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Exploration of Parents' Digital Parenting Efficacy through Several Demographic Variables

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Abstract

As digital technologies develop, they provide individuals with new opportunities in various areas of daily life. However, these technologies also bring about some potential risks. Through digital technologies, several risks including but not limited to malicious content, cyberbullying, pornography, and sexually-explicit messages can easily reach out to households. The most vulnerable group for such risks is the children. As parents are primarily responsible for the well-being of their children, they have an important role in protecting the children in the digital environment. Parents need to get acquainted with the digital age so that they could protect their children from the risks pertaining to the use of digital technologies. The purpose of this study was twofold: (a) to identify digital parenting efficacy domains and their indicators, and (b) to examine parents' efficacy levels in terms of some demographic variables through a measure based on the identified indicators. The study was survey research with two phases. In the first phase, based on a literature review and a focus group interview with experts, digital parenting efficacy fields and their indicators were identified. In the second phase, a digital parenting self-efficacy scale was developed and administered to 576 parents in Eskişehir region to explore the participants' self-efficacy levels based on parenting roles, internet use, income level, occupation, and educational level. The digital parenting competencies and their indicators used in the scale development process consisted of seven dimensions. Through the participation of separate samples of parents, the factorial structure of the scale was examined through exploratory (n=520) and confirmatory factor analyses (n=556). After construct validity steps, indicators were gathered under three factors as digital literacy, digital safety, and digital communication. These indicators did not differ based on parents' role in the process, internet use, socio-economic status, occupation, and level of education.

Keywords

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Introduction

Digital tools, especially the Internet, offer numerous facilities in social, economic, political, and cultural domains of life (Van Deursen, 2010). Applications like e-commerce, e-banking, e-communication, and e-government have become a regular part of our daily routines. Nonetheless, the use of these tools also brings about some risks, and hence, they should not be evaluated merely based on the opportunities they provide (Valcke, De Wever, Van Keer, & Schellens, 2011).

The risks stem from digital tools encompass a host of categories such as malicious content, cyberbullying, cyber fraud, and cyber harassment (Hasebrink, Livingstone, & Haddon, 2009; Van den Heuvel, Van den Eijnden, Van Rooij, & Van de Mheen, 2012; Ybarra, 2004). Although such risks threaten individuals in every age group, children are more vulnerable as they often possess lower levels of technology literacy (Akbulut, Şahin, & Erişti, 2010; Kaşıkcı, Çağıltay, Karakuş, Kurşun, & Ogan, 2014).

Contemporary trends indicate that children's introduction to digital technologies happens in earlier ages. In a way, children become native to the language of technology. In 2010, the EU Kids Online project was conducted in 25 European countries, including Turkey, to investigate the online activities of the children aged between 9 through 16. According to the project's findings, children begin to use the Internet at the age of 10. Similarly, in its Children's Media Consumption Habits Study, the Radio and Television Supreme Council of Turkey [RTÜK] (2013) reported that among children aged between 6 and 18 years 73.9% have computer or tablet at home and 63% have access to the Internet. As a consequence of widespread mobile device adaption, the minimum age of internet users appears to decrease further. Considering smartphone ownership trends, the average age of first internet use expected to fall within the 4-11 age range (Mascheroni & Ólafsson, 2016).

According to the Turkish Statistical Institute ([TurkStat], 2013) data, the age of beginning to use the internet was identified as 6 for the 6 -10 age group and 10 for the 11-15 age group. Such trends are likely to result in children encountering digital-technology-related risks in increasing frequencies and in earlier ages. In Europe, for instance, 46% of the 9-16 years-old internet users encounter at least one online risk and the percentage increases up to 69% for the 15-16 years-olds (Duerager & Livingstone, 2012). Although 25% of students in Turkey were reported to be heavy users of the Internet, 68.4% did not know how to configure privacy settings on social media sites, 69.9% did not know how to block unwanted messages, and 56.2% could not find information on how to use the Internet safely (Kaşıkcı et al., 2014). Taken the alarming frequency of the online risks experienced by the children into consideration, the relationship between children and the Internet has become an important area of concern. Thus, protecting children from online risks while preserving their online rights become an important topic (Livingstone & Helsper, 2010). Livingstone and Bulger (2013) maintained that children need the support of all stakeholders so that they could use the Internet and other digital technologies effectively in a safe manner. Parents, undeniably, have the utmost importance among these stakeholders (Guernsey, Levine, Chiong, & Severns, 2012; Rosen, Cheever, & Carrier, 2008).

Even though the parents' responsibilities in the digital lives of their children are well-acknowledged, the complexity of interactions within the child, parent, and the Internet triangle makes fulfillment of these responsibilities quite difficult. The literature suggests that parents often influence children's online experiences through banning, controlling or monitoring (Álvarez, Torres, Rodríguez, Padilla, & Rodrigo, 2013; Kenley, 2011; Valcke, Bonte, De Wever, & Rots, 2010). Parents are reported to exhibit various behaviors such as informing their children about safe internet use, setting rules about the limits of personal information sharing, talking to children about their online experiences, and tracking children's online activities using browsing history (Duerager & Livingstone, 2012; Kaşıkcı et al., 2014). Nonetheless, most children are known to feel uncomfortable about their parents' such behaviors. For example, 65% of the children in the 12-19 age range were reported to try hiding their

online activities from their parents (Livingstone & Bober, 2005). According to EU Kids Online (2010) results, when children have negative experiences online they prefer to receive help from their peers rather than their parents. Kenley (2011) associated this situation with the restricting/limiting attitude parents. Accordingly, children usually hesitate to consult with their parents due to the fear of losing access to digital technologies. In other words, restrictive parenting practices may lead children to avoid talking to their parents about their experiences in the digital world. Moreover, children tend to question their parents' digital efficacies. Kadli, Kumbar, and Kanamadi (2010) stated that children usually gather information on internet use through individual effort or through their peers due to insufficient support provided by their parents and teachers. Similarly, Sonck, Livingstone, Kuiper, and de Haan (2011) report that, among 9-to-13-year-old children, 52% of males and 48% of females believed their internet use skills were superior to their older family members.

In the literature, studies on digital parenting either involved digital parenting styles or parent roles in terms of dimensions like rule-setting, restricting, and controlling (Álvarez et al., 2013; Kenley, 2011; Valcke et al., 2010). Nonetheless, the literature seems to lack studies that aim to identify digital parenting competencies and their indicators. Hence, there exists a need for scholarly work that not only identify digital parenting competencies and their indicators but also propose instruments to assess parents' status of having such competencies. In order to reveal conditions that influence digital parenting efficacy constructs and their indicators, a variety of variables should be taken into consideration.

