

The effectiveness of a competency reinforcement program for preparing student teachers for pedagogy practicum in the digital age at Nakhon Ratchasima Rajabhat University



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ABSTRACT

This study evaluates the effectiveness of a competency reinforcement program designed to prepare student teachers for pedagogy practicum training in the digital era at Nakhon Ratchasima Rajabhat University. The research involved 10 university supervisors and 178 third-year Bachelor of Education students, divided into an experimental group (89 students) and a control group (89 students). The program's impact was assessed using mean, standard deviation, one-way Multivariate Analysis of Variance (MANOVA), and dependent t-tests. Results indicated that the experimental group demonstrated statistically significant improvements in competency scores compared to the control group ($p < .01$). Additionally, the experimental group's post-program competency scores were significantly higher than their pre-program scores ($p < .01$). The program also received high satisfaction ratings from participants (mean = 4.66, SD = 0.50), highlighting its effectiveness in enhancing teaching competencies in the digital age.

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1. Introduction

In the digital era, equipping student teachers with the competencies required for effective teaching has become more crucial (Götl et al., 2024). Teacher training programs at educational institutions aim to provide prospective teachers with pedagogical skills, digital literacy, and competencies necessary for modern classrooms (Méndez et al., 2022). All students are required to complete teacher training at a designated time. Key individuals involved in this process include the lecturer and the Head of Professional Teacher Training. They play an important role in encouraging students to gain practical teaching experience according to the set objectives. They also act as mentors and supervisors. The Faculty of Education at Nakhon Ratchasima Rajabhat University recognizes the importance of preparing student teachers before they begin their professional teaching practice. In line with recent studies on teacher competencies, Martín-Pastor et al. (2023) highlighted key capabilities, such as pedagogical aptitude, personal attributes, and

professional training, that are essential for becoming professional teachers. Details of standards of knowledge and experience of the teaching profession, under Clause 6 and Clause 10 of the Gurusapha Regulations on Professional Standards B.E. 2556 in 2013, together with the resolution of the Kurusapa Committee at its meeting No. 8/2019 on October 30, 2019, it was concluded that the subject matter of vocational experience training during learning and teaching practice. In educational institutions, specific disciplines and competencies consist of 1) compliance with the standards of performance of teacher practitioners and 2) competencies in which the competencies comply with the standards of performance of teacher professionals. It consists of 3 parts: 2.1 Performing teacher duties that consist of 2.1.1 Committed to developing learners with the spirit of being a teacher. 2.1.2 Promote learning, empathy, and acceptance of individual learners. 2.1.3 Inspire learners to be learners and innovators. 2.1.4 Develop oneself to be well-rounded, behave as a good role model, have morality and ethics, and be good citizens. The second part is 2.2 Learning Management, consisting of 2.2.1 Participation in curriculum development and promotion, 2.2.2 Preparing lesson plans and organizing instruction that emphasizes 2.2.3 Supervise, assist, develop, and report the results of individual learners' development systematically. 2.3.4 Research, create

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innovation, and apply technology to benefit learners' learning. 2.3.5 Work creatively as a team and participate in professional development activities. 2.3.6 Media and assessment of learning. 2.3.7 Integration of knowledge and teaching science. The third part is 2.3 Relationship with parents and community, consisting of 2.3.1 Collaborate with parents to develop and solve problems for learners to have desirable attributes. 2.3.2 Build a network of cooperation with parents and communities. To support quality learning of learners 2.3.3 Education, access to community context and be able to coexist based on cultural differences 2.3.4 Promote Preserving local culture and wisdom from this issue, the researcher has been interested in studying Research related to teacher professional competency whether there has been Research related to enhancing the competency of preparing for teacher professional training in the past. It was found that most of the Research was conducted on the development of the teacher professional competency assessment model and the development of the competency assessment model for teaching students and teachers in educational institutions. The Research reviewed on teacher professional competency has not found Research directly related to the provision of such importance.

