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Investigation of Mobile Learning Readiness Levels of Gifted Students and Middle School Students with Normal Abilities

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ABSTRACT

In this study aimed to examine the mobile learning readiness levels of special talents and normally developing secondary school students. As a quantitative research method, correlational survey methods were used for the research. In the study, 176 gifted students secondary school students studying at the Science and Art Center (BİLSEM) and 170 students with normal development and attending secondary school participated. In total, 346 students were included in the study. Data were collected with the 'Mobile Learning Readiness Scale'. This scale has three sub-dimensions; mobile learning self-efficacy, optimism, and self-directed learning. The findings show that all students' mobile learning readiness levels are high on average. The data was analyzed through using Statistical Package for Social Sciences (SPSS 21.0) program. According to the results of the analysis of the mobile learning readiness levels of the gifted students, a significant difference was found compared to the students with normal development. In addition, statistically significant difference was not found between the total scores of both normal and gifted students in the gender-related mobile learning readiness level scale. On the other hand, there was no statistically significant difference between the total scores of the girls and boys on the mobile learning readiness level scale. When the correlation of the sub-dimensions in the mobile learning readiness scale with each other was examined, it was seen that all sub-dimensions were positive and significant.

Keywords: Mobile technology; Mobile learning; Gifted individual

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INTRODUCTION

With the rapidly developing technology day by day, it is called today's technology age. The differentiation of technological devices and their use with wireless internet connections affect life in many ways. Individuals can freely access information with their mobile devices. With this feature brought by technology, learning environments have also been differentiated. Individuals gain knowledge in different learning environments with wireless access. This knowledge acquisition is valid not only for individuals who attend school but also for all individuals who want to acquire knowledge. These opportunities can enable lifelong learning (Sharples et al., 2009). In this way, the concept of mobile learning has emerged with the development of mobile technologies and their use in learning environments.

Literature Review

Mobile Technology and Mobile Learning

Towards the end of the 20th century, it is seen that the world population increased rapidly and there were technological developments as well. With the development of technology, in addition to classical education-teaching activities, technological devices have been used in the education-teaching process. While the use of technology in educational activities was first with radio and television, computer, internet, tablet, and mobile technologies were used with the rapid development of technology. Information technologies, especially mobile technologies (smartphones, mobile phones, personal media tools, tablet computers, etc.) have influenced the majority of people (Sharples et al., 2009; Saran, 2016). One of the most important reasons for its large size is that mobile technologies allow easy access to information at any time and place. Recently, there has been a greater tendency toward mobile technologies, with the increase in power and memory capacity in mobile technologies, and the possibilities such as Bluetooth and wireless internet (Ergüney, 2017). This orientation has started to be used in a wide range in education life as well as in daily life. The concept of mobile learning has emerged with the use of mobile technologies in education (Kalankara, 2021).

In the literature, mobile learning definitions differ according to the characteristics of mobile technologies. Some researchers define mobile learning as the use of portable devices such as tablets, smartphones, and computers in the education process (Cabot et al., 2015; Semertzidis, 2013). Some researchers define the concept of mobile learning as the ability of individuals to use mobile technologies for learning purposes whenever and wherever they want (Sabah, 2016; Bozkurt, 2015; Mahat et al., 2012). So through mobile learning, individuals can access the documents they need instantly, provide access to libraries, participate in distance education courses live or from the recording, access assessments, and games, participate in virtual learning environments, and publish their studies (Hashemi et al., 2011). Also, individuals can interact with each other through mobile learning and share with various tools such as e-mail and social media. Considering the explanations, it is seen that mobile learning offers a flexible learning environment to the individual.

