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RESEARCH ARTICLE

The E-Learning Attitude of Talented Pre-service Teachers in the Online Learning Model Following the Kahramanmaraş and Hatay Earthquakes

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Abstract
This study, which aims to determine the e-learning attitudes of talented teacher candidates following the earthquakes in Kahramanmaraş and Hatay and to compare them according to some variables, was designed with a cross-sectional-survey model, one of the quantitative research methods. The research sample was comprised of 826 pre-service teachers from the fields of Physical Education and Sports, Music Education, and Visual Arts during the spring semester of 2022-2023. Data for the study were collected using the Test of E-Learning Related Attitudes Scale, with data collection conducted through Google Forms. Data analysis was used to SPSS program. In terms of the academic department variable, it was concluded that pre-service teachers specializing in Physical Education and Sports, Music Education, and Visual Arts demonstrated similar levels of E-learning attitudes, and no statistically significant differences were observed among them ($p<0.05$). Furthermore, in the context of education and instructional activities being carried out through online learning methods, it was determined that the choice of and utilization of computers and mobile devices as learning tools resulted in similar overall E-learning attitudes ($p<0.05$). Nevertheless, those who favored mobile devices demonstrated a statistically higher level of inclination toward technology use and perceived usefulness, while those who used computers reported statistically higher levels of satisfaction and motivation in their E-learning attitudes ($p<0.05$). According to the research results, it was observed that the E-learning attitudes of pre-service teachers following the Kahramanmaraş and Hatay earthquakes were at a moderate level, with satisfaction in online learning registering as the least favorable aspect of E-learning attitude.

Keywords
E-learning, Online learning, Earthquake, Teacher

INTRODUCTION

It is well known that Turkey is a country frequently exposed to natural disasters, particularly those caused by earthquakes (Solmaz and Ozel, 2012). Between 1900 and 2023, Turkey experienced a total of 269 earthquakes resulting in casualties and significant material damage. Among these earthquakes, the most severe in terms of loss of life and extensive damage, spanning over a century, were the 2023 Kahramanmaraş and Hatay earthquakes, followed by the 1939 Erzincan and 1999 Gölcük earthquakes. The most recent earthquakes, with a magnitude of 7.7 (Mw) occurring on February 6, 2023, at 04:17 (Turkey local time) with its epicenter in Kahramanmaraş, and another with a magnitude of 6.4 (Mw) on February 20, 2023, at 20:04 (Turkey local time)

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with its epicenter in Hatay, resulted in the declaration of a total of 11 cities in the region as disaster zones. In these earthquakes, more than 48,000 citizens lost their lives, and over half a million buildings were recorded as damaged, resulting in significant material losses in various sectors, including communication and energy infrastructure (SBB, 2023).

It is undeniable that the earthquakes that have occurred in our country, referred to as the 'disaster of the century,' will have consequences that extend beyond the impact on communication and energy infrastructure. Earthquakes or natural disasters that disrupt the normal social life of individuals and communities have also affected the sustainability of education, among various other aspects (Telli Yamamoto and Altun, 2023). Considering the severity of the earthquakes centered in Kahramanmaraş and Hatay, the geographical area covering 11 cities and their populations, the number of universities and students in the region, and the fact that the spring semester was approaching in the academic calendar of all universities nationwide, the Council of Higher Education (YOK) decided, due to all these factors, to transition to online learning (E-learning) methods in higher education and suspend face-to-face education in order to ensure the continuity of education. In this context, as a result of the earthquakes centered in Kahramanmaraş and Hatay, the Council of Higher Education (YOK) announced that in the spring semester of the 2022-2023 academic year, all universities in the country would conduct and complete their educational activities through remote teaching methods (E-learning) (YOK, 2023). The concept of E-learning, achieved by the integration of digital and internet technologies and platforms, allows individuals to access information, resources, and solutions through various methods regardless of place and time. It is in harmony with open and flexible learning models, providing individuals with diverse learning experiences, diversifying the climate of learning, offering various alternatives based on the pace of individual learning, placing the learner at the center, and providing rich learning opportunities. It is a contemporary, innovative learning approach compatible with today's technology (Khan, 2005; Rosenberg, 2006). However, it should be noted that in the use of E-learning systems and methods, in addition to these advantages, certain disadvantages can also be observed from financial, psychological, academic, or technical perspectives.

