

# Development of An Instructional Model Based on the Professional Learning Community Process and Work-Based Learning to Enhance Classroom Research Competency

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## Abstract

The objectives of this research are to develop and study the effectiveness of the developed instructional model based on the professional learning community process and work-based learning in enhancing classroom research competencies. The sample groups used in the research were 32 third-year students of the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching, selected by purposive sampling, from students who were preparing for teaching in educational schools. The data collection tools used in the research include; 1) a pre-test and a post-test, which are the same test with 25 multiple-choice questions (4 choices each) and complete worksheets 1-9. Statistics used in data analysis included mean, standard deviation, and t-test for dependent., the results indicate that the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency called the PCW Model, consists of 4 important elements: 1) principles of the model, 2) objectives of the model, 3) steps of the model, and 4) measurement and evaluation of the model. Regarding the study on the effectiveness of the model; this indicates that after using the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency, the students' classroom research competency was significantly higher than before at the 0.01 level.

**Keywords:** instructional model, professional learning community, work-based learning, classroom research competency

## 1. Introduction

Over the past 30 years a new paradigm has been moving teacher professional development beyond solely the acquisition of new knowledge and skills (Zeivots et al., 2023). Teachers are increasingly expected to be more active in engagement with research. The notion of teacher-as-researcher has been commonly discussed both in relation to practitioner research and the research-engaged teacher (Furlong, 2014; Priestley & Drew, 2019). Adequate teacher professional development is needed to handle the changing teaching demands and fast advancing learning needs of students (Reynold, 2019). Promoting research in undergraduate programs is an essential component of the training process. Such knowledge allows students to reflect upon their future practice, learn about the theory of inquiry, and how to use that insight to interpret classroom difficulties practically. In a study regarding research, Edwards (as cited in Reyes-Crz et al., 2017) stated that undergraduate education programs enable pre-service teachers to solve teaching and learning challenges, in addition to “encouraging preservice teachers to do research provided reflective practice” (ViáfaraGonzález, 2008; Córdoba, Zuleta & Moreno, 2021).

Classroom action research competency is essential for the students of teaching profession program regarding the National Act of Education in 1999 Part 4 Section 30. The major aim of the national act is to improve an instructional process and teacher competency development in both basic education and higher education institutions. Moreover, Teacher's Council of Thailand emphasizes research for educational development, one of eleven educational standards of the Teacher Council of Thailand, which is one of the educational developments (Prachagool et al., 2016; Poonputta, 2021).

During the academic year 2022, observations and interviews with students teaching in educational institutions revealed that they lack the time to thoroughly examine research-related information and documents, lack motivation to do research due to its difficulty, and lack knowledge and experience in research work. As a result, these students are unable to conduct research independently. This aligns with the findings of Paiwithayasiritham & Polpanthin (2016), who surveyed information about teacher research. They summarized the reasons for the lack of development and progress in research as follows: 1) the knowledge teachers gain from training is insufficient for them to conduct formal research independently. Consequently, teachers are unable to complete their research, become discouraged, and develop negative attitudes toward conducting research; 2) Teachers do not have adequate time to thoroughly study documents due to their regular work commitments; 3) The complexity of the research process leads teachers to complete only one research project and lack the motivation to conduct continuous research; 4) Research problems do not originate from classroom issues, resulting in research that fails to provide practical solutions to classroom problems; 5) Teacher research takes a long time to complete, making it difficult to apply findings in a timely manner as by the time the research is completed, the teaching period has ended or the students with the issues are no longer in the class; and 6) Conducting research requires practice and learning from knowledgeable individuals or experts. The various processes and methods used in research are unfamiliar to teachers, difficult to understand, and require regular practice under the guidance of a mentor who understands research methods and the students learn better when they engage in learning, share ideas, and collaborate (Assen & Otting, 2022; Farajzadeh & Alavinia, 2022). The Pre-service teachers in Thailand need classroom research competency to effectively manage learning. These skills are essential for solving problems during learning management and ensuring the process aligns with and achieves the established learning goals (Paiwithayasiritham, & Polpanthin, 2016).

