

Development of extracurricular activities to strengthen research competency of Early Childhood Education undergraduates, Faculty of Education, Thaksin University

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ABSTRACT

This research is a research and development study with the objectives to: 1) develop a set of supplementary curriculum activities to enhance classroom research competency among undergraduate students majoring in early childhood education, 2) study the classroom research competency of these students, and 3) examine the students' attitudes toward the supplementary curriculum activity set. The sample consisted of 25 fourth-year students enrolled in the first semester of the 2024 academic year, majoring in Early Childhood Education at the Faculty of Education, Thaksin University. The sample was selected using cluster sampling, with the academic major used as the sampling unit. The research instruments included: 1) the supplementary curriculum activity set and its user manual, 2) a knowledge test, 3) a classroom research competency assessment form, and 4) a student attitude questionnaire. The statistical methods used for data analysis were mean (\bar{x}), standard deviation (S.D.), and the dependent t-test.

The results revealed that:

1. The supplementary curriculum activity set, designed as a modular lesson to develop classroom research competency, consisted of six components: (1) rationale of the activity set, (2) objectives, (3) classroom research competencies, (4) four modular lessons - Module 1: Developing Research Problems, Module 2: Literature Review, Module 3: Research Methodology Design, and Module 4: Data Analysis and Research Report Writing - each with a 2-hour learning duration, totaling 8 hours; (5) learning media and resources; and (6) assessment and evaluation.
2. A comparison of students' classroom research competency before and after using the activity set showed a statistically significant improvement at the .05 level. The post-test mean score was significantly higher than the pre-test score. Moreover, evaluations of the students' research projects indicated that their classroom research competencies significantly exceeded the set standard at the .05 level.
3. Students' attitudes toward the supplementary curriculum activity set improved in all aspects after its implementation when compared to their attitudes beforehand.

Keywords: Extracurricular activities, classroom research competency, early childhood field.

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INTRODUCTION

Graduate production in the teaching profession must align with the National Qualifications Framework for Higher

Education (NQF), ensuring qualifications satisfy both national and international benchmarks. The Ministry of

Higher Education, Science, Research and Innovation established this framework to maintain these standards. Specifically, the 2019 (B.E. 2562) Bachelor's Degree in Education program requires that graduates manage learning, utilize technology, conduct research, and develop themselves and their students effectively (Secretariat Office of the Teachers' Council of Thailand). In early childhood education, teachers must grasp children's individual development, design integrated learning experiences, and conduct sensitive assessments. Therefore, building early childhood teaching competency demands more than theoretical learning; it requires continuous professional training and classroom-based research to ensure qualified, capable educators.

Classroom action research competencies are crucial. "Classroom Action Research" has been identified in the Teachers Council Standards as one of the specific competencies teachers should possess. Teachers must be able to analyze learning problems, design research, and systematically apply the findings to improve learning management to develop learners to their full potential (Secretariat Office of the Teachers' Council of Thailand). According to Fullan (2019), classroom action research enables teachers to lead classroom change by using data to inform decision-making and adjust teaching strategies to suit individual learners. In early childhood education, classroom action research is a crucial mechanism that enables student teachers to design activities accurately aligned with children's behaviors and development.

An evaluation of the professional experience course at the Faculty of Education, Thaksin University, revealed that fourth-year students in early childhood education continue to struggle with developing their classroom research skills, particularly in research analysis and report writing. This is because the internship period of only one semester does not allow for in-depth observation of children's behavior, planning, and continuous data collection (Thamwichai, 2022). The research by Kaewudom (2021) indicated that student teachers with less than a year of teaching experience have high stress levels and are unable to develop their innovation design and reflection skills fully. Meanwhile, the study by Nilwong et al. (2022) found that competency-based research training during teaching practice significantly improved student teachers' confidence and research planning skills.

To address this issue, students should participate in extra-curricular activities prior to their internship placements. This is an important approach to prepare early childhood teacher students for research competence. These activities help students learn the research process step-by-step, encompassing problem formulation, research method design, data collection, results analysis, and report writing. The research of Ratchakom (2022) found that well-structured extra-curricular activities with continuous supervision and reflection effectively developed students' research, analytical thinking, and communication skills. They also

encouraged students to collaborate with mentor teachers and the community, aligning with the concept of "Community-Based Learning."

