Examination of Digital Media Literacy Levels of University Students in Sports Education

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İsmail Polatcan
Mardin Artuklu University, Turkey
https://orcid.org/0000-0001-8618-4880

Abstract
The purpose of this study is to examine the digital literacy levels of university students in sports education according to dependent and independent variables. The Digital Literacy Scale (DLS) was developed by Ng (2012) and adapted to Turkish by Hamutoglu et al. (2017). The Digital Literacy Scale consists of 4 sub-dimensions and 17 items. The sample of the study consisted of 517 university students and the data obtained were analyzed using the SPSS 25.0 software. The data collected from the participants were analyzed using an independent sample T-Test and One-Way ANOVA. The analyses conducted in the study revealed that the students had high levels of digital media literacy. A Pearson correlation analysis was completed to determine the level and direction of the relationship between dependent variables. The correlation analysis showed that the strongest, high-level relationship was between the "digital literacy scale" and its technical sub-dimension ($r= 0.890$; $p<0.000$). In conclusion, as the class and education level of students who do sports increase, the rise of digital literacy; It is thought that digital literacy between men and women will be parallel to the education of students in free and democratic conditions.
Keywords: Digital Literacy, Sports Education, Media, University Students.

Introduction

In order to access any type of information one needs today, it is crucial to attentively follow changes, keep a close eye on innovations, and have sufficient knowledge to take advantage of the technological opportunities (Özçelik & Yıldız, 2019). It is unthinkable that the developments occurring in the 21st century, which is described as the age of information, are not to be reflected or lead to changes in the world of education and teaching. Indeed, rapid technological changes and developments rose to prominence in education and training activities, enhancing educational environments and teaching activities (Kuru, 2019).

Media content presents individuals with appropriate and inappropriate behaviour, societal gender diversity, values, and information about the world. People are not always aware that they are being educated and shaped by the media culture. Thus, messages circulated by the media are implicit and directed toward the subconscious. Individuals need to be literate in a different manner, in addition to traditional literacy, to be able to comprehend how the media constructs meaning, how it affects them, and how it leaves an impression on the audience with the messages and contents it generates. This need is met through media literacy (Kelnner, 2014). Media literacy is the ability to view any information presented by the media with a critical eye and to combat false and misleading messages presented by the media by questioning them (Bulger & Davidson, 2018).

The definition of digital literacy should not be restricted, as it is usually is at first glance, to being able to use digital devices or software. Digital literacy involves employing complex cognitive, sociological, and emotional skills that users need to effectively benefit from the digital environment. Digital literacy activities include reading instructions on graphic screens, creating new meaningful materials in that environment, and determining the quality and validity of information in the digital environment. Digital literacy, which in itself is a measure in the evaluation of the quality of learning activities in the digital environment, promotes a user-oriented approach (Eshet, 2004).

Digital literacy indicates a capability to use innovative digital materials and related products. The ability to use these materials also provides a favourable environment for effective production. Additionally, it raises awareness of network-based crimes such as phishing and hacking. (Deye, 2015). It also facilitates reaching new products through accessing and managing digital resources (Martin, 2005). Digitally literate individuals can access accurate information and have the ability to synthesize information and present it in digital environments (Kozan & Bulut Özek, 2019). This is also a very important issue in digital-based learning environments.

The educational environment is affected by the rapid development and changes and directs students, teachers, and teaching environments to adapt to this change. The main responsibility of teachers in adjusting to the developments is to follow the currents of change and development, educate themselves in these areas, and guide students in this direction. Heavily influenced by the rapidly advancing world of technology, learning environments transform digital resources and a wide network of information into a functional structure for students. Students who learn in a digital environment need digital literacy awareness to adapt to the speed of the age (Techataweewan & Prasertsin, 2018). Changes in educational technologies lead to diversity in materials and resources, which are essentially limited in number, as well as facilitate shortening the learning period and receiving education anywhere (Lewis & Alirezabeigi, 2018).

For educational activities that embrace a student-centered constructivist learning model, electronic tools are elements that enrich learning environments and lead to permanent learning. Since social network technologies create many opportunities for educational activities, they enable teachers to support their teaching processes with active, creative, and cooperative learning methods. It also helps to increase student-student, student-content, and teacher-student interactions and helps students use and improve their research, questioning, and problem-solving skills. Additionally, as a result of digital literacy, which includes the aforementioned skills, views, developments, and innovations can spread more quickly than before and ensure that educational activities are carried out suitably for the current age (Martin, 2005).