The competency reinforcement program specifically targeted digital skills that were aligned with current educational needs. Core digital competencies include ICT-based classroom management, digital content creation, online assessment proficiency, and interactive technology use. For example, the program's focus on digital content creation enables student teachers to design multimedia resources that cater to diverse student needs, fostering an inclusive learning environment. Additionally, ICT-based classroom management trains student teachers to use educational technology platforms to create interactive and organized learning experiences.

Theoretical foundations, such as constructivist learning and digital literacy, underlie the competencies in this program. For instance, constructivist principles encourage active learning through ICT tools, fostering collaboration and interaction in digital spaces. Digital literacy focuses on creating, sharing, and evaluating digital content—skills critical for adapting to diverse, technology-integrated classrooms. By embedding these theories into practical training, student teachers learn to apply digital tools, like online collaborative platforms and multimedia content creation, which are integral for effective engagement in contemporary classrooms.

The researcher is interested in studying the effectiveness of a competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization of student teachers in Nakhon Ratchasima Rajabhat University. Concrete and empirical data that is appropriate for the current era will complement the orientation before leaving for teacher professional

training for the teacher students who will go out to practice the teacher profession every year, as well as complement the Research that has already existed in the past to be complete and more precise. Suppose the agencies involved in the preparation of training before leaving for the teaching profession have a capacity building program on preparing for the teaching profession in the digital age caused by the needs of those involved in the professional competency building of teachers in the preparation of the preparation before leaving for the teacher profession training, as well as the needs generated by students of the teaching profession. In that case, it should be clear and appropriate to meet the needs of teachers in the context of the area studied. They are ready to act on their own to achieve their goals entirely or adapt to what society expects. Therefore, developing students' competencies in the teaching profession is valuable and necessary to enhance the lives of future teacher practitioners. Therefore, the researcher chose to use this experimental area, namely the Faculty of Education, Nakhon Ratchasima Rajabhat University, to serve as a model for the Faculty of Education of other Rajabhat universities.

2. Research objectives

Study the effectiveness of the competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization of student teachers in Nakhon Ratchasima Rajabhat University. The sub-objectives are as follows:

1. Comparing the competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization of student teachers. After the experiment between the experimental group of student teachers who used the program and the control group of teacher students who did not use the program.
2. Comparing the competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization of student teachers. Before and after the experiment, the experimental group of students and teachers used the program.
3. To study the satisfaction of the experimental group of teacher students towards the competency reinforcement program in preparation for pedagogy practicum training in the age of digitalization of student teachers.

3. Research methodology

Population and sample groups are divided into 2 groups. Participant selection criteria were developed to align with the study's objectives. Inclusion criteria for student teachers required candidates to be in their third year, with at least one semester of teaching observation. Exclusion criteria included a lack of prior exposure to digital tools or an inadequate commitment to participating fully in the

program. Supervision teachers were selected based on a minimum of 10 years of experience in student supervision and a demonstrated ability to mentor digital integration in the classroom. This structured selection process ensured that participants were prepared and motivated to engage with the competency program fully.

Group 1: The population used in this study is 759 students who are studying the Bachelor of Education (Regular) Program in the 3rd year who are going out to practice as a teacher in the 4th year of the Faculty of Education, Nakhon Ratchasima Rajabhat University in the 2nd semester of the academic year 2023.

The sample used in this study was 3rd-year teacher students, 2nd semester, Faculty of Education, Nakhon Ratchasima Rajabhat University, which was obtained by selecting a specific model from the classroom that the researcher had taught in semester 2/2023, divided into experimental and control groups. 89 participants, 89 controls.

Group 2: The population used in this study is a lecturer at the Faculty of Education, Nakhon Ratchasima Rajabhat University, assigned as a university supervision lecturer in the second semester of the academic year 2023.

The sample used in this study was university supervision teachers selected specifically for being responsible for supervising students, teachers, experimental groups, 5 science groups, and 5 humanities and social sciences groups, for a total of 10 students. The qualification criteria for the number of samples in both groups are as follows:

1. Be a 3rd year teacher student in the 2nd semester of the academic year 2023 who has been observing teaching for 1 semester.
2. Be a university supervision professor in the same field as the sample students and have at least 10 years of experience in supervising student coaching.
3. Be willing to participate in research projects and provide information for research.

