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Examination of Digital Literacy Levels of University Students

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Abstract

In this study, it was aimed to determine the digital literacy levels of university students. The study also aimed to examine the differentiation status of university students in terms of various variables of digital literacy levels. In addition, in the study, the digital literacy levels of university students were determined by gender, type of education (normal/secondary education), higher education level (associate / undergraduate/graduate), higher education program they are enrolled in, grade point average, class, average monthly income, social network with the most time spent. It is also aimed to examine the differentiation status in terms of the variables of average internet usage time during the day, the preferred tool for internet use, and the educational status of the parents. In this study, the survey model, which is one of the quantitative patterns, was used. The population of the study consisted of a total of 17,006 students, 11,500 undergraduate and 5,506 associate degree students, studying in 11 faculties, 4 colleges and 9 vocational colleges in the 2021-2022 academic year at a state university located in the Eastern Anatolia Region. The sample consisted of randomly selected 688 university students. The "Digital Literacy Scale" developed by Bayrakçı and Narmanlıoğlu in 2021 was used as a data collection tool. In the analysis process, nonparametric techniques were used since the data could not meet the assumptions of parametric techniques. As a result of the study, it was seen that the digital literacy levels of university students were low. In addition, it was concluded that there were statistically significant differences between university students' grade point averages, the social network they spend the most time on, the preferred tool in internet use, and the educational status of

their parents and their digital literacy levels. Various suggestions were developed considering the results of the study.

Keywords: Digital Literacy, Literacy, University Students

A. Introduction

It is in question that the software and hardware elements that develop with technology affect the work to be done more effectively, widespread and useful according to the areas of use. Especially in the processes of accessing, organizing, evaluating and employing information, various digital tools and applications can be easily utilized for academic purposes or meeting daily needs (Castells, 2008). It is known that in the 21st century, a significant portion of children in developed and developing countries are acquainted with various digital tools and applications before meeting with their schools and teachers (Allen, 2016; Dinlemez, 2021). In this regard, one of the features expected from individuals in the 21st century is also the use of digital elements (computer, tablet, smart phone, digital recording devices, interactive smart boards and blogging with applications such as wiki, web 2.0, social media tools) effectively and efficiently in learning processes (accessing information, receiving information-organizing-storing-adapting-using-creating) (Kuru, 2019). However, as of 2019, the COVID-19 pandemic, which has spread rapidly all over the world, has made it necessary to use digital elements more in education and training processes. In terms of the current situation, it can be stated that digital literacy comes first among the features expected from students in the learning-teaching processes integrated with digital applications.

When the relevant literature is examined, it can be found that various researches on digital literacy in recent years. In the study conducted by Doğan in 2022, it was concluded that the digital literacy levels of university students are very sufficient and the digital literacy levels of academics are fully sufficient. In a study conducted by Thompson in 2016, it was stated that increasing the level of digital literacy would enable students to access rich content and make their lives easier. In the study conducted by Juurakko and Rontu in 2018, it was seen that digital literacy has a very important place in language learning and communication processes in Finland. In a study by Polizzi in 2020, it was stated that digital literacy can contribute to civics and information processing processes. In the study conducted by Bingöl in 2022, teachers' digital literacy levels were examined. In the study, it was seen that teachers' digital literacy levels were high. On the other hand, it was also stated that the digital literacy levels of teachers differ according to their gender, seniority and branch. Studies on digital literacy are also seen by Cote & Milliner (2018), Velez, Olivencia & Zuazua (2017), Taylor & Dalal 2017, Tomczyk (2019) and Yaman (2019). When the related studies are evaluated as a whole; It is understood that the level of digital literacy can be effective in areas such as academic success, communication, access to information and language learning. In addition, it has been observed that the level of digital literacy differs according to various variables such as gender, age and branch. From

this point of view, this research was deemed necessary in order to examine the digital literacy levels of university students in Turkey and to reveal the current situation on this subject.

In this study, it was aimed to determine the digital literacy levels of university students. In addition, in the study, digital literacy levels of university students were determined by various variables (gender, type of education, higher education level, higher education program they are enrolled in, grade point average, class, average monthly income, and social network spent the most time, average internet usage time during the day, preference in internet use). In this study, it was aimed to examine the situation in terms of the vehicle used and the education level of the parents. Thus, the level of digital literacy, which is one of the 21st century skills of university students, can be determined and various suggestions can be made to overcome and develop the deficiencies in these skills, if any. The research questions to be answered in order to achieve the aim of the study are as follows:

1. What is the digital literacy level of university students?

2. Is there a significant difference between the digital literacy levels of university students and

a. gender,
b. types of education (regular/secondary education),
c. higher education levels (associate/undergraduate/graduate),
d. higher education programs they are enrolled in,
e. grade point averages,
f. classes,
g. average monthly income,
h. social networks where they spend the most time,
i. average internet usage times during the day,
j. preferred means of internet usage and
k. parent education status.

