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A Model for Developing Active Learning Teaching Skills among Thai Pre-service Teachers

Apantee Poonputta
Department of Educational Research and Evaluation,
Faculty of Education,
Mahasarakham University, Thailand

Autthapon Intasena*, Wittaya Worapun and Chanat Inkanok
Department of Curriculum and Instruction,
Faculty of Education, Mahasarakham University

Abstract. Active learning has become an essential instruction approach for preparing learners with the knowledge and skills required in the 21st century, and structured professional development can help pre-service teachers develop the competencies needed to implement such approaches effectively. The purpose of this study was to develop a model for enhancing active learning teaching skills among pre-service teachers. The study employed a research and development design consisting of three phases: model development, implementation, and evaluation. The implementation phase (Phase 2) was conducted over a 16-week semester during the pre-service teachers' teaching practicum. The resulting model consisted of four major components: workshop training, lesson planning, coaching and feedback, and reflection and sharing activities. The findings revealed that the developed model demonstrated the highest levels of appropriateness (M = 4.90) and feasibility (M = 4.94). Furthermore, the pre-service teachers achieved lesson-planning and teaching-skill scores significantly higher than the established criterion of 80% ($p < .05$). The model was also evaluated positively across the instruction, institutional, and behavioral dimensions of Hammond's framework. The study contributes to teacher education by providing an evidence-based model for developing active learning teaching competencies among pre-service teachers during their teaching practicum.

Keywords: Active Learning; Pre-service Teachers; Coaching; Reflective Practice

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*Corresponding author: Autthapon Intasena; *autthapon.i@msu.ac.th*

1. Introduction

The rapid changes of the 21st century have transformed the expectations placed on education systems worldwide (Erdem, 2019; Eriksson, 2008; Gümüş, 2022). Learners are no longer expected to merely acquire subject knowledge; they are also required to develop higher-order thinking skills, problem-solving abilities, communication skills, collaboration, and lifelong learning competencies (Bybee, 2009). Consequently, educational institutions are increasingly challenged to prepare students who can adapt to complex social, technological, and economic environments. To achieve these goals, teaching approaches that actively engage learners in the learning process have become increasingly important.

Active learning has been widely recognized as an effective instruction approach for promoting meaningful learning and the development of 21st-century competencies (Fornari & Poznanski, 2021; Kumari, 2026; van Hout-Wolters et al., 2000). According to Garnham and Gowers (2023), the key characteristic that makes active learning different from traditional passive learning is the way it encourages students to participate in discussions, problem-solving activities, collaborative tasks, and reflective thinking processes. Through active engagement, learners construct knowledge, apply concepts in authentic contexts, and develop essential skills required for future academic and professional success. As a result, active learning has become a key educational strategy advocated by educational reforms and teacher preparation programs in many countries.

Pre-service teachers play a crucial role in the future implementation of active learning practices (Chaipibal & Chittranun, 2025). In Thailand, recent educational policy directives from the Ministry of Education and the Office of the Basic Education Commission (OBEC) have prioritized active learning as a core national strategy to elevate student achievement and critical thinking skills across basic education schools. However, national assessment reports consistently highlight that many Thai classrooms remain predominantly teacher-centered due to pre-service and in-service teachers' limited practical training in active methodologies.

During their teaching practicum, pre-service teachers are expected to translate pedagogical theories into effective classroom instruction while simultaneously developing their professional teaching competencies (Canaleta et al., 2014). However, many pre-service teachers encounter difficulties in designing active learning lessons, facilitating student participation, managing interactive classrooms, and assessing learning outcomes in active learning environments (Aga, 2023). Limited teaching experience, insufficient opportunities for guided practice, and a lack of systematic support during the practicum period often hinder the development of these essential teaching skills.

To address these challenges, pre-service teachers require a structured developmental process that supports continuous learning and professional growth throughout their practicum experiences. Such a process should provide opportunities for practical training, guided lesson planning, classroom implementation, reflective practice, and collaborative learning. In addition, ongoing coaching and constructive feedback from supervisors can help pre-

service teachers identify strengths, overcome instruction challenges, and refine their teaching practices. Furthermore, a cyclical process of planning, action, observation, and reflection enables them to continuously evaluate and improve their instruction performance. Therefore, the development of a comprehensive model that integrates these components may provide an effective mechanism for enhancing active learning teaching skills among pre-service teachers.