Therefore, professional learning communities (PCL) serve as a means and mechanism to improve their educational performance and enhance the academic achievements of their students (Allen, 2014; Balyer et al., 2015; Carpenter, 2015; Girvan et al., 2016; Jones et al., 2013; Pahlevan Sadegh et al., 2015; Sai & Siraj, 2015; Voelkel Jr & Chrispeels, 2017), and Learning targets and outcomes of Work-Based Learning (WBL) are knowledge, skills and attitudes. Their purpose is to develop professional, social, and personal competence (Bahl et al., 2019; James Avis, 2024). WBL exemplifies the integration of theory and practice, serving as a foundation for the essential academic and occupational training required for students (Cope, 2005; Harish, 2024).

Regarding the principles and concepts mentioned above, the researchers have developed an instructional model based on the professional learning community process and work-based learning to enhance classroom research competency of third-year students in the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching, Faculty of Creative Education Management, Panyapiwat Institute of Management (PIM). Whereby, the instructional model needs on-campus learning and practical experience in training schools, the results could have a significant impact on enhancing the competency in classroom research. This will prepare them to be more effective in working in the future.

Mainly, this study sought to answer the following questions:

RQ1: Can an instructional model based on the professional learning community process and work-based learning help enhance classroom research competency of Bachelor of Education students?

The specific objectives of the study are as follows:

1. To develop an instructional model based on the professional learning community process and work-based learning to enhance classroom research competency
2. To study the effectiveness of the developed instructional model based on the professional learning community process and work-based learning in enhancing classroom research competency

## **2. Method**

The researcher followed a research and development framework and proceeded with the following steps:

### *2.1 Step 1: Studying Basic Information*

Study basic information from documents and related research. Inquire about the needs for classroom research competency with 32 third-year students in the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching.

### *2.2 Step 2: Design*

Develop a draft instructional model based on the professional learning community process and work-based learning to enhance classroom research competency. This draft uses basic information analysis and incorporates

the needs identified in Step 1. Present the draft instructional model based on the professional learning community process and work-based learning to enhance classroom research competency along with an appropriateness assessment form to five experts in education, research, learning management, curriculum and instruction, and evaluation, each with at least 10 years of experience, to evaluate the model's appropriateness. Revise the draft based on expert suggestions. The finalized instructional model consists of: 1) principles of the model, 2) objectives of the model, 3) steps of the model, and 4) measurement and evaluation of the model.

### *2.3 Step 3: Trial and Improvement*

Trial the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency. This trial aims to find the efficiency value in three steps with 18 fourth-year students in the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching, consisting of 1) 3 students to find an individual efficiency value, 2) 6 students to find a group efficiency value; and 3) 9 students to find a field efficiency value. Modify the model before trialing it with the sample group, which is the target implementation group.

### *2.4 Step 4 Evaluation of the Trial Results*

#### *2.4.1 Population and Sample*

The population used in this research consists of first-year to fourth-year students in the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching, Faculty of Creative Education Management, Panyapiwat Institute of Management for the 2023 academic year, totaling 152 students.

The sample group consists of 32 third-year students in the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching, Faculty of Creative Education Management, Panyapiwat Institute of Management, selected by purposive sampling, focusing on pre-service teachers.

#### *2.4.2 Experimental Design*

The experiment according to a one-group pretest-posttest design was conducted for 10 weeks. The experiment is divided into 27 hours of on-campus learning and 24 hours of practical experience in training schools.

#### *2.4.3 Research Instruments*

The instruments used in the research include:

A pre-test and a post-test, which are the same test with 25 multiple-choice questions (4 choices each). An instructional model based on the professional learning community process and work-based learning to enhance classroom research competency and complete worksheets 1-9 to assess classroom research competency in terms of skills and attitudes, which is a formative evaluation through knowledge exchange, reflection, and feedback. The tools used in all types of research undergo quality checks by three experts (learning management, measurement and research evaluation, and learning design/curriculum) and are then refined and adjusted according to suggestions.

#### *2.4.4 Data Analysis*

The results development of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency using data analysis are as follows:

Analyze the needs for developing classroom research competency using the priority needs index (PNI modified).

