DIGITAL TECHNOLOGY USE OF KINDERGARTEN TEACHERS FOR PARENTAL INVOLVEMENT: E-NVOLVEMENT IN THE TURKISH CONTEXT

Abstract: The primary research aim of this current study was to better understand the digital technology use of Turkish kindergarten teachers in their parental involvement practices. A questionnaire designed by the authors was administered to 100 kindergarten teachers in five cities located within Turkey. It was revealed in the study results that the kindergarten teachers owned a variety of electronic devices and used those devices for both personal and educational purposes within the early childhood education setting. Teachers used digital technologies for their parental involvement practices less than they did for their own personal use or for other activities within the educational setting. The parental involvement types where teachers most often used digital technologies were for parenting and communicating. While the least popular parental involvement types where kindergarten teachers used digital technologies were decision-making and collaborating with the community. Teachers mentioned the two most common reasons for insufficient technology use for parental involvement were the parents' financial status and level of knowledge. A negative relationship between teachers' personal technology use and experience in the field increased, they were less likely to encounter problems regarding digital technology use for parental involvement.

Keywords: E-nvolvement, early childhood education, digital technology use, parental involvement

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INTRODUCTION

The early years of a child's life are a crucial period in the development of their cognitive, social, emotional, linguistic, and physical skills (Berk, 2003; Sommer, Samuelsson & Hundeide, 2013; Bakken, Brown & Downing, 2017). Importantly, through educational experiences in early childhood education (ECE) young children should be supported in every developmental domain including the accompanying short- and long-term benefits (McCoy et. al, 2017). Because of this importance, it is critical to investigate factors which affect success in ECE (Galindo & Sheldon, 2012). One of these factors is parental involvement (PI), which can be described as 'parent and teacher collaboration [in] children's learning' (Uludağ 2008, 809), and due to it being one of the quality determinants of ECE, PI and its effects have been investigated by a considerable number of researchers (McCoy, Yoshikawa, Ziol-Guest, Duncan, Schindler, Magnuson, Yang & Koepp, 2017; Morrow & Malin, 2004; Pianta, Barnett, Burchinal, & Thornburg, 2009; Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2004). In past studies, compelling proof of the positive impact of PI on educational institutions, parents, and children's real time well-being as well as future success has been presented (Jeynes, 2005; 2012).

Despite the widely recognized benefits of PI, there remains a difference between what is suggested for PI through research and policy, and what is implemented in educational institutions as PI practices (Epstein, 2016; Hornby & Lafaele, 2011). As a result, the disconnect between research and practice has led to insufficient PI practices, which are severing the connection between home and school. (Christenson & Sheridan, 2001; Henderson & Berla, 1994). In previous research within the Turkish ECE context, kindergarten teachers find PI practices in their institutions to be insufficient, even though they agree on the importance of PI in quality ECE (Hakyemez, 2015). One factor that may be leading to this gap in understanding is the differences in how PI is defined. While the core of PI is the presumption of parents and educators sharing equal responsibility for children's learning (Organisation for Economic Cooperation and Development [OECD], 2001), PI is broadly defined as parents' involvement in their children's schooling (Grolnick & Slowiaczek, 1994). Although this broad definition is easy to present, it is still challenging to fully describe it in an absolute manner because PI is a loaded and multi-faceted concept (Bakker & Denessen, 2007) that parents and educators may conceptualize differently (Moore & Lasky, 1999; Rapp & Duncan, 2012). For example, while parents might define PI as taking their children to school and providing them with what they need for their education, for educators PI can mean the active participation and hands-on support of children in the learning process (Anderson & Minke, 2007; Lau Li, & Rao, 2012).

The aforementioned barriers for successful PI are not only based on different definitions but also stem from both educator, parent, and institution-related factors such as school environment (Berger, 2008), parents' social, emotional (Berger, 2008; Hill & Taylor, 2004; Taylor, Clayton & Rowley, 2004), and economic background (Lareau, 1987; Mahmood, 2013) as well as cultural and ethnic concerns (Baker & Stevenson, 1986; Hindman, Miller, Froyen & Skibbe, 2012). With the new technological advances of the modern era, there are new possibilities to close this gap and improve PI practices (Patrikakou, 2016). Digital technologies may help the schools and parents overcome the obstacles previously mentioned such as providing a variety of opportunities for parents to respond to and interact with teachers as well as opportunities for teachers to provide feedback. On the one hand, technology creates new and practical channels for supporting PI practices, while on the other, it might fall short especially regarding its accessibility across large and varied populations. As a result, another aim of this current study was to shed light on the possible shortcomings of digital technology use for PI within the ECE setting.