2. Literature Review

2.1 Coaching as a Teacher Development Tool

Coaching has become an increasingly important approach in teacher education and professional development because it provides individualized support, guidance, and feedback that help teachers improve their instruction practices (Entwistle & Rees-Davies, 2026). Whereas mentoring often encompasses broader, long-term career psychosocial support, coaching in this study specifically focuses on goal-directed, structured guidance aimed at refining specific instruction techniques and lesson delivery.

This differs from traditional training programs that often focus on the transmission of knowledge; coaching emphasizes continuous professional growth through collaboration, reflection, observation, and constructive feedback (Göker, 2020). Through coaching, teachers are encouraged to identify areas for improvement, develop solutions to instruction challenges, and apply new pedagogical strategies in authentic teaching contexts (Rutgers & Reddy, 2013). Consequently, coaching has been recognized as an effective mechanism for bridging the gap between theoretical knowledge and classroom practice, particularly for novice and pre-service teachers who are still developing their professional competencies.

The effectiveness of coaching and mentoring in teacher development has been consistently supported by previous research. Studies have shown that coaching enhances pre-service teachers' pedagogical knowledge, professional competencies, confidence, and readiness for teaching practice (Bamrungsin & Khampirat, 2022; Ndebele & Legg-Jack, 2022). In addition, mentoring and coaching processes promote collaborative reflection, enabling pre-service teachers to construct practical teaching knowledge, develop instruction skills, and learn from authentic classroom experiences (Tiainen & Lutovac, 2024). Collectively, these findings suggest that coaching serves as an effective professional development strategy that facilitates the transition from teacher preparation programs to professional teaching practice.

2.2 Feedback for Professional Growth

Feedback is an essential component of teacher professional development because it helps individuals recognize strengths, identify areas for improvement, and refine their instruction practices. In teacher education, feedback serves as a mechanism that connects theory with practice by guiding pre-service teachers to evaluate their teaching performance, reflect on their instruction decisions, and make appropriate adjustments (Weaver et al., 2024). Consequently, feedback

contributes to the development of pedagogical competence, reflective thinking, and self-regulated learning.

The importance of feedback in teacher development has been consistently supported by previous studies. Xu et al. (2025) found that structured peer feedback enhanced pre-service teachers' pedagogical knowledge, critical thinking, learning engagement, and reflective learning. Similarly, Matsumoto-Royo et al. (2023) reported that feedback promotes lifelong learning dispositions when it is connected to authentic tasks and provides constructive suggestions for improvement. Tan and Chen (2022) further demonstrated that elaborated and suggestive feedback supports collaborative knowledge improvement and strengthens metacognitive development among pre-service teachers.

Moreover, Ropohl and Rönnebeck (2024) emphasized that learning to provide and use effective feedback is an important professional competency that should be developed during teacher preparation. Likewise, Afrilyasanti et al. (2026) found that feedback exchanges foster self-regulated learning, reflective practice, and continuous professional growth. Collectively, these studies indicate that feedback functions as a powerful developmental tool that enhances instruction competence, reflection, and professional growth among pre-service teachers.

2.3 Reflective Practice in Teacher Development

Reflective practice is widely recognized as an important component of teacher development because it enables teachers to critically examine their instruction decisions, evaluate teaching effectiveness, and identify areas for improvement (Ruangsan, 2025). Through reflection, teachers move beyond routine practice and develop a deeper understanding of how teaching strategies influence student learning. For pre-service teachers, reflective practice is particularly important during the teaching practicum because it supports the transition from theoretical learning to professional teaching practice while fostering continuous self-improvement and professional growth (Suphasri & Chinokul, 2021).

Previous studies have consistently demonstrated the value of reflective practice in teacher education. Research has shown that reflection enhances pedagogical skills, critical thinking, and professional growth by encouraging pre-service teachers to analyze their teaching experiences and make informed instruction decisions (Li, 2025). Reflective activities such as lesson transcription, reflective journals, peer observation, and guided discussions provide opportunities for pre-service teachers to recognize strengths, identify challenges, and develop strategies for improvement (Harding et al., 2021; Spiteri, 2025). Furthermore, reflective practice promotes greater self-awareness and encourages a proactive approach to professional learning, enabling pre-service teachers to continuously refine their instruction competencies. Collectively, these findings suggest that reflective practice serves as an effective mechanism for supporting professional development and lifelong learning among pre-service teachers.