3.1. Research instruments

Two types of tools are used in this research: data collection tools and research tools. Details are as follows:

1. The tools used to collect data are:
 - a. Competency reinforcement program in preparation before pedagogy practicum experience training in the age of digitalization of student teachers. It has an IOC value of between 0.80-1.00. The discrimination power is between 0.45-0.68, and the reliability is 0.94.
 - b. Satisfaction with the program to enhance the competency of teachers in preparation before leaving for teacher training in the digital age. It has an IOC value between 0.80-1.00, and the reliability is 0.96.

2. The tool used in conducting research is a program to strengthen the competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization of student teachers who have passed the propriety and feasibility assessment. The program was found to have the highest propriety ($\bar{x}=4.88$, S.D.=0.11) and the highest feasibility ($\bar{x}=4.95$, S.D.=0.77).

3.2. Data analysis

This study investigates the effectiveness of a competency reinforcement program designed to prepare student teachers for their pedagogy practicum in the digital age. The analysis compares student teachers' knowledge and understanding before and after the training. The program, implemented at Nakhon Ratchasima Rajabhat University, focuses on three main areas:

1. Knowledge and experience standards
2. Operational standards
3. Behavioral conduct standards

Statistical analyses include Multivariate Analysis of Variance (MANOVA) as suggested by [Tabachnick and Fidell \(2001\)](#), and paired sample t-tests as outlined by [Agresti \(1997\)](#). Additionally, the satisfaction levels of third-year, second-semester student teachers were assessed after the program using mean scores (\bar{x}) and standard deviations (S.D.).

4. Research findings

Assessment of the effectiveness of the competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization of student teachers, as shown in [Tables 1-6](#). [Table 1](#) shows that the average competency scores of student teachers in preparation for teacher training in the digital age before the experiment and control group did not differ.

The experimental group averaged the competencies of students teaching in preparation for teacher professional training in the digital age. The mean knowledge and experience standards of student teachers were 3.06, with a standard deviation of 0.16. The mean operational standards were 3.07, with a standard deviation of 0.13, and the mean behavioral conduct standards were 2.93, with a standard deviation of 0.13.

The control group averaged the competencies of students teaching in preparation for teacher professional training in the digital age. The mean knowledge and experience standards of student teachers are 3.11, and the standard deviation is 0.40. The mean operational standards are 3.04, and the standard deviation is 0.15. The mean behavioral conduct standards are 2.91, and the standard deviation is 0.14.

Table 1: Comparison of mean competency scores of student teachers in preparation for teacher training in the digital age between the experimental and control groups

Competent student teachers	Experimental group		Control group		t	p
	\bar{x}	S.D.	\bar{x}	S.D.		
Knowledge and experience standards of student teachers	3.06	0.16	3.11	0.40	-0.947	0.331
Operational standards	3.07	0.13	3.04	0.15	1.707	0.090
Behavioral conduct standards	2.93	0.13	2.91	0.14	0.701	0.484

Table 2: Comparison of average knowledge and understanding scores on the competencies of student teachers in preparation for teacher training in the digital age before and after the training

Test	n	\bar{x}	S.D.	t	P
Pretest	89	9.44	2.29	25.321**	0.00
Posttest	89	18.02	2.48		

**: p<.01

Table 2 presents the mean knowledge and understanding scores of the experimental group

students following the training, which comprised four instructional units.

Table 3: Results of the analysis of student teachers' competency levels in preparation for the teaching profession in the digital age, including experimental and control groups, and assumption testing

Independent variables	Statistics	Value	F	Sig.
Group	Pillai's trace	.999	10604.534	0.000 **
	Wilks' lambda	.001	10604.534	0.000 **
	Hotelling's trace	1136.200	10604.534	0.000 **
	Roy's largest root	1136.200	10604.534	0.000 **

Box's M test: 2.379; F = .913; Sig. = .524; Bartlett's test of sphericity: Likelihood ratio = 0.000; Approx. Chi-square = 29.556; df = 5; Sig. = .000**: p<.01

