

DIGITAL LITERACY SKILLS, TECHNOLOGY HABITS AND BACKGROUNDS OF EDUCATIONAL FACULTY STUDENTS IN E-LEARNING ENVIRONMENTS

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Abstract

In this pandemic era, communication has been mostly facilitated via the Internet replacing face to face interactions due to its flexible and widespread features. Likewise, education has been adapted into this new fully digitalized learning environment as well; thus, concerning the needs of the students and the teachers, e-learning has fit in the educational settings more. The technology has taken the learning off the classroom walls, and has made the distances closer. Therefore, we need a clear delivery of all types of information in these educational processes. Students' digital literacy skills, their technology habits and backgrounds are among the key factors to have an efficient digital instruction established with e-tools since it forms a base for learning via such virtual environments and anticipates their learning outcomes. Despite several advantages of digital learning environments and tools, students may show different levels of digital literacy skills and perceptions to e-learning. This is a survey study. We aim to investigate the digital literacy skills of the educational faculty students majoring in different specialties to see whether there are differences depending on their majors in the educational faculty and gender. Also, we examined the pre-service teachers' motivation source and their accessibility to and habits of usage of the Internet, technology, social media and email. We adopted the 17-Item "Digital Literacy Scale" in Turkish, which was adapted by Hamutoğlu et al. (2017) and originally developed by Ng (2012). The findings of this study exhibited that most of the pre-service teachers had their personal computers and access to the Internet, in addition they used social media and e-mail. Moreover, when the digital literacy scale scores were compared, we found out that male pre-service teachers' digital literacy scale scores were significantly higher than the female pre-service teacher while it did not show a significant difference by department.

Keywords: digital literacy skills, technology habits, pre-service teachers, technology backgrounds

1. INTRODUCTION

In the Covid-19 pandemic period, online communication has mostly superseded face-to-face interactions. Likewise, education itself has become totally digitalized and changed into new educational settings. Therefore, considering the needs of the students and the teachers, adaptation into e-learning environments has increased. In this age, the importance of information has been increasing drastically. The methods for reaching the information have been changing in this developing process. Internet technology and mobile technology are among the most common concepts. Thus, the improvement of the technology and the rapid spread of the "Internet" bring about additional needs. Hence, concepts such as technology and information have had a significant place in globalization and information society. Also, recently, we observe the spread of individual Internet use in different areas such as education, medicine, business and so on. We see individuals use the Internet for several purposes such as using social media, subscribing to some groups or blogs, reading the news, sharing their opinions, listening to music, watching movies and so on. However, all the websites offering such features are not equally trustworthy. It is also possible that while surfing on the Internet, the Internet users may come across other user profiles who do not have good intentions and experience cyber theft, swindle, cyber bullying, being misled, share of the private information, harmful software and applications and so on (Telekomünikasyon İletişim Başkanlığı, TİB, 2012, as cited in Hamutoğlu et

al., 2017). This requires people using the Internet to have the digital literacy skills, which is among the most important abilities of the future. Besides the studies conducted to increase the reliable Internet usage by using different technologies, and determine the truth of the gathered information, digital literacy is important in solving the problems the individuals come across (Hamutoğlu et al. 2017): Therefore, it is inevitable to discuss the importance of individuals' digital literacy skills (Ainley, Schulz & Fraillon, 2016; Mohammadyari & Singh, 2015).

Individuals with digital literacy skills can adapt to the new and developing technology (Ng, 2012). Digital literacy requires individuals to have the abilities of using technology in educational processes, reaching, producing and sharing the correct information and using different technologies appropriately (Hamutoğlu et al. 2017). The place of digital literacy in education is undeniable. In this regard, developing technologies and wide-spreading Internet usage has been changing the processes of people's information gathering and learning. Innovations in keeping up with the necessities of this age, following the developments, sharing and improving the information are necessary and the best way for achieving this is education, and it has the biggest role in this process (Şimşek et. al., 2008; Turan & Çolakoğlu, 2008). Amiri (2009) states that the students who cannot gain digital literacy skills will not be able to keep up with the students who become experts at digital literacy, both economically and academically. Indeed, the aim of education is to make the individuals gain the necessities of the time and prepare them for life and increase their life quality (Kesim, 2011).

