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Focal points for digital technology integration in early childhood education: implications from practitioners' perspectives

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ABSTRACT

This study explored the integration of digital technology in early childhood education from the perspectives of 11 preschool teachers using qualitative methods. Through content analysis, four key themes were identified: objectives, multidimensional effects in education, obstacles, and needs/expectations. Teachers employ digital tools to adapt to changes and enhance learning, despite concerns about potential harm. Barriers include administrative support, teacher beliefs, and competencies, as well as educational policies and parent-teacher cooperation. The study recommends the need for in-service and pre-service training for teachers and comprehensive policy development for effective technology integration.

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digital technology;
integration of technology;
teacher's perspective

Introduction

As technology evolves at an unprecedented rate, numerous digital technologies have found unrestricted use in everyday life. In contrast to the previous generation, today's children are born and raised in a world where technology increasingly dominates all facets of life. Children introduced to digital tools like smartphones and tablets at a very young age incorporate technology into their games, social interactions, communication, and learning. Children have unique interactions with digital devices and view them as an integral part of life. In addition, they bring to school the information they have learnt through their digital devices (Dunn et al. 2018; İnci and Kandır 2017).

Digital technologies are an integral component of the environment of young children. According to study findings, the usage of digital technology by various age groups is expanding daily (Gjelaj et al. 2020). The fast growth of digital technology not only raises its utilisation rate (Katz and Macklin 2007; Mourlam et al. 2019), but also enables its application in a variety of fields. The field of education is one of these categories. Digital technologies are utilised in the area of education for a variety of purposes, including the learning-teaching process, the adaptation of children to an ever-changing environment, the employment of digital technology in children's activities, the application of skills, and the search for information (Scoter, Ellis, and Railsback 2001; Ministry of National Education [MoNE], 2020). How these devices are utilised is crucial for children's safety, development, and well-being. Specifically, digital technologies are employed to make students' learning processes permanent and improve their learning environments (Kayış 2022). In this

regard, digital technologies play a significant role in education, and their significance is growing daily in the developing countries (Metin 2018; UNESCO 2005). However, it is observed that the use of technology, which is crucial at all educational levels, is most prominent in early childhood. The use of technology in early childhood, which encompasses the child's critical developmental periods, has a positive effect not only on the child's developmental areas, but also on stimulating the child's sense of curiosity, allowing him/her to explore with different ways of learning, and on reasoning and problem-solving skills (Dubicka, Martin, and Firth 2019; İnci and Kandır 2017; Özturan and Bozcan 2017; Scoter, Ellis, and Railsback 2001; UNESCO 2010).

During the time spent in preschool institutions, how children utilise electronic tools and what they accomplish with these technologies are crucial (Holloway, Green, and Livingstone 2013; McFarlane 2019; Schriever, Simon, and Donnison 2020; Şendurur and Arslan 2017). Therefore, the use of digital tools in early childhood education should be integrated into the classroom environment in order to promote the development of learning-positive attitudes (Barron et al. 2011; Parette, Quesenberry, and Blum 2010; UNESCO 2010; Zevenbergen 2007). To integrate digital tools into learning-teaching processes, it is necessary to develop an educational vision, policies, and curriculum that complement each other, encourage the development of professional knowledge, facilitate access to digital resources, and make the educational environment conducive to the use of digital technology (Kurt 2013). The practitioners participating in early childhood education also contribute to the provision of the required circumstances for the integration of digital technologies into early childhood education. Preschool teachers should be able to produce content on social media platforms, interact with large audiences by conveying their ideas and opinions, have digital literacy skills, be competent in communication and collaboration skills, be experienced in the use of digital technologies, and have knowledge and skills in digital security in addition to their professional knowledge and skills (Bates 2015). Preschool teachers have a significant role in integrating digital technology into the classroom (Bates 2015; Kayış 2022; Mishra and Koehler 2006; Veziroğlu Çelik et al. 2018). In this regard, there is a strong correlation between the attitudes and views of preschool teachers about digital tools and how they conceptualise and use technology as an element of play in early childhood settings (Edwards 2016; Yelland 2011).

Due to the favourable benefits of digital technology on children's development in a variety of fields, the integration of technology into the educational process has become essential in many countries (Wahyudi 2008). In the United Kingdom, digital technologies are viewed as a tool that supports teachers' roles in education and organises an innovative vision of education (Stephen and Plowman 2003). Similarly, countries such as Chile, India, Macedonia, Russia, Singapore, and China share similar views regarding the employment of digital technology in education (Trucano 2010). There are several research on the process of integrating digital technology into education in Turkey. While some of these studies focused on the usage of digital technology in everyday life, others were designed specifically for Ministry of National Education (MoNE) staff and students (Topuz and Göktaş 2015). In Turkey, 'MEBBIS', 'Catching the Age in Education 2000' and 'FATİH (Movement to Enhance Opportunities and Improve Technology) Project' are the attempts that aim the use of digital technology in education (Demircan 2021).