Analyze the appropriateness of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency criterion using basic statistical measures including mean, and standard deviation.

Determine the efficiency of the results development of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency achieving the 75/75 criterion using basic statistical measures including percentage, mean, and standard deviation.

The results of evaluating the effectiveness of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency using a dependent t-test.

## **3. Results**

The research results are presented in two parts: 1) results development of the instructional Model based on the Professional Learning Community process and Work-Based Learning to enhance Classroom Research Competency; and 2) results of evaluating the effectiveness of the instructional Model based on the Professional

Learning Community process and Work-Based Learning to enhance Classroom Research Competency. The details are as follows:

*3.1 Results of the Development of the Instructional Model Based on the Professional Learning Community Process and Work-Based Learning to Enhance Classroom Research Competency*

The results of the study on the needs for developing classroom research competency for students in the Bachelor of Education Program reveal that these students needed development of classroom research competency. The components of research competency with the highest need are research competency in terms of knowledge ( $PNI_{Modified} = 1.02$ ), research competency in terms of skills ( $PNI_{Modified} = 0.91$ ), and research competency in terms of attitudes ( $PNI_{Modified} = 0.35$ ), respectively, as shown in Table 1.

Table 1. Needs for developing classroom research competency for Bachelor of Education students in Teaching Chinese Language and English Language Teaching (n = 32)

Classroom research competency	Current condition (D)			Expected condition (I)			$PNI_{Modified}$	No.
	$\bar{x}$	S.D.	Interpretation	$\bar{x}$	S.D.	Interpretation		
Classroom research competency in terms of knowledge	2.28	0.596	Low	4.60	0.491	Highest	1.02	1
Classroom research competency in terms of skills	2.38	0.679	Low	4.54	0.672	Highest	0.91	2
Classroom research competency in terms of attitudes	3.54	0.682	High	4.77	0.442	Highest	0.35	3
Total average	2.53	0.572	Low	4.50	0.490	Highest	0.82	

The results of developing an instructional model based on the professional learning community process and work-based learning to enhance classroom research competency or the PCW Instructional Model were obtained from the synthesis of classroom research competency need analysis and two important theoretical concepts: 1) the theoretical concept of professional learning community, and 2) the theoretical concept of work-based learning, as shown in Figure 1.

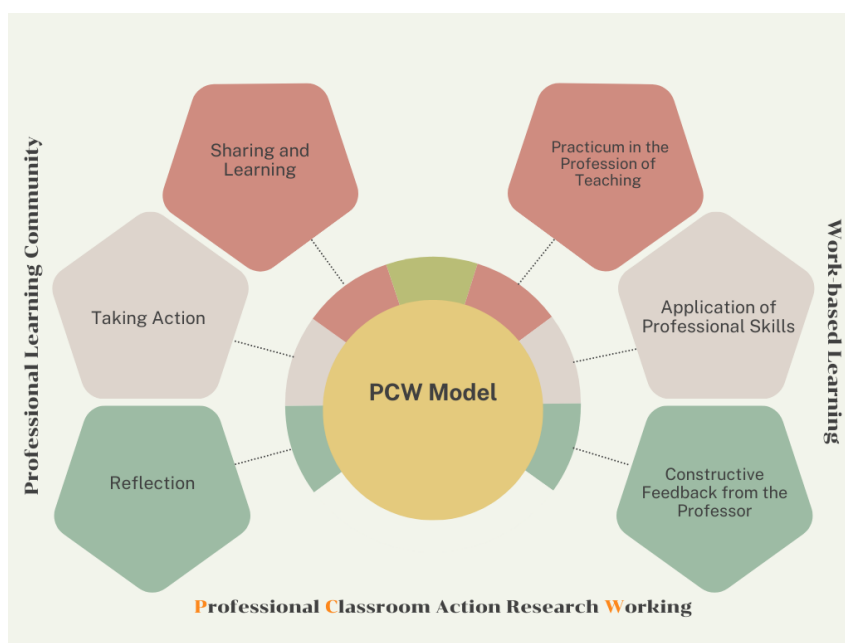


Figure 1. The instructional model based on the professional learning community process and work-based learning to enhance classroom research competency (PCW Model)