In February 2023, following the earthquakes centered in Kahramanmaraş and Hatay, in accordance with the decision made by the Council of Higher Education (YOK), there was a rapid transition back to E-learning methods that had been used extensively during the COVID-19 pandemic in educational activities. While there have been numerous studies on the psychological, sociological, and economic effects of the earthquake on individuals and society (Yıldız and Akkoyun, 2023; Cengiz and Peker, 2023; Genc et al., 2023; Ozdemir, 2023), there has been only one research study found in the literature related to E-learning titled 'The Inevitability of Online Learning in Turkey After an Earthquake' (Telli Yamamoto and Altun, 2023). Furthermore, no study has been identified in the literature investigating the effects of the earthquake and E-learning on university students. Within the context of the information available in the literature, the objective of this study is to determine the E-learning attitudes of talented pre-service teachers in the fields of physical education and sports, music education, and visual arts, who primarily complete a significant portion of their higher education studies through applied courses and examinations related to their curricula, and to compare these attitudes based on certain variables. This investigation aims to shed light on the learning experiences of these pre-service teachers who have been using distance education methods in the aftermath of the Kahramanmaraş and Hatay earthquakes in 2023.

MATERIALS AND METHODS

Research Problem

The primary research problem of this study is, "In the aftermath of the earthquakes centered in Kahramanmaraş and Hatay in February 2023, and due to the suspension of face-to-face education and the adoption of online learning methods in higher education in Turkey, what are the general attitudes of our talented pre-service teachers toward e-learning, their inclination to use technology, motivation, and their levels of usefulness and satisfaction toward e-learning systems? " In line with this main research problem, the following sub-problems were addressed in the study.

1. What is the level of general attitudes toward e-learning among pre-service teachers in the fields of physical education and sports, music education, and arts and crafts education?
2. What are the levels of inclination to use technology, motivation, usability, and satisfaction attitudes among talented pre-service teachers?
3. Is there a significant difference in the inclination to use technology, motivation, usability, satisfaction, and general attitudes toward e-learning among talented pre-service teachers based on the gender variable?
4. Is there a significant difference in the inclination to use technology, motivation, usability, satisfaction, and general attitudes toward e-learning among talented pre-service teachers based on the academic department variable?
5. Is there a significant difference in the inclination to use technology, motivation, usability, satisfaction, and general attitudes toward e-learning among talented pre-service teachers based on the device preference variable in online learning?

Model of the Research

This research was designed using a quantitative research method, specifically the cross-sectional survey model, to address both the main and sub-problems of the study. The survey model is a scientific research approach aimed at describing an existing phenomenon in its current state, whether in the past or the present (Karasar, 2002; Karasar, 2008). In this regard, our study was designed as a descriptive study.

Universe and Sample / Study Group

The population of this study, designed with a descriptive approach to determine the attitudes of talented pre-service teachers toward e-learning in online learning environments, consists of pre-service teachers currently enrolled in undergraduate programs at seven different state universities *(Anadolu, Atatürk, Çukurova, Ege, İnönü, Marmara, Ondokuz Mayıs)* in our country. The sample of the study consisted of 826 pre-service teachers who were continuing their education in the fields of physical education and sports, music, and fine arts during the spring semester of the 2022-2023 academic year and were voluntarily included in the research through random sampling. The sample size of the study was determined through power analysis using G*Power, based on an effect size of 0.53 calculated with a 5% Type-I error level and 95% power, which resulted in a minimum of 673 participants. Considering the possibility of incorrect or erroneous responses during the data collection process, the sample size was increased to 850 pre-service teachers. In the course of the study, it was determined that 24 individuals had incorrect or erroneous codings in their responses to the E-learning attitude scale. Consequently, the responses of these individuals were not included in the analyses, and the final analyses for the research objectives were conducted using the responses of a total of 826 pre-service teachers. Among the 826 talented pre-service teachers who participated in the study, 47.1% were male, and 52.9% were female. Regarding age distribution, 26.4% were in the 18-19 age range, 33.4% were in the 20-21 age range, and 40.2% were 22 years or older. In terms of academic units where they were enrolled in higher education, 36.7% were in the field of physical education and sports, 31.7% were in music education, and 31.6% were in the visual arts field. Additionally, concerning the device preference variable in online learning environments, it was observed that the majority of respondents (68.9%) preferred mobile devices, while computer preference was 31.1% (Table 1).