Although technological tools and equipment supplied to schools are essential, they are not sufficient on their own. In other words, the mere introduction of technology as a product into schools is inadequate for its effective implementation. There is an urgent need for schools (Dunn et al. 2018), and teachers in particular, to take the lead in providing opportunities for children to develop their creative skills through the use of specific applications.

Purpose

Education's primary objective is to prepare individuals for social life by providing them with the necessary information, skills, values, and attitudes. In the twenty-first century, students must successfully use technology, acquire reliable information, and apply knowledge. Consequently, it is crucial to

integrate digital technology into educational contexts in order to develop and encourage these abilities at an early age (Öner 2020). However, there is limited research on evidence-based suggestions to aid educators in using pedagogically acceptable technology with young children (Zabatiero et al. 2018).

The learning process emphasises the teacher's understanding of how children think, the development and appreciation of children's experiences, the presentation of materials in accordance with child development, and the use of a variety of learning methods to enable children to actively construct their own knowledge (Utami and Latiana 2018). In this context, knowing teachers' viewpoints regarding difficulties, impediments, challenges, and positive contributions to integrating digital technology into early childhood education are crucial to answer how, how much, and where questions. In this context, the purpose of this study is to determine the perspectives of teachers, who are major stakeholders in integrating digital tools in early childhood education, and, thus, to identify the primary focal points in integrating digital technologies in early childhood education.

Method

Research design

This study used a qualitative methodology to evaluate teachers' perspectives on the integration of digital technologies into the early childhood education process. The qualitative method subjectively assesses the nature of reality and supports the presence of multiple realities. Participants also construct knowledge through their subjective experiences (Creswell 2015). Given that the use of digital technologies in early childhood education is a contentious subject with both positive and negative features, it was believed that a qualitative approach would give a multi-perspective view. Since qualitative research is a method attempting to explain in depth the meanings that individuals attach to their lives, experiences, and the world, it is considered important. Consequently, a qualitative method offers the potential to disclose events and perceptions in their natural contexts from a realistic and holistic perspective (Büyükoztürk *et al.*, 2015; Glesne 2013; Merriam 2013; Speziale, Streubert, and Carpenter 2011).

Sampling strategy

Maximum variation sampling strategy, one of the purposeful sampling techniques, was used in the study. In this context, attention was made to produce a representation of different participants in terms of gender, degree of education, and work location. Maximum variation sampling enables the collection of valuable data by using the diverse experiences of stakeholders in varied circumstances (Suri 2011). It is thought that different personal variables may change attitudes towards the use of technology in education. In the study conducted by Gebhardt *et al.* (2019) in different countries, it is stated that different results may emerge according to gender towards the use of information technologies in the lesson. In terms of education level, it is also a result that there are differences in the use of technology in education (Güneş & Buluç, 2017. 4]). In terms of the work location, it can be said that schools in the city centre have more technological opportunities than schools in the villages. It is thought that these differences will ensure the diversity of the data collected.

Participants

There are no strict rules on the number of participants (Wilson 2015), which is one of the uncertain issues in qualitative research (Merriam 2013). Lincoln and Guba (1985) state that data can be collected until the data reach saturation. In other words, sampling is terminated when there is no new information from the sample (Merriam 2013). In order to access the participant group of the study, we used the snowball sampling method. In this context, we contacted the teachers who

were recommended by the participants and who met our diversity criteria. We included the teachers who accepted to participate in the study. In this study, interviews were conducted with 11 participants. Table 1 contains information about the participants.

Data collection process

A telephone interview was conducted with the participants to personally invite them to participate in the study, to explain the study in detail, and to get to know them better. Participants were given an informed consent form, and those who volunteered were included in the study.

Research data were collected through interviews. The purpose of qualitative interviews is to explicate people's viewpoints, interpret them, and bring them to light (Patton 2014). In accordance with the study purpose, it was determined that interviews would best disclose the perspectives of preschool teachers about the use of digital technologies in preschool education, and a semi-structured interview form was designed accordingly. In the course of preparing the form, researchers generated a draft form. The relevant form was provided to two experts in the area who have conducted qualitative research, together with a description of the research's purpose and scope and was finalised based on their comments. The interview form includes participants' demographic information and questions regarding their perspectives on the usage of digital technologies in preschool. The following are the interview's questions:

- 1) What are your purposes for using digital technologies in your classroom?
- 2) Based on your own experience, what impact do you believe the use of digital tools has on students' educational processes? Is this use positive or negative? Why?
- 3) What obstacles do you face in integrating digital tools into the educational environment?
- 4) What are your needs and expectations for the integration of digital tools into educational environments?

