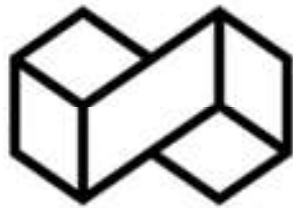


Vol. 21 No.3 May - June 2026



Interdisciplinary Research Review

ISSN 2697-536X (Online)

Interdisciplinary Research Review

Editorial Board of Interdisciplinary Research Review

Yongyudh Vajradul	(Editor)
Pranom Othaganont	(Deputy Editor)
Areerat Suputtitada	(Editorial Board)
Prabhas Chongstitvatana	(Editorial Board)
Kanchana Boonsong	(Editorial Board)
Tuantan Kitpaisalsakul	(Editorial Board)
Sayam Aroonsrimorakot	(Editorial Board)
Narumol Chumang	(Editorial Board)
Artcha Boongrapu	(Editorial Board)
Prasutr Thawornchaisit	(Editorial Board)
Orapun Metadilokkul	(Editorial Board)
Pornpip Andhivarothai	(Editorial Board)
Piyaporn Pitaktunsakul	(Editorial Board)
Ruja Sukpat	(Editorial Board)
Phatcharasak Arlai	(Editorial Board and Secretary)
Chatsanunkorn Boonma	(Assistant Manager)

International Editorial Board of Interdisciplinary Research Review

Muhammad Yunus	(Editorial Board)
Manfred Koch	(Editorial Board)
Jun Yu	(Editorial Board)
Tou Teck Yong	(Editorial Board)
Lance Chun Che Fung	(Editorial Board)
Warren Y. Brockelman	(Editorial Board)
Manfred Hartard	(Editorial Board)

Administrative Committees of Journal

Yongyudh Vajradul	(Committee)
Pranom Othaganon	(Committee)
Phatcharasak Arlai	(Committee and Secretary)

Publisher : Editorial Office of Interdisciplinary Research Review, Interdisciplinary Committee for Research and Development, the Royal Society of Thailand

Origin : The Interdisciplinary Research Review was established with the cooperation of four institutes:

1. The Royal Society of Thailand Committee of Interdisciplinary Research and Development
2. Phetchaburi Rajabhat University
3. Interdisciplinary Research Foundation
4. Kanchanaburi Rajabhat University

Objectives of journal

1. To encourage and publish knowledge and useful opinions in any field of study
2. To support academicians and teachers in creating work beneficial to the academic community
3. To stimulate and support education at the university level

Policies of the journal :

The Interdisciplinary Research Review (IRR) publishes six issues per year. All submitted articles are subject to peer review, and must be approved by two experts in the relevant field prior to acceptance. Prior to review, all articles must pass a screening process which evaluates the articles' appropriateness for the journal, originality, proper formatting, and English proficiency. All material in each article that is not original must be properly referenced to the published literature. The editors reserve the right to modify articles in the interests of clarity and proper English usage. The opinions and views expressed in the journal are those of the authors of the respective articles and not those of the editors or publisher.

Submission of articles :

Articles should be submitted on-line at <https://www.tci-thaijo.org/index.php/jtir>. The website contains full instructions about how to prepare and submit articles. Please contact the journal or editors for information at irr@npru.ac.th, or by phone at +66 3426 1053, or +66 3410 9300 ext. 3909.

Contents

Volume 21, No. 3, May – June 2026

	Page
Teachers' Perceptions on the Implementation of Executive Order No. 570: Institutionalizing Peace Education in Selected Public Secondary Schools in Bataan Bryan M. Floro	1
Strategic Promotion of School Curriculum Development in Educational Innovation and Creative City of Gastronomy: The Strategic Role of the Deputy Director of Phetchaburi Secondary Educational Service Area Office Nuttinun Pramsung	12
Development of a Model for Preventing Unintended and Low-Quality Pregnancy among In-School Adolescents in Phetchaburi Province, Thailand Phasit Sirited, Prakairat Tunit, Waratta Hemtong, Kulkamol Vannasri, Bunliang Suphim, Surasingha Sombat Suranartwatchawong and Chirawut Punyawit	20
Introduction to Environmental Law of Thailand: Barriers in the Effective Implementation and Enforcement Sayam Aroonsrimorakot, Prasert Limprasert, Worapote Thanomkul, Pramuanlert Achariyapanyakul, Poom Chokmoh, Anong Hambananda and Rattapol Sornprasert	31
A System-Based Framework for Enhancing Human Research Ethics Governance in Higher Education: Evidence from Phetchaburi Rajabhat University, Thailand Chananut Ngerntong	39

Editorial Note

The Interdisciplinary Research Review (IRR) was established with academic cooperation by The Royal Society of Thailand Committee of Interdisciplinary Research and Development, Rajabhat University (Western Group), and Rajamangala University of Technology Rattanakosin. This Issue, Volume 21, No. 3, May – June 2026. This issue contains of five interesting articles in multidisciplinary fields: (1) Teachers' Perceptions on the Implementation of Executive Order No. 570: Institutionalizing Peace Education in Selected Public Secondary Schools in Bataan,(2) Strategic Promotion of School Curriculum Development in Educational Innovation and Creative City of Gastronomy: The Strategic Role of the Deputy Director of Phetchaburi Secondary Educational Service Area Office ,(3)Development of a Model for Preventing Unintended and Low-Quality Pregnancy among In-School Adolescents in Phetchaburi Province, Thailand, (4) Introduction to Environmental Law of Thailand: Barriers in the Effective Implementation and Enforcement ,(5) A System-Based Framework for Enhancing Human Research Ethics Governance in Higher Education: Evidence from Phetchaburi Rajabhat University, Thailand.

The Editorial Board of the IRR encourages anyone to submit articles for evaluation and review. The processes of submission, review and publication of articles are described on the journal's website, <https://www.tci-thaijo.org/index.php/jtir>. The Editorial Board and Committees of the IRR sincerely thank all peer reviewers who have sacrificed their time to help us produce a better journal, and also wish to thank all teachers, researchers and other academicians for submitting their valuable research to this journal. Finally, we thank readers of our journal who help to spread the knowledge and benefits gained to others. With your feedback and suggestions, we will strive to improve the quality and relevance of the IRR.

Yongyudh Vajaradul
Editor
Interdisciplinary Research Review



Teachers' Perceptions on the Implementation of Executive Order No. 570: Institutionalizing Peace Education in Selected Public Secondary Schools in Bataan

Bryan M. Floro^{1*}

¹Bataan Peninsula State University

Abstract

Peace education is an important strategy for promoting nonviolent conflict resolution and building a culture of peace in society. In the Philippines, Executive Order No. 570 institutionalizes peace education in basic and teacher education to support this goal. This study assessed the implementation of Executive Order No. 570 in selected public secondary schools in Bataan Province based on teachers' perceptions of school policies and programs related to peace education. The study employed a descriptive quantitative research design using a survey questionnaire based on the five components of EO 570. The respondents of the study were public secondary school teachers selected through purposive sampling. The research instrument used was a structured survey questionnaire adapted from the five components of EO 570. Data were analyzed using descriptive statistics, specifically weighted mean, standard deviation, frequency, and percentage. The findings revealed a generally low level of implementation across all five components, including planning and capacity building, resource mobilization, programs and materials development, information and communication initiatives, and monitoring and evaluation. Results indicate limited institutional planning, inadequate teacher training, weak stakeholder engagement, and insufficient monitoring mechanisms. The study recommends strengthening administrative commitment, enhancing teacher training, improving resource support, and establishing systematic monitoring and evaluation to effectively institutionalize peace education in schools.

Keywords: Institutionalizing Peace Education, Executive Order No. 570

Article history: Received 2 March 2026, Revised 26 May 2026, Accepted 9 June 2026

1. Introduction

The Philippines is among the developing nations in Asia that continue to grapple with the long-term challenges of achieving enduring peace. The nation has had a history of revolutionary movements against Western imperialism, internal insurgencies against class exploitation, and criminality. Armed conflict-related violence in rural communities has interfered with the government's provision of basic social services, backward economic growth, and aggravated abject poverty [1]. The underlying origins of insurgencies have strong roots in problems of class struggle, poverty, economic need, and political exclusion. Despite various peace negotiations and government attempts at the

cessation of local insurgencies, peace hope is far from coming into being because of irreconcilable differences and the agendas of leftist groups such as the CPP-NPA. In 2006, the Philippine government changed its strategy from merely seeking peace talks with insurgents to institutionalizing peace education in all government agencies. The government issued Executive Order No. 570, also popularly referred to as Institutionalizing Peace Education in Basic and Teacher Education [2]. Through this executive order, the government acknowledged the crucial role of education in building a culture of peace. Executive Order No. 570 requires the education system to incorporate peace education in the curriculum, upholding non-violent conflict resolution, respect, and tolerance of diversity. Philippine

*Corresponding author; e-mail: bmflo@bpsu.edu.ph

government policy, as pursued through the Department of Education, stresses empowering stakeholders in the education sector as peace and understanding advocates within their respective local communities. Nevertheless, its application to peace education programs within public schools has been plagued with numerous challenges, such as inadequate teacher training, insufficient institutional and funding support, and inefficient learning resources and materials. In addition, the socio-cultural, socio-economic, and socio-political diversity of schools implies that every school has its own set of local conflicts and violence. This diversity demands a custom-designed intervention responsive to the unique conditions of each school to effectively, significantly, and context-sensitively implement peace education programs [3]. It is critical to evaluate the policies and programs pertinent to peace education to establish gaps and areas for improvement. Evaluation of school policies and programs consonant with the ideals of the national government is critical to grasping the current situation of peace education programs at the school level [4].

Despite the existence of policies and prior studies on peace education, there is a lack of localized empirical evidence assessing how Executive Order No. 570 is actually implemented in specific public secondary schools, particularly in Bataan Province, and how teachers perceive its effectiveness in practice. This assessment helps determine their effectiveness and identify the challenges and gaps that hinder the full realization of the implementation of peace education in schools [5]. This research intends to evaluate the programs and policies of some public secondary schools in Bataan that give an overview of the achievements and challenges encountered in the implementation of Executive Order No. 570 [6]. Through the analysis of the teachers' perceptions, the research aims to evaluate the schools' peace education programs and policies in accordance with Executive Order No. 570 (EO 570). It aims to evaluate the ability of school administrators, teachers, and personnel to pursue peace education activities, as well as identify the extent of the integration of peace education in the school curriculum and extracurricular activities. In addition, the research hopes to

assess the availability and use of resources that finance peace education programs and explore the participation of parents, students, and the community in peace education initiatives. Finally, it hopes to determine the problems encountered by schools in the application of EO 570 and propose potential solutions for these issues.

2. Objectives of the Study

1. To assess the level of implementation of Executive Order No. 570 in selected public secondary schools in Bataan Province in terms of peace education programs and policies.
2. To determine teachers' perceptions of the implementation of EO 570 in relation to its five components: planning and capacity building, resource mobilization, programs and materials development, information and communication initiatives, and monitoring and evaluation.
3. To identify the challenges and gaps encountered by schools in the implementation of peace education under Executive Order No. 570.
4. To propose recommendations for strengthening the institutionalization of peace education in public secondary schools based on the findings of the study.

3. Methodology

The research shall utilize a descriptive research design with a quantitative approach for evaluating the policies and programs of selected public secondary schools in Bataan province in accordance with Executive Order No. 570. Purposive sampling will be applied in the research to identify the respondents to ensure effective representation of the schools that are presently implementing peace education programs. The population includes all public secondary school teachers in selected schools, while the sample consists of 50 ($N=50$) teachers selected through purposive sampling. The survey instrument will be pilot-tested to establish its reliability using Cronbach's alpha to ensure internal consistency of the questionnaire items before actual data

gathering. A survey constructed for this research will be used as the data collection instrument. A 5-point Likert scale (from 1-Strongly Disagree to 5-Strongly Agree) was

employed to quantify perceptions and judgments.

To interpret the weighted mean scores of the respondents' perceptions, the following scale was used:

Weighted Mean Range	Description
4.21 – 5.00	Strongly Agree (Very High Implementation)
3.41 – 4.20	Agree (High Implementation)
2.61 – 3.40	Moderately Agree (Moderate Implementation)
1.81 – 2.60	Disagree (Low Implementation)
1.00 – 1.80	Strongly Disagree (Very Low Implementation)

Descriptive statistics, which consist of mean scores and standard deviation, will be used to analyze the data collected. The research will employ a Likert-scale questionnaire to understand the perceptions on the implementation of the five components under Executive Order No. 570. The first indicator, Plan Formulation, Institutional Development, and Capacity Building, aims to determine the planning and direction of peace education programs in schools, specifically in relation to capacity building, faculty training, and stakeholder participation. The second, Resource Mobilization and Networking, assesses how schools' budgets and use funds to support peace education programs and how they use partnerships to create and implement new peace education programs. The third, Programs and Materials Development, encompasses the assessment of learning materials, resources, or exemplars being used to teach peace education, available and sufficient in number. The fourth element, Information, Education, and Communication, assesses the efficiency of schools' information dissemination to promote the national government and the Department of Education's campaign for fostering a culture of peace. Finally, the fifth is Monitoring, Research, and Evaluation, which assesses the systematic mechanisms schools use to monitor, research,

and evaluate the progress and impact of their peace education programs. Before data gathering, permission was sought from the school administration. Questionnaires were distributed to respondents and retrieved within a given time. Anonymity and confidentiality were maintained throughout data collection. Descriptive statistics were used in analyzing the data collected. Central tendency measures, that is, mean and standard deviation, were employed to summarize the data and give insights into the general trends. Frequency distribution and percentages were utilized to identify the levels of effectiveness, integration, and stakeholder involvement and to identify problems as well as determine resource availability. The results were then analyzed to conclude and make recommendations on how to improve the implementation of EO 570 on peace education in public secondary schools in Bataan.

4. Results and Discussion

The findings of this study provide a comprehensive view of the current state of peace education implementation in selected public secondary schools in Bataan. The analysis focuses on five key indicators aligned with Executive Order No. 570 to assess the extent of institutionalization and identify areas for improvement (Table 1).

Table 1. Plan Formulation, Institutional Development, and Capacity Building.

Component of Executive Order No. 570 “Institutionalizing Peace Education in Basic and Teacher Education (N=50)		Weighted Mean	Standard Deviation
1.	Our school has a well-documented peace education plan aligned with Executive Order No. 570.	2.24	0.77
2.	School leadership consistently demonstrates commitment to institutionalizing peace education through policies initiatives.	2.19	0.65
3.	Teachers and staff receive ongoing training on implementing peace education programs.	2.12	0.93
4.	Clear guidelines are provided for integrating peace education into the	2.88	0.65
5.	school curriculum.		
6.	Capacity-building workshops on peace education are conducted regularly.	2.31	0.96
Overall WM & SD		WM= 2.34	SD= 0.79
Description		Disagree (Low Implementation)	Low variability (Consistent responses)

The component on the Plan Formulation, Institution Development, and Capacity Building of Executive Order No. 570 reveals that there is a significantly low level of implementation among the surveyed public school teachers. The overall weighted mean of 2.34 on the Plan Formulation, Institution Development, and Capacity Building component, which is interpreted as “disagree” or “low implementation,” is largely underdeveloped or insufficient in practice across selected public schools. This component is crucial because it sets the stage for how effectively the peace education program is embedded in the curriculum and educational system through structured planning, leadership involvement, teacher preparation, and capacity-building. Looking closely at the individual indicator, it is evident that key institutional practices are not being systematically presented. Based on the data, the document's peace education plan is not being systematically implemented or has low implementation. The existence of a well-documented peace education plan was rated at 2.24, which means

that either most schools lack a formal plan or such plans are not aligned with EO 570. In addition, the school leadership's commitment to the implementation of peace education through policy and initiatives has 2.19 which also received a low rating, indicating that peace education might not be the priority of having the less priority in the school plans and programs and that the school administration may not be actively implementing the peace education program which is mandated by the national government. The training for teachers and staff also garnered 2.12, among the lowest in the set of indicators. These indicators reflect the necessity of professional development, wherein teachers in the field were not frequently trained to be well-versed with the knowledge, skills, and methodologies needed in the implementation of peace education. Lack of training hinders teachers' confidence and abilities in integrating peace education into the teaching-learning process. Contrary to that the availability of clear guidelines for integrating peace education into the curriculum with a weighted mean of 2.88 has the highest rating,

although still falling short of moderate implementation. This may mean that although there is a clear guideline shown in the curriculum, it may seem that the application of these guidelines in actual classroom practice is uneven or poorly monitored. In the meantime, the capacity-building workshop was rated 2.31 again indicating a lack of skills training, seminars, and self-improvement activities regarding peace education. The low implementation of Plan Formulation, Institutional Development, and Capacity Building with a mean of 2.34, the standard deviation is also relatively low ranging from 0.65 to 0.96 with an overall SD of 0.79. This is an indication of the high level of consistency with the answers of the participants. Also, it shows that descriptive comments of low implementation in component 1 are not limited

to certain specific schools. This is an indication of the necessity of taking necessary action at the national, regional, and provincial levels for policy reinforcement and support. In general, the information confirms the low implementation of the component in the Plan Formulation, Institution Development, and Capacity Building of Executive Order No. 570. This shows there are few formalized plans, compliance with EO 570, and few teachers capacity-building training are contributory factors that reflect the low implementation of EO 570. Based on the following gaps mentioned the schools and division office must have a strategic plan on peace education aligned with the curriculum, school administration peace education programs, teachers' professional development, and curriculum integration of peace education [7].

Table 2. Resource Mobilization and Networking.

