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| Research Article / Araştırma Makalesi |

Teacher Candidates' Attitudes Towards Emergency Remote Education and Their Evaluations of the Education Process

Öğretmen Adaylarının Acil Uzaktan Eğitim Algıları ve Eğitim Sürecine İlişkin Değerlendirmeleri [1]

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Keywords

1. Emergency remote education
2. Attitudes towards emergency remote education
3. Evaluation of emergency remote education
4. Emergency remote education process
5.Teacher candidates

Anahtar Kelimeler

1. Acil uzaktan eğitim
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3. Acil uzaktan eğitimi değerlendirme
4. Acil uzaktan Eğitim süreci
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Abstract

Purpose: The aim of this study is to examine the attitudes of teacher candidates towards emergency remote education and their self-evaluation of using these environments.

Design/Methodology/Approach: Survey model was adopted in this study that aimed to examine teacher candidates' perceptions of emergency remote education and their reflections on the emergency remote education process. The present study was conducted by following two steps. The Distance Education Attitudes Scale was first adapted into Turkish, and then both the Distance Education Attitudes Scale and the Distance Education Evaluation Scale were administered to the teacher candidates.

Findings: Based on gender, the teacher candidates' attitudes showed no significant in the DRDE dimension while there was a statistically significant difference in the EDE dimension. The teacher candidates' evaluation of the distance education process significantly differed in the LP dimension, but did not in the TI dimension. No significant difference was observed in the emergency remote education attitudes of the students who were exposed to emergency remote education in the first and second years of higher education and who are currently studying their third and fourth years. In a similar vein, there was no difference in terms of their study programs.

Highlights: In this study, the emergency remote education attitude scale was adapted to Turkish. In this context, this study will contribute to the literature. It is important for teacher candidates to evaluate themselves in the emergency remote education process as well as determining their emergency remote education attitudes. After the distance education attitude scale was adapted to Turkish, data were collected with the distance education evaluation scale and the situation of the teacher candidates was tried to be determined. As a result of the study, it is important that there is no differentiation in terms of gender, class level or department in situations that require technology literacy skills.

Öz

Çalışmanın amacı: Bu çalışmanın amacı, öğretmen adaylarının acil uzaktan eğitime yönelik tutumlarını ve bu ortamları kullanmaya yönelik öz değerlendirmelerini incelemektir.

Materyal ve Yöntem: Öğretmen adaylarının acil uzaktan eğitime ilişkin algılarını ve acil uzaktan eğitim sürecine yansımalarını incelemeyi amaçlayan bu çalışmada tarama modeli benimsenmiştir. Mevcut çalışma iki adım takip edilerek gerçekleştirilmiştir. Uzaktan Eğitim Tutum Ölçeği önce Türkçe'ye uyarlanmış, ardından öğretmen adaylarına hem Uzaktan Eğitim Tutum Ölçeği hem de Uzaktan Eğitim Değerlendirme Ölçeği uygulanmıştır.

Bulgular: Cinsiyete göre öğretmen adaylarının tutumları DRDE boyutunda anlamlı bir farklılık göstermezken, EDE boyutunda istatistiksel olarak anlamlı bir farklılık bulunmuştur. Öğretmen adaylarının acil uzaktan eğitim sürecini değerlendirmeleri DP boyutunda anlamlı farklılık gösterirken, TE boyutunda farklılaşmamıştır. Yükseköğretimin birinci ve ikinci yıllarında acil uzaktan eğitime maruz kalan ve hâlihazırda üçüncü ve dördüncü sınıfta öğrenim görmekte olan öğrencilerin acil uzaktan eğitim tutumlarında anlamlı bir farklılık gözlenmemiştir. Benzer şekilde, çalışma programları açısından da bir fark yoktur.

Önemli Vurgular: Çalışmada uzaktan eğitim tutum ölçeği Türkçe'ye uyarlanmıştır. Bu bağlamda alana katkı sağlayacak bir çalışmadır. Öğretmen adaylarının acil uzaktan eğitim tutumlarını belirlemenin yanı sıra acil uzaktan eğitim sürecinde kendilerini de değerlendirmeleri önemlidir. Uzaktan eğitim tutum ölçeğinin Türkçe'ye uyarlanmasından sonra acil uzaktan eğitim değerlendirme ölçeği ile veri toplanarak öğretmen adaylarının durumları belirlenmeye çalışılmıştır. Araştırma sonucunda teknoloji okuryazarlığı becerisi gerektiren durumlarda cinsiyet, sınıf düzeyi veya bölüm bağlamında farklılaşmanın olmaması önemlidir.

