

Assessment of Digital Literacy Levels of Special Education Pre-service Teachers in Terms of Various Variables

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SUMMARY

This study aims to assess the digital literacy levels of special education pre-service teachers in terms of various variables. The study was quantitative and descriptive in the scanning model. The convenience sampling method was utilized to determine the sample in the study, and 139 pre-service teachers (51 females, 88 males) from different grade levels participated in the research. In the study, a scale to determine digital literacy has been utilized as a data collection tool. In line with the findings obtained in the research, male' digital literacy proficiency total scores were found to be higher than female' total digital literacy proficiency scores and demonstrated a significant difference. Furthermore, evaluating the differentiation of digital literacy levels in terms of grade class level in the study, it has been seen that the total scores have not differed significantly regarding the grade class level. In our research on the differentiation status in terms of attending seminars/conferences, etc., on the utilization of computer technologies, the total scores of digital literacy of those who received education were noted to be higher than the total scores of those who did not receive education. Still, the study determined that the students' digital literacy proficiency total scores differed significantly with respect to the frequency of computer use. Another finding attained in the study was that there was no significant difference between the digital literacy proficiency total scores between the participants who responded "Yes" and those who answered "No" regarding the pandemic's increasing frequency of internet use. Consequently, evaluating special education pre-service teachers in terms of digital literacy, it has been seen that the findings achieved include similarities or differences with other studies on the assessment of digital literacy of pre-service teachers in the literature.

Keywords: Pre-service Teachers, Special Education, Digital Literacy

INTRODUCTION

Digital technology, which began to enter our homes at the end of the 20th century, has penetrated almost every aspect of our lives with a breathtaking speed in the first quarter of the 21st century. The main aspects are social life and education life. We can find the opportunity to interact with numerous different cultures in the world with social media applications; we can instantly access the information we desired from where we stand with digital applications for education. In order to use effectively digital applications that are intertwined with our lives, digital literacy must be at a certain level. Digital literacy consists of skills, knowledge and understanding that demonstrate creative, critical and distinctive practices with digital technologies (Hague & Payton, 2010). With another aspect, digital literacy can also be represented as having sufficient cognitive, psychomotor and affective competencies to use digital environments functionally (Eshet, 2004). In Altun's opinion (2003), digital literacy is defined as the ability to understand texts presented digitally; according to Ribble (2011), it is also an important factor in the formation of digital citizenship. Digital literacy is classified as "basic digital literacy, digital literacy for general work purposes, and digital literacy for professional work" with respect to the skills and areas of use (Bacon & MacKinnon, 2016). This classification corresponds to a wide range from basic computer use to software development. In the literature, studies regarding the sub-dimensions of digital literacy are available (Acar, 2015; Bayrakçı, 2020; Calvani et al., 2009; Covello, 2010; Hague & Payton, 2010; Ng, 2012).

We are in the age of technology, and hence, we need to be able to provide the young generation with the required technological equipment to keep up with the age. Likewise, digital literacy is discussed as a tool for learning, working and socializing in the current age (Churchill, Oakley & Churchill, 2008; Stordy, 2015), and it is stated that it is more than a basic computer and internet use (Hague & Payton, 2010; Ng, 2012; Tyger, 2011). In order to be able to procure these equipment and competencies, some competencies should be acquired in the early stages of school-age children. From this point of view, individuals at all levels of the education and training process should have the capacity and understanding to access rapidly to digital information. Thus, the competence of the teacher, who is one of the fundamental elements of the teaching process, will simplify individuals to have this skill. Knobel (2011) suggests that teachers should become digital literate and digital technology leaders in the future (as cited in Tyger, 2011). This concept mentions that digital literacy should be considered a professional competence for teachers and integrated into teacher training programs (Campbell, 2016). Keeping up with the era and following technological developments is substantial for the generation they will raise. Because in our age, digital literacy is an essential element for lifelong learning (UNESCO, 2011). In this regard, it is substantial that special education teachers who address more than one type of special needs have a specific level of digital literacy in order to adapt themselves to the requirements of the age. There are existing studies to establish the digital literacy levels of pre-

service teachers from different branches in Turkey (Boyacı, 2019; Kıyıcı, 2008; Korkmaz, 2020; Özçiftçi & Çakır, 2015; Özerbaş & Kuralbayeva, 2018; Üstündağ, Güneş & Bahçivan, 2017; Yontar, 2019).

