

THE PERSPECTIVE OF PRESCHOOL TEACHERS ON THE USE OF DIGITAL TECHNOLOGY

Dondu Neslihan Bay

Department of Preschool Education, Faculty of Education, Eskisehir Osmangazi University,
Eskisehir, Turkey

bayneslihan@gmail.com

*Corresponding Author

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ABSTRACT

Rapidly developing digital technology has also entered educational settings. Teachers play a crucial role in using digital technology in education. This study aims to examine preschool teachers' views on using digital technology in early childhood learning settings in Turkey (N=43). Data were obtained qualitatively through closed and open-ended interview questions from teachers working in 16 different provinces of Turkey. Data were collected online with a semi-structured interview form. In the study, teachers' views on using digital technology in their homes and classrooms and the role of digital technology in preschool education were evaluated. The data obtained through the interview were analyzed by inductive analysis. As a result of the study, it was found that teachers possessed web-based technologies, and they mostly used smartphone applications (97.7%). On the other hand, they used digital technology less in their classrooms (48.8%); teachers generally used digital technology with their devices, such as smartphones. 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: it makes it easier to do their job (46.5%), facilitates learning in education (39.5%), facilitates the transfer of gains (41.9%), and facilitates communication with family (34.9%). On the other hand, teachers' views revealed some negativities regarding digital technology. In the 21st century, where digital technology has become an indispensable element, it is considered necessary to provide children with the skills to use digital technology. Therefore the positive aspects of digital technology in education declared in teachers' statements are an important result of the research.

Keywords: digital technology, preschool education, teacher, internet

INTRODUCTION

Significant progress has been made regarding the role of digital technology in education in Turkey. Especially the Covid 19 pandemic further revealed the importance and necessity of digital technology. Digital technology mainly covers equipment and devices, such as laptop and desktop computers, mobile technologies, and digital toys, with an internet connection, communication connection, and many functions (Aldhafeeri et al., 2016). In other words, digital technology is the devices, such as computers, mobile phones, the internet, video, camera, and applications, such as web technologies, that enable information to be displayed on a screen, stored, and transmitted electronically (Cabi, 2016). Today, all these devices and their applications have entered the lives of teachers, families, and children. They have begun to get

a permanent place in homes and early childhood education programs (Simon & Donehue, 2011). The Council of Europe has declared supportive applications of digital technology in the early childhood education as the key competence of lifelong learning (European Parliament and the Council, 2006). Integrating technology and media in early childhood education means that computers, software, digital cameras, and the internet are used daily in classrooms (Hertz, 2011). Research reveals the educational benefits of digital technology in early childhood education on learning and teaching (e.g., Fridberg et al., 2017, Jahnke & Kumar, 2014). For example, digital screens and web-based programs allow children to gain experience with animals, people, landscapes, and objects, record their real-life experiences through images, sounds, and stories, look at them repeatedly and share the information they recorded (NAEYC, 2012). In addition to these opportunities, some digital applications that give feedback when mistakes are made enable children to obtain fast and accurate information (İnci & Kandır, 2017). With all these tools, digital technology, which has taken its place in educational environments over time, offers children the opportunity to expand learning (Hertz, 2011; Özdil et al., 2021). Colorful graphics, animations, motion pictures, and videos provided by digital technology applications make learning more fun and permanent by supporting the skills such as creativity, curiosity, discovery, and independence, in early childhood (İnci & Kandır, 2017). Children actively use digital devices to express themselves creatively, draw, read and include digital activities in their dramatic play (Edwards, 2013).

The use of digital technology depends on the child's characteristics, such as age, developmental level, needs, interests, and abilities. Children show developmental progress from exploration to mastery in the practical use of technological tools and materials based on their interests while performing the desired activity (NAEYC, 2012). As children are expected to demonstrate the ability to use paper and pencil before demonstrating their writing ability, they must first be allowed to gain the ability to use technology tools by providing them access. Then they should be given the necessary time to do research and experiments (NAEYC, 2012). To develop children's digital technology skills, teachers must create a learning setting in which digital technology is adapted (Tang & Chaw, 2016). Thus, teachers should have digital technology skills and develop teaching methods, techniques, and strategies to integrate digital technology into educational programs (Sulak, 2019). With the attitude of teachers to support children in this direction, the use of digital technology in early childhood education could be possible (Otterborn et al., 2018). Teachers are expected to prepare educational programs using digital technology in preschool institutions; therefore, their attitudes, views, and skills are critical. This study examined the views of 43 preschool teachers working in 13 different provinces from each region of Turkey on the use of digital technology. The research will contribute to a better understanding of the use of digital technology in preschool education by revealing the perspective of teachers.

Digital Technology in Early Childhood Education

Digital technology in early childhood education is discussed in three aspects: early childhood education, teachers, and parents.

Preschool Education

Integrating digital technology into early childhood education brings many benefits (Mertala, 2019). The most important of them is that the integration of computers, tablets, educational

games, and multimedia presentations into education increases the motivation of children (Çakıroğlu & Taşkın, 2016; Huffstetter et al., 2010; Istenic Starčić et al., 2016). Roseberry et al. (2014) examined the effect of social media use on young children's language development, concluding that children learn new verbs easily with video chat training. Bartan (2020) examined the effect of storytelling techniques on children and concluded that the computer and storytelling method is an effective method for children compared to other methods. Using digital technology with interactions and experiences contributes to children following directives, providing self-control, and developing problem-solving skills (Aldhafeeri et al., 2016). Plowman et al., (2012) study examined the effect of technology use on preschool children's learning. They reported that children gain operational skills that enable them to use and understand technological tools, expand their knowledge and understand the world, improve learning motivation, and understand the role of technology in daily life. Digital media, which contains new literacy skills of modern media societies expressed with the terms modal literacy and multimodal literacy (Wolfe & Flewitt, 2010), improves children's reading and writing skills (Sandvik et al., 2012). In the study examining the effects of touch tablets on children's literacy skills, Neumann (2014) concluded that early literacy skills, such as writing the name, letter knowledge, and phonetics, develop in children using touch tablets. Outhwaite et al. (2017) study addressed the effect of tablet use on the development of children's early math skills; it concluded that tablets provide substantial learning gains in developing early maths skills with features such as repetition, interaction, and rapid feedback. They reported that it provides adequate individualized support, especially for children with memory difficulties or low achievement. In addition, as the use of information and communication technologies (ICT) such as tablets and interactive whiteboards supports individual, dynamic, and active involvement (Hernwall, 2016), it allows the development of cooperation and communication skills in children (Marsh, 2010; Sandvik et al., 2012).

