THE STATUS OF PRESCHOOL TEACHERS' AWARENESS OF APPLYING INFORMATION TECHNOLOGY IN CHILD CARE AND EDUCATION ACTIVITIES IN PRESCHOOL: ORIENTATION IN TRAINING STUDENTS SPECIALIZING IN EARLY CHILDHOOD EDUCATION

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Abstract: *Applying information technology in preschool education plays an important role in effectively implementing the current goal of innovating preschool education. This article aims to survey the current status of information technology application skills of preschool teachers in organizing childcare and education activities in preschools. The main method used is to survey 355 preschool teachers and combine in-depth interviews with teachers. The results show that preschool teachers have applied information technology to most childcare and education activities in preschool, and point out that difficulties in applying information technology to preschool teachers' childcare and education activities.*

1. Introduction

Early childhood education plays an important role in forming and developing children's qualities and abilities. Educational activities will create opportunities for children to practice and develop foundational skills to prepare knowledge and skills to study in elementary school [2]. Information technology (IT) is one of the key factors to effectively implement educational goals in preschool education innovation [14]. Applying IT in early childhood education creates a positive and attractive learning environment for children, providing many opportunities to develop scientific and technical abilities and creative skills... Therefore, improving skills in applying IT in the professional activities of preschool teachers is a crucial target in the current context of early childhood education innovation [13], [14].

Recent studies have shown that preschool children's access to technological devices will help them develop their abilities and foster exploration and discovery of the world around them [16]. At the same time, applying IT in professional activities will create a positive educational environment, helping children develop intellectual qualities. During the COVID-19 period, many activities to support children's online learning and play have been carried out. Preschool teachers have designed videos to guide children in practicing

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life skills, while also supporting parents to play together. children at home during the period of social distancing [17]. Although the great role of IT has impacted the effectiveness of child care and education, this skill of teachers still has many limitations. Wenwei also proposed that the training and fostering of preschool teachers have this skill to meet the requirements of educational innovation [18]. Some other studies also mention technology application trends in the digital transformation period such as building output standards to meet the digital competencies of teachers at all levels, and guiding students to use digital skills. University students adapt to the profession of preschool teachers.

Noga Magen-Nagar & Esther Firstater in the study "The Obstacles to ICT Implementation in the Kindergarten Environment: Kindergarten Teachers' Beliefs also pointed out some limitations of preschool teachers in applying IT in their professional activities" [10]. Besides, some other researchers also believe that applying IT in preschool education brings valuable opportunities to help children's learning become clear and contribute to the development and strengthening of relationships between children, families, and teachers when integrated in meaningful and purposeful ways within the early childhood teaching and learning community [7]. Difficulties in applying information technology in the professional activities of preschool teachers have also been pointed out [11]. In Vietnam, IT application skills are also identified as core competencies in current preschool teacher professional standards [3], [8]. Research results have shown that the role of IT applications in early childhood education has helped children develop psychological processes while improving the professional capacity of early childhood education teachers [4], [15]. Strengthening the application of IT in early childhood education has been strongly implemented in all early childhood education facilities. However, this skill of preschool teachers is still limited to many preschool teachers, especially older teachers and teachers in rural and mountainous areas. This leads to some difficulties in organizing childcare and education activities in preschools.

Recent studies also show some positive effects of ICT on children's development. It can be seen that research on the current state of information technology application skills of preschool teachers in child care and education activities is still limited. Therefore, this study focuses on some of the following research contents:

RQ1: What content is information technology applied to in preschool education and its application level?

RQ2: What difficulties do preschool teachers face when applying information technology?

2. The Research

2.1. Some trends in applying information technology in early childhood education

Firstly, applying IT in lesson preparation: The application of information technology in lesson preparation has become increasingly popular among teachers. This helps preschool teachers save time and effort, while also improving their IT application skills.

Second, applying IT in searching, storing, and sharing information: thanks to technology and communication devices, teachers can exploit materials to serve children's educational activities at school Preschools, teachers can share materials easily.

Third, applying IT to learning and fun activities of children: one of the differences since applying IT in early childhood education compared to before is the increased interest of children in each activity. Teachers design electronic lessons to organize activities for children or design supporting materials on preschool topics. That is why it is required that every preschool teacher must have skills in applying IT in their professional activities, and this is one of the requirements for current preschool teacher professional standards.

Fourth, apply IT in management and evaluation in preschool education: Information technology can be used to create a children's information management system, including personal information, educational history, progress, and personal evaluation of children. This helps teachers and parents easily monitor children's development and identify strengths and weaknesses. Mobile app for daily assessments: Teachers can use the mobile app to record children's progress and behavior each day. They can take photos, record audio, or write notes about the child's activities and progress in real time.