Prior to conducting interviews with the teachers, the research was approved by an ethical committee and the participants were notified. In addition, a pre-interview questionnaire was provided to the teachers in order to collect demographic information and prepare for the interview questions. First, a pilot interview lasting 30–35 min was conducted with a teacher outside the selected sample. With this pilot interview, potential interviewing issues were discovered, and steps were taken to address these issues. After the pilot interview, interviews were started with the teachers in the sample. The interviews were conducted with all participants separately and online. The interviews were recorded and lasted about 30–40 min.

Table 1. Participant Information.

Participants	Educational Status		Gender	Work location	Age	Age group participants teach to
	Undergraduate	Graduate				
T1	X		Female	City Centre	39	60–72 months
T2	X		Female	District	30	60–72 months
T3	X		Male	District	42	60–72 months
T4		X	Male	Village	27	48–60 months
T5	X		Female	City Centre	32	60–72 months
T6		X	Male	District	33	36–48 months
T7		X	Female	City Centre	45	48–60 months
T8	X		Female	City Centre	40	48–60 months
T9	X		Male	City Centre	29	48–60 months
T10	X		Female	District	26	36–48 months
T11	X		Female	Village	41	48–60 months

Data analysis

Following the completion of the interviews, the audio recordings were transcribed. Frequent in qualitative research, the content analysis approach was employed to analyze the data (Gökçe 2019). Content analysis is a data analysis approach that systematically seeks to offer non-obvious inferences from the messages meant to be given in a plain language in order to demonstrate social reality. The process involves bringing together comparable facts within the context of certain concepts and topics and organising them in a way that is comprehensible to the reader. In this direction, data are examined in four stages: 1. coding the data, 2. identifying the themes, 3. arranging the codes and themes, and 4. defining and interpreting the findings (Yıldırım and Şimşek 1999). In content analysis method, researchers create the themes (Silverman, 2014) and related codes (Merriam 2013) which are determined either during the research process or before the research in line with the literature. In this study, themes were predetermined within the framework of the research questions. In this way, when the interview transcripts were prepared, two researchers examined them and coded the data. A third researcher participated in the coding procedure in case of disagreement between the two researchers. In the case of a disagreement, a decision was reached based on the viewpoint of the third researcher. The codes obtained were compared and discussed with each other in a joint session attended by all researchers and distributed to predetermined themes. Similar codes collected under themes were divided into sub-themes and the analysis was completed by structuring them as theme-sub-theme-codes.

Validity and reliability

Several methodologies were employed within the parameters of validity and reliability. The initial method employed is researcher triangulation. Triangulation of researchers refers to the utilisation of many researchers to control the study's conclusions (Patton 2014). In this context, coding was performed independently by each researcher, whose codes were then reviewed by another researcher. There were necessary talks on the various codings, and the codes were restructured. The second tactic employed was participant verification. Participant confirmation is the second approach employed. This is a technique used to determine whether the study's conclusions truly reflect the opinions of the participants (Merriam 2013). In this way, as the outcomes of the study were presented in the study, participants engaged in an ongoing interaction and exchange of views. Utilising Miles and Huberman's (2015) formula for calculating reliability was another method employed in this investigation. According to this metric ($\text{Reliability} = \text{Consensus} / \text{Consensus} + \text{Dissensus} \times 100$), the consistency of expert and researcher analyses in qualitative research should exceed 90%. When the coding consistency between experts and researchers was analyzed in this study, 92% consensus was discovered. In the study's conclusion, direct quotations were used to express the participants' perspectives conspicuously.

Findings

In accordance with the information acquired from the information form preschool teachers were requested to complete during the interviews, the digital tools utilised by teachers in the classroom environment were identified (see Table 2). It is observed that the majority of preschool teachers have televisions in their classrooms and that many preschool classrooms are equipped with interactive whiteboards. In addition to these digital tools, two early childhood teachers reported using projectors in the classroom. Moreover, while teachers have access to the internet in the classroom, there are still preschool teachers who do not. Many teachers reported using apps for instructional purposes.

Preschool teachers reported varying levels of digital tool use in their classrooms (see Table 3). Internet access, apps downloaded for educational purposes, and educational applications are

Table 2. Digital tools in the classrooms.

Participants	Television	Television games	DVD Games	Desktop computer	Desktop computer games	IPad/ Digital Tablet (only 1)	IPad/ digital tablets (more than 2)	Digital camera	Digital cam	Interactive whiteboard	Digital radio	CD player	Internet access	Apps downloaded for educational purposes	Apps used for educational purposes	Other tools (please describe)
T1										X			X	X	X	
T2										X						
T3										X						
T4					X											Projection
T5	X				X								X	X	X	
T6					X								X	X		
T7	X				X					X			X	X	X	Projection
T8													X	X	X	Projection
T9										X			X	X	X	
T10	X															
T11	X												X			

Table 3. Usage frequency of digital tools.