Theoretical Framework

Digital citizenship construct can provide a basis for the digital parenting concept. Parents should foremost exhibit digital citizenship qualities so that they could raise their children as digital citizens. Ribble and Bailey (2007) defined digital citizenship as considering foundational norms when using technology and acting up accordingly. In another definition, digital citizenship refers to the ability to read, write, understand, and send online texts; having access to broadband internet connectivity depending on one's economic status, and using the Internet regularly in a daily basis (Mossberger, Tolbert, & Mcneal, 2008). The components of digital citizenship were identified as digital ethics, digital communication, digital literacy, digital access, digital commerce, digital rights and law, digital privacy and safety, digital responsibility, and digital health (Ribble & Bailey, 2007).

Certain socio-economic variables may be helpful in determining digital parenting levels. As to parenting roles, mothers tend to exhibit a more diligent attitude in monitoring children's online activities (Anderson, 2016). Parents' digital literacy is another variable that is worthy of scholarly attention. The literature suggests the parents of low internet literacy tend to (a) use the Internet, (b) guide their children in internet use, and (c) promote use of the Internet less frequently than the parents with high-levels of internet literacy (Lou, Shih, Liu, Guo, & Tseng, 2010). Socioeconomic status of a parent is also an important variable. The literature suggests that parents tend to talk less about the online content with their children as their socio-economic status increase (Anderson, 2016). On the contrary, in their digital citizenship definition, Mossberger et al. (2008) included socio-economical level as an indicator of broadband internet access. To summarize, parenting role, level of internet use, and income level are important variables in determining parents' perceptions of their digital parenting efficacy. Since income level changes in parallel to one's occupation, occupation was also considered in the current study. Finally, parents' educational level is expected to influence their parenting efficacies, and therefore, the level of education was considered in the current study. Parents' level of education has influences on their parenting attitudes and fostering their children (Álvarez et al., 2013).

Following research questions were formulated:

- What are the digital parenting efficacies and their indicators?

- What are the parents' level of perceived digital parenting self-efficacy?
- Do parents' level of perceived digital parenting self-efficacy differ in response to parenting role, level of internet use, income level, level of education and occupation?

Method

Research Model

This study employed a survey design and conducted in two phases. In the first phase, the Digital Parenting Self-Efficacy Perception Scale (DPSPS) was developed. The scale, then, was applied to a sample of parents in Eskisehir to examine their parenting self-efficacy perceptions in terms of background variables.

Participants

In each phase of the study, the data were collected from different participant groups. In the first phase, a workshop was organized to determine what efficacies parents need to foster digital citizens. From government and non-profit organizations, a group of officials advocating online safety for kids were invited to the workshop. Table 1 shows the information regarding the workshop participants' institutions and areas of expertise.

Table 1. Participants of the Workshop

Institution of Participants	Number of Participants	Expertise
Presidency of Telecommunication and Communication	1	Internet Safety, Information Technology Law, Information Safety
Ministry of Family and Social Policies	1	Family and Community Services
Child and Information Security Association	1	The Internet and Children
Cyber Crime Enforcement Department Office	2	Cybercrime, Information Crimes
Guidance and Research Center	1	Child Abuse
Anadolu University, Faculty of Law	1	Law, Trade Law

As seen in Table 1, Digital Parenting Workshop (DPW) was conducted with seven participants with different backgrounds. After developing DPW, the research team generated an item pool covering various indicators for digital parenting dimensions and asked the opinions of experts who had expertise in both scale development and kids' online safety. The information regarding the expert panel is provided in Table 2.

Table 2. Participants of the Expert Panel

Department	Expertise
Computer Education and Instructional Technology	Scale Development
Computer Education and Instructional Technology	Internet Safety
Guidance and Psychological Counseling	Problematic Internet Use
Guidance and Psychological Counseling	Family Structure
Social Studies Education	Digital Citizenship and Family
Turkish Education	Turkish Grammar

After the expert review and grammatical assessment, the draft scale was tested in a pilot study with ten parents. Participants were in the 35-47 age range and represented different occupational backgrounds, such as teachers, public officers, workers, housewives, and self-employed individuals. After the pilot, the scale development process continued with an explanatory factor analysis (EFA).

Participants of the EFA for Digital Parenting Self-Efficacy Perception Scale

The data for the EFA phase were collected from the parents who resided in the main district of Eskisehir province, had children in secondary school, and had Internet access at home. The rationale for choosing the parents of middle school student was that middle school students are more likely to encounter risks as their access to digital technologies increase during middle school years and they reach puberty (RTÜK, 2013). In doing so, six schools from different educational regions of the main district were identified. A total of 1200 copies of the draft scale were distributed to the parents and 587 forms were returned. During the initial screening of the forms, 67 forms were excluded from analysis due to validity issues such as monotonous responding (responding to all items with the same answer, e.g. marking only 1, 3 or 5), providing multiple answers for a single item, pattern coding, missing answers, and not using the Internet. Remaining 520 forms were used in the EFA. Considering the indirect way of reaching out to parents (counselor teachers and information technology teachers gave the forms to students, the students then gave the forms to their parents, and finally students returned the forms on behalf of their parents), the response rate was regarded as normal. Küçük, Aydemir, Yıldırım, Arpacık, and Göktaş (2013) reported that the overall response rate was around 13% for survey studies with more than 300 participants. Besides, the proportion of empirical studies in the field was about 1% when parents were the main participant group (Baydas, Kucuk, Yilmaz, Aydemir, & Goktas, 2015; Küçük et al., 2013). Considering such trends in the relevant literature, the response rate of the current study (43.3%) was considered plausible.

In the EFA process, the sample's adequacy was examined first. Different sources set thresholds to assess sample adequacy. For instances, Tabachnick and Fidell (2007), Worthington and Whittaker (2006), and Field (2009) recommend a minimum of 300 participants for factor analysis. Alternatively, Comrey and Lee (1992) consider 100 participants as "poor", 200 as "fair", 300 as "good", 500 as "very good", and finally 1000 and more as "excellent". In this study's context, the present sample of 520 participants can fulfill ideal conditions for an EFA. Further information about the participants of EFA is provided in Table 3.

Table 3. Participants of EFA and CFA phases

	EFA		**CFA**	
	Mother	**Father**	**Mother**	**Father**
Age Range	**29-52**	**33-59**	**25-57**	**32-61**
Occupation				
Housewife	228	-	273	-
Self-Employed	5	25	13	24
Public Officer	12	32		
Worker	53	80	59	79
Police/Soldier			1	12
Teacher/Academician	11	4	11	12
Engineer	-	6	1	1
Medical Doctor	1	-	-	1
Retired			3	13
Other	21	30	15	35
Not stated	-	12	-	3
Total	331	189	376	180
Educational Attainment				
Elementary School	107	24	171	38
Middle School	42	31	74	26
High School	111	77	89	66

Table 3. Continued

	EFA		CFA	
	Mother	**Father**	**Mother**	**Father**
Age Range	**29-52**	**33-59**	**25-57**	**32-61**
2-Year College	22	22	23	14
Bachelor's Degree	38	25	17	28
Master's Degree	4	5	1	5
Doctoral Degree	-	-	-	1
Other	4	2	1	1
Not stated	3	3	-	1
Total	331	189	376	180
Internet Use Status				
0 - 1 year	51	30	78	29
2 - 3 years	58	30	90	35
4 - 5 years	49	36	61	28
6 - 7 years	55	25	51	16
8 years and up	118	68	96	72
Total	331	189	376	180

* Mothers filled in the DPSPS and provided information about their spouse.
** Fathers filled in the DPSPS and provided information about their spouse.