In the recent pandemic (COVID-19) term, our need for technology in the learning process has stepped forth with distance education. Therefore, with the pandemic, all countries have realized how essential digital literacy is in their learning processes. Meanwhile, the level of digital divides in the existing conditions of countries in the pandemic has become clearer. The digital divide is described as the difference between having information and communication technologies, and those who can utilize information and communication technologies efficiently and those who cannot (Çapar & Vural, 2013). Aktaş (2020) suggested in a study that the digital literacy levels of teachers and students in the distance education process influence the digital divide. In this context, it has been revealed that the pandemic period and the digital divide lead to differentiation in learning (Sezgin & Fırat, 2020). Moreover, Arslan and Şumuer (2020) mentioned the problems experienced due to the use of distance education software and the problems had in the courses given through distance education throughout the pandemic period. In a sense, this situation has created a connection in our study on investigating the point reached in digital literacy in teacher education and the effects of the pandemic on digital literacy.

In our research, digital literacy levels of special education pre-service teachers were described in terms of various variables. With respect to the researches, the branches of teachers have been affecting their digital literacy levels (Boyacı, 2019; Kıyıcı, 2008; Korkmaz, 2020; Özçiftçi & Çakır, 2015; Özerbaş & Kuralbayeva, 2018; Üstündağ, Güneş & Bahçivan, 2017; Yontar, 2019). Therefore, the digital literacy levels of special education pre-service teachers, which are not frequently encountered in the literature, are included in the study. The variables utilized in this research to describe the digital literacy levels of special education pre-service teachers; whether or not they attended digital literacy training, the frequency of internet and computer access and use, the effects of the recent pandemic (COVID-19) and some demographic variables. In this direction, the objective of the research is to describe the digital literacy levels of special education pre-service teachers in terms of various variables.

METHOD

The study is a quantitative study, and a survey model has been utilized. This is a descriptive research in the survey model. Survey models can be expressed as a model that aims to describe a current or past situation as it is (Büyüköztürk et al., 2014). Survey models are scanning arrangements made on the whole population or the sample taken from the population to make a general judgment regarding a population with countless elements (Karasar, 2003).

Study Group

The convenience sampling method has been utilized to determine the participants in the study. The convenience sampling method was preferred since it is economical in terms of time, money and effort (Gall, Gall and Borg, 2007). The study group of the research consists of pre-service teachers in the special education department of a university who study in the 2022-2023 academic year. The research was carried out with 139 (51 females, 88 male) special education pre-service teachers. Table 1 presents the descriptive statistics of the participants.

Table 1. Descriptive statistics of participants

Variables	Groups	f	%
Gender	Female	51	36.7
	Male	88	63.3
	Total	139	100
Grade Level	1st grade	32	23.0
	2nd grade	20	14.4
	3rd grade	51	36.7
	4th grade	36	25.9
	Total	139	100

Data Collection Tool

The "Digital Literacy Assessment Scale" developed by Acar (2015) was utilized as the data collection tool in the research. The scale is a 5-point Likert type and consists of 41 items. The scale used consists of five sub-dimensions. These are "basic tool and media knowledge, contextual use, awareness, secure attendance, digital identity management" dimensions. In the digital literacy proficiency scale, it was scored as completely sufficient (5 points), very sufficient (4 points), moderate sufficient (3 points), slightly sufficient (2 points) and not sufficient (1 point). Acar (2015) found the Cronbach α value for the whole scale to be 0.980; whereas for the dimensions of "basic tool and media knowledge, contextual use, awareness, secure attendance, digital identity management", 0.899, 0.958,

0.968, 0.928, and 0.908 values were noted, respectively. The values above demonstrate that the scale is highly reliable (Kiliç, 2016).