There are many advantages to the active use of mobile learning in the education process. These;

- Formation of place and time-independent learning opportunities with mobile learning, (Sabah, 2016; Bozkurt, 2015; Mahat et al., 2012)
- The portability of mobile devices (Shudong & Higgins, 2005; Hashemi et al., 2011),
- To bring together students who are far from each other and to realize cooperative learning (Corbeil & Valdes, 2007; Hashemi et al., 2011; Sha et al., 2012),
- Students have the opportunity to learn interactively both among themselves and with their instructors (Corbeil & Valdes, 2007; Cavus & Uzunboylu, 2009; Hashemi et al., 2011),
- Flexible application of learning at the most appropriate time and place thanks to the reuse of educational resources (Vogel et al., 2007),
- The responsibility of learning is on the individual (Stone, 2012), and the individual realizes learning according to his/her learning speed (Missildine et al., 2013),
- Increasing motivation for learning in learners due to the portable features of mobile devices (Hashemi et al., 2011),
- Learners can instantly share their observations, studies, and experiences, each as a researcher (Corbeil & Valdes, 2007),
- It helps mobile learning to support lifelong learning in individuals.
- Mobile learning helps individuals support lifelong learning.

Considering that mobile devices have mobile learning features as well as being portable everywhere and can be used at any time and place, the use of mobile technologies in the teaching process is considered important for today. Briefly, the advantages of mobile learning and the use of technologies in the education process is an inevitable situation for today.

Gifted Students and Mobile Learning

Gifted students, according to the report of Marland (1972); "general mental ability", "ability in a specific academic field", "creative and productive thinking ability", leadership ability", "abilities in the arts", and "abilities in the psychomotor area" they outperform their peers in at least one of their fields (Sak, 2008). Ministry of National Education (MoNE); Gifted students individuals are defined as individuals who learn faster than their peers, can understand abstract ideas, perform higher than their peers in creativity, leadership, art, and special interests, and have special academic abilities (MoNE, 2016). The developmental characteristics of gifted students are examined in mental, physical, social, and personality dimensions (Leana, 2005). Considering these characteristics, it is seen that there are many differences in the definitions made for gifted students, where gifted students are not a homogeneous group. Considering the general characteristics of gifted students, it can be said that they are creative individuals, original, love to learn, take initiative, and try to complete their work in the best way (Kontostavlou & Drigas, 2019).

Gifted students have different affective, cognitive, and psychomotor skills than their peers, and they perform at a high level in different skill areas from a generation that can use technology well. Information and communication technologies (ICT) have an important role in the effective use of technology. Gifted students' ICT usage purposes; information acquisition and research, communication and interaction, elimination of obstacles and inadequacies, distance education/electronic mentoring, projects and cooperation, virtual trips, multimedia production, and sharing, and providing teaching materials (Öngöz & Sözel, 2018). Gifted students are also

aware of how important technology is for their own education (Mann, 1994) and they believe that they will be much more successful in the future if they improve their ICT skills (Kurnaz et al., 2014).

Among the tools used in ICT, there are many tools such as computers, telephones, television, and mobile communication tools. There are features that will provide convenience to students such as the use of mobile communication technologies, rapid access to data, access to the desired video, picture, and sound recordings, and wireless access to the internet (Özel, 2016).

Mobile technologies can be used for faster and easier access to data. Today, the effective use of mobile technologies, which are found in almost every individual, is useful for accessing information easily, analyzing information, and communicating with others. Considering these features, students can benefit from mobile technologies for self-improvement and lifelong learning.

Lifelong learning is important in the education of gifted students. It is important to enable gifted students to access and organize information themselves in lifelong learning processes (Tang & Neber, 2008). Risemberg and Zimmerman (1992) defined gifted students as often curious individuals in their learning processes. Accessing information from various sources with the use of mobile technologies provides more detailed and rapid access to information for all individuals. In this case, considering the characteristics of gifted students, mobile learning allows broad and unlimited access to information that will respond to individual interests, curiosity, and needs. In addition, mobile learning can support personalized learning, which accepts the differences and can support individualized and individual learners (Traxler, 2007).