Thaksin University's mission is to develop a competent workforce to promote social innovation, with a focus on active learning that improves learning outcomes toward becoming "intelligent, ethical entrepreneurs leading development." The Faculty of Education plays a crucial role in preparing student teachers with the necessary professional skills, along with competencies in research, innovation, and academic communication, especially in early childhood education. The Faculty of Education has created professional experience courses combined with extracurricular activities to build classroom research skills, such as formulating research questions, designing data collection frameworks in early childhood settings, and conducting behavioral analysis to support children's learning through Play-Based Learning approaches.

Policy and practice recommendations for developing classroom research competency: Although the internship lasts only one semester, a strong support system—such as thorough preparation, building a network of partner schools, using a mentoring system, and close supervision—will help students effectively practice and reflect. Additionally, "activity modules" should be designed to build research skills, especially during the pre-teaching phase. These modules should include both theory and practice, such as Module 1: Developing classroom research questions; Module 2: Planning and designing research instruments; Module 3: Data collection in early childhood settings; and Module 4: Data analysis and research report writing. These structured activities will equip early childhood student teachers with both skills and positive attitudes toward classroom research, which are essential for their future professional growth as teachers.

Thus, it is evident that promoting classroom research competence among student teachers in early childhood education is a crucial task that necessitates the systematic design of extracurricular activities. This approach aims to minimize the limitations of professional internship time and achieve the goal of becoming "researcher teachers" who can effectively enhance student learning. This aligns with the Teachers Council of Thailand's philosophy and the mission of Thaksin University. Therefore, the development of extracurricular activities is a key mechanism for enhancing the competencies required for early childhood teachers in the 21st century.

Research objectives

1. To develop extracurricular activities to enhance classroom research competence among undergraduate students in the Early Childhood Education Program, Faculty of Education, Thaksin University.
2. To study the classroom research competence of undergraduate students in the Early Childhood Education

Program, Faculty of Education, Thaksin University.

3. To study students' attitudes toward extracurricular activities to enhance classroom research competence.

RESEARCH METHODOLOGY

This research, titled "Development of Extracurricular activities to strengthen classroom Research competency of undergraduate students' early childhood field, Faculty of Education, Thaksin University," utilizes a Research and Development (R&D) methodology.

Population and sample

The population consisted of 60 fourth-year students in the Early Childhood Education program at the Faculty of Education, Thaksin University, during the 2024 academic year.

The sample included 25 fourth-year students in the Early Childhood Education program at the Faculty of Education, Thaksin University. They enrolled in the Teaching Practice in Educational Institutions 4 course (course code 0308400) in the Bachelor of Education program during Semester 1 of the 2024 academic year. The criteria met were: 1) voluntary participation in extracurricular activities and consent to provide data for the study; 2) current enrollment in an educational research course; and 3) no prior completion of classroom research training. Cluster sampling was used, with the major field of study serving as the sampling unit. This method aimed to include target groups with similar characteristics within each group and ensure efficient data collection.

Research instruments

Consisted of: 1. Data collection instruments: a classroom research knowledge and understanding test, a classroom research competency assessment form, and a student attitude assessment form toward the extra-curricular activity package to enhance classroom research competency. 2. Experimental instruments: a classroom research competency assessment form and a user manual. Four modules were used: Module 1: Research Question Development; Module 2: Document and Research Review; Module 3: Research Methodology Design; and Module 4: Results Analysis and Report Writing. The steps involved in creating and evaluating the research instruments were as follows:

1. Study theories, documents, and research related to the development of the classroom research competency assessment form.
2. Develop research instruments: a classroom research knowledge and understanding test, a classroom research

competency assessment form, a student attitude assessment form toward the classroom research competency, an extracurricular activity to improve classroom research competency, along with a user manual.

3. Five experts examined the quality of the research instruments to determine the Index of Item Objective Congruence (IOC). The instrument quality assessment results were analyzed, and the congruence index was 1.00.

4. The researcher revised and modified the research instrument based on expert suggestions and then used it for further data collection.

The research process was divided into four steps:

Step 1: Literature review and related research studies. The study proceeded as follows:

1.1. Examine concepts, theories, and research related to developing extracurricular activities to enhance classroom research skills. These included the Higher Education Qualification Standards 2022, the Teacher Professional Knowledge and Experience Standards under the Teachers Council Regulations on Professional Standards (No. 4) 2019, the Higher Education Learning Management Guidelines, and the Classroom Research Guidelines, aimed at promoting classroom research competency. These guidelines were used to develop the extracurricular activity package.