Component of Executive Order No. 570 "Institutionalizing Peace Education in Basic and Teacher Education N=50		Weighted Mean	Standard Deviation
1.	The school effectively mobilizes financial resources to support peace education initiatives.	2.25	0.57
2.	Partnerships with government and non-government organizations are established for peace education support.	2.13	0.52
3.	Community stakeholders are actively involved in promoting and sustaining peace education programs.	1.89	0.87
4.	External resources, including funding and technical assistance, are accessible and utilized.	2.28	0.64
5.	A dedicated team is responsible for managing resources and fostering collaborations.	2.04	0.71
Overall WM & SD		WM=2.12	SD= 0.66
Description		Disagree (Low Implementation)	Low variability (Consistent responses)

The data presented in Table 2: Resource Mobilization and Stakeholder Engagement reveals low implementation across all the surveyed public schools in Bataan. The overall weighted mean of 2.12 has a descriptive equivalent of "Disagree" or low

implementation. This shows that almost all respondents believe their respective schools are not properly mobilizing their resources or engaging stakeholders to support peace education. A closer look at the individual indicators reveals that the involvement of

community stakeholders in promoting and sustaining the peace education program has the lowest weighted mean of 1.89. This finding is significant because it shows the lack of community involvement, ownership, and participation, which are essential in promoting and cultivating a peaceful culture and values beyond the school environment. The results also reveal that partnerships with different governments and non-government organizations garnered a weighted mean of 2.13, representing another critical area of concern. This suggests that the surveyed schools are lacking efforts to maintain peace education initiatives. Moreover, the indicator on dedicated teams to manage collaborations and oversee peace education efforts received a weighted mean of 2.04, with a descriptive equivalent of Disagree or low implementation. This indicates either the non-existence or lack of clear organizational structures focused on implementing peace education programs. The indicator on financial resource mobilization also received a weighted mean of 2.25, with the same descriptive rating of Disagree or low implementation. The utilization of external funding or technical assistance had a slightly higher weighted mean of 2.28, but still falls under the same category. These results show that although school administrators and teachers may have some awareness of the mandate of Executive Order No. 570, schools

are not effectively leveraging support. While there may be some minimal effort in accessing resources, schools have not yet reached the point of regularly or effectively using these supports to implement peace education. This also shows that there is minimal budget allocation, which might not be reflected in the school's MOOE (Maintenance and Other Operating Expenses). The limited allocation of school funds and budgets for peace education constrains the ability of schools to sustain meaningful implementation of peace education programs. Moreover, the overall standard deviation for Component 2: Resource Mobilization and Networking is 0.66, indicating that all of the responses were consistent regardless of their contexts. This suggests that selected schools have a uniformly low level of implementation when it comes to resource mobilization and stakeholder engagement. In conclusion, school administrations need systematic improvements in resource mobilization and partnerships with the community and stakeholders [8]. In addition, schools need to develop innovations that secure school funding, establish strong partnerships with various organizations, designate a focal person to monitor peace education programs and encourage stakeholders to actively participate in planning and implementation processes.

Table 3. Programs and Materials Development.

Component of Executive Order No. 570 “Institutionalizing Peace Education in Basic and Teacher Education N=50		Weighted Mean	Standard Deviation
1.	Appropriate learning materials for peace education are developed and made accessible.	1.97	0.58
2.	Peace education concepts are integrated into various subjects within the school curriculum.	2.34	0.50
3.	Extracurricular activities such as clubs and events promote peace education initiatives.	2.40	0.65
4.	Teachers are encouraged to create and adapt supplementary peace education materials.	2.23	0.73

Component of Executive Order No. 570		Weighted Mean	Standard Deviation
“Institutionalizing Peace Education in Basic and Teacher Education N=50			
5.	Digital and multimedia resources are effectively used to enhance peace education learning.	2.14	0.65
Overall WM & SD		WM=2.21	SD= 0.62
Description		Disagree (Low Implementation)	Low variability (Consistent responses)

The data regarding the programs and materials development on peace education demonstrate a low level of implementation in the selected public secondary schools surveyed. The overall weighted mean of 2.21, interpreted as “Disagree,” indicates that the implementation of the peace education program is not yet effectively integrated into the curricular and extracurricular activities of the schools. The findings also suggest the need for substantial support and improvement in the development of instructional materials and educational resources that are significant in promoting peace education in the classroom. The development of appropriate peace education learning materials received a low weighted mean of 1.97 which shows that among the surveyed schools, they either do not have resources or have limited access to instructional materials. While the integration of peace concepts across subjects garnered a slightly higher score of 2.3 still reflects the low implementation of peace education within formal education. Moreover, extracurricular activities like school organizations, clubs, and school events had the highest mean of 2.40. This indicates that the implementation of peace education is more evident in extracurricular activities in schools. However, it still does not meet the minimum threshold for moderate implementation. Thus, it implies that such peace-related activities are either occasional or minimal. Furthermore, teachers are not

sufficiently encouraged to create or adapt supplementary materials with a weighted mean of 2.23 and the use of digital or multimedia tools to enhance peace learning is also limited with a weighted mean of 2.14 (Table 3). These findings reveal that while there may be individual efforts among teachers or student groups, the systemic support to strengthen teaching practices and learning experiences related to peace education is insufficient. The standard deviation of 0.62 indicates low variation in responses, and it suggests that the perceptions of low implementation are consistent across schools and stakeholders. The homogeneity indicates the pervasiveness of the challenges of integrating peace education into teaching and learning activities. Overall, the information suggests that schools have not yet institutionalized peace education as a normal and integrated part of classroom curriculum and extracurricular life. To address this, there is a clear need to develop and distribute age-appropriate peace education materials, incorporate peace themes into curriculum subjects, enhance teacher support and innovation in material development, and promote the use of digital resources. These improvements are needed to advance the goals of Executive Order No. 570 and foster a more peaceful and inclusive learning environment [9].

Table 4. Information, Education, and Communication.

Component of Executive Order No. 570 “Institutionalizing Peace Education in Basic and Teacher Education N=50		Weighted Mean	Standard Deviation
1.	Regular campaigns and events raise awareness about peace education within the school and community.	2.07	0.76
2.	Advocacy materials (e.g., posters, brochures, videos) are used to promote peace education.	1.97	0.53
3.	Social media platforms are utilized to enhance visibility and engagement with peace education programs.	2.1	0.84
4.	Students are empowered to participate in peace advocacy initiatives.	1.87	0.62
5.	Feedback from stakeholders is actively sought to improve communication efforts regarding peace education.	2.19	0.80
Overall, WM & SD		WM=2.04	SD=0.89
Description		Disagree (Low Implementation)	Low variability (Consistent responses)

The data in Table 4: Information, Education, and Communication of Executive Order No. 570 indicate consistently low implementation among the public secondary schools surveyed in Bataan. The weighted mean of 2.04 with a standard deviation of 0.89 falls in the descriptive category of "Disagree" or low implementation. It indicates that peace education is not effectively mainstreamed in communication and advocacy in schools. The low standard deviation also indicates consistent perception among the respondents, which reveals a systemic issue and not isolated cases. One of the most significant indicators, which deals with organizing regular events and campaigns to ensure awareness of peace education, had a weighted mean of 2.07. This signifies that schools hardly organize such events, limiting both student and community access to peace education beyond classroom learning. The use of advocacy items like posters, brochures, and videos, which are very important items for information dissemination of peace was even lower at a mean of 1.97. This signifies a lack of materials or ineffective use of

available materials. Although the use of social media platforms to increase visibility about peace education had a slightly higher mean of 2.10, it is still not sufficient, considering the current age of the internet where online platforms offer extensive levels of avenues for advocacy and engagement [10]. The lowest rate among this component was enabling the students to engage in peace advocacy programs, which was assigned a weighted mean of only 1.87. This is a highly critical area of deficiency because student engagement is central to bringing peace education from a theoretical subject to a lived and practiced virtue. The indicator for getting feedback from stakeholders, however, had the highest mean at 2.19, but is still a low level of implementation. This means that schools are not actively involving stakeholders such as parents, community leaders, and external agencies to enhance communication and collaborative efforts towards peace education. In general, the information reveals the lack of information and communication plans that will underpin the objectives of EO No. 570 [11]. The absence of

visibility, stakeholder engagement, and student engagement indicates that peace education is not yet part of the school culture. To turn this around, schools must develop a strategic communication plan for peace education, enhance the utilization of media and advocacy instruments, empower students through active

engagement, harness social media outlets, and institutionalize feedback mechanisms that involve stakeholder voices. These are crucial steps towards making peace education more meaningful, visible, and sustainable in the school and community context

Table 5. Monitoring, Research, and Evaluation.

Component of Executive Order No. 570 “Institutionalizing Peace Education in Basic and Teacher Education N=50		Weighted Mean	Standard Deviation
1.	A systematic process is in place for monitoring the implementation of peace education programs.	1.56	0.90
2.	Clear indicators are used to evaluate the success and impact of peace education initiatives.	1.87	0.51
3.	Regular assessments are conducted, and results are documented and reported.	1.58	0.62
4.	Stakeholder feedback is analyzed to enhance peace education strategies.	1.61	0.78
5.	Research activities are encouraged to explore the effectiveness and challenges of peace education programs.	1.73	0.59
Overall WM & SD		WM=1.67	SD=0.68
Description		Disagree (Low Implementation)	Low variability (Consistent responses)

The results in Table 5: Monitoring, Research, and Evaluation reveal a very low implementation level in the selected public secondary schools of Bataan, with a total weighted mean of 1.67 and a standard deviation of 0.68. This indicates that there are structures needed for monitoring and enhancing peace education programs that do not exist or are practiced on a minimal scale. The persistently low scores of all the indicators are a reflection of a systemic lack of monitoring and evaluation processes, which are most critical in the assurance of the quality and sustainability of educational programs. The lowest mean score indicator of 1.56 reflects that there is no systematic process for monitoring the

implementation of peace education and therefore schools are not monitoring the progress or effectiveness of the programs they are implementing regularly. In addition, the overall score of 1.87 on the use of salient indicators to measure success indicates that schools are not using clear criteria to monitor the outputs and effects of their peace education initiatives. The absence of measurable indicators compromises the capacity to measure progress and make informed decisions. Likewise, the overall score of 1.58 on frequent monitoring and documentation indicates that schools are not institutionalizing monitoring procedures that could result in reflective and ongoing improvement. The monitoring of

stakeholder feedback, which is key in comprehending the needs and inclinations of students, teachers, parents, and members of the community, also scored a low rating of 1.61. This indicates that such feedback is not being systematically gathered or being used to inform peace education enhancements. Besides, the indicator of research activities, with a mean of 1.73, indicates a lack of effort in carrying out studies to examine the effectiveness, challenges, and opportunities for improving peace education. Such a failure to conduct research is an impediment to innovation and an impediment to the formulation of contextually appropriate and evidence-based interventions. The low response variability, as indicated by the standard deviation of 0.68, also attests to the fact that these problems are pervasive and not limited to certain schools. Overall, the evidence shows a critical lack of establishment of monitoring, research, and evaluation elements of peace education programs. Without these frameworks, schools cannot hold anyone accountable, measure impacts, or bring about actual improvement. In connection with these gaps, the schools must establish and implement systematic monitoring and evaluation frameworks, establish clear performance indicators, encourage research on peace education, and engage stakeholders actively in the feedback process. These actions are needed to ensure the quality improvement of the implementation of Executive Order No. 570 and to institutionalize peace education as part of the school system.

5. Summary of Findings

The analysis of the five components of Executive Order No. 570 reveals a consistent and overarching pattern of low implementation of peace education across selected public secondary schools in Bataan. Across all indicators, Plan Formulation, Institutional Development, and Capacity Building; Resource Mobilization and Networking; Programs and Materials Development; Information, Education, and Communication; and

Monitoring, Research, and Evaluation, the results consistently fall under the descriptive level of “Disagree” or low implementation, indicating that peace education has not yet been fully institutionalized in the school system. Among the five components, Monitoring, Research, and Evaluation obtained the lowest overall mean (WM = 1.67), followed by Information, Education, and Communication (WM = 2.04) and Resource Mobilization and Networking (WM = 2.12). These findings suggest that the weakest areas lie in program sustainability mechanisms, stakeholder engagement, communication strategies, and support systems. Meanwhile, Programs and Materials Development (WM = 2.21) and Plan Formulation, Institutional Development, and Capacity Building (WM = 2.34), although slightly higher, still reflect low implementation, indicating that foundational planning and instructional integration are also insufficient. The standard deviations across all components are generally low, indicating consistency in responses among participants, which further implies that the low level of implementation is not isolated to specific schools but is instead a system-wide concern across the selected institutions. Overall, the findings suggest that while Executive Order No. 570 provides a clear framework for institutionalizing peace education, its implementation in practice remains limited due to gaps in planning, inadequate teacher training, weak resource allocation, minimal stakeholder participation, insufficient instructional integration, poor communication strategies, and the absence of a structured monitoring and evaluation system.

6. Conclusion and Recommendation

The analysis of the five indicators of Executive Order No. 570 shows a generally low level of implementation among the chosen public secondary schools in Bataan. The results show that peace education has not yet been institutionalized fully in all key areas such as planning, capacity building, resource

mobilization, instructional integration, communication, and monitoring. The need for formalized plans, teacher training, and institutional commitment are significant impediments to effective implementation. Efforts at resource mobilization and stakeholder engagement are low, with few partnerships and insufficient funding to aid peace education efforts. Instructional integration also needs to improve, with schools needing to develop materials suited to their students' age and adequate curriculum guidance, but with peace education appearing in occasional extracurricular events more than integrated into educational instruction. Further, there are inadequate communication and advocacy measures, minimal utilization of media facilities, and a lack of participation of stakeholders. The deficient systematic monitoring, evaluation, and research mechanisms are critical to tracking progress, accountability, and program improvement [12]. In response to these challenges, several strategic recommendations are made. Schools and the Division Office must develop a strategic and comprehensive peace education plan that is aligned with the curriculum and institutional objectives. There is a dire necessity for firming up administrative commitment through facilitating policies and the hiring of committed peace education coordinators. Regular professional development programs need to be held to enhance teachers' skills in the teaching of peace education. At the same time, the mobilization of resources needs to be enhanced through forging partnerships with government bodies, NGOs, and private actors, as well as the hiring of focal persons to guide collaboration and implementation [13]. Instructionally, schools must prepare, adapt, and disseminate relevant peace education materials, mainstream peace concepts across the curriculum, and promote innovative, technology-based pedagogical approaches. Communication efforts need to be intensified through organized Information Communication Education IEC campaigns, increased utilization

of social media and advocacy platforms, and active student participation in peace-related activities [14]. Feedback from stakeholders needs to be systematically collected and utilized to further develop peace education communication strategies. Lastly, schools should institute a strong system of monitoring and evaluation with measurable indicators, regular review, and documentation of findings. Research on peace education should further be promoted to provide data-driven findings that guide continuous improvement. Through these areas, schools in Bataan can effectively improve the institutionalization of peace education, thus promoting the objectives of Executive Order No. 570 and a culture of peace in the educational system and the broader community.

Future researchers may consider expanding the scope of this study by including private secondary schools or other provinces to allow for comparative analysis of peace education implementation across different educational settings. It is also recommended that future studies explore the perspectives of students and school administrators, not only teachers, to obtain a more comprehensive understanding of peace education practices. Moreover, qualitative or mixed-method approaches may be used to gain deeper insights into the challenges and lived experiences of stakeholders in implementing Executive Order No. 570. Lastly, future research may focus on the development and evaluation of specific intervention programs or training modules aimed at strengthening the institutionalization of peace education in basic education

References

- [1] W. Santos, The roots of insurgency and conflict in the Philippines, *J. Peace Conflict Stud.* 23(2) (2010) 15–30. <https://doi.org/10.1234/jpcs.2010.015>
- [2] R.M. Castro, J.L. Galace, *Peace education: A path to a culture of peace in the Philippines*, Ateneo de Manila University Press, 2010.

- [3] R.A. Guevara, Philippine peace processes: A history of negotiations, *Philippine Stud.* 59(1) (2011) 60–75. <https://doi.org/10.1234/ps.2011.0060>
- [4] Department of Education, Executive Order No. 570: Institutionalizing peace education in basic and teacher education, Department of Education, 2007.
- [5] Philippine Congress, Republic Act No. 8044: An act creating the National Youth Commission, <https://www.gov.ph/ra8044> (accessed 4 March 2026).
- [6] Department of Education, National framework on peace education, <https://www.deped.gov.ph/peace-education-framework> (accessed 4 March 2026).
- [7] I. Macapagal, Conflict, peace, and education in the Philippines: A socio-political analysis, Ateneo de Manila University Press, 2010.
- [8] J. Marcos, Peace education in the Philippine context: Challenges and prospects, *Peace Res. J.* 45(2) (2012) 121–134. <https://doi.org/10.1234/prj.2012.0121>
- [9] Reconciliation and Unity Council, Report on the state of peace education in the Philippines: Findings and recommendations, Reconciliation and Unity Council, 2015.
- [10] Department of Education, Peace education programs in Philippine secondary schools: An evaluation, <https://www.deped.gov.ph/peace-education-evaluation> (accessed 4 March 2026).
- [11] J.P. Tan, Building a culture of peace through education in the Philippines, *Educ. Dev. Rev.* 5(1) (2014) 28–42. <https://doi.org/10.1234/edr.2014.028>
- [12] United Nations Educational, Scientific and Cultural Organization (UNESCO), Global citizenship education: Preparing learners for the challenges of the 21st century, UNESCO, 2016.
- [13] F.P. Quijano, Social and political exclusion in Philippine society: Implications for peace education, *Asian J. Soc. Sci.* 12(3) (2017) 145–159. <https://doi.org/10.1234/ajss.2017.0145>
- [14] R.C. Reyes, The role of schools in peacebuilding: A case study of public secondary schools in the Philippines, *Int. J. Educ. Dev.* 11(2) (2019) 98–112. <https://doi.org/10.1234/ijed.2019.0098>



Strategic Promotion of School Curriculum Development in Educational Innovation and Creative City of Gastronomy: The Strategic Role of the Deputy Director of Phetchaburi Secondary Educational Service Area Office

Nuttinun Pramsung^{1*}

¹Deputy Director, The secondary educational service area office Phetchaburi, Thailand.