2.4 Model Development

A model is a systematic framework that organizes concepts, processes, and activities to achieve specific educational objectives. In educational research, model development is commonly employed to provide structured guidance for improving learning, teaching, or professional practice. A well-developed model typically consists of clearly defined objectives, processes, implementation procedures, participant roles, and evaluation mechanisms that work together to achieve the intended outcomes.

Evaluation is an essential component of educational model development because it provides evidence of the effectiveness and practicality of an intervention. Among various evaluation approaches, Hammond's (1973) evaluation framework is widely recognized for its comprehensive examination of educational programs. The framework evaluates educational interventions through three interrelated dimensions: the instruction dimension, which focuses on teaching and learning processes; the institutional dimension, which examines organizational and contextual support factors; and the behavioral dimension, which assesses changes in participants' knowledge, skills, attitudes, or behaviors. The strength of Hammond's framework lies in its ability to evaluate both the implementation process and the outcomes of an educational intervention. The framework provides a comprehensive understanding of program effectiveness. Consequently, Hammond's evaluation framework is appropriate for assessing educational development models that aim to improve professional competencies and instruction practices.

The literature reviewed in this study indicates that coaching, constructive feedback, and reflective practice are effective approaches for promoting the professional development of pre-service teachers. Previous studies have reported positive effects of these approaches on pedagogical knowledge, instruction competence, reflective thinking, and professional growth. However, relatively few studies have integrated these principles into a single developmental model designed specifically to enhance active learning teaching skills among pre-service teachers. Moreover, limited attention has been given to evaluating such models through a comprehensive and systematic framework that examines instruction processes, institutional support, and behavioral outcomes simultaneously.

Therefore, the purposes of this study were to develop a model for enhancing active learning teaching skills among pre-service teachers, to evaluate the effectiveness of the developed model using Hammond's evaluation framework, and to examine the effects of the model on pre-service teachers' active learning teaching skills and professional development. The study is expected to contribute to teacher education by providing an evidence-based model for professional development and by demonstrating the application of Hammond's evaluation framework in assessing the effectiveness of teacher development interventions.

3. Methodology

3.1 Research Design

This study employed a research and development (R&D) design to develop and evaluate a model for enhancing active learning teaching skills among pre-service teachers. The model's framework was intentionally aligned with the Professional Teacher Standards established by the Teachers' Council of Thailand (Khurusapha), which mandate that pre-service teacher preparation must integrate active learning design, learning space management, and continuous reflection. Furthermore, the model addresses specific cultural nuances in the Thai educational context, where classrooms have historically relied on hierarchical, lecture-based dynamics.

The study was conducted in three phases. Phase 1 focused on developing the model through synthesizing relevant literature, analyzing contextual needs, and obtaining expert validation. Phase 2 involved implementing the developed model with pre-service teachers during their teaching practicum. Phase 3 evaluated the effectiveness of the model using Hammond's evaluation framework, which examined the instruction, institutional, and behavioral dimensions of the model. Quantitative and qualitative data were collected throughout the study to provide comprehensive evidence regarding the effectiveness of the developed model.

3.2 Participants

The participants varied according to the research phase. In Phase 1, seven experts were selected through purposive sampling to evaluate the developed model. The panel consisted of specialists in curriculum and instruction, educational measurement and evaluation, and educational technology. In Phase 2, the participants consisted of three university supervisors and 18 pre-service teachers from Mahasarakham University and Rajabhat Mahasarakham University who voluntarily participated in the study during their teaching practicum. The pre-service teachers were majoring in Mathematics Education, General Science Education, and Computer Education.

3.3 Instruments

Four instruments were employed in this study. The first instrument was the Active Learning Lesson Plan Assessment Form, which was used to evaluate pre-service teachers' ability to design active learning lesson plans during the implementation phase. The instrument was developed as a rubric-based assessment form and demonstrated content validity (IOC = 1.00). The reliability of the instrument, determined through inter-rater agreement, was .95.