1.2. Investigate the problems in teaching and learning during the second semester of the Teacher Professional Experience Training course for fourth-year students in the Early Childhood Education Program, Faculty of Education, Thaksin University.

Step 2: Developing extracurricular activities to enhance undergraduate students' classroom research competencies in early childhood education. The process was as follows:

2.1 Using the results from Step 1, the extracurricular activity was developed to enhance classroom research competencies.

2.2 Developing a draft extracurricular activity to enhance classroom research competencies.

2.3 The developed draft extracurricular activity was evaluated for effectiveness by three experts to verify the quality of the research instrument, assess its content validity, calculate the Indices of Integrity (IOC), and test its reliability.

2.4 The draft extracurricular activity was revised based on the experts' suggestions to enhance its completeness before being piloted with a sample group.

Step 3: The piloting of the extracurricular activity to enhance classroom research competency among

undergraduate students in the Early Childhood Education program proceeded as follows:

3.1 The researcher scheduled an orientation session for the sample group.

3.2 The researcher conducted an orientation session for the sample group to ensure understanding of the research data collection procedures and methods, and conducted a pre-test.

3.3 The extracurricular activity designed to improve classroom research competency, which experts had assessed for suitability, was piloted with a sample of undergraduate students in the Early Childhood Education program enrolled in courses related to classroom research during the second semester of the 2024 academic year. Each module lasted 2 hours, totaling 8 hours, and was conducted during off-campus hours. The extracurricular activity, titled "Classroom Research," was included in four modules as follows:

Module 1: Research Problem Development covers teaching practices in educational institutions, sources of research problems, research questions, writing research objectives, research scope, and research conceptual frameworks. The learning materials and methods include videos, accompanying slides, and ready-made textbooks.

Module 2: Review of Documents and Research comprised the following: searching for relevant documents and research, writing and organizing documents, and writing academic references.

Module 3: Research Design includes defining the population and sample, designing research methods, designing and developing research instruments, and collecting and analyzing data.

Module 4: Analyzing Results and Writing Research Reports covers analyzing research data, analyzing quantitative and qualitative research results, discussing findings, and preparing research reports.

Step 4: Study of classroom research competency among undergraduate students in the Early Childhood Education Program, Faculty of Education, Thaksin University, proceeded as follows:

4.1 The researcher assessed the classroom research competency of the sample students after their participation in the activity using the classroom research competency assessment form and the student attitude assessment form toward the extracurricular activity package to enhance classroom research competency.

4.2 Data analysis was conducted, comparing classroom research competency (before and after) using the extracurricular activity to assess the learning development of the sample students in terms of classroom research competency.

4.3 Research results were summarized according to the

objectives, and a research report was written.

4.4 Research results were disseminated, and policy recommendations were made to relevant agencies.

Data analysis

The researcher performed quantitative data analysis using a classroom research knowledge and understanding test, a classroom research competency assessment, and an assessment of student attitudes toward extracurricular activities to improve classroom research competency. Content analysis was also carried out.

RESULTS

1. Results of developing extracurricular activities: module lessons to enhance classroom research competency. This module includes six components: 1) principles of extracurricular activities.
2. Objectives of the extracurricular activities.
3. Classroom research competency.
4. Learning activities. The four module lessons are as follows:

Module 1: Research problem development. Content covers teaching practices in educational institutions, sources of research problems, research questions, writing research objectives, research scope, and research conceptual frameworks. The learning duration is 2 hours.

Module 2: Document and Research Review. Content includes searching for relevant documents and research, compiling and writing documents, and creating academic references. Media and methods such as videos, slides, and self-study textbooks are used. The learning duration is 2 hours.

Module 3: Research Methodology Design. Content involves defining the population and sample, designing research methods, developing research instruments, collecting and analyzing data, and interpreting results. The learning duration is 2 hours.

Module 4: Analyzing Results and Writing Research Reports. Content includes data analysis, quantitative and qualitative research analysis, discussion of findings, and writing research reports. Each session lasts 2 hours.

5. Media and learning resources: The module lessons utilize media and teaching methods, including videos, slides, and self-study textbooks.