B. Literature Review

Although literacy is basically a concept used for individuals with literacy proficiency (Dinlemez, 2021; Gül, 2007), it can also mean having sufficient knowledge in any subject or field in a broader sense (Karabacak and Sezgin, 2019). There are many types of literacy such as information literacy, academic literacy, visual literacy, cultural literacy, media literacy, mathematical literacy, historical literacy and digital literacy (Ateş and Aşçı, 2021). In this regard, according to Kim (2019), digital literacy is the ability to make use of information and technological elements in digital platforms correctly, While according to the Joint Information Systems Committee (JISC-2014), it is defined as adapting digital technologies to life and incorporating these technologies into learning processes. Aviram and Alkalai defined it as the ability to solve problems encountered through digital technologies (Aviram and Alkalai, 2006). At the same time, digital literacy is seen as the ability to be aware of digital technologies and use them when necessary (Goodfellow,

2011). Bingöl, on the other hand, defined digital literacy as the ability to obtain, produce, share and use the necessary information by using technology-supported tools-equipment-applications in education-teaching processes in an appropriate way (Bingöl, 2022). In the light of the definitions and explanations made, it can be thought that digital literacy is to reach information, to create and share information, and to benefit from the existing technology effectively and efficiently in learning processes by making use of various technologies in accordance with its purpose (Hamutoğlu et al, 2017).

There are many elements to which digital literacy is related. These elements are; media literacy, information literacy, technology literacy, digital learning, learning skills, career and identity management, and communication and cooperation (Bayrakçı & Narmanlıoğlu, 2021; Dinlemez, 2021; Eshet-Alkalai & Chajut, 2010; JISC, 2014; Günay, 2022, Karabacak and Sezgin, 2019; Payton and Hague, 2022). It can be said that the concept of digital literacy has begun to find more place in the literature by separating it more clearly from these elements that it is related to in recent scientific studies. So that; many international studies/projects on digital literacy; The 21st century Learning Framework can be listed as the Digital Competence Framework 2.0, the Global Standards Framework for Digital Literacy, Skills and Preparation, the Digital Education Action Plan and the European Qualifications Framework. The main goals of these studies are to raise digital individuals who can adapt to the world where digitalization is increasing and to ensure the development of digital literacy (European Qualifications Framework, 2018; European Commission, 2017; European Union, 2021; P21 Leadership States, 2017; Pehlivanlı, 2022). When the national studies on digital literacy are examined, it is possible to encounter the Movement to Increase Opportunities and Improve Technology (FATİH) and the Turkish Competencies Framework. The main objectives of these projects and activities are to raise individuals who can adapt to the digitalizing world and develop digital literacy in line with international studies (Dinçer, Şenkal, & Sezgin, 2013; Eryılmaz & Uluyol, 2015; Turkish Competences Framework, 2017). On the other hand, in the study conducted by Zher in 2017, the data obtained from the Program for the International Assessment of Adult Competencies are analyzed and it is understood that Turkey ranks 33rd among 34 countries of the Organization for Economic Development and Cooperation in terms of digital literacy. It has been observed that the countries with the highest digital literacy among the countries of the OECD are Norway, Denmark, Sweden, the Netherlands and Finland, respectively (Zher, 2017).

When the studies related to the research subject are evaluated, It can be stated that this study is important in terms of the data obtained from a sample of students of a state university located in the eastern part of Turkey, students' gender, education type (normal/secondary education), higher education level (associate/undergraduate/graduate), higher education program they are enrolled in, grade point average, class, average monthly income, social network spent the most time, average internet usage during the day examination of variables such as duration, preferred means of internet use, and educational status of parents; developing various suggestions for practitioners with determining the digital literacy levels of students and contributing to future studies.

C. Research Methodology

1. Research Design

In this study, the survey model, which is one of the quantitative patterns that allows data to be obtained from crowded masses, was used. The survey model is a quantitative research model that enables the researcher to collect the data he/she aims to obtain from the target population with a measurement tool whose validity-reliability has been tested (Fraenkel & Wallen, 2006; Karadeniz, Koşan, Geçgin & Beyazgül, 2019).

2. Population and Sample

The study population consists of students studying at a state university in the Eastern Anatolia Region in the spring semester of the 2021-2022 academic year. According to the information obtained from the Registrar's Office of the relevant university, the total number of students is 17,006, 11,500 undergraduate and 5,506 associate degree students studying in 11 faculties, 4 colleges and 9 vocational schools. The sample size was calculated with the formula (n=(t^2 pq)/d^2 =((1.96)² (0.5)(0.5)/(0.5)²)=(at least 384 mass to be reached) with 95% reliability and 5% error (Erkorkmaz & Günay, 2002);. Data were obtained from 702 students and since the data obtained from 14 students were incomplete / inaccurate, the analysis process was carried out with the data obtained from 688 students in the final stage. Simple random sampling method was used in the sampling process. In this method, the sampling is reached randomly and each person in the population forming the universe is given equal probability, so that each individual can have the chance to represent the universe in the sample, which can make simple random sampling more qualified than selective sampling methods in terms of representing the universe (Baltacı, 2018; Kerlinger & Lee, 1999).