As seen in Table 3, 331 of the participants were mothers (63.65%), whereas the remaining 189 were fathers (36.35%). Mothers' ages ranged between 29 and 52 while fathers' ages ranged between 33 and 59. Moreover, the number of child(ren) in the household ranged between one to five. After the EFA, a confirmatory factor analysis (CFA) was also conducted with the data gathered from a new sample of parents.

Participants of the CFA for Digital Parenting Self-Efficacy Perception Scale

EFA is used to focus on the relationship between the data and variables. Therefore, employing the same data in the subsequent CFA is not recommended (Worthington & Whittaker, 2006). A new round of data collection was carried out for the CFA phase. The selection criterion for the CFA phase required one middle school form each educational region. Excluding the schools selected for the EFA phase from the list, one school from each of the six educational regions of Eskişehir Province was randomly selected. 1200 copies of the draft scale were distributed, and 656 forms were returned. After screening of the forms, 100 forms were excluded due to validity concerns such as monotonous responding, providing multiple answers for a single question, pattern coding, missing answers, and the like.

Different rules of thumb were suggested to judge a sample's adequacy for CFA. Kline (2005), for instance, stated a sample of 100 to 200 participants would suffice. From other approaches to sampling adequacy, Bryant and Yornold (1995) suggested including 5 to 10 participants per item while Worthington and Whittaker (2006) maintained including 5 participants per item was sufficient yet including 10 per item would be more appropriate. In this regard, a sample of 556 participants can be regarded as ideal. Further information about the participants of the CFA is provided in Table 3.

As seen in Table 3, 376 of the participants were mothers (67.26%) while the remaining 180 were fathers (32.74%). Mothers' ages ranged between 27 and 57 while fathers' ages ranged between 32 and 61. Furthermore, the number of child(ren) in the household ranged between one and nine.

Data Collection

The workshop was conducted to identify digital parenting efficacy domains and their indicators based on expert opinions and to generate an item pool. In doing so, expert opinions were documented through video and audio recordings. Moreover, during the workshop, worksheets were distributed to the participants so that they could write down their opinions regarding digital parenting efficacies and their indicators. After the workshop, the researchers collected and analyzed the worksheets.

Before starting data collection, permissions obtained from Anadolu University Ethics Board and the National Education Directorate of Eskisehir Province. Then, data collection packages that consisted of permission documents and adequate number of forms were given to school principals. The task of distributing the forms to students and recollecting them was assigned to school counselor teachers or information technology teachers in most cases. Students gave the forms to their parents and returned the filled-in forms to their teachers. Finally, the researchers got the forms and used them for the EFA. A similar process was also carried out in the CFA phase.

Data Analysis

The data analysis methods employed in this study are provided together with their respective research questions in Table 4.

Table 4. Data Analysis Methods by Research Questions

Research Question	Research Model	Research Question	Data Collection Instrument	Data Analysis
1	Survey Research	Based on expert opinions, what are the digital parenting efficacies and their indicators?	Focus Group Interview (Digital Parenting Workshop)	Inductive Analysis
2	Survey Research	What are the parents' level of perceived digital parenting self-efficacy?	Digital Parenting Self-Efficacy Scale	EFA, CFA Descriptive Statistics (%, f, $\bar{x}$, SD)
3	Correlational Research	Do parents' level of perceived digital parenting self-efficacy differ in response some variables?	Digital Parenting Self-Efficacy Scale	Descriptive Analysis (%, f, $\bar{x}$, SD), Independent-Samples t Test, Analysis of Variances (ANOVA)

As seen in Table 4, an inductive approach was taken in the analysis of the DPW data. In the inductive analysis, researchers take an in-depth look at the data to identify previously unknown themes and dimensions, and reveal concepts and relationships (Creswell, 2012). For the second and the third research questions, relevant quantitative analysis methods were employed.

Results

This study covered the development process of the DPSPS. In this section, the findings were presented in accordance with the research questions.

What are the digital parenting efficacies and their indicators?

In addition to dimensions that existed in the literature, new dimensions of digital citizenship were identified during the DPW. Participating experts extended the pre-established dimensions of digital citizenship (i.e., digital ethics, digital communication, digital literacy, digital access, digital commerce, digital rights and responsibilities, digital law, digital privacy and safety, and digital health) with new dimensions such as information literacy, critical literacy, and media literacy. Upon further analysis of these new dimensions and their indicators, it has been concluded that they were strongly related to the pre-established dimensions. Thus, information literacy, critical literacy, and media literacy were excluded from digital parenting efficacies. The final structure of the digital parenting efficacies is shown in Table 5.

Table 5. Digital Parenting Efficacies and Indicators

Main Constructs	Competencies (Efficacies)	Indicators
Digital Ethics	Accuracy	Modeling proper information sharing practices in digital media
	Copyrights	Using digital content with an awareness of its commercial value
	Privacy of Personal Information	Knowing what personal information can be shared to what extent
	Digital Values	Representing real-life cultural values in digital media
	Digital Footprint	Modeling appropriate digital footprint generation practices for children
Digital Communication	Digital communication tools	Using digital tools (e-mail, social media etc.) for communication
	Digital monitoring	Valuing children's online posts
Digital Literacy	Using digital tools	Getting acquainted with the digital tools that children use
	Monitoring	Tracking children's browsing history
Digital Access	Digital tool selection	Choosing digital tools appropriate for children's developmental level
	Safe Access	Ensuring that children engage in age-appropriate digital media
Digital Commerce	e-Commerce	Protecting personal information during e-commerce
	Digital budget	Establishing a spending limit for digital purchases
Digital Safety	Digital rights	Knowing personal rights in digital media
	Digital responsibility	Protecting children in digital media
	Digital law	Knowing legal ways to deal with issues that may arise in digital media
	Digital privacy	Knowing how to protect personal information in digital media
Digital Health	Physical health	Considering ergonomic features when choosing digital tools
	Psychological health	Avoiding using digital tools for prolonged times

As Table 5 indicates, within the digital ethics dimension, the experts mentioned efficacies and indicators such as complying with copyrights, modeling ethical behavior, and distinguishing virtual life from the real one. The research team examined these findings and established five efficacy domains on the basis of Mason's (1986) PAPA (i.e., Privacy, Accuracy, Property, Accessibility) framework. These efficacy domains are accuracy, copyrights, privacy of personal information, digital values, and digital footprint.

