Digital competency development for early childhood teachers under the Office of the Basic Education Commission

Nuntiya Noichun[1], Akapong Inkuer[2], and Chutima Klysung[3]

[1,2,3]Suan Sunandha Rajabhat University

Email: nuntiya.no@ssur.ac.th[1]; akapong.in@ssru.ac.th[2];

chutima.kl@ssru.ac.th[3]

Abstract

This research aimed to (1) investigate the current and desired states, as well as analyze the priority needs for developing the digital competence of early childhood teachers in schools under the Office of the Basic Education Commission (OBEC), and (2) propose guidelines for enhancing their digital competence. The study sample consisted of 400 early childhood teachers affiliated with OBEC, selected through stratified random sampling. Data collection instruments included a questionnaire assessing the current and desired states of digital competence and a form for proposing development guidelines. Data were analyzed using mean, standard deviation, and the Priority Needs Index (PNI). The results revealed that the current state of digital competence was at a high level (Mean = 3.76, S.D. = 0.89), while the desired state was at the highest level (Mean = 4.67, S.D. = 0.51). The most critical area for improvement was Competence Area 5: Using Digital Technology in Teaching (PNI modified = 0.89). The study proposed five guidelines for development: (1) enhancing basic digital skills, (2) integrating digital tools into classroom instruction, (3) fostering awareness of digital safety and ethics, (4) building professional learning communities, and (5) evaluating and refining digital competence. These findings provide actionable insights to support the development of digital competence among early childhood teachers, addressing the demands of modern education.

Keywords: Development of Competence, Digital Competence, Early Childhood Teachers

1. Introduction

The digital age has profoundly transformed modern society, integrating technology into every aspect of daily life. This shift has reshaped economic structures and social processes, compelling nations worldwide to develop the digital competencies of their citizens to stay competitive in a rapidly changing global landscape. Digital technology has evolved from being a mere supportive tool to a key driver of national development, fostering innovation and efficiency across sectors (Jarupa Sankharamai, 2017).

Among younger generations, often referred to as "digital natives," the use of digital tools and platforms is almost second nature. These individuals demonstrate a high level of fluency in engaging with social networks, digital media, and advanced technologies. However, despite their adaptability, many lack the critical digital competencies necessary for effective learning, responsible use, and informed decision-making. This gap often results in an inability to

navigate information responsibly, leaving individuals vulnerable to risks such as misinformation and online threats (Nowapat Kemkaman, 2020).

In the context of education, teachers play an essential role in bridging this gap, particularly in early childhood education. Early childhood is a formative period for building foundational skills, including digital literacy, that prepare children for lifelong learning. Early childhood educators, therefore, need to possess robust digital competencies to design engaging, age-appropriate learning experiences. This capability enables them to foster a dynamic and equitable learning environment that supports children's cognitive and social development while promoting digital literacy from a young age (Karunapon Prahmphayate, 2014).

The development of digital competencies among early childhood teachers has far-reaching implications. It allows teachers to integrate innovative digital tools into their teaching practices, create inclusive educational experiences for diverse learners, enhance communication with parents, and support their professional development. Furthermore, equipping teachers with digital skills ensures they can navigate the evolving demands of 21st-century education and support children in acquiring critical skills for the digital era.

This study focuses on early childhood teachers under the Office of the Basic Education Commission (OBEC) to explore their current and desired levels of digital competence, identify developmental needs, and propose practical guidelines for enhancement. Aligning with national qualifications frameworks and professional standards, the study aims to provide actionable insights for improving digital competence in early childhood education. This effort contributes to the broader goal of fostering sustainable, equitable, and technology-driven learning environments, ensuring young learners are prepared to thrive in the digital age.

1.1 Research Objective

1. To examine the current and desired states of digital competence among early childhood teachers in schools under the Office of the Basic Education Commission (OBEC) and analyze the priority needs for their development.
2. To propose guidelines for enhancing the digital competence of early childhood teachers in schools under the Office of the Basic Education Commission (OBEC).

2. Methodology

1. Population and Sample

1.1 **Population**: The population for this study consists of early childhood teachers in schools under the Office of the Basic Education Commission (OBEC).

1.2 **Sample**: The sample comprises 400 early childhood teachers from schools under OBEC, selected through stratified random sampling.

2. Research Instruments

The research utilized two primary instruments:

1) A questionnaire assessing the current and desired states of digital competence among early childhood teachers in OBEC schools.

2) A form for proposing guidelines for enhancing digital competence among early childhood teachers.

The process of developing and refining these instruments involved the following steps:

2.1 Questionnaire on Current and Desired States

1) Review relevant literature and studies concerning the digital competence of teacher trainees.

2) Examine documents and research on designing questionnaires to measure the digital competence of early childhood teachers.