To define technology supported parental involvement, the term parental e-nvolvement was introduced. Parental e-nvolvement is defined as "parental efforts to plan, engage in, support, monitor, and/or assess the learning experiences of their children either at home or at school by predominantly using technological devices and media" (Şad, Konca, Özer & Acar, 2016). Importantly, a variety of actions for both teachers and parents are offered through parental e-nvolvement. For example, teachers can prepare e-portfolios, find sources and materials from the internet, easily communicate with parents and children via voice or video chat, and/or attend online courses for their professional development regarding PI. Meanwhile, parents can engage in a topic with their child through online searches to reach information as well as communicate with other parents, teachers, and/or school administrators. However, Runcorn (2018) reports that although some parents use digital technologies in daily life, they are not successful in using them for parental involvement due to social, cultural, socio-economic, and/or technological obstacles. Therefore, parents may need effective and consistent support as well as specific parental involvement opportunities that focus on digital technologies (Olmstead, 2013). As previously expressed, one of the barriers to successful parental involvement is that parents and teachers may not be available at the same time. However, the dynamic and asynchronous nature of communication provided through digital technologies can help cope with this challenge (Thompson, Mazer & Grady, 2015). Therefore, digital technologies within the context of parental involvement are often found to be mainly used by teachers and parents for communication (Ho, Hung & Chen, 2013).

USE OF DIGITAL TECHNOLOGIES AND PARENTAL E-NVOLVEMENT

More and more digital technologies have become a fundamental part of teachers' lives (Edwards, 2016). Although many kindergarten teachers use digital technologies daily, the implementation of digital technologies into their teaching practices often differs. The primary factors kindergarten teachers reported for influencing their use of digital technologies in ECE were age and years of experience (Inan & Lowther, 2010), self-efficacy (Sang, Valcke & Tondeur, 2010), competence and experience with digital technologies (Hew & Brush, 2007), and the attitudes of teachers towards using digital technologies within the classroom (Inan & Lowther, 2010). Although most kindergarten teachers have positive attitudes towards using digital technologies in ECE, they also think that digital technologies are difficult to use in this manner (Konca & Erden, 2021; Lindahl & Folkesson, 2012). Therefore, they may under use digital technologies within the ECE classroom because of a perceived difficulty of use. Some studies reveal that kindergarten teachers mostly use digital technologies for preparation of materials and activities as well as for music-based classroom activities (Russell, Bebell, L. O'Dwyer & O'Connor, 2003; Simsar & Kadim, 2017; Yurt & Cevher-Kalburan, 2011). In a recent study, it was reported that kindergarten teachers preferred using televisions and computers in the classroom in order for the children to watch cartoon films and listen to music (Konca & Erden, 2021).

Although the research mentioned above implies limited use of digital technologies, teachers can provide a variety of learning experiences for young children through developmentally appropriate learning environments and activities (National Association for the Education of Young Children [NAEYC] & the Fred Rogers Center, 2012). Also, successful two-way parent-school communication is important for parental involvement as parents should be encouraged to actively engage with the school community and listen to the school staff, while also giving attention to their children's needs (Young et al., 2013). Therefore, technology is widely used for increasing communication opportunities between parents and teachers such as blog-based home-school communication (Ozcinar & Ekizoglu, 2013) as well as through technology supported feedback systems (Oinas, Vainikainen & Hotulainen, 2017). In addition, utilizing classroom newsletters through blogs and social media can also enrich and improve the connection between the classroom and home (Walsh, Cromer & Weigel, 2014). For example,

online teacher and family communities can connect home and school through common or shared goals, interactivity, collaboration, and a sense of belonging (Zhang, Du, Sun & Ding, 2018). Besides, videos can provide rich information about children's in-school activities as well as promote parents' understanding of their children's development (Walsh, Romo & Jeon, 2018). Providing families with up-to-date and comprehensive information through digital technologies can also increase parents' engagement in their children's educational process (Gauvreau & Sandall, 2019). Through an action study, Cruz and Miranda (2019) show that teachers' using digital technologies to improve parental involvement results in more engagement of parents' in their children's school activities as well as a better understanding of the educational process. However, it is reported that barriers to teachers' technology use for communicating with parents were problems with connection quality, lack of time and skills of teachers, and additional fees for digital communication (Konca, Ozel & Zelyurt, 2016; Şad, Konca, Ozer & Acar, 2016). Besides, some parents seem to prefer face-to-face interaction rather than a voice call (Sormunen, Kirilina, Goranskaya & Tossavainen, 2018). Hosick (2018) investigates perceptions of parents and teachers regarding use of digital technologies for supporting parental involvement and indicates that teachers express the supportive nature of digital technologies regarding parent-teacher communications and fostering parent involvement. Digital technologies can ease communication even though teachers and parents have busy schedules. Teachers also express that parents' seeing actual footage of children's experiences through videos and photos help in their understanding of the children's school atmosphere.