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INTRODUCTION

Noam (1995) states that people used to look for and get knowledge that was in universities, but in the future, knowledge would be available to people regardless of their position. Considering the present-day conditions after an important proposition about what changes would happen in education, it seems that the developments in technology have made it possible. With the developments in information and communication technologies (ICT), a rapid change has been observed in education at all levels across the world in the last 50 years. The pandemic has been one of the biggest challenges that education systems have ever dealt with (Daniel 2020). In educational institutions around the world, the transition to the distance education has happened almost overnight (UNESCO, 2020). The situation is described with the concept of emergency distance education that refers to the temporary transition of teaching, which is normally conducted face-to-face, online or in a blended manner, to alternative options due to a crisis (Ferri, Grifoni & Guzzo, 2020; Hodge et al., 2020). With the decision of distance education, 1.6 billion students in 191 countries around the world were subjected to the distance education process (Drane et al. 2020, UNESCO, 2020). This has radically changed the educational life not only for students who receive face-to-face education, but also for teachers (Lall & Singh, 2020). In this regard, teachers' attitudes towards distance education has gained importance.

Attitudes Towards Distance Education

Attitude is defined as an individual's stance regarding an object, person or situation (Dündar et al., 2017). It reflects the behavior that has not yet been exhibited. Attitudes towards education are shaped by individuals' experiences in the subject area (Kaban, 2021). Research on attitudes towards distance education show that individuals have positive (Ağır, 2007; Bunk, Li, Smidt, Bidetti & Malize, 2015; Dündar et al., 2017; Kaban, 2021) or negative attitudes (Nasser & Abouchedid, 2000). In addition, the attitudes of individuals with positive thoughts about distance education are at moderate level (Ağır, 2007) and above the average (Dündar et al., 2017). Having a computer and Internet connection at home and the level of participation in virtual classes are stated to positively affect attitudes towards distance education (Kaban, 2021). University students have low levels of attitudes towards distance education (Barış, 2015; Kaban, 2021). Attitudes towards distance education have been examined in terms of gender, education level, having a computer and Internet connection, professional experience, major, age, education level, ICT competencies and institution. Findings in the literature show that attitudes towards distance education differ based on gender (Başar et al., 2019; Kaban, 2021) while other findings reveal no such difference (Ağır, 2007; Barış, 2015; Gündüz, 2013; Gündüzalp, 2021; Şimşek, İskenderoğlu & İskenderoğlu, 2010). Male teacher candidates have more positive perceptions of distance education than their female colleagues (Başar et al., 2019; Kaban, 2021). The level of education may also lead to a significant difference (Barış, 2015; Kaban, 2021) or no difference (Gündüzalp, 2021; Şimşek, İskenderoğlu & İskenderoğlu, 2010) in attitudes towards distance education. However, teachers' professional experience is stated to lead to a significant difference in their attitudes. Distance education attitudes of teachers with less professional experience are more positive (Ağır, 2007). In a study conducted with school principals and teachers, attitudes towards distance education were found to be negative for school principals, but positive for teachers (Nasser & Abouchedid, 2000). As for university staff, faculty members' attitudes towards distance education were observed to be affected by their motivation and teaching experience (Bunk, Li, Smidt, Bidetti & Malize, 2015). Faculty members with high intrinsic motivation and who have experience in distance education develop positive attitudes towards distance education. In another study on teacher candidates, experience in distance education were found to affect attitudes (Şimşek, İskenderoğlu & İskenderoğlu, 2010).

The attitude levels of those who have a computer, constant Internet access and a mobile device are higher (Barış, 2015). In other words, the use of technology is a key factor in these attitudes (Tabata & Johnsrud, 2008). Faculty members participate more in distance education if they have technical skills, and they improve their technical skills as they participate more. Having distance education skills facilitates participation in distance education. Technology usage and competencies can shape the attitudes of faculty members towards distance education. Attitudes towards distance education determine educators' behaviors in the instructional process (Gündüzalp, 2021).

For a successful implementation of distance education, teachers' attitudes are of great importance (Tzivinikou et al., 2020) and these attitudes are also reflected on students (Aydın & Sağlam, 2012). Teacher candidates studying in education faculties should thus be trained as individuals with positive attitudes towards distance education (Kışla, 2016). In the distance education process, it is important to determine and evaluate the attitudes of teachers towards distance education. Successful distance education can be possible with quality teachers (Tabata & Johnsrud, 2008). For distance education to be of high quality, teachers' digital literacy is also considerably important as well as their attitudes towards distance education. This is because ICT tools are employed in distance education environments. Woodcock et al. (2015) states that one of the most significant factors affecting teacher candidates' online learning-teaching competencies is their self-efficacy perceptions regarding these environments. Likewise, Hung (2016) considers the self-efficacy in using digital tools as an important factor that determines the readiness of teachers for online teaching.

