Vietnamese Preschool Teachers' Views on Technology Use in the Classroom: Benefits, Barriers, and Measures for Improvement

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Technology integration in preschool education has gained significant attention in recent years, with educators and researchers exploring its potential to enhance learning outcomes and engage young children. Although some studies have confirmed that teachers' perspectives influence the effectiveness of using technology in preschool classrooms, more research is needed on Vietnamese preschool teachers' views on the topic. This study examined preschool teachers' perspectives on the benefits and feasibility of technology use, obstacles when incorporating technology, and measures to enhance the quality of using technology in the preschool classroom. A quantitative research design was employed, and a questionnaire was administered to 249 preschool teachers in Thua Thien Hue province, Vietnam. The findings indicated that both teacher groups (those in kindergartens meeting national quality standards and those in non-meeting kindergartens) had generally positive perspectives on the benefits and feasibility of technology in the preschool classroom. Technology was perceived as a tool to enhance engagement, bring external resources into the classroom, make activities enjoyable, and support communication with parents. However, there were slight differences between the two groups, with teachers in kindergartens meeting national quality standards having a slightly more positive outlook. Barriers to technology integration included insufficient equipment, lack of technical support, outdated devices, limited training opportunities, and curriculum gaps.

Introduction

Technology integration in preschool education has been a growing interest for educators, researchers, and policymakers. Many educators seek to integrate technology into their teaching practices to enhance learning outcomes and support student engagement (Zomer & Kay, 2018). However, despite its potential benefits, using technology in the education of young children is still a subject that is being discussed and argued about,

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with some educators and researchers concerned about its impact on young children's development (Jack & Higgins, 2019). In this context, it is crucial to understand preschool teachers' perspectives on technology use in the preschool classroom and how they see its role in supporting young children's learning and development.

Previous research has shown that preschool teachers have a range of perspectives on technology use in the preschool classroom, with some viewing it as a valuable tool for supporting children in learning and development. They also emphasised the importance of providing teachers with financial support and technology training to improve their use of technology in the classroom (Smith, 2018). In contrast, others have concerns about its negative impact on children's development. For example, a study by Koc, K. (2014), Blackwell et al. (2014), and Chuanmei Dong & Qianqian Xu (2021) found that preschool teachers who had positive attitudes towards technology use in their classroom saw technology as a way to engage students and support their learning, while those with negative attitudes expressed concerns about the potential for technology to be a distraction and to impact children's social and emotional development negatively. Despite these differing perspectives, it is clear that technology use in preschool education is an important issue that requires further investigation (Ebrahim & Johnson, 2016). By understanding preschool teachers' perspectives on technology use in the preschool classroom, researchers can gain valuable insights into the challenges and opportunities associated with integrating technology into preschool education and develop strategies to support teachers in effectively using technology to support young children's learning and development (Blackwell, 2014; Alsuwidan, 2018).

The integration of technology in preschool education in Vietnam commenced in the year 2001 with IBM Kidsmart project. On July 5, 2006, the Ministry of Education and Training sanctioned the project "Applying Technology in Early Childhood Education period 2006 – 2010". The project aimed to enhance the technological infrastructure, augment teachers' technical skills, and promote technology use in children's learning activities in preschools. The project was implemented extensively and yielded positive results (Tran et al., 2021). In terms of research, several studies have been conducted to understand preschool teachers' perspectives on the use of technology in the classroom. The majority of these studies revealed that while teachers acknowledged the potential benefits of technology in the classroom, they also expressed concerns about the need for more comprehensive training and support for technology integration (Dao, 2011; Nguyen, 2019; Ho, 2023).

However, a significant gap in the research is the focus on major cities such as Ho Chi Minh City (Dao, 2019) and Thanh Hoa province (Nguyen, 2011; Ho, 2023), with a lack of information on this topic in Thua Thien Hue province. So, a survey was conducted among 249 Thua Thien Hue province preschool teachers to gather information on the benefits and feasibility of technology use, the obstacles encountered when incorporating technology, and the measures to enhance the quality of using technology in the preschool classroom. The findings of this study could be leveraged by educational management organisations and institutions responsible for training preschool teachers, aiding in the creation of guidelines and educational programs associated with integrating technology into preschool education, thereby strengthening the technological proficiency of preschool teachers.

Methodology

Data Collection and Participants

A quantitative research design was utilised in this study. The research team conducted a questionnaire to gather information on teachers' perspectives on using technology in the preschool classroom. To guarantee that teachers of various ages, credentials, years of experience, and regions were included, the study utilised stratified ran-

dom sampling, ensuring that the sample of teachers was representative. The participants were informed about the research project's purpose and allowed to withdraw at any time, with their privacy and anonymity protected through data protection measures.