Implementation Process and Ethics

Following the determination of the research objectives, permissions were obtained for the use of the TELRA for this study, which was designed after the interruption of face-to-face education in higher education due to the Kahramanmaraş and Hatay earthquakes and the transition to online learning methods in February 2023. In addition, the ethical approval of this research was granted by the Bayburt University Ethics Committee on 29.12.2020 with decision number 26654. Once the necessary permission procedures for the research were completed, data collection tools were transferred to a digital platform using Google Forms. The pre-service teachers in the sample group were then contacted at the universities they attended and asked to respond to the questions voluntarily.

Table 1. Descriptive Information on Pre-service Teachers' Demographic Characteristics

Variables	Groups	*n*	%
Gender	Male	389	47.1
	Female	487	52.9
Age	18 – 19	218	26.4
	20 – 21	276	33.4
	22 years and older	332	40.2
Department	Physical education and sports	303	36.7
	Music	262	31.7
	Arts and Crafts	261	31.6
Electronic device	Computer	257	31.1
	Mobile devices	569	68.9
Total		826	100

Data Collection Tools

In this study, the Personal Information Form, consisting of questions determined by the researchers, and the Test of E-Learning Related Attitudes Scale (TELRA) were used as data collection tools to achieve the objectives of the research. The TELRA was utilized to determine the attitudes of pre-service teachers toward e-learning.

Test of E-Learning Related Attitudes Scale

This inventory, developed by Kisanga and Ireson (2016) to determine the attitudes of university students in higher education toward e-learning, was adapted to Turkish through the work completed by Biçer (2019) (Determinants of Teachers' Attitudes E-Learning in Higher Learning Institutions). The adapted scale consists of 23 items and uses a 4-point Likert scale. Bicer (2019) designed the items of the scale under four different factors: Tendency to Use Technology, Satisfaction, Motivation, and Usefulness. Scores that can be obtained based on the responses to TELRA range from a minimum of 23 to a maximum of 92. Any increase or decrease in the total score obtained from the TELRA by the participants is considered as an increase or decrease in their attitudes toward e-learning. In this study, the reliability coefficients analyzed for TELRA, along with the values from Bicer's (2019) adaptation study, are shown in Table 2 below.

Table 2. Reliability Coefficients of the Test of E-Learning Related Attitudes Scale

E-learning Attitudes	**Number of items**	**Kisanga (2016)**	**Biçer (2019)**	**Türker et al. (2023)**
Tendency to use technology	6	α=,680	α=,729	α=.79
Satisfaction	5	α=,788	α=,757	α=.823
Motivation	6	α=,651	α=,717	α=.811
Usefulness	6	α=,731	α=,689	α=.787
TELRA	23	α=,888	α=,789	α=.836

TELRA : Test of E-Learning Related Attitudes Scale

Analysis of Data

Following the completion of the data collection process, research data were analyzed using the statistical software package SPSS (Version 26.0) in accordance with the research questions. Frequency analysis was conducted for percentage distributions, and reliability analysis was performed for scoring. The normality distribution and skewness-kurtosis values of the research data were assessed. Based on the criterion that these values should fall within the range of +1.5 and -1.5 (Tabachnick & Fidell, 2013), it was determined that the responses exhibited a statistically normal distribution. Consequently, independent sample t-tests were employed for pairwise comparisons of variable groups, while one-way analysis of variance (ANOVA) with the Tukey method was applied for comparisons involving more than two variable groups.