3) Develop a questionnaire to assess the current and desired states of digital competence among teacher trainees. The questionnaire employed a five-point Likert scale based on Boonchom Srisa-ard's criteria (2002, pp. 66–67), as follows:

5 points: Very high
4 points: High
3 points: Moderate
2 points: Low
1 point: Very low

The rating scale corresponds to the following intervals:
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

4) Evaluate **content validity** by consulting three experts to ensure the alignment of the questionnaire items with the components of digital competence. Items with an Item-Objective Congruence (IOC) score of 0.5 or higher were retained, while items scoring below 0.5 were revised based on expert feedback.

2.2 Form for Proposing Guidelines for Digital Competence Development

This form was developed to collect suggestions for enhancing the digital competence of early childhood teachers. It underwent a similar validation process to ensure clarity, relevance, and reliability.

The data gathered from these instruments will provide a comprehensive basis for analyzing the current and desired states of digital competence, identifying priority needs, and formulating actionable development guidelines.

3. Data Collection

Phase 1: Study of Current and Desired States and Analysis of Priority Needs for Developing Digital Competence

1.1 Sent formal requests for data collection, specifying the timeline for questionnaire distribution and collection.

1.2 Distributed questionnaires to the sample group, consisting of 400 early childhood teachers in schools under the Office of the Basic Education Commission (OBEC), selected through stratified random sampling.

1.3 Analyzed the current and desired states of digital competence.

1.4 Used the findings to calculate the Priority Needs Index (PNI) to prioritize the development needs for digital competence.

Phase 2: Development of Guidelines for Enhancing Digital Competenc

2.1 Utilized the results from the priority needs analysis to formulate guidelines for developing digital competence among early childhood teachers in OBEC schools.

4. Data Analysis

The data analysis employed the following statistical and qualitative methods:

1. **Analysis of Current and Desired States:**

Calculated the mean (average) and standard deviation to assess the current and desired states of digital competence.

2. **Priority Needs Analysis:**

Used the Modified Priority Needs Index (PNI modified), based on the method of Suwimon Wongwanich (2015), to identify and rank the priority development needs for digital competence.

3. **Content Analysis:**

Performed qualitative content analysis to interpret and refine the data into actionable recommendations for developing digital competence.

3. Results

1. The study examined the current and desired states, as well as the priority needs for developing digital competence, using a questionnaire focused on the current state, desired state, and priority needs of digital competence among teacher education students at Suan Sunandha Rajabhat University. The collected data were scored and analyzed, and the results of the analysis are presented as follows:

Table 1: Results of the Current State, Desired State, and Priority Needs Analysis for Developing Digital Competence

Digital Competence	Current State		Desired State		PNI modified	Rank
		SD.		SD.		
Competence 1: Basic knowledge of digital media and technology	3.81	0.78	4.60	0.49	0.79	3
Competence 2: Accessing information	3.86	0.76	4.58	0.49	0.76	5
Competence 3: Creating and developing innovations	3.83	0.81	4.61	0.49	0.78	4
Competence 4: Digital literacy and safe usage	4.00	0.89	4.58	0.49	0.58	8
Competence 5: Using digital technology in teaching	3.76	0.89	4.67	0.48	0.89	1
Competence 6: Communication and coordination	3.92	0.92	4.63	0.48	0.71	7
Competence 7: Self-development and professional growth	3.82	0.94	4.63	0.49	0.81	2
Competence 8: Ethics in the use of digital technology	3.93	0.98	4.65	0.47	0.72	6
Overall	**3.87**	**0.87**	**4.62**	**0.49**	0.75	

2. Proposed Guidelines for Developing Digital Competence of Early Childhood Teachers in Schools under the Office of the Basic Education Commission

1. **Developing Basic Digital Skills**

Promote learning to use fundamental digital tools and programs, such as computers, smartphones, tablets, and educational applications. Provide training on software for creating teaching materials, such as illustration, video, or multimedia production programs.

2. **Applying Technology in the Classroom**

Enhance skills in using digital media to design age-appropriate learning activities for early childhood learners, such as utilizing educational game applications. Encourage the use of technological devices, such as smart boards or projectors, to improve teaching effectiveness.

3. **Strengthening Understanding of Digital Safety and Ethics**

Educate early childhood teachers on digital safety, including personal data protection and safe internet usage. Instill digital ethics for the responsible and appropriate use of online media.

4. **Building a Professional Learning Community**

Create networks among early childhood teachers to exchange experiences and strategies for using technology in classrooms. Establish collaborative learning groups through online platforms, such as Facebook groups or virtual meeting applications.

5. **Evaluating and Enhancing Digital Competence**

Develop tools to assess the digital competence of teachers, such as online tests. Encourage continuous self-improvement among early childhood teachers through training sessions or short courses.