Participants	Television	Television games	DVD games	Desktop computer	Desktop computer games	IPad/ Digital Tablet (only 1)	IPad/ Digital tablets (more than 2)	Digital camera	Digital cam	Interactive WB whiteboard	Digital radio	CD player	Internet access	Apps downloaded for educational purposes	Apps used for educational purposes	Other tools (please describe)
T1										1			1	2	2	
T2										2						
T3										1						
T4					1											Projection
T5	4				2								1	4	4	
T6					1								1	1		
T7	2				3					2			1		1	Projection
T8													1	2	2	Projection
T9	2									1			1	2	2	
T10	2															
T11	1												1			

Note: 1: Daily usage; 2: 2–3 times a week; 3: Less than 2–3 times; 4: Usually when the schools are open.

utilised regularly by teachers in the classroom. Additionally, television, desktop computer, and interactive whiteboard are utilised regularly, but less frequently than the others.

Theme and subthemes

In accordance with the preschool teachers' responses to the interview questions, four major themes regarding the integration of digital technology were found. These themes include purpose, multidimensional effects in education, obstacles, needs and expectations (See Figure 1). These themes also represent the primary foci of the integration of digital technology into early childhood education. Each topic and subtheme are elaborately described below.

Purpose

The purpose theme is comprised of three subthemes addressing the reasons why teachers employ digital tools. These include individual use, educational process, and child welfare. Individual subtheme refers to the use of digital technology by educators in the context of professional development in order to adapt to change. As digital technologies are one of the most essential elements of our society, it was noted that teachers emphasised the need of keeping up with change on an individual level.

Following are the opinions of T4, who emphasised the necessity to follow and keep up with advances individually in a dynamic and changing world:

T4: 'I utilize digital technology in my classroom for a variety of reasons, the first of which is to keep up with the rapidly changing world. I believe it is critical for children to understand about digital devices at a young age and to acquire conscientious usage skills. As a result, I must first better myself.'

As a result, keeping up to date in a changing technological environment and enabling students to use digital devices competently is a source of motivation for teachers to use digital tools in their classrooms.

The educational process subtheme refers to teachers' use of digital technologies in educational processes for the purposes of concretising an abstract/non-visual concept, enriching the teaching

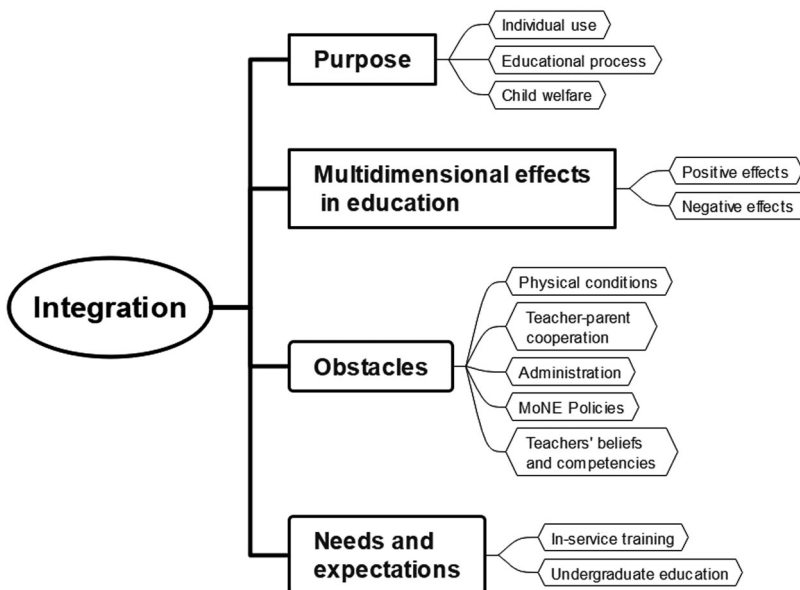


Figure 1. Theme and subthemes.

process, attracting the child's attention, accessing different educational platforms and applications for pre-school education, ensuring active participation of parents, and preparing for the lesson. The following are the opinions of T5 on this subtheme.

T5: 'Technology is a natural part of today's children's lives, and I believe using technological tools is an essential life skill. I frequently utilize digital technologies to teach the information, skills, and behaviors I want children to acquire. I have seen that when we do game-based activities with digital tools, children are significantly more engaged and motivated.'

When the purposes of using digital technologies in the classroom are evaluated in terms of child welfare, it is seen as providing equal opportunities for all children, supporting their development, promoting the proper use of digital tools by children, and providing children with a variety of perspectives. Within the scope of this topic, the following are the opinions of T6 on this subtheme.

T6: 'Since we are in the digital era, children will have positive and negative experiences with these technologies. The school is a unique opportunity for a child to acquire the correct usage skills of digital tools.'