Data Analysis

The data attained in the research were assessed in computer media via the SPSS 22.0 statistical program. Frequency and percentage analyzes were used to specify the demographic characteristics of the students participating in the research, and mean and standard deviation statistics were used to examine the scale. T-test, one-way analysis of variance (ANOVA) and post hoc (Tukey, LSD) analyses were utilized to review the differences in scale levels according to the demographic characteristics of pre-service teachers.

FINDINGS

A number of statistical findings, which were assessed in line with the answers given by the participants to the scale utilized in the study and to the questions directed, were presented. In practice, firstly, "Have you taken a lecture/seminar/conference on the usage of information technologies?" has been asked to the participants. In this direction, statistical information regarding the answers given by the participants to the question expressed is presented in Table 2.

Table 2. Statistical information on the status of the participants to attend courses/seminars/conferences, etc., regarding Information Technologies

Answers	f	%
Yes	84	60.4
No	55	39.6

The answers given to the question directed in line with the findings acquired from Table 2 are that 60.4% of the participants took "lectures/seminars/conferences, etc" for information technologies. It is stated that 39.6% of the participants did not receive a course/seminar/conference, etc., on information technologies. Secondly, in practice, "What is the frequency of your computer use?" has been asked to the participants. The statistical information given by the participants regarding this question is shown in Table 3.

Table 3. Statistical information on the frequency of computer use of the participants

Answers	f	%
Every Day	21	15.1
3-5 Days a Week	22	15.8
1-2 Days a Week	58	41.7
Never	38	27.3

In Table 3, among the answers given by the participants to the frequency of computer use, the most common answer has been "1-2 Days a Week", with 41.7%. Among the answers given, "Never" has been determined to be 27.3%. The least given answer is "Every day", with 15.1%. In the third practice, "What is your frequency of internet use?" has been asked to the participants. The statistical information given by the participants regarding this question is presented in Table 4.

Table 4. Statistical information on the frequency of computer use of the participants

Answers	f	%
Every Day	124	89.2
3-5 Days a Week	9	6.5
1-2 Days a Week	5	3.6
Never	1	0.7

The findings obtained from Table 4 demonstrate that 89.9% of the participants use the internet "Every Day". Only 0.7% of the participants gave the answer "Never", that is, one person. In the fourth practice, "What do you often use as an internet access tool?" has been asked to the participants. Table 5 presents the statistical information given by the participants regarding this question.

Table 5. Statistical information on the internet access tools frequently used by the participants

Answers	f	%
Computer	6	4.3
Tablet	1	0.7

Mobile Phone	131	94.2
All	1	0.7

In parallel with the information provided in Table 5, 94.2% of the participants answered "Mobile Phone" as their frequently used internet access tool. The rate of participants using computers as an internet access tool was 4.3%, and the rate of participants using tablets was 0.7% as well. In practice, as fifth question, "Do you think the pandemic (COVID-19) period increased your frequency of internet use?" has been asked to the participants. The statistical information given by the participants regarding this question is given in Table 6.

Table 6. Statistical information on the increase in the frequency of internet use of the pandemic

Answers	f	%
Yes	128	92.1
No	11	7.9

As shown in Table 6 reviewing the information regarding the increase in the frequency of internet use of the pandemic, 92.1% of the participants answered "Yes," and 7.9% answered "No". A number of questions asked to the participants, and afterwards, the "Digital Literacy Assessment Scale" was presented. Table 7 shows the arithmetic mean, standard deviation and minimum-maximum levels of the participants' digital literacy competencies for the total and sub-dimensions.