The Pandemic and Distance Education

Various definitions of distance education are available in the literature, and the phenomenon is thought to have emerged with the Internet, but took place in various forms before the Internet era (Moore & Kearsley, 2012). Keegan (1990) defines distance education as an educational activity based on the gathering of all stakeholders via communication technologies, although the

learner, the teacher, the learning material and the content are in different environments. Distance education makes the learner independent of time and place, the content is conveyed to the learner through technology by the teacher, and the communication between the learner and the teacher takes place through technology (Kidd & Song, 2007). Based on the definitions, distance education can be described as the realization of learning and teaching activities by means of various technological tools in situations where the student and the teacher are not face to face. Today, computer technologies can enable meaningful learning processes to be implemented from any distance under the structure of a student-teacher system (Bachmaier 2011).

In the last three decades, distance education has gained great importance and become more important during the pandemic process. With the pandemic, various distance education activities were implemented in 191 countries in order not to interrupt education (Yamamoto & Altun, 2020). In these practices, different tools, assignments, updated and structured content, and alternative education models were used to continue education that had to be interrupted at school (Zhao, 2020). The distance education process was started with decisions taken rapidly during the pandemic. The emergency remote education process has brought institutions, trainers and students face to face with various difficulties such as lack of technological tools, internet, socio-economic factors, and digital competence level. (OECD, 2021; UNESCO, 2021). For this reason, distance education carried out during the pandemic period is called emergency remote education. Bozkurt and Sharma (2020) define emergency remote education as a temporary shift of educational activities to an alternative delivery mode due to crisis conditions, unlike pre-pandemic distance education. Hodges et al. (2020) state that this process can be considered as a repair process that offers educational experiences that are not expected to be perfect. Bozkurt et al. (2020) distinguish between distance education and emergency remote education as follows:

- While emergency remote education is a necessity; distance education is an option.
- While trying to produce temporary solutions for the current need of emergency remote education; distance education, on the other hand, is to continue within the framework of lifelong learning and to try to produce permanent solutions.
- While trying to keep education alive with the resources at hand during the emergency remote education crisis; the theoretical and practical knowledge specific to the field of distance education does not make education sustainable with planned and systematic activities in line with a specific purpose.
- The concept of "emergency remote education", which is the English equivalent of the concept of emergency remote education, and "distance education", the English equivalent of the concept of distance education. Although the concept of distance is expressed with the same word in Turkish, the concept of "remote" emphasizes physical distance, while the concept of "distance" emphasizes physical, interactional, and psychological distance.

UNESCO (2020) made the following recommendations regarding the disruption of education and its effective implementation during the pandemic process:

- The most suitable tool should be chosen
- Distance education curricula should be included in the process
- Data privacy and security must be ensured
- Solutions for psychosocial difficulties should be prioritized before education
- A plan for the distance learning curriculum should be prepared
- Support should be provided to teachers and parents in the use of digital tools
- Suitable approaches should be combined and the number of applications and platforms should be limited
- Distance learning rules should be set and students' learning process should be monitored.
- The duration of distance learning units should be defined on the basis of students' self-regulation skills
- Communities should be formed and a connection be established between them

Considering these recommendations, it can be stated that teachers have a great responsibility throughout the distance education process. At this point, teachers' perceptions, attitudes, and levels of digital literacy by which they can use this environment are of great importance. The primary aim of this study is to examine teacher candidates' attitudes towards emergency remote education and their evaluations of the emergency remote education process. Based on this aim, the following research questions were addressed:

RQ1. Do the teacher candidates' attitudes towards emergency remote education differ based on:

a) gender,

b) year of study and

c) their program?

RQ2. Do the teacher candidates' evaluations of emergency remote education process differ based on:

a) gender,

b) year of study and

c) their program?

RQ3. Is there a relationship between the teacher candidates' attitudes towards emergency remote education and their evaluations of the emergency remote education process?

METHOD

Research Model

Survey model was adopted in this study that aimed to examine teacher candidates' perceptions of distance education and their reflections on the distance education process. This research model is more concerned with how opinions and features are distributed in the target universe or among individuals, rather than what they stem from (Fraenkel, Wallen, & Hyun, 2012). In survey studies, data are collected from an entire universe or from a sample in order to make an overall judgement about the universe (Creswell, 2014). In addition, in such studies, the research phenomena can be examined in the sample at a certain point in time by collecting data only once. The present study was conducted by following the steps represented in Figure 1.

Figure 1. Steps followed in the study

As is seen in Figure 1, the Distance Education Attitudes Scale was first adapted into Turkish, and then both the Distance Education Attitudes Scale and the Distance Education Evaluation (DEE) Scale were administered to the teacher candidates.

Participants

In the study, the Distance Education Attitudes (DEA) scale was adapted into Turkish. For this purpose, permission was obtained from Tzivinikou, Charitaki and Kagkara (2021) to adapt the scale to the target language, which was followed by the adaptation process. The procedure laid out by Hambleton and Bollwark (1991) and Hambleton and Kanjee (1993) was employed to adapt the scale. Accordingly, the following steps were taken:

- translating the items into the target language,
- checking whether the items are equivalent to the original ones,
- testing the reliability and validity of the scale translated into the target language.