Overall, teachers consider that the use of digital technologies in the classroom contributes to children's holistic well-being by enabling them to adapt to the digital age, develop critical thinking skills and benefit from diversified learning experiences.

Multidimensional effects in education

This theme consists of two sub-themes explaining the multidimensional effects of using digital tools in the classroom environment. These sub-themes are positive effects and negative effects. In the positive effects subtheme, teachers stated that the usage of digital technologies in the classroom is essential and positively impacts the educational process in several ways. According to the teachers, the usage of digital tools in the classroom minimises the teachers' burden, offers pupils with permanent learning by varying their learning methods, and provides children with digital literacy skills for the modern world. Teachers also believe that digital tools contributes to the diversification of methods and techniques, stimulates children's sense of curiosity, allows them to compare the real world to the virtual world, makes the subject to be taught more interesting, and facilitates special needs children to adapt to the classroom environment.

T5 addressed the variety of learning styles and digital technologies that capture children's interest. In addition, T5, who attempted to integrate various technology applications into the classroom, reported that although digital technologies improved children's attention span, they also contributed positively to digital literacy.

T11, who argued that digital technologies allow youngsters to see the link between their real life and the virtual world, as well as to experience attention span and lifelong learning in many ways, expressed his thoughts as follows:

T11: 'Digital tools have a particularly favorable impact on concretization and permanency. Thanks to digital tools, children experience with virtual activities, experiments, and trips. That is why, I believe that they are so important and have positive impacts on children.'

Teachers discussed the disadvantages of employing digital technologies in the school setting. Consequently, while teachers voiced concern over integrating digital technology into the classroom, they also emphasised that improper time management might lead to screen addiction and make teachers inactive in the classroom. In addition, teachers noted that the usage of digital tools should be supervised; if they are not, they can be used for non-educational purposes, and children may be exposed to inappropriate content. They also stated that distraction might occur in children, limit peer interaction, negatively impact social relations, and hinder time management. However, it was revealed that every teacher expressed concerns about integrating digital tools into the classroom. Several participants highlighted the following concerns:

T2: 'Teachers can abuse the use of technology in the classroom and its long-term use during the day worries me.'

T8: 'I think privacy is very important today, especially in childhood. The fact that teachers can use digital tools unconsciously at some times is the point that worries me the most. They must be inspected.'

T11 emphasised time management and supervision while discussing the importance of adopting digital technology in the classroom, and he expressed his opinions as follows:

T11: 'Unfortunately, the educational setting has a restricted number of digital tools. Every child should have an iPad in the classroom and should not be subjected to time constraints when engaging in activities. However, the teacher should utilize technology consciously. First of all, we must be aware of this awareness before teaching children this awareness.'

T5 and T7, who drew attention to the monitoring of the use of digital tools in the classroom environment, time management, and potential obstacles, provided the following statements:

T5: 'I believe that technology is essential in today's society. However, using digital technologies should not be set as a goal. I believe it can cause addiction. Thus, it should only be used when required and in moderation.'

T7: 'I believe the content of instructional materials should be reviewed by the teacher beforehand. The likelihood that children may be exposed to inappropriate material compels me to believe that greater caution is required.'

While the use of digital technologies in the classroom contributes positively to education by lightening the burden of teachers and enriching learning processes, it also brings potential negative effects such as screen addiction, distraction and decreased social interaction. This highlights the importance of a balanced and thoughtful use of digital tools in education.

Obstacles

Teachers of early childhood were asked, 'What obstacles do you encounter when integrating digital technologies into the educational environment?' As a consequence of the analyses, it was established that integrating digital technologies into the classroom setting presented several obstacles for educators. These obstacles were analyzed under the subthemes of physical conditions, teacher-parent cooperation, administration, MoNE policies, and teacher beliefs and competencies.

Teachers encountered the following challenges when integrating digital tools into the classroom: the region where the school is located, the physical conditions of the school and the number and variety of digital tools in the school, lack of budget, excessive class size, inadequate support from administrators, and the fact that preschool education is not yet mandatory according to MoNE policies and is therefore excluded from the projects aiming to integrate digital tools. Moreover, parents' prejudices toward using digital tools in the classroom environment, teachers' lack of knowledge, and negative attitudes toward using digital tools are among these obstacles.

In this regard, T3, T5 and T9 emphasised the significance of physical conditions in the integration of digital tools and stated the following opinions:

T3: 'Unfortunately, our classroom is overcrowded, and because there is only one device, the students must wait their turn. Due to their limited attention span, they become bored while waiting.'

T5: 'I only face a single challenge. The Ministry of National Education provides restricted internet connectivity. Due to this, my access to the files I've downloaded is occasionally restricted.'

T9: 'I worked at Şırnak province for three and a half years. When I worked there, the physical conditions of the school were really deficient. We had difficulty accessing various resources, and digital technologies were not our priority.'