Table 7. Some statistical information on the digital literacy scale and its sub-dimensions

Scale Dimensions and Total	Sub-Tool	N	Mean	SD	Min.	Max.	Kurtosis	Skewness	Alpha
Basic and Environment Information		139	18.302	4.286	7.000	25.000	-0.632	-0.167	0.899
Contextual Use		139	34.518	7.976	12.000	45.000	-0.594	-0.483	0.936
Awareness		139	67.784	12.119	26.000	85.000	-0.052	-0.489	0.959
Secure Attendance		139	22.669	5.100	10.000	30.000	-0.746	-0.217	0.899
Digital Identity Management		139	15.482	3.486	6.000	20.000	-0.769	-0.335	0.889
Digital Literacy Qualification Total		139	158.755	29.795	74.000	205.000	-0.582	-0.327	0.978

In line with the information provided in Table 7, the total Cronbach's alpha value of the scale is 0.978; the values of the sub-dimensions vary between 0.899 and 0.959 as well. All these values indicate that the scale is reliable. Besides, it is noted that the skewness/ kurtosis coefficients are distributed between -1 and +1. This indicates that the data obtained represent a normal distribution. The differentiation of the digital literacy competence scores of the participants in terms of gender is given in Table 8.

Table 8. Independent groups t-test for gender differentiation of digital literacy qualification scores

Group	Basic Tool and Environment Information	Contextual Use	Awareness	Secure Attendance	Digital Identity Management	Digital Literacy Qualification Total
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Male	20.059±4.08 1	36.059±6.833	70.902±11.9 15	24.490±4.67 5	16.373±3.515	167.882±27.67 3
Female	17.284±4.08 8	33.625±8.478	65.977±11.9 33	21.614±5.06 2	14.966±3.382	153.466±29.84 9
t	3.859	1.747	2.346	3.320	2.330	2.818

p	0.000	0.083	0.020	0.001	0.021	0.006
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With respect to the findings obtained from Table 8, the total digital literacy qualification scores of males ($x=167.882$) were found to be higher than the total digital literacy qualification scores of females ($x=153.466$) and showed a significant difference ($t=2.818$; $p=0.006<0.05$; $d=0.496$; $\eta^2=0.055$). Male's basic tool and environment knowledge scores ($x=20.059$) were found to be higher than female's basic tool and environment knowledge scores ($x=17.284$) and had a significant difference ($t=3.859$; $p=0<0.05$; $d=0.679$; $\eta^2=0.098$). Students' contextual use scores did not differ significantly by gender ($t=1.747$; $p>0.05$; $d=$; $\eta^2=$). Male's awareness scores ($x=70.902$) were found to be higher than female's awareness scores ($x=65.977$) and had a significant difference ($t=2.346$; $p=0.02<0.05$; $d=0.413$; $\eta^2=0.039$). Male's secure attendance scores ($x=24.490$) were found to be higher than women's secure attendance scores ($x=21.614$) and had a significant difference ($t=3.320$; $p=0.001<0.05$; $d=0.584$; $\eta^2=0.074$). Finally, the digital identity management scores of males ($x=16.373$) were noted to be higher than the digital identity management scores of females ($x=14.966$) and showed a significant difference ($t=2.330$; $p=0.021<0.05$; $d=0.410$; $\eta^2=0.038$). The differentiation of the digital literacy qualification scores of the participants in terms of grade level is presented in Table 9.

Table 9. ANOVA test on the differentiation of digital literacy competence scores in terms of grade level

Group (grade)	Basic and Environment Information	Tool Use	Contextual Use	Awareness	Secure Attendance	Digital Identity Management	Digital Literacy Qualification Total
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
1st grade	18.406±3.92 6	32.469±9.11 9	69.656±10.0 50	23.188±5.17 1	16.406±3.10 9	160.125±27. 873	
2nd grade	16.850±5.39 3	31.950±9.92 3	62.750±15.1 69	20.450±5.91 6	14.150±3.66 0	146.150±37. 098	
3rd grade	18.922±4.15 1	36.216±6.72 7	68.157±11.4 36	22.824±4.78 2	15.510±3.45 5	161.628±27. 548	
4th grade	18.139±4.07 2	35.361±6.82 1	68.389±12.6 36	23.222±4.87 6	15.361±3.63 4	160.472±29. 553	
F	1.148	2.368	1.465	1.548	1.768	1.427	
p	0.332	0.074	0.227	0.205	0.156	0.238	