Abstract

This academic article aims to present approaches for promoting school curriculum development under the Phetchaburi Secondary Educational Service Area Office within the context of educational innovation areas and UNESCO Creative City of Gastronomy. The article focuses on analyzing the academic role of the Deputy Director of the Educational Service Area Office in translating educational policies into school practices. The study employed document analysis of educational theories, policy documents, curriculum development concepts, and contextual information related to Phetchaburi Province. The findings indicate that effective curriculum development should integrate local cultural capital, community wisdom, competency-based learning, and digital technology into educational management. In addition, collaboration among educational institutions, communities, local organizations, and higher education institutions plays a significant role in enhancing learners' competencies and lifelong learning opportunities. Furthermore, the author synthesized the "P-DYNAMICS" practical framework from educational administration theories, competency-based curriculum concepts, educational supervision approaches, and local educational contexts in Phetchaburi Province. The framework consists of Planning and Policy, Digital Integration, Yielding Local Wisdom, Networking, Active Learning, Monitoring and Evaluation, Innovation, Competency Development, and Sustainability. The framework can be applied as a practical guideline for school curriculum development in educational innovation areas and local-context-based education management in the 21st century.

Keywords: School Curriculum Development; Educational Innovation Area; Creative City of Gastronomy; Academic Administration; Phetchaburi Province

Article history: Received 30 May 2026, Revised 8 June 2026, Accepted 9 June 2026

1. Introduction

Over recent years, schools in Phetchaburi Province have faced mounting challenges in designing learning experiences that simultaneously address rapid societal transformation and the diverse needs of local learners. A central concern has been the integration of regional cultural identity into the development of 21st century competencies a

pedagogical imperative that demands both contextual sensitivity and forward-looking curriculum design. In response, educational systems are increasingly called upon to undergo substantive reform aimed at equipping learners with competencies aligned with the demands of a rapidly evolving global landscape, including critical thinking, effective communication, digital literacy, and lifelong learning

*Corresponding author; e-mail: nattiwan.yyn@esdc.go.th

dispositions [1]. Consequently, contemporary educational management is required to embrace a holistic developmental orientation, fostering not only academic achievement but also the broader personal attributes and adaptive capacities essential for meaningful participation in modern society.

Phetchaburi Province possesses a remarkably rich foundation of cultural capital and indigenous knowledge, most notably in the domain of traditional culinary heritage. This distinctive identity received formal international recognition in 2021, when UNESCO designated Phetchaburi as a Creative City of Gastronomy under its Creative Cities Network, an acknowledgment that positions the province as a globally significant site of living culinary culture [2]. Educational institutions within this context are therefore uniquely situated to harness such cultural assets, local wisdom, and community-based ways of life as meaningful resources for curriculum integration, thereby cultivating learners' sense of local pride and enabling them to apply contextually grounded knowledge in practical and personally relevant ways. Furthermore, schools bear a critical responsibility to systematically incorporate this distinctive regional identity into curricular frameworks and pedagogical processes, equipping learners with the knowledge foundations necessary to translate cultural competencies into viable and sustainable career pathways in their future professional lives. The concept of educational innovation zones further affords schools greater latitude to develop curricula and instructional models that are both adaptable and more closely attuned to local contextual realities [3]. Within this framework, school curriculum development is increasingly directed toward competency-based learning approaches, the meaningful integration of digital technologies, and the cultivation of collaborative networks among educational institutions, surrounding communities, and relevant stakeholder agencies. Within this context, the Deputy Director of the Phetchaburi Secondary Educational Service Area Office occupies a strategically significant position in promoting, supporting, and systematically overseeing school curriculum development in alignment with national educational policy directives and

regional contextual demands. This role encompasses multiple interconnected dimensions, including academic administration, teacher professional development, the establishment of collaborative educational networks, and the continuous conduct of instructional supervision and monitoring. In practical terms, therefore, the Deputy Director functions as a pivotal institutional actor responsible for ensuring that curriculum development and educational management across affiliated schools remain coherently aligned with both ministerial policy frameworks and the distinctive socio-cultural context of the province.

2. Approaches to School Curriculum Development in the Context of Phetchaburi Province.

The following strategic approaches are proposed to guide the promotion, administration, and development of school curricula within educational institutions under the jurisdiction of Phetchaburi Secondary Educational Service Area Office.

2.1. Integration of Local Identity into Learning Management

School curriculum development should establish meaningful connections between the distinctive identity of Phetchaburi Province and instructional practices within educational institutions. Particular emphasis is placed on traditional culinary heritage, community ways of life, and indigenous local wisdom, all of which serve as authentic knowledge bases capable of fostering learners' higher-order thinking skills, problem-solving capacities, and innovative dispositions.

2.2. Promotion of Community-Based Learning

Instructional design should actively create opportunities for learners to engage with authentic learning sources embedded within the local community, including community markets, traditional food production sites, and community enterprise groups. Such experiential engagements are essential for generating direct, contextually meaningful learning experiences that extend beyond classroom boundaries.

2.3. Integration of Competency-Based Curriculum Frameworks

School curricula should be systematically oriented toward developing learners' capacity to

apply acquired knowledge, skills, and personal attributes in contextually appropriate and practically relevant ways across diverse life situations [4].

2 . 4 . Application of Digital Technology in Education

The strategic incorporation of digital technologies and online learning platforms substantially expands learners' access to diverse knowledge resources while simultaneously supporting the development of self-directed and lifelong learning orientations essential for navigating an increasingly knowledge-driven society.

3. The P-DYNAMICS Conceptual Framework

Document Selection and Synthesis Process

To ensure that the development and synthesis of the "P-DYNAMICS" framework are grounded in robust research methodology and supported by credible empirical evidence, a systematic document analysis was conducted. The process of selecting and synthesizing the academic literature, research articles, and policy documents followed four rigorous phases:

1. Database Searching:

Comprehensive searches were executed across national and international databases, including the Thai-Journal Citation Index (TCI Tier 1 and Tier 2), ERIC, Scopus, and Google Scholar. Key search terms included school curriculum development, educational innovation zones, creative city of gastronomy, instructional leadership, and credit bank system.

2. Selection Criteria: Inclusion criteria were established for peer-reviewed journal articles, dissertations, and official reports published between 2017 and 2026 that directly addressed academic administration at the educational service area level or focused on the localized educational context of Phetchaburi Province. Publications lacking peer-reviewed validation or those unrelated to competency-based curriculum reforms were excluded.

3. Quality Assessment and Data Extraction: A final set of 15 high-quality studies and official policy guidelines was selected. Relevant administrative variables, localized curriculum strategies, and instructional supervision mechanisms were systematically extracted and categorized.

4. Content Synthesis: Qualitative content analysis was applied to synthesize the extracted data, mapping the relationship between international administrative theories and the specific needs of schools in the Phetchaburi Secondary Educational Service Area. This synthesis formed the systemic foundation for the structural components of the P-DYNAMICS framework.

Theoretical Foundations and Framework Construction

The "P-DYNAMICS" practice-oriented conceptual framework was developed by the author through a systematic analysis and synthesis of theoretical perspectives drawn from educational administration, curriculum development, and competency-based learning management, in conjunction with the specific educational context of Phetchaburi Province. The framework draws upon four foundational theoretical pillars: the systems management theory of Gulick and Urwick [5], the instructional leadership and learning-focused supervision framework of Hallinger [6], the CIPP evaluation model of Stufflebeam [7], and the educational change theory of Fullan [8]. In addition, the author incorporated competency-based education guidelines established under the policy directives of the Ministry of Education [9] alongside theoretical perspectives on educational innovation zones, thereby ensuring that the framework maintains coherent alignment with the distinctive context of Phetchaburi Province as a UNESCO Creative City of Gastronomy [2]. The framework was further informed by a comprehensive review of relevant academic literature and empirical research. These theoretical and contextual sources were collectively synthesized to produce the structural components and operational dimensions presented in the following section.

Application of the Four Underpinning Theoretical Foundations

The P-DYNAMICS framework is anchored upon four internationally recognized theoretical pillars, systematically adapted to the strategic role of the Deputy Director in facilitating area-based curriculum development:

1. Systems Management Theory (POSDCORB) of Gulick and Urwick [5]: This theory provides the systemic framework for designing the administrative structure at the educational service area level. Specifically, the

functions of Planning (P), Coordinating (CO) and Budgeting (B) are utilized to orchestrate localized educational policies and distribute resources equitably, ensuring that affiliated schools can implement competency-based curricula with adequate operational support.

2. Instructional Leadership and Leadership for Learning Framework of Hallinger [6]: Moving away from traditional administrative control, this concept emphasizes leadership that supports teacher professional learning to enhance student learning outcomes. The Deputy Director operationalizes this by fostering internal school-based supervision and active coaching through Professional Learning Communities (PLCs), driving pedagogical transformation toward active learning in classrooms.

3. CIPP Evaluation Model of Stufflebeam [7]: This model serves as a quality-assurance and monitoring cycle for curriculum implementation. It assesses: (a) Context: Phetchaburi's educational innovation area demands and UNESCO culinary identity; (b) Input: the availability of digital media and the OBEC Content Center; (c) Process: active learning instructional delivery; and (d) Product: PISA-aligned student learning outcomes and competencies, providing actionable feedback for continuous curriculum refinement.

4. Theory of Educational Change of Fullan [8]: This framework explains the developmental progression of curriculum reform across three overlapping phases: Initiation (building shared vision and policy commitment), Implementation (providing continuous professional development, coaching, and reducing administrative burdens on teachers), and Institutionalization (embedding the competency-based curriculum and Credit Bank system into the normal operational culture of the schools).

Components of the P-DYNAMICS Framework

The P-DYNAMICS framework consists of nine interrelated components as follows:

1. P - Planning and Policy
2. D - Digital Integration
3. Y - Yielding Local Wisdom
4. N - Networking
5. A - Active Learning and Supervision
6. M - Monitoring and Evaluation
7. I – Innovation and Research
8. C - Competency and Quality

9. S - Sustainability

The detailed description of each component is presented as follows:

3.1 P: Planning and Policy

The initial component centers on systematic context analysis, drawing upon the Phetchaburi Provincial Education Development Plan (2023–2027) and policy directives issued by the Office of the Basic Education Commission (OBEC). The Deputy Director, in collaboration with the Educational Service Area Committee, establishes learner quality targets that are coherently aligned with the province's designation as a UNESCO Creative City of Gastronomy and the projected demands of future labor markets [10].

3.2 D: Digital Integration

This component promotes the comprehensive embedding of digital technologies across all stages of curriculum implementation, encompassing electronic curriculum documentation, utilization of the OBEC Content Center media repository, and the adoption of hybrid learning modalities. The strategic deployment of digital tools enables learners to access global knowledge resources on an equitable basis with their counterparts in other educational contexts.

3.3 Y: Yielding Local Wisdom

This component involves the systematic transformation of Phetchaburi's cultural capital into locally relevant learning content. The Deputy Director actively supports schools in developing supplementary subject curricula encompassing food science, fisheries, and cultural tourism, developed in collaboration with local scholars and community experts. Representative examples include the development of innovative culinary menus utilizing indigenous ingredients such as palmyra palm and Persian lime [11].

3.4 N: Networking

This component involves the establishment of academic networks linking affiliated schools with external institutions. Memoranda of Understanding (MOU) concluded with Phetchaburi Vocational College facilitate the operation of vocational classrooms, enabling learners to concurrently obtain both secondary education qualifications and vocational certificates through a dual education pathway. Credit bank linkages with regional universities further extend learners' academic progression opportunities [12].

3.5 A: Active Learning and Supervision

This component promotes teachers' adoption of active learning methodologies and STEAM education approaches to cultivate learners' critical thinking and innovative capacities. With respect to instructional supervision, the Deputy Director drives a coaching process employing classroom observation techniques and critical incident recording, the findings of which are subsequently utilized in collaborative reflective practice sessions with teachers [13].

3.6 M: Monitoring and Evaluation

This component involves the development of a monitoring system that prioritizes learning outcomes over documentary compliance. The application of PISA-aligned competency assessment instruments and the analytical utilization of O-NET results to inform instructional improvement constitute the central mechanisms of long-term evaluative practice [1].

3.7 I: Innovation and Research

This component supports the "One School, One Innovation" (IFTE) initiative, encouraging teachers and educational personnel to develop pedagogical innovations that enhance learning management quality. The Deputy Director facilitates knowledge exchange forums and Best Practice competitions, thereby fostering professional

motivation and enabling the broader dissemination of research-informed practices [10].

3.8 C: Competency and Quality

This component is oriented toward developing learners who possess comprehensive curriculum-aligned competencies alongside strong ethical and moral foundations. The ultimate outcome envisioned is learners capable of engaging in self-directed study anytime and anywhere, equipped with the capacities necessary for successful career entry or further academic progression [14].

3.9 S: Sustainability

The final component aims to establish a dynamic curriculum development system characterized by resilience —defined here as the capacity to adapt responsively to evolving societal and technological conditions. The strengthening of internal quality assurance mechanisms ensures that curriculum development processes remain continuous and institutionally embedded, irrespective of administrative transitions [15]. The distinct components of the P-DYNAMICS Model, together with their corresponding driving mechanisms and anticipated outcomes, are systematically presented in Table 1 and Figure 1.

Table 1. Components of the P-DYNAMICS Model: Driving Mechanisms of the Deputy Director and Expected Curriculum Outcomes.

P-DYNAMICS Component	Driving Mechanism of the Deputy Director, Secondary Educational Service Area Office	Expected Outcomes for School Curriculum
P - Policy	Establishing clear policy directions across 9 strategic focus areas	The school curriculum demonstrates clarity and coherent alignment with local contextual needs
D - Digital	Procuring and developing technological media resources through the OBEC Content Center	Learning becomes boundless, continuously updated, and technologically current
Y - Yielding	Integrating the UNESCO Creative City of Gastronomy designation into curriculum frameworks	The curriculum reflects a distinctive local identity and generates enhanced economic value
N - Networking	Connecting the Credit Bank system with vocational colleges and regional universities	Learners access seamless and uninterrupted educational progression pathways
A - Active	Conducting instructional supervision through Coaching techniques and Professional Learning Community (PLC) processes	Teachers design and implement effective active learning activities

P-DYNAMICS Component	Driving Mechanism of the Deputy Director, Secondary Educational Service Area Office	Expected Outcomes for School Curriculum
M - Monitoring	Applying competency-based assessment approaches aligned with PISA frameworks	Accurate and actionable feedback data is systematically generated to drive curriculum improvement
I - Innovation	Promoting the IFTE initiative and classroom-based action research	Diverse and context-relevant educational innovations are produced and disseminated
C - Competency	Emphasizing the five core competencies of learners	Learners develop strong life skills and career-ready competencies
S- Sustainability	Establishing robust internal educational quality assurance systems	Curriculum development proceeds in a continuous, adaptive, and sustainable manner

Source: Synthesized by the author based on the concepts of Gulick and Urwick [5], Stufflebeam [7], Hallinger [6], and Fullan [8], integrated with the Phetchaburi Provincial Education Office on data driven educational innovation for developing education in Phetchaburi Province [10], the implementation to address out of school children and youth [12] and the Phetchaburi Secondary Educational Service Area Office's Strategic Plan [15]

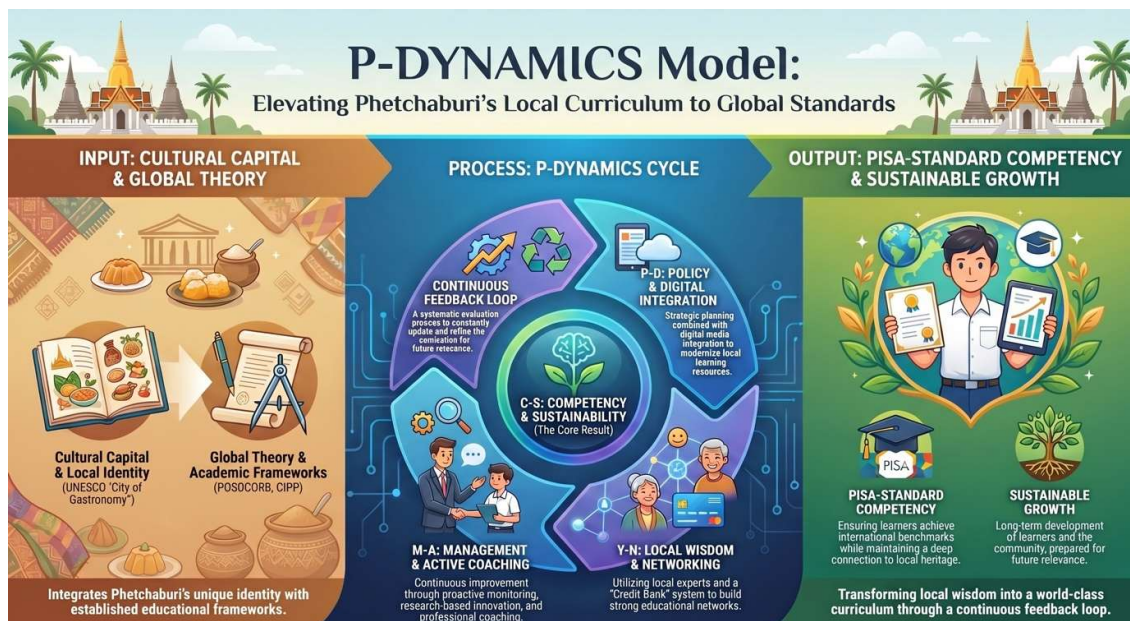


Figure 1. Systemic Diagram of the P-DYNAMICS School Curriculum Development Model.

Source: Synthesized by the author based on the concepts of Gulick and Urwick [5], Stufflebeam [7], Hallinger [6], and Fullan [8], integrated with the Phetchaburi Provincial Education Development Plan [15] and the policy implementation reports of the Phetchaburi Secondary Educational Service Area Office [10].