One of the most important reasons for using digital technology in early childhood education is the failure to meet the changing educational needs of children with the digitalization of societies. There should be changes in the content of early childhood education, and the use of technology should be included to prepare children for a society that changes with technology (Aldhafeeri et al., 2016; Casillas Martín et al., 2020; Hernwall, 2016; Larson & Miller, 2011; Lindahl & Folkesson, 2012; Özdil et al., 2021). Effective education systems are possible by combining cultural capital representing the knowledge brought by age, such as the ability to use cultural tools and cultural habits that include the values and attitudes of societies. Therefore, digital devices, which have become an element of cultural heritage, have become a pedagogical tool in education (Aldhafeeri et al., 2016). The use of technology to enhance children's cultural and developmental learning requires professional judgment on what is appropriate (Hobbs, 2010). However, teachers' lack of ever-increasing technology knowledge causes them to have problems applying digital technology in age-relevant pedagogy content. Creative solutions are needed to maximize the benefits of teachers' use of digital technology in play-based education programs (Aldhafeeri et al., 2016; Aubrey & Dahl, 2014).

One of these solutions is shifting from the traditional classroom order in educational institutions to digital classrooms where individuals with the qualifications needed by society can be trained. Today, digital technology tools such as video projectors, smart boards, e-books, mobile devices, downloadable music, online social networks, and uninterrupted audio and video networks are technological developments that can be used in classrooms (Karoğlu et al., 2020). There are many examples of their applications in education, i.e., coding, word cloud creation, concept map preparation, digital story preparation, educational cartoon preparation, web page preparation, google drive sharing applications, blogs, digital games, augmented

reality and virtual classroom environments (Gülen, 2021). Only teachers can make this shift in education through regular educational practices (Casillas Martín et al., 2020). Teachers act shyly regarding technology because care is prioritized to making children feel better in younger age groups (Puroila & Haho, 2017); they use digital technology more as the age increases (Dong & Newman, 2016). In many studies, the developments of pedagogical approaches encouraging teachers to integrate digital technology into educational programs so that children acquire these skills in early childhood and support them more let early childhood teachers see technology as a fact that could be fought, resisted, and made less threatening instead of exploring the characteristics of technology (e.g., Sandvik et al., 2012; Wang et al., 2010; Wolfe & Flewitt, 2010).

Research reported that teachers worry that the use of digital technology may limit children's communication with other people, keep them away from active play, cause physical problems, create a risk of addiction, and expose them to harmful content (Öner, 2020; Mustafaoğlu et al., 2018; Şahin et al., 2015). These teachers' concerns about technology use result from their perception that children should be protected and the definition of digital technology in early childhood (Hernwall, 2016; Lindahl & Folkesson, 2012). Digital technology usage is avoided, especially in babies and young children (Schmidt et al., 2009). In preschool, digital technology should not replace creative play, exploration, physical activity, outdoor experiences, and social interactions, which are essential for children (Van Scoter et al., 2001). It should be included in the daily routine in a balanced way (NAEYC, 2012). Preschool children who use digital technology in their education possess digital technology skills at various levels (NAEYC, 2012). Pedagogical approaches that encourage the integration of digital technology into education programs should be developed so that children can acquire these skills in early childhood and get more support (Edwards, 2013; Neumann, 2014). The natural integration of digital technology in education can be achieved by children and teachers focusing on activity or discovery rather than digital technology (Edutopia, 2007).

Preschool Teachers

Teachers are the decision-makers of what, how, when, and why to apply in various social-cultural contexts to expand children's knowledge in the education process regarding their development, learning, individual interests, and readiness to use digital technology (NAEYC, 2009). In order to make the right decisions, teachers should spend time evaluating the digital technologies to be used in the classrooms and choose the appropriate one, carefully observe children's use of materials to identify opportunities and problems, and then use digital technology in a developmentally appropriate content without prejudice (Buckleitner, 2011). When devices and applications are adequately chosen, children become more and more competent in using technology tools to perform applications such as painting, playing games, recording stories, taking photos, and creating books (NAEYC, 2012).

In addition, integrating technology into educational environments is necessary to eliminate the disadvantages of children who experience economic difficulties in accessing technology. The failure to intervene in these children, who cannot use digital technology as their peers, at an early age will cause a cumulative increase in educational inequality in society (Dereli & Türk Kurtça, 2022; Mertala, 2019). It is known that educational inequality has increased, especially with the Covid-19 pandemic announced as of 2020. Education Information Network (EBA) applications are necessary for using digital technology in education in Turkey (Dereli & Türk Kurtça, 2022; Karoğlu et al., 2020). EBA is used as a

network for information exchange in education. This system, built by the Ministry of National Education, is a social education platform. However, this process has made the inadequacy of digital technology use in children even more apparent. The disadvantages arising in children's access to and use of digital technology can only be minimized by integrating digital technology into the education process by early childhood teachers, and a positive effect will occur on children's digital technology levels. Therefore, teachers play an important role in developing digital technology skills (Tuğluk & Özkan, 2019), one of the 21st-century skills, and in preventing disadvantages by providing equal opportunities in education.

Parents of Preschool Children

In early childhood education, digital technology is actively used in family education and involvement activities (Aktulun & Elmas, 2019). Technology tools such as smartphones, mobile devices, and their applications allow teachers to constantly communicate with the parents, share information and online resources with them, and allow parents to ask questions about their children and be more involved in their children's education. Thus, it is an effective way to establish and strengthen the home-school connection. Internet-based communication tools allow families to participate in meetings and conferences through video calls in case the family cannot attend face-to-face meetings and prepare a digital portfolio containing audio and video recordings (NAEYC, 2012). Teachers are responsible for being a model for the safe, healthy, ethical, and acceptable use of digital technology for families and children for all these practices. Accurate modelling of technology and digital media usage ensures that parents are informed more effectively. It also allows parents to be conscious about making the right choices regarding the use of technology and screen time at home. Families who become conscious of the use of digital technology become teachers who expand learning in the classroom by participating in practices such as doing activities at home, participating in activities with children, and using standard digital media (Takeuchi, 2011).

Digital technology contributes to the professional development of early childhood teachers. Teachers can form groups with their colleagues to share their knowledge and experiences, collaborate with them, access audio-visual research, follow current news, follow the pages of experts and institutions, communicate with them, and attend online courses. Thanks to these opportunities, digital technology increases teachers' motivation in their professional development; it improves their technology use by providing unlimited opportunities (Carlson & Gadio, 2002). Teachers' skills in using digital technology are related to being a model in safe and careful use of technology and how much they can use strategies such as choosing equipment suitable for children's perceptual and physical abilities; recommending programs or applications that emphasize open-ended learning, allowing practice and exercises, and explore the drawing; enabling children and adults who play with them to use devices together; using classroom technology that is visible and accessible from all points of the classroom; and encouraging children to verbalize their thoughts when solving technology problems (Epstein, 2015). Along with these skills, it should be aimed that teachers use technology more to support professional development. Teachers whose development is supported will integrate technology into education more effectively in their classrooms (Blackwell et al., 2013).

