Enhancing teachers' instructional skills through mentorship experiences

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Article Info	ABSTRACT
	Mentorship programs have emerged as a vital support system for new teachers' professional development. This study developed and evaluated a structured mentoring process to enhance instructional skills among novice teachers. Using mixed-methods research, the researchers examined 97 teachers from 15 disciplines who participated in a local teacher development project in Thailand. The mentoring process incorporated four key components: professional learning teams, collaborative teaching design, mentored practice, and reflective exchange. Quantitative results showed significant improvement in teachers' instructional capabilities, with overall assessment scores increasing. Qualitative findings revealed that mentorship enhanced abilities in student analysis, lesson planning, and teaching implementation. The study demonstrates that systematic mentorship effectively develops new teachers' pedagogical competencies while fostering professional growth through collaborative learning. *This is an open access article under the CC BY-SA license.*

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1. INTRODUCTION

Teachers serve as the cornerstone of educational achievement at both school and national levels, making teacher preparation institutes crucial to education development. Within this context, the Thai government promotes Thailand education 4.0 [1], [2], recognizing the nation's need for an innovation-driven economic paradigm to ensure the fourth industrial revolution. This initiative supports the 20-year national strategic plan, which emphasizes internal strength and worldwide engagement under the sufficiency economic theory and civil state mechanism [3]–[5]. The Thailand 4.0 strategy considers teachers vital to national development because they prepare young people to become citizens ready for the 4.0 era [6].

New teachers face significant challenges in their early career development, particularly in translating theoretical knowledge into effective classroom practice. Research examining curriculum design, teaching management, classroom reflection, and lesson plan analysis and improvement between experienced and inexperienced instructors [7]–[13] reveals critical insights. The findings show that novice instructors perceive classrooms holistically without considering learner analysis while developing curriculum or lessons. Additionally, these instructors frequently employ few teaching approaches and struggle with student assessment and evaluation, resulting in pupils not meeting learning goals.

These challenges manifest primarily in instructional abilities, classroom management, and student achievement [14], [15]. Instructional skills comprise several interrelated components: learner analysis and

characteristics, content selection and logical sequencing, defining learning objectives, determining teaching strategies and activities, selecting learning resources, designing assessment and evaluation, and establishing classroom management guidelines [16], [17]. The complexity of these tasks often overwhelms novice instructors as they struggle to prepare, execute, analyze, and improve lesson plans and teaching [18]. Teacher development research demonstrates that new instructors require induction training, with educational supervisors and administrators supporting growth throughout a 1-3 years probationary term [19], [20].

Research indicates that new teachers need support in two fundamental domains [21]–[23]. First, they require professional development opportunities during their early teaching stages, including structured learning from experienced colleagues, understanding of work systems, and guidance for professional self-development. Second, they need personal development through socialization in the school context, where building strong collegial relationships helps boost early career confidence and reduce professional isolation. This dual support system-professional and personal-creates a foundation for sustainable teaching practice.

However, examination of existing teacher development systems reveals significant limitations. Conventional induction procedures typically restrict support to basic orientation and initial knowledge transfer at career entry [13]. While mentors assist new teachers in establishing formal teaching performance evaluation and learning skills before employment begins [24], the process remains confined to assessment rather than development. Current teacher development approaches via mentorship [25], [26] typically create an evaluator-evaluatee relationship that may inhibit genuine professional growth. This traditional model, relying on a single mentor-evaluator, often lacks consistency and meaningful integration with daily teaching practice.

To address these limitations, this research aims to develop and evaluate a mentoring-based process for enhancing new teachers' instructional skills. The novelty of this research lies in its comprehensive, structured mentoring framework: professional learning teams, collaborative teaching design, mentored practice, and reflective exchange. Unlike conventional induction programs, this approach creates a supportive ecosystem where experienced mentors guide new teachers through collaborative planning, implementation, and reflection. The integration of quantitative and qualitative methods to evaluate this mentoring process provides a unique contribution to teacher professional development within the Thailand education 4.0 initiative. By examining the outcomes, the study seeks to improve teaching quality, student learning outcomes, and teachers' professional self-development while moving beyond traditional evaluation-focused relationships.

2.   METHOD

This study employed a systematic research and development model conducted through three sequential phases of an induction program. Each phase built upon the findings of the previous phase to develop and evaluate a comprehensive mentoring approach for new teachers. The initial phase examined the conditions and challenges new teachers face in developing their instructional skills. The researchers conducted a thorough investigation through two approaches. First, a comprehensive review of concepts and relevant documents established the theoretical foundation. Second, empirical data collection involved semi-structured interviews with 5 teachers and 5 experts in educational management. The interview protocol focused on three critical areas: instructional problems, challenges in learning activity design, and difficulties in lesson planning and instructional media development. Content analysis of interview data revealed key themes that informed the development of induction process guidelines.