2.2. Research subjects and methods

Research area: This study was conducted in Thanh Hoa province. Select preschools in many regions with different developments, including preschools in cities, rural areas, and mountainous areas.

Research subjects: This study surveyed 355 preschool teachers in 35 kindergartens in Thanh Hoa province. The participants working seniority from 5 to 25 years. Regarding professional qualifications, there are 12 people with a Master's degree (majoring in Early Childhood Education and majoring in Educational Management) accounting for 3.4%, with 288 people having a university degree, accounting for 81.1%, and 55 people having a college degree in Early Childhood Education, accounting for 15.5% (currently studying to enter the university level of Early Childhood Education). The survey participants were from the Kinh, Thai, Muong, and Mong ethnic groups, and they were directly teaching in preschools with different development conditions (city, rural, and mountainous areas).

To evaluate the current status of information technology applications in preschool education, this study uses a Likert scale with 5 levels for research questions 1 and 2.

Survey on the frequency of technology application in professional activities of teachers (always; often; sometimes; rarely; never), with a score of 5 - 1 point.

Survey on teachers' difficulties in applying information technology (Very difficult; difficult; normal; not difficult and not at all difficult), corresponding score from 5 - 1 point.

Survey results data were processed using SPSS 20.0 software.

2.3. Survey results and discussion

2.3.1. Preschool teachers' awareness of some technology application contents in early childhood education

Table 1. Preschool teachers' awareness of technology application in early childhood education nowadays

N₀	Some applications in preschool education	Frequency (N = 355)					(SD, range)
		1	2	3	4	5	
1	Preparing lesson plans	0	0	64	201	90	4.07 (.655, 3-5)
2	Organizing learning and fun activities for children	0	0	75	170	110	4.10 (.716, 3-5)
3	Search documents, store, and share information	0	0	69	150	136	4.19 (.737, 3-5)
4	Classroom management	0	0	80	166	109	4.08 (.726, 3-5)
5	Application in Preschool Education Assessment	0	0	69	150	96	3.96 (.760, 3-5)
6	Discussing with parents about children's development	0	0	90	156	109	4.05 (.748, 3-5)

The survey results in Table 1 show that information technology is widely used in preschool education. Among them, searching and sharing information in teachers' professional activities has the highest level of application (with 4.19/5 points). Teachers believe that with the support of information technology, they have searched for a lot of pictures and videos related to educational topics for children in preschool to integrate them into activities for children to explore. Encourage children to interact actively in activities. The second place belongs to "Application in organizing learning and fun activities" (with 3.96/5.0).

Apply information technology in developing lesson plans; Classroom management and information sharing with parents are also done regularly. Most preschools are equipped with computers and projectors for teachers to teach through electronic lesson plans. Besides, using technological devices and software to manage classrooms and discuss children's development with parents. Research by the author team Hye in Jeong & Yeolib Kim on 160 preschool teachers teaching at a public preschool in Daejeon, Korea also showed that they accepted the introduction of technology into classroom management. or build lessons to create positive changes in child care and education in preschool. They also believe that incorporating technology into early childhood education practices requires teachers to have skills in using technology in the classroom [9]. Döndü Neslihan Bay (2022) found that teachers possessed web-based technologies, and they mostly used smartphone applications. The findings on the use of digital technology in preschool education revealed that teachers grouped digital technology applications under four themes, teacher, education, program, and family involvement. Regarding teachers' views, the pros

of digital technology are: that it makes it easier to do their job, facilitates learning in education, facilitates the transfer of gains, and facilitates communication with family [1].

The application of information technology in assessment plays an important role in preschool education today. However, the application is less than in other areas. The main reason is that preschool teachers have difficulty using technology software to carry out the assessment process. When discussing the application of technology in ECEC, the author Feng Wang also affirmed that children naturally explore and learn through computer technology. It is a medium used to make accessible to expand children's exposure to the world around them. Currently, more and more interactive games and educational software have been implemented in early childhood education and are applied in many areas of children's education such as activities to familiarize yourself with elementary concepts of mathematics, explore science, and become familiar with letters, language, and social skills. Based on existing theoretical frameworks, the study also proposes that teaching support technologies should be widely used in preschool education to enrich the operating environment for children facilitate the use of resources, and support children's cognitive processes [6], [12].

This survey result shows that the application of information technology in preschool education is regularly implemented in preschools today. Most preschool teachers already know how to exploit the advantages that information technology brings to organize childcare and education activities in preschools during the digital transformation period in education.