The participants were different in these three steps. After the items of the DEA scale were translated into the target language by the researchers, they were reviewed by three English language instructors working at a state university in Turkey. The scale that was revised based on their comments were also checked by two Turkish language experts for its language use and comprehensibility in the target language. In order to make sure that the translated items overlapped with the original ones, the scale was administered to 21 English language teacher candidates (14 female, 7 male) twice in a two-month interval, first in English and then in Turkish. After the final structure of the DEA scale was formed, the reliability and validity studies were conducted in the second phase of the study, shown in Figure 1. The information on the participants who took part in this phase is presented in detail below.

In the study, it was aimed to choose teacher candidates who were exposed to the distance education process at higher education level during the pandemic in order to examine the perceptions and evaluations of participants regarding distance education. Therefore, the participants of the study included teacher candidates studying their third and fourth years at the education faculty of a Turkish state university (Table 1).

Table 1. Information on the participants of the study

Program	Year of Study	Gender				Total	
		Female (%, f)		Male (%, f)			
Science Education	Third	4	80%	1	20%	5 100%	10
	Fourth	5	100%	-	-	5 100%	
Mathematics Education	Third	17	60.7%	11	39.3%	28 100%	54
	Fourth	9	34.6%	17	65.4%	26 100%	
Preschool Education	Third	20	80%	5	20%	25 100%	50
	Fourth	17	68%	8	32%	25 100%	
Guidance and Psychological Counselling	Third	24	55.8%	19	44.2%	43 100%	83
	Fourth	29	72.5%	11	27.5%	40 100%	
Elementary Education	Third	14	48.3%	15	51.7%	29 100%	45
	Fourth	9	50.0%	9	50.0%	18 100%	

Program	Year of Study	Gender				Total	
		Female (%, f)		Male (%, f)			
Social Studies Education	Third	14	77.8%	4	22.2%	18 100%	44
	Fourth	17	65.4%	9	34.6%	26 100%	
Turkish Language Education	Third	9	52.9%	8	47.1%	17 100%	45
	Fourth	19	67.9%	9	32.1%	28 100%	
Total		207		126			333

As is seen in Table 1, a total of 333 teacher candidates studying in seven different teacher training programs participated in the study. Of these teacher candidates, 207 were female, and 126 were male. In this phase, teacher candidates studying English language teaching were not included as participants because they contributed to the process in which the translated and original items were checked if they were equivalents.

Data Collection Tools

In the study, data were collected with a data collection tool consisting of three parts. The first part contained three questions regarding the demographic characteristics of the teacher candidates. The second part consisted of the DEA scale developed by Tzivinikou, Charitaki and Kagkara (2021) and adapted into Turkish by the researchers. The DEA scale had 10 items on two factors, and a 4-point Likert scale. In the scope of adapting the scale into the target language, a confirmatory factor analysis (CFA) was conducted on the DEA scale. The values obtained as a result of this analysis are presented in Table 2.

Table 2. Fit indices of the DEA scale

Fit indices	Good fit	Acceptable Fit	Observed Value	References
χ^2	$0 \le \chi^2 \le 2df$	$2df < \chi^2 \le 3df$	51.87	Tabachnick and Fidell, 2012
p value	.05 < p ≤ 1.00	.01 ≤ p ≤ .05	0.014	Hoyle, 1995
χ^2/df	$0 \le \chi^2 / df \le 2$	$2 < \chi^2 / df \le 3$	1,620	Schermelleh-Engel, Moosbrugger and Müller, 2003; Wheaton, Muthen, Alwin, and Summers, 1977
RMSEA	0 ≤ RMSEA ≤ .05	.05 < RMSEA ≤ .08	0.056	Browne and Cudeck, 1992; Hu and Bentler, 1999; Schreiber et al., 2006
SRMR	0 ≤ SRMR ≤ .05	.05 < SRMR ≤ .10	0.079	Hu and Bentler, 1999
NFI	.95 ≤ NFI ≤ 1.00	.90 ≤ NFI < .95	0.94	Schermelleh-Engel, Moosbrugger and Müller, 2003; Tabachnick and Fidell, 2012
NNFI	.97 ≤ NNFI ≤ 1.00	.95 ≤ NNFI < .97	0.95	Hu and Bentler, 1999
CFI	.97 ≤ CFI ≤ 1.00	.95 ≤ CFI < .97	0.96	Hu and Bentler, 1999; Tabachnick and Fidell, 2012
χ^2=51.87; *df* =32.01				

The fit indices for all values were found to be within the expected ranges. As a result of CFA, it was determined that the fit indices of the DEA scale were within the range acceptable in the literature.