6. Measurement and evaluation: These resources serve as guidelines to enhance student teachers' knowledge, understanding, and competence in classroom research, enabling them to effectively apply research data to improve their own learning management and address learners' needs in real-world settings. The total duration

of this activity set is 8 hours.

The Extracurricular Activity Manual: Classroom research competency development module consists of 8 components: 1) Principles and rationale, 2) Objectives of the manual, 3) Structure of the activity set, 4) Guidelines for using the activity set, 5) Evaluation methods, 6) Teacher roles, 7) Media and materials, and 8) Suggestions for using the activity set. These are used to implement activities in the Extracurricular Activity Module: Classroom Research Competency Development Module. The evaluation results of the developed extracurricular activity

indicate that the effectiveness exceeded the criteria ($E1/E2 = 80.33/83.60$), indicating that the developed activity set can be applied in practice and achieve the specified learning outcomes.

2. Results of the study of classroom research competencies of undergraduate students in the Early Childhood Education Program, Faculty of Education, Thaksin University, are as follows:

2.1 Comparison of classroom research competencies (before and after) using the extracurricular activity, as shown in Table 1.

Table 1 Comparison of classroom research performance results (pretest and posttest) using the extracurricular activity set (n = 25).

Classroom research competencies	N	(\bar{x})	S.D.	t	p
Preset	25	9.96	1.29	22.017	0.00*
Posttest	25	16.72	0.54		

* $p < .05$

Table 1 shows the results of comparing students' classroom research competency scores pretest and posttest using the extracurricular activity. The average score before using the activity was $\bar{x} = 9.96$ points (S.D. = 1.29), and after using the activity, it increased to $\bar{x} = 16.72$ points (S.D. = 0.54). The statistical test value (t) was equal to 22.017 and was statistically significant at the .05 level

(Sig. = 0.00). Students' classroom research competencies increased significantly after using the extracurricular activity at the .05 level.

2.2. Results of comparing classroom research competencies (pretest and posttest) in modules 1-4, as shown in Table 2

Table 2. Comparison of classroom research competencies pretest and posttest in the module lessons 1 - 4 (n = 25).

Extracurricular activity	Pretest		Posttest		t	p
	(\bar{x})	S.D.	(\bar{x})	S.D.		
Module1	9.36	1.66	12.32	0.63	7.288	0.00*
Module 2	9.80	1.78	11.84	0.69	5.772	0.00*
Module 3	8.96	1.86	11.96	0.54	7.006	0.00*
Module 4	9.32	0.90	12.08	0.57	16.613	0.00*

* $p < .05$

Table 2 displays the results of comparing students' classroom research competency scores before and after participating in extracurricular activities in modules 1 through 4. It was observed that the average scores after completing each module were higher than before. In the Module 1 lesson, the average score before learning was 9.36, and it increased to 12.32 afterward. For Module 2, the scores went from 9.80 to 11.84; for Module 3, from 8.96 to 11.96; and for Module 4, from 9.32 to 12.08.

The t-test values of all 4 module lessons ranged from

5.772 to 16.613 and are statistically significant at the .05 level (Sig. = 0.00). All lesson modules demonstrate that a set of extracurricular activities was used to develop students' classroom research competencies in each lesson. The results were statistically significant at the .05 level.

2.3. Comparative results of classroom research competencies after studying, compared to the 70 percent criteria shown in Table 3.

Table 3. Comparison results of classroom research competencies. After studying, the results are compared to the criterion of 70 percent (full score of 20, which is 14 points) (n=25).

Variable	N	(\bar{x})	S.D.	t	p
Posttest	25	16.72	0.96	18.450*	0.00*

* $p < .05$

Table 3 presents the results of comparing students' classroom research competency scores after studying. With the criterion set at 70 percent (equivalent to a score of 14 out of 20), the students had an average score of 16.72, which exceeds the criterion. The standard deviation was 0.96, and the t-test value was 18.450, which is statistically significant at the .05 level (Sig. = 0.00). This

indicates that students' classroom research competency after studying is significantly higher than the criterion at the .05 level.

2.4. Results of the evaluation of students' classroom research competencies from the research project evaluation form, as shown in Table 4.

Table 4. Results of the evaluation of students' classroom research competencies from the research project evaluation form.