As shown in Table 9 the students' total digital literacy qualification scores do not differ significantly based on the grade level ($F=1.427$; $p=0.238>0.05$). Nevertheless, basic tool and environment knowledge ($F=1.148$; $p=0.332>0.05$), contextual use ($F=2.368$; $p=0.074>0.05$), awareness ($F=1.465$; $p=0.227>0.05$), secure attendance ($F=1.548$; $p=0.205>0.05$), digital identity management ($F=1.768$; $p=0.156>0.05$) scores do not differ significantly by grade. The differentiation status of students' digital literacy qualification scores in terms of whether they received training on computer technologies is shown in Table 10.

Table 10. Independent groups of digital literacy qualification scores in terms of receiving courses/seminars/conferences, etc., regarding the use of computer technologies T-test

Group	Basic and Environment Information	Tool Use	Contextual Use	Awareness	Secure Attendance	Digital Identity Management	Digital Literacy Qualification Total
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Yes	18.750±4.197	35.607±7.355	69.857±11.59 7	23.441±4.944	15.964±3.431	163.619±28.6 04	
No	17.618±4.369	32.855±8.646	64.618±12.31 9	21.491±5.153	14.746±3.471	151.327±30.3 02	
t	1.530	2.012	2.541	2.236	2.039	2.420	
p	0.128	0.046	0.012	0.027	0.043	0.017	

As shown in Table 10 the digital literacy proficiency total scores ($x=163.619$) of those who received the IT use seminar were noted to be higher than the digital literacy qualification total scores ($x=151.327$) of those who did not receive the IT use seminar ($t=2.420$; $p=0.017<0.05$; $d=0.420$; $\eta^2=0.041$). The contextual use scores of those who received the IT use seminar ($x=35.607$) were detected to be higher than the contextual use scores of those

who did not receive the IT use seminar ($x = 32.855$) ($t = 2.012$; $p = 0.046 < 0.05$; $d = 0.349$; $\eta^2 = 0.029$). The awareness scores of those who received the IT use seminar ($x = 69.857$) were noted to be higher than the awareness scores of those who did not receive the IT use seminar ($x = 64.618$) ($t = 2.541$; $p = 0.012 < 0.05$; $d = 0.441$; $\eta^2 = 0.045$). The secure attendance scores of those who received an IT use seminar ($x = 23.441$) were found to be higher than the safe participation scores of those who did not receive an IT use seminar ($x = 21.491$) ($t = 2.236$; $p = 0.027 < 0.05$; $d = 0.388$; $\eta^2 = 0.035$). The digital identity management scores ($x = 15.964$) of those who took an IT use seminar were noted to be higher than the digital identity management scores ($x = 14.746$) of those who did not take an IT use seminar ($t = 2.039$; $p = 0.043 < 0.05$; $d = 0.354$; $\eta^2 = 0.029$). The students' basic tool and environment knowledge scores do not differ significantly based on the status of attending the IT use seminar ($p > 0.05$). The differentiation status of students' digital literacy qualification scores in terms of whether they had training on computer technologies is presented in Table 11.

Table 11. Differential status of digital literacy qualification scores regarding computer use frequency ANOVA and PostHoc tests