The instructional model based on the professional learning community process and work-based learning to enhance classroom research competency (PCW Model) consists of the following:

- 1) Principles of the model were synthesized from two important theoretical concepts:
- 1.1) The theoretical concept of professional learning community consists of three important components, namely PLC 1: Sharing and learning in terms of knowledge, skills, and experiences necessary to develop classroom research competency; PLC 2: Taking action by applying knowledge, skills, and experiences in classroom research practice; and PLC 3: Reflection and feedback.
- 1.2) The theoretical concept of work-based learning consists of three important elements: WBL 1: Practicum in the profession of teaching; WBL 2: Application of professional skills; and WBL 3: Constructive feedback from the professor.
- 2) The objective of the model is to develop classroom research competency for Bachelor of Education students.
- 3) The steps of the model were carried out according to the guidelines for organizing learning activities for students who are preparing to teach in educational institutions over a 10-week period. This is divided into 27 hours of on-campus learning and 24 hours of practical experience in training schools. The scheduled activities are as follows:

Table 2. Guidelines for organizing activities according to the steps of the model

Week (s)	Topic	Number of learning hours	
		University activities	Activities in educational institutions (Network schools)
1	Pre-service teachers clarified objectives and conducted a pre-test before the activities to develop classroom research competency	3	-
2	Pre-service teachers learned and observed student behavior in educational institutions.	-	3
3 - 4	Pre-service teachers learned and observed student behavior in educational institutions, and returned to campus to exchange knowledge with each other.	6	6
5 - 9	Pre-service teachers received training to develop classroom research competency.	15	15
10	Pre-service teachers conducted a post-test after the activities to develop classroom research competency	3	-
	Total	27	24

- 4) Measurement and evaluation of the model can be divided into 2 forms:
- 4.1) Administer multiple-choice tests to evaluate classroom research competency in terms of knowledge.
- 4.2) Complete worksheets 1-9 to assess classroom research competency in terms of skills and attitudes, which is a formative evaluation through knowledge exchange, reflection, and feedback.

The appropriateness of the instructional model, according to the professional learning community process and work-based learning to enhance classroom research competency, was assessed by five experts. The overall appropriateness of the instructional model was at the highest level ( $\bar{x}=4.52$ , S.D. = 0.10), as shown in Table 3.

Table 3. Average appropriateness of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency

Assessed Items	Appropriateness level		
	$\bar{x}$	S.D.	Interpretation
1. The principles, concepts, and theories used in the design are appropriate and consistent.	4.60	0.49	Highest
2. The principles and objectives of the model are appropriate and consistent.	4.60	0.49	Highest
3. The steps of the model are appropriate and consistent with the professional learning community and the theoretical concept of work-based learning.	4.40	0.49	High
4. Learning objectives are consistent with learning behaviors.	4.60	0.49	Highest
5. Learning activities are consistent with the principles, concepts, and theories used in the design.	4.40	0.80	High
6. Pre- and post-tests can evaluate classroom research competency in terms of knowledge.	4.60	0.49	Highest
7. Practicing activities according to worksheets 1-9 can evaluate classroom research competency in terms of skills and attitudes.	4.40	0.49	High
8. The model shows the interconnectedness of elements in a systematic and sequential manner.	4.60	0.49	Highest
Total average	4.52	0.10	Highest

The assessment of the effectiveness of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency, as shown in Table 4.