2.3.2. Difficulties of preschool teachers in applying information technology

Table 2. Difficulties of preschool teachers in applying information technology

No	Difficulties	Levels (N = 355)					(SD, range)
		1	2	3	4	5	
1	Access to some advanced technology software	26	98	131	62	38	2.97 (1.084, 1-5)
2	Understanding digital technology in early childhood education.	16	89	85	122	43	3.25 (1.097, 1-5)
3	Skills in using technology equipment and some supporting technology software.	11	69	113	104	58	3.36 (1.066, 1-5)
4	Conditions of facilities and equipment at preschools.	11	69	114	108	53	3.35 (1050, 1-5)
5	Regular professional training in information technology applications	11	71	120	100	53	3.32 (1.051, 1-5)

The survey results showed that applying information technology in their professional activities still faces many difficulties. Among the factors surveyed, skills in using technology equipment and some support software are considered the most difficult for preschool teachers. Specifically, 58 people responded that it was very difficult, 104

teachers confirmed that they had difficulty and there was no opinion that this was not difficult. When discussing with teachers they suggested using computers and some technological devices for preschool teachers is the biggest difficulty, especially for teachers who are teaching in mountainous areas and older teachers. The second position is the conditions of facilities and equipment in the classroom. Teachers believe that to apply technology in organizing child care and education activities, it is necessary to have computers and software to support expertise in assessing and managing children. These conditions have not yet been met in all preschool educational establishments, especially preschools in rural and mountainous areas and places with difficult economic and social conditions. In addition, regular professional training for preschool teachers on the application of information technology in preschool education is also considered the third biggest difficulty among the factors surveyed.

Among these 5 factors, "Access to some technology software" and "Understanding digital technology in Early Childhood Education" are considered less difficult than other factors. Specifically, 38 respondents responded that they encountered many difficulties, and 11 respondents responded that they did not encounter any difficulties. Many teachers have designed games and recorded videos using technological devices to create an attractive operating environment for children. The sounds and images made with several technology software have helped teachers have initial success when receiving children's interest in each lesson. In particular, during the Covid-19 epidemic, not only high schools but also teachers have come up with many good ideas about guiding children to explore many interesting experiments or directions. Guide children to practice many necessary skills to protect their health every day during the Covid-19 pandemic. Most of the knowledge and skills in applying technology they learn from the internet or colleagues sharing. Therefore, teachers think that they can learn for themselves to access some of the skills in applying technology to meet digital transformation in early childhood education.

Research by the authors Noga Magen-Nagar and Susan Edwards has shown three main types of obstacles, of which the first two are the most prominent: (1) pedagogical, although recognized for its value, information technology does not play a major role in the educational philosophy of kindergarten teachers; (2) in terms of materials, information technology is used primarily as a source of information and to illustrate instruction, rather than as a vehicle for new teaching strategies; and (3) developmentally, computer use affects the social development of children, especially those with special needs, but not always positively. The main conclusion is that kindergarten teachers do not overcome these obstacles and do not use the full potential of information technology; Therefore, teachers should be encouraged to participate in professional training in digital technology to apply it to the care and education of children in preschools [10], [5]. This survey results not only reflect the reality of teachers' difficulties in applying information

technology to preschool activities but also serve as a basis for training and fostering preschool teachers as well as equipping more facilities in preschools in implementing preschool education innovation.

2.4. Some orientations in training students specialized in early childhood education

Educational innovation requires training institutions to adjust training programs to suit current developments. The training program must determine the amount of knowledge and skills nececsary for applying technology in the professional activities of preschool teachers. It should be also flexible and open. Flexibility is shown both in the process of establishing the program as well as in implementing the program. The learning must develop the ability to apply new technology and adapt to continuous social change. Building output standards of the training program will consider the requirements for digital competency criteria in some modules or the entire training program. Criteria for the ability to apply digital technology can be clearly stated based on the knowledge and skills that learners must achieve. The knowledge and skills that learners receive come from many sources and gradually increase through a smart training environment with support from smart devices, systems, and virtual reality environments,... to ensure requirements for knowledge, skills, and attitudes toward digital competency. Therefore, in designing training programs, it is possible to set out standard output requirements of digital competencies for students majoring in Early Childhood Education.

The preschool education training program needs to equip learners with knowledge and skills about digital technology and information technology applications to meet the requirements of today's digital transformation. For example, in the Early Childhood Education training program at Hong Duc University, the "digital technology" module is a "compulsory" module in the general education knowledge block to equip learners with knowledge and skills in digital technology, this module helps students have foundational knowledge to later apply in the learning process in modules of specialized knowledge blocks. At the same time, in the specialized knowledge block, there is the module "Application of information technology in preschool education" which is a "mandatory" module, it is both a mandatory module in the training program and a core module to evaluate the degree to which learners meet learning outcomes.