Many international studies are addressing the use of digital technology in preschool education from teachers' perspectives (e.g. Gao et al., 2011; Hammond et al., 2009; Ottenbreit-Leftwich et al., 2010; Sandvik et al., 2012; Thorpe et al., 2015; Wang et al., 2010; Wolfe &

Flewitt, 2010; Veen, 1993). On the other hand, the studies in Turkey on the views and attitudes of teachers towards the use of digital technology in preschool education are few and limited (e.g., Halmatovet al., 2017; Konca & Tantekin Erden, 2021; Oğuz et al., 2011; Öner, 2020; Önkol et al., 2011). Moreover, related studies did not holistically examine teachers' views on the teacher, education, program, and family involvement dimensions of using digital technology in preschool education.

This study focuses on early childhood education teachers' use of digital technologies. The study attempted to obtain information in two areas.

1. Teachers' use of digital technology (the digital technologies they have at home and in their classrooms, the digital technologies they use, their daily internet use, and the availability of internet in their classrooms).
2. Teachers' views on the use of digital technologies in preschool education.

The study will contribute to understanding teachers' views on the use of digital technology in the Turkish early childhood education context.

METHODOLOGY

It aims to understand early childhood education teachers' use of digital technology and their perspectives on its use in education. The research was conducted following the qualitative method (Creswell, 2007), allowing flexible and extensive data collection to reveal the participants' experiences, perceptions, and thoughts. The case study design, one of the qualitative research designs, was used in this study; a case study is an in-depth investigation of one or more situations with a holistic approach (Yıldırım & Şimşek, 2013).

In Turkey, preschool teachers receive four years of education in education faculties, and after graduating, they are appointed to schools with an exam conducted by the state. The preschool curriculum approved by the state is implemented by the teachers in the preschool education institutions. The applied preschool curriculum is a program developed by academicians after examining educational approaches and existing curriculums implemented in different countries. Participation of families is an essential part of education. Preschool teachers inform parents about educational practices, provide educational support to families on the subjects they need, ensure their participation in classroom activities, and organize home visits and individual meetings.

In the research, semi-structured interviews were used to collect the teachers' views on digital technology from 7 regions of Turkey, and teachers' views on using digital technology were examined in a holistic and in-depth manner. The study addressed the general views of the teachers on using digital technology. However, since the teachers used it mainly during the pandemic, they emphasized the pandemic process in their answers, but the study is not limited to the pandemic period.

Participants

Participants were determined based on the snowball sampling method, one of the purposive sampling methods (Yıldırım & Şimşek, 2013). Regarding its geographical structure, Turkey

consists of seven regions and 81 provinces. A total of 43 teachers from 16 different provinces in 7 regions of Turkey participated in this research (Istanbul, Kocaeli, Çanakkale, Ankara, Eskişehir, Sivas, Aksaray, Van, Kars, Adıyaman, Diyarbakır, Urfa, Hatay, Isparta, Zonguldak, Manisa). Demographic information of teachers is given below.

Table 1
Demographic Information of Participants

| Variable | Sub-categories | N | % |
|----------------------------------|----------------|----|------|
| Gender | Female | 41 | 95.4 |
| | Male | 2 | 4.6 |
| Professional experience | 1-5 years | 21 | 48.8 |
| | 6-10 years | 8 | 18.6 |
| | 11-20 years | 14 | 32.6 |
| The organization where they work | Kindergarten | 18 | 41.9 |
| | Preschool | 25 | 58.1 |
| The age group they work with | 4-year-old | 5 | 11.6 |
| | 5-year-old | 38 | 88.4 |

ECE Curriculum constructed by the Ministry of National Education is implemented in all public schools throughout the country. 5-year-old children receive education in preschool, while 3-5-year-old children attend kindergartens. The participants are teachers working in public schools and actively implementing the preschool educational program. Each region has different geographical conditions, and the socio-economic status of families of children attending public schools varies.

Data Collection

The data were collected through a questionnaire developed to inquire about preschool teachers' use of digital technology. The questions were developed by considering previous studies (Marsh et al., 2015; Thorpe et al., 2015), examined by two field experts, and revised according to their advice. The semi-structured interview form was transferred to Google forms online and shared with the teachers, and the data were obtained from the teachers' answers. Teachers participated in this study voluntarily. Teachers' consent was taken at the beginning of the interview form. They were asked to answer all the questions, but it was not obligatory. The answers of the teachers were taken in writing and recorded.

The interview form consists of three parts: demographic information, teachers' technology use, and their views on digital technology use.

Demographic Information

Information on teachers' gender, age, work experience, school type, and age group they work with were collected.

Teachers' Use of Technology

Five closed-ended questions were asked about teachers' use of technology. Teachers declared the technological devices they have at home (desktop computer, laptop computer, tablet, television, smartphone, game console), the availability of internet at home, daily internet use, and the digital technologies they use (smartphone applications, video DVD, online research, installing software on the computer, sending/receiving e-mail, communication programs such as Skype, social networks such as Facebook, Twitter, programs to prepare presentations (such as PowerPoint), processing packages such as Microsoft Word, drawing programs such as Microsoft Paint, storytelling programs such as Microsoft Photo Story, editing digital photos, playing computer games, digital technology devices they have in their classrooms (desktop computer, laptop computer, tablet, television, electronic whiteboard) and the availability of internet in their classrooms.

Teachers' Views on The Use of Digital Technology

Four open-ended questions were asked as a google doc to get teachers' views on the use of digital technology. The open-ended questions are given below.

- Please tell us how you approach using digital technology as a teacher?
- Based on your own experience, what are the effects of using digital technology on children's early childhood education?
- What are the effects of using digital technology on the national preschool educational program?
- What are the effects of using digital technology on family involvement?

Teachers' answers about the role of digital technology in early childhood education were transcribed.

Data Analysis

The data were analyzed inductively following qualitative analysis stages, that is, finding the themes, organizing the codes and themes, and defining and interpreting the findings (Yıldırım & Şimşek, 2013). This method allows for creating and understanding the themes by in-depth analysis of the relationship between emerging concepts (Glesne, 2012). The Program for the Analysis of Qualitative Data (AQUAD), which allows the assignment of the codes resulting from classifying the meaning units derived from the participants' statements and grouping them under four themes, was used in the inductive analysis. This program facilitated the analysis by revealing the coding combinations in participants' statements. The researcher created 52 codes from the participants' views, and eight categories were determined based on these codes. Categories were grouped under four themes.

In line with the purpose of the research, the percentages of the codes representing participants' views were calculated to determine and examine the effects of digital technology. In these calculations, groupings were made considering that the participants gave at least one view for each theme, and some participants' views covered more than one code. In order to ensure reliability in the coding and calculations, the data of 8 participants, representing 20% of the sample, were coded by two experts. The reliability of coding was calculated by the formula of Miles, Huberman and Saldaña (2014) ($\text{Reliability} = \frac{\text{Agreement}}{\text{Total Agreement} + \text{Disagreement}}$). 58 codes were compared, 3 were changed, and the reliability was 95% ($\frac{55}{55+3}$). According to Miles, Huberman and Saldaña, coding is reliable when this number exceeds 85-90%. Participants were named T1, T2, T3...., and the findings were interpreted through the themes and codes by including direct quotations of the participants. Closed-ended questions on the use of technology were presented as percentages and frequency and then interpreted.