Classroom research competencies	(\bar{x})	S.D.	t	p
Chapter 1 Introduction	4.49	0.13	28.70	<.001
Chapter 2 Literature Review	4.47	0.23	15.32	<.001
Chapter 3 Research Methodology	4.50	0.22	16.49	<.001
Chapter 4 Results	4.49	0.19	18.78	<.001
Chapter 5 Summary, Discussion and Recommendation	4.55	0.18	22.58	<.001

Table 4 shows the results of the evaluation of students' classroom research competencies from the research project evaluation form. Using a research project evaluation form, it was found that students' classroom research competencies resulted in average scores for each chapter of the research report at a very good level. Chapter 1, Introduction, received an average score of 4.49 points, Chapter 2, Literature Review, received 4.47 points, Chapter 3, Research Methodology, received 4.50 points, Chapter 4, Results, received 4.49 points, and Chapter 5, Summary, Discussion, and Recommendation, received the highest score of 4.55 points.

When comparing the average scores for each chapter with the evaluation criteria, it was found that students' performance in classroom research exceeded the standard, with statistical significance at the .05 level, indicating that organizing learning activities and existing academic support can effectively enhance students' research competencies.

3. Results of the study of students' attitudes towards a set of extracurricular activities to enhance classroom research competencies, as shown in Table 5.

Table 5. Comparison results of students' attitudes towards extracurricular activities to enhance classroom research competencies (pretest and posttest).

Attitudes	Pretest		Posttest		t	p
	(\bar{x})	S.D.	(\bar{x})	S.D.		
1. Feelings and happiness in doing research	2.54	2.65	4.01	7.5	9.33	<.001
2. Application of research results in teaching and learning	2.51	4.30	4.04	5.50	32.88	<.001
3. Awareness of the value of research	2.54	5.57	3.98	2.52	33	<.001
4. Enthusiasm and skill training	2.58	2.08	4.05	5.57	12.14	<.001
5. Teacher professional development	2.5	0.50	4.14	0.80	13.32	<.001

Table 5 presents the results of comparing students' attitudes towards extracurricular activities designed to enhance classroom research competencies. The pretest and posttest data show that students who participated in extracurricular activities had significantly higher mean attitude scores after the intervention than before. This improvement was observed across all aspects, including feelings of happiness and engagement in research, application of research results in teaching and learning, awareness of the value of research, enthusiasm and skill development, and teacher professional development. This notable difference indicates that the extracurricular activities effectively improve students' attitudes, with results being statistically significant at the .05 level.

DISCUSSION

1. Results of developing a set of extracurricular activities to enhance undergraduate students' classroom research competencies of the early childhood major at The Faculty of Education, Thaksin University, show that the Extracurricular Activity: Module Lessons to Develop Classroom Research Competency is a module consisting of six elements: 1) Principles of the extracurricular activity. 2) Objectives of the extracurricular activity. 3) Classroom research competencies. 4) Learning activities, including four lesson modules, totaling 8 hours. 5) Media and learning resources. 6) Measurement and evaluation. There is also a manual for using the extracurricular activity, which includes eight elements: 1) Principles and reasons. 2) Objectives of the manual. 3) Structure of the extracurricular activity. 4) Guidelines for using the extracurricular activity. 5) Evaluation methods. 6) Roles of the teacher. 7) Media and supporting materials. 8) Suggestions for utilizing the extracurricular activity. Based on the evaluation of the developed extracurricular activities, the quality is high, supporting the research hypothesis. This may be because the researcher studied relevant concepts, theories, and research related to guidelines for developing extracurricular activities to build comprehensive classroom research skills. Additionally, they examined basic issues encountered during students' professional training experiences, specifically in early childhood education majors, identifying limitations and challenges in conducting research. Consequently, key development areas such as strengthening classroom research skills were identified, leading to the creation of module lessons aimed at building these competencies. This aligns with the research conducted by Pruittikul (2019), who studied developing learning activities to enhance students' professional teaching skills in early childhood education. Her work involved systematically developing learning activities to improve teaching competency, evaluated by experts, and designed to meet the needs and characteristics of early childhood education students. The students' performance was excellent. This

success likely results from research-based development employing appropriate foundational concepts and principles. It demonstrates that developing extracurricular activities to reinforce classroom research competencies is effective. The researcher emphasizes the need for a systematic study of relevant concepts, theories, and research on guidelines for developing these activities, as well as an understanding of the fundamental problems encountered during professional training, to better prepare students for future challenges in their classroom research endeavors.