The independent variables of the research are gender, type of education (normal/secondary education), higher education level (associate/undergraduate/graduate), the higher education program they are enrolled in, grade point average, class, average monthly income, and social network spent the most time during the day. Table 1 shows the distribution in terms of average duration of internet usage, preferred means of internet use, and educational status of parents.

Table 1. Distribution of the Sample by Independent Variables

VARIABLES		n	%
Gender	Female	438	63.7
	Male	250	36.3
Type of education	Normal education	586	85.2
	Secondary education	102	14.8
Higher education level	Associate degree	280	40.7
	Undergraduate	408	59.3
Higher education program	Vocational high school	280	40.7
	College	151	21.9
	Faculty	257	37.4
Grade average	2,00 Altı	62	9.0

	2.01-2,50	132	19.2
	2,51-3,00	181	26.3
	3,01-3,50	191	27.8
	3,51-400	122	17.7
Class	1.Grade	308	44.8
	2. Grade	258	37.5
	3. Grade	70	10.2
	4. Grade	52	7.6
Average monthly income	1000 TL ve Altı	477	69.3
	1001-2000 TL	110	16.0
	2001-3000 TL	101	14.7
Social network spent the most time during the day	Youtube	108	15.7
	Instagram	289	42.0
	WhatsApp	218	31.7
	Twitter	73	10.6
Average duration of internet use	Less than 1 hour	125	18.2
	1-2 hours	158	23.0
	2-3 hours	107	15.6
	More than 3 hours	298	43.3
Preferred means of internet use	Cellphone	637	92.6
	Computer	51	7.4
Education status of mother	Illiterate	226	32.8
	Primary school	288	41.9
	Secondary school	101	14.7
	High school	54	7.8
	University	19	2.8
Education status of father	No Illiterate	61	8.9
	Primary school	290	42.2
	Secondary school	151	21.9
	High school	137	19.9
	University	49	7.1

3. Data Collection Techniques

In order to examine the digital literacy levels of university students, the "Digital Literacy Scale" developed by Bayrakçı and Narmanlıoğlu in 2021 was used. The Digital Literacy Scale was developed as a result of a scale development study conducted with 1738 undergraduate students throughout Turkey. The scale consists of 6 dimensions and 29 items in total. Dimensions of the scale: 1st Dimension (Ethics and Responsibility-ER): Items 1, 2, 3, 4, 5, 6, 7; 2nd Dimension (General Knowledge and Functional Skills-GKFS): Items 8, 9, 10, 11, 12, 13; 3. 3rd Dimension (Daily Use-DU): Items 14, 15, 16, 17, 18, 19; 4th Dimension (Professional Production-PP): Items 20, 21; 5th Dimension (Privacy and Security-PS): Items 22, 23, 24, 25; 6th Dimension (Social Dimension-SD): Items 26, 27, 28, 29. The scale is a five-point Likert type with "1-Strongly Disagree", "2-Disagree", "3-Partly Agree", "4-Agree" and "5-Strongly Agree". The evaluation ranges of the average scores obtained with the Digital Literacy Scale are "1.62-3.07/Very Low", "3.08-3.62/Low", "3.63-4.17/Medium", "4.18-4.72/High" and "4.73-5.00/Very High" (Bayrakçı and Narmanlıoğlu, 2021). Bayrakçı and Narmanlıoğlu (2021), in their study, obtained data from the Confirmatory Factor

Analysis (CFA) applied to the Digital Literacy Scale as χ2/sd=4.347, RMR=.055, NFI=.891, AGFI=.901, CFI=.914, while RMSEA=.051, IFI=.914; In the analysis for the reliability of the scale, the Cronbach Alpha-CA internal consistency coefficient was found to be .91 (Bayrakçı & Narmanlıoğlu, 2021). These data meet the reference ranges specified in the studies conducted by Çokluk, Şekercioğlu and Büyüköztürk in 2018 and by Tavşancıl in 2010 for the Digital Literacy Scale and reveal that the scale is valid-reliable. In addition, The "Personal Information Form" was used in order to obtain data about the Digital Literacy Scale and the independent variables such as gender, type of education (normal / secondary education), higher education level (associate / undergraduate / graduate), higher education program registered, grade point average, class, average monthly income, social network where a lot of time was spent, the average internet usage time during the day, the preferred tool for internet use, and the educational status of the parents.

In this study, CFA and CA internal consistency coefficients were used to retest the validity and reliability of the Digital Literacy Scale. In Figure 1, the diagram obtained as a result of CFA, and in Table 2, the fit index values obtained as a result of CFA are given.