1.1 Digital Literacy

In educational research, digital literacy has been a widespread issue (Ng, 2012; Thompson, 2013) and it is among the 21st century skills (van Laar et al. 2017; Voogt & Roblin, 2012). By emphasising critical thinking, and by using information technologies and the Internet, the main ingredient of digital literacy is "the ability to understand and use information in multiple formats from a wide range of sources" (Gilster, 1997, p. 1). In other words, digital literacy can be defined as having the skills for choosing, evaluating and re-using the current information on the Internet (Van Dijk, 2005), therefore, it can be named as a survival skill in the digital era (Eshet-Alkalai & Amichal-Hamburger, 2004). According to Ng (2012), the indicator of digital literacy can be the individual's adaptation to new and emerging technologies. Ng (2012), presented a bigger framework including three dimensions of technical, cognitive and socio-emotional. First, the technical dimension requires having the technical and operational abilities to use technology for learning and daily activities. Second, the cognitive dimension is about the assessment, transformation and formation of the information and also critical thinking. The last, socio-emotional, dimension is the ability to use the internet for the purposes of communication, socialization and learning in a responsible way. As for the measures of the digital literacy, there are ongoing debates about the dimensions of digital literacy and how it is measured. Although most of the digital literacy frameworks define it as a multi-dimensional form, many studies presented only one general digital literacy score (e.g., Gebhardt & Schulz, 2015; Katz, 2007, as cited in Jin et al., 2020).

Since digital literacy has been an important feature of our lives recently, lack of its skills affect individuals' success in their education and business life and their social interactions (Meyers et al., 2013). Today, via computers or smart-phones, students and adults can easily send or get messages or emails, learn what they get curious about, watch movies or videos, listen to music, read electronic sources such as e-books, write texts in different formats and do online shopping or book a room or buy a ticket online and so on. Therefore, people live with the chances that speed up what they want to do and ease their daily lives (Tüzel & Tok, 2013).

Digital literacy requires the ability to use technology in educational processes effectively and using different technologies correctly (Hamutoğlu, et. al. 2013). As the definition states, digitally literate people adopt and improve their long-term learning tasks and share well-behaviours with the society by using technology knowledge and abilities (Çam & Kiyici, 2015). Therefore, as Koltay (2011) states, digital literacy plays an important role in all educational levels and it is a key in learning and teaching today (Zulkarnain et al., 2020). Thanks to digital literacy, young individuals make use of digital information resources, therefore they get prepared for the current technology challenge (Çam & Kiyici, 2015). It also develops critical thinking skills while using digital technology (Muliawanti &

Kusuma, 2019 as cited in Zulkarnain et al., 2020). Thus, it can be implied that achievement of digital literacy can be adopted as an indicator of academic success. Hence, it can be defined as the skills of people to use functional skills in digital environments, therefore they can reach and select information, have critical thinking, be productive, cooperate with other people, communicate efficiently, yet beware of cyber security (Zulkarnain et al., 2020). However, in the digitalization age, teachers have difficulties in catching up with the changes in technology and education and also they face significant difficulties in incorporating these developments into a consistent plan for classroom practices (Allen & Berggren, 2016).