In addition, the technology application skills of students majoring in Early Childhood Education are also clearly shown in the output standards of the modules in the detailed syllabus, especially the modules in the knowledge block. specialized (modules on methods of organizing activities for children in preschool). The course output standards demonstrate the required levels such as: presenting group discussions using PowerPoint software, planning children's education using electronic lesson plans; and Organizing teaching training combined with information technology applications. For the

information technology application module in preschool education, it is necessary to equip learners with skills in using software to design educational materials in organizing activities at preschool and know specialized software to support child care and assessment activities (Kidsmart software, Nutrikids, HappyKids, etc.).

3. Conclusion

Survey results show that information technology is currently applied to most activities in preschools. However, applications for finding, sharing, and storing information and applications for designing and organizing learning and play activities for children are used most often.

Regarding the challenges faced by teachers in applying information technology, it has been pointed out that the skill of using technological devices and some supporting software in designing electronic materials and lectures is considered the most difficult for preschool teachers.

The limitation of this study is that it has not compared the current status of information technology applications by preschool teachers in different areas. However, the survey results at kindergartens in Thanh Hoa province also partly reflect the current status of preschool teachers' technology application skills in the current context of preschool education innovation, and at the same time, this study is the foundation for training and fostering preschool teachers to meet preschool education standards and current preschool teacher professional standards.

References

[1]   Bay D. N. (2022), *The perspective of preschool teachers on the use of digital technology*, Southeast Asia Early Childhood Journal, 11(02).

[2]   Ministry of Education and Training (2021), *Early Childhood Education Program,* (Bộ Giáo dục và Đào tạo (2021), Chương trình giáo dục mầm non).

[3]   Ministry of Education and Training (2018), *TCircular regulating professional standards for preschool teachers*, (Bộ Giáo dục và Đào tạo, Thông tư số 26/2018/TT-BGDĐT Ban hành quy định chuẩn nghề nghiệp giáo viên mầm non).

[4]   Chunkai Zhao et al. (2023), *ICT in education can improve students' achievements in rural China: The role of parents, educators and authorities*, Journal of Policy Modeling, 45(2), 320-344.

[5]   Edwards S. (2013), *Digital play in the early years: a contextual response to the problem of integrating technologies and play-based pedagogies in the early childhood curriculum*, European Early Childhood Education Research Journal, 21(2), 199-212.

[6]   Feng Wang et al. (2019), *Applying Technology to Inquiry-Based Learning in Early Childhood Education*, Early Childhood Education Journal, 37, 381-389.

[7]   Frederick U. (2014), *The Role Of Information And Communication Technology In Early Childhood Education*, Computer Education Research Journal, 1(1), 127-133.

[8]   Ho Sy Hung, Digvijay Pandey (2021), *Developing the Professional Capacity of Preschool Teachers in Mountainous Areas to Meet the Requirements of Augmented Education Innovation 4.0*, Augmented Human Research, 6(9).

[9]   Hye In Jeong et al. (2017), *The acceptance of computer technology by teachers in early childhood education*, Interactive Learning Environments, 25(4), 496-512.

[10]   Noga Magen-Nagar et al. (2019), *The Obstacles to ICT Implementation in the Kindergarten Environment: Kindergarten Teachers' Beliefs*, Journal of Research in Childhood Education, 33(2).

[11]   Qi F. (2021), *Application of New Media Technology in the Information Teaching of Preschool Education* , International Conference on Society Science.

[12]   Tan R.-J. D. F. a. P. J. B. (2019), *Application of Information Technology in Preschool Aesthetic Teaching from the Perspective of Sustainable Management*, Sustainability, 11.

[13]   Lê T. M. T. et al. (2022), *The current situation of integrating technology education for preschool children in Hue city, Thua Thien Hue province*, Ha Noi Journal of Education University, 67(4A), 81-90.

[14]   Nhi T. V. et al. (2022), *Using technology in preschool classrooms: Teachers' perspectives in the Central and Central Highlands regions*, Ha Noi University of Education, 67(4A), 72-80.

[15]   Jef Peeraer et al. (2011), *ICT in teacher education in an emerging developing country: Vietnam's baseline situation at the start of 'The Year of ICT*, Computers and Education, 56(4), 974-982.

[16]   Sarika Kewalramani et al. (2020), *Technology-integrated pedagogical practices: a look into evidence-based teaching and coherent learning for young children*, European Early Childhood Education Research Journal, 163-166.

[17]   Wenwei Luo et al. (2023), *A Social Media Analysis of the Experiences of Chinese Early Childhood Educators and Families with Young Children during Covid-19*, Sustainable Early Childhood Education for the Sustainable, 15(3).

[18]   Wenwei Luo et al. (2021), *Are early childhood teachers ready for the digital transformation of instruction in Mainland China? A systematic literature review*, Children and Youth Services Review, 120.