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Author Contribution Statement

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Conceptualization, literature review, methodology, implementation, data analysis, translation, and writing.

Abstract

It is evident to everyone that the being referred to as human needs to meet many requirements in order to sustain their life. With the rapid growth of technology, even fulfilling these needs is almost dependent on the use of technology, which would not be wrong to say. The reflections of high literacy levels observed in developed societies are significant research subjects in the online environment and their effects on learning. The importance of this development and change in educational institutions, especially, cannot be underestimated. Within this scope, this study aims to examine the impact of sports science students' digital literacy levels on e-learning. The universe of the study consists of students from faculties and colleges providing sports education in Turkey, and the sample includes 922 individuals selected through a simple random sampling method. The sample group was administered the "Digital Literacy Scale" developed by Ng (2012) and adapted to Turkish by Hamutoğlu et al. (2017), as well as the "Attitude Scale towards E-learning" developed by Haznedar (2012). As a result, it is predicted that digital literacy (and its sub-dimensions) has a 32.4% effect on being inclined towards e-learning.

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Research Article**Perceptions of the Effect of Digital Literacy Levels of who Take Sports Education Students on E-Learning ***Fatih Harun TURHAN¹ **Abstract**

It is evident to everyone that the being referred to as human needs to meet many requirements in order to sustain their life. With the rapid growth of technology, even fulfilling these needs is almost dependent on the use of technology, which would not be wrong to say. The reflections of high literacy levels observed in developed societies are significant research subjects in the online environment and their effects on learning. The importance of this development and change in educational institutions, especially, cannot be underestimated. Within this scope, this study aims to examine the impact of sports science students' digital literacy levels on e-learning. The universe of the study consists of students from faculties and colleges providing sports education in Turkey, and the sample includes 922 individuals selected through a simple random sampling method. The sample group was administered the "Digital Literacy Scale" developed by Ng (2012) and adapted to Turkish by Hamutoğlu et al. (2017), as well as the "Attitude Scale towards E-learning" developed by Haznedar (2012). As a result, it is predicted that digital literacy (and its sub-dimensions) has a 32.4% effect on being inclined towards e-learning.

Keywords: Digital literacy, e-learning, sport studens, physical education**1. INTRODUCTION**

Today, we live and learn in a culture where the flow of information is constant, and technologies keep individuals connected 24/7. Networks create tremendous and vibrant opportunities for teaching and learning, requiring contemporary students to be literate in written, visual, and digital forms of expression (Fotunu, 2015). The internet is a tool that enables individuals in society to effectively socialize, communicate through flexible and multiple networks. Unlike traditional media, it offers users a wide range of content and services to choose from, giving rise to a new digital world. The process of adapting to technological advancements varies depending on individuals' generation and digital literacy levels (Öztürk, 2023).

Technological advancements spreading rapidly have led to significant changes in the field of education (Jones, 2010). Especially in recent years, e-learning (electronic learning) methods are considered an alternative approach to traditional learning methods (Alshammari, 2019). E-learning refers to a learning process that takes place using information and communication technologies, allowing learning to occur independent of time and place (Rosell-Aguilar, 2020). The concept of e-learning is believed to have been first used by Desmond Keegan. In his book "The Foundations of Distance Education," published in 1986, Keegan used the term "e-learning" to define distance learning conducted in electronic environments, emphasizing the inclusion of computer-based and digital technologies in distance learning processes. Sports science education, unlike other fields, requires

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students to combine theoretical knowledge with practical experience. In this context, the digital literacy levels of sports science students can play a significant role in the e-learning process.

Previous studies have highlighted many advantages associated with the implementation of e-learning technologies in university education (Raspopovic, Cvetanovic, Medan, & Ljubojevic, 2017). It is seen as effective in catering to students' individual needs or providing digital-age information resources according to instructors' requirements (Huang & Chiu, 2015). E-learning enables reaching goals with the least effort in the shortest possible time. While managing the e-learning environment, the impact of providing equal access to information regardless of users' locations, ethnic backgrounds, races, and ages is observed (Joshua, Obille, John, & Shuaibu, 2016). E-learning allows for more flexible learning methods that significantly reduce the need for travel. Through interactive video features in the classroom, it facilitates a deeper understanding of the subject matter for students (Gautam & Tiwari, 2016).