The experts identified two efficacy domains under the digital communication dimension, namely using digital communication tools and monitoring. Since the notion of using digital communication tools is interwoven with digital literacy, the study team reworded the efficacy domains as digital communication tools.

Within the digital literacy dimension, the experts established two efficacy domains. Considering the efficacies and indicators the domains of digital tools and digital monitoring were regarded suitable for the digital literacy dimension.

In the digital access dimension, the study team analyzed the experts' opinions including taking actions appropriate for child development, selecting digital tools, and emphasizing safety in digital access. Within this dimension, digital tool selection and safe access efficacy domains were established.

The experts identified the highest number of efficacies for the digital commerce dimension. The research team analyzed six digital commerce efficacies reported by experts and narrowed them down to two domains.

The experts mentioned overlapping efficacies and indicators related to digital citizenship dimensions like digital rights and responsibilities, digital law, and digital privacy and safety. The study team, consequently, decided to gather these efficacies under the same title and established four efficacy domains within the digital safety dimension.

Within the digital health dimension, the experts listed some efficacies and indicators related to physical and psychological health. The research team preserved these domains as suggested.

What are the parents' level of perceived digital parenting self-efficacy?

The development of the DPSPS consisted of the steps delineated in this section.

Item Pool Generation for Digital Parenting Self-Efficacy Perception Scale

In the development process, an item pool was generated first. The initial pool included 44 items in line with the efficacy and indicators identified in the DPW. Later in the process, the study team extended the item pool with relevant items from the literature and thereby increased the number of items to 66.

Expert review of Digital Parenting Self-Efficacy Perception Scale

Once the item pool was generated, expert opinions on the items were sought. In doing so, an expert review form was employed. Then, for each item, an item content validity index was calculated using the $CVI = \frac{N_G}{N/2} 1$ (N_G=number of experts that deem the item necessary; N= total number of experts) formula and the resulting indices were interpreted. After the expert review, 61 items were preserved. A grammar expert also reviewed the resulting instrument to ensure grammatical accuracy and clarity.

Conducting a Pilot Study of the Digital Parenting Self-Efficacy Perception Scale

In a small pilot study, the expert-reviewed version of DPSPS was applied to ten parents. Participants completed the instrument within the predicted time and no problems were detected regarding the intelligibility of the items.

EFA Phase of the Digital Parenting Self-Efficacy Perception Scale

The EFA phase was conducted according to the steps suggested by Huck (2012) as follows;

- Assessing the data set's eligibility for factor analysis,
- Selecting a factor extraction method,
- Selecting a factor rotation method,
- Identifying the number of useful factors,
- Identifying variables within factors and
- Naming the identified factors.

In addition to subjective measures, Kaiser-Meyer-Olkin test for sampling adequacy (KMO) and Bartlett's test of sphericity were used. The results of the test are provided in Table 6.

Table 6. KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Test for Sampling Adequacy		,959
Bartlett's Test of Sphericity	Approximate Chi-squared	16757,811
	Df	1830
	P	,000

As seen in Table 6, the KMO value was very good (Hutcheson & Sofroniou, 1999; Kaiser, 1974; Pallant, 2001) and Bartlett's Test of Sphericity was significant at $p < .000$ level. In addition to sampling adequacy for the EFA, the descriptive statistics for each dimension were investigated. To satisfy univariate normality requirement, the absolute values of the skewness and kurtosis statistics should be below 3 and 10, respectively (Kline, 2005). In the study, the skewness values were between -1.476 and -0.648 and the kurtosis values were between -0.078 and 2.645. Therefore, the skewness and kurtosis values were in acceptable range. Hence, the data were accepted as fulfilling univariate normality assumptions.

As Principal component analysis (PCA) is a computationally simple, yet psychometrically strong method that could deal with potential factor indeterminacy issues (Stevens, 1996), it was utilized to identify the subdimensions of the scale. As a common factor rotation method employed in the literature (Büyüköztürk, 2010; Field, 2009; Hair, Black, Babin, & Anderson, 2005; Huck, 2012), Varimax was chosen to ease interpretations. Based on analyses, nine factors with eigenvalues higher than 1 were identified and 60.128% of the variance could be explained. Following Worthington and Whittaker's (2006) suggestions, items with factors loadings lower than .25 and the overlapping items having similar loadings with other items were excluded from the instrument to improve interpretability and explanative power of the instrument.

After excluding the items, a three-factor structure that could explain 49.339% of the variance using 40 items was established. As they were not interpretable within their respective factors, two items and their effects on the explanatory power of the instrument were investigated employing step-wise methods. The factor structure of the remaining items was not affected by the exclusion of these two items, and therefore, they were excluded from the instrument. The final version of the scale consisted of 3 factors and 38 items that explained 50.56% of the variance (Table 7).

Table 7. Factorial Structure of DPSPS

Factors and Items	Eigenvalue	Explained Variance	Mean	SD	Item total r	Factor Loading
Factor 1 - Digital Literacy (α: 0,939)						
Configuring browser security …			3,79	1,34	0,76	,788
Updating security software …			3,76	1,37	0,72	,760
Informing my children …			3,93	1,23	0,72	,723
Monitoring my children's …			3,99	1,28	0,72	,698
Helping my children in …			4,13	1,21	0,75	,672
Initiating proper legal …			3,84	1,36	0,66	,665
Talking to my children …			4,17	1,13	0,70	,659
Monitoring websites that …	15,06	39,64	3,96	1,35	0,66	,650
Configuring parental control …			3,80	1,33	0,68	,637
Installing advertisement blocking …			3,23	1,46	0,62	,623
Teaching my children …			4,13	1,20	0,66	,614
Installing applications …			3,65	1,41	0,64	,597
Blocking websites that …			4,14	1,19	0,67	,577
Informing my children about …			3,93	1,15	0,66	,575
Informing my children …			4,09	1,21	0,67	,562
Factor 2 - Digital Safety (α: 0,925)						
Warning my children …			4,54	,88	0,63	,726
Warning my children …			4,38	1,07	0,69	,717
Telling my children …			4,55	0,89	0,68	,668
Telling my children not …			4,51	1,03	0,58	,655
Telling my children …			4,45	1,01	0,63	,633
Restricting my children …			4,30	1,16	0,65	,626
Telling my children not to …			4,45	1,00	0,63	,605
Ensuring my children …			4,29	1,18	0,60	,597
Telling my children that …	2,29	6,05	4,22	1,15	0,58	,587
Establishing rules of using …			4,06	1,16	0,65	,580
Informing my children …			4,15	1,24	0,64	,559
Talking to my children …			4, 02	1,25	0,58	,558
Choosing digital tools …			4,23	1,10	0,56	,550
Warning my children about …			4,48	,98	0,62	,546
Restricting my children …			4,21	1,07	0,60	,542
Suggesting my children …			4,29	1,03	0,57	,532
Monitoring how often …			4,33	1,06	0,55	,467
Selecting a safe internet …			4,18	1,09	0,54	,466
Factor 3 - Digital Communication (α: 0,775)						
Liking my children's posts …			3,62	1,44	0,64	,789
Using digital tools similar …			3,89	1,28	0,54	,674
Encouraging/supporting my …	1,84	4,86	3,00	1,42	0,52	,665
Making comments on my …			3,32	1,41	0,57	,654
Using digital communication …			3,78	1,29	0,44	,579