In the digital age we live in, it is one of the duties of teacher training programs to prepare pre-service teachers and their potential students for the digital age (Watulak, 2016). Therefore, teachers should have critical knowledge of technology not only for themselves but also for the benefit of their students in their classrooms (List, Brante, & Klee, 2020). It is thought that digital literacy skills are also important for pre-service teachers in the learning and teaching process (Can, Çelik, & Çelik, 2020). In this respect, examining the digital literacy skills of the teachers, pre-service teachers and stakeholders, and shaping the education programs, teaching method, strategy and techniques accordingly are necessary in adapting today's digital era for the quality of education. Based on this requirement, the aim of the present study is to determine the digital literacy of the education faculty students and to examine them according to the variables of department and gender. In addition, it was aimed to determine the motivation sources of teacher candidates in the learning process and their habits of accessing and using the internet, technology, social media, email. For this purpose, answers to the following research questions were sought in the study:

1. What are the pre-service teachers' habits for using the Internet, technology, social media and email and their accessibility and availability conditions for them? What are their motivational sources in their learning process?
2. Are there any significant differences between the digital literacy scores of the female and male pre-service teachers?
3. Are there any significant differences among the digital literacy scores of the pre-service teachers in different departments?

2. THE METHODOLOGY

2.1 Research Design

This is a quantitative survey study, whose main goal is to define the characteristics of a group with the help of tools such as interview questions, questionnaires, and tests (Fraenkel & Wallen, 2009).

2.2 The Participants

The convenience sampling was used for the participant selection method. A convenience sample is a group of individuals who (conveniently) are available for study (Fraenkel & Wallen, 2009). With this regard, the study was announced to the students taking an elective course that was offered by one of the researchers within the curriculum of the educational faculty. In addition, these students were asked to share the research with their friends who might be interested in participating in the research. The study was on a voluntary basis. As a result, we ended up having 360 participants, who were pre-service teachers in the educational faculty in total. The participants who did not complete filling in the participant information form or the digital literacy scale and the data having outliers were eliminated and finally the data from 301 participants were analyzed.

2.3 Data Collection Tools

2.3.1 The participant information form

In this study, we used a participant information form and a digital literacy scale. The participant information form asked for general demographic information of the students such as department, class level, biological gender and age. It also asked the pre-service teachers' habits for using the Internet,

technology, social media and email and also availability of these tools, the participants' motivational sources and type and also their background information. It included 18 questions in total, which was formed by using both open and closed ended questions depending on the question type.

2.3.2 The digital literacy scale

The Digital Literacy Scale that was adopted in this study was originally developed by Ng (2012) and adapted into Turkish by Hamutoğlu et al. (2017) to determine the digital literacy of pre-service teachers. The adapted scale was prepared with 5 point likert scale and it consists of 17 items and 4 dimensions which were "attitude", "technical", "cognitive" and "social" dimensions. The scale did not have any reverse scored items. According to Hamutoğlu et al. (2017), The fact that the scale shows sufficient fit indices in both first-level and second-level confirmatory factor analysis reveals that in addition to the scores taken from the sub-dimensions of the scale, a total score for digital literacy can also be obtained from the scale. Therefore, the highest score that can be obtained from the scale is 85 and the lowest score is 17. The increase in the scores obtained from the sub-dimensions of the scale and the overall score of the scale indicates high digital literacy. The Cronbach's alpha reliability coefficient for the entire scale was calculated as .93.

2.4 Data Collection Process

The data of this study was collected through an online survey. In this process, an online form including the "participant information form" and the "Digital Literacy Scale" was first prepared through Google forms. Afterwards, pre-service teachers were informed about the aims of the study and the principle of voluntary participation. The URL links of the questionnaires were shared with the pre-service teachers via email. The data collection process continued for about 10 days.

2.5 Data Analyses

The data analysis methods used in the research are presented below.

2.5.1 Analysis of the data obtained from the participant information form:

The data obtained from the participant information form were analyzed with descriptive statistical methods. In this process, the frequencies and percentages of the answers given by the pre-service teachers in the closed-ended questions were interpreted. In the open-ended questions, the interval coefficient was determined for the answers given by the pre-service teachers. The interval coefficient value was obtained by dividing the difference between the largest value and the smallest value in the series of measurement results by the number of determined groups (Kan, 2009). By using the determined interval coefficient, the grouped frequency distribution and percentages were interpreted for each open-ended question.