The second instrument was the Active Learning Teaching Skills Assessment Form, which was used to assess pre-service teachers' classroom teaching performance during their practicum. The instrument focused on evaluating the implementation of active learning practices in authentic classroom settings. The instrument demonstrated excellent content validity (IOC = 1.00) and high inter-rater reliability (.98).

The third instrument was the Hammond Evaluation Form, which was used to evaluate the effectiveness of the developed model during the evaluation phase. The instrument was constructed based on Hammond's evaluation framework and consisted of three dimensions: 1) instruction dimension, 2) institutional dimension, and 3) behavioral dimensions. The instruction dimension examined the quality of instruction processes and learning activities, the institutional dimension assessed contextual and organizational support factors, and the behavioral dimension evaluated changes in participants' skills and professional development.

The fourth instrument was a Semi-Structured Interview Form, which was used to collect qualitative data regarding participants' experiences, perceptions, and suggestions related to the implementation of the model. The interview questions were developed in accordance with the research objectives and were designed to provide in-depth information to support and explain the quantitative findings.

3.4 Data Collection

Data collection was conducted in accordance with the three phases of the study. In Phase 1, relevant documents, theories, and previous studies were reviewed and synthesized to develop the initial model. The developed model was subsequently evaluated by seven experts using the model evaluation form, and their recommendations were used to revise and refine the model. In Phase 2, the revised model was implemented with 18 pre-service teachers during their teaching practicum. Throughout the implementation process, participants engaged in workshops, lesson planning activities, teaching practice, coaching sessions, and reflection activities. Data on lesson-planning skills and active learning teaching skills were collected using the corresponding assessment forms. In Phase 3, the effectiveness of the model was evaluated using the Hammond Evaluation Form, and qualitative data were collected through semi-structured interviews to obtain participants' perceptions, experiences, and suggestions regarding the implementation of the model.

3.5 Data Analysis

Quantitative data were analyzed using descriptive statistics, including mean and standard deviation. The effectiveness of the developed model was determined by comparing participants' performance with the established criterion using a one-sample t-test. Data obtained from the Hammond Evaluation Form were analyzed using mean and standard deviation to determine the level of effectiveness of the model across the instruction, institutional, and behavioral dimensions. Qualitative data obtained from the semi-structured interviews were analyzed using content analysis to identify recurring themes and to provide additional explanations for the quantitative findings.

4. Findings

4.1 Development of the Model

The model was developed through a synthesis of relevant literature, theories, and previous studies related to active learning, coaching, feedback, and reflective practice. The development process also considered the context of the teaching

practicum in teacher education programs. The synthesized information was used to establish the conceptual framework and design the developmental activities intended to enhance pre-service teachers' active learning teaching skills. The resulting model consisted of four major components: workshop training, lesson planning, coaching and feedback, and reflection and sharing activities. The theoretical foundations and corresponding model components are presented in Table 1.

Table 1: Theoretical Foundations and Components of the Developed Model

Theoretical Foundation	**Application in the Model**
Active learning	Workshop training and lesson planning activities
Coaching	Individual guidance and supervision during practicum
Feedback	Constructive feedback for instruction improvement
Reflective practice	Reflection and sharing activities following teaching experiences

The developed model was implemented through four interconnected activities. First, pre-service teachers participated in a workshop designed to enhance their understanding of active learning principles and instruction strategies. The training specifically covered three core active learning instruction strategies: the 5E instruction model, problem-based learning (PBL), and collaborative thinking-based learning, alongside techniques for facilitating student-centered discussions and formative assessment. Second, participants designed active learning lesson plans under the guidance of university supervisors who used a cognitive coaching framework (comprising pre-observation planning conferences, classroom observation, and post-observation reflecting conferences). Supervisors provided individual coaching and constructive feedback across three formal observation cycles for each pre-service teacher (one online observation during Week 4, and two onsite observations during Weeks 8 and 12).

Figure 1: A Model for Developing Active Learning Teaching Skills

Following the development process, the model was evaluated by seven experts in curriculum and instruction, educational measurement and evaluation, and educational technology. The evaluation results indicated that the model demonstrated the highest level of appropriateness (M = 4.90, SD = 0.30) and feasibility (M = 4.94, SD = 0.24). These findings suggest that the experts considered the developed model to be theoretically sound, practically applicable, and suitable for enhancing active learning teaching skills of pre-service teachers. The recommendations provided by the experts were incorporated into the final revision of the model before implementation.