In the third part of the data collection tool, the DEE scale developed by Özkul et al. (2020) was used. The DEE scale consisted of 15 items on two factors. The item-total correlation coefficients of the factors in the scale that was developed with 600 teachers and administrators ranged between .55 and .87, while the internal consistency (Cronbach's Alpha) coefficients were between .96 and .89. In order to make sure that the DEE scale developed with teachers would be reliable and valid when it was used with teacher candidates, CFA was also performed on the DEE scale, and the fit values were obtained and presented in Table 3.

Table 3. Fit indices of the DEE scale1

Fit indices	Good fit	Acceptable Fit	Observed Value	References
χ2	0 ≤ χ2 ≤ 2df	2df < χ2 ≤ 3df	278.42	Tabachnick and Fidell, 2012
p value	.05 < p ≤ 1.00	.01 ≤ p ≤ .05	0	Hoyle, 1995
χ2/df	0 ≤ χ2 / df ≤ 2	2 < χ2 / df ≤ 3	3.12	Schermelleh-Engel, Moosbrugger and Müller, 2003; Wheaton, Muthen, Alwin, and Summers, 1977
RMSEA	0 ≤ RMSEA ≤ .05	.05 < RMSEA ≤ .08	0.08	Browne and Cudeck, 1992; Hu and Bentler, 1999; Schreiber et al., 2006
SRMR	0 ≤ SRMR ≤ .05	.05 < SRMR ≤ .10	0.073	Hu and Bentler, 1999
NFI	.95 ≤ NFI ≤ 1.00	.90 ≤ NFI < .95	0.95	Schermelleh-Engel, Moosbrugger and Müller, 2003; Tabachnick and Fidell, 2012
NNFI	.97 ≤ NNFI ≤ 1.00	.95 ≤ NNFI < .97	0.96	Hu and Bentler, 1999
CFI	.97 ≤ CFI ≤ 1.00	.95 ≤ CFI < .97	0.97	Hu and Bentler, 1999; Tabachnick and Fidell, 2012
χ2=278.42; df =89,23				

The fit indices of all values were within the expected ranges. The values as a result of CFA showed that the NFI and CFI values were in the range of good fit, while the other values were also in the range of acceptable fit. The descriptive statistics of the data collection tools are presented in Table 4 on the basis of factors.

Table 4. Descriptive statistics of the participants' answers2

Scales	Factors	$\bar{X}$	SD	Skewness	Kurtosis
Distance Education Attitudes Scale (4-point Likert)	Efficacy of Distance Education (EDE)	2.196	0.568	0.339	0.382
	Difficulties Related to Distance Education (DRDE)	2,736	0.56	-0.48	0.77
Distance Education Evaluation Scale (5-point Likert)	Technical Issues (TI)	3,189	0.812	-0.013	-0.421
	Learning Process (LP)	2,078	0.811	0.62	-0.078

For univariate normality, the limit skewness value is accepted as ±3, and the kurtosis value as ±10 (Kline, 2012). In this sense, the skewness values were between -.480 and .620, and the kurtosis values between -.421 and .770. Accordingly, the data collected with both scales were accepted to have provided the assumptions for univariate normality.

Data Collection Process

In the study, the adaptation of the DEA scale was firstly conducted and this was done in the spring semester of the 2021-2022 academic year. The items translated into the target language were presented to English language instructors through a form prepared by the researchers and their feedback was obtained.

Orijinal Maddeler	
1	My participation in distance education programs during COVID-19 crisis is satisfactory
2	I cope with difficulties in Distance education rather than traditional education

Maddelerin Türkçeye Uyarlanmış Halleri		Madde Çevirisi Uygundur	Düzenlenmeli
1	Kovid-19 krizinde uzaktan eğitim programlarına katılımın memnun ediciydi.		
2	Geleneksel eğitimden ziyade uzaktan eğitimde zorlukların üstesinden geliyorum.		

Figure 2. Expert opinion form for translated items1

As is seen in Figure 2, the form included the original version of the items and the translated version in the target language. The experts were asked to state whether the translation was appropriate or should be edited. They stated their suggestions in the parts with the Turkish translations. The items that were translated into Turkish were also checked by Turkish language experts by using a form shown in Figure 3.

Maddelerin Türkçeye Uyarlanmış Halleri		Madde Çevirisi Uygundur	Düzenlenmeli
1	Kovid-19 krizinde uzaktan eğitim programlarına katılımım tatmin ediciydi.		
2	Geleneksel eğitimin aksine uzaktan eğitimde zorluklarla başa çıkarım.		