Websites are used as a way of digitally communicating with parents to share news, announcements, and school activity information as well as pictures and videos of student's work. However, this avenue for digital sharing may be ignored because updating the website may require technical knowledge and more effort than is the case with the current social media platforms. In a study, Moss, Bergren and Maughan (2019) report that fewer than one third of schools have websites and very few have a page that belongings to teachers. Besides, parents are reluctant to use websites as is reported in one study that parents visit the websites of schools and teachers only 1 to 2 times per month (Olmstead, 2013).

Today, digital technologies are in many cases one of the most pervasive elements of people's lives. Just as in many other areas of technology, they have also gradually integrated into education. Now, digital technologies play a pivotal role in the educational development of children. There is an increasing interest by policymakers, administrators, teachers, and parents towards integrating digital technologies into education (Keengwe, 2007). Televisions, computers, touch screen devices, internet access, digital game-based learning opportunities and some software programs are the first that come to mind when digital technologies are considered for an educational context. In this current study, the use of digital technologies in the context of PI practices within ECE were explored. In Turkey, early childhood curriculum underlines the importance of parental involvement and encourages kindergarten teachers to improve parental involvement (Ministry of National Education, 2013). However, although teachers have positive attitude towards the use of digital technologies in ECE, it was revealed that they used digital technologies for certain activities (Simsar & Kadim, 2017).

In a position statement by the NAEYC and the Fred Rogers Center (2012) regarding use of technology in ECE, teachers should use digital technologies to "help children save, document, revisit, and share their real-life experiences through images, stories, and sounds" (p. 7). Parent involvement is influenced by processes and complex relationships, rather than parents' simply attending events, and as a result, schools have a role of reaching out to parents for improving their involvement (Ferrara, 2009). Therefore, through digital technologies great opportunities can be provided for teachers to document children's work and share it with children's families.

For this current research, PI is described as a multi-faceted collaboration between parents and educational institutions in various activities, which are conducted through kindergarten teachers' initiatives. As a result, the multidimensional nature of PI through the PI types suggested by Epstein's (2016) overlapping spheres of influence (OSoI) model were explored. Epstein (2016) explains the dynamics of PI in her model, which is concentrated on the role played by educators (Tekin, 2011). In this model, Epstein (2016) proposes six types of PI:

- *Parenting*; helping parents providing a supportive environment for their children.
- *Communication*; implementing different ways to inform parents about educational activities and their children's progress.
- *Volunteering*; encouraging parents to contribute to educational activities.
- *Home learning*; designing activities for parents to support their children's learning at home.
- *Decision-making*; involving parents in the decision-making process of the educational institution.
- *Collaborating with the community*; including community resources and services for educational programmes.

The current study adopts OSoI model as theoretical framework and was designed based on those PI types. To complete the theoretical framework, research tool created accordingly. In this way, the aim of this research was to explore the current state of digital technology use in PI practices within ECE from the point of view of educators. In addition to getting a grasp of viewpoints regarding use of technology in PI, the teachers' personal digital technology use, their attitudes towards using digital technology in ECE, and potential insufficiencies in their practices were also investigated. Results derived from this research could be used to integrate digital technologies in PI practices of teachers, and improve parental involvement in ECE. The research questions of this research were provided below;

- What is the current state of kindergarten teachers' technology use in early childhood education for parental involvement in Turkey?
- What are the associations between kindergarten teachers' technology use for parental involvement and their gender, experience in the field, and personal technology use of teachers?
- What are kindergarten teachers' self-reported obstacles that prevent technology use in parental involvement?
- What are the associations between kindergarten teachers' self-reported obstacles that prevent technology use in parental involvement and gender, experience, and personal technology use of teachers?

METHOD

This quantitative study is designed as a cross-sectional descriptive survey placing research in positivist paradigm (Fraenkel & Wallen, 2009). The main purpose was to gain descriptive information regarding kindergarten teachers' technology use in parental involvement. Additionally, the relationship between background variables on their technology use for parental involvement and the reasons behind the insufficient methods are investigated.

SAMPLE

Data were collected from 100 early childhood educators through a survey. Accessible population was 2187 kindergarten teachers working at a public early childhood education school in chosen five cities which were situated in central region of Turkey, near country's capital city. Cluster sampling method was used and 20 kindergarten teachers from each city included in the sample. There were a variety of reasons for choosing the cities as the research

sample. Firstly, the population of these cities were not as dense as larger metropolitan areas in Turkey, which allows for the data to be more representative of the regional population. Secondly, there may have been stark differences between the larger and smaller cities in terms of technological resources. Investigating the state of technology use for PI practices in smaller cities creates an opportunity to catch a glimpse of the bigger picture. Finally, this sampling method allowed for the data collection to be completed easily, because one of the researchers was residing in the targeted region. the Detailed demographic information of the participants.is presented in Table 1.