RESULTS

This chapter presents the results obtained from assessing the attitude levels of talented pre-service teachers who are continuing their higher education in relation to e-learning. Additionally, it includes comparisons based on gender, the academic units they are enrolled in, and the choice of electronic devices in online learning environments, in alignment with the research objectives. Examining the attitudes of teacher candidates admitted to higher education through special talent exams and continuing their education at the undergraduate level toward e-learning in the aftermath of the Kahramanmaraş and Hatay earthquakes in online learning environments, it was determined that the attitude of usefulness had the highest value, while the attitude of satisfaction had the lowest value regarding e-learning. Furthermore, it was observed that the general attitude toward e-learning had a mean score of 56.55 ± 7.27 and a skewness-kurtosis value ranging from -.235 to .157 (Table 3).

Table 3. Descriptive Statistics of Attitudes toward E-Learning

E-learning Attitudes		Skewness	Kurtosis	Min.	Max.	$\bar{X}$±Ss
Talented Pre-service Teacher (*N*=826)	Tendency to use technology	-.018	.162	6	24	13.52±3.3
	Satisfaction	.936	.170	5	44	13.09±3.2
	Motivation	.165	.427	6	34	15.07±3.9
	Usefulness	-.140	.210	6	24	15.11±3.7
	TELRA	-.235	.157	23	92	56.55±7.27

TELRA : Test of E-Learning Related Attitudes Scale

Upon reviewing Table 4, while no statistically significant differences were found in terms of satisfaction and motivation attitudes toward online learning activities based on gender (p >.05), it was observed that female pre-service teachers had a statistically significant difference in terms of their inclination to use technology and their perception of the usefulness of e-learning tools during the earthquake period. Furthermore, in the general TELRA score, female pre-service teachers (57.05 ± 6.61) created a statistically significant difference compared to male pre-service teachers (55.97 ± 7.91) (p <.05)

Table 4. Comparison of Attitudes toward E-Learning by Gender

E-learning Attitudes		Male (*n*=389)	Female (*n*=437)	t	p
		$\bar{X}$±Ss			
Talented Pre-service Teacher (*N*=826)	Tendency to use technology	12.83±3.44	13.63±3.14	-3.473	.001
	Satisfaction	13.21±3.57	12.99±2.84	.996	.320
	Motivation	15.30±4.23	14.86±3.71	1.575	.116
	Usefulness	14.61±3.82	15.56±3.71	-3.587	.000
	TELRA	55.97±7.91	57.05±6.61	-2.113	.035

TELRA : Test of E-Learning Related Attitudes Scale

In the aftermath of the Kahramanmaraş and Hatay earthquakes that occurred in Turkey in February 2023, during the period when education activities were conducted through E-learning methods in online environments, it was observed that there were no statistically significant differences in the technology usage tendency, satisfaction factors, and the general attitudes toward E-learning among talented pre-service teachers based on the variable of their academic department, which includes physical education and sports, music, and visual arts.

The average scores were found to be very close to each other, and there were no statistically significant differences in the technology usage tendency and satisfaction factors as well as the general E-learning attitudes of pre-service teachers studying in these academic units (p > 05).
However, it was observed that pre-service teachers in the field of visual arts created a notable difference with an average score of 15.52±3.98 compared to pre-service teachers in the physical education and sports department, and in terms of usefulness attitude, pre-service teachers in the physical education and sports department, with an average score of 15.53±3.80, significantly differed from those in the visual arts department (Table 5).

Table 5. Comparison of Attitudes toward E-Learning by Academic Department

E-learning Attitudes		Physical Education and Sport (*n*=303)	Music (*n*=262)	Arts and Crafts (*n*=261)	F	p
		$\bar{X}$±Ss				
Talented Pre-service Teacher (*N*=826)	Tendency to use technology	13.51±3.41	13.01±3.01	13.21±3.46	1.667	.190
	Satisfaction	12.97±3.50	12.99±3.11	13.35±2.90	1.194	.304
	Motivation	14.57±3.96 [b]	15.20±3.91 [ab]	15.52±3.98 [a]	4.195	.015
	Usefulness	15.53±3.80 [a]	15.03±3.74 [ab]	14.71±3.79 [b]	3.367	.034
	TELRA	56.60±6.93	56.24±7.77	56.80±7.15	.393	.675