Discussion

1. **Current and Desired States and Priority Needs for Digital Competence Development**

The findings revealed that the current state of digital competence among early childhood teachers was rated at a high level (Mean = 3.87, S.D. = 0.87), while the desired state was rated at the highest level (Mean = 4.62, S.D. = 0.49). The most significant priority need was identified in *Competence Area 5: Using Digital Technology in Teaching* (PNI modified = 0.89). This result highlights the essential role of digital technology as a tool for expanding educational opportunities and ensuring equity. Teachers must possess strong digital competence to foster students' ability to use digital technology effectively, safely, and efficiently.

These findings align with the study by Thanita Kaewsri (2023), which emphasized that teachers need to continuously develop their digital competence to design appropriate learning experiences using digital tools. Students with adequate digital skills can enhance their learning and perform activities more efficiently. Similarly, Sumalee Thienthongdee (2023) suggested that educators must help students build foundational technology skills to thrive in the 21st century. Jarupa Sankharamai (2017) also identified the necessity of developing digital media creation competencies among public relations practitioners, highlighting their importance in modern education. Furthermore, Mukda Ansiri (2022) pointed out that the ability to manage and evaluate digital technology is crucial for educational administrators, indicating a parallel need for competence among teachers to improve the overall quality of teaching and learning.

2. **Proposed Guidelines for Developing Digital Competence**

The synthesis of proposed guidelines identified five key strategies:

1. Developing basic digital skills.
2. Applying digital tools in the classroom.

3. Promoting understanding of digital safety and ethics.
4. Building professional learning communities.
5. Evaluating and improving digital competence.

These guidelines are critical for enhancing the quality of education in the country. However, the current level of support and promotion for digital competence development is insufficient to meet the needs of educational personnel. This gap could hinder the advancement of educational quality. The proposed strategies align with numerous studies by researchers and scholars, which advocate for diverse approaches to developing digital competence. These studies collectively emphasize the importance of equipping educators with the skills and knowledge necessary to adapt to the evolving demands of modern education and to drive sustainable improvements in teaching and learning.

Recommendations

1. Recommendations for Applying Research Findings

1.1 The use of digital technology in teaching was identified as the most critical digital competence. This finding highlights the integral role of digital technology in modern education. Educational institutions at all levels should promote the use of various forms of digital technology among teachers, teacher trainees, and students to enhance educational outcomes and foster continuous improvement.

1.2 Educational institutions at all levels should explore the five proposed guidelines for developing digital competence and use them as a foundational framework for improving curricula, strategies, and operational plans. Institutions should systematically monitor and gather data to benchmark, analyze, and further refine development efforts.

2. Recommendations for Future Research

2.1 Future studies should explore the current state of development in other competencies among early childhood teachers. Such research could inform equitable educational policies and practices, leading to improved quality across all educational institutions.

2.2 Future research should investigate the factors influencing the development of digital competence among early childhood teachers. This would provide more precise guidelines for effectively promoting and supporting digital competence development.

References

Ansiri, M. (2022). Guidelines for developing ICT competence for educational administrators in Kalasin Primary Educational Service Area Office 2. *Journal of Educational Administration and Leadership, 11*(41), 226–236.

Chaiyanarat, P. (2021). Guidelines for developing ICT competence in the digital era for school administrators in opportunity expansion schools, Phitsanulok Primary Educational Service Area Office.

Kaewsri, T. (2023). The use of digital technology in students' scientific work. *Journal of Research and Development Suan Sunandha Rajabhat University, 15*(2), 27–36. Retrieved from https://so05.tci-thaijo.org/index.php/irdssru/article/view/266071

Kemkaman, N. (2020). *Guidelines for digital literacy development for teachers in secondary education service area office 7* [Unpublished master's thesis]. Rajamangala University of Technology Thanyaburi.

Peeraphan, N. (2018). Development of an ICT competency assessment tool for 21st-century teaching for teachers. *Journal of Educational Sciences, 19*(1), 244–260.

Prahmphayate, K. (2014). *Knowledge management model for teacher development: A case study of Nam Phut Photharam school cluster, Trang primary educational service area office 1* [Unpublished doctoral dissertation]. Prince of Songkla University.

Sankharamai, J. (2017). *Development of ICT competence for public relations officers in educational service area offices* (1st ed.). Document Plus Co., Ltd.

Srisa-ard, B. (2002). *Statistical methods for research.* Suwiriyasarn.

Thienthongdee, S. (2023). Guidelines for developing communication and technology skills in the 21st century for schools in the network of teacher training centers, Suan Sunandha Rajabhat University. *SSRU Education Journal*, *7*(2), 25–34. Retrieved from https://so04.tci-thaijo.org/index.php/ssru-edu/article/view/264101

Wongwanich, S. (2015). *Needs assessment research* (4th ed.). Chulalongkorn University Press.