Figure 3. Expert opinion form for language use in Turkish

Turkish language experts were asked to state whether the language use was appropriate or needed editing. For items that they thought needed editing, they were asked to offer suggestion, and in this way the translation of the items into the target language was finalized. In order to see whether the items were equivalent or not, a form was prepared in Google Forms and administered to students. Since the equivalence of the items was being checked, student number and gender information were collected as demographic information. The reason for taking the student numbers is that the English and Turkish forms of the scale would be administered in a two-week interval and the answers given were to be compared.

After having the final version of the adapted DEA scale, a data collection tool consisting of three parts was prepared by using a word processor. Data were collected from students (i.e. teacher candidates) studying their third and fourth years in seven different teacher training programs. In this step, the collection was done by pen-and-paper forms because the response rates in digital platforms were low.

Data Analysis

The data were analysed in accordance with the research questions. The data analysis process is summarized in Table 5.

Table 5. Data analysis3

Research Question	Data collection tool	Data Analysis
RQ1. Do the teacher candidates' attitudes towards distance education differ based on: **a)** gender, **b)** year of study and **c)** their program?	Distance Education Attitudes Scale	Independent Samples t-Test, Analysis of Variance (ANOVA)

Research Question	Data collection tool	Data Analysis
RQ2. Do the teacher candidates' evaluations of distance education process differ based on: **a)** gender, **b)** year of study and **c)** their program?	Distance Education Evaluation Scale	Independent Samples t-Test, Analysis of Variance (ANOVA)
RQ3. Is there a relationship between the teacher candidates' attitudes towards distance education and their evaluations of the distance education process?	Distance Education Attitudes Scale Distance Education Evaluation Scale	Correlation

In data analysis, %, f, $\bar{X}$, t-test, ANOVA and correlation were used to analyse the data collected. The effect size was also included, and the effect size values were interpreted based on Cohen (1988).

Research Ethics

The study was carried out with the permission of the Scientific Research and Publication Ethics Committee at Muş Alparslan University (Permission no: 13.10.2022-67409).

FINDINGS

In this study examining teacher candidates' attitudes towards distance education and their evaluations of the distance education process, the findings are presented and discussed in this section in parallel with the research questions.

The teacher candidates' attitudes towards distance education based on gender

T-test was used to determine whether the teacher candidates' attitudes towards distance education differed based on gender. The male participants ($\bar{X}_{EDE}$=2.349; $\bar{X}_{DRDE}$=2.789) had a higher mean than their female peers ($\bar{X}_{EDE}$=2.103; $\bar{X}_{DRDE}$=2.704) in both factors of the scale. However, the difference in the DRDE dimension was not large and the only statistically significant difference was in the EDE dimension ($t_{(239,487)}$=-3.911; p<0.05; η^2= .031). The effect size in this dimension was found to be low.

The teacher candidates' attitudes towards distance education based on year of study

The teacher candidates' attitudes towards distance education were examined to see whether there was a difference based on their year of study. No statistically significant difference was observed between the third-year ($\bar{X}_{EDE}$=2.193; $\bar{X}_{DRDE}$=2.684; $t_{(330,969)}$=-.072; p<0.05) and fourth-year students ($\bar{X}_{EDE}$=2.198; $\bar{X}_{DRDE}$=2.787; $t_{(329,464)}$=-1.672; p<0.05).

The teacher candidates' attitudes towards distance education based on program

The distribution of the teacher candidates in the context of the EDE and DRDE dimensions was examined based on their study programs (Table 6).

Table 6. Descriptive statistics of scores in the DEA scale based on programs4

Departments	Efficacy of Distance Education (EDE)	Difficulties Related to Distance Education (DRDE)
Science Education	$\bar{X}$=2.183; sd=.552	$\bar{X}$=2.850; sd=.567
Mathematics Education	$\bar{X}$=2.250; sd=.541	$\bar{X}$=2.717; sd=.502
Preschool Education	$\bar{X}$=2.166; sd=.651	$\bar{X}$=2.775; sd=.479
Guidance and Psychological Counselling	$\bar{X}$=2.174; sd=.543	$\bar{X}$=2.792; sd=.514
Elementary Education	$\bar{X}$=2.305; sd=.572	$\bar{X}$=2.718; sd=.609
Social Studies Education	$\bar{X}$=2.162; sd=.546	$\bar{X}$=2.653; sd=.624
Turkish Language Education	$\bar{X}$=2.125; sd=.587	$\bar{X}$=2.688; sd=.676

The difference in the teacher candidates' attitudes towards distance education based on their programs was analysed by using analysis of variance. The results showed no significant differences in the EDE ($F_{(6,326)}$=.545; p<0.001) and DRDE ($F_{(6,326)}$=.474; p<0.001) dimensions based on the study programs of the teacher candidates.