FINDINGS

This section presents the obtained data in graphs and tables with quotations from the participants' statements.

Teachers' Use of Digital Technology

The digital technologies that preschool teachers have at home and in their classrooms are given in Figures 1 and 2.

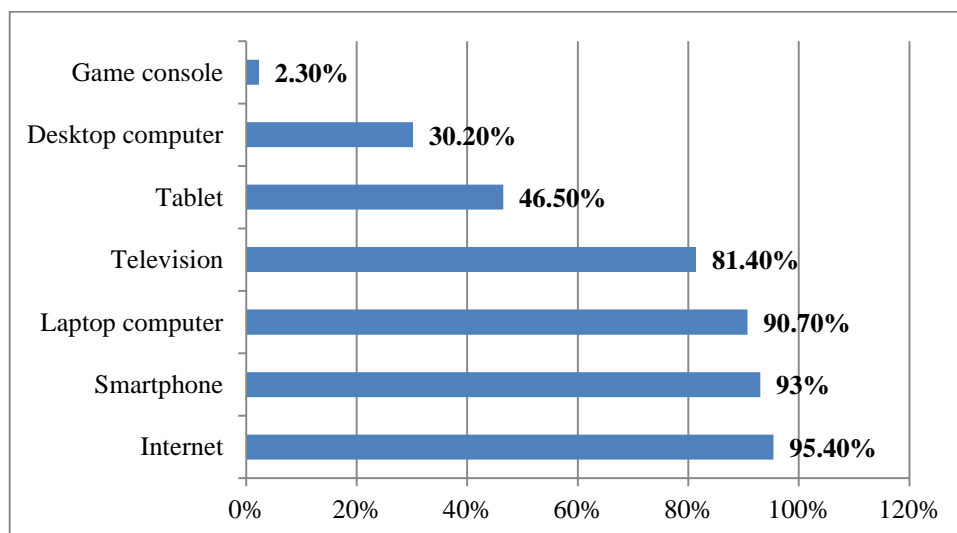


Figure 1. Preschool Teachers' Digital Technologies at Home

Regarding digital technologies teachers have at home, the vast majority of them have internet (95.4%), smartphones (93%), and laptop computers (91%). On the other hand, only one teacher owns a game console (2.3%).

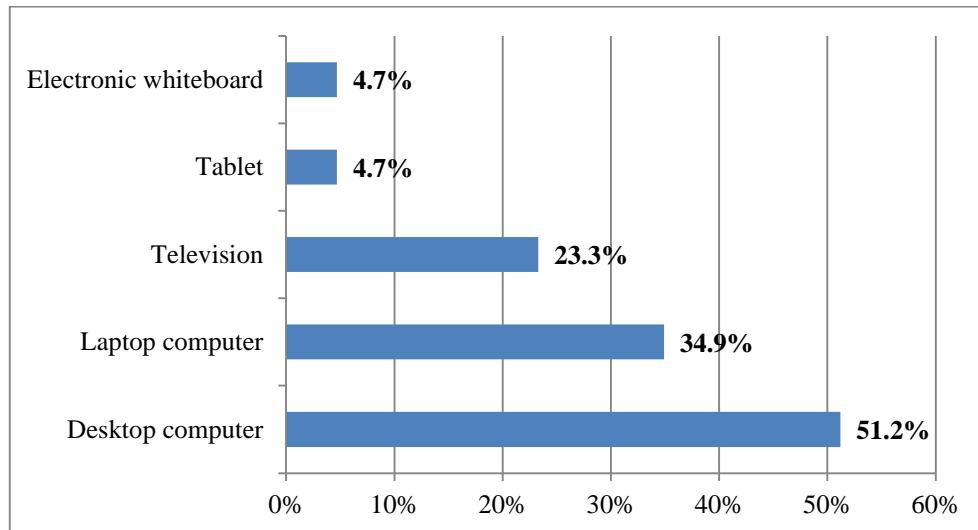


Figure 2. Preschool Teachers' Digital Technologies Preschool in Their Classrooms

The digital technology teachers have mostly in their classrooms is desktop computers (51.2%). The least-owned digital technology is the electronic whiteboard (4.7%). Four teachers (9.3%) only have a television in their classroom, and these teachers stated that they use their own digital devices. The figure below shows internet availability in classrooms.

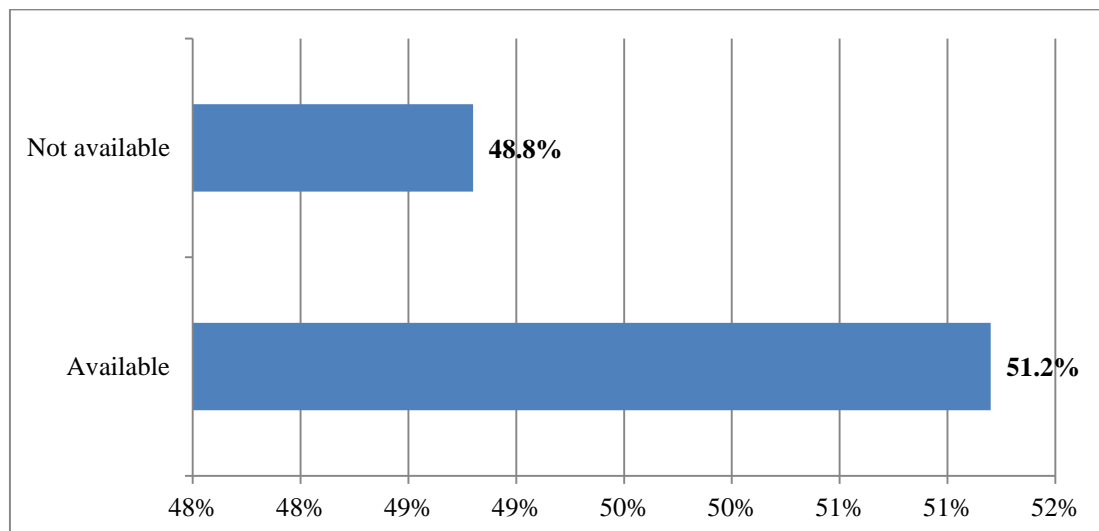


Figure 3. Internet Availability in Classrooms

Remarkably, almost half of the teachers do not have internet, which is crucial in using digital technology, in their classrooms (48.84%). The digital technologies used by the teachers are given in the figure below.