Based on the EFA results, the items were gathered around the three factors shown in Table 9. To name the factors, the contents of the items were examined. Since factor 1 included items regarding digital literacy skills, factor 2 included items relating to safety in digital environments, and factor 3 included items about the communication tools that can be used in digital environments, the factors were named *digital literacy*, *digital safety*, and *digital communication,* respectively. Thus, the factor structure of the resulting scale was clearly interpretable and in line with the theoretical framework of the study. EFA is used to establish a theoretical basis, whereas CFA is used to test the established theoretical relationships (Huck, 2012). Hence, the study included a CFA phase to statistically test the structure identified in the EFA phase.

The CFA phase of Digital Parenting Self-Efficacy Perception Scale

The three-factor and 38-item structure of DPSPS was tested in the CFA phase. Participants of this phase were 556 parents whose children were studying at one of the six schools chosen from different educational regions of the main district of Eskisehir. The model fit statistics for the CFA are provided in Table 8.

Table 8. Goodness-of-Fit indices calculated for the CFA of DPSPS

Fit Index	Perfect Fit Range	Observed Fit	Reference
χ^2	0≤ χ^2≤2df	2419,27>1324	(Sütütemiz, 2005)
p value	,05≤p≤1,00	,000	(Hoyle, 1995)
χ^2/df	0≤ χ^2/df≤3	3,654	(Kline, 2005; Sümer, 2000)
RMSEA	0≤RMSEA≤,05	,069	(Lomax & Schumacker, 2004)
SRMR	0≤SRMR≤,05	,066	(Keeney, 2010)
NFI	,95≤NFI≤1	,949	(Keeney, 2010)
NNFI	,95≤NNFI≤1	,960	(Arbuckle, 2007)
CFI	,95≤CFI≤1	,963	(Hu & Bentler, 1999)
χ^2=2419,27; df=662			

According to the cut-off values suggested by Schermelleh-Engel, Moosbrugger, and Müller (2003), DPSPS showed perfect fit in NFI, NNFI, and CFI indices, whereas an acceptable fit was observed in the RMSEA and SRMR indices. Nonetheless, χ^2/df ratio did not fall into an acceptable fit range. As the χ^2 statistic is sensitive to sample size, it is often suggested to adjust it with the degree of freedom (Kline, 2005). For analyses conducted on large samples, a χ^2/df ratio equal to or lower than 3 indicate a good fit, and a ratio up to 5 indicate a satisfactory fit (Çokluk, Şekercioğlu, & Büyüköztürk, 2010; Meydan & Şeşen, 2011). Although the model did not show a good fit in χ^2/df index, it showed a good or better fit in all other indices reported in Table 10 (e.g., Çokluk et al., 2010; Meydan & Şeşen, 2011; Schermelleh-Engel et al., 2003). RMSEA and SRMR indices indicated an acceptable fit. A visual representation of the model is provided in Figure 1.

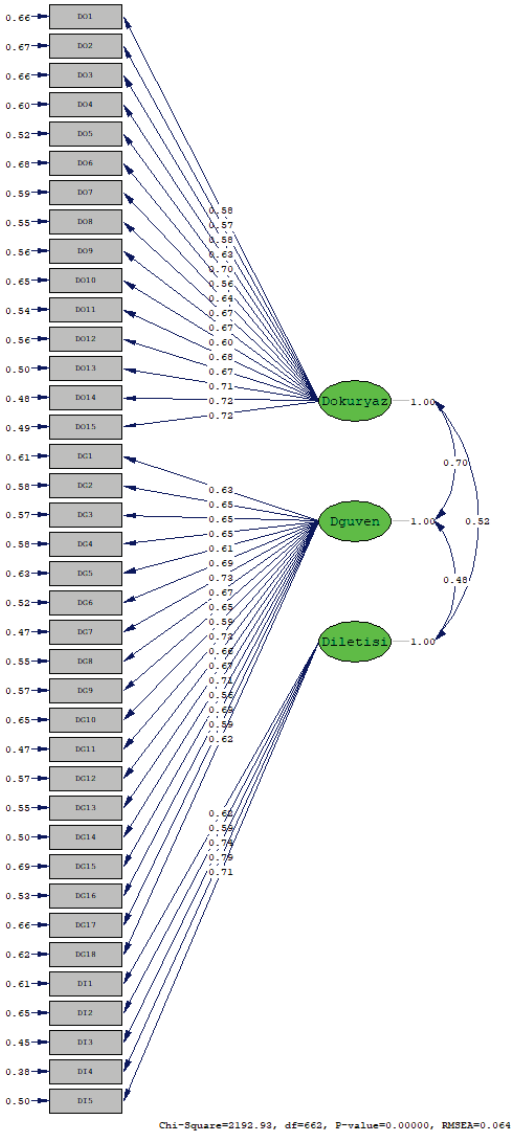

Figure 1. DPSPS CFA Model

Thus, it is safe to say that the measurement model established in the EFA phase was confirmed through the CFA. In addition to the analysis involving the entire data set, model fit indices were also calculated for random samples of 200, 250, 300, and 350 participants. The fit statistics derived from these samples are provided in Table 9.

Table 9. Goodness-of-Fit indices calculated for the random samples of CFA participants

Fit Index	Perfect Fit Range	Sample Size (n)	Observed Fit	Reference
χ^2	$0 \leq \chi^2 \leq 2df$	200	1556,45>1324	(Sütütemiz, 2005)
		250	1850,74>1324	
		300	1808,68>1324	
		350	1898,77>1324	
p value	,05≤p≤1,00	200	,000	(Hoyle, 1995)
		250	,000	
		300	,000	
		350	,000	

Table 9. Continued

Fit Index	Perfect Fit Range	Sample Size (n)	Observed Fit	Reference
χ^2/df	0≤ χ^2/df≤3	200	2,662	(Kline 2005; Sümer, 2000)
		250	2,795	
		300	2,732	
		350	2,868	
RMSEA	0≤RMSEA≤,05	200	,082	(Schumacker & Lomax, 2004)
		250	,085	
		300	,076	
		350	,073	
SRMR	0≤SRMR≤,05	200	,078	(Keeney, 2010)
		250	,075	
		300	,079	
		350	,069	
NFI	,95≤NFI≤1	200	,910	(Keeney, 2010)
		250	,917	
		300	,929	
		350	,930	
NNFI	,95≤NNFI≤1	200	,943	(Arbuckle, 2007)
		250	,942	
		300	,951	
		350	,957	
CFI	,95≤CFI≤1	200	,913	(Hu & Bentler, 1999)
		250	,945	
		300	,953	
		350	,953	
$\chi^2 = 2419{,}27;\ df = 662$				

As seen in Table 9, fit indices calculated for smaller samples were in line with the reference values suggested in the literature. The influence of the sample size on χ^2 values was apparent and all χ^2/df ratios were below 3, which indicated a perfect fit. In relatively small samples (N ≤ 100), RMSEA values often fail to exhibit ideal fit characteristics. In other words, RMSEA is sensitive to sample size and tend to result in values greater than the actual value in small samples (Kenny, Kaniskan ve McCoach, 2014; Kline, 2005; Sharma, Mukherjee, Kumar ve Dillon, 2005).