Despite the significant advantages of e-learning, students may encounter various challenges that can lead to negative outcomes. For example, Arkorful and Abaidoo (2015) pointed out in their study that e-learning can sometimes result in reduced interaction due to distance and lack of face-to-face communication. When compared to traditional teaching methods, e-learning might be less effective due to the absence of in-person interaction. Assessments in e-learning are generally conducted online, which may decrease the possibility of preventing illegal activities such as cheating and plagiarism. The most notable disadvantage of e-learning is the lack of fundamental personal interaction with teachers, as well as among students (Islam, Beer, & Slack, 2015). Lack of motivation, deviation from goals, difficulty in maintaining focus, and individuality are among other disadvantages of e-learning (Raspopovic et al., 2021).

The concept of digital literacy was first introduced by Paul Gilster. In his book titled "Digital Literacy," published in 1997, Gilster defined and explained the term digital literacy. The book explored the effects of digital technologies in the information age and emphasized the need for literacy skills that would enable individuals to function effectively in these new technological environments. Digital literacy refers to individuals' abilities to understand, use, and evaluate digital technologies (Prensky, 2001). An individual's level of digital literacy encompasses elements such as accessing internet resources, understanding digital content, conducting data analysis, and using critical thinking skills (Fraillon, Ainley, Schulz, Friedman & Duckworth, 2020). For sports science students, developing digital literacy skills can provide more effective access to information, content creation, and sharing opportunities in the e-learning process. Today, the term "digital literacy" can be defined as the necessary technical knowledge and skills for leading a productive life, engaging in continuous learning activities for personal development, and making positive contributions to society. According to this definition, the types of literacy included in digital literacy are information literacy, visual literacy, software literacy, technology literacy, and computer literacy (Raice & Bailon, 2023).

In today's world, the necessity of technology in the educational process is evident in all fields, making the relationship between digital literacy and e-learning inevitable. In this context, the aim of this study is to investigate the impact of sports science students' digital literacy levels on the e-learning process. This study aims to assess sports science students' abilities to use e-learning materials, access information, create and share content. Additionally, it will examine the influence of digital literacy levels on learning achievement, motivation, and satisfaction in the e-learning process.

2. METHOD

2.1. Research Design

In this study, a quantitative research method has been used. The quantitative research method aims to understand and explain reality based on objective scientific data. This method is grounded in a positivist scientific approach and a realist philosophy. According to the positivist perspective, there is

a specific order in the universe, and this order can be discovered, understood, and controlled by humans. The quantitative research method aims to obtain results based on concrete observations and measurable data (Sönmez & Alacapınar, 2011).

2.2. Participants

The population of this research consists of undergraduate students enrolled in sports education programs at universities in Turkey during the 2022-2023 academic year. The sample of the study consists of 922 participants selected through a simple random sampling method.

2.3. Data Collection

As the data collection method, a survey form consisting of three sections was used. The first section of the survey includes 4 questions to gather demographic data such as gender, class, department, and daily internet usage duration. The second section of the survey includes the “Digital Literacy Scale” developed by Ng (2012) and adapted to Turkish by Hamutoğlu, Güngören, Uyanık, and Erdoğan (2017). This scale consists of a total of 4 sub-dimensions and 17 items, including attitude, technical, cognitive, and social dimensions. In the third section, the “Attitude Scale towards E-learning,” developed by Haznedar (2012), was used. Data was collected through an online form using the internet. The researcher prepared an online survey form in advance and shared it with academicians from different departments (determined through simple random sampling), asking for voluntary participation from students in an online environment.