Group	Basic Tool and Environment Information	Contextual Use	Awareness	Secure Attendance	Digital Identity Management	Digital Literacy Qualification Total
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Every Day	22.714±4.01 4	41.143±6.06 9	77.000±10.50 2	26.762±4.34 6	17.952±3.26 3	185.571±27.14 7
3-5 Days a Week	19.364±3.41 6	39.091±4.53 5	71.500±8.268	23.727±3.83 2	16.318±2.76 7	170.000±17.79 5
1-2 Days a Week	17.931±3.68 9	34.845±6.32 1	67.483±10.75 8	22.397±4.81 6	15.224±3.28 8	157.879±26.06 3
Never	15.816±3.73 3	27.711±7.68 3	61.000±12.93 4	20.211±5.12 1	14.026±3.52 2	138.763±28.13 5
F	16.377	25.170	10.523	9.223	7.079	16.670
p	0.000	0.000	0.000	0.000	0.000	0.000
PostHoc : Tukey, LSD	1>2, 1>3, 1>4, 2>4, 3>4 (p<0.05)	1>3, 1>4, 2>4, 3>4 (p<0.05)	1>3, 1>4, 2>4, 3>4 (p<0.05)	1>2, 1>3, 1>4, 2>4, 3>4 (p<0.05)	1>3, 1>4, 2>4 (p<0.05)	1>2, 1>3, 1>4, 2>4, 3>4 (p<0.05)

As shown in Table 11 the total digital literacy qualification scores of the students differ significantly with respect to the frequency of computer use ($F = 16.670$; $p = 0 < 0.05$; $\eta^2 = 0.270$). Additionally, students' basic tool and environment knowledge scores differ significantly with respect to the frequency of computer use ($F = 16.377$; $p = 0 < 0.05$; $\eta^2 = 0.267$). Students' contextual use scores differ significantly based on the frequency of computer use ($F = 25.170$; $p = 0 < 0.05$; $\eta^2 = 0.359$). Students' awareness scores differ significantly according to the frequency of computer use ($F = 10.523$; $p = 0 < 0.05$; $\eta^2 = 0.190$). Students' safe participation scores differ significantly according to the frequency of computer use ($F = 9.223$; $p = 0 < 0.05$; $\eta^2 = 0.170$). Students' digital identity management scores differ significantly according to the frequency of computer use ($F = 7.079$; $p = 0 < 0.05$; $\eta^2 = 0.136$). Statistical data on the differentiation of digital literacy qualification scores of students' digital literacy competence scores regarding the increase in the frequency of internet usage of the pandemic are shown in Table 12.

Table 12. Independent groups T-test of the differentiation of digital literacy qualification scores regarding the increase in the frequency of internet use due to pandemic

Group	Basic Tool and Environment Information	Contextual Use	Awareness	Secure Attendance	Digital Identity Management	Digital Literacy Qualification Total
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Yes	18.266±4.225	34.430±7.955	67.891±11.767	22.664±5.075	15.500±3.418	158.750±29.273
No	18.727±5.159	35.546±8.537	66.546±16.330	22.727±5.641	15.273±4.384	158.818±36.994
t	-0.342	-0.444	0.352	-0.039	0.207	-0.007
p	0.733	0.658	0.725	0.969	0.836	0.994

As shown in Table 12 Regarding the increase in the frequency of the internet due to the pandemic, no significant difference was observed between the total digital literacy competence scores of the participants who answered "Yes" and the participants who answered "No" ($t = -0.007$; $p=0.994>0.05$). Furthermore, the participants' basic knowledge of tools and environments ($t = -0.342$; $p=0.733>0.05$), contextual use ($t= -0.444$; $p=0.658>0.05$), awareness ($t=0.352$; $p=0.725>0.05$), secure attendance ($t = -0.039$; $p=0.969>0.05$), digital identity management ($t=0.207$; $p=0.836>0.05$) scores do not differ significantly according to the increase in the frequency of internet use due to pandemic.

CONCLUSION AND DISCUSSION

With respect to the findings, it was observed that 60.4% of the prospective special education teachers received courses/seminars/conferences, etc., on information technologies (Table 2). The "Information Technologies" course is included in the undergraduate education programs of existing education faculties in Turkey. Nonetheless, among the professional qualifications of the teaching profession is "*the ability of the teacher to use the required information and communication technologies in the learning and teaching process*" (MoNE, 2017). Accordingly, pre-service teachers receive the required education during the undergraduate period without making an effort to reach activities such as an external seminar, conference or training. The reason why all of the prospective special education teachers could not answer "Yes" to this question is that they have not yet attended this course within the ongoing undergraduate programs due to their level of proficiency.