Convergent and Divergent Validity of DPSPS

To test the construct validity of the DPSPS, following validity and reliability analyses were conducted and summarized in Table 10.

Table 10. CFA Summary of the DPSPS

Item	Mean	SD	Factor Average	SD	Alpha Reliability	Composite Reliability	Average Variance Explained	Item Loading	t value	Error
Digital literacy										
DO1	3,12	1,42						0,48	15,98	1,319
DO2	3,17	1,46						0,46	16,00	1,407
DO3	3,72	1,39						0,51	16,01	1,284
DO4	3,75	1,50						0,62	15,79	1,338
DO5	3,99	1,32						0,64	15,47	0,909
DO6	3,76	1,40						0,55	16,07	1,335
DO7	4,17	1,17						0,66	15,82	0,832
DO8	3,88	1,40	3,68	0,94	0,91	0,89	0,36	0,60	15,53	1,053
DO9	3,60	1,41						0,59	15,50	1,047
DO10	3,11	1,45						0,54	15,91	1,326
DO11	3,82	135						0,64	15,47	0,947
DO12	3,63	1,42						0,61	15,55	1,094
DO13	3,91	1,36						0,63	15,34	0,927
DO14	3,80	1,25						0,67	15,21	0,744
DO15	3,80	1,32						0,71	15,26	0,848
Digital Safety										
DG1	4,61	,82						0,57	15,94	0,408
DG2	4,60	,94						0,60	15,71	0,484
DG3	4,66	,84						0,57	15,96	0,436
DG4	4,67	,85						0,55	15,85	0,424
DG5	4,56	,94						0,54	16,03	0,567
DG6	4,47	,98						0,67	15,57	0,493
DG7	4,58	,83						0,66	15,36	0,323
DG8	4,54	,90						0,63	15,64	0,425
DG9	4,39	1,00	4,42	0,67	0,93	0,92	0,39	0,62	15,89	0,599
DG10	4,17	1,12						0,60	16,13	0,852
DG11	4,28	1,09						0,71	15,54	0,591
DG12	4,33	1,04						0,60	15,91	0,644
DG13	4,33	1,06						0,65	15,72	0,615
DG14	4,56	,87						0,63	15,57	0,38
DG15	4,29	1,06						0,56	16,20	0,79
DG16	4,29	1,04						0,65	15,69	0,58
DG17	4,12	1,17						0,60	15,97	0,84
DG18	4,10	1,23						0,69	15,97	0,93
Digital Communication										
DI1	3,87	1,37						0,52	14,67	1,12
DI2	4,02	1,27						0,48	14,94	1,01
DI3	3,18	1,41	3,57	1,08	0,82	0,58	0,22	0,40	12,98	0,90
DI4	3,12	1,48						0,46	11,49	0,81
DI5	3,64	1,47						0,44	13,42	1,04

n: 556; explained variance: 49,59%

As seen in Table 10, alpha coefficients for all three factors are greater than .70 level. As to composite reliability, all factors except for digital communication have values above .70. According to Nunnally and Bernstein (1994), these values indicate that the measurements are reliable.

To examine discriminant validity, the researchers utilized the correlations among dimensions of the DPSPS and the square root of average variance explained (AVE) values. As a rule of thumb, the square root of an AVE value of a dimension should not be smaller than .50 or smaller than the individual correlations of that dimension with other dimensions (Fornell & Larcker, 1981).

Table 11. Correlations among the DPSPS factors and square-rooted AVE values

Dimensions	Symbol	Mean	SD	[1]	[2]	[3]
Digital literacy	[1]	3,68	0,94	**0,60**		
Digital Safety	[2]	4,42	0,67	0,64**	**0,62**	
Digital Communication	[3]	3,57	1,08	0,46**	0,46**	**0,46**

** significant at 0.01 level.

Most factor loadings were above 0.50 which indicated acceptable values for convergent validity. However, factor loadings were below 0.50 in terms of the digital communication component, which were reflected in low AVE values as well. Thus, the scale needs to be improved in terms of convergent validity. In addition, correlations across components were quite close to the square roots of AVE. Square roots of AVE values should be above .50 and higher than the correlations across components (Fornell & Larcker, 1981). Thus, even though the current component structure was confirmed through a confirmatory factor analysis, current indicators are open to new adjustments to improve the indices pertaining to convergent and discriminant validity.

Do parents' level of perceived digital parenting self-efficacy differ in response to the parenting role, level of internet use, level of education, occupation, and income?

Digital parenting self-efficacy perceptions were examined in terms of parenting role, level of internet use, income, occupation, and educational level. Considering the dependent variables' quantitative and theoretical relationships with dimensions of the scale, a MANOVA test would be appropriate. However, due to failure to satisfy multivariate normality assumption and Box's M test results, multiple ANOVAs was conducted instead. As using multiple statistical tests to answer a research question may cause a Type I error (Huck, 2012), Bonferroni adjustment was applied to the significance levels, and therefore, a p value of $.0167$ $(.05/3)$ was regarded as significant.

In subgroup comparisons, two-way factorial ANOVA was utilized to examine the effects of parenting role (mother or father) and internet use experience on digital parenting self-efficacy scores. The results of the ANOVA are shown in Table 12.