The participants were 249 full-time preschool teachers from Thua Thien Hue province of Vietnam. Most of the teachers (49.4%) were 30 or younger, followed by those between 31 and 40 years old (39.4%). Only a few (11.2%) were older than 40. The age group of 5-6 years old was the most prevalent (27.3%) among the children they taught, while the 24-36 months old was the least common (21.7%). Most of the teachers (69.1%) had a bachelor's degree (four years of training), while a small proportion (11.2%) had an intermediate degree. The remaining teachers (19.7%) had a college degree (three years of training). The teachers also differed in their years of experience in preschool education. The most frequent group (44.1%) had 6 to 15 years of experience, while the least frequent group (18.1%) had more than 16 years of experience. The remaining teachers (37.8%) had five years of experience or less. About half of the teachers (50.6%) worked in preschools that complied with the national quality standards (group A), while the other half (49.4%) did not (group B). The number of teachers in schools is unequal.

Preschool education in Vietnam, which includes nurseries (3-36 months old) and kindergartens (3-6 years old), is mainly provided by state-run and private institutions. However, it is not compulsory for children to attend preschool before entering primary school (National Assembly, 2019). Thua Thien Hue, a province in central Vietnam, has a total of 289 preschools, consisting of 204 kindergartens (183 public and 21 private) and 85 independent child-care centres. In the 2022-2023 academic year, the province achieved a higher rate of nursery children attending school (46.0%) than the national average (32.1%). The rate of kindergarten enrolment was also very high, reaching 96.6% compared to nationwide (93.1%). However, the province still lagged behind the national average in terms of the proportion of kindergartens meeting national standards, which was 54.9% compared to 56.9%. Out of 204 kindergartens in the province, only 112 met the quality criteria (Thong Nhat, 2023).

Measures

The study utilised a multiple-choice questionnaire based on a 5-point Likert scale. The questionnaire comprised 35 items, divided into three sections. It was designed based on the research of Konca, A.S., Ozel, E., & Zelyurt, H. (2016). The three sections were as follows: Question 1 (15 items) assessed teachers' opinions on the advantages and appropriateness of technology use in the preschool classroom. Question 2 (11 items) aimed to identify challenges faced by teachers when incorporating technology into preschool classrooms. Question 3 (9 items) explored teachers' perspectives on enhancing the impact of technology in the preschool classroom. Participants rated their responses using a 5-point Likert scale, where 1 indicated 'Strongly disagree/not a barrier' and 5 indicated 'Strongly agree/Significant barrier.' A pilot test was conducted with 30 teachers, and revisions were made before the final use. The questionnaire demonstrated excellent internal consistency, with a total Cronbach's alpha coefficient of 0.932 (n = 249).

The collected data were analysed by using SPSS software (version 26.0), where descriptive statistics were calculated using percentages, means, and standard deviations. Furthermore, ANOVA was employed to examine the differences between school qualities. The results of the present study's research are expected to contribute to understanding teachers' perspectives on technology use in preschool education and provide insights into potential areas for improvement.

Results and discussion

Preschool teachers' perspectives on the benefits and feasibility of the technology in the preschool classroom

Table 1 below presents preschool teachers' perspectives on the benefits and feasibility of using technology in the preschool classroom.

	Statements	Group A (n = 126)		Group B (n = 123)		Total (n = 249)		P
		M	SD	M	SD	M	SD	
1	Technology in the classroom helps the children to be more engaged in learning.	4.12	.786	3.91	.975	4.02	.889	.064
2	Technology in the preschool classroom helps the teacher to bring outside resources into the classroom more easily	4.18	.720	3.96	.944	4.07	.844	.037*
3	Technology in the preschool classroom helps to make children's activities more enjoyable	4.15	.727	3.89	1.002	4.02	.882	.018*
4	Technology in the preschool classroom makes teaching more effective	4.13	.685	3.87	1.032	4.00	.882	.017*
5	Technology in the preschool classroom facilitates the teacher's workflow and classroom management	4.05	.691	3.75	1.060	3.90	.904	.009**
6	It is important to have technology tools in the preschool classroom	4.14	.723	3.83	1.006	3.99	.887	.005**
7	Technology in the preschool classroom helps teachers to assess students' learning	3.80	.780	3.49	1.089	3.65	.957	.009**
8	Technology in the preschool classroom makes it easier for teachers to communicate with parents	4.02	.726	3.89	1.002	3.95	.874	.242
9	Technology tools are easy to use	3.79	.741	3.61	.955	3.70	.857	.090
10	Technology tools are appropriate for preschool and kindergarten-age students	3.65	.915	3.46	.986	3.56	.953	.121