T6 explained as follows on the significance of administration in integrating digital technologies into the educational environment:

T6: 'Infrastructure issues exist in our school. There is a lack of digital tools, and it had better be bought new ones. However, my school's administrator is quite helpful and supportive in this aspect. The cooperation of administrators is crucial in this regard.'

Preschool teachers emphasised that the integration of digital tools into the classroom environment and this process is not only related to the physical conditions of the school but also to educational policies and stated that the desired point in MoNE policies for preschool education has not yet been reached. T8 drew attention to the fact that preschool education is not mandatory and that, for this reason, it is excluded from the scope of several projects in education plans with the following statements:

T8: 'Unfortunately, opinions towards education policy reflect the reality that preschool education is not required. For instance, preschool education was excluded from the FATİH Project's scope. Therefore, we receive an allowance depending on the help offered for our preschool education-related expenditures. This serves as a benchmark. Even though the budget is insufficient to meet this requirement, digital technologies cannot even be considered.'

Regarding the integration of digital technologies into the classroom, teachers also highlighted the need of teacher-parent cooperation. It has been noted that cooperation between teachers and parents has a favourable impact on both the school environment and the maintenance of digital literacy abilities acquired by children. However, it was also mentioned that teachers should be digitally literate and equipped with the necessary knowledge and equipment to utilise digital technologies. In accordance with these ideas, T8 stated his opinions as follows:

T8: 'I believe that cooperation between teachers and parents is crucial in this respect. The teacher should have knowledge and understanding of digital tool usage. This understanding, which we call digital literacy, may also be developed at home when parents are involved. I believe that coordinated lessons between parents and teachers are beneficial in every manner.'

The views of early childhood teachers show that the obstacles encountered in the integration of digital technologies into the classroom environment are not limited to structural factors such as physical infrastructure deficiencies, budget constraints and inadequacy of educational policies. The importance of teacher-parent collaboration and the need to increase teachers' digital literacy skills stand out as critical elements for the success of this integration process. It is also emphasised that MoNE policies and the support of school administrators are important for the effective use and integration of digital tools, especially in preschool education.

Needs and expectations

It was found that teachers need assistance with integrating digital devices into the preschool classroom setting. These needs are given under the subthemes of in-service training and undergraduate education.

Teachers emphasised the need of training in the utilisation of digital tools. They also noted that this training, which may be supplemented by in-service training, can be connected to their undergraduate study. They noted that in-service training for the use of digital technologies should aim to enhance digital literacy skills, should be oriented toward the use of Web 2.0 tools, and workshops might be effective in this regard. In addition, they suggested adding courses on the use of digital technologies to the curriculum for undergraduates. In this regard, a number of participants provided the following comments:

T3: 'There are frequent updates to software, therefore ongoing training is required to maximize the use of technology. Our undergraduate education did not adequately prepare us for our present use of digital technology.'

T6-T7-T9: 'I wish to be able to use Web 2.0 tools. For this reason, I am interested in receiving education of these tools.'

Teachers' opinions point to the importance of developing a comprehensive training programme for teaching digital literacy skills and the use of technological tools in both undergraduate and in-service trainings for the effective integration of digital tools in preschool education.

Discussion and implication

This research aims to determine the usage of digital tools in preschool education based on teachers' perspectives and to determine areas to prioritise when integrating digital tools into the preschool classroom setting. The research concluded that teachers use digital technologies to adapt to change, contribute to the learning process, and promote child welfare. It might be claimed that teachers view keeping up with technological advancements and implementing these technologies in the classroom as a necessity of professionalism. The innovative implementation efforts of educators to enhance the quality of education are a crucial factor in determining success or failure (Fullan 1992). It was determined that teachers used digital technologies in the educational process to concretise an abstract concept to be taught, enrich the teaching process, attract the child's interest and attention, and highlight the importance of preschool education through various educational platforms. In addition, they used them to ensure the active participation of parents in the preschool process and enrich their own lesson preparation. The relevant literature supports our research findings. Kayış (2022) and Veziroğlu Çelik et al. (2018) found that the majority of preschool teachers employ digital devices for educational purpose in the classroom. Nonetheless, there are studies that reveal that teachers use digital tools to enhance the teaching process in the classroom (Hacısalihioğlu Karadeniz 2014; Simsar and Kadim 2017), to increase children's awareness of digital tools (Gillen et al. 2018) and to attract children's attention and support their motivation (Kabadayı 2006). Different characteristics of digital technologies provide students with the possibility to repeat, concretise course content, facilitate individual learning, and assure student engagement (Aksoy 2021). There is evidence that the employment of digital technology in the classroom promotes the cognitive development of children (Yıldız and Zengin 2021). The use of digital tools in the classroom also serves the objective of promoting child wellbeing. In this context, it was determined that teachers utilise digital technologies to promote equality of opportunity among children, to support children's developing fields, to promote children's awareness and conscious use of digital tools, and to provide children with a variety of perspectives. Digital technologies play a vital role in creating equality of opportunity by personalising learning and serving as a learning resource. However, barriers to digital technology access can re-create inequality of opportunity. Schools with varying technological infrastructure facilities may have varying teaching quality. The usage of digital tools is also required by technological literacy. Therefore, proper use of digital technologies has become an essential skill nowadays. Early childhood might be a wonderful time to acquire these talents. It can support child welfare by contributing to children's conscious use of these tools in their later lives.

