with diverse viewpoints, thereby increasing political participation, particularly among first-time voters in the upper northern region, who rely on social media as their main source of news and platform for political expression. Additionally, research has found that social media serves as a space where

young people engage in discussions, exchange opinions, mobilize politically, and encourage participation in the democratic process. (Sawadee & Damjan, 2024), which indicates that young people, regardless of their economic status, use social media to express their political views in various ways. As a result, the younger generation has experienced shifts in political attitudes and beliefs, demonstrating greater confidence in their political rights and a decreased tendency to adhere to the political ideologies of previous generations.

The next factor is the economic aspect, specifically the family's financial status variable (X_2), which has a statistical significance level of (Sig.) <.001, with a regression coefficient in raw score (Beta) equal to 1.153 and a value of = .211.

The financial status of a family significantly influences not only access to education and political information but also shapes political attitudes and behaviors. Verba, Schlozman, and Brady (1995) found that economic resources, such as income and financial stability, along with social resources like education and social networks, play a crucial role in political participation, with individuals from wealthier backgrounds having greater access to political information and engagement. Similarly, Schoon & Cheng (2011) highlighted that financial stability impacts political trust, as those with economic security tend to have higher confidence in the political system, while those facing financial difficulties are more likely to distrust it. Economic conditions also contribute to variations in political culture, with wealthier individuals more likely to support and participate in political activities, whereas lower-income groups may hold negative perceptions of the political system and engage less. Additionally, Inglehart (2005) emphasized that economic status influences life satisfaction, which in turn affects political culture.

Additionally, social factors were found in the variable of social trust (X_3), which had a statistical significance level (Sig.) of .033, a regression coefficient in raw scores (Beta) of 0.604, and a value of .139, respectively.

Social trust is an important factor influencing political culture. Trust between individuals helps build relationships and cooperation in society, leading to increased political participation and strengthening democracy (Putnam, 2000; Newton, 1997). High levels of social trust contribute to stability and security in the political system and enhance citizens' involvement in expressing opinions and political action. It also impacts trust in political institutions and politicians, making the public more willing to support changes that promote democracy (Rothstein & Stolle, 2008).

Summary of Hypothesis Testing Results: Economic, social, and political factors have a significant impact on political culture, with statistical significance at the 0.01 level.

Discussions

The study of the impact of family financial status on changes in political culture reveals that family financial status significantly influences political awareness and participation. The research findings show that families with stable financial status tend to place more importance on political participation and have greater confidence in political processes compared to families with unstable financial status. This results in differences in interest and political involvement among individuals from different groups, such as support for democracy and changes in political systems (Dalton, 2004; Verba et al., 1995).

The research also finds that differences in family financial status affect political awareness and participation. Families with better financial status are more likely to support the political system and engage more in political processes, while families with poor financial status often feel excluded and voiceless in political matters, which may lead to disengagement and apathy toward politics (Mair, 2013; Lipset, 1959). similarly discuss the impact of economic structural factors, life satisfaction, and the emergence of younger generations. They highlight

that economic status, whether affluent or impoverished, significantly influences the change in the political ideas, attitudes, beliefs, values, access to political information, political expression, and political participation of these populations, ultimately leading to a change in political culture that characterizes this group. (Chandoevwit & Suriyanrattakorn, 2022; Sawasdee & Damchan, 2024)

The changes in economic structure over the past few decades, including the emergence of industry and the growth of the service economy, have created economic disparities that impact politics. This is particularly true in countries with high economic inequality, such as Thailand, leading to a decline in trust in political systems and reduced political participation. As people gain more education and economic stability, they tend to place more importance on their rights and freedoms, increasingly demanding participation in democratic processes, which contributes to strengthening democracy and positively impacts changes in political culture (Inglehart, 1998; Stiglitz, 2012). When people achieve greater economic stability, they are more likely to value their rights and political participation, thus fostering democratic processes and contributing to the evolution of political culture (Inglehart & Welzel, 2005; Fukuyama, 1995).

Social structure plays a crucial role in the transformation of political culture, particularly among first-time voters who grew up during periods of social change. Social media has a significant influence on the political attitudes and values of this group, helping to stimulate political participation and social movements (Inglehart & Welzel, 2005). Research findings align with those of Kanokrat Leartchusukul (2021), who presents that social media has a high influence on the political culture of first-time voters in northern Thailand. Access to information and the expression of political opinions via social media affect the openness of political views and the transformation of political attitudes (Tufekci & Wilson, 2012; Boulianne, 2015). The development of digital technology and the expansion of social media contribute to enhancing political participation and movements on important issues (Sawasdee & Damjan, 2024).

Social trust plays a crucial role in the formation and transformation of political culture, especially among first-time voters. Trust in society helps create a sense of stability and justice, which boosts people's confidence and encourages them to participate more in political activities (Brehm & Rahn, 1997). Additionally, social trust strengthens political participation and social movements, particularly among youth (Putnam, 2000; Newton, 2001). When individuals trust that others will follow societal rules, it fosters cooperation and collaboration within society, contributing to the stability and strength of democracy (Zmerli & Newton, 2008). In the context of social and economic changes in Northern Thailand, the emerging political culture has been influenced by social trust and social interactions through social media, which drives increased political participation and responsibility among first-time voters (Tufekci & Wilson, 2012; Boulianne, 2015).

Conversely, economic and social structures with inequalities hinder some groups from participating in political processes, leading to an authoritarian political culture that is not conducive to democratic change (Inglehart, 1997). Economic and educational disparities are key factors that make some people feel unfit for political participation (Newton, 2001). At the same time, the Thai political system, which still has hierarchical and patronage-based structures, leads citizens to believe that those with higher status should govern the country (Putnam, 2000). Therefore, changes in economic and social structures are necessary to promote democracy and political participation in Thailand (Zmerli & Newton, 2008).

This study emphasizes that economic factors, particularly the financial status of households, influence political culture. Economic disparities, especially among different socioeconomic groups, significantly impact the political culture of the studied population. Structural economic differences highlight that family financial status plays a key role in

shaping political attitudes and participation, especially among young people. For this group, economic inequality limits opportunities for full participation in the democratic system, aligning with Western research that shows a decline in democratic support when people perceive economic conditions as unjust. Those from lower socioeconomic backgrounds often feel voiceless in political systems, leading to disengagement or reduced support for democracy, thus shaping the political culture within society.

The impact of social media on political attitudes is significant, as access to diverse political information through online platforms encourages citizens to adopt more open political views and respond to rapid changes. The dissemination of critical information and political communication can occur freely, allowing the public to assess news from multiple perspectives. Additionally, social media enables individuals with similar ideologies to meet and exchange opinions more easily, leading to stronger ideological connections. This, in turn, promotes political participation and activism on important issues (Tufekci & Wilson, 2012).

Conclusion and suggestions

The research objectives to study the influence of economic, social, and political factors on the political culture of first-time voters in the general election of 2023 in the upper northern region. From the research results, the following can be summarized in descending order: The social factor in terms of social media has the highest coefficient (β = .340) and a p-value less than .001, indicating that this variable has a significant influence and is a crucial factor with a significantly positive impact on the political culture of the studied population, ranking first. The economic factor regarding the family's financial status has a coefficient (β = .211) and a p-value of .001, indicating a significant positive correlation with the dependent variable. The increase in the family's financial status leads to a significant change in the political culture of the studied population, ranking second. The social factor concerning social trust has a coefficient (β = .139) and a p-value of .033, which is statistically significant at the .05 level. It indicates a positive relationship between social trust and significant changes in the political culture of the studied population, ranking third. It was found that various factors mentioned above influence the political culture of first-time voters in the general election of 2023 in the upper northern region, with a predictive power of 25.9% (R^2 = .259) affecting political culture.

Theory Implication

This research highlights the relevance of integrating classical and contemporary political culture theories, offering a comprehensive framework for understanding the political behaviors of first-time voters. By combining the foundational concepts of Almond and Verba with Inglehart's and Clack & Martinot's modern perspectives, the study encourages the expansion of political culture research into other dimensions, such as rural versus urban sociology and psychological motivations behind political participation. The findings imply that further comparative research between generational cohorts (e.g., Generation Z and previous generations) can offer valuable insights into how economic, social, and political factors shape political culture differently across age groups. This approach could enrich our theoretical understanding of political engagement and behavior, ultimately informing policies to promote more inclusive and effective democratic participation.

Practical Implication

Practical recommendations for economic and social development involve the creation of an integrated economic plan that prioritizes job creation, income generation, and the reduction of inequality. This plan should incorporate tax reforms that support low-income

groups and businesses fostering sustainable employment, alongside initiatives such as a minimum income guarantee. Expanding access to welfare systems is essential to ensure equity, while enhancing education through curriculum updates and providing equal educational opportunities remain crucial for long-term development. Furthermore, the national economic strategy should focus on clear objectives to improve citizens' well-being, with the Ministry of Finance playing a key role in implementing these reforms. Policies should also aim to reduce economic disparities and promote quality education through government-supported initiatives for equal opportunities and improved educational institutions.

For political participation of young people, policy recommendations include developing transparent and accessible data management systems and secure online platforms for public expression. Continuous and effective communication between the government and the public is necessary, along with creating public spaces for young people to express their opinions. Additionally, public campaigns should foster trust in society, and supporting youth group activities and exchanges between regional youth will help reduce distrust and promote understanding.

Suggestions

The formulation of an integrated economic plan at the national level should focus on clear objectives to enhance the well-being of citizens, emphasizing job creation, income generation, and reducing inequality. Additionally, the Ministry of Finance should implement tax reforms and financial support measures, such as tax reductions for low-income groups and businesses that foster sustainable employment. Furthermore, policies aimed at reducing economic disparities and improving education should be promoted, including equal educational opportunities and the development of quality educational institutions with government support.

There should be the creation of public spaces for expression, with government agencies establishing youth-friendly public areas, such as forums or community centers, to allow young people to freely voice their opinions and organize various activities. Additionally, there should be measures to implement public awareness campaigns that emphasize the importance of trust and life satisfaction. These campaigns should encourage the public, especially the younger generation, to recognize the significance of mutual trust and the creation of a society conducive to happiness, facilitated through mass media.

New knowledge and the effects on society and communities

This research aims to challenge the traditional framework for analyzing Thai political culture, as the traditional frameworks of Almond and Verba, which emphasize the stability of political culture, may not fully respond to the structural changes occurring in Thailand. Over the past two decades, Thailand has faced intense political dynamics and social, economic, and technological contexts, leading to the proposal of a more flexible political culture concept that is connected to the current context, particularly among first-time voters in northern Thailand. This group has grown up under rapidly changing political and economic contexts.

Additionally, this research also attempts to explain the formation of political culture that responds to changes in uncertain social and political environments, without adhering to traditional fixed frameworks. It has expanded the knowledge regarding the study of Thai political culture in terms of content and the demographic groups studied by using economic, social, and political factors as frameworks for analysis in the study of the formation of political culture among first-time voters, which is a new target group for research.

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The Model of Occupational Health and Safety Management by Community- Based Approach of Self- Employed Elderly Workers in Uttaradit Province, Thailand

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Abstract

This study employed participatory action research (PAR) , aimed to analyze the occupational health and safety (OHS) situations of self-employed elderly workers and develop community participation processes for OHS management. It also sought to create and evaluate OHS management models in urban, semi- urban, and rural communities in Uttaradit province, Thailand. The research involved 350 self- employed elderly workers, selected through simple random sampling, and 60 key informants from the public sectors, selected purposively. Data were collected using structured interviews and group discussions, with content analysis employed for data interpretation.

Urban elderly workers predominantly reported musculoskeletal discomfort due to prolonged sitting, while rural elderly faced heat- related illnesses. Semi- urban elderly encountered both ergonomic and physical hazards, including lifting heavy objects. Tailored interventions were identified: disease prevention for urban elderly, workplace safety training for semi-urban workers, and chemical safety practices for rural workers. Ergonomic challenges were pervasive across all settings. The development of community participation model involved situational analysis, priority setting, planning, knowledge management, and reflective practices. This evidence-based model is critical for addressing the specific OHS needs of self-employed elderly workers and enhancing health promotion and disease prevention within the community.

Keywords: Occupational health and safety, Elderly workers, Community-based approach, Safety management

Introduction

The transition to an aging society has profound implications on demographic, economic, and social structures, especially in rural areas. In Thailand, the multi-dimensional poverty rate among the elderly in rural regions stood at 18.1% in 2021 (Office of the National Economic and Social Development Council, 2021), highlighting significant socioeconomic challenges. Many elderly individuals continue to work to support themselves and their families, as evidenced by the 2021 survey by the National Statistical Office, which revealed that over half of the early elderly (aged 60-69) desired employment for financial reasons (National Statistical Office, 2022).

However, elderly workers face a high health risk of developing occupational diseases or injuries due to job characteristics that involve exposure to various health hazards, such as agricultural chemicals, pathogens, light, heat, and stress (Chantaramanee, 2017).

Occupational health and safety issues among elderly informal workers reveal a high level of health risks in the workplace. These include working conditions that negatively impact health, such as lifting heavy objects or performing tasks in postures that cause muscle pain. Additionally, work environments may contain dust, expose workers to hot weather conditions, and increase the risk of injuries from sharp objects (Phetliap et al., 2023). Elderly workers exhibit poor self-care behaviors, including daily smoking (5.8%), alcohol consumption (3.3%), and insufficient sleep (23.2% sleeping <6 hours). Health promotion is inadequate, with 58.0% in Bangkok avoiding exercise due to time and income concerns (Suksamai et al., 2012). Additionally, 73.3% engage in improper work postures, increasing musculoskeletal pain risks (Kaewmanee et al., 2011).

In Uttaradit Province, older adults account for 26.16% of the total population, classifying the province as a "complete aged society." This demographic shift presents a significant challenge for the province. Notably, 26.97% of the elderly population remain economically active, with the majority engaged in the agricultural sector (Uttaradit Provincial Labor Office, 2025). Additionally, many elderly workers have chronic health conditions, with the most prevalent being essential hypertension, followed by diabetes (Uttaradit Provincial Statistical Committee, 2024). In semi-urban areas such as Pai Lom Subdistrict, Laplae District, a substantial 39.65% of older adults continue to work as farmers to sustain their livelihood, with 69.10% suffering from chronic diseases, most commonly hypertension (43.51%) (Jaikhamwang et al., 2020).