Among the answers given by special education pre-service teachers regarding the frequency of computer use in the study, the answer was "*1-2 Days a Week*", with a maximum of 41.7% (Table 3). Another remarkable finding in the research is that 27.3% of the participants did not use a computer in any way. In the study performed by Okur Akçay and Halmatov (2015) with preschool pre-service teachers, the most common answer given to the question regarding the frequency of computer use was a few hours a day with 29.8% and a few hours a week with 28.2%. In the same study, 5.3% of the participants answered "Never". In the study conducted by Demirez (2019) with 258 social studies pre-service teachers, the frequency of computer usage was evaluated weekly, and it was suggested that 54.3% of the students answered "one hour or less".

In the question asked about the frequency of internet use of the participants, 89.9% of the participants answered "*Every Day*" (Table 4). Similarly, in his study with 314 pre-service teachers, Kılıç (2022) asked pre-service teachers about the frequency of daily internet use, and 29% answered two hours or more, whereas 28% answered between 30 minutes and one hour. Çolak and Öztürk (2022) investigated the frequency of internet use on a daily basis for social studies pre-service teachers, and 35.2% of the 236 participants stated that they used the internet for more than 6 hours per day. Moreover, in the same study, 30.1% of the participants stated that they used the internet between 4 and 6 hours. In a study carried out with pre-service teachers, Ata and Alpaslan (2019) gave a maximum response of 36.8% for more than 4 hours a day in their findings on the frequency of internet use and a second response of 35.5% for 3-4 hours a day. In their study with 409 prospective teachers, Şad and Nalçacı (2015) stated that 57.7% of the participants answered "less than 1 hour" in the findings regarding the daily evaluation of the frequency of internet use. In the study conducted by Demirez (2019) with 258 social studies pre-service teachers, the frequency of internet use was assessed weekly, and it was observed that the participants answered "15 hours or more," with a maximum of 38.4%.

Another finding attained in the study is that 94.2% of special education pre-service teachers responded that "*Mobile Phone*" as the internet access tool they frequently use (Table 5). Mobile phones are commonly used as a means of mobile internet access today. In a study performed by Engin and Genç (2020) with 172 pre-service teachers, they determined the average daily mobile phone screen usage time of pre-service teachers as 255 minutes. In the study carried out by Çuhadar and Yücel (2010) with 65 senior pre-service teachers studying in the department of foreign languages education, it was determined that mobile phones were among the most used computer and hardware products of the participants, with a rate of 98%.

Reviewing the information regarding the increase in the frequency of internet use with the pandemic in the study, 92.1% of the participants responded as "*Yes*" (Table 6). The COVID-19 pandemic period is expected to increase the frequency of internet use all over the world. Likewise, individuals who could not leave their homes throughout the pandemic tried to fulfil their daily routines through the internet, resulting in an increase in the frequency of internet use. Baltacı, Akbulut and Zafer (2020) revealed in their study with 52 university students that university students spent more time on the internet during the COVID-19 pandemic period. Babaarslan (2021) investigated the relationship between the fear of the pandemic and internet addiction of 200 university students in his study. In this study, it was observed that internet addiction increased as fear increased. Dong et al. (2020) suggested in their study in China that excessive internet use is seen in children and adolescents. Siste (2020) et al. expressed that the internet usage of adults increased with the COVID-19 pandemic process based a study they carried out in Indonesia.