Students receiving sports education should be able to take advantage of digitalization opportunities to be more successful both in classroom environments and areas of sports. Digital literacy is needed to adapt to the digital age, to be able to correctly evaluate information related to sports and to become a qualified physical education and sports teacher, sports manager, and trainer. In this context, this study aims to examine the digital literacy levels of university students receiving sports education.

Method

Research Model

This is a descriptive study examining the digital literacy levels of teachers. The study utilizes the survey model, which is a quantitative research method. The survey model is a method in which questions and answers about a predetermined subject are described (Jackson, 2015).

The study uses the convenience sampling method for sampling purposes. Convenience sampling is one of the most commonly used sampling methods in the social sciences. In convenience sampling, researchers select participants from voluntary individuals who are easily reachable and suitable for the study (Gravetter & Forzano, 2012). The population of the study consists of 1112 people. The study sample was calculated as at least 286 people at a 95% confidence level and t=0.05 significance level according to the sample size formula. 517

scale forms that were compatible and usable with the convenience sampling method were included in the study. The study group consists of 517 students attending Mardin Artuklu University and Bitlis Eren University in the 2021-2022 academic year and receiving sports education.

Data Collection Tools

The "Personal Information Form", developed by the researcher, and the 17-item "Digital Literacy Scale" which was developed by Ng (2012) and adapted into Turkish by Hamutoğlu et al. (2017) were used to collect information about the socio-demographic characteristics of university students receiving sports education. The digital literacy scale consists of 4 sub-dimensions (attitude, technical, cognitive, and social) and 17 items. The scale was designed in a 5-point Likert-type format, with the responses of "Strongly Disagree," "Disagree," "Undecided," "Agree," and "Strongly Agree." The Cronbach's alpha value of the scale was measured as 0.91, indicating that the scale was sufficiently reliable.

Data Analysis

Skewness and kurtosis tests were performed to determine whether the data obtained from the study showed a normal distribution. In social science research, the skewness and kurtosis coefficients in the range of (-1.5,+1.5) (Tabachnick & Fidell, 2007) or (-2,+2) (George & Mallery, 2016) indicate that the data show a normal distribution. The tests showed that the skewness and kurtosis values were between +1.5 and -1.5, pointing to a normal distribution, and then parametric tests were conducted. Table 1 shows the skewness and kurtosis values of the sub-dimensions of the digital literacy scale of university students receiving sports education.

Table 1 Normality Test Results of the Digital Literacy Scale and its Sub-Dimensions

Scale	N	Mean	SD	Skewness	Kurtosis
Digital Literacy Scale	517	3.882	0.720	[-0.709; 0.107]	[1.423; 0.214]
Attitude	517	4.142	0.815	[-0.905; 0.107]	[0.923; 0.214]
Technical	517	3.833	0.775	[-0.544; 0.107]	[0.753; 0.214]
Cognitive	517	4.126	0.952	[-0.766; 0.107]	[0.488; 0.2014]
Social	517	3.498	1.023	[-0.280; 0.107]	[-0.559; 0.2014]

An "independent t-test" was conducted to determine whether the digital literacy levels of university students receiving sports education had a statistically significant difference between gender and the variables of following news, information, and competitions related to sports, and a "One-Way Variance" analysis was conducted to determine whether the age and grade variables showed a statistically significant difference. Following the "One Way Variance" analysis, the "LSD" test was used to identify groups with statistically significant differences. A "Pearson Correlation" analysis was conducted to determine the level and direction of the relationship between the sub-dimensions of the digital literacy scale of university students receiving sports education. Correlations between dependent variables were measured as follows (Kalaycı, 2006): "0.00-0.25: very weak correlation; 0.26-0.49: weak correlation; 0.50-0.69: moderate correlation; 0.70-0.89: strong correlation; 0.90-1.00: very strong correlation."

Findings

Below are the results obtained from the opinions of prospective physical education and sports teachers in line with the objectives of the study.

The results in Table 2 show that there is a statistically significant difference in the attitude (t=-4.960; p=0.000), cognitive (t=-1.980; p=0.040), social (t=-9.470; p=0.000) sub-dimensions and the digital literacy scale (t=0.033; p= 0.974), but there is no statistically significant difference (p>0.05) in the technical (t=-7.830; p=0.260) sub-dimension.