The second phase focused on developing the process for introducing new teachers to the profession using a mentoring approach to enhance instructional skills. Five experts in teaching management, specifically experienced in mentoring approaches, curriculum and instruction, and measurement and evaluation, participated in this phase. The development process began with synthesizing findings from phase 1 to create a conceptual framework. Mentors were selected based on three key qualifications: subject-specific knowledge, classroom management abilities, and instructional design capabilities. These mentors collaborated to develop the process and methods for supporting new teachers. Research instruments included evaluation forms for lesson plans, lesson plan implementation, and lesson plan improvement. Expert recommendations underwent content analysis, while quantitative data from evaluation forms were analyzed using mean and standard deviation. Results were interpreted using a five-point scale: 4.51-5.00 (highest), 3.51-4.50 (high), 2.51-3.50 (moderate), 1.51-2.50 (low), and 1.00-1.50 (lowest).

The validity of research instruments was established through content validity procedures. The evaluation forms for lesson plans, lesson plan implementation, and lesson plan improvement were validated by a panel of five experts with specializations in teaching management, mentoring approaches, curriculum and instruction, and measurement and evaluation. Each item was assessed using the index of item-objective congruence (IOC) technique, with all items achieving scores above 0.80, indicating high content validity. Reliability was determined through a pilot test with 30 teachers not included in the main study sample. The Cronbach's alpha coefficients for the lesson plan evaluation form, lesson plan implementation evaluation form,

and lesson plan improvement evaluation form were 0.89, 0.87, and 0.91 respectively, demonstrating high internal consistency reliability.

The final phase involved implementing and evaluating the developed mentoring process. The sample size of 97 teachers was determined using Krejcie and Morgan's [27], formula for calculating sample sizes from a known population. From the population of 136 teachers appointed in 2022 under the local teacher development project across 15 disciplines in Thailand's Lower Northeastern Network, this sample size provides a confidence level of 95% with a margin of error of 5%, ensuring adequate representation of the target population. The sampling method involved stratified random sampling across the 15 disciplines to maintain proportional representation of teachers from each subject area. These participants worked in both basic and vocational education levels. The implementation followed the process developed in phase 2, with ongoing evaluation of its effectiveness in enhancing instructional skills.

Several measures were implemented to control potential confounding variables. First, mentor selection followed standardized criteria focusing on subject-specific knowledge, classroom management abilities, and instructional design capabilities, ensuring consistency in mentorship quality. Second, all mentors received identical training based on the process guidelines developed in phase 2, minimizing variation in mentoring approaches. Then, the implementation period was standardized across all participants, controlling for time-related variables. Lastly, to minimize observer bias, structured observation protocols were used, and multiple evaluators were involved in the assessment process. Furthermore, the integration of quantitative and qualitative methods enabled data triangulation, which strengthened the credibility of results by reducing potential biases associated with single-method approaches.

Quantitative analysis examined scores from lesson plan evaluation, implementation, and improvement forms using mean and standard deviation, comparing results against established criteria. Qualitative analysis of classroom observations and teaching reflections employed content analysis, with findings presented in narrative form. The interpretation framework-maintained consistency across all phases, using the standardized five-point scale established in phase 2 for quantitative assessments. This comprehensive approach ensured systematic evaluation of both the process development and its implementation effectiveness.

3. RESULTS AND DISCUSSION

The synthesis of documents, concepts, theories, and interviews with new teachers revealed specific challenges in curriculum and learning management. New teachers generally do not analyze learners, do not plan diverse teaching activities, and adhere to defining learning objectives for students according to the curriculum. They have problems in designing learning assessments. In teaching management and lesson plan implementation, new teachers conduct non-diverse teaching activities that do not respond to the potential of all students in the classroom. They lack confidence in using new teaching methods, focus on students' academic achievement, resulting in neglecting problem-solving to help students achieve learning objectives.

Learning from more experienced instructors is a better way to introduce novice teachers to the profession than trial and error [28], [29]. Interactions with colleagues and other new instructors help new teachers improve. Reflection improves teaching and learning. Teachers get fresh views by observing and having others watch their classes. Mentors' insightful input following classroom observations helps novice teachers progress. The research synthesized teaching profession entry procedures with mentoring concepts [30], distinguishing between basic coaching and comprehensive mentoring approaches. The process yielded four guidelines for developing professional entry using a mentoring approach, as shown in Table 1.

