

ENHANCING MULTI-GRADE TEACHING COMPETENCIES IN EARLY CHILDHOOD EDUCATION: NEEDS ASSESSMENT FOR STUDENT TEACHERS IN PROFESSIONAL TEACHING PRACTICE SCHOOLS IN THAILAND

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ABSTRACT

The objectives of this research were 1) to study the current and desired conditions, and 2) to assess the needs for enhancing multi-grade teaching competencies in early childhood education for student teachers in professional teaching practice schools. This quantitative survey research was conducted using a purposive sampling. The population consisted of 208 student teachers in professional teaching practice schools majoring in early childhood education. The sample comprised 71 student teachers who had experienced or previously organized mixed-grade instruction in early childhood education, selected through purposive sampling. The research instrument was a questionnaire designed to assess current and desired conditions using a 5-point Likert scale. The questionnaire demonstrated an Index of Item Objective Congruence (IOC) ranging from 0.66 to 1.00 and a Cronbach's Alpha reliability coefficient of 0.99. Data were analyzed using descriptive statistics, including percentages, means (M), the Priority Needs Index (PNI), and content analysis. The research findings revealed: 1) Regarding current and desired conditions for enhancing multi-grade teaching competencies in early childhood education for student teachers in professional practice schools, the overall current conditions were rated at a high level, whereas the overall desired conditions were rated at the highest level. 2) Regarding needs in multi-grade teaching competencies for student teachers, the highest priority need was identified as promoting learning based on individual differences. However, the most common problem faced by student teachers was learning media design and development.

Keywords: Needs assessment, Enhancing Multi-grade Teaching Competencies in Early Childhood Education, Student Teachers, Professional Teaching Practice Schools

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INTRODUCTION

Teachers play a vital role in educating students, equipping them with both academic knowledge and essential life skills that contribute to their development into productive members of society. Among them, early childhood education teachers hold a particularly crucial position, as they are the first educators children encounter. They guide young learners through the transition from home to school, fostering holistic development by providing love, care, and support across all domains of growth: physical, emotional-social, and cognitive development.

Early childhood education operates within diverse contexts, with many schools in Thailand, particularly in rural and small communities, serving mixed-age classrooms—environments where children of different ages and developmental levels learn together. This multi-grade classroom structure is an educational reality that requires teachers to possess specialized competencies. Every child in these mixed-age classrooms possesses unique learning needs, developmental levels, and potential. To address this diversity effectively, teachers must develop and implement instructional strategies that are responsive to each child's age, maturity, interests, and abilities. This approach requires considerable time, commitment, and specialized knowledge for understanding individual children and adapting instruction accordingly.

Mixed-age or multi-grade learning involves organizing educational activities for students of varying ages, grade levels, and developmental abilities within the same classroom environment. A single teacher facilitates these activities, adapting them to suit the capabilities of individual students or groups. This method emphasizes cooperative learning and peer support. According to UNESCO (2015), designing mixed-grade experiences demands specific knowledge, skills, and attitudes from teachers. However, mixed-grade teaching is distinct from combined-grade teaching in four main areas: 1) lesson planning and scheduling, 2) design of learning activities, 3) classroom management and student grouping, and 4) physical arrangement of the classroom (Office of the Basic Education Commission & Faculty of Education, Chulalongkorn University, 2008; Ministry of Education & Office of the Basic Education Commission, 2008; Thatthong, 2009; Pahe, 2010).

Despite the prevalence of mixed-age classrooms in early childhood settings, early childhood education student teachers often receive limited preparation in multi-grade teaching competencies during their initial teacher education programs. This gap in preparation creates challenges when student teachers conduct their practicum experience in schools with mixed-age configurations. Kalasin University is a public university located in the northeastern region of Thailand that graduates approximately 60 Bachelor of Education in Early Childhood Education students annually. As part of their professional experience training, early childhood education students participate in practicum placements from their first year through their fourth year, with varying durations as specified in the curriculum.