Table 2 Difference Between Sex and Digital Media Literacy Levels of Students Receiving Sports Education (T-Test)

Scale	Sex	N	Mean	SD	t-Value	p-Value
Attitude	Female	223	3,796	0,985	-4,960	0,000
	Male	294	4,169	0,611		
Technical	Female	223	3,590	0,847	-7,830	0.260
	Male	294	4,119	0,627		
Cognitive	Female	223	3,789	1,010	-1,980	0,040
	Male	294	3,959	0,898		
Social	Female	223	3,161	1,065	-9,470	0,000
	Male	294	3,979	0,834		
Digital Literacy Scale	Female	223	3,648	0,817	-7,130	0,000
	Male	294	4,104	0,564		

Table 3 The Difference between Age and Digital Media Literacy Levels of Athletes (Variance Analysis)

Scale	Age	N	Mean	SD	Sd	F	P	Significant Difference
Attitude	18-21	289	3,893	,793	3/513	5,361	,001	1-2, 1-4
	22-25	168	4,112	,880				
	26-29	24	4,142	,145				
	30+	36	4,357	,779				
Technical	18-21	289	3,825	,721	3/513	1,738	,158	------
	22-25	168	3,964	,878				
	26-29	24	4,083	,664				
	30+	36	3,944	,721				
Cognitive	18-21	289	3,795	1,004	3/513	2,613	,051	------
	22-25	168	3,964	,878				
	26-29	24	4,250	,571				
	30+	36	4,000	,971				
Social	18-21	289	3,498	1,070	3/513	5,400	,001	1-2, 1-3, 1-4
	22-25	168	3,696	,892				
	26-29	24	4,125	1,270				
	30+	36	4,000	,828				
Digital Media Literacy	18-21	289	3,811	,706	3/513	4,486	,004	1-2, 1-3, 1-4
	22-25	168	3,993	,787				
	26-29	24	4,132	,327				
		36	4,127	,570				

The results in Table 3 show that there is a significant difference in the attitude (F=5.361; p=0.001) and social (F=5.400; p=0.001) sub-dimensions and the digital literacy scale (F=4.486; p=0.004), while there is no statistical difference in the technical (F=1.738; p=0.158) and cognitive (F=6.295; p=0.051) sub-dimensions.

The results of the LSD test performed to determine the source of these differences show that the difference in the attitude sub-dimension is between the age groups (22-25) and (18-21), and (30+) and (22-25).

The difference in the social sub-dimension is between the age groups (18-21) and (22-25), (18-21) and (26-29), and (18-21) and (30+).

The results of the LSD test show that the difference in the DLS is between the age groups (22-25) and (18-21), (26-29) and (18-21), (30+) and (18-21).

Table 4 Difference Between the Grade Levels and Digital Media Literacy Levels of Athletes (Variance Analysis)

Scale	Grade	N	Mean	SD	Sd	F	P	Significant Difference
Attitude	1st grade	133	4,097	,758	3/513	8,397	,000	1-2, 2-3, 2-4
	2nd grade	168	3,765	,810				
	3rd grade	84	4,051	,671				
	4th grade	132	4,201	,889				
Technical	1st grade	133	3,959	,743	3/513	6,624	,000	1-2, 2-3, 2-4, 3-4
	2nd grade	168	3,708	,736				
	3rd grade	84	4,142	,506				
	4th grade	132	3,893	,932				
Cognitive	1st grade	133	3,601	1,194	3/513	6,295	,000	1-2, 1-3, 1-4
	2nd grade	168	4,017	,787				
	3rd grade	84	4,071	,803				
	4th grade	132	3,886	,894				
Social	1st grade	133	3,676	1,094	3/513	4,741	,003	1-2, 2-3, 3-4
	2nd grade	168	3,428	1,069				
	3rd grade	84	3,928	,868				
	4th grade	132	3,636	,935				
Digital Literacy Scale	1st grade	133	3,941	,738	3/513	5,444	,001	1-2, 2-3, 2-4
	2nd grade	168	3,735	,683				
	3rd grade	84	4,071	,525				
		132	3,989	,815				

The results in Table 4 show that there is no significant difference in attitude (F=8.397; p=0.000), technical (F=6.624; p=0.000), cognitive (F=6.295; p=0.000), and social (F=4.741; p=0.000) sub-dimensions and the digital media literacy scale (F=5.444; p=0.000).

The results of the LSD test performed to determine the source of this difference show that the difference in the attitude sub-dimension is between the 1st grade and the 2nd grade, the 3rd grade and the 2nd grade, and the 4th grade and the 2nd grade groups.

The difference in the technical sub-dimension is between the 1st grade and the 2nd grade, the 3rd grade and the 2nd grade, the 4th grade and the 2nd grade, and the 3rd grade and the 4th grade groups.

The difference in the cognitive sub-dimension is between the 2nd grade and the 1st grade, the 3rd grade and the 1st grade, and the 4th grade and the 1st grade groups.

The difference in the social sub-dimension is between the 1st grade and the 2nd grade, the 3rd grade and the 2nd grade, and the 3rd grade and the 4th grade groups.