Table 1. The guidelines for developing the process of entering the teaching profession using a mentoring approach to enhance instructional skills

Process	Steps
Creating professional learning teams	1. Creating teams of new teachers and mentors
	2. Training mentors to set desired goals
Collaborating on classroom teaching design	1. Planning and designing teaching activities, classroom observation by mentors
	2. Implementing teaching activities and classroom observation
	3. Reflecting on observation results
Sharing teaching processes through mentoring	1. Improving lesson plans and teaching activities in collaboration with mentors
Exchanging learning and reflecting on teaching management outcomes	1. Exchanging learning about instructional design
	2. Exchanging learning about teaching practice

The process emphasizes building teams, introducing new teacher professional development, cooperating on classroom teaching design, and mentoring new teachers [31], [32]. Teachers collaborate, exchange resources,

and spread effective approaches across the school or educational system. Teachers must commit to active learning for self-improvement, time allocation, and administrative support for all teacher professional development initiatives to succeed. Teachers may apply their learning to their current teaching and gain feedback from colleagues and administrators [33]. Collaboration improves teacher training and school culture. Teachers working together may solve issues, test new ways, and share successes, promoting transformation.

Mentoring demonstrated the following about novice teachers' teaching skills: new instructors had a mean score of 4.03 and a standard deviation of 0.49 in the first evaluation, accounting for 80.60% of the total score. The lesson plan assessment form had a mean of 3.82, standard deviation of 0.51, and 76.43% for individual components. Lesson plan implementation evaluation form means: 3.87, standard deviation: 0.48, 77.41%. Average lesson plan improvement evaluation form score was 4.40, standard deviation 0.49, 87.97%. With an overall mean of 4.46, standard deviation of 0.49, and 89.19% of the total score, new instructors demonstrated excellent teaching abilities in the second evaluation. Individual parts of the lesson plan assessment form had a mean of 4.40, standard deviation of 0.49, and 88.00%. 88.25% of the lesson plan implementation assessment form had a mean of 4.41 and standard deviation of 0.49. The lesson plan improvement assessment form had a mean of 4.57, standard deviation of 0.49, and 91.34%. Table 2 shows new instructors' teaching abilities have increased.

Table 2. The results of implementing the process for introducing new teachers to the profession using a mentoring approach to enhance instructional skills

Aspects	n	1st Assessment			Quality level	2nd Assessment			Quality level
		Mean	SD	%		Mean	SD	%	
Lesson plan evaluation form	97	3.82	0.51	76.43	High	4.40	0.49	88.00	High
Lesson plan implementation evaluation form	97	3.87	0.48	77.41	High	4.41	0.49	88.25	High
Lesson plan improvement evaluation form	97	4.40	0.49	87.97	High	4.57	0.49	91.34	High
Overall		4.03	0.49	80.60	High	4.46	0.49	89.19	High

First assessment findings showed that teachers demonstrated improved systematic approaches to student analysis and better understanding of student potential. This enabled more appropriate content selection aligned with indicators. Teachers defined clearer learning objectives and designed more suitable teaching activities and methods. They selected instructional media aligned with content and teaching methods, and designed assessment methods corresponding with learning objectives [34].

Initial lesson plan development revealed some limitations. Learning objectives did not fully cover process skills and desirable characteristics. Content specification did not comprehensively address all indicators, with heavy reliance on textbook publishers. Learning activity design lacked diversity.

Second assessment results demonstrated significant improvements. Teachers defined comprehensive learning objectives covering all aspects. They aligned learning content with standards and indicators. Learning activities emphasized hands-on experiences appropriate to student age and goals. Teachers wrote detailed, step-by-step lesson plans and improved their instructional media design. Assessment tools became more clearly defined.

From the qualitative study of implementing the process for introducing new teachers to the profession using a mentoring approach to enhance instructional skills, conducted through observation, note-taking, and informal interviews with the sample group, the researchers analyzed the content and summarized interesting points that reflect the results of implementing the process. The findings are as follows:

"After entering this process, I can analyze students better. I'm able to assess students to adjust my teaching to be more suitable for them." (Teacher A)

"After entering the development process, I can specify content in lesson plans in more detail. I can sequence content from easy to difficult very well. I can link knowledge from previous lessons with current content in my teaching." (Teacher B)

"Before the development process, I only focused on knowledge objectives and didn't include behavioral objectives. The objectives lacked clear definition. After the development process, I can set learning objectives more clearly. I can specify criteria or performance levels of students more clearly, such as 'students can state/explain', etc." (Teacher C)

"After participating in the development process, I can observe learning situations of students and adjust my teaching to be more appropriate for them. I can encourage students to construct their own learning concepts. I can use more examples of situations related to daily life in my teaching." (Teacher D)

"After entering the development process, I can use technological media to help students understand content better. I use more questions to assess students' knowledge and understanding." (Teacher E)

Learning activity management showed enhancement in inquiry process organization, allowing students to synthesize knowledge independently. Teachers provided opportunities for student-directed topic selection and practiced age-appropriate questioning to stimulate thinking [35]. Media usage improved through appropriate selection of engaging resources that encouraged participation [36]. Assessment and evaluation demonstrated better design of consistent tools with clear measurement criteria. Table 3. presents the comprehensive transformation observed in teaching practices.