The teacher candidates' evaluations of the distance education process based on gender

T-test was used to determine whether the teacher candidates' evaluations of the distance education process differed based on gender. The male participants (t_{TI}=3.195; t_{LP}=2.262) had a higher mean than their female peers (t_{TI}=3.186; t_{LP}=1.965) in both

dimensions. However, the difference in the TI dimension was not large and the only statistically significant difference was in the LP dimension ($t_{(235,566)}$=-3.287; p<0.05; η^2= .031). The effect size in this dimension was found to be low.

The teacher candidates' evaluations of the distance education process based on year of study

The teacher candidates' evaluations of the distance education process were examined to see whether there was a difference based on their year of study. No statistically significant difference was observed between the third-year ($\bar{X}_{TI}$=3.196; $\bar{X}_{LP}$=2.051; $t_{(330,974)}$=.139; p<0.05) and fourth-year students ($\bar{X}_{TI}$=3.183; $\bar{X}_{LP}$=2.103; $t_{(325,958)}$=-.584; p<0.05).

The teacher candidates' evaluations of the distance education process based on program

The distribution of the teacher candidates in the context of the TI and LP dimensions was examined based on their study programs (Table 7).

Table 7. Descriptive statistics of scores in the DEE scale based on programs5

Departments	Technical Issues (TI)	Learning Process (LP)
Science Education	$\bar{X}$=3.433; sd=.991	$\bar{X}$=2.022; sd=.877
Mathematics Education	$\bar{X}$=3.240; sd=.825	$\bar{X}$=2.160; sd=.713
Preschool Education	$\bar{X}$=3.063; sd=.770	$\bar{X}$=2.060; sd=.911
Guidance and Psychological Counselling	$\bar{X}$=3.291; sd=.795	$\bar{X}$=1.954; sd=.718
Elementary Education	$\bar{X}$=3.258; sd=.885	$\bar{X}$=2.297; sd=.817
Social Studies Education	$\bar{X}$=3.015; sd=.751	$\bar{X}$=2.042; sd=.800
Turkish Language Education	$\bar{X}$=3.125; sd=.806	$\bar{X}$=2.044; sd=.946

The difference in the teacher candidates' evaluations of the distance education process based on their programs was analysed by using analysis of variance. The results showed no significant differences in the teacher candidates' evaluations of the distance education process based on their programs departments in the TI ($F_{(6.326)}$=1.045; p<0.001) and LP dimensions ($F_{(6.326)}$=1.027; p<0.001) factors.

The relationship between the teacher candidates' attitudes towards distance education and their evaluations of the distance education process

The last phase of the study included an analysis of the relationship between the teacher candidates' attitudes towards distance education and their evaluations of the distance education process. Correlation analysis was conducted for this purpose and the findings are presented in Table 8.

Table 8. The relationship between attitudes towards distance education and evaluations of the distance education process6

	1	2	3	4
EDE[1]	1			
DRDE[2]	.528**	1		
TI[3]	.348**	.511**	1	
LP[4]	.633**	.322**	.381**	1

Correlation is significant at the 0.01 level (2-tailed).**

As is seen in Table 8, there was a positive relationship between the teacher candidates' attitudes towards distance education and their evaluations of the distance education process. While the relationships between the EDE and the TI dimensions (r=.348; p<.001), between the DRDE and the LP dimensions (r=.322; p<.001) and between the TI and the LP dimensions (r=.381; p<.001) were weak, there was a moderate-level relationship between the DRDE and TI dimensions (r=.511; p<.001) and a strong relationship between the EDE and LP dimensions (r=.633; p<.001).

DISCUSSION & CONCLUSION

In the present study, teacher candidates' attitudes towards distance education and evaluations of the distance education process were examined in terms of different variables. Based on gender, the teacher candidates' attitudes showed no significant in the DRDE dimension while there was a statistically significant difference in the EDE dimension. The items in the DRDE dimension required digital literacy skills. Considering the age of the participants from which data were collected, the target population can be defined as the Generation Z, digital native or the alpha generation. In this sense, it can be argued that the target group can cope with the technological difficulties they may encounter in the distance education process, depending on the level of digital

literacy. The EDE dimension was about views on distance education, and the answers to the items in this dimension showed a significant difference based on gender.

The teacher candidates' evaluation of the distance education process significantly differed in the LP dimension, but did not in the TI dimension. The items in the TI (technical issues) dimension) required digital literacy skills like those items in the DRDE dimension. The teacher candidates' having high levels of digital literacy could be the reason why there was no significant difference. However, a significant difference was revealed in the LP dimension and the male teacher candidates were observed to be more active in the process. When the data collected with both measurement tools are considered together, there seems to be no difference in terms of digital literacy. Studies reporting findings based on self-reports show that men seem to be advantageous in the context of attitudes and competencies regarding technology, but a statistically significant difference can be observed in favor of women when performance is taken into account (Siddiq & Scherer, 2019). In this respect, the finding that there was no significant difference between men and women in dimensions that require digital literacy can be regarded as normal. In their study using a measurement tool that has sub-dimensions such as personal suitability, effectiveness, instructiveness and disposition, Duzgun and Sulak (2020) stated that the views of teacher candidates on distance education practices did not differ based on gender. In another study, Bayram, Peker, Aka and Vural (2019) examined attitudes towards distance education in terms of advantages and limitations and did not report a significant difference for advantages based on gender. Gökbulut (2021) similarly found that there was no significant difference between distance learning students' perceptions of distance education and its sub-factors based on gender.