Given the aforementioned situation, it is imperative to prepare for the challenges faced by the elderly by developing and managing various aspects that enable them to maintain good health and self-care for a high quality of life. This approach must be elderly-centered, promoting self-reliance and a sense of belonging within the community. Community involvement is crucial, with a focus on volunteer networks to manage and support these efforts. Health promotion and disease prevention among informal elderly workers necessitate a community-based approach, which has proven essential in developing individuals' capacity to contribute effectively within their communities (Hoffmeister & Mensink, 1990). This concept has been applied by researchers in creating a model for occupational health and safety management tailored to informal elderly workers within the community. This model encourages elderly workers to actively participate in their development in a manner that aligns with the local context and culture.

Objectives

1. To analyze the occupational health and safety (OHS) situations of self-employed elderly workers.
2. To develop OHS management model of self-employed elderly workers by using the community participation process.
3. To create and evaluate OHS management models in urban, semi-urban, and rural communities in Uttaradit Province.

Methodology

This participatory action research was conducted in four phases based on the framework proposed by Moule & Goodman (2014), consisting of: 1) Fact-finding or reflection, 2) Planning, 3) Action, and 4) Evaluation or reflective practice.

The study adopted a community-based approach, emphasizing community ownership in promoting health and occupational safety, aligned with the principles outlined by Hoffmeister and Mensink (1990). This approach encompassed seven core components: 1) Community focus, 2) Community member participation, 3) Intersectoral collaboration, 4) Substantial resource mobilization, 5) Long-term program development, 6) Multifaceted interventions, and 7) Population-level health and safety outcomes. The implementation was divided into four phases as previously described.

This study employed participatory action research (PAR), a community-based approach that empowers local residents or community representatives to generate new knowledge for themselves and their communities. The process involved data collection, problem analysis, and collaborative problem-solving through planning, implementation, and evaluation of actions to address identified issues. The ultimate aim was to ensure solutions were accurate, relevant, and aligned with community needs. External researchers acted as facilitators to guide and support the research process in achieving its objectives (Walaithes, 2005).

Population and sample

The study population consisted of two groups:

1. Elderly Informal Workers (Group 1): A total of 2,121 individuals aged 60–70 years, literate in Thai, and actively engaged in self-employment. Sample sizes were calculated using Krejcie and Morgan's table, resulting in 350 participants distributed proportionally across urban (150), semi-urban (150), and rural (50) communities.
2. Community Health Leaders (Group 2): A purposive sample of 60 individuals, comprising village health volunteers (VHVs), elderly care volunteers, elderly leaders, housewife group leaders, and members of local government organizations, with 20 participants from each community type.

Inclusion Criteria: Participants were required to be recognized by their community, have no plans to relocate within a year, and consent to participate. Community health leaders had to be aged 20 years or older.

Exclusion Criteria: Participants who withdrew or were unable to engage in all activities were excluded.

Research Method

This study was conducted in three types of communities in Uttaradit province, Thailand: urban (Tha It Sub-district), semi-urban (Tha Sao Sub-district), and rural (Chai Jum Phon Sub-district). These communities were selected based on the varying levels of occupational health and safety (OHS) practices among elderly informal workers.

A total of 350 informal older workers and 60 community-based health volunteers participated in the community analysis during Phase 1. They were actively engaged in the participatory process of community-based occupational health and safety (OHS) management, which included: 1) Joint planning, 2) Implementation of the plan, and 3) Participatory reflection and lesson learned activities during Phase 2. In Phase 3, the community-based health volunteers also played a key role in monitoring and evaluating the outcomes of community actions.
The research procedure was divided into three phases as follows:

Phase 1: Community Analysis

This phase involved assessing the capacity of community health leaders to manage occupational health and safety (OHS) for elderly informal workers. Data were collected through focus group discussions conducted once per sub-district, resulting in three sessions. These discussions aimed to identify current strengths, limitations, and community-specific OHS challenges.

Phase 2: Developing Community Participation Processes

This phase emphasized fostering collaborative efforts between community members and leaders to create sustainable OHS management practices.

2.1 Presentation of Community Analysis Results:

Feedback Session: Research findings were presented to the community to build awareness of the current situation, encouraging participants to provide additional input and feedback.

Problem Analysis and Planning: Participatory meetings were held to analyze problems, prioritize issues, and collaboratively plan solutions, conducted once per sub-district, totaling three sessions.

2.2 Brainstorming and Action Planning:

Workshops for Planning: Designed plans, projects, and activities tailored to community needs in OHS management.

Plan Implementation: Distributed responsibilities among community groups, established project teams, mobilized local and external resources, and provided training to enhance skills.

Lessons Learned Sessions: Conducted four times per sub-district (12 sessions in total), these focus groups reflected on implementation progress and adjusted plans as needed.

Phase 3: Evaluation

A structured evaluation process was carried out to assess both implementation and outcomes of the intervention.

Process Evaluation: Continuous monitoring and assessment of each phase, focusing on alignment with community needs and contextual adjustments. Conducted every four weeks via focus groups, totaling 12 sessions.

Summative Evaluation: A final evaluation was conducted after completing all activities to assess overall project outcomes. Focus groups and participatory lessons learned sessions were held once per sub-district, totaling three sessions.

Data Collection

Data were collected through multiple methods to ensure a comprehensive understanding of OHS practices:

1. Semi-structured Interviews: Focused on the role of community health leaders in OHS management for elderly informal workers.
2. Participant Observations: Recorded interactions, participation levels, and engagement of study participants during activities.
3. Field Notes: Documented insights from group discussions and participatory workshops conducted across all phases of the study.

Validation and Reliability of the Research Instrument

The interview guide was validated for content accuracy and alignment with the research objectives by three experts specializing in occupational health, gerontology, and behavioral science, using the Index of Item-Objective Congruence (IOC). A pilot test was conducted with a sample of 30 participants who shared similar characteristics to the target population. The reliability of the instrument was assessed using Cronbach's Alpha, which yielded a coefficient of 0.89, indicating a high level of internal consistency.

For the focus group discussion guide, experts reviewed the instrument for accuracy, coverage, and relevance to the study objectives, and the IOC was used to assess item-objective alignment. Revisions were made based on expert feedback to ensure content validity.

In addition, data triangulation was employed to enhance the credibility of the findings, using the following strategies: 1) Data triangulation, by comparing data from different times, locations, and sources; 2) Investigator triangulation, by rotating interviewers or observers; and 3) Methodological triangulation, by using multiple data collection methods.

Data Analysis

Content analysis and triangulation techniques were employed to ensure validity and reliability. Data were systematically categorized to identify key themes and patterns in OHS practices and community participation. Triangulation was achieved through the integration of data from interviews, observations, and field notes, enhancing the robustness of findings.

Research Validity

The validity of the research was strengthened through participatory approaches, ensuring alignment with community needs and local contexts. Focus group discussions, reflective sessions, and periodic evaluations provided iterative feedback loops to refine the research process.

Ethics Statement

The research protocol was approved by the Human Research Ethics Committee of Uttaradit Rajabhat University (COA No. 071/2022). All participants provided informed consent prior to engagement in the study, with assurance of confidentiality and the right to withdraw at any stage. Ethical considerations included the protection of participant autonomy, privacy, and respect for community traditions.

Results

The research findings can be summarized according to each phase of the study as follows:

Phase 1: Community Analysis

The area-based situational assessment indicated that older workers in urban, semi-urban, and rural communities were predominantly female, accounting for 66.70%, 67.30%, and 52.00%; respectively. The average age was 64.94 years in urban areas, 64.90 years in semi-urban areas, and 64.40 years in rural areas. The majority of older adults in urban and rural areas were classified as obese based on Body Mass Index (BMI) (31.33% and 28.00%; respectively), whereas those in semi-urban areas mostly had a normal BMI (31.30%). The primary occupations of older workers varied by setting: self-employment was predominant in urban areas (38.67%), daily wage labor in semi-urban areas (36.00%), and agriculture in rural areas (58.00%).

Chronic illnesses were commonly reported across all three areas. In all settings, injuries from sharp objects such as lacerations or puncture wounds from knives and thorns were frequently reported as work-related health issues. Older workers in semi-urban communities were more likely to be exposed to heat or work outdoors compared to those in urban and rural areas. Similarly, they experienced poor lighting conditions and worked in environments with dust, smoke, or unpleasant odors. However, older adults in rural areas report higher levels of chemical exposure during work processes. Musculoskeletal disorders from heavy lifting were most found among older workers in semi-urban areas. Across all regions, the most common symptom reported was body aches and muscle strain from prolonged sitting.

These findings highlight the need for targeted interventions to address these challenges within the community.

The survey on the health issues among elderly informal workers across urban, semi-urban, and rural areas identified four key findings:

1. **Occupational Injuries**

The most prevalent occupational health risk across all three geographic areas was trauma induced by sharp objects, such as lacerations or puncture wounds from knives and thorns. The incidence rate was disproportionately higher among older adults in rural areas compared to their urban and peri-urban counterparts, suggesting an elevated occupational hazard due to the nature of rural labor practices.

2. **Workplace Environmental Hazards**

Exposure to excessive heat and outdoor working conditions was significantly more common in peri-urban areas than in urban and rural settings. The physiological manifestations associated with these exposures included dehydration, exertional fatigue, thermoregulatory strain (excessive sweating), and visual discomfort due to suboptimal or excessive lighting. Additionally, environmental contaminants such as airborne particulate matter, occupational smoke inhalation, and noxious odors were frequently reported as contributing to adverse health outcomes.

3. **Chemical Exposure**

Occupational exposure to hazardous chemical agents was more prevalent among older workers in rural settings than in urban and peri-urban areas. This may be attributed to the widespread use of agrochemicals and a lack of regulatory oversight or personal protective measures in rural occupational environments.

4. **Ergonomic and Musculoskeletal Strain**

The burden of physically strenuous labor, particularly tasks involving heavy lifting, was markedly higher among older adults in peri-urban areas compared to those in urban and rural settings. Despite geographic variations in work-related biomechanical strain, musculoskeletal discomfort, particularly mild but persistent myalgia and fatigue, was a universally reported occupational health concern among older workers across all three areas.

The findings led to collaborative efforts in managing occupational health and safety (OHS) for informal elderly workers within the community. This participatory approach fostered local understanding of the problems and the development of context-specific solutions, raising awareness across all three pilot areas. Key interventions included:

1. **Chemical Hazard Management**: Community members were trained in the safe and appropriate use of chemicals, the proper use of personal protective equipment (PPE), and correct work attire.
2. **Ergonomic Risk Reduction**: Initiatives included promoting exercise and proper posture during work, forming village-level exercise groups, and utilizing traditional remedies such as herbal medicine, massage, and hot compresses to alleviate musculoskeletal discomfort.

3. **Health Promotion and Work-Related Disease Prevention**: Communities introduced appropriate tools for safer work, increased safety awareness, conducted accident prevention training, and disseminated information through various local communication channels such as LINE groups, community broadcast towers, elderly clubs, and monthly village meetings.
4. **Mitigation of Environmental Hazards (Light, Dust, and Smoke)**: This included provision and use of suitable PPE and educational sessions to prevent harm from poor lighting, airborne dust, and smoke exposure.

In phase 1, community participation contributed to mobilizing local resources and support networks to develop interventions and activities for protecting informal older workers. These efforts have led to a reduction in work-related health issues and improved access to efficient health services for the aging workforce.

Phase 2: Development of Community Participation Processes

The community engagement process led to significant improvements in the awareness and practices of elderly informal workers. Four key areas were addressed:

1. Nutritional Self-Care: Promoted better dietary practices for health improvement.
2. Prevention of Musculoskeletal Disorders: Encouraged self-care to reduce strain and injury.
3. Toxicity Prevention: Educated on safe handling of agricultural chemicals.
4. Pollution Mitigation: Raised awareness on how to protect against dust and smoke exposure.

In Phase 2, qualitative findings obtained through interviews enhanced the credibility and depth of the proposed model. The target group engaged in discussions about their perceived needs and challenges, aiming to promote health-enhancing behaviors and prevent work-related illnesses. This participatory dialogue led to a collective consensus on practical solutions for occupational disease prevention and health promotion tailored to their context.

One informal older worker expressed:

> *"We need a project that provides knowledge about self-care and how to prevent occupational illnesses. The training should cover musculoskeletal disorders and the proper and safe use of agricultural chemicals, including clear guidance on correct practices."*

The participatory process followed a four-step approach:

1. Acceptance of Individual Differences: Empowered elderly workers by acknowledging their personal limitations and fostering confidence in self-management.
2. Creating Awareness: Facilitated knowledge exchange among peers, enhancing health awareness.
3. Raising Problem Awareness: Highlighted the health risks stemming from dietary habits, lack of exercise, and exposure to chemicals and pollution.
4. Understanding Problem-Solving: Encouraged active problem-solving by linking personal experiences to health practices, motivating lifestyle changes.