2.5.2 Analysis of the data obtained from the digital literacy scale:

The quantitative data obtained through the "digital literacy scale" were analyzed using descriptive and inferential statistical methods through the SPSS program. In the descriptive statistical analysis, score types such as frequency, percentage, mean and standard deviation were used. In the inferential statistical analyses, independent samples t-test was used to compare the digital literacy scores of pre-service teachers for gender variable, and one-way analysis of variance was used to compare the scores for the department variable. The results obtained from the inferential statistical analyses were interpreted according to the .05 significance level.

3. RESULTS

3.1 Results of the Participant Information Form

The demographic data gathered from the participant information form are presented in Table 1.

Table 1. Background of the Participants

Variable	Categories	f	%
Gender	Female	211	70,1
	Male	90	29,9
Age	19-22	237	78,7
	23-26	51	16,9
	27-30	8	2,7
	31-34	5	1,7
Department	Special education	167	55,5
	Elementary science education	39	13,0
	Classroom Instruction Education	60	19,9
	Early Childhood Teacher Education	35	11,6
Class level	1st grade	3	1,0
	2nd grade	163	54,2
	3rd grade	86	28,6
	4th grade	49	16,3

Table 1 shows that 70.1% of the participants are women and 78.7% of them are between the ages of 19-22. In addition, it is seen that pre-service teachers studying at 4 different departments and grades participated in the research, while 55.5% of them were in the special education department and 54.2% of them were at the 2nd grade level.

Table 2 below displays data obtained from the answers to the questions of “Do you have personal internet access?”, “If you have personal internet access, is it sufficient for educational use?” in the participant information form.

Table 2. Personal Internet Access and Sufficiency of the Internet Access for educational Purposes

Questions	Answers	Female		Male	
		f	%	f	%
Personal Internet Access	Yes	209	99,11	88	97,8
	No	2	0,9	2	2,2
Sufficiency of the Internet Access for educational purposes	Yes	159	75,4	68	75,6
	No	52	24,6	22	24,4

In Table 2, it is seen that almost all of the participants, both male and female, have internet access and that the majority of the participants find their internet access/availability sufficient for educational use.

Table 3 below shows the data obtained from the answers to the questions about the technology access and usage habits of the participants e.g. “Do you have a personal computer/tablet?”, “How many years

have you been actively using a computer/tablet?”, “How many hours/how much time do you spend using computers/tablets/smartphones etc. in a day?”

Table 3. Technology Access and Usage Habits

Questions	Answers	Female		Male	
		f	%	f	%
Having a Personal Computer/Tablet	Yes	177	83,9	67	74,4
	No	34	16,1	23	25,6
Active Usage Time-Duration (year)	1-5	102	48,3	21	23,3
	6-10	74	35,1	33	36,7
	11-15	19	9,0	25	27,8
	16-20	3	1,4	4	4,4
	Other	13	6,2	7	7,8
Daily Usage Time-Duration (hour)	1-6	113	53,6	53	58,9
	7-12	88	41,7	34	37,8
	13-18	7	3,3	2	2,2
	Other	3	1,4	1	1,1

In Table 3, it is observed that 83.9% of female pre-service teachers and 74.4% of male pre-service teachers own personal computers/tablets. While 48.3% of female pre-service teachers reported that they have been using computers actively for 1-5 years, 36.7% of male pre-service teachers reported that they have been actively using computers for 6-10 years. Responses stating that they do not actively use computers/tablets (f=20) were included in the “other” category in both gender groups. Finally, it observed that the daily computer/tablet/smartphone usage time of both female and male pre-service teachers is mostly in the range of 1-6 hours. We included very short (for example, 20 minutes, f=2) or varying (f=2) daily use time duration responses in the “other” category for both gender groups.

Table 4 presents the data obtained from the responses to the questions which were asked to obtain information about the social media access and usage habits of the participants: e.g. “Do you use social media (Facebook, Twitter, Instagram, etc.)?”, “If your answer to the previous question is “yes”; How many years have you been using social media?”, “Are you an active user on social media?”, “How long/How many hours do you use social media in a day?”