An online data gathering tool was used in addition to face-to-face data collection procedures. While printed version of the questionnaire was administered to 65 teachers, 35 teachers fulfilled the questionnaire through online version. The permission to conduct the current research was granted by the Ministry of National Education (TMoE) following application submission in 2018. Although there was no approved IRB for the study, ethical considerations (European Early Childhood Education Research Association [EECERA], 2015) were taken into account throughout the study. First, included in the questionnaire was informed consent which only targeted the early childhood educators; therefore, no details regarding minor children were pursued. Then, even though no personal information except for gender was gathered at any point in this study, the gathered information was kept completely anonymous.

Table 1. Descriptive statistics of participants' background variables

Variable	**N**	**%**
Gender		
Female	86	86
Male	14	14
Age		
20-30 years old	36	36
31-40 years old	52	52
41-50 years old	12	12
Experience in the field		
7 months - 5 years	24	24.7
>5-15 years	56	57.7
>15-35 years	17	17.5
Education level		
Open university (bachelor)	4	4
University (bachelor)	92	92
Master's degree	4	4
Age group		
3 years old	6	6
4 years old	16	16
5 years old	56	56
6 years old	22	22
Type of ECE institution		
Public kindergartens	53	53
Private kindergartens	4	4
Public ECE classroom in a primary school	43	43

INSTRUMENT

The survey instrument was a questionnaire prepared and administered by the authors and the language used was Turkish. The questionnaire was designed to measure early childhood educators' technology use regarding parental involvement practices as well as within their own personal life. Within the framework of Epstein's model, an item pool was created by the authors of the research. The items aimed to combine digital technology use and parent involvement practices of teachers. To ensure validity of the questionnaire, the item pool was presented to an

expert group which consisted of a researcher focusing on parental involvement, a researcher from instructional technology department, and an expert in the field of measurement and evaluation. The last version of the questionnaire was piloted through administering to a group of kindergarten teachers. As there was no need for revising, the piloted version of the questionnaire was used for entire data collection of this research. A reliability test was conducted for all items in the questionnaire, and it was determined to be reliable (see Table 2).

Table 2. Instrument

Name of the section	**Number of items**	**Type of the items**	**Reliability score (α)**
Personal technology use "Technology is an indispensable part of my life"	19	Multiple choice and 5-point Likert (1-strogly disagree, 5-strongly agree)	.78
General view on technology use PI "I feel supported in my technology use"	12	5-point Likert (1-strogly disagree, 5-strongly agree)	.71
Parenting "Parents can reach me via e-mail when they need my assistance"	14	5-point Likert (1-never, 5-always)	.87
Communication "I communicate with parents via e-mail"	13		.81
Volunteering "I take photos of parents' volunteering activities"	9		.82
Learning at home "I give simple homework for children to do with their parents by using technological devices"	5		.79
Decision-making "I use a Facebook group to involve parents in decision-making"	6		.75
Collaborating with the community "I share newsletters via e-mails to inform parents about the community activities for children"	12		.88

DATA ANALYSIS

Method of the text should mainly give information about the methodological construction and the process followed throughout the study. Descriptive and inferential statistics were used in this study. Descriptive statistics were utilized to describe kindergarten teachers' use of digital technologies for parental involvement. A multiple regression and a logistic regression analysis were used to predict teachers' digital technology use for parental involvement based on their gender, work experience, and personal digital technology use. According to Tabachnick and Fidell (2007) sample size, multicollinearity, outliers, normality, linearity, and independence of residuals assumptions should be checked before conducting the regression analysis. To ensure multicollinearity, correlations between the independent variables were below .80, VIF scores were below 10, and tolerence values were above .20. When Mahalanobis distance was checked, no outliers was seen. To check normality, linearity and homoscedasticity, residual scatter plot was checked, and concluded that the assumption was verified. Lastly, Durbin-Watson score showed that independence of residuals assumption was satisfied.

RESULTS

KINDERGARTEN TEACHERS' USE OF DIGITAL TECHNOLOGIES FOR PARENTAL INVOLVEMENT

The personal use of digital technologies among kindergarten teachers was surveyed to determine if this in any way influenced their use of digital technology for parental involvement.

As presented in Table 3, kindergarten teachers owned a variety of electronic devices, and as can be seen, ownership of a smartphone (94%), television (90%), and computer (84%) was widespread among participating teachers. Also, half of the teachers reported using their devices to connect to the internet for more than two hours per day. Regarding the use of digital devices for educational purposes in an ECE setting, they reported using social media (81%), accessed online sources such as blogs (80%), checked e-mail (73%), used the devices for planning activities/materials (61%), listened to music/watched videos (52%), and made video calls (27%). As many of them were social media users, the platforms they utilized were also investigated. WhatsApp (95%), Instagram (67%), YouTube (63%), and Facebook (56%) were the most common social media platforms reported being used by the teachers.