		M	SD	M	SD	M	SD	p
11	Technology tools in the children's classroom can improve individualised learning	3.70	.870	3.49	1.027	3.59	.955	.082
12	Technology in children's classrooms facilitates social interactions among children	3.75	.817	3.55	1.042	3.65	.938	.091
13	Technology tools can improve children's cognitive skills	3.73	.804	3.61	.964	3.67	.887	.285
14	Having one or more technology devices in the classroom is an essential part of children's learning	3.85	.868	3.76	.995	3.80	.932	.432
15	The use of technology positively contributes to young children's development	3.86	.836	3.72	1.012	3.79	.928	.229

*Table 1. Perspectives of preschool teachers on the benefits and feasibility of the technology in the preschool classroom. Note: Group A = Teachers of preschools meeting national quality standards; Group B = Teachers of kindergartens not meeting national quality standards; M = mean; SD = Standard deviation; $1 \leq M \leq 5$; * = $0.01 < p < 0.05$; ** = $p < 0.01$; − = $p > 0.05$*

The data in Table 1 provides insights into teachers' perspectives on the benefits and feasibility of using technology in the preschool classroom. The table compares the views of two groups of teachers: those who teach in kindergartens that meet national quality standards (Group A) and those who teach in kindergartens that do not meet national quality standards (Group B).

To be recognised as a National Standard School, Vietnamese kindergartens must undergo quality accreditation, including self-assessment and external assessment, and meet the standards stipulated in Circular No. 19/2018/TT-BGDĐT dated August 22, 2018, of the Ministry of Education and Training (Regulations on quality accreditation and recognition of national standards for preschools). Regarding quality accreditation, there are five primary standards, including (1) Organisation and management of the school; (2) Management of staff, teachers, and employees; (3) Physical facilities and teaching equipment; (4) Relationship between the school, family, and society; (5) Activities and results of nurturing, caring, and educating children. These standards are concretised into criteria and indicators at four levels, from level 1 to level 4, corresponding to the quality of the school. Schools that meet the quality accreditation must have been in operation for at least five years and have external evaluation results from Level 1 or higher. Based on the evaluation results, the provincial Department of Education will issue a certificate of quality accreditation, clearly showing the specific level of education quality for the preschool. Schools that are recognised as meeting the national standards must have been in operation for at least five years and have external evaluation results from Level 2 or higher. (MOET, 2018)

The research results indicate that both Group A and Group B have a generally positive perspective on the benefits and feasibility of technology in the preschool classroom. The majority of statements received a mean score above 3.5 out of 5, indicating that teachers in both groups view technology as applicable and engaging children in learning, bringing outside resources into the classroom, making activities more enjoyable, making teaching more effective, and facilitating communication with parents. There are also some indications that technology can help assess and contribute to children's development.

The study supports previous studies' findings (e.g., Knezek & Christensen, 2008) that technology can enhance children's engagement in learning and bring outside resources into the classroom. However, there were some differences between the two groups, with Group A having a slightly higher mean score for certain statements (such as "technology in the preschool classroom helps the teacher to bring outside resources into the classroom more easily" and "technology in the preschool classroom makes teaching more effective"). These results suggest that kindergarten teachers in kindergartens meeting national quality standards may be more equipped or confident in using technology in the classroom compared to their counterparts in kindergartens not meeting national quality standards.

According to the table, there is a statistically significant difference between the two groups regarding their perspectives on the benefits of technology in the preschool classroom, with Group A having higher mean scores for most of the statements. Specifically, group A has a higher average score for the statement "Technology in preschool classroom helps teachers assess children's learning," "It is important to have technology tools in the preschool classroom," and "Technology in the early childhood facilitates the teacher's workflow and classroom management)" (p < 0.01).

Teachers' perspective on barriers to using technology in the preschool classroom

Table 2, shown below, illustrates the hindrances or obstacles that may prevent teachers from utilising technology in the preschool classroom.