Table 4. Social Media Access and Usage Habits

Questions	Answers	Female		Male	
		f	%	f	%
Social Media Usage	Yes	198	93,8	86	95,6
	No	13	6,2	4	4,4
Social Media Usage- Time Duration (year)	1-5	87	41,2	25	27,8
	6-10	101	47,9	52	57,8

	11-15	10	4,7	9	10,0
	Other	13	6,2	4	4,4
Active User on Social Media	Yes	123	58,3	65	72,2
	No	88	41,7	25	27,8
Daily Usage of Social Media- Time Duration (hour)	1-5	184	87,2	80	88,9
	6-10	21	10,0	10	11,1
	11-15	3	1,4	0	0
	Other	3	1,4	0	0

Table 4 exhibits that the majority of both female and male pre-service teachers use social media. 47.9% of female pre-service teachers and 57.8% of male pre-service teachers reported that they have been using social media for 6-10 years. According to Table 4, 58.3% of female pre-service teachers and 72.2% of male pre-service teachers define themselves as an “active user” on social media. 87.2% of female pre-service teachers and 88.9% of male pre-service teachers reported that they spend 1-5 hours on social media daily.

As seen in Table 4, the daily use of social media by the majority of both female and male pre-service teachers is in the range of 1-5 hours. The responses for “never using social media” were placed in the “other” category. A remarkable finding was that although they stated that they “never use social media” in the previous question, some of the female (f=13) and male (f=4) pre-service teachers ticked “Instagram” (f= 2) and “YouTube” (f=11) as a response to the question of “Which social media tool(s) do you use?” (f=11). Moreover, in addition to the existing answer options for this question, a pre-service teacher wrote “WhatsApp” by filling in the blank for the extra answer besides the provided options. Therefore, these pre-service teachers also reported their daily use of social media.

The responses to the question of “Which social media tool(s) do you use?” are given in Table 5.

Table 5. The Social Media Tool(s) that are used by the Participants

The Type of the Social Media Platform*	Social Media Platform	f	%
Social Networking	Facebook	73	9,2
	Twitter	176	22,2
	LinkedIn	1	0,1
	Skype	3	0,4
Media Sharing Websites	Instagram	267	33,6
	YouTube	251	31,6
	TikTok	11	1,4
Messaging Applications	WhatsApp	6	0,8
	Telegram	2	0,2
Social Communication and Social Bookmarking Websites	Pinterest	3	0,4
Live Streaming Platform	Twitch	1	0,1

Source: Compiled from Özdemir & Nacar, 2020; Özkömrücü, 2013; Zarella, 2010; Safko & Brake, 2012.

When Table 5 is examined, it is seen that the pre-service teachers marked more than one answer option for the question asking the social media tool(s) that they use or filled in the blank for extra answers besides the options. According to Table 5, the most used social media tools by the pre-service teachers were Instagram (f=267), YouTube (f=251) and Twitter (f=176). The least used social media tools were reported as LinkedIn (f=1), Twitch (f=1), Telegram (f=2), Pinterest (f=3) and Skype (f=3).

The questions of “Do you use email as an active communication tool?”, “How often do you check your email account/emails?”, and “For how many years have you been using email?” were asked to examine the email access and usage habits of the participants. The data obtained from the answers to these questions are presented in Table 6 below.