In parallel with the findings obtained in the study, male' digital literacy qualification total scores were noted to be higher than female' total digital literacy qualification scores and show a significant difference. There are a number

of data outcomes in the literature regarding the use of different or the same scale for digital qualification. Among the studies in the literature, Ocak and Karakuş (2018) applied the "*Digital Literacy Self-Efficacy Scale of Pre-service Teachers*" developed by them with 284 pre-service teachers and stated that there was no significant difference in terms of gender in the total scores of the scale. Fidan and Yeleğen (2022) used the "*Digital Competencies Scale for Educators*" as a data collection tool in their practice with 158 teachers, and as a result of the practice, it was determined that there was a significant difference in favor of females in the total scores of the scale. In his study with 500 prospective teachers from different fields, Boyacı (2019) stated that digital literacy levels differ significantly in favor of females in terms of gender. In their study with 71 physics pre-service teachers, Rizal et al. (2021) revealed that there was a significant difference in favor of males in terms of digital literacy levels. Öztürk and Budak (2019) concluded that there was a significant difference in digital literacy in favor of males in their study with the "*Digital Literacy Assessment Scale*" applied to pre-service teachers in 340 different fields. Şahin and Kalkan (2022) revealed that there was a significant difference in favor of males in terms of digital literacy level in their study with 130 preschool pre-service teachers.

Evaluating the differentiation of digital literacy levels in terms of grade level in the study, it was observed that the total scores did not differ significantly in terms of grade level. In their study on digital literacy levels, Öztürk and Budak (2019) stated that digital literacy levels increased as the grade levels increased. In his study on digital literacy levels, Boyacı (2019) discussed that the scores of the 1st grades were lower than the other grades. In his study with 150 preschool pre-service teachers, Bay (2021) examined whether digital literacy levels changed based on the grade levels and stated that despite the average of 3rd-grade students being high, there was no statistical difference in terms of grade levels.

In our study on the differentiation status in terms of attending seminars/conferences, etc., on the use of computer technologies, the total scores of digital literacy of those who received education were found to be higher than the total scores of those who did not receive education. Kozan and Bulut-Ozek (2019), in their study with 122 students studying in the Department of Computer and Instructional Technologies Education, suggested that the digital literacy levels of the 3rd grades were higher than the 2nd and 4th grades. Şahin and Kalkan (2019) found a significant difference between grade levels in their study.

In the study, students' digital literacy qualification total scores differ significantly based on the frequency of computer usage (Table 11). Kozan and Bulut-Ozek (2019) investigated the relationship between computer usage time and digital literacy level, and those who used computers for a long time had lower digital literacy levels than those who used computers for a relatively shorter time. Şahin and Kalkan (2022) statistically determined the relationship between having a personal computer and digital literacy in favor of those who have a computer. In his study with 345 teachers, Arslan (2019) investigated teachers' digital literacy levels and computer use times. In the study, it was observed that the mean digital literacy levels of those who used computers for the shortest period (0-5 years) among the groups (those who used them for 0-5 years, 6-8 years and over 9 years) were noted to be higher than the other groups.

Regarding the increase in the frequency of internet use of due to pandemic, no significant difference was found between the total digital literacy qualification scores of the participants who responded as "Yes" and the participants who responded as "No" (Table 12). In the research performed by Yılmaz and Toker (2021) with 6118 teachers in different branches, it was revealed that digital qualifications were positively affected during the pandemic process according to the data obtained after the pandemic comparing before and after the pandemic. In the study conducted by König, Jager-Biela and Glutsch (2020) in Germany, they revealed that the digital qualifications of teachers were required in terms of professional qualifications throughout the pandemic period. Perifanou, Economides and Tzafilkou (2021) suggested the requirement of training teachers on digital qualifications in their research conducted in Greece during the pandemic period. Sánchez-Cruzado, Santiago Campián, and Sánchez-Compañá (2021) stated in a research they performed in Spain during the COVID-19 period that teachers had a low perception of their digital qualifications.

In conclusion, evaluating prospective special education teachers in terms of digital literacy, it was observed that the findings obtained contained similarities or differences with other studies on digital literacy in the literature. One of the limitations of our study is the evaluation of the digital literacy levels of special education pre-service teachers of only one university, and the utilization of a scale that will provide only quantitative data to determine digital literacy levels in our study. In future studies, it is probable to work with special education pre-service teachers from various universities with a more significant number of participants utilizing different measurement tools. In future studies, the effects of different variables affecting digital literacy on digital literacy can be examined. Qualitative findings regarding digital literacy may be included in other studies.

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