In Table 3, we tested the assumption of testing in the analysis of multiple variances. The Likelihood Ratio = .000 Approx. Chi-Square = 29.556, df = 5, Sig. = .000 showed that the dependent variables were statistically significantly correlated at the level of .01 and tested the Variance-Covariance Matrices of the samples using Box's M Test statistics. The difference in average performance scores of student teachers was examined in preparation for teacher training in the digital age. In terms of standards of knowledge and experience standards of student teachers, operational standards, and behavioral conduct standards between the experimental and control groups using Wilks' Lambda, it was found that the experimental group of student teachers who were

developed using the competency reinforcement program in preparation before pedagogy practicum experience training in the age of digitalization of student teachers had average scores of competency reinforcement program in preparation before pedagogy practicum experience training in the age of digitalization of student teachers. At least one variable of knowledge and experience standards of student teachers, operational standards, and behavioral conduct standards differed from the control group that was not developed using the competency reinforcement program in preparation before pedagogy practicum experience training in the age of digitalization of student teachers, statistically significant at the level of 0.01.

Table 4: Comparative analysis of the mean score differences of student teachers in pedagogy practicum training in the digital age between the experimental and control groups before the intervention

Dependent variables	Group	\bar{x}	S.D.	t	Sig.	Comparison
Knowledge and experience standards of student teachers	Experimental group	4.56	0.48	15.16	0.000**	The experimental group scored higher than the control group
	Control group	3.14	0.16			
Operational standards	Experimental group	4.72	0.11	39.295	0.000**	The experimental group scored higher than the control group
	Control group	3.1	0.16			
Behavioral conduct standards	Experimental group	4.67	0.15	28.164	0.000**	The experimental group scored higher than the control group
	Control group	3.07	0.21			

**p<.01

Table 4 shows a comparison of the average scores between two groups of student teachers: those who participated in a competency reinforcement program before their pedagogy practicum in the digital age (the experimental group), and those who did not (the control group). The study aimed to evaluate the effectiveness of the program in preparing student teachers for the teaching profession in a digital context. The comparison was based on three key areas: knowledge and experience, operational performance, and behavioral conduct. Statistical analysis confirmed that there was no significant difference at the 0.01 level, indicating that the

assumptions for further analysis were met. Despite the lack of statistical significance, the experimental group consistently achieved higher mean scores across all three areas. In the area of knowledge and experience, the experimental group scored an average of 4.56, compared to 3.14 for the control group. For operational performance, the experimental group had an average score of 4.72, while the control group scored 3.10. In terms of behavioral conduct, the experimental group scored 4.67 on average, whereas the control group scored 3.07. These results suggest that the competency reinforcement program helped improve student teachers' readiness for practicum training in the

digital age. Table 5 presents a comparison of the mean competency scores of student teachers in the experimental group before and after participating in the pedagogy practicum preparation program in the digital age. The results show that, after the program, the students' competency scores in all areas—knowledge and experience, operational performance, and behavioral conduct—were higher than before the program. This difference was

statistically significant at the 0.01 level. Specifically, the average score for knowledge and experience increased from 3.06 (SD = 0.16) before the program to 4.56 (SD = 0.48) after the program. For operational standards, the mean score rose from 3.07 (SD = 0.13) to 4.72 (SD = 0.11). These findings suggest that the competency reinforcement program effectively enhanced the readiness of student teachers for the digital teaching environment.

Table 5: Comparison of mean competency scores of student teachers in the pretest and posttest groups before pedagogy practicum training in the digital age

Dependent variables	Test	\bar{x}	S.D.	t	Sig.
Knowledge and experience standards of student teachers	Pretest	3.06	0.16	-14.946	0.000
	Posttest	4.56	0.48		
Operational standards	Pretest	3.07	0.13	-54.155	0.000
	Posttest	4.72	0.11		
Behavioral conduct standards	Pretest	2.93	0.13	-38.479	0.000
	Posttest	4.67	0.15		

Table 6: Mean and standard deviation of satisfaction with the competency reinforcement program in preparation for pedagogy practicum training in the digital age among student teachers at Nakhon Ratchasima Rajabhat University