Table 6. Email Access and Usage Habits

Questions	Answers	Female		Male	
		f	%	f	%
Email Use	Yes	157	74,4	61	67,8
	No	54	25,6	29	32,2
Email Usage time duration (Year)	1-6	187	88,6	70	77,8
	7-12	18	8,5	18	20,0
	13-18	5	2,4	2	2,2
	Other	1	,5	0	0
Frequency of email checking	Several Times in a day	14	6,6	6	6,7
	Daily	50	23,7	40	44,4
	Weekly	108	51,2	23	25,6
	Monthly	34	16,1	17	18,9
	Other	5	2,4	4	4,4

When Table 6 is examined, it is seen that 74.4% of female pre-service teachers and 67.8% of male pre-service teachers use email as an active communication tool. The vast majority of both female and male pre-service teachers have been using email as a personal communication tool for approximately 1-6 years. According to the table above, it is understood that 44.4% of male pre-service teachers check their emails daily, and 51.2% of female pre-service teachers check their email weekly. Finally, unlike the answer options provided in the demographic form, some pre-service teachers reported that they check their emails every other day or when they wait for an email or when they need to use it. These answers were not considered as a separate answer category due to their low frequency, but were given under the “other” category.

Table 7 below represents the answers to the question of “Which is your main motivation source in the learning process?” which is the last question in the participant information form.

Table 7. The Source of the Motivation in the Learning Process

Answers	Female		Male	
	f	%	f	%
Myself	194	91,9	87	96,7
Others	17	8,1	3	3,3

In table 7, it is seen that both options “myself” and “others” were marked as the source of motivation in the learning process in both gender groups. With these results, it is observed that both female and male pre-service teachers saw themselves as the source of their learning motivation.

3.2 Results of the Digital Literacy Scale

An independent-samples t-test was conducted to compare the digital literacy scores of female and male pre-service teachers, and the results are displayed in Table 8 below.

Table 8. T-test Results of the Digital Literacy Scale Scores by Gender

Gender	N	M	s	df	t	p
Female	211	63,61	8,45	299	2,81	.005
Male	90	66,47	7,21			

As seen in Table 8, the mean scores of the male pre-service teachers’ digital literacy ($M=66.47$; $s=7.21$) is significantly higher than the mean scores of the female pre-service teachers’ digital literacy ($M=63.61$; $s=8.45$); ($t(299)=2.81$; $p<.05$; $r^2=0.02$). These results suggest that gender might play a role in digital literacy of the pre-service teachers. Specifically, our results suggest that male pre-service teachers have higher digital literacy than female pre-service teachers. According to Cohen (1988), the calculated r^2 value is accepted as a small effect size. Therefore, gender explains 2% of the variance in the scores of the digital literacy scale.

The descriptive results of the digital literacy scores of the pre-service teachers majoring at different departments are given in Table 9 below.

Table 9. Descriptive Results of the Digital Literacy Scale Scores by Department

Department	N	M	s
Special Education Department	167	64,7485	8,89139
Science Education Department	39	65,0000	6,92060
Elementary School Teaching Department	60	62,8333	7,08344
Early Childhood Education Department	35	65,3429	7,73435

As for the descriptive analysis, as seen in Table 9, the digital literacy scale scores of the pre-service teachers at the early childhood department ($M=65.3429$; $s=7.73435$) is the highest while the scores of the pre-service teachers at the elementary school teaching department ($M=62.8333$; $s=7.08344$) are the lowest among all the four departments presented in Table 9 above. In between these two departments, the scores of the pre-service teachers at the science department ($M=65.0000$; $s=6.92060$) are higher than the scores of the pre-service teachers at special education department ($M=64.7485$; $s=8.89139$).

A one-way analysis of variance was conducted to compare the digital literacy scale scores of the pre-service teachers studying in different departments: Early childhood department, elementary school teaching department, science department and special education department. The ANOVA results are displayed in Table 10 below.

Table 10. The Summary of ANOVA for Digital Literacy Scale Scores by Department

Source	SS	df	MS	F	p
Between	211,294	3	70,431	1,049	,371
Within	19937,656	297	67,130		
Total	20148,95	300			

As seen in Table 10, there is no significant difference between the mean scores of the digital literacy scale scores of the pre-service teachers studying at the early childhood department, elementary school teaching department, science department and special education department ($F(3,297)=1.049$; $p>.05$; $\eta^2=.01$). Although according to Cohen (1985), the η^2 value calculated in the study is in the small effect size category, it is an indication that 1% of the variance in the scores of the digital literacy scale is due to the department variable.