Table 12. Two-way ANOVA on Digital Parenting Efficacies with Regard to Parenting Role and Internet Use Experience

Dimensions of Digital Parenting	Source of Variance	SS	df	MS	F	(p)	η^2
Digital Literacy	Parenting Role (PR)	0,072	1	0,072	0,084	0,772	0,000
	Internet Use Experience (IUE)	17,954	4	4,488	5,220	0,000	0,037
	PR x IUE	1,572	4	0,393	0,457	0,767	0,003
	Error	466,909	543	0,860			
	Total	8002,310	553				

Table 12. Continued

Dimensions of Digital Parenting	Source of Variance	SS	df	MS	F	(p)	η^2
Digital Safety	Parenting Role (PR)	0,107	1	0,107	0,240	0,625	0,000
	Internet Use Experience (IUE)	5,232	4	1,308	2,928	0,020	0,021
	PR x IUE	1,221	4	0,305	0,683	0,604	0,005
	Error	242,554	543	0,447			
	Total	11068,075	553				
Digital Communication	Parenting Role (PR)	3,045	1	3,045	2,644	0,104	0,005
	Internet Use Experience (IUE)	12,646	4	3,161	2,746	0,028	0,020
	PR x IUE	1,640	4	0,410	0,356	0,840	0,003
	Error	625,198	543	1,151			
	Total	7679,601	553				

As seen in Table 12, the only significant main effect within the digital literacy dimension belonged to internet use experience. Neither the main effects of parenting role (mother - father) nor the interaction between parenting role and internet use experience was significant. Besides, the partial eta-squared for internet use experience was small. The Bonferroni-adjusted pairwise comparisons indicated a significant difference between the parent who use the Internet for up to 1 year ($\bar{X} = 3.396$; $Std.Error = 0.101$), and the ones using the Internet for 8 years or more ($\bar{X} = 3.923$; $Std.Error = 0.072$), $p < 0.001$). Due to the stricter alpha level adjusted for family-wise error rate, no significant effect was observed in the digital safety and digital communication dimensions. In other words, none of the effects were significant in these dimensions.

Another set of ANOVA was conducted to examine the effects of internet use experience and income level on the dimensions of digital parenting. The results are provided in Table 13.

Table 13. ANOVA on Digital Parenting Efficacies with Regard to Internet Use Duration and Income Level

Dimensions of Digital Parenting	Source of Variance	SS	*df*	MS	F	(p)	η^2
Digital Literacy	Internet Use Experience (IUE)	11,993	4	2,998	3,544	,007	,026
	Parent's Income Level (PIL)	6,796	5	1,359	1,607	,157	,015
	IUE x PIL	20,796	20	1,040	1,229	,224	,045
	Error	445,034	526	,846			
	Total	8051,616	556				
Digital Safety	Internet Use Experience (IUE)	1,474	4	,368	,820	,512	,006
	Parent's Income Level (PIL)	1,903	5	,381	,848	,516	,008
	IUE x PIL	6,443	20	,322	,717	,810	,027
	Error	236,208	526	,449			
	Total	11137,226	556				
Digital Communication	Internet Use Experience (IUE)	10,639	4	2,660	2,330	,055	,017
	Parent's Income Level (PIL)	2,866	5	,573	,502	,775	,005
	IUE x PIL	27,099	20	1,355	1,187	,260	,043
	Error	600,460	526	1,142			
	Total	7736,681	556				

Similar to the previous analysis, only the effect of internet use experience on digital literacy was significant. In addition, the effect of income level and the interaction between income level and internet use experience were not significant. Pairwise comparisons with Bonferroni adjustment resulted in similar findings to the previous analysis, that is, longer internet use experience meant higher digital literacy level.

Finally, the effects of occupation and educational level on dimensions of digital parenting were investigated. As seen in Table 14, occupation, educational level and their interactions did not have a significant effect. In other words, parents' digital parenting efficacy levels did not differ significantly in response to their occupation and educational level in any one of the digital parenting dimensions, $p > 0.05$.

Table 14. ANOVA on Digital Parenting Efficacies with Regard to Parents' Occupation and Educational Level

Dimensions of Digital Parenting	Source of Variance	SS	*df*	MS	F	(p)	η^2
Digital Literacy	Parent's Occupation (PO)	2,073	5	0,415	0,471	0,798	0,005
	Parent's Level of Education (PLE)	7,364	5	1,473	1,673	0,139	0,016
	PO x PLE	10,508	15	0,701	0,796	0,683	0,023
	Error	445,531	506	0,880			
	Total	7665,413	532				
Digital Safety	Parent's Occupation (PO)	1,798	5	0,360	0,800	0,550	0,008
	Parent's Level of Education (PLE)	2,084	5	0,417	0,927	0,463	0,009
	PO x PLE	5,203	15	0,347	0,772	0,710	0,022
	Error	227,451	506	0,450			
	Total	10642,719	532				
Digital Communication	Parent's Occupation (PO)	6,028	5	1,206	1,056	0,384	0,010
	Parent's Level of Education (PLE)	9,759	5	1,952	1,710	0,131	0,017
	PO x PLE	15,145	15	1,010	0,885	0,582	0,026
	Error	577,588	506	1,141			
	Total	7406,081	532				

Discussion, Conclusion and Suggestions

The purpose of this study was to (a) define digital parenting efficacies and their indicators based on the literature and expert opinions, (b) develop a digital parenting self-efficacy scale based on these definitions, and (c) investigate digital parenting self-efficacy in terms of some demographics. In this section, the results will be discussed around the research questions.

The digital parenting efficacies and indicators identified during the expert review phase are presented in Figure 2.

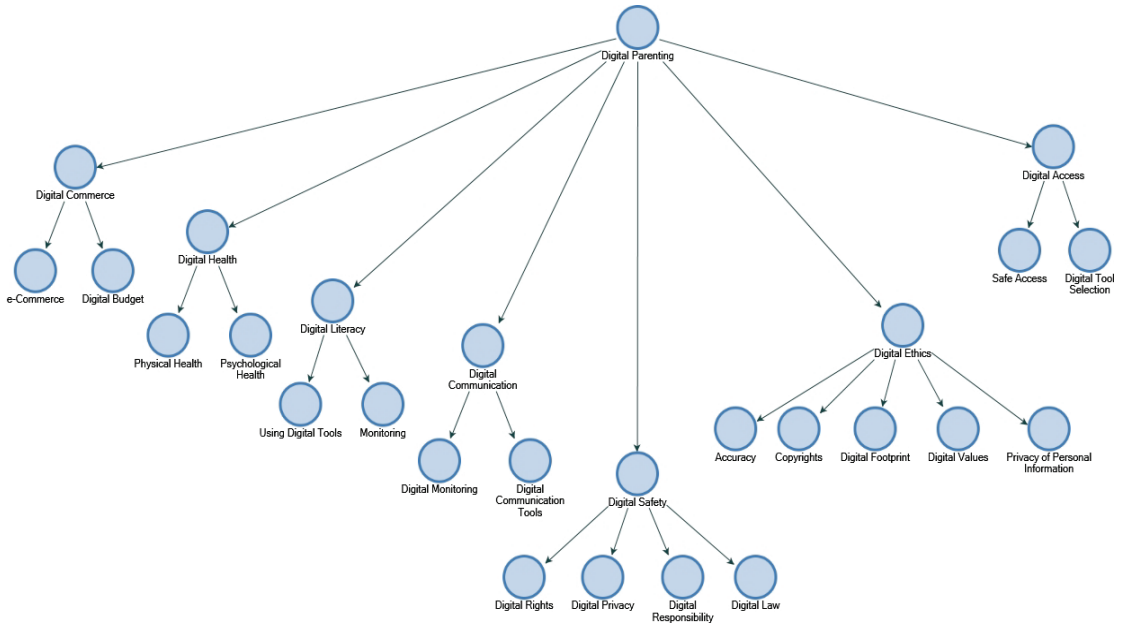

Figure 2. The Structure of Digital Parenting Efficacies and their Indicators Based on Expert Opinions