Notably, most of students choose to complete their practicum at small primary schools, medium-sized primary schools, or primary schools with expanded educational opportunities—settings that often employ multi-grade classroom structures (Faculty of Education and Educational Innovation, 2023).

Recent research has demonstrated the importance of specialized competencies for managing multi-grade classrooms effectively. A study by Kusolsong (2023) introduced the ATEP MODEL, developed to enhance preschool teachers' competencies in managing multi-grade classrooms, particularly in small schools. Key areas of focus include classroom management, activity planning, teacher competencies, and the creation of a positive learning atmosphere. The model encompasses six core components: concepts, principles, learning objectives, content, instructional procedures, learning materials and resources, and assessment methods. Implementation of the ATEP MODEL resulted in a 40.97% improvement in teachers' competencies in activity organization, classroom management, and professional development.

Another relevant study by Photiart and Jaruchainiwat (2020) explored the roles of preschool teachers in managing learning within culturally diverse classrooms. The findings highlighted four key areas of teacher responsibility: instructional management, environmental design, role modeling, and collaboration with parents. Overall, preschool teachers demonstrated varying levels of competency across these areas of responsibility.

Understanding the current state of multi-grade teaching competencies among student teachers and identifying their specific competency needs is essential for developing appropriate teacher preparation programs and professional development interventions. A comprehensive needs assessment can provide valuable insights into the gaps between current competencies and desired competencies in multi-grade teaching, thereby informing the development of targeted support and training initiatives. Therefore, this research aims to assess current conditions and desirable conditions of multi-grade teaching competencies among early childhood education student teachers in professional teaching practice schools, with the goal of identifying areas that require strengthened competency development.

Research Objectives

- 1) To study the current and desirable conditions of multi-grade teaching competencies in early childhood education for student teachers in professional teaching practice schools.
- 2) To assessment the needs for enhancing multi-grade teaching competencies in early childhood education for student teachers in professional teaching practice schools.

LITERATURE REVIEWS

Needs

Wongwanich (2019) defined needs as follows:

1) Psychological Perspective

According to Maslow's theory of needs, they exist at multiple levels, ranging from basic to higher-order needs. Humans and animals must have their basic needs satisfied first before addressing higher-level needs.

2) Assessment Perspective

Needs can be classified into two groups:

2.1) Discrepancy

This perspective emphasizes studying the difference between the actual current condition and the desired condition. It identifies problems that cause the current state to be incomplete or ineffective, requiring solutions. It represents the contradiction between what currently exists and what is desired or should exist.

2.2) Needs as Benefits

This perspective defines essential needs as whatever produces satisfaction (Satisfaction). The level of satisfaction depends on context. The needs of one group may not be the same as those of another group; therefore, it is necessary to determine which essential needs are most important.

Hauer and Quill (2011) stated that assessing needs requires analyzing information and prioritizing problems. This involves identifying gaps between what should be and what currently is, making needs assessment distinct from general evaluation.

In summary, defining needs according to the discrepancy perspective demonstrates needs in terms of outcomes, which reflect problems that have occurred. In contrast, defining needs by focusing on desired conditions or what is needed aims to eliminate the identified gaps, with outcomes reflecting solutions to problems or pathways toward objectives.

Competency

The Royal Thai Society (2018) defined competency as the ability demonstrated through behavior and actions in performing personal and professional tasks successfully by

appropriately applying knowledge, skills, and various characteristics that are congruent with the context of society and culture in diverse situations.

The Office of the Education Council (2019) defined competency as knowledge, skills, abilities, and other characteristics of individuals that are demonstrated through behavior and are necessary for performing duties in a particular position efficiently and successfully.

The work produced must meet or exceed the established standards, or be more outstanding than that of others.

In summary, competency refers to knowledge, skills, and abilities demonstrated through behavior and actions, as well as characteristics necessary for individuals to perform personal and professional tasks successfully at a level that exceeds general standards. Competency comprises three components: knowledge, skills, and attributes.