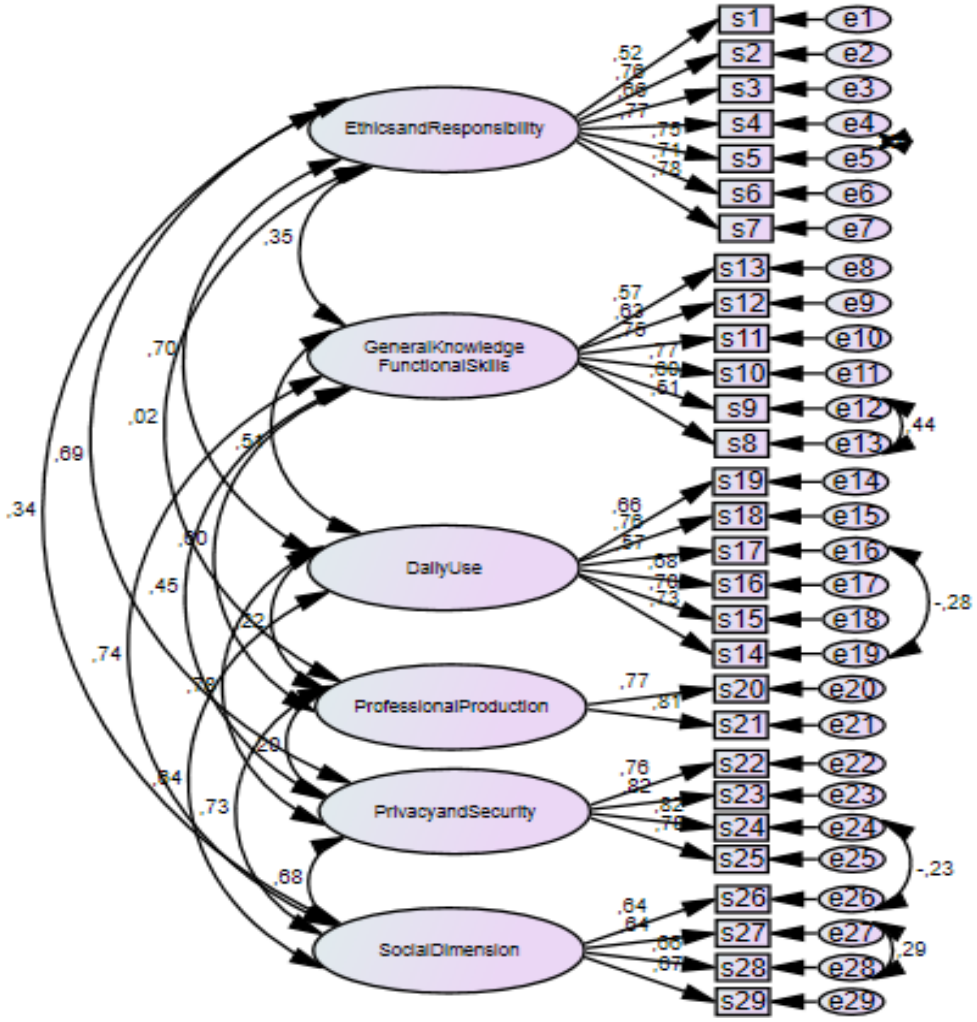

Figure 1. Digital Literacy Scale DFA Diagram

The factor loads of the Digital Literacy Scale items in Figure 1 are .52, .76, .66, .77, .75, .74, .78, .57, .63, .75, .77, .60, . 51, .66, .76, .57, .68, .70, .73, .77, .81, .76, .82, .82, .78, .64, .64, .68, .67 can be sorted. Since the obtained item factor loads were above .50, indicating that the item was significant for the relevant dimension (Yıldırım & Naktiyok, 2017), there was no need to remove any item. However, in order to improve the fit indices, "s4-s5; s8-s9; s14-s17; s24-s26; It was deemed appropriate to make modifications between items s27-s28". The fit index values obtained after the modification and the reference values of the fit indices are given in Table 2.

Table 2. Fit Indices and Reference Values

İndex	*References*		*Result*	*Decision*
	Good Adaption(GA)	*Appropriate Adaption (AA)*		
CMIN/DF	0<X≤ 3	3<X≤ 5	3.389	***AA***
RMSEA	0≤X≤.05	.05 ≤X≤ .08	.059	***GA***
GFI	.95<X≤ 1	.90 <X≤ .94	.90	***AA***
NFI	.95<X≤ 1	.90 <X≤ .94	.90	***AA***
CFI	.95<X≤ 1	.90 <X≤ .94	.92	***AA***
RMR	0≤X≤.05	0.05≤X≤.10	.08	*AA*
TLI	.95<X≤ 1	.90 <X≤ .94	.90	***AA***
Sd			357	

In Table 2, fit indices were χ2/sd=3.389, TLI=.90; RMSEA=.059; RMR=.08; CFI=.92; GFI=.90; It was determined that NFI=.90. The data obtained are in line with the reference ranges expressed by Yüce and Korucuk (2020), Özdamar (2017) and Schermelleh-Engel, Moosbrugger and Müller (2003). In other words, the construct validity of the Digital Literacy Scale was also confirmed within the scope of this study.