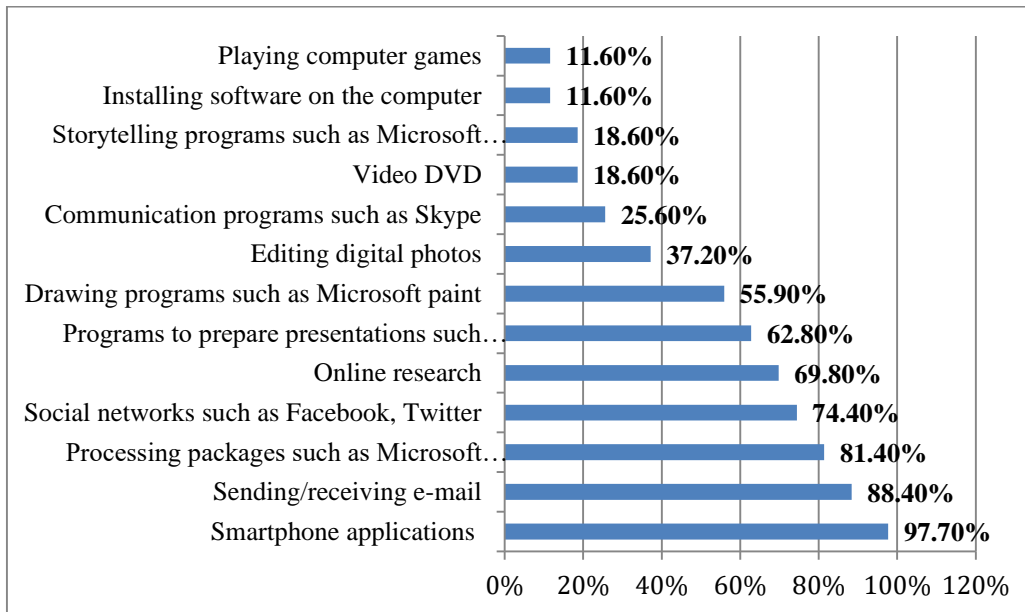


Figure 4. Digital Technologies Used by the Teachers

Figure 4 shows that teachers mostly use smartphone applications (97.7%), and the least used digital technology is playing computer games (11.6%) and installing software on the computer (11.6%). Teachers' daily internet usage is given in Figure 5 below.

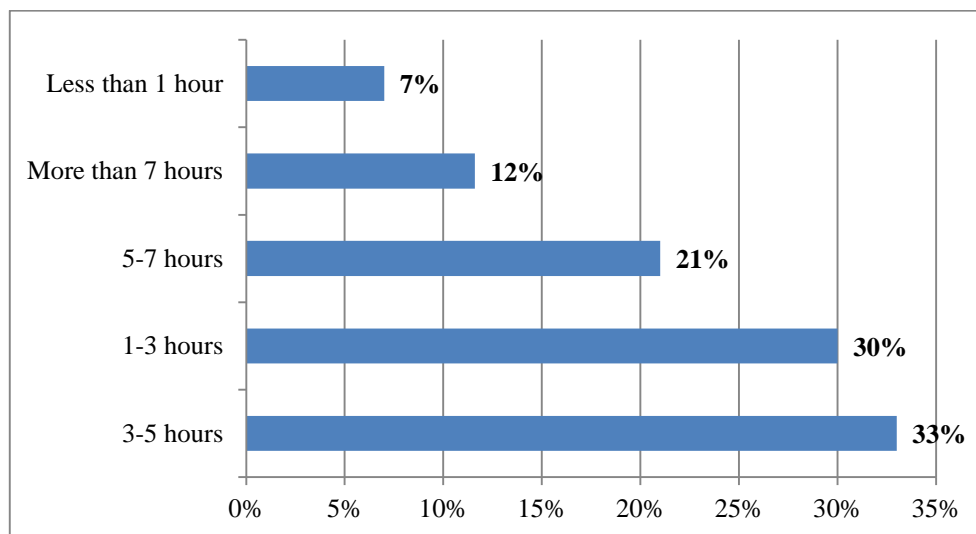


Figure 5. Teachers' Daily Internet Usage

Most teachers use the internet for 3-5 hours (33%) and 1-3 hours (30%). Nearly two-thirds of teachers use the internet for 1-5 hours. Despite teachers who use the internet for less than 1 hour (7%), some teachers use the internet for 7 hours or more (11,6%).

Teachers' Views on The Use of Digital Technologies in Early Childhood Education

Use of Digital Technology by Teachers

Four themes and categories emerged from teachers' views on the use of digital technology. One of the phenomena examined in the research is teachers' use of digital technology. All identified themes, categories, and codes are given in Table 2, aiming to show them holistically.

Table 2
Use of Digital Technology by Teachers

| Theme: Teacher | Categories | Positive | | Negative | | | |
|-------------------|---|----------|------|----------|-----------------------|---|-----|
| No | Codes | f | % | No | Codes | f | % |
| 1 | Facilitates doing the job | 20 | 46.5 | 1 | Piggybacking | 3 | 7 |
| 2 | Ease of accessing information | 15 | 34.9 | 2 | Waste of time | 3 | 7 |
| 3 | Facilitates activity preparation | 10 | 23.3 | 3 | Insufficient hardware | 2 | 4.6 |
| 4 | Keeping up to date with current information | 9 | 20.9 | 4 | Social media use | 1 | 2.3 |
| 5 | Useful | 8 | 18.6 | 5 | Challenging | 1 | 2.3 |
| 6 | Facilitates communication | 8 | 18.6 | | | | |
| 7 | advantageous | 7 | 16.3 | | | | |
| 8 | Quick access to information | 7 | 16.3 | | | | |
| 9 | self-improvement | 6 | 14 | | | | |
| 10 | Effective use of time | 5 | 11.6 | | | | |
| 11 | Opportunity to receive online education | 5 | 11.6 | | | | |

In Table 2, there are 11 codes for the teacher theme, grouped under positive and negative categories. Most of the teachers stated that digital technology facilitates their job (46.5%), followed by the use of digital technology facilitates access to information (34.9%), they prepare their activities more easily (23.3%), allows them to follow up-to-date information (20.9%), they find it useful (18.6%), facilitates communication (18.6%), provides advantages (16.3%), allows personal development (14%), allows them to take online training (11.6%) and enables them to use time effectively (11.6%). These positive views can be interpreted as teachers seeing digital technology as a factor that supports their professional development. On the other hand, the negative views are; that digital technology causes teachers to piggyback

(7.0%), lose time in searching for information (7.0%), inadequate equipment (4.6%), excessive use of social media by teachers (2.3%), and difficulties experienced due to the lack knowledge of digital technology (2.3%). Some of the participants' views are given below in their words.

(T3)"One advantage is taking online courses that I cannot take because of not having time and means of transportation, thanks to technology. Being able to reach many ideas instantly can also be an advantage. It allows me to save time in many subjects and convey more achievements to children." (Codes 1, 10, and 11 in the positive category).