Multi-grade teaching competencies in early childhood education

Smit and Engeli (2015) identified the elements of mixed-age teaching as follows:

- 1) The teacher's role: Teacher is a facilitator and a coach, in addition to being an instructor.
- 2) Differentiated instruction: Learners in each grade group engage in learning tasks appropriate to their level of learning.
- 3) Socially collaborative classroom: A supportive classroom climate where students help each other and collaborate flexibly.
- 4) Flexible grouping: Learning is flexibly organized in the whole class and includes teacher-led groups, individuals within groups, collaborative groups, and individuals.
- 5) General learning topic: The same general topic or theme in the same subject is covered for all learners.
- 6) Quality of learning tasks: The learning tasks are more open-ended, exploratory, and problem-oriented.
- 7) Formative assessment: To observe and diagnose how a learner is learning to improve teaching and learning.

UNESCO (2015) offered useful suggestions for teaching effectively in multigrade classrooms: All children have individual learning potential with different needs and abilities. Teachers must use instructional strategies that respond to these differences while considering each child's age, maturity, interests, and abilities. The following guidelines help create inclusive, supportive mixed-age classrooms:

- 1) Use strategic grouping: Group children by mixed abilities for collaborative activities, and by age or grade level for skill-based instruction in reading, writing, mathematics, and science.
- 2) Prepare flexible and appropriate materials: Develop diverse, challenging materials that accommodate different ability levels. Create varied worksheets for different groups, including teacher-guided activities, group learning tasks, individual practice sheets, and peer-directed materials.
- 3) Promote self-paced learning: Allow children to engage in curriculum-based activities at their own learning pace while supporting them in achieving grade-level learning objectives.
- 4) Support children with special needs: Ensure children with disabilities and learning difficulties achieve the same outcomes as peers. Provide differentiated worksheets and additional support based on each child's specific needs.
- 5) Adapt curriculum and lesson plans: Design curriculum appropriate to children's age and grade level in a gradual, continuous manner that reflects the school's cultural, economic, and social context.

According to the Educational Equity Fund (2024), the assessment criteria for multi-grade teaching competencies are specified in the professional practicum handbook for student teachers in the Rural Teacher Development Program, who will teach in small schools. These competencies in Early Childhood Education comprise two components:

Component 1: Ability to Analyze, Design, and Develop Learning Plans that Support Mixed-Grade Instruction

- 1) Analyze the alignment of learning content and desired characteristics standards according to the 2017 Early Childhood Education Curriculum or school-based curriculum.
- 2) Analyze the development of children across all four domains (physical, emotional-social, social, and cognitive) on an individual basis.
- 3) Appropriately identify learning units and learning objectives that align with children's developmental stages.
- 4) Appropriately design learning experiences that correspond to learning units and children's developmental levels.
- 5) Appropriately establish assessment criteria for development that align with learning experiences in each unit.

Component 2: Ability to Organize Learning Activities that Support Mixed-Grade Instruction

- 1) Create a learning environment and manage classrooms appropriately for children at different developmental stages.
- 2) Design experiences that appropriately promote individual differences among children at different age levels.

Based on the synthesis of the three sources mentioned above, it can be concluded that the components of multi-grade teaching competencies consist of seven components:

- 1) curriculum analysis and design; 2) learning experience design; 3) classroom management and flexible grouping of children; 4) learning media design and development; 5) creating a cooperative learning atmosphere; 6) promoting learning based on individual differences; and 7) teacher role transformation (Educational Equity Fund, 2024; Smit and Engeli's , 2015; UNESCO, 2015).

The researcher selected the needs assessment method for this study because it can systematically classify and prioritize the needs for developing specific competencies in managing multi-grade early childhood education learning. This differs from research designs that merely describe or compare. The needs assessment method provides a comprehensive framework for developing a process to build multi-grade teaching competencies in early childhood education.