The results of the LSD test show that the difference in the DLS is between the 1st grade and the 2nd grade, the 3rd grade and the 2nd grade, and the 4th grade and the 2nd grade groups.

The results in Table 5 show that, while there is no statistically significant difference in attitude (t=1.894; p = 0.059), there is a statistically significant difference in the technical (t=4.953; p= 0.000), cognitive (t=2.266; p=0.024), and social (t=6.711; p= 0.000) sub-dimensions and the digital literacy (t=4.212; p= 0.000) scale.

Table 5 The Difference Between Following Competitions, Programs, News Magazines and Newspapers Related to Sports in Digital Media on a Weekly Basis and the Digital Media Literacy Levels of the Athletes (T-Test)

Scale	Following digital media	N	Mean	SD	t	p
Attitude	Yes	283	4,070	,760	1,894	,059
	No	234	3,934	,872		
Technical	Yes	283	4,041	,673	4,953	,000
	No	234	3,709	,849		
Cognitive	Yes	283	3,971	,941	2,266	,024
	No	234	3,782	,954		
Social	Yes	283	3,890	,985	6,711	,000
	No	234	3,307	,980		
Digital Literacy Scale	Yes	283	4,027	,663	4,212	,000
	No	234	3,763	,761		

Table 6 Correlation Analysis for the Relationship between DLS and Its Sub-Dimensions

Scale Descriptors		(1)	(2)	(3)	(4)	(5)
Attitude (1)	r	1				
	p					
	N	517				
Technical (2)	r	,628*	1			
	p	,000	-			
	N	517	517			
Cognitive (3)	r	,675*	,641*	1		
	p	,000	,000	-		
	N	517	517	517		
Social (4)	r	,467*	,710*	,563*	1	
	p	,000	,000	,000	-	
	N	517	517	517	517	
Digital Literacy Scale (5)	r	,887*	,890*	,807*	,742*	1
	p	,000	,000	,000	,000	-
		517	517	517	517	517

*p<0.05

The results in Table 6 show that the highest level of relationship is positive, strong, and between the "digital literacy scale" and the technical (r=0.890; p=0.000) sub-dimension. The lowest relationship was positive, weak, and between the social and the attitude sub-dimensions (r=0.467; p=0.000).

Conclusion and Discussion

Below is a review of the results of the analyses performed within the scope of the study.

There was a statistically significant difference between the sexes in the study group (Table 2). The digital literacy levels of male students were higher than the digital literacy levels of female students. However, although there is no difference between female students and male students in the technical sub-dimension, male students had high digital literacy scores. Contrary to the results of this study, (Erol & Aydın, 2021; Yaman 2019; Kozan & Bulut Özek, 2019) stated that there was no difference between the digital literacy levels of male and female participants in their studies. Sunay and Kaya (2020) stated in their study that there was no difference between female trainers and male trainers, although female trainers

had higher levels of literacy. Kul (2020), and Aslan and Tuncer Basel (2017) stated in their studies that between male and female participants, there was a significant difference in favour of female students in terms of digital literacy levels of university students. In line with the results of this study, Güngör and Kurtipek (2020) found that the digital literacy levels of male participants were statistically higher than female participants in their study. Similarly, Baydar-Arıcan (2022), Çetin (2016), Göldağ & Kanat (2018), Horne (2007), Kubiatko et al. (2010), Nguyen and Habók (2021), Özerbaş and Kuralbayeva (2018) and Yontar (2019), also found that male participants had higher digital literacy levels than female participants in their studies. The reason why the results seem to be in favour of male participants may be that male participants use technological devices and tools more often in daily life, do more sports and participate in more sports activities, watch sports competitions more frequently than female participants, follow sports-related news through newspapers, magazines, and articles. However, there are also studies in which the digital literacy levels of female participants are higher than those of males, indicating that the digital literacy levels of women and men may be parallel in places where democratic and innovative educational and cultural systems are established.

There was a statistically significant difference between the age and digital literacy in the study group (Table 3). Participants in the (18-21) age range scored lower on the digital media literacy scale, and it can be inferred that there is an improvement in the digital literacy levels of the students receiving sports education as the age and university education levels increase. Similarly, participants in the (18-21) age range scored lower on the attitude and social sub-dimensions of the digital literacy scale, with findings revealing that digital literacy improved as the ages increased, and students receiving sports education used media and media tools. Contrary to the results of this study, Erol and Aydın (2021), Korkmaz (2020), Öçal (2017) and Yeşildal (2018) argued in their studies that the level of digital literacy increased as the age level decreased. The results also showed that the technical and informatics knowledge levels of physical education and sports teacher candidates on digital literacy were close to each other. The findings show that students who receive sports education use digital tools and equipment to meet their needs and access information, that they are close to one another in age, and that they are on similar digital literacy levels because they belong to the same generation.