No significant difference was observed in the distance education attitudes of the students who were exposed to distance education in the first and second years of higher education and who are currently studying their third and fourth years. In a similar vein, there was no difference in terms of their study programs. With regard to the technical issues and learning process included in the second measurement tool, the teacher candidates' perceptions did not differ based on year of study and program. In other words, year of study and program were not predictors of scores in the DEA and DEE scales, and did not lead to a significant difference in the sample. Barış (2015) examined undergraduate students' attitudes towards distance education in the context of gender and program, and found that the students' attitude scores were low. Yalman and Kutluca (2013) also did not report a significant difference in mathematics teacher candidates' attitudes towards distance education in terms of gender and program. Karatepe, Küçükgencay and Peker (2020) found that mathematics, science and elementary school teacher candidates' perceptions of synchronous education did not show a significant difference based on major. However, Yenilmez, Balbağ and Turgut (2017) stated that there was a difference in science and elementary school teachers' attitudes towards distance education. Duzgun and Sulak (2020) reported that teacher candidates' views on distance education practices differed based on year of study, but not on study program. Likewise, Bayram, Peker, Aka and Vural (2019) did not report a significant difference in attitudes towards distance education in terms of year of study.

Following the interpretation of the findings revealed as a results of data analysis, suggestions for practitioners and researchers are offered in the present study.

Suggestions for practitioners

The results of the study showed that the teacher candidates' attitudes towards distance education did not significantly differ based on the DRDE dimension, but they did in the EDE dimension. While there were items that require digital literacy in the DRDE dimension, there were items that reveal views on distance education in the EDE dimension. In order to enhance the views of teacher candidates on distance education, university instructors have a great responsibility in courses taught online. Instructors can design and present distance education processes based on instructional design models.

In another measurement tool used in the scope of the study, the teacher candidates were asked to evaluate themselves for the technical issues and learning process. There was no significant difference in the technical dimensions based on gender, but a difference was observed in the teacher candidates' participation in the learning process. In this context, an environment in which teacher candidates can actively participate in the learning process in distance education should be designed, and in these environments, they should be able to participate in the learning process easily.

Suggestions for researchers

In the study, no significant differences in the teacher candidates' attitudes were observed in the DRDE and EDE dimensions based on program and year of study. Researchers can examine the reasons for this result by conducting experimental studies at different years of study or programs.

The teacher candidates who evaluated themselves in the distance education process did not differ in the dimensions of technical issues and learning process in terms of program and year of study. In this regard, researchers can study teacher candidates from different years of study or programs.

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Statements of publication ethics

We hereby declare that the study has no unethical issues and that research and publication ethics have been observed carefully.

Ethics Committee Approval Information

The study was carried out with the permission of the Scientific Research and Publication Ethics Committee at Muş Alparslan University (Permission no: 13.10.2022-67409).

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Appendix

Appendix 1. The DEA Scale's Turkish Form

		Kesinlikle Katılmıyorum	Katılmıyorum	Katılıyorum	Kesinlikle Katılıyorum
1	Salgın döneminde uzaktan yapılan derslere katılım sürecim tatmin ediciydi.	1	2	3	4
2	Geleneksel eğitimin aksine uzaktan eğitimde zorluklarla başa çıkarım.	1	2	3	4
3	Uzaktan eğitimin geleneksel eğitimle aynı düzeyde etkili olduğunu düşünürüm.	1	2	3	4
4	Dijital materyaller kullanmadaki zorluklarla başa çıkarım.	4	3	2	1
5	Eşzamanlı/senkron görüşme sürecindeki zorluklarla başa çıkarım.	4	3	2	1
6	Canlı ders/Eşzamanlı görüşme sürecinde dersin hocası ile etkileşim kurabilirim.	1	2	3	4
7	Uzaktan ve geleneksel eğitimde öğrenme çıktılarına eşit şekilde ulaşabileceğimi düşünürüm.	1	2	3	4
8	Uzaktan eğitime katılmak için uygun becerilere sahibim.	1	2	3	4
9	Uzaktan eğitime ve geleneksel eğitime katılma motivasyonum aynı düzeydedir.	1	2	3	4
10	Gelecekte uzaktan öğrenme programlarına katılmayı isterim.	1	2	3	4