2. The study on undergraduate students' classroom research competency in the Early Childhood Education major at the Faculty of Education, Thaksin University, found that:

2.1 Comparison of classroom research competency (pretest and posttest) using extracurricular activities. The results showed that the classroom research competency of undergraduate students after participating in the extracurricular activity had a statistically significantly higher mean score than before, at the .05 level. This indicates that the extracurricular activity significantly impacts the development of knowledge, understanding, and skills related to classroom research among student teachers. This research aligns with the Constructivist Theory, which states that learning is most effective when students engage in meaningful activities connected to real experiences. This is especially true when learning management encourages students to build their own knowledge through interactive processes, practice, and reflection (Piaget, 1970; Vygotsky, 1978). Additionally, the design of activities based on Kolb's (1984) Experiential Learning Theory supports competency development. Through the learning process of doing (Concrete Experience), reflecting on experiences (Reflective Observation), analyzing (Abstract Conceptualization), and applying through experimentation (Active Experimentation), learners understand and can systematically apply the research process.

Within the context of student teacher development, the research findings are also consistent with Khaemmani's (2019) concept, which states that "teacher competence should be developed holistically through hands-on training in simulated or real situations to develop skills, knowledge, and desirable characteristics in the teaching profession." This is consistent with the use of activity packages designed to enhance research competence systematically. Similarly, Siriwattana (2023) proposed that the development of student teachers in the new era should focus on building research skills for use in developing their own teaching. The activity packages used in this study focused on developing this competence through a learning process with clear goals and steps. Developing student classroom research competence through extracurricular

activities grounded in constructivism and experiential learning, while linking them to the real context of the teaching profession, is a practical approach that aligns with current student teacher education needs.

2.2 Comparative results of classroom research competence (pretest and posttest) in Modules 1-4 showed that the average posttest score for students' research competence was significantly higher than the pretest, at the .05 level. This suggests that the developed extracurricular activities effectively enhanced student teachers' research competence. These findings support Schunk's (2021) view that effective learning should be designed to enable students to interact continuously with the content and gain practical experience through systematically designed activities, especially in the context of professional skills development, which requires both theoretical knowledge and hands-on practice. They also echo Dewi's (2022) perspective, who studied teacher competence development at the undergraduate level and proposed that integrated learning through module-based activities fosters connections between knowledge and real-world situations, systematically improving students' understanding of research concepts.

In the context of Thai education, these findings align with Sukbongkot's (2023) proposal to promote student-teacher research competence through creative activities that foster self-directed learning. (Self-directed Learning) combined with reflection on learning outcomes (Reflection) helps make learners aware of the value and importance of research in the teaching profession. Meanwhile, Chaisiriwat (2019) also observed that organizing learning in a module format with a clear, step-by-step design encourages gradual learning, allows learners to evaluate their own progress, and intrinsically motivates them to develop academically, especially in research. The research results indicate that the extra-curricular activity set, designed as module lessons, is suitable for enhancing student teachers' classroom research competencies. It is supported by concepts, theories, and research that can be expanded and developed into learning guidelines for student-teacher training in various contexts.

2.3 The comparison of pretest and posttest classroom research competency with the 70% criterion showed that students' posttest scores averaged 16.72 out of 20, which was 14 points above the 70% criterion. The standard deviation was 0.96, and the t-value from the statistical test was 18.450, which was statistically significant at the .05 level. This suggests that extracurricular activities significantly improved students' classroom research competency beyond the criterion. This finding aligns with Bandura's (1997) social cognitive theory, which states that effective learning arises from learners' self-efficacy and opportunities to practice skills in a hands-on environment. The extracurricular activities in this study were

systematically designed to boost students' confidence and research skills, leading to higher competency levels. These results support Khaemmani's (2021) proposal that teacher competency development should focus on situated learning that provides students with opportunities to practice systematic analytical thinking, planning, decision-making, and synthesizing new knowledge through research. Additionally, Siri wattana (2023) emphasized that developing classroom research competency in student teachers should be an ongoing process, involving activities that encourage participation and allow students to think and act, aligning with the structure of the activity package developed. Overall, the findings demonstrate that extracurricular activities based on theoretical principles are highly effective in enhancing student teachers' classroom research competency and can serve as a model for developing student teachers in other settings.