This academic article aims to present strategic approaches to promoting school curriculum development within the distinctive context of Phetchaburi Province, while simultaneously synthesizing a practice-oriented conceptual framework termed "P-DYNAMICS" intended to serve as a systematic guide for curriculum administration and development within educational innovation zone contexts. This academic article holds profound significance and substantial academic value across three primary dimensions. First, from a policy perspective, it bridges a critical gap in translating centralized educational directives, specifically the Ministry of Education's "Happy and Quality Learning" policy and the educational sandbox framework into concrete regional implementation, successfully integrating internationally recognized cultural capital (Phetchaburi's designation as a UNESCO Creative City of Gastronomy). Second, regarding educational administration, this study offers a reflective perspective from the Deputy Director of the Secondary Educational Service Area Office as an academic leader. It demonstrates how an administrator can move beyond traditional, compliance-focused supervision toward the role of a "strategic facilitator." Finally, this paper introduces the "P-DYNAMICS" model, systematically synthesized from established administrative and evaluation theories alongside empirical local research. This provides an exemplary area-based educational management framework that can be practically adapted or scaled in other educational service areas with similar socio-cultural and economic contexts.

Application of the P-DYNAMICS Model in Integrating Local Wisdom through the Dimension of Food Science into School Curricula within Phetchaburi Secondary Educational Service Area Office.

A particularly distinguished operational achievement of the Phetchaburi Secondary Educational Service Area Office lies in its systematic translation of the vision of "Phetchaburi as a Creative City of Gastronomy" into concrete educational practice at the secondary level. The Deputy Director of the Educational Service Area Office has actively

promoted the application of the P-DYNAMICS Model as an integrative mechanism for embedding local wisdom within the dimension of food science into school curricula, guiding affiliated schools in the development of competency-based curricula that establish meaningful connections with the province's entire food value chain from primary production through to final consumption.

Within the Science and Technology learning area, schools are encouraged to design instructional units such as "The Chemistry of Palm Sugar" or "The Physics of Sea Salt Production," enabling learners to develop a substantive understanding of scientific processes through the lens of locally available natural resources. Within the Foreign Languages learning area, learners are provided with opportunities to develop practical competencies as "Local Guides," acquiring the communicative skills necessary to present and explain local culinary menus in both English and a third language, thereby preparing them to contribute meaningfully to the province's development as a globally recognized tourism destination in accordance with Michelin Guide standards.

Furthermore, the instructional supervision and monitoring process has undergone a significant paradigmatic transformation, shifting from conventional curriculum document inspection toward direct field-based observation of authentic learning activities, including the "Youth Nature Conservation Camp" and the "Social Enterprise Activity," both of which serve as purposeful platforms for learners to demonstrate their creative innovation skills and collaborative teamwork capacities. This transformative shift in supervisory orientation provides compelling evidence that the curriculum promoted by the Deputy Director of the Educational Service Area Office is fundamentally centered on observable learner behaviors and competency manifestations, rather than merely on the textual content contained within formal curriculum documents.

4. Conclusion

This academic article has presented the "P-DYNAMICS" practice-oriented conceptual framework, synthesized from theoretical

perspectives encompassing educational administration, competency-based curriculum development, and the educational innovation zone context of Phetchaburi Province. The framework places particular emphasis on the integration of local cultural identity, digital technology, and collaborative educational networks into school curriculum development processes, with the overarching aim of enhancing learner quality and promoting contextually responsive and sustainable educational management. Accordingly, school curriculum development within the context of Phetchaburi Province necessitates the coherent integration of cultural capital, indigenous local wisdom, and learner competency development into a unified and mutually reinforcing framework. Academic administration at the educational service area level, therefore, assumes a critically significant role in promoting, supporting, and systematically monitoring affiliated schools' capacity to develop curricula that are meaningfully aligned with both local contextual realities and the broader societal transformations characteristic of the twenty-first century. The P-DYNAMICS framework thus offers a practically applicable and theoretically grounded guide for advancing school curriculum development within educational innovation zones in an appropriate and sustainable manner.

References

- [1] Office of the Education Council, Thai education competitiveness in the international arena 2020 (IMD 2020), 21st Century, 2020.
- [2] UNESCO, Phetchaburi: UNESCO Creative City of Gastronomy, UNESCO, 2021.
- [3] Office of the Permanent Secretary, Ministry of Education, Project to promote forums and communities for developing formats and approaches for continuous curriculum development linking basic education with vocational and higher education, Ministry of Education, 2022.
- [4] P. Boonma, Competency-based learning management for developing 21st century skills, *Journal of Education* 33(1) (2022) 45–59.
- [5] L. Gulick, L. Urwick, *Papers on the science of administration*, Institute of Public Administration, 1937.
- [6] P. Hallinger, Leadership for learning: Lessons from 40 years of empirical research, *Journal of Educational Administration* 49(2) (2011) 125–142.
- [7] D. L. Stufflebeam, The CIPP model for evaluation, in: T. Kellaghan, D. L. Stufflebeam (Eds.), *International Handbook of Educational Evaluation*, Kluwer Academic Publishers, 2003, pp. 31–62.
- [8] M. Fullan, *The new meaning of educational change*, 4th ed., Teachers College Press, 2007.
- [9] Ministry of Education, Policies and priorities of the Ministry of Education for fiscal years 2024–2025, Ministry of Education, 2024.
- [10] Phetchaburi Provincial Education Office, Report on the results of the Innovation for Thai Education (IFTE) project: Educational innovation for developing education in Phetchaburi Province, Supervision, Monitoring and Evaluation Group, 2024.
- [11] P. Thongnil, N. Yooyen, K. Boonsong, Development of a local curriculum on palm leaf weaving at Sala Khuean of Wat Sala Khuean (Uphai Phet) School, Phetchaburi Province, using a participatory action research process, *MCU Ubon Paritat Journal* 8(2) (2023) 1435–1450.
- [12] Phetchaburi Provincial Education Office, Report on data-driven implementation to address out-of-school children and youth (Thailand Zero Dropout), Phetchaburi Province, Educational Development Group, 2025.
- [13] S. Mahachai, E. Khositpimanwet, School curriculum development, *Manee Chettaram Journal*, Wat Jom Mani 5(2) (2022) 168–185.
- [14] S. Huangkaewprai, D. Prasertsawat, K. Boonsong, N. Phetchasom, Development of competency-based curriculum and school curriculum, *MCU Phetchaburi Paritat Journal* 8(2) (2025) 233–245.
- [15] Phetchaburi Primary Educational Service Area Office 1, Nine educational development priorities and approaches (9 Priorities), Policy and Planning Group, 2021.

Development of a Model for Preventing Unintended and Low-Quality Pregnancy among In-School Adolescents in Phetchaburi Province, Thailand

Phasit Sirited^{1*}, Prakairat Tunit¹, Waratta Hemtong¹, Kulkamol Vannasri¹, Bunliang Suphim²,
Surasingha Sombat Suranartwatchawong³ and Chirawut Punawit⁴

¹ Faculty of Nursing Science and Allied Health, Phetchaburi Rajabhat University,
Phetchaburi, Thailand

² Faculty of Science and Technology, Loei Rajabhat University, Loei, Thailand

³ Faculty of Medicine, Burapha University, Chonburi, Thailand

⁴ Faculty of Science and Technology, Nakhon Pathom Rajabhat University, Nakhon Pathom, Thailand

Abstract

Adolescent pregnancy rates in Phetchaburi Province, Thailand, persistently exceed the national average. Despite the Adolescent Pregnancy Prevention Act B.E. 2559 (2016), evidence-based prevention models suited to the local sociocultural context remain scarce. This study identified key predictors of pregnancy prevention behavior among in-school adolescents and developed a structured prevention model. A sequential mixed-methods design was conducted in Mueang District, Phetchaburi Province. In Phase 1, 308 adolescents aged 15–19 years were recruited through multi-stage random sampling. A validated questionnaire (Cronbach's $\alpha = 0.87$) measured sexual health literacy, self-efficacy, attitudes toward pregnancy prevention, perceived social support, and prevention behavior, analyzed using multiple regression. In Phase 2, four focus group discussions and two brainstorming sessions with 45 key informants informed model development. The regression model explained 41.4% of variance in pregnancy prevention behavior ($R^2 = 0.414$; $F(4,303) = 53.47$, $p < 0.001$). Self-efficacy was the strongest predictor ($\beta = 0.42$), followed by sexual health literacy ($\beta = 0.31$), attitude ($\beta = 0.23$), and perceived social support ($\beta = 0.18$). These findings guided development of the KAS Model — integrating sexual health Knowledge, self-efficacy (Ability), and pregnancy prevention behavior (Self-management) — comprising 12 structured activities, with strong content validity (CVI = 0.91). The KAS Model provides a practical, replicable framework for reducing unintended adolescent pregnancy. Utilizing community health volunteers and digital platforms such as the LINE application, the model is designed for integration into school health programs and primary care settings across comparable Thai provinces.

Keywords: adolescent pregnancy prevention, pregnancy prevention behavior, sexual health literacy, self-efficacy, empowerment model, Phetchaburi Province,

Article history: Received 28 May 2026, Revised 16 June 2026, Accepted 23 June 2026

1. Introduction

Adolescent pregnancy was recognized as a significant global public health concern with wide-ranging health, social, and economic consequences for young women, their families, and society at large [1]. The World Health Organization (WHO) defined adolescence as the period between 10 and 19 years of age, and pregnancy occurring within this window was

generally considered unplanned and associated with elevated medical risk [2]. Globally, the adolescent birth rate (ABR) decreased from 64.5 births per 1,000 women aged 15–19 in 2000 to 41.3 births per 1,000 women in 2023, although the rate of decline has been uneven across regions. Despite this downward trend, adolescent pregnancy continued to impose substantial burdens at both the individual and

*Corresponding author; e-mail: phasit2530@gmail.com

population levels. Early pregnancy and childbearing could derail girls' otherwise healthy development into adulthood and had negative impacts on their education, livelihoods, and health. Many girls who were pregnant were pressured or forced to drop out of school, which affected their educational and employment prospects. From a clinical standpoint, adolescent mothers faced disproportionately higher risks of obstetric complications, including pre-eclampsia, obstructed labor, puerperal sepsis, and postpartum hemorrhage, compared with women aged 20–24 years, while their neonates were more likely to experience low birth weight and preterm delivery [3].

In Thailand, teenage pregnancy had steadily increased over the preceding fifteen years prior to legislative reform. In 2002, 32 out of every 1,000 girls under 19 had been pregnant at least once; by 2014, this number had risen to 53 per 1,000 girls. In response to this trend, Thailand enacted the Prevention and Solution of Adolescent Pregnancy Act B.E. 2559 (2016), which established a legal framework to coordinate national efforts in providing sexual and reproductive health rights to young people [4]. Under this Act, the national target was set to reduce the live birth rate to no more than 0.5 per thousand girls aged 10–14 and no more than 15 per thousand girls aged 15–19 by 2027. By 2023, Thailand's adolescent fertility rate had declined to 26.1 births per 1,000 women aged 15–19, indicating measurable progress; however, substantial gaps remained before national targets could be achieved. Phetchaburi Province, in particular, was identified as one rural area in Thailand with a higher prevalence of teenage mothers relative to the national average, reflecting persistent local-level challenges that warranted targeted investigation.

The consequences of adolescent pregnancy extended beyond obstetric risk. Adolescent mothers and their children were reported to be disproportionately affected by poverty, limited employment opportunities, and reduced quality of life [5]. Children born to adolescent mothers carried a greater risk of adverse developmental outcomes, including malnutrition and lower academic achievement, thereby perpetuating intergenerational cycles of disadvantage [6]. These compound consequences underscored the necessity of

effective prevention strategies directed at in-school adolescents, who constituted a clearly identifiable and accessible target population.

The literature identified multiple determinants of pregnancy prevention behavior among adolescents. Knowledge of contraception, attitudes toward sexual activity and pregnancy, perceived social support from family members, teachers, and peers, and self-efficacy for pregnancy prevention were consistently reported as influential factors [7, 8]. A study conducted in Thai secondary schools found that knowledge of contraception, social support from family, peers, and teachers, self-perceived ability to protect oneself, and perceived severity of adolescent pregnancy were significantly associated with pregnancy prevention behavior at the 0.01 level of significance. Additionally, school-based interventions guided by the Information-Motivation-Behavioral Skills (IMB) model demonstrated that pregnancy prevention behavior was influenced by adolescents' understanding of relevant information, their motivation to practice prevention behaviors consistently, and their behavioral skills to initiate and sustain those practices.

Several school-based prevention programs have been evaluated in the literature. A scoping review of school-based comprehensive sexuality education published in *BMC Women's Health* in 2024, involving studies from their inception to November 2023, identified randomized and non-randomized controlled trials of programs implemented in public and private schools globally, with the majority being cluster randomized controlled trials. Collectively, these studies highlighted the importance of multicomponent interventions that integrated educational content, skill-building, and social engagement. In the Thai context, integrated reviews indicated that multicomponent interventions combining education, skills training, and community participation improved knowledge and attitudes, although behavioral outcomes such as consistent contraceptive use remained difficult to sustain without continuous reinforcement [9]. Notwithstanding these findings, studies that comprehensively examined all relevant determinants simultaneously and translated the results into a structured, context-specific prevention model

for in-school adolescents in Phetchaburi Province were limited.

Phetchaburi Province possessed four distinctive characteristics that differentiated it from other areas. First, the province had one of the highest proportions of older adults in the western region, accounting for 18.5% of the total population, which reduced the availability of attentive caregiving for adolescents in multigenerational households [10]. Second, the majority of the working population was engaged in agricultural activities, including rice cultivation and fruit orchards, which limited adolescents' access to reliable sexual health information and reproductive health services. Third, certain districts in Phetchaburi were geographically remote from secondary- and tertiary-level health facilities, restricting adolescents' utilization of youth-friendly reproductive health services. Fourth, the province maintained a well-established network of village health volunteers (VHVs), which represented a community resource well suited to supporting and sustaining health behavior interventions.

Given this context, the present study was designed to investigate factors influencing pregnancy prevention behavior among in-school adolescents in Phetchaburi Province (Phase 1) and to develop a structured prevention model informed by the identified determinants (Phase 2). The study employed a mixed-methods approach comprising quantitative analysis using multiple regression and qualitative model development through focus group discussions and expert brainstorming. The findings were expected to contribute a practical, context-specific prevention model that could be integrated into existing school and community health infrastructure in Phetchaburi Province and potentially replicated in comparable settings elsewhere in Thailand.

2. Methodology

This study employed a mixed-methods research design conducted in two sequential phases in Mueang District, Phetchaburi Province, Thailand. Phase 1 utilized quantitative methods to identify factors influencing pregnancy prevention behavior among in-school adolescents, and Phase 2 applied qualitative methods to develop a

structured prevention model based on the Phase 1 findings.

2.1 Phase 1: Quantitative Research

Objective: To investigate factors associated with pregnancy prevention behavior among in-school adolescents with unintended pregnancy risk in Phetchaburi Province.

2.1.1 Study Population and Sample Size

The study population comprised in-school adolescents aged 15–19 years enrolled in secondary educational institutions under the Office of the Secondary Educational Service Area in Mueang District, Phetchaburi Province, totaling approximately 3,200 students. The sample size was calculated based on the principles of multiple regression analysis following the guidelines of Green [11], whereby the minimum sample size was estimated as $N \geq 50 + 8m$, where m represented the number of predictor variables. With 10 predictor variables in the present study, the minimum required sample size was 130 participants; however, the sample was set at 320 to account for a potential non-response rate of approximately 10% and to enhance statistical power.

2.1.2 Inclusion and Exclusion Criteria

Inclusion criteria were: (1) students aged 15–19 years currently enrolled in secondary school in Mueang District, Phetchaburi Province; (2) ability to read and communicate in Thai; and (3) willingness to participate and provide informed consent or assent.

Exclusion criteria were: (1) students who were pregnant at the time of data collection; and (2) students unable to participate in data collection activities during the study period.

Withdrawal criteria were that participants were requested to withdraw from the study at any point without consequence.

2.1.3 Sampling Method

This study employed a multi-stage random sampling procedure consisting of three steps. In Stage 1, purposive sampling was used to select Mueang District as the study site, given its highest number of in-school adolescents with reported pregnancy risk in

Phetchaburi Province. The district was subsequently divided into four administrative health zones based on geographic proximity, service accessibility, and administrative management. In Stage 2, one school was randomly selected from each zone by lottery without replacement, yielding four participating schools. In Stage 3, proportional allocation combined with systematic random sampling was applied to recruit participants from each school according to the proportion of the eligible student population.

2.1.4 Research Instrument

The data collection instrument was a structured questionnaire developed by the researchers through a comprehensive literature review, with a total reliability coefficient (Cronbach's alpha) of 0.87. The questionnaire consisted of six sections as follows.

Section 1 comprised personal and demographic information, including sex, age, grade level, family structure, primary caregiver, monthly household income, and history of sexual intercourse.

Section 2 assessed sexual health literacy (24 items) using a 5-point Likert scale, ranging from "most true" (5 points) to "least true" (1 point). Levels were classified according to the criteria of the Health Education Division, Ministry of Public Health [12] as sufficient (80–100%), intermediate (60–79%), and insufficient (0–59%).

Section 3 measured self-efficacy for pregnancy prevention, adapted from the General Self-Efficacy Scale of Schwarzer and Jerusalem [13] and the Contraceptive Self-Efficacy Scale [14], comprising 17 items on a 5-point confidence scale ranging from "most confident" (5 points) to "least confident" (1 point). Scores were classified into three levels based on Bloom's criteria [15]: high (57–85), moderate (35–56), and low (17–34).

Section 4 assessed attitude toward pregnancy prevention, adapted from the Theory of Planned Behavior [16], comprising 20 items on a 5-point scale. Total scores were classified into three levels: strongly agree (73–100), moderately agree (47–72), and slightly agree (20–46).

Section 5 measured perceived social support, adapted from the Multidimensional Scale of Perceived Social Support (MSPSS) of Zimet et al. [17], comprising 12 items covering

four dimensions: emotional support, informational support, tangible assistance, and positive affirmation. A 3-point scale was used (2 points for regular support, 1 point for occasional support, and 0 points for no support). Scores were classified into three levels: high (17–24), moderate (9–16), and low (0–8).

Section 6 assessed pregnancy prevention behavior, adapted from the Summary of Diabetes Self-Care Activities measure framework and modified for sexual and reproductive health contexts [18], comprising 24 items covering contraceptive use behaviors, communication with partners and parents, health service utilization, and avoidance of risk situations. Scores were classified using Bloom's criteria [15] into three levels: good (≥ 38), fair (28–37), and poor (< 28).