2.4. Data Analysis

In this research, normality tests were conducted to check the assumption of normality for the data obtained in the sub-dimensions of the scale. In these tests, the skewness and kurtosis values of the data were examined, and as shown in Table 1, it was determined that the skewness and kurtosis values of the scale were between +1.5 and -1.5. This indicates that the data is normally distributed. As expressed by Tabachnick and Fidell (2007), when the skewness and kurtosis values are between +1.5 and -1.5, it can be interpreted that the distribution is normal.

The scores obtained from the “Digital Literacy” scale and the “Attitude Scale towards E-learning” scale applied to the participants were analyzed using “Multivariate Analysis of Variance (MANOVA)”. Additionally, the assumptions of normality were checked for the application of MANOVA, and the values obtained from the Box Test for Equality of Covariance Matrices based on the dataset were examined. In this analysis, it was determined that the p-values were greater than 0.05, indicating that the variances were equal. As a result, differences arising from the MANOVA analysis were interpreted based on post hoc tests such as LSD and Tukey. The internal consistency of the sub-dimensions of the scales was calculated, and Cronbach's Alpha coefficients ranged from 0.68 to 0.94.

3. FINDINGS

Table 1. Descriptive information on participants

Vaiable	Group	N	%
Gender	Male	640	69,4
	Female	282	30,6
Grade	1. Grade	256	27,8
	2. Grade	128	13,9
	3. Grade	202	21,9
	4. Grade	336	36,4
Department	Teaching Education	254	27,5
	Coaching Training	234	25,4
	Sport Management	402	43,6
	Recreation Education	32	3,5
Internet Using	1 Hour A Day	34	3,7
	1-3 Hours A Day	272	29,5
	3-5 Hours A Day	366	39,7
	5 Hours and Above	250	27,1

When examining the gender distribution, it is observed that 69.4% of the participants are male and 30.6% are female. Regarding the class level distribution, it is seen that 27.8% of the participants are in the 1st grade, 13.9% in the 2nd grade, 21.9% in the 3rd grade, and 36.4% in the 4th grade. This indicates that the participants come from various class levels, representing different student groups in the study. When looking at the distribution by department, it is observed that 27.5% of the participants are from the education department, 25.4% from the sports coaching department, 43.6% from the management department, and 3.5% from the recreation department. Examining the distribution based on internet usage habits, it is found that 3.7% of the participants use the internet for 1 hour daily, 29.5% use it for 1-3 hours daily, 39.7% use it for 3-5 hours daily, and 27.1% use it for more than 5 hours daily. This indicates that the participants use the internet at different levels and durations.

Table 2. Descriptive information on the scales

Scale	Factor	N	Mean	Ss	Skewness	Kurtosis	C'Alpha
Digital Literacy	Attitude	922	3,74	,90	-,718	,213	,91
	Technical	922	3,73	,86	-,551	,303	,90
	Cognitive	922	3,88	,98	-,434	-,176	,75
E-Leaning	Social	922	3,41	,97	-,248	-,290	,68
	Predisposition	922	3,08	,99	-,148	-,377	,94
	Escape	922	3,43	,90	,023	-,280	,87

When examining the factors of the Digital Literacy Scale, it is observed that under the “Attitude” factor, the participants' average score is 3.74. The standard deviation for the scale scores in this factor is 0.90, the kurtosis value is -0.718, and the skewness value is 0.213. Additionally, the Cronbach's Alpha reliability coefficient for this factor is calculated as 0.91. Similarly, under the other factors of the Digital Literacy Scale, namely “Technical”, “Cognitive”, and “Social”, the average scores are 3.73, 3.88, and 3.41, respectively. The standard deviations, kurtosis, skewness, and Cronbach's Alpha reliability coefficients for these factors are between -0.248 and 0.303, and the internal consistency coefficients are 0.90, 0.75, and 0.68, respectively. When examining the E-Learning Scale, under the “Propensity” factor, the participants' average score is 3.08. The standard deviation for the scale scores in this factor is 0.99, the kurtosis value is -0.148, and the skewness value is -0.377. The Cronbach's Alpha reliability coefficient for this factor is calculated as 0.94. Under the other factor of the E-Learning Scale, namely “Avoidance,” the participants' average score is 3.43. The standard deviation, kurtosis, skewness, and Cronbach's Alpha reliability coefficient for this factor are given without specific values mentioned.