In order to test the reliability of the scale, the CA internal consistency coefficient was used and the value of .926 was reached. In addition, two half-test techniques were also used. In this regard, .871 for the first part of the scale and for the second part, .882 values were reached. These values show that the Digital Literacy Scale is highly reliable, according to Can (2018).

4. Data Analysis Techniques

Before starting this study, necessary permissions were obtained from the institution from which data will be obtained. In addition, ethics committee permission was obtained within the scope of the decision of the Scientific Research and Publication Ethics Committee of Kafkas University, Social and Human Sciences, dated 21.04.2022 and numbered 32-27.

Statistical package programs were used in the analysis of the data obtained with the Digital Literacy Scale and the Personal Information Form. In this regard, first of all, homogeneity of variance and normality of distribution were checked in order to decide which analysis techniques to apply to the data. First of all, Levene test was applied for homogeneity of variance and it was seen that the data was at the level of (p<.05). In addition, skewness/kurtosis data and boxplot and histogram graphs were also checked in order to decide on the normality of the distribution. Finally, Kolmogorov-Smirnov and

Shapiro-Wilk tests, which are normality tests, were applied to the data. The data obtained as a result of the normality tests are presented in Table 3.

Table 3. Digital Literacy Scale Normality Test Values

Scale	Kolmogorov-Smirnov			Shapiro-Wilk			Skewness	Kurtosis
	Statistics	Sd	p	Statistics	Sd	p		
ER	,117	688	**,000**	,911	688	**,000**	**-1.216**	**2.435**
GKFS	,070	688	**,000**	,990	688	**,000**	**.102**	**-.088**
DU	,082	688	**,000**	,955	688	**,000**	**-.626**	**.834**
PP	,141	688	**,000**	,951	688	**,000**	**.363**	**-.322**
PP	,148	688	**,000**	,915	688	**,000**	**-.896**	**2.831**
SD	,097	688	**,000**	,981	688	**,000**	**-.082**	**.052**
The whole scale	,042	688	**,007**	,985	688	**,000**	**-.402**	**2.037**

When the data in Table 3 were evaluated, it is understood that the distribution was not normal. For this reason, it was deemed appropriate to use nonparametric techniques in the study. In this regard, the Mann-Whitney U (MW-U) test was used to determine the differences in the digital literacy levels of university students according to gender, type of education, higher education level and the preferred tool in internet use; The Kruskal Wallis (K-W) test was used to determine the differences according to the variables of higher education school type, grade point average, class, average monthly income, the most time spent social network, average internet usage time and parent education status. In the analysis process, the level of significance was considered as .05. However, in order to determine the place of the difference reached as a result of the K-Wtest within the group and to eliminate Type 1 errors, the Bonferroni arrangement was used and the significance level of .05 was divided by the MW-U number to determine the differences within the group. For this reason, since a total of 3 MW-U tests would be applied within the group in the variables of higher education school type and monthly average income, .05, which is the significance level, was divided by 3 and the new significance level was determined as .016. Similarly, since a total of 10 MW-U tests would be applied within the group to the variables of grade point average and parental education status, the new significance level was .05/10=.005; Since a total of 6 MW-U tests would be applied to the variables of class, social network, and average internet usage time, the new significance level was determined as 0.05/6=.008.

D. Findings

In this section, the research questions were analyzed under the titles of "Findings Reached in the Line of the First Research Question" and "Findings Reached in the Line of the Second Research Question" and it was deemed appropriate to present the findings under two main headings.

1. Findings Obtained in Line with the First Research Question

In order to answer the first research question, "*1.What is the level of digital literacy of university students?*", the values corresponding to the data obtained by calculating the mean and standard deviations of the data are presented in Table 4.

Table 4. Values of the Digital Literacy Scale

Scale	n	$\overline{X}$	ss	Value
Digital Literacy Scale	688	3,56	,61	**Low level**

It was observed that the mean and standard deviation values of the Digital Literacy Scale of university students were ($\overline{X}$=3.56, sd=.61). Considering that these values are expressed as "Low Level" by Bayrakçı and Narmanlıoğlu (2021), it can be stated that the digital literacy levels of university students are low.

2. Findings Obtained in Line with the Second Research Question

The second research question, "*2.Is there a significant difference between the digital literacy levels of university students and gender, education types (regular/secondary education), higher education levels (associate/undergraduate/graduate), and type of higher education school they are enrolled in, grade point averages, classes, average monthly income, social networks they spend the most time on, average internet usage times during the day, the tools they prefer to use the internet, and the educational status of their parents?*" In order to analyze it, the MW-U test and K-W test, which are nonparametric techniques, were used. While university students' digital literacy levels, according to gender, type of education, higher education level, and the preferred tool in internet use were analyzed with the MW-U test; the differences between the variables of the type of higher education school they are enrolled in, grade point average, class, average monthly income, the social network they spend the most time on, the average internet usage time during the day and the educational status of the parents were analyzed with the K-W test. The differences in the digital literacy levels of university students according to gender, type of education, higher education level, and the preferred tool for internet use are shown in Table 5 with the MW-U test.