There was a statistically significant difference between the grade variable and digital literacy in the study group (Table 4). Overall, in terms of the digital literacy scale and its sub-dimensions, the digital literacy levels of the 2nd grade students were lower, and the 3rd and 4th grade students were higher. While the digital literacy levels of the students are expected to increase along with the duration of education at the university, the higher digital literacy scores of the 1st grade students compared to the 2nd grade students create a contrast. There was a statistical difference between the 2nd grade students and students in other grades in the attitude and technical sub-dimensions. 3rd grade students receiving sports education showed high digital literacy in the digital literacy scale and its sub-dimensions. In line with the results of this study, Özerbaş and Kuralbayeva (2018) observed in their study that 3rd grade students had higher digital literacy levels than both 2nd and 4th grade students. Similarly, Biricik (2019) stated in a study that the media literacy scores of the 2nd grade students attending the faculty of sports sciences were lower than the 1st, 3rd, and 4th grade students. In another study, Tutkun (2020) stated that the grade level did not create a difference between the media literacy levels of university students. Yaman (2019) observed a statistical difference in the digital literacy levels of university students according to their grade levels, as well as an increase in digital literacy levels of students parallel to the duration of their university education. Öztürk and Budak (2019) also stated in their study that as the grade levels of teacher candidates increased, so did their mean scores of digital literacy. Teacher candidates in the 4th grade had a higher mean in digital literacy than those in other grades. They argued that this was because the classes taken at the university had an impact on digital literacy as well.

There was a statistically significant difference between following competitions, programs, news, magazines and newspapers related to sports in the digital media on a weekly basis and the digital media

literacy levels in the study group (Table 5). There was a difference in the digital literacy scale and technical and social sub-dimensions, while no difference was found in following competitions, programs, news, magazines and newspapers related to sports in the digital media on a weekly basis in the attitude and cognitive sub-dimensions. However, those who follow competitions, programs, news, magazines and newspapers related to sports in digital media on a weekly basis scored high on the digital literacy scale and its sub-dimensions. Yaman (2019) found that those who follow social networks, regularly use the internet, technological news sites, and access digital magazines have higher digital literacy levels than those who do not. Sunay & Kaya (2020) examined the difference between the media literacy levels of the trainers according to the frequency of reading newspapers on a weekly basis, and observed a significant difference in the sub-dimensions of "Being Informed," "Discerning, Seeing Implicit Messages" and the total scale.

Correlation analysis showed in the study group that the highest level of relationship was between the "digital literacy scale" and the technical (r=0.890; p=0.000) sub-dimension, and that it was positive and strong. The lowest relationship was between the social and the attitude (r =0.467; p=0.000) sub-dimensions, in the positive direction and weak. Üztemur & Avcı (2020) stated in their study that there was a positive and moderate relationship between the media literacy scale and its sub-dimensions. In a study titled, "Examining the effect of individual innovation level of students of sports sciences faculty on digital literacy with structural equation model," Güngör and Kurtipek (2020) stated that there was a positive and weak relationship between the digital literacy and resistance to change scores of participants.

In conclusion, the study shows that university students receiving sports education have high levels of digital literacy. The active social lives of students receiving sports education, the universality of sports, and the socializing and animating aspects of sports, which encourage individuals to follow, watch, and read global and local sports news and utilize digital opportunities, all help to improve digital literacy in students. There was a difference between digital literacy levels of male and female participants, and as males participate more in sports activities and follow sports events more frequently, they show higher digital literacy levels, leading to the aforementioned difference. The necessity of using technology in the field of sports sciences, as in every other field, is constantly increasing, making it crucial to boost the digital literacy levels of students receiving sports education at the same rate. For this reason, it is important to make sure that students who will become physical education and sports teachers in the future are provided with a high-quality education in this respect.

Recommendations

The inclusion of a course covering media, media literacy and digital literacy in the curriculum of the departments of the university students studying sports in order to improve the level of digital literacy of the students will make it easier to follow the digital and scientific developments in the field of sports. In addition, panels, courses and symposiums should be organized in order to develop digital media and literacy in sports.

It is thought that the digital literacy levels of physical education teachers, sports managers and trainers are developed, those who work in the field of sports will act in a scientific and rational way and will contribute more to sports.

It is suggested that research on digital literacy should also be conducted on those working in the field of sports and compared with university students receiving sports education.

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Author Details

İsmail Polatcan, *Mardin Artuklu University, Turkey,* ***Email ID****: polatcan86@gmail.com*