4. DISCUSSION

The aim of this study is to examine the digital literacy skills, technology habits and experiences of pre-service teachers studying in different departments in the faculty of education, in e-learning environments.

According to the data obtained, regarding the technology usage habits of the pre-service teachers, it was seen that female pre-service teachers had higher participation rates in this study. This case is similar to the results of some studies when the digital literacy levels of teacher candidates in the education faculty were examined (e.g. Can, Çelik, & Çelik, 2020; Yılmaz, 2021; Öztürk & Budak, 2019; Yontar, 2019; Okumuş & Atılğan 2021; Eryansah, Petrus, Indrawati & Ernalida, 2020; Nabhan, 2021; Ata and Yıldırım 2019; Aslan, 2021; List, 2019; Güneş and Bahçivan 2018). The fact that more female participants participated in the research may be due to the fact that women prefer the teaching profession more than men, or that female pre-service teachers show more volunteerism in terms of participation in the study compared to male pre-service teachers (Öztürk & Budak, 2019).

According to our findings, the majority of the pre-service teachers had a personal computer. Likewise, it is seen that the majority of teacher candidates have personal computers in the literature (e.g. Doğruluk 2017; Kırık, Pepeler, & Özbek, 2018; Kozan & Bulut-Özek, 2019; Özerbaş & Kuralbayeva 2018; Öztürk & Budak, 2019; Aslan, 2021 among others). Likewise, our findings showed that the majority of the pre-service teachers used social media. Some studies in the literature also displayed that most of the participants stated that they were followers of the social networks (e.g. Accuracy 2017; Sevinç 2018). Within the scope of the research, the most used social media tools by teacher candidates were found to be Instagram, YouTube and Twitter. Unlike our result, García-Martín and García-Sánchez (2017) stated that teacher candidates frequently use Facebook, Tuenti and Twitter. In the literature, Karakoyun (2017) stated that the most used social networks were Facebook, Instagram, YouTube, respectively, while Saritepeci, Durak and Durak (2017) found Facebook and Instagram, Hark-Söylemez (2017) found Instagram, Facebook, YouTube, Twitter and Sevinç (2018) found WhatsApp, YouTube, Instagram, Facebook, Twitter, LinkedIn, Vine as the most preferred social media tools. In addition, in the studies of Eryansah, Petrus, Indrawati, and Ernalida (2020), it is stated that teacher candidates use social media tools such as Facebook and Instagram very well. Other socio-demographic factors or the trend social media tool of the particular period might affect these preferences. In our study, most of the pre-service teachers reported that they had been using social

media for 6-10 years and that they had spent 1-5 hours on social media daily. Likewise, similar results were seen in the literature about the social media use history: it was found to be between 4-6 years by Sevinç (2018), and 6-8 years by Hark-Söylemez (2017). Regarding the frequency of usage, studies have shown that the daily time spent on social media was between 4-6 hours (Sevinç, 2018), 1-3 hours (Saritepeci, Durak, & Durak, 2017), 1-2 hours (Hark-Söylemez, 2017).

As for the email usage, we see that the majority of both female pre-service teachers and male pre-service teachers use email as an active communication tool. The vast majority of both female and male pre-service teachers have been using email as a personal communication tool for approximately 1-6 years, showing that they have started using email as a communication tool since high school. The results also might imply that the pre-service teachers do not use email as actively as their phones or messages since less than half of the male pre-service teachers check their emails daily while this case is lower for the female pre-service teachers. In addition, as the last part of the first research question, almost all of the participants reported “themselves” as the course of the motivation. This can be implied that the vast majority of both female and male pre-service teachers had internal motivation and they see “themselves” as their source of motivation in the learning process (Angraini, 2011).