Table 5. Gender, education type, higher education level, and the preferred tool variables in internet use and MW-U Test for Digital Literacy Level

Scale	Variables		n	Mean	Total	U	z	p
Digital literacy scale	**Gender**	Female	438	341.62	149629.00	53488.000	-.503	.615
		Male	250	349.55	87387.00			
	Education type	Normal education	586	347.51	203643.00	28120.000	-.953	.340
		Secondary education	102	327.19	33373.00			
	Higher education level	Associate degree	280	339.43	95039.50	55699.500	-.555	.579
		Undergraduate	408	347.98	141976.50			

The preferred tool variables in internet use	Cellphone	637	330.46	216875.00	13672.000	-1.983	**.045***
	Computer	51	394.92	20141.00			

*Denotes significance at the 0.05 level.

No statistically significant difference was found between university students' gender, education types (normal/secondary education) and higher education levels (associate/undergraduate/graduate) and digital literacy levels [(UDigital Literacy-Gender=53488,000, z=-.503, p= .615); (UDigital Literacy-TeachingType=28120.000, z=-.953, p=.340); (UDDigital Literacy-Higher Education Level=55699.500, z=.555, p=.579)]. However, it can be said that there is a statistically significant difference in the digital literacy levels of the students who prefer the computer (Average Rank=394.92) and the students who prefer the phone (Average Rank=330.46) in favor of the candidates who prefer the computer [(UDDigital Literacy-Preferred Tool for Internet Use =13672,000) , z=-1.983, p=.045)].

Differences in digital literacy levels of university students according to the variables of the type of higher education school they are enrolled in, grade average, class, average monthly income, the social network they spend the most time on, the average internet usage time during the day, and the educational status of their parents (K-W test and the MW-U test to identify the differences between the variables with two levels) are given in Table 6.

Table 6. The K-W Test for the Variables of School Type, Grade Point Average, Grade, Average Monthly Income, Social Network They Spend the Most Time, Average Internet Use During the Day, Educational Status of Parents, and Digital Literacy Level

Variables		n	Mean	Sd.	X^2	p	Difference
School Type	VHS (1)	280	339.43	2	.503	.777	---
	Colleage (2)	151	353.66				
	Faculty (3)	257	344.65				
Grade Point Average	2.00 Altı (1)	62	296.78	4	13.497	.009*	5>1. 5>2. 5>3. 5>4***
	2.01-2.50 (2)	132	352.16				
	2.51-3.00 (3)	181	334.94				
	3.01-3.50 (4)	191	330.53				
	3.51-4.00 (5)	122	396.52				
Grade	1st Grade (1)	308	333.81	3	3.309	.346	---
	2nd Grade (2)	258	345.02				
	3rd Grade (3)	70	361.26				
	4th Grade (1)	52	382.66				
Average Monthly Income	1000 TRY and less (1)	477	336.11	2	4.085	.130	---
	1001-2000 TRY (2)	110	338.45				
	2001-3000 TRY (3)	101	379.82				
Social Network They Spend the Most Time	Youtube (1)	108	332.75	3	3.176	.047*	4>1. 4>2. 4>3.**
	Instagram (2)	289	339.81				
	Whatsapp (3)	218	343.89				
	Twitter (4)	73	412.26				

Average Internet Usage Time	1 Less than 1 hour (1)	125	319.57	3	6.906	.075	---
	Between 1-2 hour (2)	158	328.54				
	Between 2-3 hours (3)	107	335.53				
	More than 3 hours (4)	298	366.64				
Mother Education Status	No Illiterate (1)	226	297.80	4	24.216	.000*	2>1. 3>1. 4>1. 5>1***
	Primary (2)	288	350.48				
	Secondary (3)	101	395.28				
	High School (4)	54	400.06				
	University (5)	19	381.45				
Father Education Status	No Illiterate (1)	61	248.90	4	24.465	.000*	2>1. 3>1. 4>1. 5>1***
	Primary (2)	290	333.78				
	Secondary (3)	151	351.46				
	High School (4)	137	378.89				
	University (5)	49	409.32				

** p≤0.05; ** p≤0.05/6=0.008; *** p≤0.05/10=0.005.*

When the K-W test results in Table 6 were evaluated, it was seen that there was a statistically significant difference between the students' grade point averages and their digital literacy levels (X2(4) Average Grade=13.497, p<.05). According to the results of MW-U test performed between in-group couples in order to determine the difference; students whose mean is 3.51-4.00 (Rank Average 3.51-4.00=396.52) and 2.00 and below, 2.01-2.50, 2.51-3.00 and 3.01-3.50 (Rank Mean2 and below=296.78; Rank Average 2.01-2.50=352.16; Rank A significant difference was found among the students whose mean was 2.51-3.00=334.94; Rank Average 3.01-3.50=330.53) in favor of students whose mean was 3.51-4.00.