Purpose of the Research

The main purpose of this study is to examine the mobile learning readiness levels of gifted and normally developing secondary school students. For this purpose, the following research questions were tested.

1- What is the average score of gifted and normally developing students from the scale to determine their readiness for mobile learning?
2- Is there a statistically significant difference between the mobile learning readiness levels of gifted secondary school students and the mobile learning readiness levels of their normally developing peers?
3- Is there a statistically significant difference in mobile learning readiness levels of gifted secondary school students and their peers with normal development according to the gender variable?
4- Is there a relationship between the sub-dimensions of the mobile learning readiness scale of all students participating in the research?

Importance of Research

With the rapid use of mobile technology in daily life, the use of mobile technology has begun to be used by young children (Çakmak & Yalçın, 2013). Especially in the last few years, the diseases that have occurred in the process of staying at home have led to an increase in mobile

use. Due to the Covid-19 epidemic, distance education has been started in primary, secondary, and higher education in our country. It is thought that with the active use of mobile tools in the education process, mobile learning has become important for all levels. In this context, the current research has considered that it may be important to determine the mobile learning readiness levels of secondary school students with special abilities and secondary school students with normal development.

Cheon et al (2012) state that the adoption of mobile learning by teachers and students is critically important. It is important in the mobile learning process that students have a high level of mobile learning readiness. Cheon et al. (2012) with Christensen & Knezek (2018) emphasize that readiness for mobile learning is important and that students' mobile learning readiness should be determined before mobile learning applications. Mobile learning readiness can be expressed as students' readiness and preference to use mobile devices as part of the learning process (Mahat et al., 2012).

METHOD

In this study, the correlational survey model, which is a subtype of the general survey model, which is one of the quantitative research methods, was used. General screening models are screening arrangements made on the whole population or a group, sample or sample to be taken from the universe to make a general judgment about the universe in a universe consisting of many elements. Single or relational scans can be made with general screening models. A relational screening model is a research model that does not determine the existence or degree of co-variation between two or more variables (Karasar, 2016). This study aimed to examine the mobile learning readiness levels between gifted students and students with normal development.

Sample Population and Sampling Technique

The study group of the research consists of a total of 346 students who continue their education in the 2021-2022 academic year. Gifted students consist of 176 students who continue their education in Science and Art Centers (BİLSEM) located in Adana city center. Normally developing students consist of a total of 170 students continuing their education in Istanbul.

Measurement

Mobile learning readiness scale developed by Lin et al., (2016), mobile learning self-efficacy (Article 7) optimism (7 items), and self-managed learning (Article 5) three sub-dimensions. The scale, adapted into Turkish by Şata, Torbacı, and Koyuncu (2019), is a 19-item 7-point Likert-type scale. The range of scores that can be obtained from this scale varies between 19 and 133. Those who score high on the scale indicate higher mobile learning readiness, while those with low scores indicate less mobile learning readiness. When the internal consistency characteristics of the mobile learning readiness measurement tool are examined (Şata et al., 2019), found that the Cronbach alpha coefficient for the whole scale was 0.870. Şata et al. (2019) found the Cronbach alpha coefficients for mobile learning self-efficacy, optimism, and self-directed learning sub-dimensions as 0.889, 0.866 and 0.860, respectively. According to our results, the Cronbach alpha coefficient of the mobile learning readiness measurement tool was found to be

0.922. The Cronbach alpha coefficient for the sub-dimensions was found to be 0.874, 0.899 and 0.834, respectively, for the sub-dimensions of mobile learning self-efficacy, optimism, and self-directed learning.

Data Analysis

As a result of the Kolmogorov-Smirnov test in mobile learning readiness scale to test normality; since it is .08 (p>.05) for gifted students and .07 (p>.05) for the whole study group, it can be said that the data are normally distributed (George & Mallery, 2010). For this reason, parametric statistical techniques were used in the analysis of the data.