The second research question of the study regarding whether there is a significant difference between the digital literacy scores of female and male teacher candidates was examined. The fact that the digital literacy skills scores of both female and male pre-service teachers are closer to the maximum score that can be obtained from the scale can be interpreted as that female and male pre-service teachers have a relatively high level of digital literacy. However, the findings showed that the mean score of male pre-service teachers’ digital literacy skills scale is statistically significantly higher than the female pre-service teachers’ digital literacy skills scale scores. Similar results were observed in the studies conducted with the pre-service teachers studying at the sports sciences department (Güngör and Kurtipek, 2020); elementary school teaching, social studies departments (Yontar, 2019); and elementary school teaching, social studies, mathematics and early childhood departments (Özerbaş & Kuralbayeva, 2018).

In addition, it has been observed that male pre-service teachers have a longer history of active use of computers, social media and e-mail. Moreover, the males use social media more than female pre-service teachers, and they define themselves as an “active user” of social media. These findings can be accepted as supportive and explanatory for the significantly high digital literacy scores of male teacher candidates. In addition, it can be said that the results obtained from two different data collection tools based on the self-reports of the pre-service teachers are compatible. Based on the findings, it can be implied that male pre-service teachers consider themselves more competent in digital literacy skills (Öztürk & Budak, 2019) and they are better in using technology (Özerbaş and Kuralbayeva 2018). In the emergence of this situation, the reasons such as the fact that the digital literacy and technology subjects might be more challenging for female pre-service teachers might be one of the underlying reasons (Ata and Yıldırım 2019). Also, men's curiosity towards technological tools from an early age, their willingness to use these tools and spending more time with these tools may be effective in gathering such results (Güngör and Kurtipek, 2020).

The third question of the study about whether there is a significant difference between the digital literacy scores of the pre-service teachers studying in different departments, was examined. The fact that the mean scores of the pre-service teachers studying in different departments are closer to the maximum score that can be obtained from the scale can be interpreted as the fact that the pre-service teachers in these departments have a relatively high level of digital literacy. Statistically, there was no significant difference between the digital literacy scale scores of the pre-service teachers at the special education, elementary school teaching, science and early childhood education departments. Similarly, in the studies conducted in different departments in educational faculties, no significant difference was found between the digital literacy scores of the pre-service teachers studying at the science, Turkish, elementary school teaching, guidance and psychological counseling departments (Öztürk & Budak, 2019); and elementary school teaching and social studies departments (Yontar, 2019). This may be due to the past experiences of the pre-service teachers studying in different departments and the fact that the undergraduate curriculum they are subject to does not require any qualifications to

differentiate their digital literacy levels. In other words, the global and digital age we live in today requires pre-service teachers studying in different departments to have similar competencies in terms of digital literacy. However, unlike the results of this study, there are also studies in which a significant difference was found between the digital literacy scores of teacher candidates studying in different departments in the faculty of education (Yılmaz, 2021; Özerbaş & Kuralbayeva, 2018; Ocak & Karakuş 2019; Ata & Yıldırım 2019; Aslan, 2021).

5. CONCLUSIONS

In conclusion, we investigated the pre-service teachers' digital literacy skills, technology habits and experiences in e-learning environments. They studied at different departments in the faculty of education. Although there were differences in terms of gender, we found the prospective teachers had relatively high digital literacy scores while they had different technological backgrounds. We came to the conclusion that digital literacy skills of pre-service teachers studying at the faculty of education are important skills for both themselves and their future students especially today when education is forced to go beyond the classroom walls. Therefore, in line with the research findings, more studies can be carried out to develop digital literacy by considering the technology related demographic information, especially to improve the conditions for the female pre-service teachers and enhance their technological skills. As an implication, more courses related to technology knowledge and usage in daily lives and also in educational settings can be included in teacher-training programs.

As for the limitations, we analyzed technology related backgrounds of the pre-service teachers descriptively as demographic information, however, in further research, their relation with the digital literacy and academic achievement might be researched and certain implications for instructional purposes should be suggested.

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