This process has contributed to the development of a structured learning process for community-based occupational health and safety (OHS) management. The process is driven by collaborative mechanisms involving two key sectors: (1) the academic sector and its allied networks, and (2) the community sector. The approach comprises six core components as following: 1) the use of senior-friendly learning materials, 2) application of clear and simplified language, lecture-based instruction integrated with gamification techniques, and content relevant to daily living, 3) repetition of key concepts to enhance retention, 4) lecture sessions incorporating practical demonstrations, 5) showcasing and presenting best practices through role models, and 6) engaging community-based group activities involving health volunteers

and local leaders. These strategies were designed to align with the learning capacities of older adults and promote participatory and experiential learning within the community context. (Figure 1)

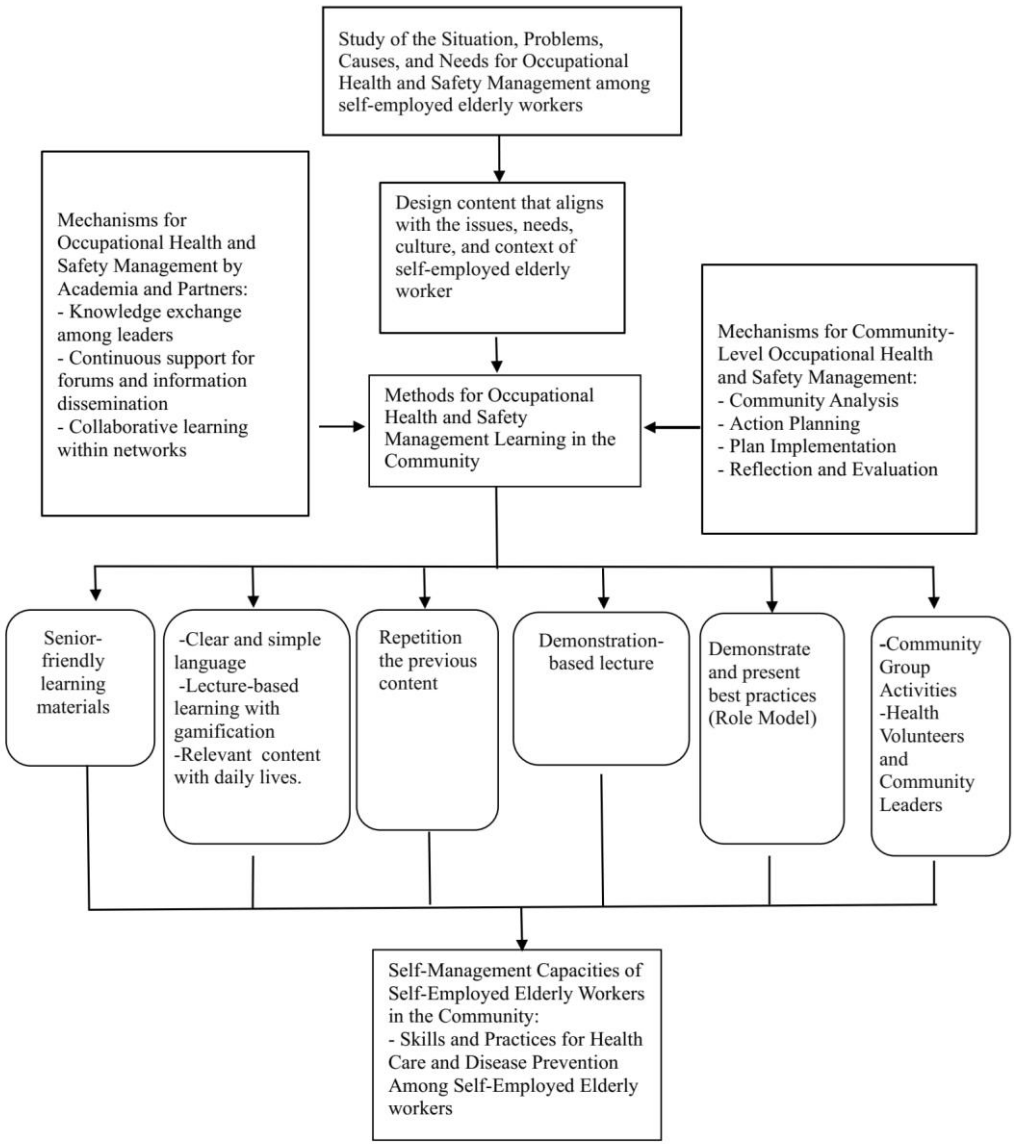

Figure 1 Development process of Occupational Health and Safety Management among Informal Elderly Workers in the Community, Uttaradit Province, Thailand

Phase 3: Evaluation of Occupational Health and Safety Management Model

The evaluation phase focused on the implementation and outcomes of the developed model for occupational health and safety management:

1. Knowledge Reinforcement: Strengthened the capacity of community health volunteers (CHVs) and leaders through home visits, under the guidance of public health officials.
2. Inter-Community Knowledge Exchange: Facilitated learning across communities to establish sustainable health promotion models.
3. Positive Behavioral Outcomes:

3.1 Elderly informal workers adopted healthier diets, exercised more, and improved self-care practices.

3.2 CHVs gained confidence in disseminating health knowledge and demonstrated improved skills in providing care.

4. Successful Adoption: Communities across urban, semi- urban, and rural areas effectively adopted self- care practices, addressing occupational health risks and enhancing the quality of life for elderly workers.

In Phase 3, qualitative data obtained from interviews further enhanced the credibility of the developed model. The findings revealed the following:

1. Most informal older workers were able to practice appropriate self- care for health promotion and prevention of occupational illnesses. They organized group exercise sessions and engaged in physical activity more regularly. Additionally, improvements in dietary behaviors were observed, including consuming all five essential food groups and avoiding undercooked food. One local health officer reflected:

"People in the community are now more enthusiastic about exercising. They eat a balanced diet and avoid raw foods. Group discussions about exercise postures have also taken place, and when I visit households, I often see people following the routines. They feel the postures are effective and really helpful."

2. The community collectively engaged in health promotion and disease prevention activities, particularly through group-based physical exercise. A community leader shared:

"Now we have formed exercise groups. Elderly members come to participate in the workouts. They see the benefits, and when they see us doing it, they're inspired to join in the activities."

The implementation of the research, which aimed to develop a model for Occupational Health and Safety (OHS) Management among informal elderly workers in the Community, Uttaradit Province, Thailand, was carried out in three main phases and led to the development of a comprehensive participatory model. The model began with a situational analysis in the community, focusing on both the health status and occupational hazards of the elderly workforce, as well as identifying key stakeholders. This was followed by the mobilization of community participation, emphasizing collaborative action through shared learning processes, and leadership and network development. In this phase, a Participatory Action Research (PAR) approach was integrated, involving community- based situational assessment, planning, implementation, and participatory reflection and evaluation. The final phase focused on the evaluation of OHS management for informal elderly workers. The evaluation centered on improved skills and practices related to occupational disease prevention, as well as a review of the local OHS systems and mechanisms, conducted with active community involvement. Details of the model are illustrated in Figure 2.

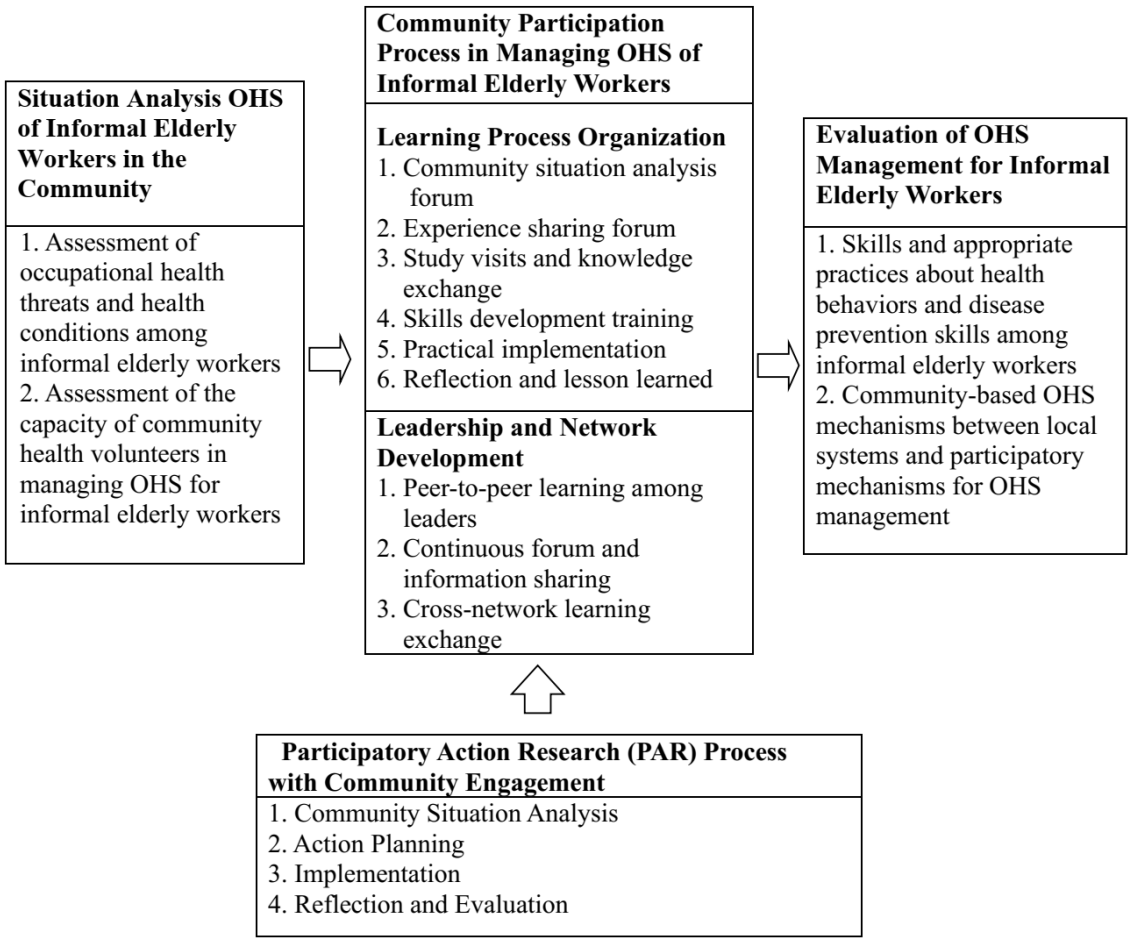

Figure 2 Model of Occupational Health and Safety Management among Informal Elderly Workers in the Community, Uttaradit Province, Thailand

Discussions

A participatory model for OHS management among informal elderly workers in Uttaradit Province was developed through three phases: situational analysis, community engagement using a Participatory Action Research (PAR) approach, and outcome evaluation. The model improved skills in occupational disease prevention and strengthened local OHS systems through active community participation**.** The discussion is structured according to the specific objectives of the research as follows:

1. Occupational health and safety concerns among informal elderly workers in urban, semi-urban, and rural areas primarily arise from exposure to hazardous and ergonomically unsuitable working conditions. These workers frequently encounter airborne pollutants, including dust and other environmental contaminants, while performing physically strenuous tasks in postural improper positions. Such occupational stress contributes to adverse health outcomes, including increased susceptibility to work-related musculoskeletal disorders and the adoption of unhealthy coping behaviors, such as poor dietary consumption and inadequate self-care practices. (Senanuch, & Suntonanantachai, 2018; Ranasinghe et al., 2023)

2. Developing a Community-Based Participatory Process for Occupational Health and Safety Management: Enhancing occupational health and safety management for informal elderly workers requires the community to first identify problems and their root causes. In addition, community-led problem analysis, collaborative efforts among relevant stakeholders

have been strengthened, leading to the development of operational models and mechanisms for health promotion and disease prevention (Ruksanont et al., 2023). These initiatives have been translated into projects and activities addressing occupational health and safety among older adults in the informal labor sector.

This enables them to manage and care for themselves while establishing a framework for community-based occupational health and safety management. The framework emphasizes: 1) Self-management through health-promoting dietary habits, 2) Prevention of musculoskeletal disorders, 3) Protection against toxic exposure from agricultural chemicals, and 4) Prevention of inadequate lighting, dust, and smoke exposure (Moule & Goodman, 2014). By fostering cooperation within the community, this participatory process raises awareness and encourages active involvement in problem-solving, planning, and decision-making. This approach aims to bring about changes in occupational health and safety management, promoting well-being and preventing work-related illnesses, ultimately reducing occupational health risks effectively (Nilwarangkoon et al., 2022)

3. A Community-Based Model for Occupational Health and Safety Management of Informal Elderly Workers: The development of an occupational health and safety management model requires participatory community action. As a form of social capital, community members play an active role in enhancing access to local knowledge, fostering contextual understanding, and mobilizing resources to support community-based actions. (Unthong et al., 2021)

This approach focuses on encouraging behavioral changes among informal workers to prevent occupational diseases and promote workplace health. The resulting model aligns with the cultural and contextual aspects of the community, fostering a shared understanding of the issues. Through collaborative decision-making, evaluation, and continuous reflection on practices, the community strengthens its capacity to effectively manage the occupational health and safety of informal elderly workers. (Garrido et al., 2020)

One crucial factor for successful behavioral change in health promotion among elderly informal workers is understanding the community's culture and context. This involves collaborative problem identification and cause analysis with community leaders and target groups, respecting and considering their perspectives and jointly making decisions for problem-solving, evaluation, and continuous improvement.

To effectively address the occupational health and safety needs of elderly informal workers, it is crucial for the Ministry of Public Health, the Ministry of Social Development and Human Security, and local government organizations to establish systems for knowledge exchange, continuous support forums, and collaborative learning within community networks. These mechanisms will help sustain improvements and ensure ongoing community engagement. Health authorities should adopt a proactive approach by implementing a four-step learning process: community analysis, action planning, plan implementation, and reflective evaluation. This approach will enable tailored interventions that address the specific health risks faced by elderly workers and ensure continuous improvement through community feedback and adaptation.

Conclusion and suggestions

The study successfully developed and evaluated community-based models for managing occupational health and safety among self-employed elderly workers. These models emphasized the importance of health promotion, disease prevention, and community involvement. The findings underscore the need for ongoing support and education to ensure the well-being of elderly workers in various settings.

New knowledge and the effects on society and communities

The Model of Occupational Health and Safety Management by Community- Based Approach of Self-Employed Elderly Worker in Uttaradit Province is research that is useful for the elderly group, which is currently increasing in number. The model emphasized situational analysis, community engagement, and skill development through a PAR approach. Results showed improved safety practices and local system strengthening by using six key components: senior- friendly materials; clear, simple language with gamified lectures; repetition of key concepts; practical demonstrations; role model presentations; and community group activities involving health volunteers and local leaders. This model can be adapted for use in other aging communities facing similar challenges.