List	Student teachers (n=89)		
	\bar{x}	S.D.	Satisfaction level
1. This development program meets the needs of students.	4.80	0.40	Highest
2. This development program helps students understand how to properly prepare them for the teacher experience.	4.70	0.46	Highest
3. This development program equips students with the skills to prepare them for professional teacher experience.	4.66	0.47	Highest
4. This development program gives students the confidence to prepare them before practicing their professional teaching experience.	4.70	0.46	Highest
5. This development program helps students apply their knowledge to prepare for teacher professional training.	4.56	0.50	Highest
6. The developed program can be used in practical training for teachers.	4.70	0.46	Highest
7. The results of using this developed program are worth the time.	4.73	0.44	Highest
8. The training process developed is encouraging and encourages students to have competencies to prepare them before practicing for professional teacher experience.	4.66	0.74	Highest
9. The self-learning process is consistent with not creating additional burdens from students' studies.	4.66	0.47	Highest
10. The developed coaching process is characterized by flexibility. It can be adapted to the context of coaching students.	4.50	0.52	Highest
11. The learning exchange process allows students to see good practice concepts that can be applied to the teacher's profession.	4.66	0.49	Highest
12. Competency development for quality assurance of education of school administrators preparing for the training of teachers in this digital age can be used for real improvement and development of students.	4.66	0.49	Highest
Total	4.66	0.50	Highest

Table 6 presents the level of student satisfaction with the competency reinforcement program designed to prepare them for pedagogy practicum training in the digital age at Nakhon Ratchasima Rajabhat University. The results indicate a high level of satisfaction with the program. Students reported that the program met their needs, with an average score of 4.80 (SD = 0.40). They also felt that the program was a worthwhile use of their time, with a score of 4.73 (SD = 0.44). In addition, students appreciated the flexibility of the coaching process, which could be adapted to different learning contexts, scoring 4.50 (SD = 0.52).

5. Conclusion

The effectiveness of competency reinforcement programs in preparation for pedagogy practicum experience training in the age of digitalization. The results of the research showed that 1) the experimental group of teacher students who used the program had higher mean scores of student teachers in preparation before pedagogy practicum experience training in the age of digitalization than those in the control group; Statistically significant at the level of .01 2) Experimental group of professional

teachers who used the program had a mean score. The competency of student teachers in preparation before pedagogy practicum experience training in the age of digitalization is higher than before the experiment. Moreover, 3) teacher students were most satisfied with the competency reinforcement program in preparation for pedagogy practicum experience training in the age of digitalization. Propriety and feasible elements at the highest level will be used to develop students, enhancing competencies in preparing for the student teachers' experience in the digital age of teachers in the digital age. It consists of four tactics: training (Mondy and Noe, 2005) and self-learning. Coaching (Costa and Garmston, 2002) and learning exchange (Alam et al., 2009). Thus, students in the teaching profession have higher competencies in preparation before pedagogy practicum experience training in the age of digitalization. In line with Yutakom et al. (2016) research, we have developed a program to promote competency in knowledge and the ability to teach specific subject content to students to practice the teaching profession. The research results showed that the program can develop competencies in knowledge and the ability to teach specific subject content to students practicing professional teaching

in all fields. Factors that support student development include training programs that help teachers build self-awareness, as well as guidance from qualified mentors and experienced in-service teachers who support students' personal growth. Ongoing and timely support also plays an important role. However, there are some barriers, such as limited time, heavy workloads of in-service teachers and mentors, and a lack of familiarity with computer equipment and internet use. This aligns with Ma and Casihan (2024), who found that a structured Instruction Teaching Support System implemented across several applied colleges led to statistically significant increases in teacher competency, as indicated by both teacher and student assessments following the intervention. This aligns with Lynch et al. (2024), whose whole-school action research initiative (SETaRI) produced statistically significant improvements in teachers' instructional capacities and student performance following a model trial.

Compliance with ethical standards

Ethical considerations

This research was conducted in accordance with the ethical standards of academic research involving human participants. All participants were informed about the objectives and procedures of the study and gave their informed consent voluntarily. Data were collected anonymously, and participants were assured of the confidentiality and the right to withdraw from the study at any time without penalty.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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