RESEARCH METHODOLOGY

Literature reviews

The researcher studied the preliminary data on the components of mixed-age teaching for kindergarten teachers from documents, textbooks, and related research, including Smit and Engeli (2015) "An overview of the elements of mixed-age teaching," the Equitable Education Fund (2024) competency assessment criteria for mixed-age teaching, and UNESCO (2015) "Teaching Effectively in a Multi grade Classroom." The data were then analyzed and defined as the components of multi-grade teaching competency in early childhood education, which consisted of seven components. The research framework is presented in Figure 1.

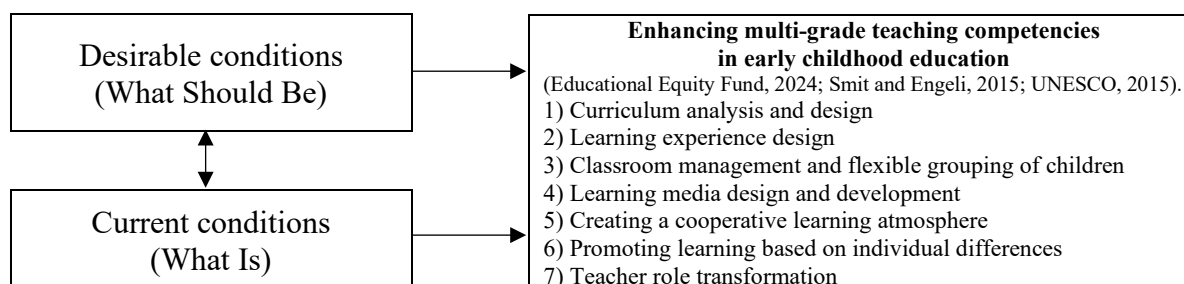


Figure 1 The research framework

Identifying population and sample groups

The population used in this research consisted of 208 student teachers in the 1st to 4th year of professional internship in professional teaching practice schools majoring in early childhood education. The sample comprised 71 student teachers who had experience in managing or had previously organized mixed-grade instruction at the early childhood education level, selected through purposive sampling.

Research instrument

The research instrument was a questionnaire on the needs for enhancing multi-grade teaching competencies in early childhood education for student teachers in professional teaching practice schools. The questionnaire was developed by the research team based on content analysis of both domestic and international academic sources and was structured in three sections:

Section 1: Basic Information contained multiple-choice and fill-in-the-blank items covering: 1) school characteristics and size, 2) the age range of children in mixed-grade classes where student teachers had provided instruction, and 3) the number of children in each classroom.

Section 2: Current and desired conditions of multi-grade teaching competencies in early childhood education comprised a dual-response (current and desired conditions) 5 rating scale with 28 items assessing seven components of competency.

Section 3: Problems and suggestions for enhancing multi-grade teaching competencies for student teachers was an open-ended section requesting descriptions of challenges encountered and suggestions for improvement.

The questionnaire was reviewed by three experts to ensure validity. The Index of Item Objective Congruence (IOC) values ranged from 0.66 to 1.00. Following pilot testing with the target population, the instrument demonstrated a reliability coefficient (Cronbach's Alpha) of 0.99, indicating acceptable internal consistency.

Data collection

The research collected quantitative data through online using survey questionnaires forms with student teacher in professional teaching practice schools.

Data analysis

The research instrument was a questionnaire. The data were analyzed by using frequency, percentage, standard deviation, and identifying and prioritizing needs using the Modified Priority Needs Index (Wongwanich, 2015), the calculation formula is as follows:

$$(PNI_{\text{Modified}}) = (I-D)/D$$

The Priority Needs Index (PNI) measures the gap between current and desired states using two variables: D (Degree of Success) represents the actual condition, and I (Importance) represents the desired or expected condition. Needs are ranked by PNI value, from highest to lowest priority, with higher values indicating greater priority needs. It is a rating scale questionnaire using the criteria for determining the score weight and 5-level rating scale according to the Likert method are presented in Table 1.

Table 1 The score weight and 5-level rating scale and interpretation.