2.4 The results of the evaluation of students' classroom research competence from the research project evaluation form showed that students demonstrated excellent classroom research competence in all sections of the research project report, which was significantly above the standard criteria at the .05 level. This suggests that the learning management process, academic support, and extracurricular activities effectively enhance students' classroom research skills. These findings align with Vygotsky's (1978) Constructivist Learning Theory, which emphasizes the role of social context and scaffolding in developing learners' knowledge. During professional experience training, students had opportunities to practice under the supervision of mentors and supervisors, leading to ongoing development of their competence. This also supports Keosakul's (2022) assertion that developing student teachers' classroom research competence should involve activities that encourage continuous practice, provide constructive feedback, and help learners connect theory with practice—an applied approach to conducting research. Chiamchitphanit (2020) also noted that students' research competence can be significantly improved when learning activities are problem-based, include reflection, and foster teamwork, characteristics that align with the extracurricular activities used in this research. A study by Panthuworakul and Nuansri (2022) explored the causes and approaches for developing classroom research competencies among early childhood teachers. They identified that the main challenges stem from teachers' lack of knowledge of classroom research, misunderstandings about how to analyze research problems, and limited research skills. Additionally, teachers often have a superficial understanding of educational research methodology and a negative attitude toward research due to perceived heavy workloads. They proposed three strategies for improving research competence among early childhood teachers: 1) Knowledge in classroom research- through practice-based

training, developing manuals, and training programs focused on research to address classroom issues. 2) Classroom research skills- by conducting pre- and post-assessments of teachers' knowledge and skills, establishing mentoring systems, and organizing hands-on training. 3) Attitude toward classroom research- by following six guidelines: administrators should clearly define roles and tasks, establish a strong organizational management system, ensure sufficient staffing, increase awareness and understanding of research, boost morale and motivation, and promote the idea that research is an integral part of teaching and learning.

3. The study of student attitudes toward the extracurricular activity to enhance classroom research competency revealed that after using the activity package, students' attitudes in all dimensions significantly improved compared to before using the extracurricular activity. This included feelings and happiness in conducting research, applying research findings to teaching and learning, recognizing the value of research, enthusiasm and skill training, and teacher professional development. This increased difference demonstrated that the activity package significantly impacted student attitudes, at the .05 level. This demonstrated that the developed extracurricular activity was effective in promoting positive student attitudes. This may be due to the extracurricular activity's emphasis on student participation in hands-on practice and on case studies. This aligns with Bruner's (1966) emphasis on the role of "self-discoverers" through hands-on activities. The extracurricular activity also included reflection, assessment, and discussion activities on applying research findings to learning. The diverse, appropriately sequenced activities allowed students to develop research skills step by step, fostering a clear understanding and reducing research anxiety. This increased enthusiasm and readiness to continuously learn more, leading to happiness, confidence, and a positive feeling toward the activity. When students are allowed to develop themselves through classroom research, they become aware of their role as "researcher teachers." This aligns with the concept of Zeichner and Noffke (2001), who emphasize that classroom research is a key mechanism for building identity and developing teachers' potential to continuously analyze, improve, and develop their own

teaching methods. This fosters positive attitudes toward the profession and a recognition of the importance of continuous learning in the future. It can be argued that extracurricular activities significantly promote students' attitudes toward classroom research, including feelings, understanding, skills, and awareness. This aligns with the concept of creative learning and sustainable competency development in the teaching profession.

Suggestions for implementing research results

1. The extracurricular activity should be integrated into classroom research-related courses to enhance students' skills and positive attitudes toward research, starting from the undergraduate level, especially in early childhood education, where research development is vital for creating learning strategies suitable for early childhood growth.
2. The extracurricular activity could be used as a guideline for preparing for teacher internships. Since the extracurricular activity emphasizes hands-on practice, situation analysis, and the application of research, it is ideal for building students' confidence before entering the real school context.
3. Relevant agencies should support the adaptation of the extracurricular activity to suit the context of each curriculum. This could include organizing workshops for instructors to ensure effective use of the extracurricular activity and to adjust the content to suit students' readiness at each grade level.

Further research recommendations

1. A long-term study on the effects of engaging in extracurricular activities should be conducted to evaluate the durability of student research competency data and its application to practical teaching and practice.
2. Other factors affecting research competency development, like advisor attitudes, the learning environment, or student intrinsic motivation, should be examined, as they may interact with extracurricular activities to enhance learning success.