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Supporting Request and Medical Efficacy of COVID-19 Patients: A Cross-sectional Survey from the Help Society Network

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Abstract

This study employs a cross-sectional survey to assess the support needs of COVID-19 patients within the Help Society network, considering the outbreak's extensive social consequences. Assistance–including medication, food supplies, counseling, oxygen tanks, bed supplies, and patient transportation–is dynamically allocated to respond to the varying intensity of COVID-19 waves. Data were collected from March to May 2023 *via* Google Forms and Line Official Accounts within the Help Society and the Volunteer Club at Sirindhornrajavidhayalaya Campus (Bundit Asa) from 120 respondents (average age: 39.27 years, SD = 11.69), and analyzed using nonparametric test. The results reveal that the most frequently requested forms of assistance were medication, food supplies, and counseling. Medication usage is catagorized into three types: herbal remedies (79.17%), contemporary pharmaceuticals (61.67%), and COVID-19-specific antiviral drugs (25%). Notably, there is a significant discrepancy between the medicines dispensed and actual medication utilization by patients ($p < .001$). Specifically, 64% adhered to the prescribed dosage, while 23% exceeded it, and 13% underutilized it. Furthermore, after five days of medication, participants reported substantial relief from thirteen symptoms ($p < 0.05$). This research highlights the complex relationship between pandemic response strategies and individual treatment adherence within the Help Society network, providing valuable insights for optimizing assistance during public health crises.

Keywords: Assistance, COVID-19, Food, Medication, Volunteer

Introduction

The initial outbreak of COVID-19 occurred in China. In 2020, the COVID-19 mortality rate in China was determined to be 0.66%, with an increase reported among older age groups (Mahase, 2020). However, other research conducted in China found mortality rates ranging from 3% to 6% (Ioannidis, 2021). The World Health Organization estimated that global mortality due to COVID-19 from 2020 to 2021 was approximately 14.83 million. Additionally, the estimated COVID-19 mortality in China between December 2022 and February 2023 was 1.41 million, significantly higher than the official reported figures (Du et al, 2023). In Thailand, from 2020 to 2022, there were five waves of the COVID-19 epidemic. The fourth wave had the highest incidence rate, with 9,007 cases per 100,000 people, followed by the fifth wave (Sandar U et al., 2023). The post-COVID-19 era has witnessed substantial transformations in both individual lifestyles and corporate operations (Jattamart et al., 2023; Sukphan et al., 2023; Wang et al., 2023). The magnitude of each subsequent COVID-19 wave causes varied degrees of suffering for patients and the wider population, demanding different types of assistance (Mahikul et al., 2021; Rajatanavin et al., 2021; Pangsapa, 2022).

The COVID-19 pandemic has exposed significant shortcomings in healthcare systems worldwide, including in Thailand, where there has been inadequate allocation of essential resources such as hospital beds, medications, and oxygen tanks (Yingyong & Ragkhanto, 2022). Similarly, Canada confronted food insecurity during the initial wave of the pandemic, revealing inefficiencies in food distribution (Slater et al., 2022). In the United States, online food ordering became a crucial means of ensuring both immediate and long-term access to food support (Knearem & Carroll, 2021). The previous study in China that developed a microblogging platform for medical requests enhanced communication and access to healthcare resources (Yang et al., 2022). Meanwhile, volunteers in Nepal played a key role in providing COVID-19 patients with information about the availability of hospital services, including intensive care unit beds and ventilators (Adhikari & Shrestha, 2022). Previous studies conducted in India, Bangladesh, Pakistan, Sierra Leone, Kenya, and Ethiopia have demonstrated the importance of community health workers as a bridge between healthcare providers and the community. These studies emphasized the need for training, personal protective equipment, and financial incentives to empower these workers in their roles (Salve et al., 2023). Together, these examples highlight the various requests for assistance that emerged during the COVID-19 pandemic, underscoring the urgent need for improved resource allocation and greater community engagement in healthcare systems worldwide.

The utilization of various medications during the first wave of the COVID-19 outbreak showed significant differences across the world. In Germany, there was a notable increase in pneumococcal vaccine utilization by 373% and paracetamol by 111% (Enners et al., 2021). In contrast, New York hospitals reported increased use of hydroxychloroquine, chloroquine, midazolam, propofol, ketamine, cisatracurium, and fentanyl (Dabestani et al., 2020). A study examining drug use in four countries—China, Spain, South Korea, and the USA—revealed distinct patterns, with high utilization of hydroxychloroquine in Spain and umifenovir in China (Prats-Uribe et al., 2020). In Pakistan, corticosteroids, particularly dexamethasone, were used in over 90% of cases (Mustafa et al., 2022). Similarly, a national dataset from the United States indicated that corticosteroids were the most frequently utilized medications during the pandemic (Stroever et al., 2021). These variations in drug utilization reflect differing national strategies and responses to the challenges posed by COVID-19.

Initially, hydroxychloroquine was widely used for outpatient treatment of COVID-19; however, subsequent studies found no evidence that it reduced symptom duration or prevented severe outcomes (Schwartz et al., 2021). In contrast, traditional Chinese medicine, when

combined with conventional Western treatments, has shown promise in improving clinical symptoms of COVID-19—such as fever, cough, chest tightness, shortness of breath, and fatigue—as well as in reducing hospitalization and mortality rates in China (Adhikari & Shrestha, 2022). The standardized formulation of Andrographis paniculata for COVID-19 treatment has a high safety profile and can reduce the severity of the disease (Shanker et al., 2023). This formulation is a commonly selected option for self-treatment in Thailand. However, in cases of mild COVID-19, the use of favipiravir did not lead to improved recovery times (Bosaeed et al., 2022).

Throughout the COVID-19 pandemic, there was a discernible surge in the demand for emotional support, yet accessibility to such aid was often impeded. To be specific, approximately 51% of individuals acknowledged experiencing a high or severe level of vulnerability in managing and articulating their emotions, while a significant 74% of this demographic lacked access to formal bereavement services or mental health support (Harrop et al., 2021). A study conducted in Bangkok revealed that both families and society at large experienced moderate economic impacts alongside heightened levels of anxiety due to social factors (Phuangprayong, 2021). Consequently, a variety of physical, mental, and social interventions were implemented to enhance the effectiveness of treatment during the COVID-19 outbreak. These interventions involved telehealth exercise programs specifically designed for older adults (Sangprapai et al., 2023). Initiatives included discussions on coping strategies, the provision of fresh and dry food supplies, "happiness boxes," the distribution of goods from local almshouses, and financial support (Sutdhivajano et al., 2022; Promsriya & E-sor, 2021). Moreover, there has been a concerted effort to leverage herbal medicine to alleviate COVID-19 symptoms (Itharat et al., 2021).

Diverse sectors within the Thai public sphere collaborated to alleviate the burden on healthcare professionals and support fellow citizens in navigating the crisis. In the wake of the COVID-19 epidemic, a multitude of informal organizations and community initiatives emerged in Thailand (Thongthep & Lukarang, 2021). The Help Society network represents a collaborative endeavor involving nearly 40 organizations committed to assisting COVID-19 patients. This network was established in response to the disaster caused by COVID-19 in Thailand, with immediate actions taken to provide relief to the Thai people. The initiative originated with the Volunteer Club at Sirindhornrajavidhayalaya Campus (Bundit Asa) (Khanthong et al., 2024). This support was provided through two channels: the LINE Official Account of the Bundit Asa and the Help Society. Individuals affected by COVID-19 experienced various sorts of assistance, including patient transportation, oxygen tanks, and the distribution of needed food and drugs.

While the current outbreak and effects of COVID-19 may not be as severe as in the past, a discernible trend of mutation and rapid spread is evident. This includes an escalation in the severity of symptoms among certain groups of infected individuals. According to data acquired by the Help Society Network from previous support activities, 363 individuals formally registered for assistance through the authorized LINE Official Accounts. Therefore, the research team sought to investigate the specific needs of COVID-19 patients, enlisting the support of the Help Society Network to provide guidance in managing similar crises in the future.

Research objectives

The primary aim is to investigate the necessity for support for COVID-19 patients through the Help Society network. The secondary objectives are as follows:

1. To investigate the types of support provided by the Help Society network.
2. To investigate the distribution of medication types among COVID-19 patients.

Methodology

A cross-sectional survey was conducted with 363 individuals affected by COVID-19 who formally sought assistance from the Help Society network. The sample size was determined using Yamane's formula with a margin of error of 0.0949, resulting in a required sample size of 85 respondents out of a total population of 363 registered individuals. To account for an anticipated 40% rate of incomplete data, the sample size was adjusted to 119 participants. Therefore, data collection was planned to conclude upon receiving responses from 120 participants. Inclusion criteria included individuals aged 18 years or older who sought aid through the Line Official Account of either Bundit Asa or Help Society during the COVID-19 pandemic in 2021 and 2022 and subsequently received support. In March 2024, the LINE official account of the Bundit Asa group was transferred to Wat Phraram 9 to serve as the principal platform for online engagement and activities at Wat Phraram 9, Kanchanapisek, in Bangkok. Individuals seeking assistance can access various platforms within the main organizational network, as illustrated in Figure 1. Exclusion criteria encompassed participants who were involuntarily enrolled as well as surveys administered beyond the specified period.

Figure 1 Accessing support from the Help Society network

The questionnaire was distributed via Google Forms between March and May 2023, yielding responses from 120 volunteers. The Google Forms survey instrument comprised four sections: baseline characteristics of participants, types of assistance received, medication usage, and COVID-19 symptoms. Respondents could choose from a variety of predetermined answers in the sections on types of assistance and medication usage. The COVID-19 symptoms section employed a 5-point Likert scale to assess the severity of each symptom (1 = absence, 2 = mild, 3 = moderate, 4 = severe, and 5 = very severe). Content validity was assessed by a panel of five experts, followed by the calculation of item-objective congruence (IOC). Internal consistency reliability was measured using Cronbach's alpha coefficient, while test-retest reliability was evaluated using Pearson's correlation coefficient. The results indicated strong content validity (IOC = 0.91), good internal consistency (Cronbach's alpha = 0.85), and high test-retest reliability (Pearson's correlation = 0.92). This dataset facilitated a comprehensive analysis of both the support provided and the utilization of medications. Subsequently, 85 individuals completed the COVID-19 symptom questionnaire, as shown in the study flow in Figure 2.

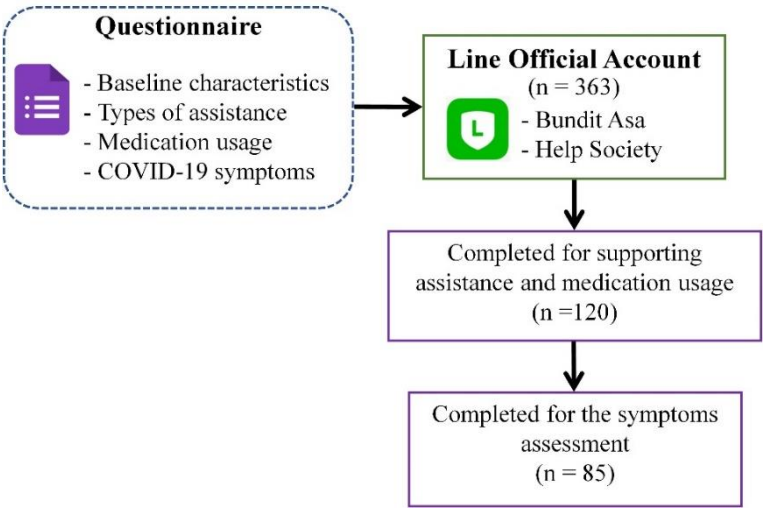

Figure 2 Study flow

Research Procedure

1. Three experts reviewed the questionnaire, which consists of four components, using the Index of Item- Objective Congruence. Part 1 collected baseline characteristics of the participants, while the second part addressed the type of assistance sought. The third section focused on medication received and its usage. Lastly, part 4 examined symptoms experienced before and after receiving self-care medicine for COVID-19. The questions covered symptoms that manifested both initially and five days after the use of medication, in accordance with the Ministry of Health's guidelines for returning to work after contracting COVID- 19. These guidelines also align with a prescribed five- day treatment regimen (Bureau of Information Office of the Permanent Secretary of MOPH, 2022).

2. The administrator broadcast the questionnaire to participants via the Line Official Account in two groups (Bundit Asa and Help Society) once a month between March and May 2023.

3. Participants were given a three-month period in which to complete the questionnaire. Following that, the data obtained was processed.

Data Analysis

The data from the study were analyzed using Jamovi Desktop (2023). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were calculated. The Shapiro-Wilk test was performed to assess the distribution of the data. Due to the non-normal distribution, nonparametric tests, including the Chi- square test and the Wilcoxon signed- rank test, were employed. A significance level of < 0.05 was used for all statistical analyses.

Ethical Considerations

This research has undergone ethical review by Walailak University's Human Research Ethics Committee and has been granted certificate number WUEC- 23- 077- 01 on March 17, 2023.

Results

In this study, a total of 120 participants completed and returned the questionnaire, representing various regions of Thailand, with a particular concentration in Bangkok and its surrounding provinces. Table 1 provides an overview of the participants' baseline characteristics (n = 120), indicating an average age of 39.27 ± 11.69 years. Among the participants, 90 were female and 30 were male, with 29% reporting a congenital disease. They sought support from both the Help Society network and other sources. Notably, 78% of participants exclusively sought assistance from the Help Society network, while the remaining participants sought support from two or more networks.

Table 1 Baseline characteristic of participants (n = 120)

Variebles		Frequency	%
Age (year), Mean ± SD		39.27±11.69	
Gender	Female	90	75
	male	10	25
Congenital diseases	Yes	35	29
Numbers Supporting network	1	94	78
	≥2	26	22

Figure 3 represented the supporting assistance during the COVID-19 pandemic, the majority primarily request is medication, followed by survival food, mental health counseling, oxygen tank, bed supply and transportation of patients, respectively.