T6. With a single click, we can find the opportunity to instantly list and examine many situations and events related to our profession. We can evaluate preschool education and its developments throughout the world and make adaptations according to the essence and conditions of our own country. Here, it is vital to keep authenticity and creativity alive and prevent lazily copying and pasting, direct application (Codes 3, 4 in the positive category; code 1 in the negative category).

(T21) "There are numerous advantages. For example, I encountered many difficulties in the first days of the profession. I realized that I was not the only one who experienced these difficulties from the videos of the teachers on the internet and youtube channels about their first professional years. I had good ideas about how to overcome these difficulties. Another advantage is that we can find good activity ideas on Pinterest. I do not think there is a disadvantage in terms of professional development. I can get activity ideas. We share ideas with friends; we support each other in maintaining order in the classroom and overcoming the difficulties encountered. I can also access images related to the concepts I will address in class on the internet. I can download educational videos to the laptop and show them to the children in the classroom." (Codes 3, 6, and 7 in the positive category).

(T25)"Digital technology makes our work easier most of the time, but the lack of sufficient hardware and infrastructure decreases the efficiency of this process. Sometimes learning new things or trying to use unfamiliar programs stresses me out. (Code 1 in the positive category; codes 2, 5 in the negative category).

As seen in the participants' statements, teachers mainly evaluated the use of digital technology as positive; however, they also expressed some negative aspects, albeit a little."

Use of Digital Technology in the Education

The second fact examined in the study is the use of digital technologies in education. The themes, categories, and codes obtained are given in Table 3.

Table 3
Use of Digital Technology in the Education

| Theme: Education | | Categories | | Positive | | Negative | |
|------------------|----------------------------|------------|------|----------|-----------------------|----------|------|
| Codes | | f | % | Codes | f | % | |
| 1 | Facilitates Learning | 17 | 39.5 | 1 | Distractibility | 7 | 16.3 |
| 2 | Attracting attention | 16 | 37.2 | 2 | Dependence | 5 | 11.6 |
| 3 | Contributing | 15 | 34.9 | 3 | Piggybacking | 5 | 11.6 |
| 4 | Permanent learning | 10 | 23.3 | 4 | Boredom | 4 | 9.3 |
| 5 | commitment | 9 | 20.9 | 5 | Social media | 2 | 4.6 |
| 6 | Enrichment | 7 | 16.3 | 6 | Harmful content | 2 | 4.6 |
| 7 | Different ways of learning | 6 | 14 | 7 | Health problem | 2 | 4.6 |
| 8 | visualization | 4 | 9.3 | 8 | Developmental problem | 1 | 2.3 |
| 9 | Entertaining | 3 | 7 | | | | |
| 10 | Augmented reality | 2 | 4.6 | | | | |

Table 2 shows 18 codes constituting the education theme, grouped as positive and negative. Regarding positive statements, facilitates learning (39.5%) was mentioned the most, followed by attracting children's attention (37.2%), contributing to learning (34.9%), providing permanence in learning (23.3%), concretizing abstract concepts (20.9%), enriching education (16.3%), enabling to use different learning ways (14%), providing visualization (9.3%), making education entertaining (7%) and augmented reality applications (4.6%). The view that digital technology causes distraction (16.3%) was expressed the most regarding negative statements. Other negative codes are that it causes addiction in children (11.6%), the ease of digital technology makes children piggyback (11.6%), children start to get bored after a while (9.3%), increases the use of social media in children (4.6%), causes children to be exposed to harmful content (4.6%), causes health problems (4.6%) and developmental problems (2.3%) in children. Some quotations from the positive and negative views of the participants are given below.

(T7)"Technology, which has the power to make education more enjoyable and enrich the lessons with interesting content, will bring many negativities when misused. For example, some families introduce their children to technology to give them the habit of eating. However, this makes children insensitive to the feeling of hunger and satiety, and long-term use of technological tools may have some psychosomatic outcomes. It is a well-known fact that many studies have been conducted on the negative effects of technology addiction on health, such as obesity. The effect of technological tools on children is proportional to the duration of use. The effect increases at the same rate with the duration. Positive or negative effects vary according to their intended use. Today, although the harms of technology are constantly mentioned, its proper use will also be extremely beneficial. Because technology is now a reality that we have

to accept. We live in the age of technology in a globalizing world. We must be aware of this." (Codes 2, 6, 9 in the positive category; codes 2, 7 in the negative category).

(T10)"A great advantage if it can be used well. It allows us to show something we want to show in its actual form much more easily. Technology makes learning even easier, helping children grasp faster. Their interest and attention are drawn much more easily. For example, they participate more enthusiastically in activities when I use things like animating pictures with a 4D reality app. As a disadvantage, I can say that more effort is needed to draw children's attention, who are accustomed to visuals and movements, to prevent them from getting distracted quickly." (Codes 1,2,4,5,10 in the positive category; code 1 in the negative category).

(T41)"Digital technology products play an important role in accessing the shortest and fastest process. These technological tools are frequently used in education and training, making it easier to give students concrete information. It makes children feel better as they actively participate and provides perceptual permanence." (Codes 1,4,5 in the positive category).

The participants' statements emphasize the positive aspects of digital technology in education; the negative aspects of the children's use of digital technology are also stated. The third phenomenon in the research is digital technologies in the national ECE curriculum.

The Use of Digital Technologies in the ECE curriculum

In Table 4, the codes determined under the theme were given for the positive-negative categories.

Table 4
The Use of Digital Technologies in the ECE Curriculum

| Theme: Program | | Categories | | Positive | | Negative | |
|----------------|-------------------------------|------------|------|----------------------------------|---|----------|--|
| No | Codes | f | % | Codes | f | % | |
| 1 | Facilitates giving gains | 18 | 41.9 | 1 Learning inappropriate content | 1 | 2.3 | |
| 2 | Useful | 13 | 30.2 | 2 Eloignement from learning | 1 | 2.3 | |
| 3 | Balanced use | 4 | 9.3 | 3 Useless for some gains | 1 | 2.3 | |
| 4 | Gaining technology use skills | 3 | 7 | | | | |

In Table 4, positive and negative views on the program theme are reported with 7 codes. Regarding positive statements, participants mainly stated that digital technology facilitates giving gains (41.9%), followed by usefulness for the program (30.2%), the positive effect of balanced use (9.3%), and giving children the ability to use technology (7 %). Although the participants mainly evaluated digital technology positively regarding the program, a negative category emerged in the program theme as in other themes. Negative statements include digital technology causes to see inappropriate content (2.3%), elicits children from learning (2.3%), and it is useless for some of the gains aimed to be given in the program (2.3%). The views of some participants are given below.

(T17)"I believe it has more negative effects than positive ones. My students fail to learn by seeing and experiencing; therefore, no concept fits perfectly. Another negative aspect is that not every student can access digital technology." (Code 2 in the negative category)

(T19)"As I mentioned in the previous questions, I think that applications such as augmented reality in education can also be used to realize many gains of our program. In the classroom environment, we may not always be able to work with real objects; I can say that using digital technologies has positive effects in such cases." (Codes 1,2 in the positive category).