Table 3. MANOVA results of the scores of the participants according to the gender variable

Scale	Factor	Gender	N	Mean	Ss	F	P
Digital Literacy	Attitude	Male	640	3,76	,90	,337	,56
		Female	282	3,72	,92		
	Technical	Male	640	3,74	,83	1,281	,25
		Female	282	3,67	,93		
	Cognitive	Male	640	3,67	,96	3,329	,06
		Female	282	3,54	1,02		
Social	Male	640	3,48	,98	4,667	,03*	
	Female	282	3,33	,94			
E-Leaning	Predisposition	Male	640	3,21	,97	10,019	,00*
		Female	282	2,99	1,02		
	Escape	Male	640	3,01	,89	,055	,81
		Female	282	3,03	,91		

This table presents the results of the MANOVA (Multivariate Analysis of Variance) for the scores obtained from the scales according to the gender variable of the participants. When examining the “Attitude” factor of the Digital Literacy Scale, it is observed that male participants have an average score of 3.7612 and female participants have an average score of 3.7234. The MANOVA analysis revealed that the effect of gender on this factor is not statistically significant ($F = 0.337, p = 0.562$). In the "Technical" factor of the Digital Literacy Scale, male participants have an average score of 3.7427, and female participants have an average score of 3.6726. The MANOVA analysis indicated that the effect of gender on this factor is not statistically significant ($F = 1.281, p = 0.258$). For the "Cognitive" factor of the Digital Literacy Scale, male participants have an average score of 3.6781, and female participants have an average score of 3.5496. The MANOVA analysis revealed that the effect of gender on this factor is not statistically significant ($F = 3.329, p = 0.068$). However, for the "Social" factor of the Digital Literacy Scale, male participants have an average score of 3.4875, and female participants have an average score of 3.3369. The MANOVA analysis indicated that the effect of gender on this factor is statistically significant ($F = 4.667, p = 0.031^*$). Moving on to the E-Learning Scale, in the "Propensity" factor, male participants have an average score of 3.2194, and female participants have an average score of 2.9950. The MANOVA analysis revealed that the effect of gender on this factor is statistically significant ($F = 10.019, p = 0.002^*$). However, in the "Avoidance" factor of the E-Learning Scale, male participants have an average score of 3.0197, and female participants have an average score of 3.0348. The MANOVA analysis indicated that the effect of gender on this factor is not statistically significant ($F = 0.055, p = 0.815$).

Table 4. MANOVA results of the scores of the participants from the scales related to the class variable

Scale	Factor	Group	N	Mean	Ss	F	p
Digital Literacy	Attitude	1. Grade	256	3,68	,93	2,224	,08
		2. Grade	128	3,61	,91		
		3. Grade	202	3,80	,91		
		4. Grade	336	3,81	,87		
	Technical	1. Grade	256	3,72	,87	1,464	,22
		2. Grade	128	3,59	,84		
		3. Grade	202	3,80	,83		
		4. Grade	336	3,71	,88		
	Cognitive	1. Grade	256	3,55	,94	1,608	,18
		2. Grade	128	3,55	1,00		
		3. Grade	202	3,70	,97		
		4. Grade	336	3,69	1,00		
	Social	1. Grade ^a	256	3,36	1,00	2,878	,03*
		2. Grade ^b	128	3,29	,99		
		3. Grade ^c	202	3,57	,91		
		4. Grade ^d	336	3,47	,97		
E-Leaning	Predisposition	1. Grade	256	3,08	1,00	1,204	,30
		2. Grade	128	3,06	1,03		
		3. Grade	202	3,21	,96		
		4. Grade	336	3,19	,99		
	Escape	1. Grade	256	2,99	,95	,547	,65
		2. Grade	128	3,10	,83		
		3. Grade	202	2,98	,94		
		4. Grade	336	3,03	,85		