2.1.5 Instrument Quality Assessment

Content validity was assessed by three experts in reproductive health, public health, and adolescent nursing. The Index of Item-Objective Congruence (IOC) values ranged from 0.67 to 1.00 across all items. Reliability was evaluated through a pilot test with 30 students who had characteristics similar to the study sample but were not included in the main study. The Cronbach's alpha coefficient for the total instrument was 0.87.

2.1.6 Data Analysis

Descriptive statistics were used to describe the demographic characteristics of participants and the levels of each study variable. Inferential analysis employed multiple regression analysis (MRA) to examine the independent contribution of each predictor variable — sexual health literacy, self-efficacy, attitude, and social support — to pregnancy prevention behavior. The assumptions of MRA, including normality of residuals, homoscedasticity, and absence of multicollinearity (Variance Inflation Factor < 10), were verified prior to analysis. Statistical significance was set at $P < 0.05$.

2.2 Phase 2: Qualitative Research

Objective: To develop a prevention model for unintended and low-quality pregnancy among in-school adolescents in Phetchaburi Province, based on Phase 1 findings.

2.2.1 Selection of Key Model Components

The Phase 1 findings identified the variables that exerted statistically significant independent effects on pregnancy prevention behavior. The two predictor variables with the highest standardized regression coefficients — sexual health literacy (K) and self-efficacy for pregnancy prevention (A) — were selected as the intervention components of the model. Pregnancy prevention behavior (S) was included as the targeted outcome component that the model aimed to improve, rather than as a predictor variable. Together, these three components constitute the KAS Model.

2.2.2 Activity Allocation

The number of activities allocated to each component was determined according to the magnitude of its influence on the outcome variable, proportional to the standardized regression coefficient (β) identified in Phase 1, thereby ensuring that the model's emphasis reflected the empirical evidence.

2.2.3 Activity Design

Activities were designed to address the research findings, with particular attention to building social support through group-based learning, a LINE application network for ongoing health communication, and structured follow-up by village health volunteers (VHVs) and school nurses.

2.2.4 Feasibility Verification

The suitability and practical feasibility of the drafted model were assessed through focus group discussions and brainstorming sessions with relevant stakeholders. Key informants comprised 45 participants, including 15 in-school adolescents, 8 parents or caregivers, 6 public health officers, 10 village health volunteers, and a multidisciplinary panel of 2 physicians, 2 pharmacists or public health pharmacists, and 2 school counselors, selected to ensure comprehensive representation of all parties involved in adolescent care. Inclusion criteria for key informants were: (1) being a stakeholder directly involved in adolescent health, education, or community care in Mueang District; (2) willingness to participate and provide informed consent; and (3) ability to communicate in Thai. Individuals who had not been involved in adolescent care or health promotion activities were excluded.

Model development activities were conducted over three months (May–July

2025) and consisted of four focus group discussion sessions and two brainstorming sessions. Each session involved 8–10 participants and lasted 90–120 minutes. Focus group discussions aimed to confirm the relevance and acceptability of the proposed model components and activities, while brainstorming sessions were used to assign responsibilities and refine activity content. Qualitative data were analyzed using content analysis following the approach of Graneheim and Lundman [19], through a six-step process: (1) verbatim transcription of all sessions; (2) repeated reading to obtain an overall understanding; (3) identification of the unit of analysis; (4) open coding; (5) categorization into subcategories and main categories; and (6) thematic synthesis. Trustworthiness was established through member checking for credibility, thick contextual description for transferability, and dual-researcher verification for confirmability.

The Nominal Group Technique was applied during the consensus-building process, in which all 45 key informants voted on the suitability of each proposed activity. Activities receiving more than 80% endorsement were retained in the final model.

2.2.5 Model Validity Assessment

Following completion of model development, the draft KAS Model was submitted to a panel of five experts comprising one adolescent medicine physician, two public health specialists, and two health promotion academics for assessment of content validity and practical applicability. The Content Validity Index (CVI) was computed, with a value of 0.91 indicating high validity.

2.3 Data Collection Period

Data collection for Phase 1 was conducted from May to August 2021. Phase 2 model development activities were conducted from May to July 2025 in Mueang District, Phetchaburi Province, Thailand.

2.4 Ethical Considerations

The rights of all research participants were protected throughout the study in accordance with established ethical principles. To ensure respect for autonomy and to maximize benefit to those who consented to participate, written informed consent was obtained from parents or legal guardians prior

to enrollment, as all participants were minors. Participants were also provided with a full explanation of the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time without consequence. Confidentiality of all personal data was strictly maintained throughout the study period.

This research was reviewed and approved by the Human Research Ethics Committee for Medicine and Public Health, Phetchaburi Province, Office of the Phetchaburi Provincial Public Health (Certification No. 022/2568, approved July 7, 2025).

3. Results

3.1 Demographic Characteristics of Participants

A total of 320 questionnaires were distributed, of which 308 were returned with

complete responses, yielding a response rate of 96.3%. Just over half of the participants were female (53.2%), while the remainder were male (46.8%). The majority were aged 16–17 years (61.7%), with a mean age of 16.8 years ($SD = 1.21$). Regarding educational level, most participants were enrolled in Mathayom 4–5 (Grade 10–11), accounting for 68.5% of the sample. With respect to family structure, 52.3% lived in two-parent households, 31.2% lived with a single parent or grandparent, and 16.5% lived in other arrangements. The majority of participants (71.4%) reported monthly household incomes below 10,000 baht. Regarding sexual experience, 18.8% reported having had sexual intercourse at least once, of whom 65.5% reported inconsistent or no use of contraception (Table 1).

Table 1. Demographic Characteristics of Participants (N = 308).

Characteristic	n	%
Sex		
Female	164	53.2
Male	144	46.8
Age group		
16–17 years	190	61.7
Other ages	118	38.3
<i>Mean age (SD)</i>		16.8 (1.21)
Educational level		
Mathayom 4–5 (Grade 10–11)	211	68.5
Other levels	97	31.5
Family structure		
Two-parent household	161	52.3
Single parent / grandparent	96	31.2
Other arrangements	51	16.5
Monthly household income		
Below 10,000 baht	220	71.4
10,000 baht or above	88	28.6
Sexual experience		
Had sexual intercourse at least once	58	18.8
Inconsistent/no contraception use*	38	65.5
No sexual intercourse	250	81.2

* Percentage calculated among those who reported sexual intercourse (n = 58). Questionnaires distributed = 320; response rate = 96.3%.

With regard to study variables, the majority of participants demonstrated intermediate levels of sexual health literacy (56.8%), with 22.1% at the sufficient level and 21.1% at the insufficient level. Self-efficacy for pregnancy prevention was moderate in most participants (58.4%), with 24.0% scoring at the high level

and 17.6% at the low level. Attitude toward pregnancy prevention was moderately favorable in 61.0% of participants. Social support was reported at a moderate level by 57.1% of participants, with 28.3% reporting high social support. Pregnancy prevention behavior was rated as fair in 53.2% of

participants, good in 27.6%, and poor in 19.2% (Table 2).

Table 2. Distribution of Study Variables (N = 308).

Variable	Level	n	%
Sexual health literacy	Sufficient	68	22.1
	Intermediate	175	56.8
	Insufficient	65	21.1
Self-efficacy for pregnancy prevention	High	74	24.0
	Moderate	180	58.4
	Low	54	17.6
Attitude toward pregnancy prevention	Moderately favorable	188	61.0
	Other	120	39.0
Social support	High	87	28.3
	Moderate	176	57.1
	Low	45	14.6
Pregnancy prevention behavior	Good	85	27.6
	Fair	164	53.2
	Poor	59	19.2

3.2 Multiple Regression Analysis

Multiple regression analysis was performed to identify predictors of pregnancy prevention behavior. Prior to analysis, assumptions of normality of residuals, homoscedasticity, and multicollinearity were examined. Variance Inflation Factor (VIF) values for all predictors ranged from 1.12 to 2.34, indicating the absence of problematic multicollinearity. The Durbin-Watson statistic was 1.97, indicating independence of residuals.

The overall regression model was statistically significant ($F(4, 303) = 53.47, p <$

0.001) and accounted for 41.4% of the variance in pregnancy prevention behavior ($R^2 = 0.414$, Adjusted $R^2 = 0.406$). Self-efficacy for pregnancy prevention was the strongest predictor ($\beta = 0.42, p < 0.001$), followed by sexual health literacy ($\beta = 0.31, p < 0.001$), attitude toward pregnancy prevention ($\beta = 0.23, p < 0.001$), and perceived social support ($\beta = 0.18, p = 0.003$). All four predictors made statistically significant independent contributions to the model (Table 3).

Table 3. Multiple regression analysis of factors predicting pregnancy prevention behavior (n = 308).

Predictor Variable	B	SE	β	t	p
Sexual health literacy	0.38	0.07	0.31	5.43	< 0.001
Self-efficacy	0.51	0.08	0.42	6.38	< 0.001
Attitude	0.29	0.07	0.23	4.14	< 0.001
Social support	0.21	0.07	0.18	3.00	0.003

$R^2 = 0.414$, Adjusted $R^2 = 0.406$, $F(4, 303) = 53.47, p < 0.001$

3.3 Results of Model Development

Based on the Phase 1 findings, the two predictor variables with the highest standardized regression coefficients were selected as the intervention components of the KAS Model: sexual health literacy (K, $\beta = 0.31$) and self-efficacy for pregnancy prevention (A, $\beta = 0.42$). Pregnancy prevention behavior (S) was incorporated as the targeted outcome component of the model, representing the behavioral change that the intervention aimed to achieve. Together, these three components constitute the KAS Model. The proportion of activities allocated to each intervention component was determined according to the magnitude of β : self-efficacy received the greatest allocation (5 activities, 41.7%), followed by sexual health literacy (4 activities, 33.3%), and pregnancy prevention behavior (3 activities, 25.0%), totaling 12 activities.

Activities under the sexual health literacy component (K) included: (1) training on interpreting laboratory and health screening results; (2) establishing a LINE network for sexual health information exchange; (3) providing knowledge about reproductive health and contraceptive options; and (4) developing skills in evaluating the accuracy of online health information.

Activities under the self-efficacy component (A) included: (1) video modeling of adolescent peers who demonstrated effective pregnancy prevention practices; (2) peer experience-sharing sessions; (3) goal-setting with rewards upon achievement; (4) problem-solving skills training for high-risk situations; and (5) practical self-efficacy building through role-playing in real-life scenarios.

Activities under the pregnancy prevention behavior component (S) included: (1) collaborative setting of personal pregnancy prevention goals; (2) provision of a structured health behavior self-monitoring handbook; and (3) continuous follow-up by village health volunteers and school nurses.

The model was verified for feasibility and suitability through four focus group discussion sessions and two brainstorming sessions with 45 key informants over a three-month period. Activities receiving endorsement from more than 80% of informants were retained. The final KAS Model was subsequently submitted to five experts, yielding a Content Validity Index (CVI) of 0.91,

confirming high content validity and appropriateness for practical implementation.

4. Discussion

4.1 Factors Influencing Pregnancy Prevention Behavior

The present study found that self-efficacy for pregnancy prevention was the strongest independent predictor of pregnancy prevention behavior ($\beta = 0.42$, $p < 0.001$), which was consistent with Bandura's social cognitive theory [20], wherein self-efficacy was posited as a primary determinant of health-related behavior. This finding was in line with previous research conducted in Thai adolescent populations. Perceived self-efficacy and knowledge on self-care during pregnancy were identified as the two most considerable predictors, together accounting for 25% of the variance in self-care behaviors of Thai teenagers with primigravida. The role of self-efficacy in shaping preventive behavior among adolescents has also been noted in intervention studies; the SESS model, a multi-component framework combining system coordination, empowerment workshops, peer and institutional support, and digital platforms including Facebook and LINE, demonstrated that strengthening adolescent sexual health required addressing self-efficacy as a central mechanism. In the specific sociocultural context of Phetchaburi Province, the researchers suggest that the prominence of self-efficacy over social support as a predictor may be attributable to the predominantly agricultural and semi-rural household environment, where parents' long working hours in rice cultivation and orchard farming reduce opportunities for direct parental guidance on sexual health matters. Under these circumstances, adolescents are more likely to rely on their own perceived capability to make protective decisions rather than on external social reinforcement. This interpretation is consistent with findings from studies in similar rural Thai settings, where self-reliance was identified as a key determinant of health-protective behavior among adolescents whose caregivers had limited availability [21].

Sexual health literacy emerged as the second most influential predictor ($\beta = 0.31$, $p < 0.001$). This finding was consistent with the existing Thai literature. Critical health literacy

significantly predicted pregnancy prevention behavior ($\beta = 0.438$, $p < 0.001$), whereas a regression model incorporating health literacy dimensions explained 17.8% of the variance in behavior among ethnic adolescents in Northern Thailand. Furthermore, sexual health literacy has been identified as a proven effective intervention for preventing teenage pregnancy among secondary school female students in Thailand, with mobile-based health literacy programs demonstrating measurable improvements [22]. These findings collectively supported the inclusion of sexual health literacy as a core component of the KAS Model.

Attitude toward pregnancy prevention was the third significant predictor ($\beta = 0.23$, $p < 0.001$). This result was consistent with Ajzen's Theory of Planned Behavior [16], which posited that attitude was one of the primary determinants of behavioral intention and subsequent action. Attitudes across society have been identified as a key driver of adolescent pregnancy rates, with negative attitudes toward women and girls and stigmatization surrounding access to birth control cited as persistent barriers to effective prevention. The present finding suggested that positive attitudes toward pregnancy prevention were associated with more consistent preventive practices, which reinforced the importance of attitude modification strategies within school-based interventions.

Perceived social support was a statistically significant though comparatively modest predictor ($\beta = 0.18$, $p = 0.003$). This finding supported the broader literature demonstrating the facilitating role of social networks in adolescent health behavior. A program applying motivation, information, self-efficacy, and social support concepts among vocational school female students in Nakhon Ratchasima Province demonstrated that social support was integral to sustaining pregnancy prevention behaviors. Although social support did not emerge as the dominant predictor in the present study, its statistically significant contribution underscored the value of engaging family members, peers, and community health volunteers in prevention efforts, an element that was subsequently incorporated into the KAS Model through structured follow-up activities. The researchers view the comparatively modest role of social support in this sample as a reflection of the

limited availability of consistent social networks among adolescents in Mueang District, where geographic dispersion and parental occupational demands constrain regular family-based communication about sexual health. Nevertheless, the significant contribution of social support to the model suggests that structured community-based reinforcement — such as the village health volunteer follow-up component of the KAS Model — may serve as a meaningful substitute for naturally occurring social support in this context, a view supported by evidence that community health worker interventions improve adolescent reproductive health outcomes in resource-limited settings [23].

4.2 Development of the KAS Model

The KAS Model developed in the present study represented an integrative, community-based prevention framework grounded in the empirical findings of Phase 1. The selection of three core components — sexual health literacy (K), self-efficacy (A), and pregnancy prevention behavior (S) — reflected both the statistical evidence and the practical feasibility considerations identified through stakeholder engagement.

The model's emphasis on self-efficacy as the component with the largest activity allocation (41.7%) was consistent with findings from comparable intervention studies. The use of video modeling of successful peers, peer experience-sharing, and practical role-play scenarios aligned with Bandura's four sources of self-efficacy: mastery experiences, vicarious learning, verbal persuasion, and physiological states [20]. The incorporation of LINE application-based communication networks addressed the technological preferences of adolescents in contemporary Thai society, and was supported by evidence that mobile health messages improved sexual and reproductive health literacy among secondary school female students in Thailand [22].

The integration of village health volunteers and school nurses in the follow-up component of the KAS Model reflected a community-based participatory approach, consistent with the strengths of Phetchaburi Province's established VHV network. Thailand's success in reducing adolescent birth rates from above the target to below 25 per thousand by 2021 was partly attributable to the

coordinated use of community-level health resources alongside legislative reform [23]. The KAS Model sought to build upon this infrastructure by formalizing a structured referral and monitoring pathway between schools, primary care units, and community volunteers.

The high CVI of 0.91 confirmed that the model's components and activities were regarded by experts as appropriate and practically implementable within existing educational and health system resources. These findings suggested that the KAS Model had strong potential for integration into primary care units and school health programs across Phetchaburi Province, and could serve as a replicable framework for other provinces with comparable demographic and healthcare characteristics.

4.3 Strengths and Limitations

This study employed a rigorous mixed-methods design that integrated quantitative identification of predictors with qualitative model development, ensuring that the resulting intervention framework was both empirically grounded and contextually appropriate. The instrument demonstrated high reliability (Cronbach's $\alpha = 0.87$), and the involvement of diverse stakeholders through the Nominal Group Technique enhanced the model's acceptability and feasibility. However, several limitations warranted consideration. The study was conducted exclusively in Mueang District, Phetchaburi Province, which may limit generalizability to other districts or provinces with differing sociocultural contexts. Additionally, the cross-sectional design of Phase 1 precluded causal inference regarding the identified predictors. The KAS Model has not yet been subjected to clinical or program evaluation; therefore, evidence of its effectiveness in reducing unintended pregnancy rates among in-school adolescents remains to be established through future experimental research.

5. Conclusion

This study was conducted in two sequential phases. The Phase 1 findings demonstrated that self-efficacy for pregnancy prevention ($\beta = 0.42$), sexual health literacy ($\beta = 0.31$), attitude toward pregnancy prevention ($\beta = 0.23$), and perceived social support ($\beta = 0.18$) were statistically significant independent

predictors of pregnancy prevention behavior among in-school adolescents in Mueang District, Phetchaburi Province ($p < 0.05$), together accounting for 41.4% of the variance in the outcome ($R^2 = 0.414$). These findings informed the development of the KAS Model in Phase 2, which comprised 12 activities organized across three core components: sexual health literacy (K), self-efficacy (A), and pregnancy prevention behavior (S). The model demonstrated high content validity (CVI = 0.91) and was regarded by stakeholders as feasible and appropriate for implementation within existing school and community health infrastructure.