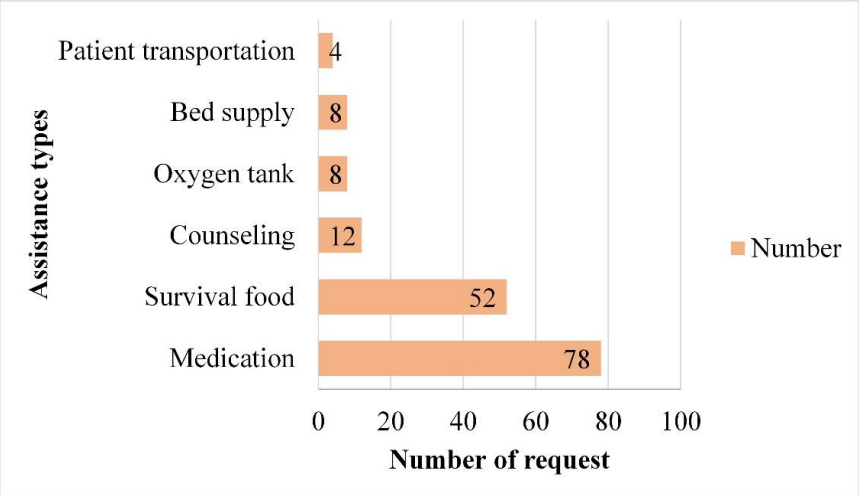

Figure 3 Types of assistance requests during COVID-19

In this study, medications administered to COVID-19 patients were categorized into three groups. The first group comprises herbal medicines, including Andrographis paniculata capsules and the Wat Khiriwong drug formula. The second group encompasses conventional medications, such as paracetamol, cough medicines, sore throat remedies, and vitamins. The final group consists of COVID-19-specific antiviral pharmaceuticals, notably favipiravir and molnupiravir. Table 2 illustrates the prevalence of each medication category among the COVID-19 patients in the Help Society network.

Table 2 The distribution of medication types administered to COVID-19 patients within the Help Society network (n = 120)

Medication type	Frequency	Percentage
Herbal medicines	95	79.17%
Conventional medications	74	61.67%
Covid-19 Antiviral Pharmaceuticals	30	25.00%

The results indicate that each patient received a variety of medications tailored to their symptoms, severity levels, and the availability of medications at that time. Table 3 summarizes the data related to the number of medications received and utilized by the patients, with a range of 0 to 5 types. Notably, none of the patients received zero medications; the majority received one, two, or three types, with frequencies of 36, 25, and 24, respectively. However, there were different between number of medications received and used. The data indicated a significant discrepancy between the medications received and utilized, with a p-value <.001 based on Chi-square testing.

Table 3 Comparative analysis of medicine receipt and utilization in COVID-19 patients (n = 120)

Received	Used						Total	P-value*
	0	1	2	3	4	5		
0	0	0	1	4	1	1	7	
1	1	30	6	1	1	0	39	
2	0	3	15	3	3	0	24	
3	0	2	3	12	4	2	23	< .001
4	0	1	0	2	13	1	17	
5	1	0	0	2	1	6	10	
Total	2	36	25	24	23	10	120	

*Test the relationship using the Chi-square test, significance level at .05

According to the data shown in Table 3, 64% of patients utilized medications as prescribed, whereas 23% exceeded the amount received and 13% underused, as demonstrated in Figure 4.

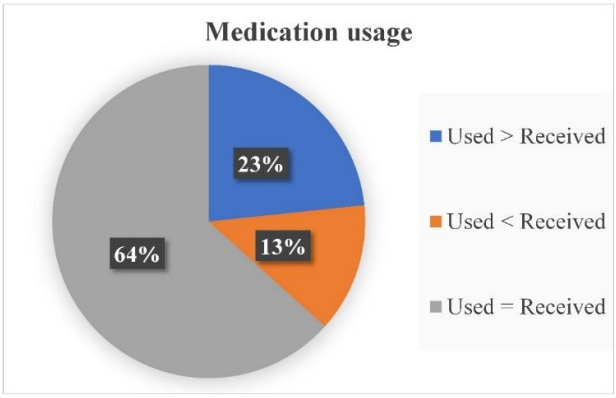

Figure 4 Using medicine

Table 4 compares pre- and post-medication symptom levels in COVID-19 patients (n = 85) who received medications at home over a 5-day period. The findings reveal significant improvements across various symptoms. Specifically, all symptoms demonstrated substantial improvement after five days of medication use. Notable reductions were observed in both mean scores and median values for symptoms including fever, cough, weakness, myalgia, sore throat, diarrhea, headache, taste or smell disturbances, difficulty breathing, chest pain, and fatigue. These changes were statistically significant, indicating the treatment's effectiveness. However, conjunctivitis did not show a significant change. Additionally, while the rash of fingers or toes showed a slight improvement, this change was statistically significant.

Table 4 The pre- and post-symptom levels of COVID-19 patients after a 5-day medication regimen (n = 85)

Symptoms	Mean ± SD		Median (range)		P-value
	Pre	Post	Pre	Post	
Fever	2.72±1.14	1.54±0.76	3 (1, 5)	1 (1, 4)	< .001
Cough	2.61±1.14	1.88±0.83	3 (1, 5)	2 (1, 4)	< .001
Weakness	2.85±1.21	1.95±0.96	3 (1, 5)	2 (1, 5)	< .001
Myalgia	3.01±1.2	1.82±0.84	3 (1, 5)	2 (1, 5)	< .001
Sore throat	2.89±1.15	1.82±0.96	3 (1, 5)	2 (1, 5)	< .001
Diarrhea	1.4±0.80	1.09±0.39	1 (1, 4)	1 (1, 3)	< .001
Conjunctivitis	1.25±0.67	1.14±0.51	1 (1, 4)	1 (1, 3)	0.308
Headache	2.38±1.20	1.52±0.78	2 (1, 5)	1 (1, 5)	< .001
Taste or smell disturbance	2.18±1.37	1.44±0.76	2 (1, 5)	1 (1, 4)	< .001
Rash of fingers or toes	1.32±0.80	1.09±0.36	1 (1, 4)	1 (1, 3)	0.009
Difficulty breathing	1.87±1.07	1.35±0.64	1 (1, 5)	1 (1, 3)	< .001
Chest pain	1.66±0.93	1.2±0.48	1 (1, 5)	1 (1, 3)	< .001
Fatigue	1.45±0.88	1.15±0.47	1 (1, 4)	1 (1, 4)	< .001

*Test the statistics using the Wilcoxon signed-rank test, significance level at .05

Discussions

The survey focused on assessing the support needs of COVID-19 patients within the Help Society network, drawing upon 120 respondents representing diverse regions across Thailand. Notably, with an average age of 39.27 years, most respondents were female, and 29% indicated underlying health issues. These demographic characteristics are consistent with prior study undertaken during the April 2021 COVID-19 epidemic in Phang Nga Province, which found a varied range of demographic profiles (Chaturabundit, 2022).

In these challenging times, the support required by COVID-19 patients is diverse and can vary based on the specific needs of each individual. Figure 2 highlights that the most common requests are for medication and survival food, respectively. Medication emerges as the foremost essential requirement, closely followed by consumer goods. Within the Help Society network, advisors, who are monks, draw guidance from the Lord Buddha to develop innovative Buddhist approaches (Pariyattikitworawat, 2022). The Help Society network also encompasses medical professionals and practitioners of traditional Thai medicine who provide advice and assistance in medication usage. This aligns with the global shortage of drugs during the COVID-19 pandemic (Badreldin & Atallah, 2021; Salahuddin et al., 2022) and corresponds to the issue of food insecurity within the country (Walsh & Lovichakorntikul, 2023). Therefore, both medication and survival food were the most highly requested from the Help Society network.

Significant variations were observed in the distribution of medication usage across each group. Table 2 offers a detailed breakdown of the administered medications, highlighting a notable preference for herbal medicines, followed by conventional medicines. A smaller portion was COVID-19 antiviral pharmaceuticals. It is worth noting that the use of antiviral drugs intended for combating the COVID-19 virus is less widespread compared to other types of medication. This discrepancy can be attributed, in part, to challenges associated with drug availability and the necessity to explore alternative remedies for managing various symptoms. This practice aligns with trends observed in foreign countries, where herbal remedies have been employed for self-care during the COVID-19 outbreak (Ang et al., 2020; Fan et al., 2020; Liana & Phanumartwiwath, 2022). Additionally, the introduction of home drug delivery services has garnered high levels of satisfaction (Chaomuang et al., 2022).

After analyzing both the medicines received and those actually consumed by the COVID-19 patients, we observed statistically significant discrepancies, as outlined in Table 3. Moreover, Figure 3 illustrates variations in medication usage. It is worth noting that some volunteers sought assistance from multiple agencies, potentially resulting in an excess of medication received (Iloanusiet al., 2021; Ghasemi et al., 2022). Polypharmacy, especially in the elderly, can lead to hospitalization and even death (Sirois et al., 2022).

The final topic addressed the symptoms experienced before and after receiving medication from the volunteers. It was observed that, five days after medication administration, there was a statistically significant improvement in all 13 symptoms reported by COVID-19 patients (Table 4). This positive outcome was consistent with previous studies that utilized Thai herbal medicine in treatment (Yingyong & Ragkhanto, 2022). Despite the majority of medications received from the Help Society network being herbal and conventional medicines, they demonstrated significant efficacy.

The study results suggest that the Help Society network is a collaborative effort of volunteers who united in response to the COVID-19 crisis, providing assistance to numerous individuals across the country. Some patients experienced severe symptoms following the delivery of the oxygen tank, which the Help Society network supported. Nevertheless, a majority of the volunteers who participated in the questionnaire reported experiencing mild to moderate symptoms and were able to manage their treatment at home. Recent global studies have yielded several valuable insights, including the significant progress volunteers have made in adopting technology (Miao et al., 2021). Specifically, these volunteers utilize the LINE Official Account and other online channels to coordinate requests for assistance. This finding parallels observations from Denmark, where support during the COVID-19 outbreak was facilitated through existing social networks, underscoring their role in mobilizing individuals (Carlsen et al., 2021). In the UK, research indicates that the most common activities were purchasing food and providing emotional support (Mao et al., 2021). This aligns with the present study, which identified food and medicine as the primary support needs. Suggestions of further management-related crises in Thailand comprise using technology to leverage volunteer work, identify the actual needs of those requiring assistance, and provide support that effectively addresses those needs while minimizing redundant efforts from the government or other organizations.

However, this study presents several limitations. Firstly, only one-third of the distributed questionnaires were returned by those who had registered to seek assistance. Secondly, the questionnaire requested information about past experiences, potentially introducing recall bias and resulting in deviations from actual occurrences of help, medication use, and symptomatology. Lastly, the survey exclusively examines the assistance provided by a single group, potentially limiting its ability to offer a comprehensive overview of the broader context.

Conclusion and suggestions

In conclusion, this study emphasizes the critical support needs of COVID-19 patients within the Help Society network. The analysis of 120 participants from various regions of Thailand revealed distinct patterns of assistance, with medication requests being identified as the most urgent need during the COVID-19 crisis. Notably, herbal medicines emerged as the most used for self-treatment, reflecting a significant interest in traditional remedies. These findings underscore the importance of addressing diverse patient needs and integrating alternative treatments into healthcare strategies to improve outcomes for COVID-19 patients.

Suggestions for Future Research

Future study might focus on the long-term impacts of the given assistance, including post-recovery well-being and mental health outcomes. Furthermore, a thorough knowledge of pandemic dynamics might be achieved by investigating how socioeconomic variables impact support-seeking behavior and resource availability. Furthermore, learning about the experiences of healthcare practitioners and support networks in providing treatment to COVID-19 patients will provide a full view of the obstacles and overcomes in this critical undertaking.

New knowledge and the effects on society and communities

This study underscores the critical necessity of essential supplies, particularly survival food and medications, in the context of COVID-19 pandemic incidents due to their substantial demand. To enable individuals to effectively navigate the myriad challenges posed by the pandemic, response strategies must entail coordinated efforts that integrate both public and commercial entities, along with volunteer activities. This study distinguishes itself from previous research by focusing on the specific needs for assistance among individuals seeking help. Additionally, it identifies a significant difference between the prescribed medication and the medication actually used for COVID-19. The sustained involvement of the Help Society network, a group dedicated to supporting the Thai community during periods of crisis, stands out within this collaborative framework. This network serves as an exemplary instance of purposeful teamwork, mobilizing resources and expertise to alleviate the hardships faced by individuals and communities. It transcends immediate relief efforts, significantly contributing to the broader societal fabric by fostering solidarity and communal support.

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Examining the Factors Influencing Employee Retention and Loyalty in a Private Hospital in Bangkok, Thailand

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Abstract

Employee retention and loyalty are critical for operational efficiency and quality patient care in hospitals. This study investigates the key factors influencing these outcomes through Structural Equation Modeling (SEM) using survey data from 332 employees of a private hospital in Bangkok. The model examined compensation, dedication, engagement, leadership, teamwork, and career advancement. Results revealed dedication ($\beta = 0.62$, $p < 0.01$) and teamwork ($\beta = 0.83$, $p < 0.01$) as the strongest positive predictors of retention and loyalty, while career advancement showed a significant negative direct effect ($\beta = -0.66$, $p < 0.05$) when not supported by internal opportunities. Compensation positively influenced retention ($\beta = 0.27$, $p < 0.01$), and leadership, though beneficial for teamwork and career growth, had a small negative direct effect ($\beta = -0.05$). These findings suggest strategic actions such as enhancing leadership development, fostering collaborative cultures, aligning career pathways with internal opportunities, and offering competitive compensation packages. By implementing these targeted strategies, hospital administrators can reduce turnover, strengthen workforce commitment, and improve healthcare service delivery.

Keywords: Employee retention and loyalty, Structural equation modeling, Employee loyalty in hospital, Healthcare management, Employee satisfaction

Introduction

Employee retention and loyalty are critical for ensuring stability, efficiency, and high-quality care in healthcare institutions. Hospitals face persistent challenges in retaining skilled professionals due to high job demands, workplace stress, and competitive external opportunities (Talib Al Shuaili, 2025). Multiple organizational and individual factors—such as compensation, job satisfaction, leadership, organizational culture, career advancement, and work-life balance—shape employees' commitment and intent to remain (Yang, 2024).