(T22)"The positive effects are the gains such as thinking creatively, establishing a cause-effect relationship, and using Turkish correctly. On the other hand, the negative effects are being exposed to negative messages of technology, taking the information directly into their minds without filtering the wrong information." (Code 1 in the positive category; code 1 in the negative category).

(T43)"We can see in our lessons that digital technology is a facilitator in implementing the preschool program. The subject to be given to children can be conveyed more easily." (Code 1 in the positive category).

Digital Technology in Terms of Family Involvement

The last phenomenon in the research is digital technologies regarding family involvement. Table 5 shows the theme of family involvement holistically with its categories and codes.

Table 5
Digital Technology in Terms of Family Involvement

| Theme: Family | | Positive | | | Negative | | |
|------------------|---------------------------|----------|------|---|---|---|------|
| No | Codes | f | % | | Codes | f | % |
| 1 | Facilitates communication | 15 | 34.9 | 1 | It cannot be used in families with a low socio-economic level | 7 | 16.3 |

| | | | | | | | |
|---|---------------------------------------|---|------|---|----------------------------------|---|-----|
| 2 | Supports education at home | 6 | 14 | 2 | I do not use it | 2 | 4.6 |
| 3 | Supports family in distance education | 5 | 11.6 | 3 | Unnecessary use in communication | 2 | 4.6 |
| 4 | Facilitates family participation | 5 | 11.6 | 4 | Not useful | 2 | 4.6 |
| 5 | Family's education path | 4 | 9.3 | 5 | Families are unconscious | 1 | 2.3 |
| 6 | Easy access to information | 3 | 7 | | | | |

As shown in Table 5, the view that digital technology facilitates communication was expressed mainly regarding family involvement (34.9%). Other positive views are that the use of digital technology supports children's education at home (14%), provides support to the family in the distance education process (11.6%), facilitates family participation (11.6%), provides education for the family (9, 3%) and allows the family to access information easily (7%). The negative statements are that families with low socio-economic status cannot use digital technology (16.3%), it is not used for family involvement (4.6%), it is used unnecessarily by the family in communication (4.6%), it is not beneficial for families to use digital technology (4.6%), and unconsciousness of the families for their child (2.3%). Examples of the participant's views on family involvement are given below.

(T10)"It would be very useful if they[family]wanted to involve, especially since this is the only way to communicate during the pandemic, but some do not even have a smartphone. Unfortunately, communication with these people is limited. In order to ensure family involvement, sensitivity and awareness should be created in the family before relying on technology; otherwise, it will not work." (codes 1, 5 in the negative category).

(T16)"Many platforms facilitate reaching the family. I use it in family education rather than family involvement." (codes 1, 5 in the positive category).

(T19)"Positive aspects are being able to communicate more easily. The negative side is that the parents misunderstand this accessibility and think they have the right to text you in the middle of the night." (code 1 in the positive category; code 3 in the negative category).

(T37)"I do not think that digital technologies will be useful in family involvement. I know that kids are already stuck between cell phones and TVs in their homes. That is why I refrain from using it." (code 4 in the negative category)

(T38) "Thanks to digital technology, we communicate with parents more quickly. Thus, we can involve the family in activities at any time" (codes 1, 4 in the positive category).

Although the statements about family involvement are primarily positive, there are also negative ones. The view that families cannot use digital technology, primarily due to socio-economic reasons, is remarkable.

DISCUSSION

This study addressed two aspects of preschool teachers' use of digital technology. These are (a) teachers' use of digital technology (the digital technologies they have at home and in their classrooms, the digital technologies they use, their daily internet use, and the availability of the internet in their classrooms) and (b) teachers' views on the use of digital technologies in preschool education. The study results expanded the existing knowledge and paved the way for future research.

Teachers' Use of Digital Technology

The study revealed that teachers mostly have digital technologies at home and use the internet frequently; however, they use some digital technologies at a low level. On the other hand, it is noteworthy that less internet-enabled digital technology is used in classrooms. The number of tablets, electronic whiteboards, and laptops does not permit individual use of each child. Ergüleç and Kiremit (2019) examined the effect of tablet use in preschool on children's drawings and reported that using tablets provided more efficiency. Therefore, teachers should be supported by using digital technologies such as tablets. This requirement has also emerged in similar studies. In the study of Kara and Çağiltay (2017), examining preschool teachers' thoughts about technology use, teachers had favourable views. However, they stated they needed technological equipment in educational settings and further support to improve preschool education and develop technology use skills. Öner (2020), in his research examining the views of teachers on technology use and digital games in early childhood, stated that teachers have a basic level of digital technology use skills and that they only use computers, television, and the Internet as digital technology in the educational process, and that they use the internet mainly for social media in their personal use. Similarly, Demir (2015) concluded that preschool teachers' use of digital technology is limited to the use of computers and television.

Regarding the studies, it can be said that the teacher has a crucial role in using digital technology in the educational process. However, it is a fact that teachers need to be supported in terms of knowledge, skills, and equipment to use digital technology. Teachers must be able to create rich educational applications using technology (Bourbour Hosseinbeigi, 2020). Konca and Tantekin Erden (2021) concluded that although preschool teachers have a positive attitude towards digital technology, they use it to a limited extent in classroom activities. It is emphasized that the barriers to technology use should be identified to increase the quality of in-class digital technology use. Regarding the current study, the biggest obstacle to using digital technology is the absence of the internet in 48% of the classrooms. Similarly, in Thorpe et al. (2015) study examining the use of digital technology by preschool teachers in Australia, 48% did not have internet access in their classrooms. However, the internet is a necessary resource for quick access to information, and the absence of the internet limits the search for and access to up-to-date information.

Teachers' view on the use of digital technologies in preschool education

Teachers' views on digital technology were grouped under the themes of teacher, education, program, and family involvement. Teachers expressed positive views about using digital technology under the teacher theme, such as facilitating their job (46.5%) and accessing information (34.9%). Positive views such as the opportunity to participate in online courses, especially during the Covid-19 pandemic, show that digital technology contributes to teachers' personal and professional development. Under the education theme, teachers mostly expressed positive views, such as digital technology facilitates learning in the education process (39.5%) and attracts children's attention (37.2%). Studies revealing the positive effects of using digital technology in education support these views (e.g., Alberola-Mulet et al., 2021; Alpay & Okur, 2021; Çakıroğlu & Taşkın, 2016; Ergüleç & Kiremit, 2019). In their study involving teachers' views on technology and use, Veziroğlu et al. (2018) reported that preschool teachers mostly used technology for finding various types of activities, acquiring up-to-date professional knowledge, and using cartoons, videos, and puppet shows. In Koç's (2014) study examining teacher attitudes towards technology use in preschool classrooms, teachers had positive attitudes towards technology use. Teachers must enter a transformation that includes digital child-centered practices to change their educational strategies and pedagogical thoughts (Karoğlu et al., 2020).