Table 4. Results of assessing the effectiveness of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency

Item	Full score	Total score	Percentage	Benchmark	Efficiency (E <sub>1</sub> /E <sub>2</sub> )
Post-test mean score after organizing the activities	25	18.89	75.76	75	75.76/75.11
Post-test mean score after implementing the model	25	18.78	75.11	75	

From Table 4, it was found that the mean score from the post-test after organizing the activities was 75.56%, and the mean score from the post-test after implementing the model was 75.11%. The efficiency values E<sub>1</sub>/E<sub>2</sub> were equal to 75.56/75.11, indicating that the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency meets the specified criteria (75/75)

### 3.2 Results of Evaluating the Effectiveness of the Instructional Model Based on the Professional Learning Community Process and Work-Based Learning to Enhance Classroom Research Competency

Table 5. Results of comparing the difference in pre-test and post-test mean scores before and after implementing the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency for students of the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching (n = 32)

Test	n	$\bar{x}$	S.D.	t	Sig
Pre-test score	32	9.50	4.42	16.30	0.00 **
Post-test score	32	16.62	3.79		

\* p < . 01

From Table 5, it was found that the pre-test mean score was 9.50, and the post-test mean score was 16.62. This indicates that after using the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency, the students' classroom research competency was significantly higher than before at the 0.01 level.

## 4. Discussion

From the results of this research, the important issues to be discussed are as follows:

#### *4.1 The Research Results Indicate that the Components of Research Competency Most Needed among Bachelor of Education Students are:*

1) classroom research competency in terms of knowledge, 2) classroom research competency in terms of skills, and 3) classroom research competency in terms of attitudes. These align with the findings of Chuchuaysuwan, P & Yanprechaset, Y (2020), whose survey on the problems of classroom research competency among primary school teachers found that teachers had a need to develop classroom research competency in terms of knowledge, skills, and attitudes. The research results reflect that the development of classroom research competency for Bachelor of Education students should cover knowledge, abilities, skills, and attitudes. This is because competency is the sum of knowledge, skills, and attitudes that enable a person to create good work (Phuthanonnok, T., 2022). Therefore, competency is the characteristic hidden within a person that drives them to achieve performance that exceeds set goals (McClelland, 1975).

#### *4.2 The Instructional Model Based on the Professional Learning Community Process and Work-based Learning (PCW Instructional Model) to Enhance Classroom Research Competency is Based on the Synthesis of Needs Analysis and Two Key Learning Concepts:*

1) the concept of professional learning communities and 2) the concept of work-based learning, which can be summarized as follows:

##### *4.2.1 The Model Uses the Theoretical Concept of Professional Learning Community, Consisting of Three Important Elements*

1) exchange of knowledge, 2) practice, and 3) reflection and feedback. The results reflect that professional learning communities are a practice for improving quality and changing the culture from being passive learners to active learners. Therefore, during training activities, network schools must still be used as places for learning, in addition to the university. This is consistent with Phetnawa (2020), who mentions that developing a professional learning community requires an organizational structure with a good support network. This is also in line with (Kasemsawas, 2023; Ruadreo, 2022), who stated that “a professional learning community will change the atmosphere of learning and help members create changes at the learning reform level to develop student learning and develop the teaching profession.” Similarly, Dechakupt & Yindeesuk (2017) said that creating a professional learning community positively affects teachers by helping them become professional teachers. This corresponds with Chandit et al., (2019), who studied the results of developing teachers’ classroom research competency using the PLC process. It was found that after development, teachers had a greater understanding of the classroom research process and could conduct research in class, including producing high-quality research reports.

##### *4.2.2 Because the model uses the concept of work-based learning, which consists of three important elements:*

1) practicum in the profession of teaching, 2) application of professional skills, and 3) constructive feedback from the professor, it facilitates the process of developing classroom research competency. Students in the Bachelor of Education Program must complete their training both on campus and in network schools, with an environment arranged to be similar to real-world contexts. This allows students to apply their knowledge and skills to their assigned tasks. This is in accordance with Yawai et al. (2019), who stated that “the heart of the system for organizing learning environments in real conditions is learning that focuses on learning outcomes.” The professional learning community model to enhance classroom research competency for Bachelor of Education students also aligns with Kirkpatrick’s four-level training evaluation model at Level 3. Level 3 behavioral outcomes specify areas that apply knowledge and skills gained from training to work or performance related to outstanding work (Bates, 2004).