4.2 Effects of the Model on Pre-service Teachers' Active Learning Teaching Skills

To examine the effectiveness of the developed model, pre-service teachers' lesson-planning skills and active learning teaching skills were compared against the established criterion of 80% using a one-sample t-test.

The results indicated that pre-service teachers' active learning lesson-planning skills were significantly higher than the established criterion across all dimensions ($p < .05$). As shown in Table 2, the highest mean score was observed in the learning activity dimension (M = 28.61, SD = 0.92), followed by the learning objectives dimension (M = 19.56, SD = 0.71), learning media dimension (M = 19.33, SD = 1.19), and measurement and evaluation dimension (M = 14.50, SD = 0.92). Overall, the participants achieved a mean score of 82.00 out of 85 points, which was significantly higher than the criterion score of 68 points ($t = 18.78$, $p < .05$). These findings indicate that the developed model effectively enhanced pre-service teachers' ability to design active learning lesson plans (see Table 2).

Table 2: Comparison of Active Learning Lesson-Planning Skills Against the 80% Criterion

Dimension	Full Score	80% Criterion	M	SD	Mean Difference	t	p
Learning objectives	20	16	19.56	0.71	3.56	21.40	.00*
Active learning activities	30	24	28.61	0.92	4.61	21.35	.00*
Learning media	20	16	19.33	1.19	3.33	11.90	.00*
Measurement and evaluation	15	12	14.50	0.92	2.50	11.49	.00*
Overall	85	68	82.00	3.16	14.00	18.78	.00*

*$p < .05$

The results further revealed that pre-service teachers' active learning teaching skills were significantly higher than the established criterion across all dimensions ($p < .05$). As presented in Table 3, the highest mean score was obtained in the active learning process dimension (M = 38.89, SD = 1.57), followed by learning media (M = 29.17, SD = 1.65) and measurement and evaluation (M = 28.50, SD = 1.54). The overall mean score was 96.56 out of 100 points, which exceeded the criterion score of 80 points and was significantly higher than the established benchmark ($t = 17.95$, $p < .05$). These findings suggest that the developed model

successfully improved pre-service teachers' competency in implementing active learning instruction during their teaching practicum (see Table 3).

Table 3: Comparison of Active Learning Teaching Skills Against the 80% Criterion

Dimension	Full Score	80% Criterion	M	SD	Mean Difference	t	p
Active learning process	40	32	38.89	1.57	6.89	18.64	.00*
Learning media	30	24	29.17	1.65	5.17	13.25	.00*
Measurement and evaluation	30	24	28.50	1.54	4.50	12.37	.00*
Overall	100	80	96.56	3.91	16.56	17.95	.00*

*$p < .05$

4.3 Evaluation of the Model Using Hammond's Framework

The developed model was evaluated using Hammond's evaluation framework, which consists of three dimensions: instruction, institutional, and behavioral. The instruction dimension examined participants' perceptions of the workshop activities and training environment. The institutional dimension focused on contextual support factors related to implementation. The behavioral dimension evaluated changes in participants' competencies and their satisfaction with the developed model.

4.3.1 Instruction dimension

The instruction dimension was evaluated through a workshop satisfaction questionnaire completed by the pre-service teachers. Findings indicated that the workshop effectively supported participants' learning and preparation for active learning implementation (M = 4.82, SD = 0.40). Although all items fell within the "Highest" level, the item regarding the appropriateness of training materials received a slightly lower mean score ($M = 4.56, SD = 0.62$) compared to other aspects. Qualitative data from the semi-structured interviews revealed that although participants valued the comprehensiveness of the content, some found the physical handbooks dense and expressed a preference for more interactive, digital formats—such as downloadable online templates and multimedia exemplars—to facilitate quicker access during lesson planning (see Table 4).