This table shows the analysis results of the scores obtained from the scales among different groups (different class levels). When examining the “Attitude” factor of the Digital Literacy Scale, it was investigated whether there is a significant difference between the averages of different class levels (1st class, 2nd class, 3rd class, 4th class). According to the results, there is no statistically significant difference among class levels in this factor ($F = 2.224, p = 0.084$). Similarly, for the "Technical" factor of the Digital Literacy Scale, it was examined whether there is a significant difference among different

class levels. The results show that there is no statistically significant difference among class levels in this factor ($F = 1.464$, $p = 0.223$). When analyzing the "Cognitive" factor of the Digital Literacy Scale, it was also investigated whether there is a significant difference among class levels. The results indicate that there is no statistically significant difference among class levels in this factor ($F = 1.608$, $p = 0.186$). However, for the "Social" factor of the Digital Literacy Scale, a significant difference among different class levels was found ($F = 2.878$, $p = 0.035^*$). When examining the "Propensity" and "Avoidance" factors of the E-Learning Scale, it is observed that there is no significant difference among different class levels in these factors. The respective p-values ($p > 0.05$) indicate that there is no statistically significant difference.

Table 5. MANOVA results of the scores of the participants from the scales related to the department variable

Scale	Factor	Group	N	Mean	Ss	F	p
Digital Literacy	Attitude	Teaching Education	254	3,77	,95	2,401	,06
		Coaching Training	234	3,62	1,03		
		Sport Management	402	3,79	,79		
		Recreation Education	32	3,93	,83		
	Technical	Teaching Education	254	3,72	,84	7,174	,00*
		Coaching Training	234	3,51	,98		
		Sport Management	402	3,82	,79		
		Recreation Education	32	3,88	,76		
	Cognitive	Teaching Education	254	3,57	,99	3,747	,01*
		Coaching Training	234	3,50	1,11		
		Sport Management	402	3,74	,89		
		Recreation Education	32	3,84	,91		
Social	Teaching Education	254	3,39	1,00	3,859	,00*	
	Coaching Training	234	3,29	1,01			
	Sport Management	402	3,53	,92			
	Recreation Education	32	3,68	1,04			
E-Learning	Predisposition	Teaching Education	254	3,13	1,04	2,640	,05
		Coaching Training	234	3,09	1,08		
		Sport Management	402	3,15	,92		
		Recreation Education	32	3,61	,83		
	Escape	Teaching Education	254	2,95	,98	1,262	,286
		Coaching Training	234	3,09	,91		
		Sport Management	402	3,03	,81		
		Recreation Education	32	2,87	1,03		

This table presents the analysis results of the scores obtained from the scales among different groups (e.g., teaching, coaching, management, recreation). When examining the "Attitude" factor of the Digital Literacy Scale, it was investigated whether there is a significant difference in score averages among different groups. The results show that there is no statistically significant difference among groups in this factor ($F = 2.401$, $p = 0.066$). Similarly, for the "Technical" factor of the Digital Literacy Scale, it was examined whether there is a significant difference in score averages among different groups. The results indicate that there is a statistically significant difference among groups in this factor ($F = 7.174$, $p = 0.000^*$). This difference occurred between groups a-b, b-c, and b-d. When analyzing the "Cognitive" factor of the Digital Literacy Scale, it was also investigated whether there is a significant difference among different groups. The results show that there is a statistically significant difference among groups in this factor ($F=3.747$, $p = 0.011^*$). This difference occurred between groups a-c and b-c. Similarly, for the "Social" factor of the Digital Literacy Scale, a significant difference among different groups was found ($F=3.859$, $p = 0.009^*$). This difference occurred between groups b-c and b-d. When examining the "Propensity" and "Avoidance" factors of the E-Learning

Scale, it was investigated whether there is a significant difference among different groups. The respective p-values ($p > 0.05$) indicate that there is no statistically significant difference among the groups.