The study also revealed the multidimensional effects of digital technologies on early childhood education. It was found that teachers focused on the positive effects of using digital technologies in the classroom on educational processes, but they were also concerned about the potential negative effects. They expressed these effects as follows; when time planning is not accomplished while using digital tools in the classroom, it may cause screen addiction; the use of digital tools in activities may make the teacher passive; digital tools may be used for purposes other than their intended purpose when there is no control; children may be exposed to inappropriate content; and it may prevent the socialisation process of children by limiting their peer interaction. A significant amount of research confirms the findings of the study and reveals the teachers' and parents' concerns regarding the negative effects of digital technology. In literature, there are studies emphasising that the use of digital tools can passivate the teacher (Hacısalihioğlu Karadeniz 2014; Kynigos and Argyris 2004; Wang 2002), cause screen addiction in children when time planning is not done correctly (AAP 2016), that digital tools can be used inappropriately when there is no supervision (Doğan 2016), that children may be exposed to inappropriate content (Zabatiero et al. 2018), that it may negatively affect children's peer relationships (Ebbeck et al. 2016; Hacısalihioğlu Karadeniz 2014), and that teachers may have problems with time management in the classroom. These mentioned considerations led to the evaluation of digital technology as both an enemy and a friend depending on their negative and positive characteristics (Mertala 2019). Using digital tools

appropriately in the classroom might help relieve worries. In this context, there exist suggestions for the proper use of digital technologies (Mantilla and Edwards 2019), but more evidence-based recommendations are needed.

In line with the purposes of use, teachers expressed many positive contributions of digital technologies. Positive effects are mostly in the direction of students' attention, motivation and contribution to individual learning. In line with the purposes of use, teachers expressed many positive contributions of digital technologies. Positive effects are mostly in the direction of students' attention, motivation and contribution to individual learning. The researches conducted reported that the use of digital tools develops cognitive, social-affective and psychomotor areas in children (AAP 2016; Brooker and Siraj-Blatchford 2002; NAEYC 2012; Özturan and Bozcan 2017), arouses curiosity in children with its remarkable feature (Aksoy 2021; Demirel, Seferoğlu, and Yağcı 2004; Uluser-Inan 2003), increases peer interaction (Gedik, Çetin, and Koca 2017; Hsin, Li, and Tsai 2014), enriches the educational process (Aslan Akın and Atıcı 2015; Gündoğan 2014; Karataş, Bozkurt, and Hava 2016; Kuzgun and Özdiñç 2017; Sayan 2016), concretises information (Ömrüuzun 2019), and provides equal opportunities by bringing the conditions that children cannot have in daily life to the classroom environment (Epstein 2015; Scoter, Ellis, and Railsback 2001), improves digital literacy skills (Blum and Parette 2015; Kardeş 2020; Kayış 2022; Marsh 2014), enables children to distinguish between real life and virtual environment (Gecu-Parmaksız and Delialioğlu 2018; Yılmaz 2016). Digital technologies have a great deal to contribute to the quality of early childhood education, as demonstrated by our study findings and related studies. In addition, the study's findings reveal that practitioners' positive attitudes and perspectives about the usage of digital technology are impacted by their observations of multiple positive effects of digital technologies on educational processes. As part of their professional skills, this situation also allows teachers to analyze the efficient use of digital tools in the classroom. In this context, the beneficial effects of digital technologies on early childhood education experienced by practitioners will ease the integration of digital technology. In addition to the positive effects of digital technology, practitioners expressed concern about its negative effects. Most of these difficulties stem from improper use. Therefore, it is acknowledged that research based on evidence are required to determine the proper utilisation.