Job satisfaction has a strong influence on retention and loyalty. Satisfied employees tend to remain committed and perform at higher levels, and in hospital settings, this satisfaction is shaped by fair compensation, opportunities for growth, supportive leadership, and a positive organizational culture (Putra et al., 2024). In Thailand, internal service quality and supportive workplace practices have been shown to enhance employee satisfaction and loyalty in hospital contexts, which in turn positively influence patient care and organizational performance (Srisorn, 2020; Tangthong et al., 2014). Retention strategies must address these elements in an integrated way rather than in isolation.

Hospitals operate in dynamic, high-pressure environments where high turnover increases recruitment costs, disrupts patient care, and diminishes operational efficiency (Sija, 2022). Previous research often focuses on single factors such as leadership or compensation, but fewer studies have examined how multiple organizational and psychological factors interact to influence retention in the healthcare sector (Putri & Renwarin, 2023). Thai healthcare sector also suggests that structured career pathways, particularly for nursing professionals, play a significant role in retention, though their effects may vary depending on workload and organizational culture (Rakhab et al., 2021). This highlights the need to understand contextual influences in hospital environments.

Despite extensive literature, there is a lack of comprehensive, empirical models in the hospital context that simultaneously assess the interplay between compensation, dedication, engagement, leadership, teamwork, and career advancement, and their impact on retention and loyalty. Existing studies often neglect mediating pathways (e.g., teamwork and career growth) and rarely differentiate between direct and indirect influences. However, prior studies in Thailand and internationally have largely examined these variables in isolation, often focusing on single constructs such as leadership or compensation. Few have developed multi-factor SEM models in hospital contexts that integrate organizational, interpersonal, and career-related dimensions into a single framework. Additionally, limited research has explored the mediating roles of teamwork and career advancement in shaping employee retention and loyalty within the healthcare sector. This study addresses that gap by applying an advanced inferential modeling approach to evaluate these relationships in a private hospital in Bangkok, offering novel, data-driven insights that can inform targeted human resource strategies in healthcare. While this study is grounded in the Thai private hospital context, the conceptual framework and findings may be transferable to other healthcare systems facing similar workforce challenges such as high turnover, resource constraints, and the need for sustainable retention strategies thereby enhancing the global applicability of the research and providing a foundation for cross-national comparisons.

Research Objectives

This study aims to examine the organizational and individual factors influencing employee retention and loyalty in a healthcare context. Specifically, the research is conducted in a private hospital in Bangkok, Thailand, targeting a broad range of hospital employees including nurses, nurse assistants, operational staff, and professional staff (e.g., laboratory technicians, pharmacists). The objectives are:

1. To identify and evaluate the direct effects of compensation, dedication, engagement, and leadership on employee retention and loyalty.
2. To analyze the mediating role of teamwork and career advancement in the relationship between key predictors and retention/loyalty.
3. To provide evidence-based recommendations for hospital administrators to improve retention and loyalty through strategic human resource management.

Literature review

Job satisfaction is a critical factor influencing employee retention and loyalty, particularly within the demanding environment of hospitals. High turnover rates in healthcare institutions lead to increased recruitment costs, reduced staff morale, and disruptions in patient care, making the understanding of factors influencing job satisfaction essential.

Several theoretical models explain job satisfaction, including Herzberg's motivation-hygiene theory (Michael & Giannis, 2022), Maslow's Hierarchy of Needs (Ghaleb, 2024), and the Job Demand-Resource (JD-R) model (Bakker & Demerouti, 2014). Herzberg's motivation-hygiene theory identified intrinsic motivators (e.g., achievement, recognition) and extrinsic hygiene factors (e.g., salary, work conditions) as key determinants of job satisfaction. The Job Demand-Resource (JD-R) model emphasizes the balance between job demands and available resources as crucial for employee well-being.

Factors Influencing Job Satisfaction

Compensation

Compensation, including financial rewards (e.g., salaries, bonuses, and benefits) and non-monetary rewards (e.g., recognition and professional development opportunities), plays a significant role in influencing employee retention (Mohamad & Siti, 2023). While some studies focus on financial compensation, the impact of intrinsic rewards on employee loyalty should not be neglected.

Engagement and Job Commitment

Employee engagement is another key factor influencing retention, with engaged employees demonstrating higher commitment, lower turnover intentions, and greater productivity (Rathaba & Naong, 2024). The psychological connection between employees and their work is particularly relevant in hospitals, where patient care requires continuous motivation and dedication.

Leadership

Leadership is widely recognized as a crucial factor in shaping workplace culture and employee satisfaction. Transformational leadership, which inspires and motivates employees, is linked to higher retention rates (Kothari, 2023). However, certain leadership styles, such as authoritarian or micromanaging approaches, may reduce job satisfaction and contribute to higher turnover (Putra et al., 2024).

Career Advancement

Opportunities for career growth and professional development are significant in retaining hospital employees. Human Capital Theory (Pasban & Nojedeh, 2016) emphasizes that investing in employee development leads to greater organizational commitment and reduced turnover. Employees who perceive clear career advancement prospects are more likely to remain loyal to their employers (Rathaba & Naong, 2024).

Teamwork

Effective teamwork fosters a positive work environment, improves job satisfaction, and enhances employee retention (Indasari et al., 2024). Hospitals require strong collaboration among healthcare professionals to ensure patient safety and operational efficiency.

Previous studies have often examined factors influencing retention in isolation, without analyzing their combined effects. For example, the role of leadership in retention remains unclear, with some studies reporting a positive impact while others suggest negative direct effects. Additionally, the mediating roles of factors like teamwork and career advancement in the relationship between leadership, engagement, and retention require further exploration. This study aims to address these gaps by employing Structural Equation Modeling (SEM) to examine the direct and indirect relationships between these key factors and job satisfaction in a hospital setting.

Conceptual Framework

The conceptual framework of this study, as illustrated in Figure 1, examines the relationships between key factors influencing employee retention and loyalty in hospital environments. It proposes that compensation, dedication, engagement, and leadership act as key predictors of teamwork and career advancement, which subsequently shape employee retention and loyalty. Specifically, compensation (H_{1a}, H_{1b}), which represents financial and non-financial rewards, is expected to positively impact teamwork and career advancement by fostering satisfaction and reducing workplace conflicts. Similarly, dedication (H_{2a}, H_{2b}), reflecting employees' commitment and effort toward their roles, is hypothesized to enhance collaboration within teams and opportunities for professional growth. In this model, teamwork and career advancement are specified as mediators influenced by compensation, dedication, engagement, and leadership, which subsequently affect retention & loyalty.

Moreover, engagement (H_{3a}, H_{3b}), defined as employees' psychological connection to their work, is proposed to strengthen teamwork and career advancement by promoting proactive participation and alignment with organizational goals. Leadership (H_{4a}, H_{4b}), encompassing effective management practices and organizational culture, is also expected to play a pivotal role in fostering a supportive environment conducive to teamwork and career progression. These intermediate outcomes—teamwork (H_5) and career advancement (H_6)—are posited to directly influence employees' loyalty and retention by enhancing their sense of belonging, satisfaction, and trust in the organization.

This framework is grounded in contemporary theories such as Herzberg's Two-Factor Theory (Alshmemri et al, 2017), which highlights the role of hygiene factors like compensation and motivators like career advancement. As further explored in recent research, this theory remains relevant in the public healthcare sector, emphasizing the impact of both hygiene and motivational factors on employee retention (Raj, 2024).

Building upon Human Capital Theory (Becker, 1964), the framework emphasizes investments in employee development as predictors of loyalty, aligning with findings from Rathaba and Naong (2024), who linked human capital development culture to enhanced staff retention through increased job satisfaction and commitment (Rathaba & Naong, 2024).

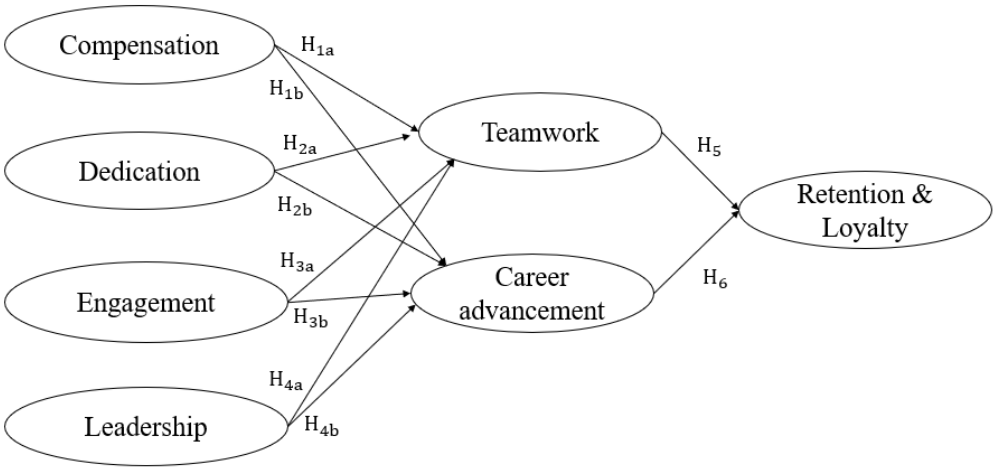

Figure 1 Concept Framework (Sources: Researcher, 2025)

Guided by the research objectives and supported by prior studies, the following hypotheses have been formulated:

H_{1a}***:*** Compensation has significantly impacted Teamwork.
H_{1b}***:*** Compensation has significantly impacted Career Advancement.
H_{2a}***:*** Dedication has significantly impacted Teamwork.
H_{2b}***:*** Dedication has significantly impacted Career Advancement.
H_{3a}***:*** Engagement has significantly impacted Teamwork.
H_{3b}***:*** Engagement has significantly impacted Career Advancement.
H_{4a}***:*** Leadership has significantly impacted Teamwork.
H_{4b}***:*** Leadership has significantly impacted Career Advancement.
H_5***:*** Teamwork, as a mediating variable, has significantly impacted Retention and Loyalty.
H_6***:*** Career advancement, as a mediating variable, has a significant effect on retention and loyalty.

Methodology

This study employed a quantitative research methodology to investigate the factors influencing employee retention and loyalty in a private hospital in Bangkok, Thailand. The analysis used survey responses from a cross-section of hospital employees, including nurses, nurse assistants, operational staff, and professional staff such as laboratory technicians, pharmacists, and allied health personnel. The data collected from the participants were analyzed using statistical techniques, including Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM), to test the formulated hypotheses.

Research Instrument

The primary research instrument used in this study was a questionnaire, specifically designed by the researchers to assess various factors influencing employee retention and loyalty. The questionnaire comprised seven sections with a total of 30 items. The first section focused on collecting demographic information, including gender, age, education level, job position, years of service, and work schedule (i.e., normal working hours or rotating shifts). The remaining sections measured key constructs including compensation, dedication, engagement, leadership, teamwork, career advancement, and retention and loyalty using

Likert-scale items adapted from validated employee engagement and organizational commitment measures, refined for the hospital context. For example, dedication reflected sustained effort, pride, and willingness to exceed job requirements; compensation measured perceived fairness of pay and benefits; leadership assessed clarity, fairness, and supervisor support; teamwork evaluated collaboration and mutual help; career advancement examined growth and promotion opportunities; and retention/loyalty measured intent to remain and commitment to the hospital.

Validation of the Research Instrument

To ensure the validity and reliability of the questionnaire, the researchers conducted a content validity assessment using the Index of Objective Congruence (IOC), reviewed by three experts in the field. The experts evaluated the clarity and relevance of each item, ensuring that they accurately measured the intended constructs. Following this validation process, a pilot test was conducted with 50 participants who met the study's eligibility criteria. The internal consistency reliability of the questionnaire was then assessed using Cronbach's Alpha. The results demonstrated high reliability across all constructs, with Cronbach's Alpha values exceeding 0.87 for all factors. This indicates a strong internal consistency of the measurement tool, ensuring that the questionnaire was suitable for full-scale data collection.

Population and Sample Size

The study used a purposive sampling technique, selecting participants from the hospital staff roster to ensure representation across job roles. Out of the hospital's eligible workforce, 332 employees completed the survey, meeting the recommended sample size for Structural Equation Modeling (SEM) (generally >200 cases).

Data collection and analysis

Data collection was conducted using an online questionnaire, with the link distributed to all eligible hospital employees through the internal communication system. To mitigate potential bias and ensure data completeness, participation was made voluntary and anonymous, with no incentives offered to prevent undue influence. After the data was collected, descriptive statistical analyses were performed to summarize the demographic characteristics and response distributions.

To test the research hypotheses, AMOS software was employed to conduct Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). CFA was used to assess the validity of the measurement model, evaluating factors such as standardized loadings, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha for each construct. SEM was then applied to examine the relationships among the variables, testing the direct and indirect effects of compensation, dedication, engagement, leadership, teamwork, and career advancement on employee retention and loyalty.

The results of the reliability and validity tests, including standardized factor loadings, AVE, CR, and Cronbach's Alpha, confirmed the robustness of the measurement model. Each construct met the required statistical thresholds, ensuring that the findings were based on a well-validated and reliable instrument. These analyses provided empirical insights into the factors that significantly influence employee retention and loyalty in the hospital setting.

Results

Demographic information

The demographic characteristics of the respondents are presented in Table 1. A total of 332 employees participated in the study, with 262 females (78.9%) and 70 males (21.1%). The majority of respondents (37.0%) were aged 25-35 years, followed by those under 25 years old (24.4%). The highest level of education attained by most participants was a bachelor's degree (53.3%), while 29.5% had completed secondary education.

Regarding job roles, 39.5% of respondents were operational staff, followed by nurse assistants (21.4%) and nurses (20.2%). Employees had varying levels of work experience, with 36.4% having worked between 1-5 years and 19.9% having less than one year of experience. The majority of employees (56.3%) worked regular hours, while 43.7% worked rotating shifts.