Table 6. MANOVA results of the scores of the participants from the scales regarding the internet usage duration

Scale	Factor	Group	N	Mean	Ss	F	p
Digital Literacy	Attitude	1 Hour A Day ^a	34	2,63	1,29	32,829	,00*
		1-3 Hours A Day ^b	272	3,59	,84		a-b
		3-5 Hours A Day ^c	366	3,75	,86		a-c
		5 Hours and Above ^d	250	4,06	,81		a-d b-c b-d c-d
	Tecnicial	1 Hour A Day ^a	34	2,73	1,17	20,657	00*
		1-3 Hours A Day ^b	272	3,64	,80		a-b
		3-5 Hours A Day ^c	366	3,74	,85		a-c
		5 Hours and Above ^d	250	3,90	,79		a-d b-d c-d
	Cognitive	1 Hour A Day ^a	34	2,97	1,27	10,976	,00*
		1-3 Hours A Day ^b	272	3,51	,91		a-b
		3-5 Hours A Day ^c	366	3,65	,96		a-c
		5 Hours and Above ^d	250	3,85	,98		a-d b-d c-d
Social	1 Hour A Day ^a	34	3,00	1,37	3,544	,01*	
	1-3 Hours A Day ^b	272	3,40	,87		a-b	
	3-5 Hours A Day ^c	366	3,43	,96		a-c	
	5 Hours and Above ^d	250	3,55	1,01		a-d b-d	
E-Learning	Predisposition	1 Hour A Day	34	3,07	1,21	2,095	,09
		1-3 Hours A Day	272	3,15	,94		
		3-5 Hours A Day	366	3,07	1,04		
		5 Hours And Above	250	3,27	,94		
	Escape	1 Hour A Day	34	2,75	1,11	1,582	,19
		1-3 Hours A Day	272	3,03	,84		
		3-5 Hours A Day	366	2,99	,90		
		5 Hours And Above	250	3,08	,92		

This table presents the analysis results of the scores obtained from the scales (“Attitude”, “Technical”, “Cognitive”, “Social”, “E-Learning Propensity”, and “Avoidance”) among different groups (“1 Hour Daily”, “1-3 Hours Daily”, “3-5 Hours Daily”, “Over 5 Hours Daily”). In the “Attitude” factor of the Digital Literacy Scale, a significant difference among groups was found ($F = 32.829$, $p=0.000$). For the “Technical” factor, a significant difference among groups was also observed ($F=20.657$, $p = 0.000$). Participants who allocate 1 hour daily have lower technical scores compared to other groups. Similarly, for the “Cognitive” factor, a significant difference among groups was determined ($F=10.976$, $p=0.000$). Participants who allocate 1 hour daily have lower cognitive scores compared to other groups. Regarding the “Social” factor, a significant difference among groups was observed ($F = 3.544$, $p=0.014$). Participants who allocate 1 hour daily have higher social scores compared to other groups. However, there was no significant difference among groups for the “E-Learning Propensity” and “Avoidance” factors ($p > 0.05$).

Table 7. Regression analysis results showing the effect of participants' digital literacy on susceptibility to e-learning

		B	Ss	β	t	p
Digital Literacy	Constant	,978	,126	-	7,757	,00
	Attitude	,196	,048	,179	4,062	,00*
	Technical	-,222	,054	-,193	-4,122	,00*
	Cognitive	,426	,041	,422	10,436	,00*
	Social	,208	,041	,204	5,128	,00*
	R2= 0,324 F(111,548)=0,000					