The KAS Model offers a practical, evidence-based framework for preventing unintended and low-quality pregnancy among in-school adolescents. It draws upon existing community resources, including village health volunteers and the LINE application network, to support continuous follow-up and health communication beyond the classroom setting. The results of this study may contribute to the development of effective intervention programs that prioritize psychological empowerment and sexual health education at the community level. Promoting these three key factors is expected to reduce unintended pregnancy rates, lower the risk of school dropout, and improve the long-term quality of life of adolescents in Phetchaburi Province. The KAS Model may further serve as a replicable framework for other provinces in Thailand with comparable demographic and healthcare characteristics.

Acknowledgements

The authors would like to express sincere gratitude to the Thailand Research Fund (TRF) and Phetchaburi Rajabhat University for their financial support throughout the duration of this research project. The authors also wish to thank the school directors, teachers, and Mathayom 3-6 students in Mueang District, Phetchaburi Province, for volunteering to participate in this program, which made the successful completion of this research possible.

References

- [1] World Health Organization, Adolescent pregnancy [Internet], Geneva: WHO, 2024 [cited 2024 Apr]. Available from:

<https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy>

- [2] World Health Organization, Adolescent health [Internet], Geneva: WHO, 2023. Available from: <https://www.who.int/health-topics/adolescent-health>
- [3] J. A. Osaikhuwuomwan, A. P. Osemwenkha, Adolescent pregnancy: assessment of risk factors and obstetric outcome in a Nigerian tertiary hospital, *J Obstet Gynaecol* 33(5) (2013) 475–478.
- [4] Prevention and Solution of Adolescent Pregnancy Act B.E. 2559, Royal Gazette of Thailand, 2016.
- [5] UNICEF, Early childbearing and teenage pregnancy rates by country [Internet], New York: UNICEF, 2024 [cited 2024 May]. Available from: <https://data.unicef.org/topic/child-health/early-childbearing/>
- [6] World Bank Gender Data Portal, The social and educational consequences of adolescent childbearing [Internet], Washington DC: World Bank, 2022. Available from: <https://genderdata.worldbank.org/en/data-stories/adolescent-fertility>
- [7] P. Ong-Arb, K. Seangpraw, S. Boonyathree, N. Auttama, P. Winaiprasert, Health literacy, self-efficacy, self-care behaviors, and glycemic control among older adults with type 2 diabetes mellitus: a cross-sectional study in Thai communities, *BMC Geriatr* 23(1) (2023) 297.
- [8] H. W. Kim, S. H. Ahn, E. S. Ji, Factors influencing adolescents' healthy pregnancy preparation behavior: a cross-sectional gender comparison applying the health belief model, *Reprod Health* 19(1) (2022) 90.
- [9] M. Su Myat, P. Pattanittum, J. Sothornwit, C. Ngamjarus, S. Rattanakanokchai, School-based comprehensive sexuality education for prevention of adolescent pregnancy: a scoping review, *BMC Womens Health* 24 (2024) 137.
- [10] Phetchaburi Provincial Health Office, Phetchaburi provincial health office strategic plan 2023–2027, Phetchaburi: Phetchaburi Provincial Health Office, 2022.
- [11] S. B. Green, How many subjects does it take to do a regression analysis?, *Multivariate Behav Res* 26(3) (1991) 499–510.
- [12] W. Roma, C. Thanasugarn, M. Thipayamongkolkul, et al., Final report: health literacy survey of Thai population aged 15 years and over, 2017 (Phase 1), Nonthaburi: Department of Health, Ministry of Public Health, 2018.
- [13] R. Schwarzer, M. Jerusalem, Generalized self-efficacy scale, in: J. Weinman, S. Wright, M. Johnston (Eds.), *Measures in health psychology: a user's portfolio*, Windsor: Nfer-Nelson, 1995, pp. 35–37.
- [14] R. A. Levinson, Contraceptive self-efficacy: a perspective on teenage girls' contraceptive behavior, *J Sex Res* 22(3) (1986) 347–369.
- [15] B. Bloom, *Taxonomy of educational objectives: handbook I: cognitive domain*, New York: David McKay, 1975.
- [16] I. Ajzen, The theory of planned behavior, *Organ Behav Hum Decis Process* 50(2) (1991) 179–211.
- [17] G. D. Zimet, N. W. Dahlem, S. G. Zimet, G. K. Farley, The multidimensional scale of perceived social support, *J Pers Assess* 52(1) (1988) 30–41.
- [18] D. J. Toobert, S. E. Hampson, R. E. Glasgow, The summary of diabetes self-care activities measure: results from 7 studies and a revised scale, *Diabetes Care* 23(7) (2000) 943–950.
- [19] U. H. Graneheim, B. Lundman, Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness, *Nurse Educ Today* 24(2) (2004) 105–112.
- [20] A. Bandura, Self-efficacy: toward a unifying theory of behavioral change, *Psychol Rev* 84(2) (1977) 191–215.
- [21] P. Leekuan, R. Kane, P. Sukwong, Narratives on sex and contraception from pregnant adolescent women in a northern province in Thailand: a phenomenological study, *SAGE Open* (2021) 469580211056219.
- [22] P. Narkarat, S. Taneepanichskul, R. Kumar, R. Somrongthong, Effects of mobile health education on sexual and reproductive health information among female school-going adolescents of rural Thailand, *F1000Research* 10 (2021) 452.
- [23] Bureau of Reproductive Health, Department of Health, Ministry of Public Health, Teenage pregnancy surveillance report, Thailand 2021, Nonthaburi: Bureau of Reproductive Health, 2022.



Introduction to Environmental Law of Thailand: Barriers in the Effective Implementation and Enforcement

Sayam Aroonsrimorakot^{1,2*}, Prasert Limprasert², Worapote Thanomkul², Pramuanlert Achariyapanyakul²,
Poom Chokmoh², Anong Hambananda² and Rattapol Sornprasert³

¹ Faculty of Environment and Resource Studies, Mahidol University, Salaya, Thailand

² Department of Law, Faculty of Social Science Mahachulalongkornrajavidyalaya University

³ Faculty of Science, Chandrakasem Rajabhat University, Chatuchak, Bangkok, Thailand

Abstract

This qualitative study examines the systemic barriers that hinder the effective implementation and enforcement of environmental laws in Thailand, where a stark dichotomy persists between comprehensive statutory frameworks and accelerating ecological degradation. Utilizing an interpretive qualitative research design, data were collected through in-depth, semi-structured interviews with eight purposively selected key informants, including environmental jurists, senior officials from the Pollution Control Department, non-governmental legal advocates, and environmental policy scholars. The comparative textual and thematic analysis reveals critical institutional vulnerabilities, primary among which are severe legislative fragmentations and direct jurisdictional conflicts between the Enhancement and Conservation of National Environmental Quality Act (NEQA) B.E. 2535 and industrial development laws such as the Factory Act B.E. 2535. Empirical findings demonstrate that the enforcement gap is further exacerbated by acute technical and budgetary deficits within provincial regulatory bodies, a lack of specialized environmental forensic capacities, and the systematic marginalization of public participation within the Environmental Impact Assessment process. These structural imbalances encourage regulatory capture by industrial capital while stripping local administrative organizations of genuine oversight authority. The study concludes that achieving environmental sustainability requires a comprehensive legislative overhaul to harmonize overlapping ministerial mandates, the establishment of an independent environmental enforcement agency with punitive authority, and the institutionalization of binding community-led strategic environmental assessments to bridge the gap between statutory design and enforcement reality.

Keywords: Environmental Law Enforcement, NEQA B.E. 2535, Regulatory Fragmentation, Qualitative Methodology, Thailand Environmental Policy

Article history: Received 5 June 2026, Revised 18 June 2026, Accepted 26 June 2026

1. Introduction

In the current world, where the climate crisis is a global priority, there is an increasing significance of the study of environmental governance, as it is an essential element in managing the problem of climate change and ensuring sustainable development by reducing the carbon footprint. Environmental governance refers to the system of rules, practices, processes, institutions, and actors that manage the environment and natural resources.

It governs beyond traditional government regulations, relying on the combined efforts of the state, private companies, civil society, and international organizations to promote sustainability [1]. To date, a search of the literature in Thailand lacks the study of Environmental governance / environmental law. The current study aims to fill the gap in the literature. The study of environmental law is based on the framework of environmental governance theory. Environmental governance

*Corresponding author; e-mail: sayam.aro2560@gmail.com

theory refers to the systems, rules, practices, and processes by which political, civil, and corporate actors manage human-environment interactions. It marks a conceptual shift away from traditional top-down state control, focusing instead on polycentric, collaborative, and adaptable approaches to sustainability challenges [2]. Governance is one of the most important factors for ensuring effective environmental management and conservation actions. Yet, there is still a relative paucity of comprehensive and practical guidance that can be used to frame the evaluation, design, and analysis of systems of environmental governance. So, it is important to provide a practical framework that can be applied in designing, evaluating, and analyzing environmental governance in different contexts, social and political, to diverse environmental problems and modes of governance [3].

The kingdom of Thailand has developed a highly sophisticated and dense matrix of environmental statutes over the past four decades. The foundational pillar of this legal architecture is the Enhancement and Conservation of National Environmental Quality Act (NEQA) B.E. 2535 (1992), which was enacted to provide a centralized framework for environmental management, establish environmental quality standards, create the National Environment Board (NEB), and codify the Environmental Impact Assessment (EIA) mechanism [4]. This statutory framework is reinforced by constitutional mandates—most notably within the recent Constitutions of B.E. 2550 (2007) and B.E. 2560 (2017)—which explicitly recognize community rights, the right to a clean environment, and the obligation of the state to protect natural resources and public health.

Despite this robust *de jure* legal infrastructure, Thailand faces a severe enforcement gap: a systemic disconnect between the protective intent of environmental statutes and the *de facto* reality of accelerating

ecological degradation. This gap manifests in recurring seasonal crises, such as the hazardous levels of ambient particulate matter (PM_{2.5}) caused by agricultural biomass burning and industrial emissions [5-6]. It is also evident in the widespread illicit dumping of hazardous electronic and chemical waste, and the progressive contamination of vital aquatic ecosystems [7-8].

The fundamental problem of environmental governance in Thailand does not stem from a deficit of legal text, but rather from the mechanics of institutional implementation and law enforcement. The execution of environmental mandates is distributed across a highly fragmented network of ministries, including:

- The Ministry of Natural Resources and Environment (MNRE),
- The Ministry of Industry (MOI),
- The Ministry of Public Health (MOPH),
- The Ministry of Agriculture and Cooperatives (MOAC).

This fragmentation yields deeply entrenched administrative silos, bureaucratic inertia, and direct jurisdictional friction. For example, while the Pollution Control Department (PCD) under the MNRE is tasked with setting environmental quality standards, it lacks direct police or punitive powers to penalize non-compliant industrial facilities. That enforcement authority remains localized within the Department of Industrial Works (DIW) under the Ministry of Industry, whose primary developmental mandate often conflicts with environmental preservation goals.

Furthermore, local government units—specifically Municipalities and Sub-district Administrative Organizations (OrBorTor)—frequently lack the fiscal flexibility, specialized technical expertise, and independent political insulation required to monitor complex

pollutants or challenge entrenched commercial interests [9]. Consequently, environmental laws are often enforced through a reactionary, complaint-driven mechanism rather than a proactive, systematic regulatory model [8-10]. This structural failure compromises public health, drives environmental injustice, and undermines Thailand's progress toward the United Nations Sustainable Development Goals (SDGs).

2. Objectives of Research

To dissect and address these structural dynamics, this research article aims to describe the following objectives:

- **Primary Objective:** To isolate, identify, and categorize the systemic legal, institutional, and structural obstacles that impede the effective implementation and enforcement of environmental laws within Thailand.
- **Secondary Objective 1:** To conduct a comparative legal analysis of major statutory frameworks—specifically evaluating the jurisdictional overlap, contradictions, and gaps between the Enhancement and Conservation of National Environmental Quality Act (NEQA) B.E. 2535 and sectoral development legislation such as the Factory Act B.E. 2535 (and its subsequent revisions).
- **Secondary Objective 2:** To empirically assess the operational, technical, and political-economic constraints faced by regulatory actors and local authorities, drawing directly on the field experiences of key institutional and legal stakeholders.
- **Secondary Objective 3:** To formulate a comprehensive policy and legislative roadmap capable of harmonizing institutional mandates, expanding public participation, and strengthening enforcement mechanisms to secure long-term environmental sustainability in Thailand.

3. Methodology of the Research

This study adopts a qualitative, interpretive research paradigm to capture the complex institutional dynamics and socio-legal nuances of environmental law enforcement in Thailand. Because the enforcement gap is shaped by bureaucratic behavior, political-economic pressures, and subtle statutory interpretations, a purely quantitative approach would miss the underlying causal mechanisms.

The primary empirical data for this study were gathered through in-depth, semi-structured interviews with eight carefully selected key informants. Purposive sampling was used to conduct in-depth interviews with 8 key informants who have knowledge related to the study topic. This sampling method ensures that all selected individuals possessed specialized expertise and held high-level positions across the primary sectors involved in Thai environmental governance. All participants for the in-depth interview were contacted by phone and sent an official letter, requesting that they spare time for the interview at a place and time according to their convenience. When they gave consent for the interview, the researchers conducted the interview. The data was collected through a questionnaire that the researchers designed, keeping in mind the study's objectives. The interview took about one hour to complete the in-depth interview. All the data provided was kept anonymous and confidential, following the ethical nature of the Helsinki Declaration Principles.

Key Informant Codes and Sectors

- KI-1 (Senior Environmental Jurist): A high-ranking judge within the Environmental Division of the Central Administrative Court, providing expertise on environmental litigation bottlenecks and evidentiary standards.
- KI-2 (PCD Regulator): A senior policy analyst and enforcement officer from

the Pollution Control Department (MNRE), offering insight into inter-agency friction and monitoring constraints.

- KI-3 (DIW Enforcement Officer): A senior inspector from the Department of Industrial Works (Ministry of Industry), detailing the practical application of the Factory Act and industrial compliance monitoring.
- KI-4 (Environmental Law Academic): A professor of environmental law at a leading Thai university, specializing in comparative statutory analysis and constitutional rights.
- KI-5 (NGO Legal Advocate): A lead attorney from an environmental justice non-governmental organization, representing communities affected by industrial pollution.
- KI-6 (Provincial Environmental Officer): A regional director of the Provincial Office of Natural Resources and Environment, highlighting localized implementation challenges.
- KI-7 (Local Government Leader): A chairperson of a Sub-district Administrative Organization (OrBorTor) experiencing high industrial density, detailing municipal monitoring and fiscal constraints.
- KI-8 (Environmental Consultant / EIA Specialist): A certified technical expert with two decades of experience preparing Environmental Impact Assessment reports for state and private infrastructure projects.

Interviews were guided by a flexible protocol covering three primary themes:

- 1) statutory conflicts: occur when two or more legislative provisions contradict each other, overlap in jurisdiction, or cannot be applied simultaneously to the same set of facts. Courts and legal scholars apply structured interpretive principles and legal rules to harmonize or resolve these inconsistencies;
- 2) institutional capacity: the ability of public institutions, judiciary, or government to effectively enact, administer, enforce, and implement the laws, specific policy order for which they are responsible, comprising mainly two dimensions, viz, organizational and governance dimensions. It determines whether a legal system can operate fairly, independently, and in a way that truly serves the public [11-12].
- 3) political-economic barriers to law enforcement: refer to the systemic ways in which economic conditions and political dynamics obstruct the effective application of the law. Common barriers include policing for revenue, state capture, resource constraints, and political interference, all of which heavily distort enforcement priorities and hinder institutional legitimacy [13-15].
To ensure academic rigor and data validity, the data analysis process followed a strict protocol.

Data Analysis

1. Verbatim Transcription: Audio recordings of interviews were transcribed verbatim in Thai and subsequently translated into English, ensuring linguistic and conceptual equivalence.
2. Thematic Content Analysis: Transcripts were systematically coded using an inductive-deductive approach to isolate recurrent operational themes.
3. Triangulation: Interview data were cross-verified against official regulatory documents, supreme court precedents, and international legal audits.
4. Member Checking: Preliminary analytical findings were returned to four key informants to validate the accuracy and contextual integrity of their statements.

4. Results

4.1 Statutory Conflicts: NEQA B.E. 2535 vs. The Factory Act B.E. 2535

A comparative analysis of Thailand's core environmental and industrial legislation reveals deep structural contradictions that systematically undermine enforcement. The Enhancement and Conservation of National Environmental Quality Act (NEQA) B.E. 2535 is designed around the Precautionary Principle

and the Polluter Pays Principle, asserting the state's duty to protect ecosystems and human health [4]. Conversely, the Factory Act B.E. 2535 (extensively amended in B.E. 2562 / 2019) is primarily a market-facilitation statute designed to regulate industrial expansion and minimize operational friction for corporate enterprises. The regulatory cross-examination in the table below outlines these structural contradictions, as shown in Table 1.

Table 1. Structural Contradictions in Thailand's Environmental and Industrial Regulatory Framework.

Statutory Dimension	NEQA B.E. 2535 (1992)	Factory Act B.E. 2535 / Revised B.E. 2562 (2019)	Systemic Vulnerability Created
Primary Institutional Mandate	Environmental protection, conservation of natural resources, and public health restoration (MNRE).	Promotion, regulation, and facilitation of industrial expansion and economic efficiency (MOI).	Institutional Conflict: The developmental agency holds the veto power over environmental remediation orders.
Enforcement Powers & Punitive Authority	Authorizes the setting of ambient environmental standards, but lacks direct operational powers to seal factories or arrest corporate polluters.	Grants absolute authority to issue, renew, suspend, or revoke industrial operating licenses (Ror.Ngor. 4).	Regulatory Impotence: The PCD cannot directly penalize a factory; it must formally request the DIW to act, which frequently results in bureaucratic delays.
Trigger Thresholds for Oversight	Governed by potential ecological impact, requiring rigorous EIA or EHIA tracking for designated project categories.	The 2019 amendment raised the minimum threshold for a facility to be legally classified as a "factory" from 5 horsepower/7 workers to 50 horsepower/50 workers .	Deregulation Loophole: Thousands of small-to-medium enterprises (SMEs) handling hazardous substances are now completely exempt from DIW environmental monitoring.
Public Participation Mechanisms	Codifies public rights to information and compensation under Article 6, though these are often non-binding.	Maintains highly centralized, discretionary decision-making, with minimal mandatory windows for local community input during licensing.	Community Marginalization: Local populations cannot legally block an industrial license application even if it threatens a local watershed.