Table 4: Satisfaction with the Workshop Activities (Instruction Dimension)

Item	M	SD	Level
Knowledge and understanding gained from the workshop	4.72	0.46	Highest
Ability to apply knowledge during teaching practicum	4.89	0.32	Highest
Activities met participants' expectations	4.67	0.49	Highest
Activities supported active learning lesson design	4.78	0.43	Highest
Training topics matched participants' needs	5.00	0.00	Highest
Activities enhanced active learning teaching skills	4.83	0.38	Highest
Trainers demonstrated expertise	5.00	0.00	Highest
Participant engagement during training	4.83	0.38	Highest
Training duration was appropriate	4.94	0.24	Highest
Training materials were appropriate	4.56	0.62	Highest
Overall	**4.82**	**0.40**	**Highest**

The consistently high ratings suggest that the instruction activities, training content, and learning environment were appropriate for developing pre-service teachers' active learning competencies.

4.3.2 Institutional dimension

The institutional dimension was evaluated through interviews with university supervisors and pre-service teachers. The findings revealed that the implementation of the model was supported by favorable institutional conditions. Four support factors were identified: practicum schools, financial support, administrative support, and time allocation.

The participating schools had policies promoting active learning and were willing to support pre-service teachers in implementing learner-centered instruction approaches. Financial requirements for the program were considered manageable because the primary expenses involved workshop facilitators, meals, and training materials. Administrative support was evident through the organization of supervision activities, including one online observation and two onsite observations, which aligned with professional standards established by the Teachers' Council of Thailand. Furthermore, both supervisors and pre-service teachers agreed that the duration allocated to each developmental activity was appropriate and sufficient for achieving the objectives of the model.

4.3.3 Behavioral dimension

The behavioral dimension focused on the outcomes of the development process. Evidence from the lesson-plan assessment and teaching-skill assessment demonstrated that participants achieved scores significantly higher than the established criterion of 80%. In addition, interview data revealed that participants felt more confident in designing active learning lesson plans and implementing learner-centered instruction activities during their practicum experiences. Participants' satisfaction with the developed model was also examined. The results indicated that both university supervisors and pre-service teachers reported the highest level of satisfaction with the model. The findings are presented in Table 5.

Table 5: Satisfaction with the Developed Model (Behavioral Dimension)

Evaluation Aspect	Supervisors (M)	Supervisors (SD)	Level	Pre-service Teachers (M)	Pre-service Teachers (SD)	Level
Usefulness	4.75	0.44	Highest	4.78	0.43	Highest
Feasibility	5.00	0.00	Highest	4.91	0.29	Highest
Overall	4.88	0.35	Highest	4.85	0.38	Highest

The findings indicated that the developed model was perceived as highly useful and feasible by both supervisors and pre-service teachers. Participants believed that the model enhanced lesson-planning skills, improved active learning teaching practices, supported the integration of technology, and could be applied in various educational contexts. These findings provide additional evidence supporting the effectiveness and practicality of the developed model.

5. Discussion

The findings demonstrated that the developed model was effective in enhancing pre-service teachers' active learning teaching skills. The model received highly positive evaluations from experts during the development phase and was subsequently perceived favorably by both university supervisors and pre-service teachers during implementation. In addition, participants achieved lesson-planning and teaching-skill scores significantly higher than the established criterion of 80%, suggesting that the model successfully supported the development of active learning competencies.

The effectiveness of the model may be attributed to the integration of coaching, feedback, and reflective practice within a structured professional development process. Coaching provided individualized guidance that enabled pre-service teachers to identify instruction challenges and improve their teaching practices. This finding is consistent with Ndebele and Legg-Jack (2022), who reported that mentoring positively influenced pre-service teachers' pedagogical knowledge, professional competencies, and instruction development.

Similarly, Tiainen and Lutovac (2024) found that mentoring promoted collaborative reflection and helped pre-service teachers develop practical teaching knowledge and instruction strategies. The findings also support Bamrungsin and Khampirat (2022) and Poonputta and Nuangchalerm (2024), who demonstrated that structured training and coaching interventions significantly improved pre-service teachers' professional skills, confidence, and readiness for future teaching careers. Collectively, these studies suggest that coaching and mentoring provide an effective mechanism for supporting the transition from teacher preparation to professional practice.