The results of the study indicate that preschool teachers confront several obstacles while using digital technologies in the classroom. These obstacles include physical conditions, cooperation between teachers and parents, administration, MoNE policies, teacher competencies and beliefs. In terms of physical conditions, insufficient digital technology infrastructure of the schools, limited classroom sizes, and overcrowded classrooms might hinder the adoption of digital technology in early childhood education. Simsar and Kadim (2017) examined the impact of preschool teachers' use of digital tools on the educational process. As a result of their research, it was determined that the majority of teachers had trouble gaining access to digital tools and that the internet infrastructure did not meet expectations. Before digital technology can be implemented in early childhood education, the technological infrastructure and other physical facilities must be sufficient. Cooperation between teachers and parents is a further obstacle to the use of digital technologies. Parent-teacher cooperation was emphasised in the study by Gjelij et al. (2020) to maximise the advantages and minimise the risks of digital technology usage in early childhood education. Different expectations and beliefs on the use of digital technology might lead to conflict between parents and teachers. Similarly, administration and teacher cooperation can influence the utilisation of digital technology in classrooms. According to the teacher participants, some administrators may view the usage of digital technologies in the classroom as a waste of time and disregard their benefits. In the current environment, administrators must also modify and update their expectations and learning standards (Utami and Latiana 2018). Otherwise, the management intervention may limit teachers' use of digital technology in the classroom. Supporting this situation, Gök, Turan, and Oyman (2011) found that the lack of digital tools and the unfavourable attitudes of school principals severely impacted the job performance of teachers. In Turkey, the FATİH Project has improved the digital technology infrastructure of schools, particularly at the high school level, and produced

crucial policies for this level of education. Teachers view the absence of high-level policy for the integration of digital technology in early childhood education as a barrier. Additionally, the assistance of school administration and the cooperation of parents are deemed essential for the use of digital technology. In this context, there is a need for study on the attitudes of school administrators and parents regarding digital technology and improvement strategies.

Finally, it was determined that the competencies and beliefs of teachers constitute a barrier to the integration of digital technologies. The conceptualisation and integration of digital tools into pedagogy is influenced by teacher beliefs towards the use of digital technology in early childhood education. Teachers' unfavourable views toward the use of digital technology may originate from their beliefs of their own self-efficacy, their lack of knowledge regarding the use of digital technology in the educational setting, and the negative effects of digital tools on their students. According to the research done, teachers believe that digital tools hinder children's imagination and creativity (Palaio-logou 2016) and that traditional games support children's cognitive, affective, social, emotional, and physical development more than digital games (Öner 2020). McMurtry and Burkett (2010) highlighted the significance of teachers' self-efficacy levels in the use of technology. They concluded that educators felt insufficient in their use of digital tools. Since teacher attitudes on the use of digital tools in early childhood education settings influence their decisions and behaviours (Vidal-Hall, Flewitt, and Wyse 2020), enhancing teacher competencies for the pedagogical use of digital technology can promote teacher beliefs.

As a result of the research, it was concluded that teachers view the inclusion of competencies for using digital tools in the undergraduate curriculum as necessary for digital technology integration. In addition, teachers reported a need for in-service training to utilise digital technologies in the classroom and integrate them into the curriculum. In his research, Undheim (2022) concluded that teachers need professional learning opportunities to use digital tools in pedagogical practices. In contrast, Mantilla and Edwards (2019) asserted that professional learning about using digital technology would assist educators in establishing trust with children and their parents who use digital technology. In this context, in-service training is seen as essential for enhancing teachers' abilities to correctly plan, organise, and implement educational programs (Sayan 2016).

As educators, teachers should always seek to expand their knowledge, attitudes, and abilities to enhance their professional abilities. The position of a teacher in the professional sector involves unique abilities that not everyone possesses (Utami and Latiana 2018). In addition, research has shown that early childhood educators need professional development support to use digital technologies (Jack and Higgins 2019). Vidal-Hall, Flewitt, and Wyse (2020) brought attention to professional development for practitioners to consider the use of digital technologies and their possible implications on learning. Therefore, there is a need for pre-service and in-service professional development practices for teachers in order to integrate digital technology into classroom practices and the curriculum.

Conclusion

The research reveals a multidimensional landscape for the integration of digital technologies in early childhood education from the perspective of educators that needs to be focussed on. Firstly, the research highlights both the pedagogical benefits and challenges of digital tools, revealing their multifaceted impact from the teacher's perspective. Teachers often see the adoption of digital technologies as a professional imperative that enriches the learning process, engages students and facilitates parental involvement. However, they also express reservations about possible negative effects such as screen addiction and loss of social skills among children. These findings are supported by a wide range of literature, adding credibility to the results of the study. The research also highlights infrastructural limitations, attitudes of school administration and lack of intervention at the policy level in the context of Turkey's education system as barriers to the effective implementation of digital technologies.

By comprehensively examining teachers' perspectives, the research provides a valuable resource for stakeholders aiming to optimise the role of digital technologies in early childhood education. It emphasises the necessity of evidence-based practices to be able to navigate the complexities of digital tool integration effectively. Furthermore, the research highlights the need for professional development opportunities for educators, both pre-service and in-service, to equip them with the necessary skills for the judicious use of digital technologies. This is particularly important given the rapid developments in educational technology and the increasing obligation on educators to adapt. In conclusion, the study reveals the current state of digital technology use in early childhood education and offers insights for targeted improvements.

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