As seen in Figure 2, a seven-factor structure has been established for the digital parenting efficacies. This structure shares six of the nine digital citizenship dimensions from Ribble and Bailey's (2007) framework. Nonetheless, the dimension of digital safety proposed here preserves the components of its counterpart from Ribble and Bailey's work and extends it with digital privacy. The digital ethics dimensions include copyrights, privacy of personal information, accuracy, digital values, and digital footprint. Mason (1986) listed ethical issues as privacy, accessibility, property, and accuracy (PAPA in short). It is feasible to pair the ethical issues that Mason (1986) maintained with the digital ethics dimension identified in this study, as privacy can be paired with privacy of personal information, property with copyrights, and accuracy with accuracy. Nonetheless, these categories proposed in 1986 do not suffice to answer ethical issues arise in current situations. Thus, digital values and digital footprint are also included in the digital ethics dimension.

Within the scope of the second research question, the DPSPS was developed to assess the parents' perceptions of their digital parenting efficacies. In the beginning, the digital citizenship dimensions from the literature were used as a basis. Following the DPW, the framework was revised according to expert opinions and the structure presented in Figure 2 was established. This structure provided the foundations of the DPSPS. Through EFA and CFA processes a three-factor model with digital literacy, digital safety, and digital communication dimensions was formed. In the literature, there exist scale development studies focusing on how parents intervene their children's use of digital tools. For instance, Valcke et al. (2010) adapted a four-dimension internet parenting scale from Dutch to English. The scale covered the parenting profiles of permissive, laissez-faire, democratic and authoritarian. In this respect, the scale developed in the current study seems to exhibit strong structural characteristics.

Nine digital citizenship dimensions proposed by Ribble and Bailey (2007) constituted the initial theoretical basis of the DPSPS. After the EFA, the structure turned into a model with three dimensions, and the model was verified through the CFA. The item groups formed in the EFA process were examined, and the groups (i.e., factors) were named according to the overarching features of the included items. Resulting factors were digital literacy, digital safety, and digital communication. The digital communication dimension includes five items that initially generated considering this dimension. On the other hand, digital literacy dimension contains ten items that consist of two items from digital ethics, two items from digital safety, and one item from digital commerce in addition to the initial digital literacy items. The final form the digital literacy dimension includes items from digital literacy, digital ethics, digital safety, and digital commerce. Finally, the digital safety dimension verified

via the CFA includes five items from digital safety, three items from digital health, three items from digital access, three items from digital commerce, three items from digital ethics, and one item from digital literacy. The digital citizenship dimensions covered in each factor are shown in Figure 3.

Figure 3. Sub Dimensions of the Factors

Ribble (2015) organized digital citizenship dimensions under three titles, namely respect, educate, and protect (REP in short). Each component of The REP framework covers different dimensions of digital citizenship. Respect (self-respect and respect for others) includes the digital ethics, digital access, and digital law dimensions. Education (educate yourself and others) contains the digital literacy, digital communication, and digital commerce dimensions. Finally Protect (protect yourself and others) covers digital rights and responsibilities, digital safety, and digital health and wellness. The factor represented as digital literacy in Figure 3 corresponds to the Education dimension of the REP. Digital literacy and digital commerce are common in both dimensions. As basic digital literacy is a prerequisite of digital safety and digital ethics dimensions, digital literacy was also included in this dimension. The digital safety factor in the DPSPS is analogous to the Protect dimension of the REP since it covers all digital citizenship traits included in it. To ensure one's safety in the digital media, the ethical, commercial, and access-related dimensions of digital safety should be present. Thus, the dimensions included in the digital safety factors of the DPSPS are deemed appropriate.

For the third research question, the parents' perceived level of digital parenting self-efficacy was examined in terms of parenting role, internet use experience, income, occupation, and educational level. Results indicated that parenting role did not have a significant effect on any one of the digital parenting dimensions. Anderson (2016) reported that mothers talked to their children about appropriate and inappropriate behaviors more frequently than fathers. They also reported that the percentage of the mothers talking to their children about online postings was 46%, whereas 32% of the fathers did the same. Another finding of the same study was that 46% of the mothers talked to their children about the online content they view while the percentage of the fathers who did so was 31%. In the current study, however, such statistically significant differences between mothers and fathers were not observed.

Parenting role and parents' internet use experience did not have a combined effect on digital parenting dimensions. Lou et al. (2010) maintained that, depending on their levels of internet literacy, parents differed in internet activity monitoring frequency along with the guidance and encouragement they provide when children use the Internet. Specifically, the parents of low levels of internet literacy tend to be stricter when controlling their children's internet use. However, a similar effect was not found in the current study. Nonetheless, digital literacy level is observed to increase in response to experience.

Parents' internet use experiences and income level did not lead to significant changes in digital parenting dimensions. While Anderson (2016) reported that parents tended to talk less frequently with their children about their online activities as their income level increased. According to the study, 49% of the parents whose annual income was below 30000 dollars talked to their children about their online postings, whereas the percentage dropped down to 34% for the parents who earned more than 75000 dollars annually. Furthermore, 49% of the parents whose annual income was below 30000 dollars talked to their children about the online contents they viewed while 33% of parents who earned more than 75000 dollars did so.

The findings of the study also indicated that the parents' occupations and level of education did not have a significant influence on digital parenting levels. In other words, findings regarding these variables were similar to ones related to income. Considering the often-hypothesized utility of such variables in predicting parenting efficacies, these insignificant relationships were noteworthy. Specifically, these findings can guide future parent training activities to offer more homogenized experiences to different parent groups.

Recommendations

Based on the findings of this study the following recommendations are provided for institutions, practice, and researchers.

Recommendations for Institutions

- The non-governmental organizations (NGOs), foundations or institutions that focus on parents' use of the digital tools and online safety of children could collect data from parents through the DPSPS, and offer activities for parents and children accordingly.
- In this study, the participants were parents with middle-school-aged children. NGOs, foundations, or institutions could conduct studies with parents with children of other age groups.

Recommendations for Practice

- Practitioners could collect data from parents of different demographics and design learning environments according to their needs.
- Parents could participate in the designed learning environments and their progress could be monitored.

Recommendations for Researchers

- Findings of this study indicate that some digital citizenship dimensions have different functions in some cultures and that some of the proposed dimensions tend to intertwine. Hence, future studies could focus on how to create culturally responsive frameworks of digital citizenship.
- Mason's (1986) work on ethical issues could be revisited to make it more compatible with the needs of the digital era we live in.

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