Table 3. Personal digital technology use of kindergarten teachers (N=100)

Device Ownership		**Average Time Spent Online**	
Computer	84%	0-1 hour	19%
Smartphone	94%	1-2 hours	33%
Television	90%	2-3 hours	20%
Digital Camera	36%	3-4 hours	12%
Printer	78%	4+ hours	16%
Personal Use Purposes		**Platforms**	
Social Media	81%	Facebook	56%
Music/video	52%	Twitter	18%
Video chatting	27%	Instagram	67%
Plans/materials	61%	WhatsApp	95%
E-mail	73%	Pinterest	46%
Accessing sources	80%	YouTube	63%

As a first step in understanding how Turkish early childhood educators viewed technology use in general as well as within PI practices, the educators' personal technology use was investigated. The mean score (M_{PTU} = 3.68, *SD* =.484) showed that Turkish early childhood educators hold positive views regarding technology use in their personal lives.

Kindergarten teachers were also queried about how often they used technology in their PI practices. It is shown in their responses that Turkish early childhood educators incorporated technology into their PI practices less than they used digital technology in their personal lives and/or for other activities within the educational setting (Table 4).

Table 4. Early childhood educators' technology use for personal, educational, and parental involvement purposes

	Minimum	**Maximum**	**Mean**	**Std. Deviation**
Personal technology use (PTU)	2	5	3.68	.484
Technology use for parental involvement				
Parenting	1	4.64	3.06	.746
Communication	1	3.62	2.88	.756
Volunteering	1	4.44	2.55	.784
Learning at home	1	4.00	2.69	.887
Decision-making	1	4.17	2.12	.836
Collaborating with the community.	1	4.17	2.42	.839
TOTAL	1	4.12	2.46	.517

The popularity of technology use in different types of PI are demonstrated through descriptive statistics presented in Table 4. According to the mean scores, the most common type of PI in which kindergarten teachers used technology was *parenting* (*M* = 3.06, *SD* =.746), while the

least popular was *decision-making* (*M* = 2.39, *SD* =.836). Moreover, the overall mean score of kindergarten teachers' use of technology for PI was 2.26 (*SD* =.517).

ASSOCIATIONS BETWEEN KINDERGARTEN TEACHERS' TECHNOLOGY USE FOR PI AND THEIR BACKGROUND

To investigate how well teachers' gender, work experience, and personal use of technology predicted their technology use for parental involvement, a multiple linear regression analysis was carried out. Besides, Cohen's f^2 values were calculated to determine effect size. Results of the regression analysis were presented in Table 5.

Table 5: Results of Multiple Regression Analysis between predictor variables and PI types

	B (B Coefficients)	**Multiple Regression**	**ANOVA**			**F (e.size)**
Parenting	*Gender=-2.968 (-.107)*	*R*=.420	Source	*df*	*SS*	*F (f^2)*
	Experience=.010 (.085)	*R^2*=.177	Regression	*3*	*1428.819*	*5.935* (.22)*
	Pers. Tech. Use=.582 (.422)*	*S.E.*=8.95800	Residual	*83*	*6660.393*	
Communication	*Gender=-3.221 (-.131)*	*R*=.195	Source	*df*	*SS*	*F (f^2)*
	Experience=.000 (-.001)	*R^2*=.038	Regression	*3*	*239.867*	*1.094 (.04)*
	Pers. Tech. Use=.213 (.175)	*S.E.*=8.55055	Residual	*83*	*6068.285*	
Volunteering	*Gender=-2.064 (-.115)*	*R*=.350	Source	*df*	*SS*	*F (f^2)*
	Experience=.017 (.220)*	*R^2*=.123	Regression	*3*	*414.855*	*3.869* (.15)*
	Pers. Tech. Use=.237 (.265)*	*S.E.*=5.97826	Residual	*83*	*2966.387*	
Learning at home	*Gender=-.140 (-.014)*	*R*=.320	Source	*df*	*SS*	*F (f^2)*
	Experience=.005 (.106)	*R^2*=.103	Regression	*3*	*111.244*	*3.166* (.12)*
	Pers. Tech. Use=.158 (.313)*	*S.E.*=3.422	Residual	*83*	*972.148*	
Decision making	*Gender=-.417 (-.035)*	*R*=.201	Source	*df*	*SS*	*F (f^2)*
	Experience=.005 (.091)	*R^2*=.041	Regression	*3*	*61.030*	*1.170 (.05)*
	Pers. Tech. Use=.111 (.187)	*S.E.*=4.170	Residual	*83*	*1443.153*	
Collaborating with the community	*Gender=.458 (.019)*	*R*=.225	Source	*df*	*SS*	*F (f^2)*
	Experience=.013 (.122)	*R^2*=.051	Regression	*3*	*309.029*	*1.481 (.06)*
	Pers. Tech. Use=.236 (.197)	*S.E.*=8.34016	Residual	*83*	*5773.334*	
Parent Involvement	*Gender=-8.419 (-.092)*	*R*=.410	Source	*df*	*SS*	*F (f^2)*
	Experience=.050 (.124)	*R^2*=.168	Regression	*3*	11031.66	3.959* (.21)
	Pers Tech. Use=1.548 (.340)*	*S.E.*=28.09614	Residual	*83*	77079.982	