Score	Interpretation
5	Both current and desired conditions are at the highest level
4	Both current and desired conditions are at the high level
3	Both current and desired conditions are at the moderate level
2	Both current and desired conditions are at the low level
1	Both current and desired conditions are at the lowest level

The criteria for interpreting the scores were set according to Best's method (Best, 1986) and are presented in Table 2.

Table 2 The mean value scale and mean descriptive equivalent.

Weighted mean value scale	Mean descriptive equivalent
4.51-5.00	Very High
3.51-4.50	High
2.51-3.50	Moderate
1.51-2.50	Low
1.00-1.50	Very Low

Problems and suggestions were analyzed using content analysis.

RESEARCH RESULTS

Results of the study on current and desired conditions for enhancing multi-grade teaching competencies in early childhood education for student teachers.

Basic informations of Respondents

The respondents' professional internship placements were predominantly in small schools, with enrollments of 119 students or fewer (85.90%).

In terms of the age range of kindergarten children in mixed-grade early childhood education classes, respondents most frequently reported providing instruction to children aged 4-6 years (56.3%), followed by those teaching the wider age range of 3-6 years (29.6%) and 3-5 years (14.1%).

Regarding classroom composition, most classrooms contained 11-15 kindergarten children (36.60%), with smaller proportions containing 6-10 children (28.20%) and 16-20 children (21.1%).

Results of Data Analysis on Perceptions of Current and Desired Conditions for Enhancing Multi-grade teaching Competencies in Early Childhood Education for Student Teachers

The findings are presented in Table 3.

Table 3 Current and Desired Conditions for Enhancing Multi-grade teaching Competencies in Early Childhood Education for Student Teachers

Items	Current			Ordinal	Desired conditions			Ordinal	PNI _{Modify}	Level of needs
	<i>M</i>	<i>SD</i>	Meaning		<i>M</i>	<i>SD</i>	Meaning			
1) Curriculum analysis and design	4.03	0.90	High	2	4.45	0.68	High	6	0.104	6
2) Learning experience design	3.98	0.99	High	5	4.36	0.83	High	7	0.095	7
3) Classroom management and flexible grouping of children	3.99	0.91	High	4	4.51	0.74	Very high	4	0.130	4
4) Learning media design and development	3.88	0.95	High	7	4.46	0.75	High	5	0.149	2
5) Creating a cooperative learning atmosphere	4.02	0.93	High	3	4.62	0.65	Very high	1	0.148	3
6) Promoting learning based on individual differences	3.91	0.96	High	6	4.56	0.65	Very high	3	0.166	1
7) Teacher role transformation	4.16	0.86	High	1	4.60	0.64	Very high	2	0.106	5
total	4.00	0.93	High		4.51	0.71	Very high		0.128	

Based on Table 1, the overall current conditions were rated at a high level, with the highest practice levels in: teacher role transformation, curriculum analysis and design, creating a cooperative learning atmosphere, flexible classroom management, learning experience design, individualized learning promotion, and learning media design and development, respectively. The overall desired conditions were at the highest level, with the highest aspirations for: creating a cooperative learning atmosphere, teacher role transformation, individualized learning promotion, classroom management and flexible grouping of children, learning media design and development, curriculum analysis and design, and learning experience design, respectively.

The Priority Needs Index (PNI) analysis by component revealed values ranging from 0.095 to 0.149. Promoting learning based on individual differences had the highest need

(PNI = 0.166), followed by learning media design and development (PNI = 0.149), while learning experience design had the lowest need (PNI = 0.095).