TELRA : Test of E-Learning Related Attitudes Scale

Examining Table 6, it can be observed that there is no significant difference in the attitudes of talented pre-service teachers toward E-learning in online learning activities based on the variable of the preferred and utilized electronic device. Those who favor computers and those who favor mobile devices exhibit quite similar scores on TELRA (p > .05). However, when it comes to satisfaction and motivation regarding E-learning, there are significant differences in favor of those participating in online learning with computers. Conversely, in terms of usefulness and the inclination to use technology, significant differences were noted in favor of pre-service teachers who participate in online learning through mobile devices (p < .05).

Table 6. Comparison of Attitudes toward E-learning Based on the Preferred Electronic Device for Online Learning

E-learning Attitudes		Computer (*n*=257)	Mobile Devices (*n*=569)	t	p
		$\bar{X}$±Ss			
Talented Pre-service Teacher (*N*=826)	Tendency to use technology	12.69±3.42	13.51±3.22	-3.251	.001
	Satisfaction	13.52±3.52	12.90±3.03	2.458	.014
	Motivation	15.49±3.97	14.88±3.95	2.065	.039
	Usefulness	14.77±3.71	15.27±3.82	-1.774	.002
	TELRA	56.49±8.01	56.57±6.92	-.142	.887

TELRA : Test of E-Learning Related Attitudes Scale

DISCUSSION

In this chapter of the study, the findings regarding the average scores of talented pre-service teachers in their attitudes toward E-learning after the Kahramanmaraş and Hatay earthquakes (2023), as well as the findings obtained from analyses applied to gender, the academic unit of study, and the choice of electronic devices for online learning are compared and discussed in the context of similar or related research in the literature. Considering that the learning skills of the pre-service teachers included in the research are primarily associated with motor skills and the absence of any prior studies in the literature related to attitudes toward E-learning following the

Kahramanmara and Hatay-centered (2023) earthquakes, it is anticipated that this study could bring original contributions to the E-learning literature.

After the Kahramanmaraş and Hatay earthquakes, it was observed that the talented pre-service teachers had an average score of 56.55±7.27 in their attitudes toward E-learning in the education activities conducted through the online learning model (Table 3). Examining similar or related studies in the literature, it can be seen that Turker's (2021) study conducted with sports science students during the COVID-19 pandemic reported attitudes toward E-learning with an average score of 55.37±6.98, which is similar to the current study. Additionally, Ozdemir and Sonmez's (2021) study on health science students in Turkey during the COVID-19 pandemic indicated that students had a tendency toward moderate levels of avoidance of E-learning. These results may be interpreted as the curriculum of higher education, which primarily consists of practical courses, negatively affecting the attitudes toward E-learning in students/pre-service teachers. Hasan and Bao (2020) have stated that difficulties in E-learning and low attitudes can be attributed to factors such as academic year loss, decreased academic performance, and the impact of psychological symptoms such as anxiety. Furthermore, considering that individual differences and learning styles are effective not only in traditional learning environments but also in E-learning, the results reported in Turker and Bostancı's (2023) study on learning styles, where pre-service teachers predominantly reported that they learn best with the kinesthetic learning style and the multiple learning model, support these findings.

In the comparisons of E-learning attitudes among special education pre-service teachers based on the gender variable, it was observed that female pre-service teachers had a higher tendency to use technology better in online learning, found it more useful, and had a higher general E-learning attitude compared to males. Despite male pre-service teachers had higher levels of satisfaction and motivation attitudes, no statistically significant difference was found (Table 4). Similar to the findings of the present study, Saddik et al.'s (2020) study also revealed a significant difference in favor of women. It is worth noting that there are studies in the literature that have reached different results. Acar and Egilmez's study (2023) on pre-service music teachers found that male pre-service teachers had a higher E-learning attitude, yet no statistically significant difference was observed. Konakcı's study (2010) on students in the fine arts department also did not find a significant difference in terms of the gender variable. Similarly, studies conducted on pre-service teachers from different branches and university students have reported that gender is not a significant variable affecting E-learning attitudes (Ates and Altun, 2008; Demirtas, 2021; Kısla, 2005; Malkawi et al., 2021). Most studies in the literature did not reveal a significant difference in E-learning attitudes based on gender, which aligns with Deniz's (2021) findings that support a positive relationship between the perception of technological competence and attitudes toward remote education. However, the fact that the entire sample group in the present study consists of pre-service teachers whose curriculum is predominantly composed of practical courses and psychological effects related to the earthquake may be considered as factors that could differentiate E-learning attitudes based on gender.