New knowledge from research

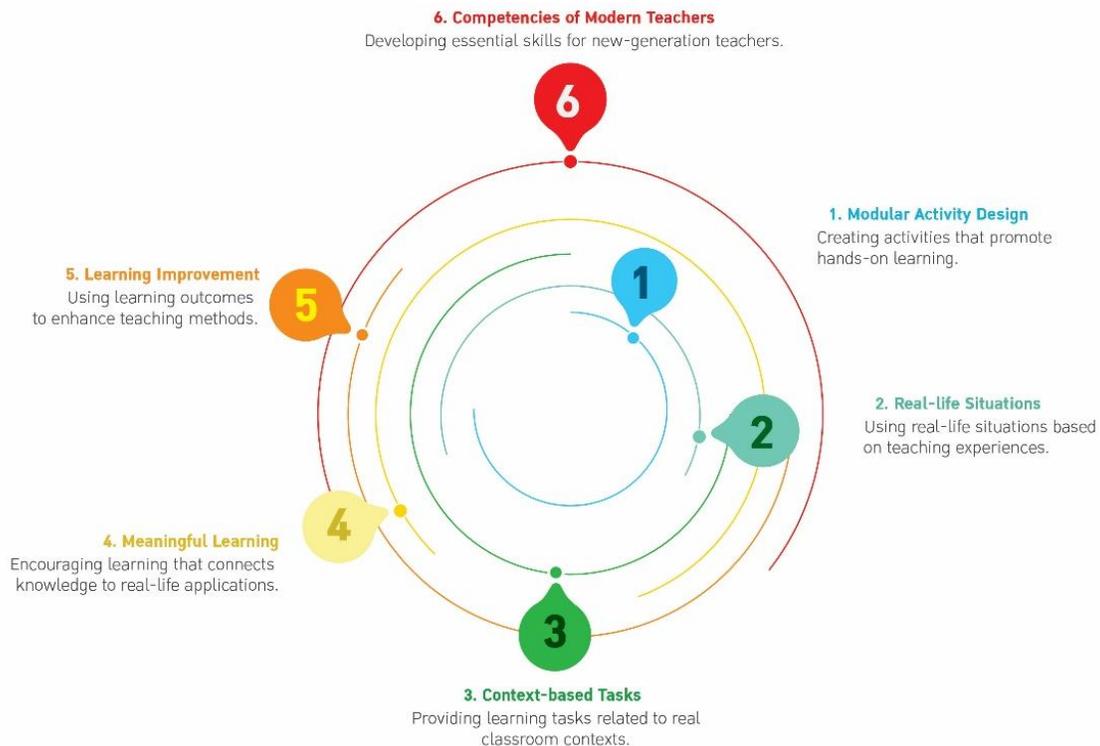


Figure 1.

The research findings indicate that developing a series of extracurricular activity modules to enhance classroom research competencies in early childhood teachers can yield valuable new knowledge for systematic teacher training. This involves designing learning content that follows the step-by-step research process, from formulating research questions and reviewing literature to designing research methods, analyzing data, and writing reports. These modules not only cover standard teacher competencies but also promote critical thinking and hands-on learning. Additionally, the structure of the activity sets and the instruction manual are carefully planned and organized.

The research findings also confirm that extracurricular activities have a statistically significant positive impact on both classroom research competencies and student attitudes, demonstrating a cause-and-effect relationship between activity participation and teacher professional skill development that can be widely applied to early childhood teacher training curricula. Furthermore, the approach aligns with learners' real-world contexts by using actual classroom teaching situations to facilitate meaningful learning and by applying research findings to enhance classroom learning. This approach addresses the need for a new generation of teachers, described as "research teachers," capable of conducting research, analyzing,

synthesizing, and creating innovations from real-world data.

Conclusion

This research produced valuable new insights: guidelines for developing curricula and extracurricular activities at the Thai higher education level that aim to develop classroom research competencies that align with student needs and teaching standards. Importantly, it also offers guidelines for designing teaching internship activities that support the development of classroom research skills. Additionally, it helps students recognize the significance and deepen their understanding of classroom research competencies within early childhood education, which will serve as a foundation for designing instruction and internships that meet local and community needs and incorporate research into actual classroom learning.

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