It was observed that there were statistically significant differences between the social networks where students spend the most time and their digital literacy levels (X2(3) MostTime Spent Social Network=3.176, p<.05). According to the results of the MW-U test, which was carried out in order to determine between which in-group couples the difference was significant among the students whose social network they spend the most time was Twitter (Rank Average Twitter=412.26) and Youtube, Instagram and Whatsapp (Rank Average Youtube=332.75; Rank Average Instagram=339.81; Rank Average Whatsapp=343.89) in favor of students whose social network they spend the most time was Twitter.

It was determined that there were statistically significant differences between the educational status of the students' parents and their digital literacy levels [(X2(4) Mother Education Status=24.216, p<.05); (X2(4) Father Education Status=24.465, p<.05)].

As a result of the analyses made to determine which variables with more two levels these differences exist, it was concluded that there were statistically significant differences among the students whose parents' education levels are higher education, high school, secondary school, and primary school [(Rank Average Mother-Higher Education=381.45; Average Rank Father-Higher Education=409.32); (Mean Rank Mother-High School=400.06; Average Rank Father-High School=378.89); (Mean Rank Mother-Middle School=395.28; Average Rank Father-Middle School=351.46); (Rank Mean Mother-Primary

School=350.48; Rank Average Father-Primary School=333.78)], and illiterate (Rank Average Mother-Illegal=297.80; Rank AverageFather-Iniliterate=248.90), on behalf of those whose parents are not illiterate.

In addition, there was no significant difference between students' school types, classes, average monthly income and average internet usage time, and digital literacy levels [(X2(2)School Type=.503, p>.05); (X2(3)Class=3.309, p>.05); (X2(2)Average Monthly Revenue=4.085, p>.05); (X2(3)Average Internet Used Time=6,906, p>.05)].

E. Discussion

In the study in which determining the digital literacy levels of university students and investigating the digital literacy levels of university students by various variables such as gender, type of education, higher education level, higher education program they are enrolled in, grade point average, class, average monthly income, the social network spent the most time, average internet usage time during the day, the survey model was used. The population of the study consisted of 17,006 students studying at a state university in the Eastern Anatolia Region in the spring semester of the 2021-2022 academic years, while the sample consisted of 688 students. The data obtained with the "Digital Literacy Scale" and "Personal Information Form" developed by Bayrakçı and Narmanlıoğlu in 2021 were analyzed with nonparametric techniques and the results were answered in line with the research questions.

As a result of the analyses made to answer the first research question, "*1.What is the digital literacy level of university students?*", it was found that the mean and standard deviation values of the Digital Literacy Scale of the university students ($\overline{x}$ =3.56, sd=.61) and It can be concluded that university students had a low level of digital literacy as these values determined by Bayrakçı and Narmanlıoğlu (2021).) were specified as "Low Level" in the evaluation ranges.

It was concluded after the result of the difference tests done that there were statistically significant differences between university students' grade point averages, the social network they spend the most time on, their parents' educational status, and their digital literacy levels; in order to answer the second reseach question,"*2. Is there a significant difference between University students' digital literacy levels and gender, education types (normal/secondary education), higher education levels (associate/undergraduate/graduate), the type of higher education school they are enrolled in (vocational school-Vocational school-/school/faculty), grade averages, classes?*"

As a result of the analyses made to determine which variables with more than two levels these differences exist, it was concluded that there were statistically significant differences among the students with an average of 3.51-4.00 and those with a grade point average of 2.00 and below, 2.01-2.50, 2.51-3.00 and 3.01-3.50, on behalf of the highest grade point average; among the students who use Twitter most of the time as the social network, and the students who use other platforms, Youtube, Instagram, WhatsApp, on behalf of students who use Twitter; and among the students whose parents' education levels are higher education, high school, secondary school, and primary school, and

illiterate, on behalf of those whose parents are not illiterate. There was a statistically significant difference in favor of the candidates who prefer the computer in the digital literacy levels of the students who prefer the computer and the students who prefer the phone in internet use. In addition, there was no significant difference between university students' gender, education types (regular/secondary education), higher education levels (associate/undergraduate/graduate), school types, classes, average monthly income and average internet usage time, and digital literacy levels.