While there was no statistically significant difference in the general attitude toward E-learning among all talented pre-service teachers based on the academic unit variable, it was observed that in terms of motivation, visual arts students had a significant difference compared to physical education and sports pre-service teachers. Additionally, in terms of the usefulness attitude, physical education pre-service teachers differed significantly from visual arts pre-service teachers (Table 5). Similarly, Turker's (2021) study in the field of sports sciences at the undergraduate level, including coaching, physical education and sports teaching, and recreation and sports management departments, did not reveal a significant difference in general attitudes toward E-learning among different departments. Considering that there are no previous studies in the literature that compare E-learning attitudes among talented pre-service teachers based on their department of study, this study is believed to contribute significantly to the literature by providing original insights in this regard. Furthermore, the fact that the curricula in all three different fields in the sample group primarily consist of practical courses throughout their undergraduate education can be interpreted as a reason for both the similarity in E-learning

attitudes and the lack of significant differences in general attitudes.

Among all the talented pre-service teachers included in the study who used mobile phones, tablets, or iPads to engage in online learning following the Kahramanmaraş and Hatay earthquakes in 2023, it was observed that they had a more positive attitude toward technology usage and found E-learning more useful compared to those who used computers for online learning. However, in terms of satisfaction and motivation attitudes, pre-service teachers who preferred using computers achieved significantly higher scores. Additionally, it was found that the preferred device did not significantly affect the general attitude toward E-learning (Table 6). Reviewing the literature, it can be observed that Acar and Egilmez's (2023) study on pre-service music teachers also reported a lack of significant differences based on the preferred/used device variable in E-learning environments. The similarity in the levels of general attitudes toward E-learning and the absence of significant differences can be associated with the fact that in today's technology landscape, mobile phones and computers do not exhibit significant differences in terms of hardware or it can be linked to the similarity in the E-learning systems preferred/developed by universities. Besides, the high levels of digital literacy scores among university students in the study conducted by Kayalı and colleagues (2021) also support these findings.

In conclusion, pre-service teachers admitted to higher education through special talent exams and continuing their education have moderate attitudes toward E-learning in the aftermath of the Kahramanmaraş and Hatay earthquakes in 2023. Among their attitudes toward online learning, satisfaction is the lowest level of E-learning attitude. Talented pre-service teachers in physical education and sports, music education, and visual arts fields have similar attitudes toward E-learning regardless of their academic units, and there is no statistically significant difference between them. Nevertheless, female pre-service teachers have a higher inclination to use technology, find it more useful, and have a more positive general attitude toward E-learning in online learning environments compared to male pre-service teachers. Moreover, during this period, when educational activities are conducted through online teaching methods, the computer and mobile devices preferred and used by pre-service teachers as learning tools have similar levels of general attitude toward E-learning. Furthermore, those who prefer mobile devices have a statistically higher level of E-learning attitude in terms of technology usage tendency and usefulness attitude, while those who use computers have higher levels of satisfaction and motivation.

Ethical approval

The ethical approval of this research was granted by the Bayburt University Ethics Committee on 29.12.2020 with decision number 26654. Voluntary participation consent was obtained from the participants.

Conflict of interest

There is no personal or financial conflict of interest within the scope of the study.

Author contribution

Study Desing, ÜT, MBS; Data Collection, ÜT, MBS, ET, MK; Statistical Analysis, ÜT; Data Interpretation, ÜT, MBS; Manuscript Preparation, ET, MBS, MK; Literatur Search, ÜT, MK. All authors have read and agreed to the published version of manuscript.

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