4.2 Empirical Findings from Key Informants

Thematic analysis of the interviews identified three primary, systemic bottlenecks that explain why Thailand's environmental laws struggle to achieve their objectives on the ground.

Theme 1: Jurisdictional Overlaps and Bureaucratic Silos

Informants consistently emphasized that the division of environmental authority across competing ministries paralyzes enforcement. KI-2 (PCD Regulator) explained this operational gridlock:

"We detect heavy metal concentrations in a local river that far exceed standard safety limits. However, our agency cannot legally cross the threshold of the suspected facility to halt operations. We must write an official request to the Department of Industrial Works. By the time the DIW inspectors schedule a visit, the effluent lines have often been flushed or altered."

This sentiment was mirrored by KI-5 (NGO Legal Advocate), who noted that the 2019 amendment to the Factory Act fundamentally stripped local communities of legal protections. By exempting facilities with under 50 employees from strict factory regulations, the law effectively pushed thousands of polluting operations into an unmonitored gray space, overwhelming local administrative budgets [7,10].

Theme 2: Technical, Forensic, and Budgetary Deficits

A recurring issue highlighted by local and provincial informants was the lack of advanced scientific equipment and specialized personnel needed to build legally bulletproof cases. KI-6 (Provincial Officer) remarked:

"We are tasked with monitoring pollution across an entire province with fewer than five field staff. Environmental laboratory tests are prohibitively expensive. When a major chemical spill occurs, we are forced to rely on private, outsourced laboratories to process samples. This delays our evidence gathering,

making it nearly impossible to meet the strict evidentiary standards required by the courts."

This dynamic is supported by recent research indicating that Thailand's environmental forensics infrastructure remains underdeveloped [8]. Consequently, corporate defendants can easily contest basic water or soil samples in court by challenging the chain of custody or the testing methodology.

Theme 3: Flawed EIA Approvals and Restricted Public Participation

Informants across both the legal and consulting sectors identified the Environmental Impact Assessment (EIA) process as a formal exercise in compliance rather than a genuine protective tool. KI-8 (EIA Specialist) observed:

"Because project developers directly pay the consulting firms that draft the EIAs, there is a clear structural incentive to downplay ecological risks. Public hearings are frequently treated as a box-checking exercise. Consultations are often held in remote areas with limited notice, or pack the room with stakeholders who support the project, effectively silencing local dissent."

KI-1 (Senior Environmental Jurist) noted that when these flawed EIAs are challenged in the Administrative Court, the court's review is typically limited to verifying whether the correct administrative procedures were followed, rather than evaluating the scientific accuracy of the ecological findings [4,16].

This procedural focus limits the court's ability to provide substantive environmental justice.

5. Conclusions and Recommendations

The enforcement gap in Thailand's environmental law is not a failure of statutory drafting; it is an institutional and structural vulnerability born of fragmented jurisdictions, resource disparities, and regulatory frameworks that prioritize industrial growth over ecological stability. Under the current system, the agencies tasked with environmental protection lack the teeth to enforce compliance, while the agencies with punitive power are explicitly mandated to foster economic expansion. To resolve these

contradictions and align Thailand with international sustainability standards, this study proposes a three-tiered policy and structural reform roadmap.

5.1 Structural and Legislative Realignment

- *Establishment of a Centralized, Independent Environmental Protection Agency*: Thailand should transition toward an independent regulatory body model, consolidating the monitoring functions of the PCD and the enforcement powers of the DIW into a single agency. This body must possess independent investigative authority, specialized environmental forensic squads, and direct powers to issue administrative fines or halt non-compliant operations without requiring secondary ministerial approval.
- *Amendment of the Factory Act B.E. 2562*: The jurisdictional thresholds established in the 2019 revision must be re-evaluated. Small and medium enterprises that process hazardous chemicals or discharge heavy metal effluents must remain subject to strict environmental oversight, regardless of their horsepower or employee count.

5.2 Enhancing Judicial Capacity and Democratizing Public Participation

- *Expanding the Environmental Judiciary*: The Environmental Division of the Court of Justice should be expanded and provided with its own independent technical and scientific advisory panels. This change would allow judges to critically evaluate complex scientific data, moving beyond procedural reviews to address substantive ecological damage.
- *Institutionalization of Strategic Environmental Assessments (SEA)*: The ad-hoc EIA model must be upgraded to a mandatory, community-led Strategic Environmental Assessment framework. SEAs should be conducted at the regional and sector-wide planning stages before specific industrial zones are established or

individual factory licenses are granted [16]. This institutional shift would ensure that public participation is embedded in macro-level development decisions rather than added as an afterthought.

5.3 Local Capacity Building

- *Decentralizing Fiscal and Technical Resources*: Sub-district Administrative Organizations (OrBorTor) must receive dedicated, ring-fenced national funding to build local pollution-monitoring capacities [9]. Equipping local communities with continuous, real-time air and water monitoring technologies would enable them to gather legally actionable data, turning local authorities into the first line of defense against environmental degradation.

6. Limitations of the Study

The study was limited by a small sample size due to a limited budget and time. It was conducted as a part of the course curriculum for the Master's Degree in Law. It can be expanded further with a bigger sample size and longer duration in future research if funding is allocated.

References

- [1] Manglai. Environmental Governance, (2026). Retrieved from <https://www.manglai.io/en/glossary/environmental-governance>
- [2] S. Partelow, A. Schlüter, D. Armitage, M. Bavinck, K. Carlisle, R.L. Gruby, A.K. Hornidge, M. Le Tissier, J.B. Pittman, A.M. Song, L.P. Sousa. Environmental governance theories: a review and application to coastal systems. *Ecology and Society* 25(4) (2020) 1-21. <https://doi.org/10.5751/ES-12067-250419>
- [3] N.J. Bennett, T. Satterfield. Environmental governance: A practical framework to guide design, evaluation, and analysis.

- Conservation Letters 11(6) (2018) e12600.
- [4] D. Pothiruk. Legal problems of environmental impact assessment in Thailand calling for law revision. *Hasanuddin Law Review* 7(1) (2021) 12–25. <https://doi.org/10.20956/halrev.v7i1.2702>
- [5] J. Nikam. Air quality in Thailand: Institutional mechanisms and enforcement challenges. *Stockholm Environment Institute (SEI) Working Paper Series*, (2021) No. 2021-01. <https://doi.org/10.5167/sei.2021.01>
- [6] D. Pakdeearporn, D. Sangnak.. Strategic policy and environmental management for driving green road construction in Thailand. *Thai Interdisciplinary and Sustainability Review* 18(1) (2026) 203–221. <https://doi.org/10.14456/tisr.2026.3>
- [7] A. Lekagul. Regulating antimicrobial resistance in the environment: Analysis of Thailand legal framework and areas for reinforcement. *Environmental Health Perspectives* 133(4) (2025) 047002. <https://doi.org/10.1128/aac.40502926>
- [8] J. Wiengsamut. Development of forensic science process guidelines for environmental crime investigations in Thailand. *International Journal of Criminal Justice Sciences* 19(1) (2024) 142–159. <https://doi.org/10.5281/zenodo.1235>
- [9] T. Topothai. Municipal officials' perspectives on challenges and opportunities in shaping urban built environments for active living in Thailand: A qualitative study. *BMJ Global Health* 10(9) (2025) e019383. <https://doi.org/10.1136/bmjgh-2025-019383>
- [10] S. Khongsong. Community rights violation by government officers influencing to lifestyle, quality of life, and safety of residents: A case study of housing estate community in Eastern Bangkok. *International Academic Multidisciplinary Research Review* 8(3) (2026) 45–58.
- [11] G. Kim, T. Kumar, R. Ramalho, S.E. Russell. Institutional Capacity for Policy Implementation: An Analytical Framework (No. 11279) (2026). The World Bank.
- [12] V. Popov. Developing new measurements of state institutional capacity (2011). Available at SSRN 1893825. 2011 Mar 1.
- [13] T. Friche, M.C. Mungan. The political economy of enforcer liability for wrongful police stops. *Journal of Public Economic Theory* 23(1) (2021) 141–57.
- [14] D. Marks, J. Connell. “Their lives don't matter to politicians”: The necropolitical ecology of Thailand's dangerous and unequal roads. *Political Geography* 108 (2024) 103012. <https://doi.org/10.1016/j.polgeo.2023.103012>
- [15] M. Dewey, C. Woll, L. Ronconi. The political economy of law enforcement. *MaxPo Discussion Paper* 21/1 (2021), Max Planck Sciences Po Center on Coping with Instability in Market Societies (MaxPo), Paris; 2021.
- [16] F. Arifin. Legal and constitutional gaps in strategic environmental assessment: Between formality and substantive environmental protection. *Journal of Environmental Policy and Constitutional Law* 14(2) (2025) 112–129.



A System-Based Framework for Enhancing Human Research Ethics Governance in Higher Education: Evidence from Phetchaburi Rajabhat University, Thailand

Chananut Ngerntong^{1,*}

¹ Institute of Research and Arts & Cultural Promotion, Phetchaburi Rajabhat University,
Phetchaburi 76000, Thailand

Abstract

This study examined the current conditions, management constraints, and development strategies for strengthening human research ethics governance at Phetchaburi Rajabhat University, Thailand. The study employed qualitative documentary research, supported by descriptive analysis of operational statistics from 84 research protocols submitted to the university Research Ethics Committee (REC) during 2022-2024. Primary documents included institutional regulations, standard operating procedures, application forms, REC meeting records, annual reports, and user satisfaction reports. Secondary documents included national and international standards, particularly the National Ethics Committee Accreditation System of Thailand (NECAST), the CIOMS guidelines, ICH-GCP, and World Health Organization guidance. Data were analyzed using content, comparative, and gap analyses, as well as data triangulation. The findings indicated that the university had established a formal research ethics governance system, including institutional regulations, a multidisciplinary REC, standard operating procedures, and an online submission platform. However, seven major limitations were identified: increasing secretariat workload relative to staffing capacity; insufficient lay representation; absence of systematic individual development plans; review timelines that exceed expected benchmarks; a 100% protocol revision rate before approval; incomplete post-approval monitoring; and a partially digitized information system. Based on the findings, the study proposes a System-Based REC Development Framework comprising inputs, NECAST-based processes, outputs, outcomes, and continuous improvement. The framework emphasizes strengthening human resources, policy integration, pre-review support for researchers, electronic post-approval monitoring, and an integrated e-REC system. The proposed framework may be adapted by medium-sized higher education institutions seeking to improve REC efficiency, transparency, accountability, and participant protection in line with national and international research ethics standards.

Keywords: human research ethics, research ethics committee, NECAST, research governance, post-approval monitoring, e-REC system

Article history: Received 23 June 2026, Revised 29 June 2026, Accepted 29 June 2026

1. Introduction

Research involving human participants plays a critical role in generating knowledge and innovation for improving quality of life, health, education, local development, and social well-being. At the same time, such research requires rigorous ethical oversight to ensure respect for human dignity, rights, safety,

privacy, and welfare. Human research ethics governance is therefore not merely an administrative requirement; it is a core institutional mechanism for protecting research participants and strengthening public trust in research.

International ethical frameworks, including the Belmont Report, the CIOMS International Ethical Guidelines for Health-related Research

*Corresponding author; e-mail: chananut.nge@mail.pbru.ac.th

Involving Humans, and the ICH-GCP, highlight the need for independent, competent, transparent, and accountable ethics review systems [1, 2]. These frameworks emphasize risk-benefit assessment, informed consent, privacy protection, scientific validity, fair participant selection, and continuing oversight throughout the research life cycle [3, 4, 5]. In higher education institutions, these principles are operationalized through Research Ethics Committees (RECs), also referred to as Institutional Review Boards (IRBs) or Human Research Ethics Committees.

In Thailand, the quality and standardization of REC operations have been promoted through the National Ethics Committee Accreditation System of Thailand (NECAST) [6, 7]. NECAST provides a structured quality framework covering five domains: (1) committee structure and composition; (2) compliance with institutional policies and specific requirements; (3) protocol review procedures; (4) post-approval procedures; and (5) documentation and archiving. This framework is highly relevant to universities striving to balance an increasing volume of research with limited administrative resources.

Phetchaburi Rajabhat University is a regional higher education institution with missions in teaching, research, community development, and local innovation. Since fiscal year 2021, the number of research projects involving human participants has increased, resulting in a higher workload for the university REC and its secretariat. Although the university has established formal regulations [8], an REC structure [9], standard operating procedures (SOPs) [10, 11], and an online submission system [12], operational constraints persist in review timelines, researcher preparedness, post-approval monitoring, personnel development, and information management.

Previous studies and institutional experiences in Thailand and internationally have reported similar challenges: prolonged review timelines, insufficient administrative support, variation in review practices, limited training, and incomplete electronic systems [13, 14, 15]. However, studies that systematically examine REC management in regional Thai

universities, particularly Rajabhat universities, remain limited [14]. This study addresses that gap by analyzing the human research ethics governance system of Phetchaburi Rajabhat University through a NECAST-based system perspective and proposing a practical development framework for institutional improvement.

2. Objectives

The objectives of this study were threefold: (1) to examine the operational conditions of human research ethics governance at Phetchaburi Rajabhat University; (2) to analyze the problems, obstacles, and management gaps affecting the efficiency of the university REC system; and (3) to propose development strategies for strengthening human research ethics governance in accordance with NECAST and international ethical standards.

3. Materials and methods

3.1 Research design

This study employed a qualitative documentary research design, supported by descriptive analysis of operational statistics. The documentary approach was appropriate because the study aimed to examine institutional governance mechanisms, formal procedures, operational records, and compliance with national and international research ethics standards.

3.2 Data sources and document selection

Data were collected from primary and secondary documents related to the operation of the Phetchaburi Rajabhat University REC during 2022-2024. This period was selected because the university had established a formalized human research ethics system with sufficient operational records available for analysis. Documents were included if they were directly related to human research ethics management, fell within the study period, could be verified for source and accuracy, and reflected the REC's policies, structures, procedures, or operational outcomes.

Primary documents comprised university regulations [8], orders and announcements [9],

SOPs [10, 11], application forms, REC meeting reports, statistical operation reports, annual REC reports [16, 17, 18], satisfaction reports from service users, and reports from training or workshop activities on research ethics. Secondary documents comprised academic literature, national standards, NECAST guidelines [6, 7], the Belmont Report, CIOMS guidelines [1], ICH-GCP [2], WHO guidance [5], and operational manuals or evaluation reports from research ethics committees in Thailand and abroad [13, 14].

3.3 Data analysis

Data were analyzed using content analysis, comparative analysis, and gap analysis. Documentary data were reviewed, coded, categorized, and synthesized according to the five NECAST domains. The university's current practices were then compared with NECAST requirements and relevant international standards to identify strengths, gaps, operational limitations, and development strategies. Quantitative operational data, including the number of protocols submitted, review timelines, revision rates, and satisfaction results, were analyzed using descriptive statistics, including frequencies, percentages, means, and trend comparison across 2022-2024.

Review time was calculated from the date a protocol entered the REC system to the date an ethics approval certificate was issued. The protocol revision rate was calculated by comparing the number of protocols returned to researchers for correction or additional information with the total number of protocols submitted in each fiscal year.

3.4 Trustworthiness

Data credibility was enhanced through triangulation across multiple sources, including university policy documents, SOPs, annual reports, REC meeting records, statistical reports, satisfaction surveys, training reports, and national and international standards. Consistency across these sources was examined before the findings were synthesized.

4. Results

The findings are presented according to the five NECAST domains. Overall, Phetchaburi Rajabhat University had established the foundations of a formal REC system; however, gaps remained in workload management, performance monitoring, post-approval oversight, and digital integration.

4.1 Standard 1: Committee structure and composition

The university had a clear governance structure for human research ethics, supported by the Phetchaburi Rajabhat University Regulation on Human Research (B.E. 2565/2022) [8]. The REC consisted of 24 members, including 10 core members and 14 associate members. Members represented diverse academic disciplines, and external members participated in the committee to strengthen independence and multidisciplinary judgment. The university also allocated a budget for REC meetings, personnel development, and office administration.

Nevertheless, two major gaps were identified. First, the secretariat was staffed by only two support personnel, despite their responsibility for coordination, meeting preparation, document management, communication with researchers, and project follow-up for the entire university. Second, the number of lay persons remained insufficient. Although all committee members had completed training in human research ethics, there was no systematic Individual Development Plan (IDP) for committee members and staff.

4.2 Standard 2: Compliance with specific policies

The university had formal regulations and SOPs covering key REC processes, including protocol submission, initial review, expedited review, exemption review, post-approval monitoring, progress reporting, adverse event reporting, and study closure. The EC-PBRU online submission system was implemented to support ethics submission and project status tracking [12].

However, the study found that REC-related key performance indicators (KPIs) had not yet

been clearly integrated into the institutional strategic plan, quality assurance system, or annual monitoring framework. The information system also did not fully cover all REC processes, particularly post-approval monitoring and integrated reporting.

4.3 Standard 3: Protocol review procedures

The REC applied three types of review according to protocol risk and category: full board review, expedited review, and exemption review. Analysis of 84 research protocols submitted during 2022-2024 found an average review time of 78 days. The minimum review time was 13 days, and the maximum was 186 days when aggregated across the three-year

period. All submitted protocols were returned to researchers for correction or additional information before approval, resulting in a 100% revision rate (Table 1).

The most common reasons for revision were incomplete documents, inconsistencies between the research proposal and supporting documents, incomplete participant information sheets or informed consent forms, insufficient explanation of risks and benefits, and revision requests based on committee recommendations. These findings indicate that review efficiency is linked not only to REC procedures but also to researcher preparedness and the quality of initial submissions.