Problems and Suggestions in Multi-Grade Teaching Competencies in Early Childhood Education for Student Teachers

The analysis of data regarding the problems that student teachers encountered in multi-grade teaching competencies at the early childhood education level revealed that the most frequently identified issues were in the area of designing and developing learning media and materials, reported by 31 persons, followed by the area of designing learning experiences, reported by 30 persons. The details are as follows:

In multi-grade classrooms in early childhood education settings, teachers face challenges in designing and developing learning media and materials. These challenges stem from various constraints including limited budgets, insufficient equipment and resources, teachers' limited understanding of child development across different age levels, and the need to manage the design of materials suitable for mixed-age learning environments. Additionally, there are issues regarding the appropriateness of content difficulty levels, the diversity and engagement value of materials, and teacher competencies in media design. Furthermore, there is a lack of varied worksheet options to accommodate different student abilities within the same classroom. Many schools report using pre-printed commercial materials rather than self-designed or handmade materials. Teachers often struggle with creating durable, safe, and developmentally appropriate learning materials. There is also insufficient consideration given to how to make materials long-lasting and safe while meeting the diverse learning needs of students in multi-grade settings.

Designing and facilitating learning experiences congruent with individual child development. For example, each child demonstrates different developmental stages and capabilities, which complicates classroom management. Individual differences in developmental trajectories result in learning activities that are disconnected from age-appropriate developmental milestones. Certain groups of learners exhibit reduced engagement, which adversely affects their academic performance. Learning activities must be continuously differentiated to accommodate each child's developmental progression. Understanding the design of learning experiences across different age levels: Such as planning activities with appropriate complexity levels for specific age groups, addressing variability in child cooperation, and managing classrooms with diverse knowledge levels among students.

DISCUSSION & CONCLUSION

Discussion

1) Current Need Levels

Student teachers demonstrated proficiency in multi-grade teaching competencies at a high level, with the strongest performance in teacher role transformation. This competency includes the ability to analyze the consistency of learning content with the early childhood education curriculum, adapt and design curriculum appropriate for children's age and grade level, arrange

curriculum content to be relevant to children's daily life and school context, and create integrated learning activities across multiple subject areas. This finding aligns with Smit and Engeli (2015), who emphasized that in mixed-grade settings, teachers must transition from traditional instructor-centered roles to serve as facilitators and coaches, promoting student agency and self-directed learning. Furthermore, States, Detrich, and Keyworth (2017) identified four critical competencies essential for effective classroom management: establishing clear rules, implementing proactive management strategies, delivering effective instruction, and reducing challenging behaviors. Student teachers' strong performance in teacher role transformation demonstrates their understanding and initial implementation of these foundational principles. Despite high overall practice levels across multiple competency components, learning media design and development ranked lowest (7th position) in current practice, revealing a critical gap in preservice preparation. This discrepancy suggests a disconnect between student teachers' understanding of instructional principles and their ability to operationalize these principles through the creation of tangible, differentiated learning materials. According to Hinon and Tansriwong (2015) documented similar challenges in professional practice settings, finding that insufficient media devices and learning materials were used in classrooms, highlighting the chronic underutilization of media as instructional tools. This persistent gap indicates systemic barriers that extend beyond individual teacher effort.

2) Desired conditions Levels

Analysis of desired competency levels revealed three components as highest priorities: creating a cooperative learning atmosphere, teacher role transformation, and promoting learning based on individual differences. These aspirational competencies directly reflect the principles outlined in Thailand's Early Childhood Education Curriculum (2017), which prioritizes complete child development from infancy through age 6. The curriculum is grounded in Developmentally Appropriate Practices (DAP), an evidence-based framework comprising three knowledge areas, with particular emphasis on recognizing and responding to individual differences among children. To operationalize these principles, the curriculum provides seven distinct teaching models. Model 3 holds relevance for professional practice schools, as it specifically addresses multi-grade classroom management—a critical competency enabling schools facing staff shortages to maintain pedagogically sound supervision and instruction across multiple age groups simultaneously (Ministry of Education, 2017; NAEYC, 1996).