Dependent Variable : Susceptibility to E-Learning

Independent Variable : Digital Literacy

The constant term shows a positive effect with a value of 0.978. This indicates that when other independent variables are held constant, there is an effect on the dependent variable. The "Attitude" factor has a positive effect on the dependent variable with a value of 0.196. This means that an increase in the "Attitude" factor positively influences the dependent variable ($\beta = 0.179$, $p = 0.000$). On the other hand, the "Technical" factor has a negative effect on the dependent variable with a value of -0.222. In other words, an increase in the "Technical" factor negatively affects the dependent variable ($\beta = -0.193$, $p = 0.000$). The "Cognitive" factor has a positive effect on the dependent variable with a value of 0.426. This indicates that an increase in the "Cognitive" factor positively influences the dependent variable ($\beta = 0.422$, $p = 0.000$). Similarly, the "Social" factor has a positive effect on the dependent variable with a value of 0.208. This means that an increase in the "Social" factor positively affects the dependent variable ($\beta = 0.204$, $p = 0.000$). The R-squared value is calculated as 0.324, indicating that 32.4% of the dependent variable's variance is explained. In other words, the "E-Learning Propensity" sub-dimension of Digital Literacy (its sub-dimensions) has an effect of 32.4%. The F-statistic shows that the model is significantly explained ($F_{(111,548)} = p = 0.000$).

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Table 8. Results of regression analysis showing the effect of participants' digital literacy on e-learning avoidance

		B	Ss	β	t	p
Digital Literacy	Constant	2,607	,135	-	19,354	,000
	Attitude	-,067	,051	-,068	-1,303	,19
	Technical	,059	,058	,056	1,018	,30
	Cognitive	-,137	,044	-,150	-3,141	,00*
	Social	,276	,043	,300	6,375	,00*
	R2= 0,055 F(14,392)=0,000					

Dependent Variable : Escape to E-Learning

Independent Variable : Digital Literacy

The "Attitude" factor does not have a significant effect on the sub-dimension of "E-Learning Avoidance" ($\beta = -0.067$, $p = 0.193$). This indicates that the attitudinal factor is not significant in determining the sub-dimension of e-learning avoidance. Similarly, the "Technical" factor does not have a significant effect on the sub-dimension of "E-Learning Avoidance" ($\beta = 0.059$, $p = 0.309$). This means that the "Technical" factor is not significant in determining e-learning avoidance. However, it is observed that the "Cognitive" factor has a significant effect on the sub-dimension of "E-Learning Avoidance" ($\beta = -0.137$, $p = 0.002^*$). This suggests that the cognitive factor can influence the tendency to avoid e-learning. Likewise, the "Social" factor has a significant effect on the sub-dimension of "E-Learning Avoidance" ($\beta = 0.276$, $p = 0.000^*$). This indicates that the Social factor can influence the tendency to avoid e-learning. The R-squared value indicates that the variables used explain 5.5% of the total variance. The F-statistic shows that the regression model is generally significant ($F_{(14,392)} = p = 0.000^*$).

4. DISCUSSION and CONCLUSION

Research has shown that income, socio-economic status, employment, education, and gender are among the most influential determinants affecting access to and usage of information and communication technologies in all seventeen African countries (Qazi, et al., 2022). In this section, the results related to gender and social demographic characteristics such as class, department, and daily internet usage are discussed.

According to the results of the MANOVA based on the scores of the participants according to the “gender” variable, a significant difference was observed in the “Social” sub-dimension of the “Digital Literacy Scale” in favor of males. This suggests that the more widespread use of digital technologies among males may lead to higher social competence in this area for males. In a study by Karakuş and Ocak (2019) measuring the digital literacy of teacher candidates, they found significant differences in favor of males only in the “ability to use applications” sub-dimension. In another study by Göldağ and Kanat (2018) examining the digital literacy levels of students in fine arts education, they found significant differences in favor of males in all sub-dimensions except for the cognitive sub-dimension. Similarly, Göldağ (2021) examined the digital literacy levels of university students and found significant differences in favor of males based on the gender variable. In a study by Gökbulut (2021) conducted on teachers in the national education system, they found significant differences in favor of males in the “technical” and “cognitive” sub-dimensions of digital literacy levels. However, when we examine the results in the literature compared to our study, it can be seen that there is no significant difference between digital literacy and the gender variable (Aksoy, Karabay & Aksoy, 2021; Bay, 2021; Kozan & Özek, 2019; Şahin, 2021). Regarding the “E-Learning” scale, a significant difference in favor of males was observed only in the “propensity” sub-dimension. In a study by Şahin (2021) examining the e-learning levels of religious culture and ethics teacher candidates, they found significant differences in favor of males in both sub-dimensions.