Table 1 Demographic information

Demographic variable	Category	Frequency	Percentage
Gender	Male	70	21.1%
	Female	262	78.9%
Age	< 25 years old	81	24.4%
	25-35 years old	123	37.0%
	36-45	54	16.3%
	46-55	38	11.4%
	> 56 years old	36	10.8%
Education	Primary	10	3.0%
	Secondary	98	29.5%
	Vocational Certificate	39	11.8%
	Bachelor's Degree	177	53.3%
	Master's Degree	8	2.4%
Position	Manager/Supervisor	16	4.8%
	Operational Staff	131	39.5%
	Nurse	67	20.2%
	Nurse Assistant	71	21.4%
	Professional Staff (LAB/X-ray/PT/Pharmacy)	27	8.1%
	Professional Staff Assistant	20	6.0%
Work experience	< 1 year	66	19.90%
	1-5 years	121	36.40%
	6-10 years	65	19.60%
	11-15 years	14	4.20%
	16-20 years	14	4.20%
	21- 25 years	9	2.70%
	> 25 years	43	13.00%
Working Hours	Regular Working Hours	187	56.30%
	Shift Work (Morning-Afternoon-Night)	145	43.70%

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was conducted to validate the measurement model, ensuring that the constructs were accurately represented. Table 2 presents the standardized factor loadings, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha for each construct. The results confirmed strong reliability and validity, as all factor loadings exceeded 0.60, AVE values were above the acceptable threshold of 0.50, and CR values exceeded 0.70, demonstrating internal consistency. The Cronbach's Alpha values ranged from 0.87 to 0.95, indicating a high level of reliability across all constructs.

Table 2 Standard loading, AVE, CR, and Cronbach's alpha of each construct

Construct	Std. loading of each item	AVE >0.50	CR >0.70	Cronbach's α
1. Compensation	0.93, 0.88, 0.83, 0.84	0.76	0.93	0.94
2. Dedication	0.89, 0.85, 0.90, 0.85	0.76	0.93	0.93
3. Engagement	0.82, 0.95, 0.85, 0.71	0.70	0.90	0.91
4. Leadership	0.91, 0.60, 0.91, 0.97, 0.95	0.77	0.94	0.94
5. Teamwork	0.69, 0.82, 0.87, 0.90	0.68	0.89	0.90
6. Career adv**.**	0.63, 0.89, 0.87, 0.84, 0.77	0.57	0.88	0.87
7. Retention & Loyalty	0.93, 0.96, 0.92	0.88	0.95	0.95

The model fit indices in Table 3. further supported the adequacy of the measurement model, with Goodness-of-Fit Index (GFI) values above 0.90, Comparative Fit Index (CFI) values exceeding 0.90, and Root Mean Square Error of Approximation (RMSEA) values below 0.08, indicating a well-fitting model.

Table 3 Index of Item Objective Congruence values according to Confirmatory Factor Analysis criteria

Variable	χ^2/df **<4.00**	p-value **>0.05**	GFI **>0.90**	AGFI **>0.90**	CFI **>0.90**	TLI **>0.90**	RMSEA **<0.08**
1**.** Compensation	0.73	0.39	0.99	0.98	1.00	1.00	0.00
2**.** Dedication	2.65	0.10	0.99	0.96	0.99	0.99	0.07
3**.** Engagement	0.50	0.47	0.99	0.99	1.00	1.00	0.00
4**.** Leadership	1.56	0.18	0.99	0.97	0.99	0.99	0.04
5**.** Teamwork	0.64	0.42	0.99	0.99	1.00	1.00	0.00
6**.** Career adv**.**	2.22	0.06	0.99	0.99	0.99	0.98	0.06
7**.** Retention & Loyalty	20.4	0.069	0.99	0.99	0.99	0.99	0.05

Analysis of Correlation Coefficients

To assess the relationships between the key variables, a correlation analysis was conducted. The correlation coefficients presented in Table 4 indicate that all constructs were significantly correlated at $p < 0.01$. The highest correlation was observed between dedication and Retention & loyalty ($r = 0.86$), followed by teamwork and Retention &loyalty ($r = 0.83$), suggesting that higher levels of teamwork and dedication are strongly associated with greater employee loyalty.

Other notable correlations include compensation and teamwork (r = 0.82), career advancement and engagement (r = 0.79), and leadership and teamwork (r = 0.62). These findings provide initial support for the hypothesized relationships tested in the Structural Equation Modeling (SEM) analysis.

Table 4 Correlation Coefficient

Variables	1	2	3	4	5	6	7
1. Compensation	**0.88**						
2. Dedication	0.77**	**0.88**					
3. Engagement	0.74**	0.72**	**0.84**				
4. Leadership	0.67**	0.51**	0.61**	**0.88**			
5. Teamwork	0.82**	0.84**	0.76**	0.62**	**0.82**		
6. Career adv.	0.77**	0.70**	0.79**	0.65**	0.76**	**0.76**	
7. Retention & Loyalty	0.77**	0.86**	0.68**	0.51**	0.83**	0.70**	**0.94**
VIF	**4.18**	**3.45**	**3.46**	**2.09**	**3.71**	**4.34**	**-**

** = p ≤ 0.01 (2-tailed)

Structural Equation Modeling (SEM)

The Structural Equation Modeling (SEM) analysis, as depicted in Figure 2, illustrates both direct and indirect relationships among predictors (compensation, dedication, engagement, leadership), mediators (teamwork, career advancement), and the outcome variable (retention and loyalty). Standardized coefficients are shown on the paths, indicating the strength and direction of each relationship.

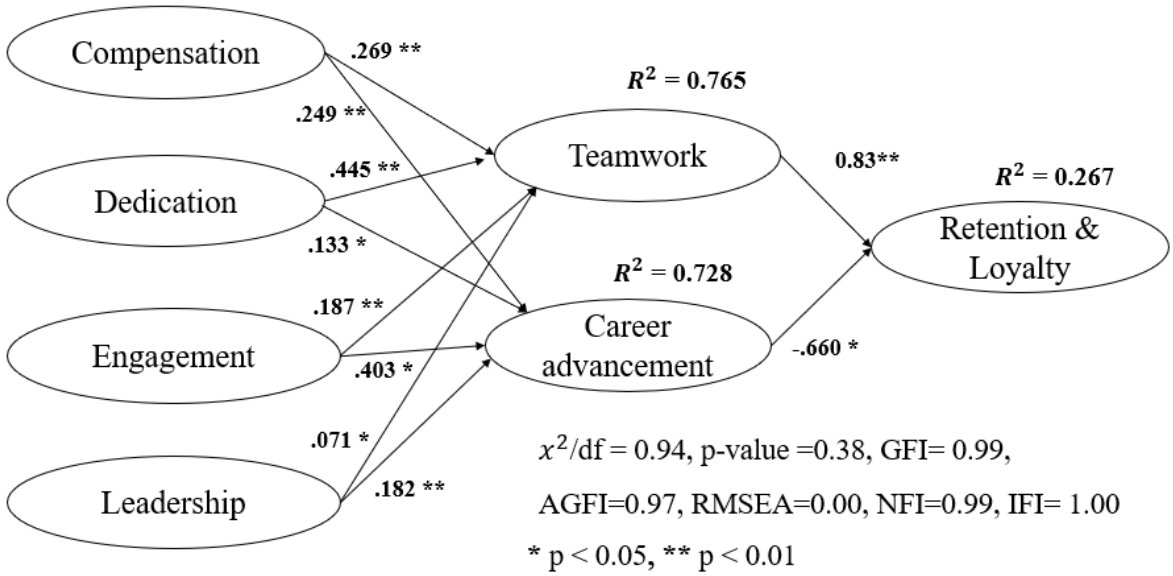

Figure 2 SEM Path Diagram of Factors Influencing Employee Retention and Loyalty (Sources: Researcher, 2025)

Table 5 presents the direct, indirect, and total effects of exogenous variables on employee retention and loyalty. Dedication had the strongest positive impact on teamwork (β = 0.44) and loyalty (β = 0.62). Compensation significantly influenced teamwork (β = 0.26) and career advancement (β = 0.24), while engagement positively affected career advancement (β = 0.40). Leadership showed modest positive effects on teamwork (β = 0.07) and career advancement (β = 0.18), but a small negative direct effect on retention and loyalty (β = –0.05), suggesting that certain leadership styles may reduce satisfaction unless their influence is

channeled through mediators. Teamwork (mediator) strongly enhanced retention and loyalty ($\beta = 0.83$, $p < 0.01$), highlighting the value of collaboration. Conversely, career advancement (mediator) had a significant negative direct effect ($\beta = -0.66$, $p < 0.05$), indicating that without sufficient internal opportunities, focus on advancement can increase turnover risk.

The analysis of the structural model provides support for several hypotheses:

H_1: Compensation → Retention & Loyalty. The SEM analysis revealed a significant positive relationship ($\beta = 0.27$, $p < 0.01$). Higher compensation levels are associated with greater employee commitment and reduced turnover intentions.

H_2: Dedication → Retention & Loyalty. A significant positive effect was found ($\beta = 0.62$, $p < 0.01$). Dedicated employees exhibit stronger loyalty to the organization.

H_3: Engagement → Retention & Loyalty. Although the effect was positive, it was not statistically significant ($\beta = 0.03$). Engagement may contribute indirectly to loyalty through other factors but does not exert a direct influence.

H_4: Leadership → Retention & Loyalty. Leadership demonstrated a small negative and non-significant direct effect ($\beta = -0.05$). While leadership positively influenced teamwork and career advancement, its direct effect on retention and loyalty was slightly negative and insignificant. This may reflect contextual factors such as performance pressures or leadership approaches that, without adequate support, could diminish long-term loyalty.

H_5: Teamwork (Mediator) → Retention & Loyalty. Teamwork had a strong positive effect ($\beta = 0.83$, $p < 0.01$). Collaborative environments foster commitment, as employees rely on colleagues during high- demand periods. Consistent with prior studies, dependable collaboration helps manage workloads and strengthens loyalty. In this study, cohesive interdepartmental support and mutual respect were linked to a greater willingness to remain with the organization.

H6: Career Advancement (Mediator) → Retention & Loyalty. A significant negative direct effect ($\beta = -0.66$, $p < 0.05$) suggests that pursuing advancement without sufficient internal opportunities may raise turnover risk. However, training, clear promotion pathways, and skills development were positively linked to loyalty. In healthcare, where continuous learning is vital, perceived investment in professional growth can offset heavy workloads and reinforce long-term commitment.

Beyond the Variance Inflation Factor (VIF) checks, tolerance values and condition indices were examined. All predictors exhibited tolerance values well above the 0.10 threshold and condition indices below 30, confirming the absence of multicollinearity. These diagnostics strengthen the robustness and credibility of the SEM results.

Table 5 Direct, Indirect, and Total Effects of Exogenous Latent Variables on Job Satisfaction Factors

Exogenous Latent Variables	Unobserved Variables								
	Teamwork			Career adv.			Retention & Loyalty		
	DE	IE	TE	DE	IE	TE	DE	IE	TE
1. Compensation	0.26**	0.00	0.25**	0.24**	0.00	0.24**	0.00	0.27**	0.27**
2. Dedication	0.44**	0.00	0.44**	0.13*	0.00	0.13*	0.00	0.62**	0.62**
3. Engagement	0.18**	0.00	0.18**	0.40**	0.00	0.40**	0.00	0.03	0.03
4. Leadership	0.07*	0.00	0.07*	0.18**	0.00	0.18**	0.00	-0.05	-0.05
5. Teamwork	0.00	0.00	0.00	0.00	0.00	0.00	0.83**	0.00	0.83**
6. Career adv.	0.00	0.00	0.00	0.00	0.00	0.00	-0.66*	0.00	-0.66*

Note: **p<0.001, *p<0.05, DE = direct effect, IE = indirect effect, TE = total effect

Discussions

Career advancement showed a negative link with loyalty, contrary to expectations. Equity Theory and Social Exchange Theory suggest that in this hospital context, advancement may be perceived as scarce, competitive, and associated with heavier workloads without added autonomy or support, reducing commitment. The study's limitations include its cross-sectional design, which restricts causal inference, and reliance on self- reported data, which may introduce bias. Future research should employ longitudinal or mixed- method designs and incorporate objective performance data to improve validity. Overall, loyalty is shaped by compensation, dedication, engagement, teamwork, and perceptions of career advancement. While teamwork fosters loyalty, poorly managed advancement opportunities can have unintended negative effects. Hospital administrators should enhance leadership programs that promote supportive supervision, transparency, and fair promotion criteria; ensure advancement opportunities are tied to skill growth, manageable workloads, and work–life balance; foster collaborative teamwork through cross- functional care teams and peer support; and regularly monitor employee perceptions of advancement to address potential drawbacks.

Conclusion and suggestions

This study investigated the factors influencing employee retention and loyalty in a hospital setting using Structural Equation Modeling (SEM) . The results highlight the significant role of compensation, dedication, engagement, leadership, teamwork, and career advancement in shaping employee loyalty. Dedication emerged as the most influential predictor, reinforcing the importance of fostering a committed workforce. While leadership positively impacted teamwork and career growth, its direct effect on loyalty was unexpectedly negative, suggesting the need for further exploration of leadership styles in hospital environments.

Overall, the model demonstrated strong reliability and validity, with fit indices indicating a well- fitting model. The findings contribute to the growing body of research on employee retention strategies and provide practical implications for hospital administrators seeking to enhance workforce stability and organizational commitment.

Future research should further explore the role of leadership styles in shaping employee loyalty. Given the unexpected negative direct effect of leadership on retention and loyalty observed in this study, it is essential to distinguish between different leadership styles—such as transformational, transactional, and servant leadership—to identify which approaches are most effective in hospital settings. Transformational leadership, which focuses on inspiring and motivating employees through vision and personal influence, may foster higher engagement and commitment. In contrast, transactional leadership, which is based on structured tasks, rewards, and punishments, might not be as effective in environments where intrinsic motivation plays a crucial role. Servant leadership, which prioritizes employee well-being and development, could be particularly relevant in healthcare settings, where compassionate leadership is essential for staff morale. Future studies should also examine the mediating effects of teamwork and career advancement, as these factors may explain the indirect pathways through which leadership and engagement influence employee retention. A deeper understanding of these relationships could help organizations design more targeted interventions to enhance workplace satisfaction and commitment.