	Obstacles	Group A (n = 126)		Group B (n = 123)		Total (n = 249)		P
		M	SD	M	SD	M	SD	
1	Insufficient technology equipment within the classroom	3.54	1.191	3.41	1.122	3.47	1.157	.365
2	Inadequate technical assistance and support	3.41	1.060	3.30	1.078	3.36	1.069	.410
3	Use of outdated technology devices in the school	3.30	1.228	3.23	1.234	3.27	1.229	.636
4	Absence of courses in universities and colleges that cover technology application in preschool education	3.23	1.133	3.14	1.140	3.18	1.135	.524
5	Limited or no formal coursework on how to integrate technology in the children's classroom	3.29	1.019	3.20	1.106	3.24	1.062	.502
6	Inadequate time allocated in the schedule for incorporating technology in the classroom	3.30	1.090	2.98	1.094	3.14	1.101	.022*

7	Limited time for teachers to learn how to use technology	3.30	1.045	3.11	1.158	3.20	1.105	.162
8	Lack of experience in integrating technology into educational topics and activities in preschool	3.28	1.115	3.10	1.155	3.19	1.136	.211
9	Low awareness level about the benefits of technology in early childhood	3.13	1.175	2.93	1.143	3.04	1.162	.175
10	Curriculum lacking information on how to integrate technology into children's learning	3.25	1.058	3.07	1.132	3.16	1.097	.194
11	Adequate access to the internet is required for using technology	3.08	1.412	2.88	1.458	2.98	1.435	.269

*Table 2. Obstacles that hinder teachers from using technology in the preschool classroom. Note: Group A = Teachers of preschools meeting national quality standards; Group B = Teachers of kindergartens not meeting national quality standards; M = mean; SD = Standard deviation; $1 \leq M \leq 5$; * = 0.01 < p <0.05; **= p <0.01; − = p >0.05*

Based on the given information, Table 2 illustrates the various obstacles that hinder the use of technology in preschool classrooms, according to the data. Group A and Group B teachers face comparable obstacles, such as a shortage of technology devices in the classroom (mean = 3.47), lack of technical assistance (mean = 3.36), and the use of outdated technology devices in schools (mean = 3.27). Additionally, there were similarities in the need for formal coursework on integrating technology in the classroom (mean = 3.24) and a shortage of experience in using technology in preschool (mean = 3.19).

However, Group B teachers reported a statistically significantly lower mean score for the lack of time in their schedule to use technology in the classroom (mean = 2.98) compared to Group A teachers (mean = 3.30) (p < 0.05). This suggests that kindergarten teachers who must adhere to national quality standards may need help incorporating technology into their curriculum due to their busy schedules.

These findings support previous research (Dao, 2011; Nguyen, 2019; Ho, 2023; Tran et al., 2021), which found that limited access to technology and a lack of professional development opportunities were barriers to integrating technology in preschool education. Additionally, the results highlight the importance of providing teachers with access to technology resources and professional development opportunities to improve technology integration in preschool education.

Preschool teachers' perspectives on measures to improve their use of technology in the preschool classroom

The survey results of teachers' perspectives on measures to improve their use of technology in the preschool classroom are shown in Table 3 below:

	Measures	Group A (n = 126)		Group B (n = 123)		Total (n = 249)		P
		M	SD	M	SD	M	SD	
1	Financial support for preschool teachers to be equipped with personal technology devices	4.10	.871	3.91	.914	4.00	.896	.104
2	Technical support for teachers (e.g., hotline phone number or technical support specialist)	4.09	.839	3.98	.863	4.03	.851	.302
3	Provision of complete technology equipment for the preschool classroom	4.29	.828	4.11	.907	4.20	.871	.120
4	Provision of high-quality software programs and applications	4.19	.787	4.04	.927	4.12	.860	.170
5	Issuing specific policies, regulations, and guidelines for the use of technology in preschool education	4.08	.786	3.94	.908	4.01	.849	.206
6	Investment in infrastructure to increase Internet access in the school	4.25	.807	4.07	.866	4.16	.840	.089
7	Provision of training courses and skills development in applying technology in preschool education for teachers	4.17	.781	4.06	.871	4.12	.827	.262
8	Provision of courses on the use of technology in preschool education at universities and colleges	4.15	.811	4.06	.852	4.10	.831	.374
9	Giving preschool teachers more time to prepare, learn, and develop their ability to apply technology in the preschool classroom	4.17	.746	4.02	.923	4.09	.840	.158

Table 3. Teachers' perspective on measures needed to improve the use of technology in the preschool classroom. Note: Group A = Teachers of preschools meeting national quality standards; Group B = Teachers of kindergartens not meeting national quality standards; M = mean; SD = Standard deviation; $1 \leq M \leq 5$; * = 0.01 < p <0.05; **= p <0.01; − = p >0.05