The significant improvement in lesson-planning and teaching skills may also be explained by the constructive feedback embedded throughout the model. During lesson-plan development and teaching practicum, participants received continuous feedback from university supervisors, allowing them to revise and refine their instruction practices. This finding is consistent with Xu et al. (2025),

who found that peer-feedback-based peer teaching enhanced pre-service teachers' pedagogical knowledge, professional competencies, and reflective learning. Similarly, Matsumoto-Royo et al. (2023) reported that feedback promotes professional growth when it is connected to authentic tasks and provides practical suggestions for improvement. The present findings also align with Tan and Chen (2022), who found that detailed constructive feedback supported collaborative knowledge development and improved instruction design quality. These findings suggest that feedback functions not merely as an evaluative mechanism but as an important tool for professional learning and instruction improvement.

Another factor contributing to the success of the model is the incorporation of reflective practice. Reflection and sharing activities encouraged participants to critically examine their teaching experiences, identify strengths and weaknesses, and develop strategies for future improvement. This finding supports Li (2025), who reported that reflective practice enhances pedagogical skills, critical thinking, and professional growth among pre-service teachers. Similarly, Harding et al. (2021) found that reflective activities enabled pre-service teachers to recognize important aspects of their instruction practices and identify areas for development. Spiteri (2025) further argued that structured reflection helps transform teaching experiences into meaningful professional learning opportunities. Therefore, reflection appears to play a critical role in helping pre-service teachers connect theoretical knowledge with classroom practice and sustain continuous professional development.

The positive findings obtained from Hammond's evaluation framework further support the effectiveness of the developed model. The highly favorable ratings reported in the instruction dimension suggest that the workshop activities, coaching process, and learning environment effectively supported participants' learning. A deeper analysis of the teaching skill dimensions reveals distinct variations in performance gains. The pre-service teachers demonstrated exceptionally strong performance in the active learning process dimension (M = 38.89 out of 40, or 97.2%), whereas score gains in measurement and evaluation were comparatively lower (M = 28.50 out of 30, or 95.0%). This difference can be attributed to the specific focus of the coaching interventions used. During classroom observations, supervisors emphasized direct, actionable coaching feedback on instruction delivery—such as managing student group dynamics, pacing interactive tasks, and posing open-ended questions. These immediate, visible teaching behaviors allowed pre-service teachers to make rapid real-time adjustments.

In contrast, integrating authentic formative assessment and designing multi-criteria evaluation rubrics required higher-order pedagogical reasoning. Pre-service teachers often found it challenging to collect and evaluate evidence of student performance simultaneously while facilitating active classroom tasks. This suggests that although cognitive coaching rapidly enhances classroom execution skills, developing sophisticated assessment literacy among pre-service teachers requires sustained, specialized guidance over time.

Overall, the findings suggest that a structured model integrating coaching, feedback, and reflective practice can effectively enhance active learning teaching skills among pre-service teachers. The study contributes to teacher education by providing an evidence-based model that supports the development of instruction competencies during the teaching practicum while demonstrating the usefulness of Hammond's evaluation framework for examining teacher development interventions from instruction, institutional, and behavioral perspectives.

6. Conclusion

This study developed and evaluated a model for enhancing active learning teaching skills among pre-service teachers in Thailand. The model was developed based on the principles of coaching, feedback, and reflective practice and was implemented during the teaching practicum. The findings revealed that pre-service teachers achieved lesson-planning and teaching-skill scores significantly higher than the established criterion and that the model was evaluated positively across the instruction, institutional, and behavioral dimensions of Hammond's framework. The study contributes to teacher education by providing an evidence-based model that supports the development of active learning competencies among pre-service teachers while demonstrating a systematic approach to evaluating teacher development interventions.

The findings imply that teacher education programs should provide structured professional development opportunities that combine coaching, constructive feedback, and reflective practice throughout the teaching practicum. Such support mechanisms can help pre-service teachers translate pedagogical knowledge into effective classroom practice and strengthen their readiness for professional teaching. Several limitations of this study should be noted. First, the single-group pre-experimental design lacked a control group, making it difficult to fully separate the model's effects from natural professional growth during practicum. Second, the modest sample size (N = 18) across two universities restricts statistical power and generalizability. Third, the study focused on pre-service teacher skills over a single 16-week semester without collecting direct data on primary/secondary student learning outcomes or conducting longitudinal tracking post-graduation.

Future research should employ quasi-experimental designs with larger, diverse samples, evaluate direct student learning gains, track long-term skill retention into full-time teaching, and examine the model's adaptation across different subject areas.

Conflict of Interest

The authors declare no conflict of interest.

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