As presented in Table 5, the linear combination of gender, experience, and personal technology use of teachers significantly predicted the PI types of parenting, volunteering, and learning at home. While teachers' personal technology use did significantly contribute to the models, gender and experience did not, so this means that there was an association between teachers' personal digital technology use and their digital technology use for parental involvement.

REASONS FOR NOT USING TECHNOLOGY FOR PI PRACTICES BY PI TYPE

As was determined from the results of this current study, participants stated that insufficient technology use occurred in at least one of the six types of PI. Overall, more than half of the participants reported insufficient technology use in all six of the parental involvement types (Table 6). Among these six types, using technology to involve parents in the decision-making process was rated as the most problematic with 70% of participants stating insufficient technology use for this specific PI type. On the other hand, according to 58% of participants, the least problematic PI type for technology use mentioned was communication.

To identify the reasons why technology use was insufficient among kindergarten teachers during specific types of PI, frequency tests were run for the multiple choice items for possible reasons (participants could choose more than one option). These options were as follows:

1. Use of technology is not suitable for this type of PI
2. I do not have sufficient knowledge on use of technology for this type of PI
3. I do not have sufficient technological equipment to use for this type of PI
4. Parents oppose to use of technology for this type of PI
5. School administrators oppose to use of technology for this type of PI
6. Parents' financial status is not sufficient to use technology for this type of PI
7. Parents' level of knowledge is not sufficient to use technology use for this type of PI
8. Our education system does not support the technology use for this type of PI
9. Education legislations are limiting the use of technology for this type of PI
10. It is hard to use technology for this type of PI
11. I do not find beneficial to use technology for this type of PI

Table 6. Percentages of self-reported reasons for insufficient PI practices

	PI practices are insufficient (%)	**Reasons for insufficiency (%)**										
		1	2	3	4	5	6	7	8	9	10	11
Parenting	63	0	6	14	2	1	25	29	13	11	12	5
Communication	58	1	1	4	8	1	20	22	11	7	13	7
Volunteering	67	9	7	15	4	0	23	19	11	9	10	4
Learning at Home	65	5	7	8	4	2	22	20	5	8	9	8
Decision Making	70	18	3	9	8	2	19	18	7	5	13	5
Collaborating with the Community	69	11	4	8	5	2	23	27	6	9	8	87

As a result, the two most common reasons cited for insufficient technology use across all PI types were that "Parents' financial status is insufficient to use technology for this type of PI" and "Parents' level of knowledge is insufficient to use technology for this type of PI". The least common reason cited was that "School administrators oppose the use of technology for this type of PI" (Fig. 1). Additionally, none of the participants provided any other type of response to the open-ended question option.

THE ASSOCIATIONS BETWEEN THE REASONS AND BACKGROUND VARIABLES

To understand the underlying reasons behind participants' stated problems, the relationship between the problems encountered and the teacher's demographic variables were analyzed. A logistic regression analysis was conducted to investigate the association between teachers' gender, experience, personal technology use, and whether teachers encountered problems during their technology use for parental involvement. Teachers' problems were converted to 0-1 level before the analysis. While 0 referred to no problem encountered, 1 referred to teachers encountered problems during technology use for parental involvement.

Table 7. Results of logistic regression analysis between the problems encountered and demographic variables of teachers

	B	**S.E.**	**Wald**	**Sig.**
Gender	.226	.884	.065	.798
Experience	-.009	.004	6.231	.013
Personal Tech. use	-.081	.042	3.647	.056
Constant	6.531	2.515	6.740	.009

It was indicated in the results from the regression analysis in this current study, that there was a significant relationship between gender, experience, personal technology use, and problems

of teachers during parental e-nvolvement ($\chi 2(3)=11.221$). Although gender (Wald = .065, $p>.05$) did not significantly relate to the problems stated by participants, the experience of teachers (Wald = 6.231, $p<.05$), and personal technology use of teachers (Wald = 4.113, $p<.05$) did significantly influence the problems they encountered during digital technology use for parental involvement. Therefore, it was indicated in these results, that as personal technology use and experience of teachers increased, they were less likely to encounter problems regarding digital technology use for parental involvement.