#### *4.3 The Research Finding that the Overall Appropriateness of the Instructional Model according to the Professional Learning Community Process and Work-based Learning to Enhance Classroom Research Competency, Assessed by Five Experts, was at the Highest Level, Demonstrates that the Researcher Developed the Model Systematically*

This process started with identifying the needs for developing classroom research competency in a sample group and studying related concepts and theories. The information was synthesized and developed into a model, and appropriateness was checked and revised according to recommendations from experts. This is consistent with Ariya et al, (2016), as cited in Eamsa-at, & Chansongsang (2021), who developed an instructional model starting with the study of related documents and research, drafting formats, checking appropriateness, making improvements based on suggestions, and trialing it. The format is complete with information for conducting research in the classroom, including: 1) defining the problem; 2) selecting innovations; 3) writing a title, research

objectives, and background; 4) writing research scope and research hypotheses; 5) writing definitions of specific terms and expected benefits; 6) writing related documents and research; 7) writing research methods; 8) writing results of data analysis; 9) writing summaries, discussing results, and making recommendations, which cover the research process in the classroom. Ritcharoon (2021) stated that classroom research has five important steps: 1) analyzing learning problems; 2) selecting innovations or solutions; 3) designing and creating innovations or methods for solving problems; 4) using innovations or methods for solving problems or development; and 5) summarizing and reporting research results.

#### *4.4 The Effectiveness of the Instructional Model Based on the Professional Learning Community Process and Work-based Learning to Enhance Classroom Research Competency was Found at 75.56/75.11, Which Met the Set Criteria of 75/75*

This reflects that the researcher systematically developed the model according to principles and concepts using the ADDIE Model process as the framework. The ADDIE Model is structured as a linear process, where each step must be completed before moving on to the next. The steps are arranged in order from step 1 to steps 2, 3, 4, and 5, which is consistent with the researcher's synthesized model. Additionally, the ADDIE Model process is widely recognized for its effectiveness, corresponding with the findings of Pipattanasuk (2019), who used the ADDIE Model process to develop lessons and training formats that were effective according to specified criteria.

#### *4.5 After Implementing the Instructional Model Based on the Professional Learning Community Process and Work-based Learning, Students' Classroom Research Competency Significantly Improved at the 0.01 Level.*

This improvement could be because the researcher organized the content to cover the entire research process in class, sequencing the learning materials from easy to difficult, with continuity. Moreover, appropriateness was verified by experts, and the model was tested for effectiveness. This is consistent with the research of Wuthikrai Pommarang<sup>1</sup> & Songsak Phusee-orn, (2023), who concluded that it is evident that the participants were able to enhance their research competencies across all aspects. Kansrirat (2016), who concluded that arranging content from easy to difficult with continuity makes it easier to understand and positively affects the academic achievement of the participants. It also aligns with Tyler's curriculum development model, which emphasizes organizing activities and learning experiences that must be continuous, with content that is related and arranged from easy to difficult (Patphol, 2024).

## **5. Conclusion and Limitations**

This study aims to develop and evaluate the effectiveness of the instructional model based on the professional learning community process and work-based learning to enhance classroom research competency for students in the Bachelor of Education Program in Teaching Chinese Language and English Language Teaching. It was found that the instructional model following the professional learning community process and work-based learning is effective and helps develop classroom research competency to a higher level.

This research focuses on creating a process that enables Bachelor of Education students to engage in hands-on classroom research across all subject areas. In future research, the development of processes for students in specific fields of study should be examined to obtain in-depth information that clearly reflects the results of using the model for each subject area. Additionally, satisfaction should be assessed to use the results for developing a more effective model.

Using an instructional model based on the professional learning community process and work-based learning to enhance classroom research competency requires a balanced integration of learning at both universities and network schools. This approach is developed from the theoretical concepts of a professional learning community, which include 1) exchange of knowledge, 2) practice, and 3) reflection and feedback, as well as work-based learning, which consists of 1) practicum in the profession of teaching, 2) application of professional skills, and 3) constructive feedback from the professor.

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## **Authors contributions**

Asst. Prof. Dr. Chompunoot Putinatr Ekkuaboon was responsible for study design, data collection, and data analysis. Reviewed and approved the final manuscript.



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## Data sharing statement

No additional data are available.

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