Since this study focused on a private hospital in Bangkok, expanding the research to include a wider range of healthcare settings— such as public hospitals, rural clinics, and

international institutions—would improve the generalizability of the findings and provide a more comprehensive understanding of employee retention and loyalty.

Finally, incorporating qualitative methods, such as interviews or focus groups, could offer deeper insights into employee experiences and perceptions. While quantitative analysis provides statistical validation of retention factors, qualitative approaches can capture nuanced perspectives, offering a richer interpretation of the challenges and motivations that influence employees' decisions to stay or leave. By addressing these areas, future research can contribute to a more holistic understanding of employee retention and inform more effective human resource strategies in the healthcare sector.

New knowledge and the effects on society and communities

This study contributes to the growing body of knowledge on employee retention and loyalty, particularly in the hospital sector, by utilizing Structural Equation Modeling (SEM) to identify key determinants influencing workforce stability. Unlike previous research that often focused on isolated factors, this study provides a comprehensive, data-driven analysis of the interconnected relationships among job satisfaction, organizational commitment, leadership style, work environment, and compensation. By highlighting both direct and indirect influences on employee retention, this research offers a nuanced understanding of how hospital administrators can create a more sustainable workforce.

The findings have significant implications for society and local communities. High employee turnover in hospitals can lead to staff shortages, increased workload for remaining employees, and potential declines in patient care quality. By implementing strategies that improve employee satisfaction and loyalty, hospitals can enhance service efficiency, reduce burnout, and ensure better health outcomes for the communities they serve. Moreover, retaining skilled healthcare professionals fosters a sense of trust and continuity in patient care, which is particularly critical in underserved and rural areas where medical resources are already scarce. Additionally, this research has policy implications. Healthcare policymakers can use these insights to develop workforce retention policies, allocate resources effectively, and design training programs that promote employee well-being. By addressing the core factors that influence hospital workforce stability, this study provides actionable recommendations that can positively impact both healthcare institutions and the broader society.

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Community and Social Development Journal : CSDJ

Formerly khows as Rajabhat Chiang Mai Research Journal
is a Journal to support academic work for Community and Social Development

Aim and scope to publish articles that are beneficial to society or locality in Social Sciences & Humanities, with 5 sub-subject. 1) General Social Sciences 2) Development 3) Education 4) Political Science and International Relations 5) General Business, Management and Accounting, which can be shown that it is able to solve problems or improve society, community and locality. Moreover, it clearly brings benefits, or changing in awareness and perception of problems and solutions of community and locality, with research elements that indicate the spatial change condition of community and society. It is the participatory research and accepted by society. It is the research that uses knowledge or proficiency, which transforming in the better way, or it can be anticipated. Evaluate changing results and propose guidelines for social development, community and local to be sustainable.

Publication Frequency: Issued 3 editions per year:
Issued 1 : January - April
Issued 2 : May - August
Issued 3 : September - December

Types of Articles :
Research Articles: Present a brief report on a specific research result or a major problem. Social Sciences, Business, Management and Accounting Each article must clearly present the research question, detailed methodology, study content, results, discussion, conclusion and suggestions, new knowledge and the effects on society and communities.

Language : English

Publication fees :
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Change of journal name

Community and Social Development Journal : CSDJ (Formerly khows as : Rajabhat Chiang Mai Research Journal)

Name of the journal (new): Community and Social Development Journal

ISSN 3027-7493 (Online)

ISSN 3027-7485 (Print)

From Vol 25 No 1 January - April 2024 onwards.

Name of the journal (formerly): Rajabhat Chiang Mai Research Journal

ISSN 2651-2068 (Online)

ISSN 1513-8410 (Print)

From Vol 1 No 1 1999 - Vol 24 No 3 2023

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Journal template / research articles

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Methodology: Text (Times New Roman, 12 pt, Tab 0.8 cm)

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8. Articles that related to human or animal research. Should be considered by the Ethics Committee (if any). The proof of certification must be attached with the article, which sent to the editor. If there is a complaint about an ethical infringement, and the editors had considered, that there is a real infringement. The author of the article must cancel the article.
9. The articles are published in " Community and Social Development Journal : CSDJ *Formerly khows as* Chiang Mai Rajabhat Research Journal" is owned proprietary right of Community and Social Development Journal : CSDJ.

Role of the editorial team

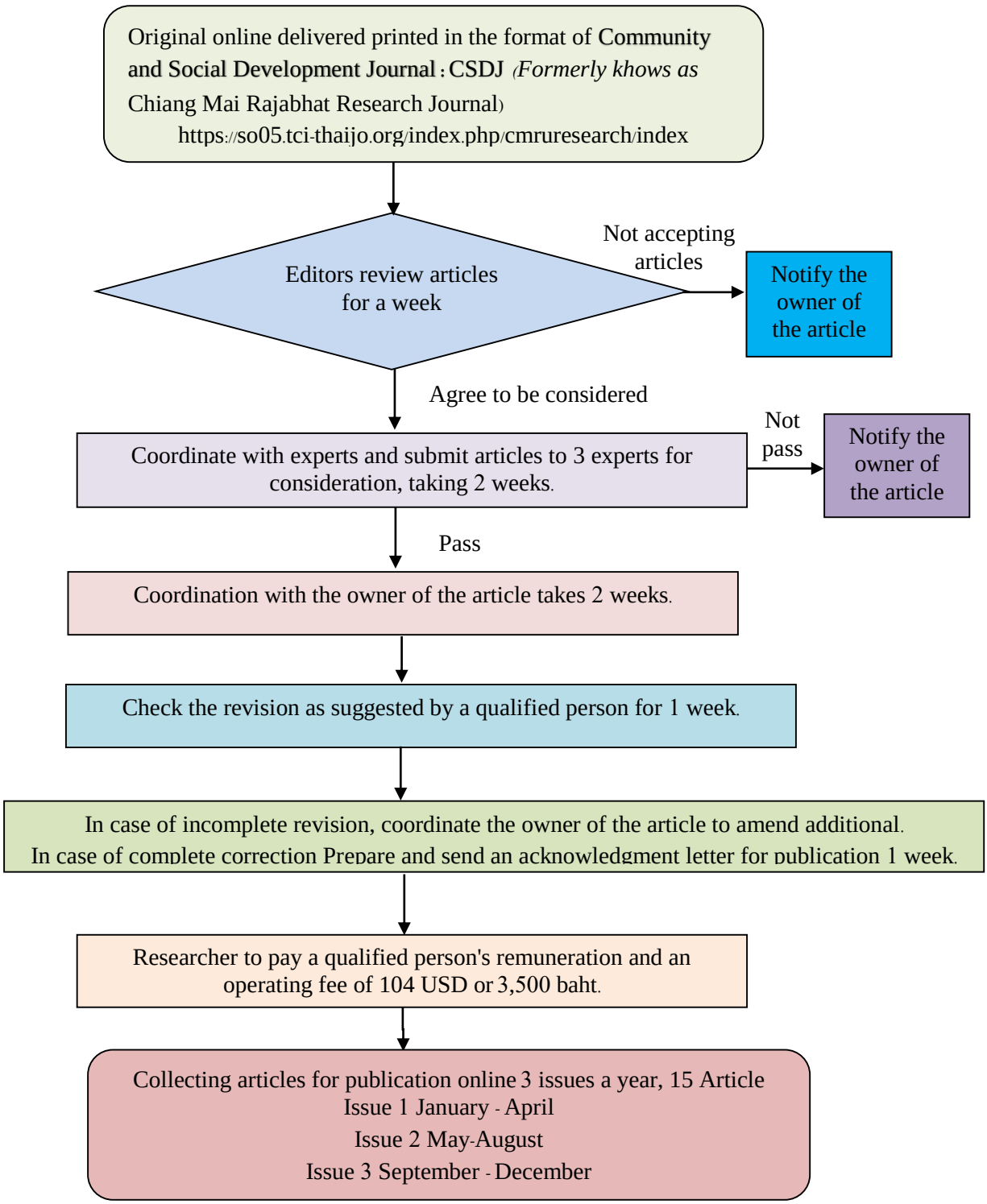
1. Journal consultants are responsible for the considering policy recommendations in operation for the Community and Social Development Journal : CSDJ *(Formerly khows as* Chiang Mai Rajabhat Research Journal).
2. Journal editor is the center and the main editor for considering and reviewing articles. Consider consistency of the article content with the aims and scopes of the journal. Including review and assessment quality of the articles before publication.
3. A journal editor is a group of people who act as a working group of editors. Responsible for considering and reviewing articles. Consider the consistency of the article content with the aims and scopes of the journal. Including review and assessment quality of the articles quality before publication.
4. Editorial's responsibilities to the authors of the articles and assessors
   4.1 Do not disclose the information of the authors of the article and reviewers to anyone else.
   4.2 Review and reject the publication of articles previously published elsewhere.
   4.3 Required using the principles of considering articles based on academic reasons, and there must not be bias to the authors of the articles and the articles that considered in any case.
   4.4 There must not have interests with the authors or reviewers. Either for business advantages, or for their own academic articles or other advantages.
   4.5 Check plagiarism of other people's academic work in the article. If plagiarism is detected, the article review process must be stopped, and contact the author of the article for clarification. To accept or reject the publication of the article.
   4.6 Check the journal article assessment process as a secret. It is fair and without bias.
   4.7 Published articles that passed the assessment process from the article reviewers only.
   4.8 The article contents and evaluation results of the article reviewers must not be modified or changed.
   4.9 The processes and procedures of the journal must be strictly followed.

Roles of the reviewers

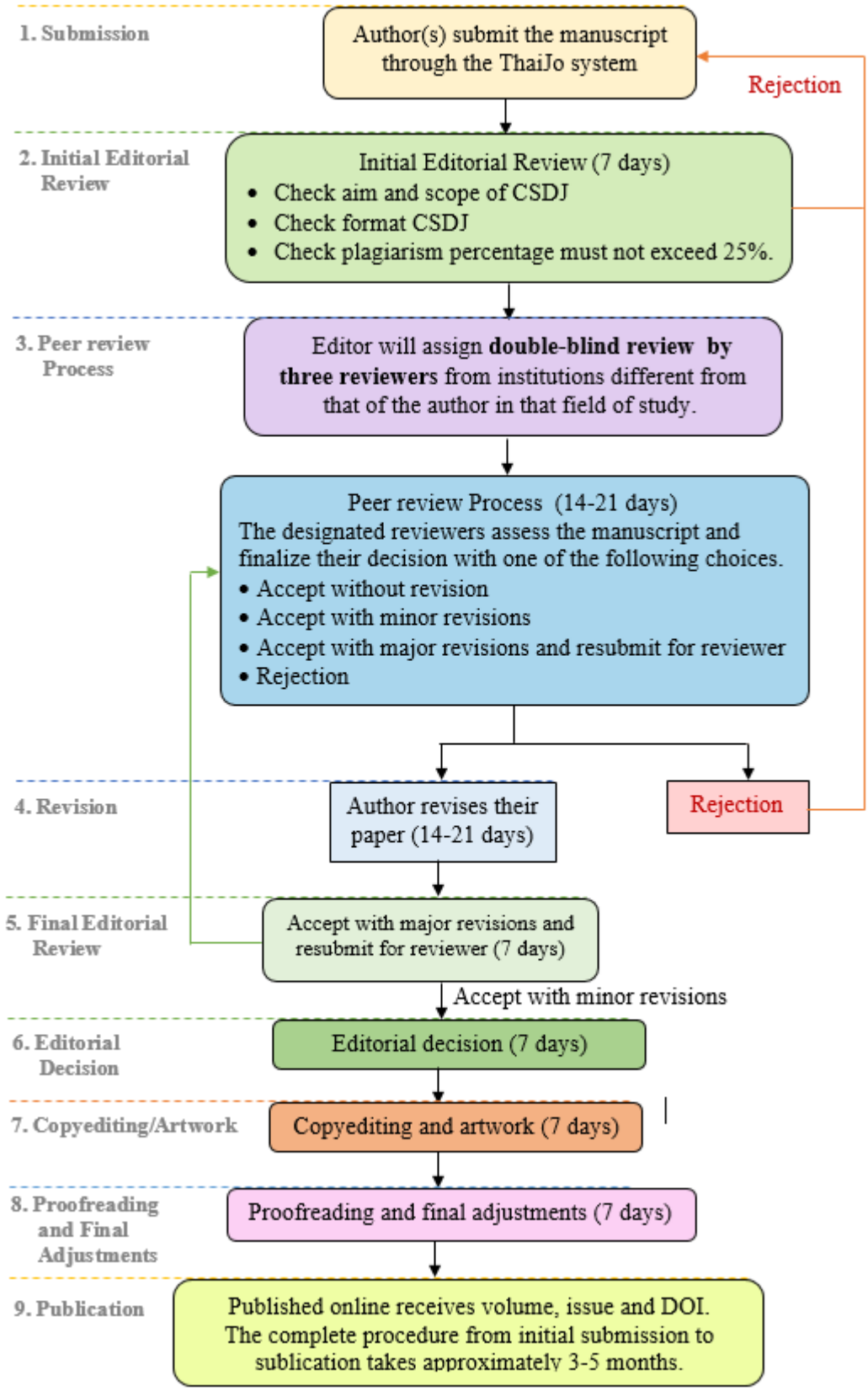
1. The article reviewers must not have interests with the author of the article.
2. The article reviewers must maintain confidentiality, and do not disclosed the information of the article to unrelated persons during the assessment of the article
3. Must not seek the advantages from the articles they had reviewed.
4. They must realize that they are an expert, knowledgeable and understanding of the content of the article being evaluated.
5. If an article is found to be similar or duplicate, article copying other work. The reviewers must immediately notify the editor of the journal with clear evidence.

   The article reviewers must maintain an evaluation period. According to the assessment time frame set by the journal.

Process for submitting articles for publication in Community and Social Development Journal : CSDJ *(Formerly khows as* Chiang Mai Rajabhat Research Journal)



Peer Review Process



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