DISCUSSION

The overarching goal of this current study was to better understand the digital technology use of Turkish kindergarten teachers in their parental involvement practices by highlighting the predictors of e-nvolvement as well as the reasons behind their self-reported insufficiency. For this purpose, the frequency of digital technology use for different PI types was investigated, along with kindergarten teachers' personal and professional use of digital technology. Based on the findings of this current study, it was determined that kindergarten teachers actively employed digital technologies in their daily life. Also, they owned a variety of digital devices, and utilized them for several different purposes such as social media, e-mail, accessing online sources, and planning activities/materials for their classrooms. According to Yurt and Cevher-Kalburan (2011), it is common that Turkish kindergarten teachers use digital technologies for planning their educational activities and accessing informative resources. Moreover, it is stated that they have positive attitudes regarding digital technology use in both their daily life and classroom settings (Kol, 2015; Sahin, Tas, Ogul, Cilingir & Keles, 2014).

In this current study, first research question was addressing the kindergarten teachers' technology use for parental involvement and it was determined that although participants actively used and had positive views regarding digital technology use in their personal life and educational activities, their use of digital technologies for parental e-nvolvement was found to be considerably low. In a previous study focusing on parental involvement activities by Hakyemez (2015), it is reported that Turkish kindergarten teachers prefer communication as a parental involvement modality more often than they do involving parents as volunteers or within the decision/making process. Considering their general gravitation towards communication as a parental involvement type, it was not surprising that they commonly integrated technology into this type of parental involvement. Similarly, Gu (2017) reports in a case study conducted in Sweden that school websites are mostly used for communication purposes rather than catering to the other types of parental involvement.

On a more general level, the total mean score for parental e-nvolvement was low which indicated that participating teachers infrequently used digital technologies for parental e-nvolvement. In order to answer the third research question, which is to uncover teachers' self-reported obstacles that prevent technology use in parental involvement, it is important to investigate the parental involvement practices of Turkish kindergarten teachers on a more general level as well as their self-reported reasons for their insufficient practice of parental involvement. It is shown in previous research that although Turkish kindergarten teachers' value parental involvement and use it often, they still state their practices were insufficient (Hakyemez, 2015). Importantly, similar results were also determined in this current study, where kindergarten teachers regarded technology use as important for ECE but also believed e-nvolvement practices were insufficient. This can be evidence that a gap between the rhetoric and practice exists (Cottle & Alexander, 2014; Hakyemez, 2015; Hakyemez-Paul, Pihlaja & Silvennoinen, 2018; Hakyemez-Paul, Lähteenmäki & Pihlaja, 2021; Hornby & Lafaele, 2011). When it comes to the kindergarten teachers' reasons for low parental e-nvolvement, the two most stated reasons were parents' financial status and lack of knowledge regarding parental e-

nvolvement. Although kindergarten teachers linked financial status of parents to the availability of digital devices in households, it is revealed in a recent nationwide report that 98.7% of families own a smartphone, 55.5% have a computer, 26.7% have a tablet computer, and 88.3% have access to the Internet (Turkish Statistical Institute [TUIK], 2019).

As previously mentioned, it is reported in other studies that there is a gap between what educators think regarding parental involvement and how the practices are carried out, which in the end results in the insufficiency of these practices. For example, in a study by Epstein (2016), some of the primary reasons for insufficiency in parental involvement practices are the lack of time, personal differences between teachers and parents as well as a lack of knowledge and training among parents. Although in this study the use of digital technology was proposed as a solution to such barriers, it was shown in the results that even though use of digital technology did aid in overcoming issues with time, such implementations continued to have limitations and this brings the attention back to the gap between rhetoric and practice (Cottle & Alexander, 2014; Hakyemez, 2015; Hornby & Lafaele, 2011). However, these limitations seemed to be quite like those reported for parental involvement practices that revolved around parents' resources and capabilities. At this point a contradiction surfaces; even though the digital technology use is very common in Turkish households (TUIK, 2019), participants of this study linked financial status of parents to the availability of digital devices hence the low level of parental e-nvolvement. These results were especially surprising considering that participants reported most of their students came from middle class families and therefore were expected to have the financial means and an acceptable knowledge for owning and using digital technologies. This contradiction might be a sign that teachers had a misconception of parents' resources and capabilities, which requires further investigation to clarify.