However, it is seen that preschool teachers also tend to focus more on the negative aspects of digital technology use on children (Öner, 2020). Although preschool teachers seem to adopt digital technology, they use technology resources less (Buckleitner, 2011; Konca & Erden, 2021; McManis & Gunnewig, 2012). Studies have shown that teacher characteristics such as pedagogical beliefs, innovation, or workload constitute barriers to teachers' use of technology in education (e.g., Hammond et al., 2009; Veen, 1993). In the present study, it is seen that teachers told some negative statements that may arise from their pedagogical beliefs, such as distancing children from learning in terms of the program or not being beneficial for family involvement. According to Slutsky et al. (2019), which examined the use of digital technology in eight different countries, digital technology use in classrooms is very low in Turkey. Teachers are reluctant to use technology due to their negative thoughts about technology. Teachers considering themselves competent and improving, can use digital technology effectively and adequately (Anastasiades & Vitalaki, 2011).

In contrast, teachers who cannot use technology adequately feel insecure supporting children (Sandvik et al., 2012). The proper use of technology is as important as using it in the preschool period. Research shows that the proper use of digital technology provides children with many benefits in terms of knowledge, skills, and cognitive and language development (e.g., Alpay & Okur, 2021; Edwards et al., 2000; McCarick & Xiaoming, 2007; Neumann, 2014; Otterborn et al., 2018; Wong, 2015); on the other hand, its improper use may cause harm (e.g., Christakis et al., 2004; Duch et al., 2013; Sosa, 2016). Due to the differences between teachers' perceptions, beliefs, and practices, teachers do not use digital technology sufficiently in the educational process, although they consider it important and necessary (Alberola-Mulet et al., 2021). Preschool teachers are expected to use technology with children as a professional resource and to know the strategies and tools for using technology in education (NAEYC, 2010). The preschool period is critical because it is the year children develop rapidly, and their attitude towards learning is shaped. It should be kept in mind that if digital technology skills are not acquired during this period, children will be disadvantaged in closing the gap in their subsequent education levels (Veziroğlu Çelik et al., 2018). However, studies also show that teachers make little or no use of technology in educational practices (e.g., Gao et al., 2011;

Ottenbreit-Leftwich et al., 2010). It is due to the skills and attitudes of teachers rather than the lack of technological tools (Aldhafeeri et al., 2016). In order to eliminate negative views about the use of digital technology, teachers should improve themselves in digital technologies in line with the cultural elements of the society, taking into account the development of children.

In this study, teachers evaluated the use of digital technology in terms of the program as positive and emphasized that it facilitates the acquisition of learning outcomes. The increasing demands of teachers who aim to support children to use technology in the program have led to a rapid increase in the use of digital technology in preschool education (Swedish Public Access to Information and Secrecy, 2016). However, teachers have difficulties combining play-based pedagogy, which is the main feature of early childhood education, and digital technology (Aldhafeeri et al., 2016; Edwards, 2016). Especially teachers think that the use of digital technology poses a threat to pedagogy and children's free play (Bourbour Hosseinbeigi, 2020), making it difficult to use digital technology within the program. Providing preschool teachers with a technology policy showing them how to incorporate technology into their programs properly will help them use technology more effectively with their children (Blackwell et al., 2013). In this way, teachers' negative thoughts about technology in terms of the program will change.

Finally, the review of teachers' views about using digital technology regarding family involvement showed that they mostly expressed positive views on communication with families. The view that digital technology provides convenience to families, especially during the Covid-19 pandemic where the education was given online, can be considered a statement that children's education can be supported by digital technology in the home environment. Despite positive views, teachers also have negative views, such as that families cannot use digital technology due to socio-economic conditions, and it is useless for family involvement. Children's access to digital technology appears to be related to the economic status of families (Marsh et al., 2015). Families can only support their children by using digital technology within the bounds of economic possibility. Knowledge about the proper use of digital technology is essential for families that fulfill economic conditions. Biber et al. (2019) examined the technology use characteristics of preschool children; they found that families seem willing to control their children, and children's technology use is high. In the current study, teachers stated that digital technology is not used in family involvement; families use it unnecessarily, and they are unconscious, possibly resulting from the concerns about children's excessive use of technology.

The covid-19 pandemic led to an unprepared process in educational practices in our country and worldwide. In this process, there has been a significant increase in digital technology use in Turkey's preschool education. Teachers, who had to use digital technology suddenly, encountered difficulties in terms of material and technical and information equipment. Regarding the use of digital technology in preschool education, teachers mostly expressed positive opinions regarding their professional development, effects on children, national program implementation and family involvement. However, it is thought that teachers have some concerns due to their inability to use digital technology sufficiently and their lack of knowledge. These concerns cause them to have negative opinions.

LIMITATIONS AND FUTURE DIRECTIONS

The study results show preschool teachers' perspectives on digital technology. As a different cultural context, it is noteworthy that preschool teachers working in Turkey have and use digital technology and mostly state the positive effects of using digital technology. The study has expanded the research literature on digital technology in preschool education. However, the research had some limitations. 43 teachers working in 16 different provinces in 7 regions of Turkey have participated in the research. Teachers' use of digital technology and their views on it may change as their demographic characteristics or working conditions change.

The study data were collected from 43 teachers through interviews, one of the qualitative data collection methods. There are no in-depth studies on how teachers can use digital technology in education (Aktulun & Elmas, 2019). In order to understand the basis of teachers' views on the use of digital technology, there is a need to conduct research using multi-data collection methods. There is a need for more observational research on teachers' use of digital technology, especially in preschool education (Mertala, 2019). In their study examining the use of digital technology in early childhood education, Aldhaferii et al. (2016) found that teachers were hesitant to integrate digital technology into their educational processes and revealed the need to examine how digital technology is embodied in classroom practices. In the future, the results obtained from this study should be confirmed by observations and interviews with different samples. Generalizations can be made on teachers' use of digital technology using larger samples in quantitative research. Future studies may examine preschool teachers' use of digital technology with the sequential analysis method based on observations in the context of children, teachers, and families.

CONCLUSION

Preschool teachers' use of digital technology and their views on using it in education provided considerable information. The results will help expand and support preschool teachers' use of digital technology. Teachers' use of digital technology and their positive views on it shows their willingness to use it. However, the research shows that teachers have various needs in using digital technology in education. The lack of the internet in almost half of the classrooms is seen as a major obstacle to the use of digital technology. In addition to the provision of the Internet, there is a need for devices with Internet features in the classrooms. Another emerging element is the negative views teachers expressed about using digital technology. It can be said that teachers need to be supported to have the necessary knowledge, digital technology skills and equipment to ensure positive and safe digital use. Children's learning can only be supported by digital technology in education after meeting these needs.

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