The research results, as presented in Table 3, show that teachers from both Group A and Group B have similar perspectives on the measures needed to enhance the use of technology in the preschool classroom. Most of the measures were rated with high mean scores from 4.0 – 4.20. Both groups rated financial support for teachers to equip with personal technology devices, technical support for teachers, and investment in infrastructure to increase internet access in the preschool highly. The groups also rated the provision of complete technology equipment for the preschool classroom, high-quality software programs and applications, and training courses and skills development in applying technology in preschool education for teachers similarly. Finally, both groups rated the provision of courses on the use of technology in preschool education at universities and colleges and giving preschool teachers more time to prepare, learn, and develop their ability to apply technology in the preschool classroom as essential measures to improve the use of technology in early childhood classrooms.

The present study results align with the findings of previous studies that have emphasised the need for financial and technical support, provision of technical equipment and infrastructure, and teacher training to effectively integrate technology into preschool education (e.g., Papert, 1980; Clements & Sarama, 2009; Smith, 2018; Sundqvist & Nilsson, 2018). However, our results suggest that the need for technical support and investment in infrastructure may be higher in the preschool classroom compared to other educational settings. The results also highlight the need for policies, regulations, and guidelines for using technology in preschool education, as well as investment in research and development of technology programs and applications for preschool education.

Conclusion

This study examines preschool teachers' perspectives on the use of technology. The survey results of 249 preschool teachers in Thua Thien Hue province show that teachers highly agree with statements related to the benefits and relevance of the application of technology in the preschool classroom. In addition, teachers also said that they face many difficulties in applying technology to the preschool classroom. They also expressed high agreement for measures to improve the use of technology in the preschool classroom. The study also noted a significant difference in some teachers' opinions following the preschool-quality group. The results of this study provide helpful information for preschool education administrators and institutions in the implementation, management, training, and retraining to improve the effectiveness of technology use in preschool education.

Despite specific contributions in terms of science, it is important to note that the sample size and location limit the results of the present study, and further research with more extensive and more diverse samples is needed to provide a more comprehensive understanding of preschool teachers' perspectives on using technology in the preschool classroom. Additionally, further studies need to research policies and measures to promote the use of technology in preschool education and to improve the technical skills of Vietnamese preschool teachers.

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Vietnámi óvodapedagógusok nézetei a technológia óvodai alkalmazásáról: előnyök, akadályok és a fejlesztés lehetőségei

A technológia integrációja az óvodai nevelésben az elmúlt években jelentős figyelmet kapott. Pedagógusok és kutatók tárják fel a tanulási eredmények javításának és a kisgyermekek bevonásának lehetőségét. Bár egyes tanulmányok megerősítették, hogy a pedagógusok nézőpontja befolyásolja a technológia óvodai csoportokban való alkalmazásának hatékonyságát, több kutatásra van szükség ahhoz, hogy megismerjük a vietnami óvodapedagógusok véleményét. Jelen tanulmányunkban az óvodapedagógusok nézőpontját vizsgáltuk a technológia használatának előnyeiről és megvalósíthatóságáról, a beépítése során felmerülő akadályokról, valamint arról, hogy milyen intézkedések javíthatnák annak óvodai alkalmazását. Kvantitatív kutatási stratégiánk során kérdőíves módszert alkalmaztunk. A kérdőívet 249 óvodapedagógus töltötte ki a vietnámi Thua Thien Hue tartományban. Az eredmények azt mutatták, hogy mindkét pedagóguscsoport (a nemzeti minőségi szabványoknak megfelelő és az annak nem megfelelő óvodák pedagógusai) általában pozitívan ítéli meg a technológia előnyeit és óvodai környezetben történő alkalmazhatóságát. A technológiát olyan eszköznek tekintették, amely fokozza az elkötelezettséget, külső forrásokat hoz az óvodába, élvezetessé teszi a tevékenységeket, és támogatja a szülőkkel való kommunikációt. A két csoport között azonban voltak kisebb különbségek, a nemzeti minőségi szabványoknak megfelelő óvodák pedagógusai valamivel pozitívabban álltak a kérdéshez. A technológia integrációjának akadályai közé tartozott a nem megfelelő felszereltség, a technikai támogatás hiánya, az elavult eszközök, a korlátozott képzési lehetőségek és a tantervi hiányosságok.

Kulcsszavak: óvodapedagógusok, technológia, előnyök, akadályok, fejlesztési intézkedések