Within the scope of the research, descriptive statistical analyzes were carried out to carry out inferential statistics for the scores obtained by the participants from the scale. The distribution in this direction is as seen in Table 1.

Table 1. Descriptive Statistics Results

Level	Variable	n	*f*	%
Gifted	Gender	Girl	88	50
		Boy	88	50
	Grade Level	5th grade	71	40.3
		6th grade	68	38.6
		7th grade	26	14.8
		8th grade	11	6.3
Normal	Gender	Girl	70	41.35
		Boy	100	58.65
	Grade Level	5th grade	68	40.4
		6th grade	47	27.5
		7th grade	31	18.1
		8th grade	24	14

When Table 1 is examined, it is seen that the majority of the participants are 5th and 6th-grade students. The participants are distributed close to each other according to the gender variable. SPSS 21 statistical analysis package program was used and an independent sample t-test was used to determine whether there is a significant difference by comparing the mobile readiness levels of gifted students and students with normal development. In addition, the effect size (Eta squared) values, which show the degree of influence of the independent variable on the dependent variable, were also calculated. Calculated effect size; If it is between .01 ≤ η2 <.06, it is interpreted as a low-level effect, between .06 ≤ $\eta 2$ <.14 it is interpreted as a medium effect, and between η2 ≥ .14 it is interpreted as a large effect (Cohen, 1988).

FINDINGS

Table 2. Descriptive Statistics for Mobile Learning Readiness Levels

Measure	N	Max.	Min.	$\bar{X}$	SD
Total	346	133	27	95.36	23.08
Gifted	176	133	47	99.06	20.32
Normal	170	133	27	91.53	25.12

When the information in Table 2 is analyzed; it is seen that the average score of the students from the mobile learning readiness scale is at a high level ($\bar{X}$ = 95.36). When the average of the student's readiness for mobile learning is examined, it is seen that the average of the gifted students is the highest ($\bar{X}$ = 99.06).

Table 3. Independent Samples T-Test Results Comparing Mobile Learning Readiness Levels of Specially Talented and Normally Developing Secondary School Students

				t-test		
	Students	**N**	**$\bar{X}$**	**SD**	***t***	***p***
Mobile Learning Readiness	Gifted	176	5.21			
	Normal	170	4.81	.007	3.071	.002

As seen in Table 3, mobile learning readiness mean scores of gifted students ($\bar{X}$ = 5.21) are statistically significantly higher (t=3.529, p<.05) than average scores of students with normal development ($\bar{X}$ = 4.81).

According to the criteria proposed by Cohen (1988), the effect size is interpreted as 0.2 small, 0.5 medium and 0.8 large effect size. The value calculated as the effect size was 0.5 and it was determined that the effect size was medium. This finding shows that the mobile learning readiness levels of the gifted students are higher than the students with normal development.

Table 4. The Results of the Independent Group T-Test Comparing the Mobile Learning Readiness Levels of Middle School Students with Special Abilities and Showing Normal Development According to the Gender Variable

				t-test		
	Groups	**N**	**$\bar{X}$**	**SD**	***t***	***p***
Mobile Learning Readiness	Girl	159	4.96			
	Boy	187	4.07	.17	-.899	.369
				9		
	Gifted	88	5.20			
	Girls			.49	-.122	.493
	Gifted	88	5.22	3		
	Boys					
	Normal	71	4.65			
	Girls			.00	-1.43	.156
	Normal	99	4.94	4		
	Boys					

As seen in Table 4, when the mobile learning readiness levels of all students were analyzed according to the gender variable, no statistically significant difference was found (t=-.122, p>.05). Likewise, when the mobile learning readiness levels of gifted students were examined according to the gender variable, no statistically significant difference was found (t=-.899, p>.05). Finally, when the mobile learning readiness levels of the students with normal development were examined according to the gender variable, no statistically significant difference was found (t=-1.43, p>.05). The value calculated as the effect size is .002 and it can be stated that the effect size is at a low level (Cohen, 1988). This finding shows that there is no significant difference in mobile learning readiness between genders.