3) Modified Priority Needs Analysis

The priority needs index gap analysis (range: 0.095-0.166) reveals critical differences in competency development needs across the seven components of multi-grade classroom management. Promoting learning based on individual differences emerged with the highest priority need (PNI = 0.166). This competency encompasses the ability to promote contextualized self-directed learning for each child, Organize differentiated learning experiences that accommodate individual differences among children at different ages, Provide individualized instruction with systematic, continuous progression, conduct ongoing formative assessment to identify and respond to individual learning needs, and foster improved learning outcomes through responsive classroom management. While learning experience design demonstrated the lowest priority need (PNI = 0.095). This competency encompasses the ability to prepare flexible and appropriate learning materials, develop varied worksheets and learning guides to accommodate different abilities, and design materials and activities that emphasize inquiry-based learning and problem-solving. These contrasting findings warrant deeper examination of the theoretical foundations and practical implications underlying each competency.

The elevated priority need for promoting learning based on individual differences (PNI = 0.166) reflects a critical characteristic of the Early Childhood Curriculum, B.E. 2568

for children aged 3-6 years, Thailand's new curriculum framework. The curriculum establishes learner quality standards defining learner competencies upon completion of early childhood education and by the end of each grade level, grounded in developmental stages and abilities appropriate to each age group while accounting for individual differences. Learner competencies encompass four domains: physical well-being and health, emotional, spiritual, and social development, citizenship and Thai identity, and intellectual ability. The curriculum aims to develop all learners to acquire age-appropriate competencies that are essential and necessary for living with quality in the 21st century world.

In contrast, learning experience design demonstrated the lowest priority need (PNI = 0.095), suggesting that student teachers already possess relatively developed competencies in this component. This finding is encouraging and may be attributed to the centrality of learning experience design in early childhood education curricula. The National Association for the Education of Young Children (NAEYC, 2025) emphasizes that effective curricula create and implement meaningful learning experiences reflecting what is known about young children in general and about each child in particular. The NAEYC framework highlights that curriculum should be planned systematically, building children's knowledge and skills in a coherent, aligned manner where each stage develops upon previous learning. Additionally, curricula should incorporate learning through play as a central component, reflecting children's interests and assets. These principles are likely well-represented in preservice teacher preparation programs, where foundational curriculum design and learning activity planning are typically core components of instruction. Student teachers' stronger foundational competencies in learning experience design (reflected in the lower PNI value) suggest that this competency area is already receiving appropriate emphasis in their training. However, the fact that PNI remains above zero indicates that even in this relatively stronger area, some targeted improvement remains beneficial.

Conclusion

This research examined the current and desired conditions for enhancing multi-grade teaching competencies in early childhood education for student teachers in professional practice schools in Thailand. The study revealed that student teachers are actively implementing mixed-grade instructional practices at high levels, particularly in teacher role transformation, learning experience design, and curriculum analysis. However, significant gaps exist between current practice and desired competency levels, highlighting specific areas requiring targeted interventions in preservice teacher education.

Suggestions and Implication

1) Student Teacher Competency Development

Student teachers could develop competency in organizing differentiated learning experiences for multi-grade classrooms across all seven components of competency.

2) Institutional Support for Practicum Settings

Professional teaching practice schools and teacher preparation institutions should provide comprehensive support including: a) curriculum materials and learning resources designed for mixed-age groups or multi-grade classroom; b) dedicated budgetary resources for producing differentiated materials and media equipment; c) protected planning time for student teachers to collaboratively design learning experiences; d) mentoring and coaching from experienced cooperating teachers; and e) ongoing feedback systems. These supports directly address identified priority needs for strengthening learning media design and individualized learning promotion during practicum experiences.

3) Higher Education Curriculum Reform

Teacher training programs could integrate multi-grade teaching design as a core competency throughout coursework and practicum.

Limitations and Future Research

This study was conducted with 71 student teachers in professional teaching practice schools majoring in early childhood education in Thailand. Results may not be generalizable to other contexts or educational systems. Future research should: 1) examine how preservice programs can effectively address identified competency needs; 2) investigate the impact of enhanced teacher preparation on student learning outcomes in multi-grade classrooms; 3) explore implementation barriers and facilitators in Thai educational contexts; and 4) conduct longitudinal studies tracking student teachers' competency development over time and into their early teaching careers.

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