According to the results of the MANOVA based on the scores of the participants according to the “class” variable, a significant difference was observed in the “Social” sub-dimension of the “Digital Literacy Scale” in favor of 3rd-grade students compared to 1st and 2nd-grade students. In a study by Kozan and Özek (2019) examining the digital literacy levels of teacher candidates in educational sciences programs, they found no significant difference based on the class variable. However, Göldağ and Kanat (2018) conducted a study examining the digital literacy levels of students in fine arts education and found significant differences in the attitude and cognitive sub-dimensions based on the class variable. In another study by Bay (2021) investigating the digital literacy levels of preschool teacher candidates, they found no significant difference based on the class variable. Regarding the “E-Learning” scale, no significant difference was observed based on the class variable. However, Şahin (2021) examined the e-learning levels of religious culture and ethics teacher candidates and found a significant difference in favor of 4th-grade students compared to 1st-grade students in the “propensity for e-learning” sub-dimension.

According to the results of the MANOVA based on the scores of the participants according to the “department” variable, significant differences were observed in the “technical” sub-dimension of the “Digital Literacy Scale” in favor of coaching, in the “cognitive” sub-dimension in favor of management, and in the “social” sub-dimension in favor of coaching. In a study by Karakuş and Ocak (2019) examining the digital literacy of teacher candidates, they found significant differences between departments in all sub-dimensions. Similarly, Göldağ and Kanat (2018) conducted a study examining the digital literacy levels of students in fine arts education and found a significant difference in the social sub-dimension based on the department variable. However, regarding the “E-Learning” scale, no significant difference was observed based on the department variable.

According to the results of the MANOVA based on the scores of the participants according to the “daily internet usage durations” variable, significant differences were observed in all sub-

dimensions of the “Digital Literacy Scale”. In a study by Aksoy et al. (2021) examining the digital literacy levels of teachers, they could not find any significant difference between digital literacy and the variable of daily internet usage duration. Similarly, Kozan and Özek (2019) conducted a study examining the digital literacy levels of pre-service teachers in educational technology and found no significant difference in terms of the variable of computer usage durations. Göldağ and Kanat (2018) examined the digital literacy levels of students in fine arts education in terms of internet usage duration and found no significant difference in any sub-dimension. However, in the same study, they observed significant differences between computer usage durations and digital literacy in all sub-dimensions. As for the “E-Learning” scale, no significant difference was observed based on the variable of “daily internet usage durations”. It is not expected that non-learning-related internet usage durations would have an impact on e-learning.

The impact of digital literacy on the “E-Learning Readiness” sub-dimension has been examined, and it was predicted to have a 32.4% effect. Considering that digital literacy and e-learning concepts are closely related to each other, it can be said that this result is lower than expected. In another sub-dimension, the “E-Learning Avoidance” sub-dimension, the impact of digital literacy was examined, and it was predicted to have a 5% effect. The fact that this effect is inversely proportional and low can be interpreted as a positive outcome. In other words, it can be stated that as the level of digital literacy increases, the avoidance of e-learning decreases. As a result, we see that the level of digital literacy has an effect on e-learning. Without underestimating the importance of this effect we found on students receiving sports education, in their future plans; digital literacy courses should be given as compulsory, and it is recommended to prepare and integrate technology-based education programs in sports practice courses.

Ethics Committee Decision

Ethical approval and written permission for this study were obtained from the Social and Human Sciences Scientific Research and Publication Ethics Committee of Karabuk University with the decision dated 19/06/2023 and numbered 2023/05-36.

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