Table 5. Correlation Analysis Results to Determine the Relationship Between the Sub-Dimensions of the Mobile Learning Readiness Scale of Specially Talented and Normally Developing Secondary School Students

N=346	General	1	2	3
Genel	1			
1 Mobile Learning Self-Efficacy	.868**	1		
2. Optimism	.838**	.559**	1	
3. Self-Directed Learning	.728**	.522**	.404**	1

According to the result of the Pearson Correlation Analysis performed in Table 5, a significant and positive relationship was found between Mobile Learning Self-Efficacy and Optimism, r = .559, p<.001. It has been found that there is a significant and weak positive relationship between Mobile Learning Dec-Efficacy and Self-Directed Learning, r = .522, p<.001. It has been found that there is a significant and positive relationship between Optimism and Self-Directed Learning, r = .404, p<.001.

RESULTS AND DİSCUSSİON

This study aimed to examine and compare the mobile learning readiness levels of gifted and normally developing students in terms of total scale items and gender variables. In addition, the scale has three dimensions and the relationships between these dimensions, mobile learning self-efficacy, optimism, and self-directed learning were examined. Normally developing students consist of a total of 170 students continuing their education in Istanbul. A total of 346 students participated in the research.

As a result of the analysis, it was determined that the average score of all students on the mobile learning readiness scale was high. Supporting the results of the study; Mahat et al. (2012) and Arslan (2019) concluded in their studies that university students' mobile learning readiness levels are high. However, when the average score of the students for mobile learning readiness is examined, it is seen that the average score of the gifted students is higher. The mobile learning readiness levels of gifted students differed significantly from the students with normal development. It is thought that mobile learning readiness levels may be high in students since mobile device use starts in early childhood (Çakmak & Yalçın, 2013).

It was determined that there was no difference according to gender in the mobile learning readiness scale of secondary school students with special abilities and normal development. There are studies that support this finding of the study. In the studies conducted by Kurnaz (2010) and Kıcı (2010), no significant difference was observed in terms of gender variables. In the study of Kuşkonmaz (2011) to determine the level of perception of mobile learning, no significant difference was found between male and female teachers. In a study conducted by Kantaroğlu and Akbıyık (2017), students' attitudes towards mobile learning were determined and no significant difference was found in the research according to the gender variable of the students.

Today, mobile devices are used effectively in many areas of life. Every day we live more and more intertwined with technology. Especially with the use of mobile technologies in education, mobile learning has an important place in our lives (Kıcı, 2010). In this direction, mobile learning environments should be introduced to individuals both for educational environments

and for lifelong learning. Educational programs to be prepared in the education and training process need to be developed and constantly updated by technological learning environments. In the studies conducted, it has been found that students use mobile learning efficiently to improve their knowledge (Mao, 2014). Almuttairi (2020), on the other hand, in his study with gifted female students, found that gifted female students who benefited from mobile learning achieved effective results from mobile learning. An experimental study was conducted and students were provided with the free iTunes U application. In the iTunes U application, besides different educational content, there are videos, pictures, pdf, and presentations. As a result of mobile learning performed with iTunes U, it was found that the results of the questionnaire applied to the students had a significant effect on their metacognitive thinking level of the students.

Especially in training aimed at continuous training or gaining skills with mobile learning, appropriate evaluations should be made for the purpose. As a result of these evaluations, a qualification certificate or certificate related to the field should be issued.

DECLARATIONS

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Conflict of Interest Disclosure

The author declares no conflict of interest.

Consent for Publication

The authors do consent for publication of this work.

Ethical Rules

The following ethical steps were followed in this research. Since the research was carried out during the pandemic process, the questionnaires were taken over the google form and filled in by the students who requested it, with the permission of the students and their families.

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