Table 3. The differences before and after entering the process

Before	After
New teachers did not demonstrate student analysis in their lesson plans.	New teachers demonstrated improved student analysis both in their lesson plans and in the implementation of those plans.
New teachers explained content in the main points section, with the main points written as lengthy content descriptions instead of concise summaries.	New teachers were able to write main points correctly and clearly and could accurately write content in knowledge sheets.
New teachers were unable to specify learning objectives that comprehensively covered knowledge, skills, and characteristics.	New teachers specified behavioral objectives that clearly indicated expected behaviors, with explicit performance criteria.
New teachers used learning media and resources well according to learning objectives and content but lacked the use of technological media.	New teachers used learning media and resources comprehensively according to learning objectives and content. They employed a variety of teaching media that aligned with learners. They were able to utilize technology in creating instructional media.
New teachers could measure and evaluate teaching and learning as specified in the lesson plan but lacked clear criteria for measurement.	New teachers could fully measure and evaluate teaching and learning as specified in the lesson plan, with clear measurement criteria. They could assess students progressively from simple to complex tasks.

New teachers' teaching methods improve following professional development. They struggled to define student success standards. These areas improved significantly after professional development for new instructors. They also improved their utilization of educational media, including technology, to meet student needs and learning goals. Clear and progressive evaluation criteria improved their capacity to track and evaluate student development.

These findings imply that professional development improved new instructors' instructional abilities, resulting in more organized and effective teaching. The entire mentoring method development process included researching key papers, ideas, and concepts, expert review, and suggestions for improvements. All new instructors designed teaching and learning activities, implemented lesson plans, and reflected on their practices to grow themselves. New instructors understood the value of student analysis and designed different instructional activities to accommodate student variances. They used modern educational technologies and hands-on learning. Their assessment techniques matched instructional goals and material.

Thai pre-service teachers' technological pedagogical subject competence requires careful consideration. A good discussion section would relate the findings to educational theories and practices and suggest ways Association of Southeast Asian Nations (ASEAN) teacher education programmes might use them [37], [38]. Policy and practice consequences should be stated. The research clarifies how technological pedagogical and content knowledge (TPACK) is seen and used in ASEAN, an understudied region. Examining how scientific attitudes and science process skills affect TPACK development is unique and significant in teacher education. This novel approach adds to science education technology integration research. For educators, policymakers, and academics interested in technology, pedagogy, and subject understanding, it provides useful insights.

This study on technology-integrated teaching may influence teacher education program design and implementation. This publication lays the groundwork for future research on the long-term effects of the TPACK framework on teaching abilities [37]. The research revealed that the procedure improved new instructors' instructional design skills [39]. New instructors might construct curriculum that met learning goals and engaged students by the end. They might create various learning evaluations and employ relevant instructional medium.

4.   CONCLUSION

Mentoring programs have been a prominent form of new teacher development for several decades. Mentoring is a continuous process that promotes professional development, especially during career transitions

such as starting a new job or taking on new roles. It has numerous benefits and can help address long-term teacher attrition issues.

Assigning mentors to new teachers teaching the same subject and level can foster good relationships, further enhancing new teachers' instructional development. This pairing allows for a more focused and relevant mentorship experience. The mentorship can provide targeted advice, share proven instructional strategies, and practical insights to the new teacher's classroom. It not only supports the new teacher's instructional development but also builds a sense of camaraderie and trust. The new teacher is more likely to feel supported and confident in their role, which can enhance their professional growth and effectiveness in the classroom.

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C : **C**onceptualization		I : **I**nvestigation		Vi : **Vi**sualization		
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CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

ETHICAL APPROVAL

The research related to human use has been complied with all the relevant national regulations and institutional policies in accordance with the tenets of the Helsinki Declaration and has been approved by the authors' institutional review board or equivalent committee.

DATA AVAILABILITY

The authors confirm that the data supporting the findings of this study are available within the article and available from the corresponding author, [PA], on request.

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