Table 1. Operational statistics of the Human Research Ethics Committee, 2022-2024.

Fiscal year	No. of protocols	Minimum review time (days)	Maximum review time (days)	Mean review time (days)	Revision rate (%)
2022	26	13	155	75	100
2023	29	31	139	88	100
2024	29	52	186	72	100
Total / Mean	84	13	186	78	100

Note: Review time was calculated from submission to issuance of the ethics approval certificate. Minimum and maximum values in the Total row represent the lowest and highest values across all 84 protocols.

4.4 Standard 4: Post-approval procedures

The university had SOPs for post-approval activities, including protocol amendment review, progress reporting, final report submission, adverse event reporting, complaint management, and premature study termination. These procedures reflect the formal existence of post-approval oversight mechanisms.

In practice, however, post-approval monitoring relied largely on documents and email communication. The EC-PBRU online submission system did not yet provide a complete electronic post-approval monitoring workflow, automatic reminders, or real-time project status tracking [12]. This gap may limit the ability of the REC to monitor continuing

ethical compliance throughout the research life cycle.

4.5 Standard 5: Documentation and archiving

The university had established documentation and record-keeping procedures under its regulations and SOPs. The EC-PBRU online submission system supported electronic submission and partial data storage [12]. However, the overall system remained semi-electronic because paper documents and email communication continued to be used alongside the online platform. A centralized database linking all stages of the project life cycle had not yet been fully developed.

The absence of an integrated database limited systematic retrieval, performance monitoring, audit readiness, and institutional-level reporting. This finding suggests the need for an integrated e-REC system capable of

linking submission, review, approval, post-approval monitoring, reporting, archiving, and traceability (Table 2).

Table 2. NECAST-based gap analysis and development strategies.

NECAST standard	Current status	Gap identified	Development strategy
1. Committee structure and composition	Formal regulation; REC with 24 multidisciplinary members; external members; budget support.	Limited secretariat capacity; insufficient lay representation; no systematic IDP; some reviews need more substantive comments.	Increase secretariat capacity; recruit additional lay persons; develop IDPs; provide continuing training in ethics and research methodology.
2. Compliance with policies	Regulations and SOPs cover major processes; online submission system exists.	REC KPIs are not clearly integrated into strategic planning or institutional quality assurance.	Define REC performance indicators; connect REC governance with strategy, quality assurance, and annual monitoring.
3. Protocol review procedures	Full board, expedited, and exemption reviews are used according to risk.	Average review time was 78 days; 100% of protocols required revision.	Establish pre-review consultation or an ethics clinic; develop researcher checklists; strengthen administrative screening before formal review.
4. Post-approval procedures	SOPs cover progress reports, amendments, adverse events, complaints, and study closure.	Monitoring remains document- and email-based; no automated or real-time tracking.	Develop electronic post-approval monitoring with automated alerts and life-cycle status tracking.
5. Documentation and archiving	Online submission and partial electronic storage are available.	System remains semi-electronic; no integrated database across all processes.	Develop an integrated e-REC system with search, audit trail, reporting, and archival functions.

5. Discussion

The study demonstrates that Phetchaburi Rajabhat University has established important

foundations for human research ethics governance, including regulations, an REC structure, SOPs, and digital submission support. These foundations are consistent with

NECAST expectations and with international guidance requiring ethics review systems to be independent, multidisciplinary, documented, and accountable [1, 2, 5]. Nevertheless, the findings also show that formal structures alone are insufficient to ensure operational efficiency and continuous participant protection. Effective REC governance requires the alignment of people, policies, processes, technology, and continuous improvement mechanisms.

For Standard 1, the existence of a multidisciplinary REC and external members supports independent and balanced ethical judgment. However, limited secretariat staffing and insufficient lay representation may affect workload management, review quality, and community perspectives. International standards emphasize that REC membership should include both scientific and non-scientific perspectives, and that administrative support must be adequate for timely and high-quality review [1, 5]. The findings therefore suggest that human resource planning should be treated as a governance issue rather than a routine administrative matter.

For Standard 2, regulations and SOPs provide a strong compliance base. However, the lack of REC-specific KPIs limits the university's ability to monitor performance, evaluate improvement, and connect REC development with institutional quality assurance. Research governance should include measurable indicators such as average review time, proportion of complete submissions, number of post-approval reports submitted on time, training coverage, user satisfaction, and audit readiness [4]. Integrating these indicators into the university's strategic and quality systems would make research ethics governance more visible and sustainable.

For Standard 3, the average review time of 78 days and the 100% revision rate indicate a need to improve both researcher preparedness and process efficiency. Many delays appear to originate from incomplete or inconsistent submissions. Comparable studies have likewise associated avoidable delays with the timing and completeness of applications [13, 15]. This suggests that REC development should not focus solely on committee review but should

also include upstream support mechanisms, such as pre-review screening, researcher checklists, templates for participant information and consent forms, and an ethics consultation clinic. Such mechanisms can reduce avoidable revisions and improve the quality of protocols before formal review.

For Standard 4, the existence of SOPs for post-approval activities is a strength. However, the lack of an electronic and proactive monitoring system reduces the ability to ensure ongoing compliance after approval. Post-approval monitoring is essential because participant protection does not end at initial approval. Progress reports, amendments, adverse events, complaints, protocol deviations, and study closure should be traceable in a single system. Automated reminders and real-time dashboards would help researchers comply with reporting requirements and help the REC identify overdue or high-risk projects.

For Standard 5, the semi-electronic system reflects a common transition challenge in higher education institutions. While online submission improves accessibility and reduces some paperwork, a fragmented system can still create duplication, data gaps, and weak audit trails. An integrated e-REC system should support the entire research life cycle, from submission and review to approval, post-approval monitoring, reporting, and archiving. Such a system would improve transparency, traceability, institutional reporting, and preparedness for NECAST accreditation.

A key contribution of this study is the proposal of a System-Based REC Development Framework. Unlike a checklist-based compliance assessment, the framework shows the causal relationships among inputs, processes, outputs, and outcomes. For example, limited secretariat capacity and inadequate lay representation affect review timelines, post-approval monitoring, and document management. Conversely, a well-designed e-REC system can simultaneously improve screening, communication, monitoring, reporting, and archiving. REC development should therefore be implemented as an

integrated system rather than as isolated activities.

This study has limitations. As a single-institution documentary case study conducted by researchers familiar with the institution, the findings reflect one regional context and may be subject to insider perspective. Generalization should therefore be treated with caution, and the proposed framework is conceptual and has not yet been empirically validated. These limitations are addressed in the recommendations for future research.

6. Proposed System-Based REC Development Framework

The proposed framework consists of five linked components: inputs, processes, outputs, outcomes, and continuous improvement. Inputs include institutional policy and leadership support, REC members and secretariat personnel, budget, information technology, SOPs, training resources, and facilities. Processes refer to the five NECAST domains: committee structure and composition, policy compliance, protocol review, post-approval procedures, and documentation and archiving. Outputs are an efficient, transparent, accountable, and traceable REC system. Outcomes include improved research quality, stronger participant protection, increased researcher capacity, institutional trust, and alignment with national and international standards (Figure 1).

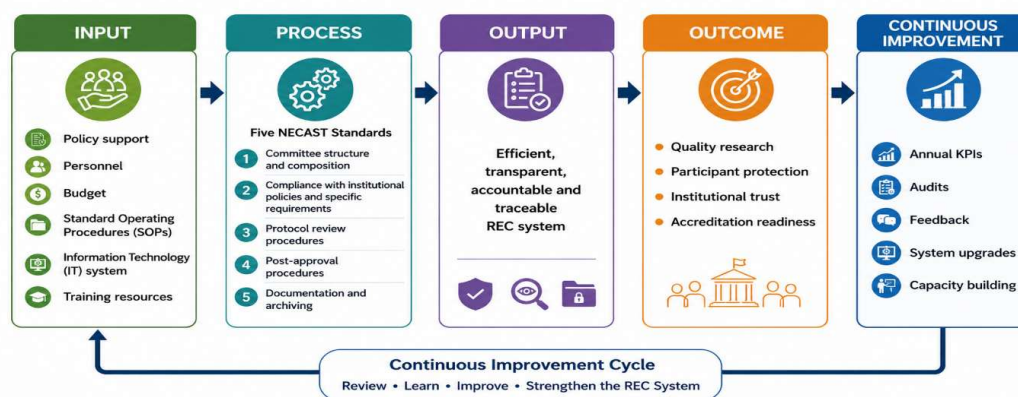


Figure 1. System-Based REC Development Framework aligned with NECAST.

The framework is particularly applicable to medium-sized universities and Rajabhat universities with similar resource constraints. It provides a practical basis for gap analysis, institutional planning, quality assurance integration, and preparation for NECAST accreditation.

7. Conclusions

This study analyzed the human research ethics governance system of Phetchaburi Rajabhat University using the NECAST framework. The findings demonstrate that the university has established a formal governance structure comprising institutional regulations, a multidisciplinary

Research Ethics Committee (REC), standardized operating procedures (SOPs), budget allocation, and an online submission platform. However, several operational limitations remain, including insufficient secretariat capacity, inadequate lay representation, the absence of systematic competency development for REC members and staff, prolonged review timelines, high protocol revision rates, incomplete electronic post-approval monitoring, and semi-electronic documentation. These findings indicate that establishing institutional structures alone is insufficient to ensure an effective research ethics governance system. Sustainable governance also requires continuous organizational development, adequate

institutional support, systematic quality management, and continuous monitoring throughout the research lifecycle.

These findings are consistent with the current direction of research ethics governance development within Thai higher education institutions. Previous studies have reported that many universities have established fundamental governance mechanisms, including institutional regulations, multidisciplinary RECs, ethics review procedures, and ethics training systems. Nevertheless, institutional capacity differs considerably among universities, particularly regional and medium-sized institutions where limitations in personnel, administrative support, and organizational resources remain common challenges. Therefore, strengthening research ethics governance requires not only compliance with national standards such as NECAST but also continuous institutional capacity building and integrated governance mechanisms.

The findings are also consistent with previous research conducted at Rajabhat Universities. Supising et al. [19] developed a system-based management framework for work-integrated education in Rajabhat Universities and demonstrated that successful institutional management depends on integrating policy, information systems, stakeholder collaboration, implementation processes, assessment, and continuous development within a unified governance framework. Although their study focused on work-integrated education rather than research ethics governance, both studies emphasize that effective institutional governance requires integrated policy, standardized operational procedures, stakeholder participation, quality assurance, and continuous improvement rather than isolated administrative activities. This comparison suggests that a system-based governance approach is an appropriate development model for Rajabhat Universities operating under similar institutional contexts and resource constraints.

The present findings are further supported by broader organizational management literature. In their review of ISO

20400 Guidance for Sustainable Procurement, Aroonsrimorakot and Laiphrakpam [20] concluded that successful organizational management depends on integrating institutional policy, strategic planning, stakeholder engagement, personnel development, accountability, performance measurement, and continual improvement into a coherent management system. Likewise, the proposed System-Based REC Development Framework integrates institutional policy, multidisciplinary REC governance, standardized operating procedures, competency development, digital management systems, post-approval monitoring, and quality assurance into a unified governance model. These similarities indicate that research ethics governance should be regarded as an institutional management system rather than merely an administrative review process.

Comparable findings were also reported by Aroonsrimorakot [21], who identified twelve critical success factors for ISO 14001 implementation, including organizational policy, personnel competency, staff participation, management commitment, monitoring and evaluation, and continual improvement. Although ISO 14001 addresses environmental management rather than research ethics governance, both systems share fundamental organizational principles emphasizing leadership commitment, standardized operational procedures, staff competency, monitoring mechanisms, and continuous quality improvement. These common characteristics reinforce the conclusion that the effectiveness of institutional governance depends not only on regulatory compliance but also on systematic organizational management and sustained institutional commitment.

Based on these comparative findings, the proposed System-Based REC Development Framework extends existing governance models by integrating organizational governance, human resource development, digital transformation, quality assurance, and post-approval oversight into a comprehensive research ethics governance system. Unlike conventional REC models that primarily focus

on ethical review prior to project approval, the proposed framework emphasizes governance across the entire research lifecycle, including protocol review, researcher support, post-approval monitoring, quality assurance, institutional learning, and continuous improvement. This lifecycle approach is consistent with internationally recognized principles of integrated governance, accountability, stakeholder participation, and organizational integrity.

Therefore, strengthening research ethics governance in higher education institutions should involve strategic institutional commitment rather than procedural improvements alone. The five strategic directions proposed in this study strengthening committee structure and personnel capacity, integrating REC indicators into institutional strategy and quality assurance, improving review efficiency through researcher support, developing electronic post-approval monitoring, and implementing an integrated e-REC system provide a practical governance model that may be adapted by Rajabhat Universities and other regional higher education institutions facing similar organizational contexts and resource limitations. Consequently, the proposed framework contributes not only to improving operational efficiency but also to enhancing institutional accountability, research quality, and long-term protection of research participants.

8. Recommendations

8.1 Practical recommendations

At the policy level, the university should incorporate human research ethics governance into institutional strategy, annual action plans, and quality assurance indicators. At the operational level, the REC secretariat should develop pre-review screening, researcher checklists, consent-form templates, and an ethics clinic to reduce avoidable revisions. At the human resource level, the university should increase secretariat capacity, strengthen lay representation, and establish Individual Development Plans for REC members and staff. At the technology level, the university

should develop an integrated e-REC system covering submission, review, approval, post-approval monitoring, reporting, archiving, and audit trails. At the network level, Rajabhat universities and medium-sized institutions may adapt this framework to their own contexts and share best practices for REC development.

8.2 Recommendations for future research

Future studies should use mixed methods to incorporate quantitative performance data and stakeholder perspectives from researchers, REC members, and administrators. Comparative studies across Rajabhat universities should be conducted to identify best practices and context-sensitive development models. Future research should design and evaluate an integrated e-REC prototype, measuring effects on review time, workload, cost, compliance, and user satisfaction. Longitudinal studies should assess whether strengthened research ethics governance improves research quality, participant protection, and public trust in institutional research.

References

- [1] Council for International Organizations of Medical Sciences, International ethical guidelines for health-related research involving humans, 4th ed., Geneva: CIOMS, 2016.
- [2] International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use, Integrated addendum to ICH E6(R1): Guideline for good clinical practice E6(R2), ICH, 2016, Available from: https://database.ich.org/sites/default/files/E6_R2_Addendum.pdf (accessed 18 May 2026).
- [3] E. J. Emanuel, D. Wendler, J. Killen, C. Grady, What makes clinical research in developing countries ethical? The benchmarks of ethical research, *Journal of Infectious Diseases* 189(5) (2004) 930-937.
- [4] P. Glasziou, I. Chalmers, M. Rawlins, P. McCulloch, Improving research ethics review and governance can improve human

- health, *Journal of the Royal Society of Medicine* 114(12) (2021) 556-562.
- [5] World Health Organization, Standards and operational guidance for ethics review of health-related research with human participants, Geneva: WHO, 2021.
- [6] National Research Council of Thailand, NECAST accreditation/survey of research ethics committees (RECs) in Thailand, 2022, Available from: <https://en.nrct.go.th/highlight/detail/159> (accessed 18 May 2026).
- [7] National Research Council of Thailand, Handbook of the national policy and ethical guidelines for research involving human subjects (National Ethics Committee Accreditation System of Thailand: NECAST), Bangkok: NRCT, 2024.
- [8] Phetchaburi Rajabhat University, Regulation on human research B.E. 2565, Phetchaburi: Phetchaburi Rajabhat University, 2022.
- [9] Phetchaburi Rajabhat University, Appointment order of the Human Research Ethics Committee No. 996/2022, Phetchaburi: Phetchaburi Rajabhat University, 2022.
- [10] Phetchaburi Rajabhat University, Standard operating procedures for human research ethics, version 1, B.E. 2565, Phetchaburi: Phetchaburi Rajabhat University, 2022.
- [11] Phetchaburi Rajabhat University, Standard operating procedures for human research ethics, version 2, B.E. 2567, Phetchaburi: Phetchaburi Rajabhat University, 2024.
- [12] Phetchaburi Rajabhat University Human Research Ethics Committee, EC-PBRU submission online, 2026, Available from: <https://ec.pbru.ac.th> (accessed 18 May 2026).
- [13] C. Vadeboncoeur, E. Townsend, C. Foster, M. Sheehan, M. Parker, Variation in university research ethics review: Reflections following an inter-university study in England, *Research Ethics* 12(4) (2016) 217-233.
- [14] S. Panichkul, et al., Current status of research ethics committees in Thailand, n.d., Available from: https://www.fercit.org/file/Current_Status_of_the_Research_Ethics_Committees_in_Thailand.pdf (accessed 18 May 2026).
- [15] Solutions IRB, Timing your IRB application for success, 2025, Available from: [URL] (accessed 18 May 2026).
- [16] Phetchaburi Rajabhat University, Annual report of the Human Research Ethics Committee, fiscal year 2022, Phetchaburi: Phetchaburi Rajabhat University, 2022.
- [17] Phetchaburi Rajabhat University, Annual report of the Human Research Ethics Committee, fiscal year 2023, Phetchaburi: Phetchaburi Rajabhat University, 2023.
- [18] Phetchaburi Rajabhat University, Annual report of the Human Research Ethics Committee, fiscal year 2024, Phetchaburi: Phetchaburi Rajabhat University, 2024.
- [19] J. Supising, S. Kosanpipat, C. Puthaprasert, P. Pongkaew, Develop a driving system of management in work-integrated education for Rajabhat Universities in the upper northern region, *Interdisciplinary Research Review* 18(2) (2023) 27-34.
- [20] S. Aroonsrimorakot, M. Laiphakpam, ISO 20400 guidance standard for sustainable procurement: A search for challenges and recommended strategies for successful implementation, *Interdisciplinary Research Review* 19(4) (2024) 80-90.
- [21] S. Aroonsrimorakot, Factors influencing the success of ISO 14001 implementation in Honda automotive service center, Thailand, *Interdisciplinary Research Review* 19(5) (2024) 39-47.