In the related literature, it is possible to find studies that overlap with the results obtained in this study and have different results from those reached in this study. In the study conducted by Arık and Kıyıcı in 2019 with 394 high school students in Sakarya and using the survey model from quantitative patterns, the differentiation status of high school students' digital literacy levels was examined according to various variables. As a result of the study, significant differences were found according to the variables of gender, computer ownership and duration of being active on the Internet. In the study conducted by Arslan with 345 teachers working in Istanbul in 2019 and using the survey model from quantitative patterns, the differentiation status of teachers' digital literacy levels according to various variables was examined. As a result of the study, it was determined that the digital literacy levels of the teachers were high and their digital literacy levels differed according to the age and gender variable. In the study conducted by Boyacı with 500 students in Düzce in 2019 and using the quantitative pattern survey model, the relationship between university students' lifelong learning tendencies and their digital literacy levels was examined. As a result of the study, it was seen that there was a positive and significant relationship between the lifelong learning tendencies of university students and their digital literacy levels. In a study conducted by Tomczyk with 279 teachers in Poland in 2019 and using a quantitative scanning model, the digital literacy levels of the teachers were examined, and as a result of the study, it was seen that there was a difference between the service time variable of the teachers and the digital literacy levels against the teachers with low service time. In the study conducted by Yaman with 192 students in Niğde in 2019 and using the scanning model from quantitative patterns, the differentiation status of the digital literacy levels of university students according to various variables was examined. As a result of the study, it was determined that the digital literacy levels of university students differ in terms of variables such as class, computer ownership, use of social networks, time spent on the Internet during the day, and being constantly connected to the Internet. In the research conducted by Cote and Milliner (2018) with 42 teachers in Japan and using the quantitative pattern scanning model, the digital literacy levels of the teachers were examined. As a result of the study, it was determined that the digital literacy levels of the teachers were high. In the study conducted by Velez, Olivencia, and Zuazua with 72 participants in Spain in 2017 and using the survey model as quantitative patterns, the digital literacy levels of the participants were examined. As a result of the study, it was determined that the digital literacy levels of the participants were high in theory but low in practice. In the study conducted by Taylor and Dalal in 2017 with 386 university students in the United States of America and using

the survey model as quantitative patterns, the differentiation status of students' digital literacy levels was examined in terms of gender variable, and as a result, significant differences were found in favor of female students.

When the other studies in the literature were evaluated, it was generally seen that subjects such as digital literacy, information literacy, internet literacy, technology literacy, scale development, relationship and finding the difference between various variables, gender, age, teacher education status, duration of internet stay, computer ownership status, class, etc. preferred social network variables were emphasized, quantitative method survey model was used, and university students were chosen as the sample. It was seen that scales and statistical techniques, correlation analysis and difference tests were preferred more as data collection tools. On the other hand, it can be said that studies on digital literacy have intensified in recent years. When the results obtained in studies focused on digital literacy in the literature and the results obtained in this study are compared the independent variables considered in this study are gender, type of education (normal/secondary education), higher education level (associate degree/undergraduate/graduate), type of higher education registered (vocational school-Vocational school-/school/faculty), grade point average, class , monthly average income, the most spent social network, the average internet usage time during the day, the preferred means of internet use and the education level of the parents overlap with other studies; however, it has been understood that determining the level of digital literacy as "Low Level" differs from other studies.

F. Conclusion

In this study, it can be concluded that the digital literacy levels of university students are low. Based on the results, it can be said that the digital literacy levels of university students differ according to the type of tool they prefer in internet use, and the digital literacy levels of the students who prefer the computer in internet use were significantly higher than the students who prefer the phone. In addition, the students with the highest grade point average of 3.51-4.00 had higher digital literacy levels than other average holders. The digital literacy levels of users whose most used social network is Twitter were higher than students who use other social networks. One of the results of the study was that the digital literacy level of the students whose parents were illiterate was lower than that of the parents with other education levels.

The results obtained in this study were evaluated and various suggestions were developed considering that it could contribute to researchers and practitioners.

- It has been observed that the digital literacy levels of university students are low. For this reason, it can be suggested that education-teaching activities (target-content-educational situations-to give more importance to the development of digital literacy level in the assessment and evaluation processes) in order to reach the digital literacy level of the students to the desired level.
- Due to the fact that the digital literacy levels of university students who prefer the computer for internet use are significantly higher than the students who prefer the phone;

It can be suggested that students who do not have a computer can benefit from the facilities of the university and facilitate access to computers.

• Due to the fact that the digital literacy levels of university students with an average of 3.51-4.00 are significantly higher than students with an average of 3.51-4.00. In order to increase the digital literacy levels of students, it can be recommended to carry out activities that can contribute to students at all grade levels.

• Due to the fact that the digital literacy levels of university students whose social network they spend most of their time is Twitter are significantly higher than those who spend time on other social networks. In order to improve students' digital literacy levels, providing trainings on the use of social networks, social networks, pictures-videos, etc., information can be given about the safe use of applications such as Twitter, Instagram, Youtube and Whatsapp, that social networks are not limited to sharing, that social networks have a multi-dimensional structure.

• Due to the fact that the digital literacy levels of university students whose parents are illiterate are significantly lower than students with parents at other education levels; It can be suggested that activities/applications and programs that can support digital literacy in regions where education levels are low should also be carried out in the education-teaching processes before higher education.

• In this study, digital literacy level as dependent variable and gender as independent variables, type of education (normal/secondary education), higher education level (associate/undergraduate/graduate), registered higher education school type (vocational college-Vocational school-/college/school/faculty) , grade point average, class, average monthly income, social network with the most time spent, average internet usage time during the day, the preferred tool for internet use, and the differences between parents' education status were examined. Digital literacy can be examined with other variables that are not covered in this study in terms of their differentiation states.

• This study was conducted with university students. It can also be carried out with different universes and samples.

• In this study, survey model from quantitative patterns was used. Similar studies can also be conducted using qualitative or mixed designs in order to reveal more detailed results.

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