Finally to answer the fourth research question, the association between self-reported obstacles that prevent technology use in parental involvement and background variables such as gender, experience, and personal technology use of teachers was investigated because along with self-reported reasons, there are also a variety of other factors that influence teachers' digital technology use in early childhood education (Konca et al., 2016). Background variables of teachers are highlighted as one of the categories regarding the difficulties and barriers of teachers' integrating digital technologies into early childhood education (Sang et al., 2010). Importantly, experience in early childhood education (Inan & Lowther, 2010) as well as the competency and personal technology use of preschool teachers (Hew & Brush, 2007) are key factors that likely affect teachers use of digital technologies in early childhood education (Inan & Lowther, 2010). Although Turkish kindergarten teachers practices and views regarding parental involvement did not correlate with their experience in the field (Hakyemez, 2015), similar to previous studies, it was revealed in this current study that personal technology use and the experience of kindergarten teachers influenced their parental e-nvolvement as well as the problems they encountered during parental e-nvolvement. It was implied through these results that although kindergarten teachers' technology use for parental involvement and their personal purposes differed, the use of digital technologies for personal use significantly predicted teachers' parental e-nvolvement. In other words, the more they used digital technologies in their personal life, the more they were found to use digital technologies in parental e-nvolvement. In addition, the more teaching experience the teachers' gained, the more they tended to practice e-nvolvement. This might be a result of the more years spent in ECE, they also became more experienced with digital technology use, and as a result, become more comfortable implementing parental e-nvolvement.

Bruniges (2003) defines the purpose of digital technology use in education as a means "*To improve and increase the quality, accessibility and cost-efficiency of the delivery of education, while taking advantage of the benefits of networking learning communities together to equip them to face the challenges of global competition*" (p. 3). According to this perspective, digital

technologies can be utilized to support parental involvement by strengthening the communication and collaboration between home and school. Also, use of digital technologies can help diminish barriers to successful and strong parental involvement, and as a result, may lead to parents becoming more active in their children's educational process. However, based on teachers' self-reported reasons for insufficient parental e-nvolvement practices, it was shown in this current study that the connection was severed between the teachers and parents. Although teachers do share information about their students' with the parents, they often prefer one-way communication (Hakyemez-Paul, Lähteenmäki & Pihlaja, in press) or in other cases parents tend not to provide a response (Hagel & Brown, 2008). So, it appears parental e-nvolvement can provide bilateral communication which leads to a strong relationship between home and school. Importantly, active parents play key roles in their children's education and digital technologies can improve this activation (Ho, Hung & Chen, 2013), provided that the Turkish kindergarten teachers' conception of parents is refined.

CONCLUSION

In conclusion, this current study determined that even though digital technology was a part of Turkish kindergarten teachers' personal life and they considered their digital technology use as a positive aspect in their educational activities, use of digital technologies for parental e-nvolvement was considerably low. Importantly, participants stated the importance of digital technology in their parental involvement practices, and also believed e-nvolvement practices were insufficient. This finding shows that Turkish kindergarten teachers are aware of their limitations when it comes to parental e-nvolvement practices. Participants mostly stated that parents' financial status and lack of knowledge were the reasons for the insufficient parental e-nvolvement.

This study revealed that although the kindergarten teachers are well-accustomed with the technology use in their personal and professional life, they did not adopt these technologies to involve parents. In order to overcome this barrier, the communication between home and school should be strengthen. In this way kindergarten teachers can evaluate the resources available to the parents and decide on a suitable technologic device. Additionally, considering the fact that the more technology kindergarten teachers use in their personal life, the more they use e-nvolvement.

Aside from practical implications, this study also presents some opportunities for further research. With more participants a more in-depth understanding of digital technology use for parental involvement practices in the Turkish ECE setting could be achieved. Nonetheless, based on the results of this study, it can be concluded that kindergarten teachers may benefit from trainings on adopting digital technologies in parental involvement. Considering that parental involvement also requires parents' efforts, such trainings/workshops would be beneficial for them as well.

This research was conducted in early childhood education settings that were affiliated with the Turkish Ministry of National Education. Since the governance of ECE in Turkey is shared between the Ministry of National Education and the Ministry of Family and Social Policies, there may be differences between institutions that are affiliated with these differing governmental ministries. As a result, further research is necessary that includes ECE institutions not governed by TMoE. Similarly, studies that are targeted towards private institutions could benefit this research in terms of providing more detailed and generalizable results.

Finally, as recognized in the results of this current research, teachers' views as well as their e-nvolvement practices were the primary focus, and it was revealed that educators considered parents' financial and educational background as barriers for e-nvolvement. Thus, in further research the views and attitudes of parents should also be investigated. Considering the latest

report from the Turkish Statistical Institute (2019), it is recognized that digital technologies are widespread among Turkish families, therefore, investigations should be carried out into how families perceive and utilize digital technologies for educational purposes.

There were some limitations in this current study due to the number of kindergarten teachers who participated. the research was only conducted within the central parts of these municipalities. As the number of participants of this study is limited the results might not reflect the e-nvolvement practices for the whole country. Besides there were still a variety of tests that could not be carried out because of assumptions that were not fully met with a number of the participants.

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