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Development of Distance Education Attitude Scale for Higher Education Students [*] [**]

Yükseköğretim Öğrencileri İçin Uzaktan Eğitim Tutum Ölçeğinin Geliştirilmesi

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ABSTRACT

Distance education has been constantly developed for decades and became the only choice for education during the COVID-19 pandemic. In the Turkish higher education, distance education practices were carried out for three semesters during the pandemic. Once again, distance education became the only means of education for higher education after the devastating earthquakes that hit Türkiye in February 2023. Assessing the students' attitudes towards distance education gained importance in order to enhance the learning outcomes of distance education and to define the problems the students had faced. Thus, the researchers aimed to develop a Distance Education Attitude Scale for Higher Education Students in this study. The data were collected from 875 undergraduate students from Turkish state universities. Explanatory Factor Analysis (n_{EFA}= 583) unfolded a two-factor structure with 16 items – explaining 57% of the total variance. For the scale and its two factors, the Cronbach Alpha internal consistency coefficient (.917, .914, .807) and McDonalds Omega coefficient (.920, .925, .811) were found satisfactory. Confirmatory Factor Analysis (n_{CFA}= 292) supported the model-data fit and confirmed the

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reached structure. The "Distance Education Attitude Scale for Higher Education Students" is found to be valid and reliable. The scale is believed to contribute to the quality and efficiency of tertiary distance education practices.
Keywords: *Attitude, Education, Distance Education, Higher Education, Scale Development*

ÖZ

Yıllardır sürekli gelişen uzaktan eğitim, COVID-19 salgını sırasında eğitim için tek seçenek haline gelmiştir. Türkiye'de yükseköğretimde pandemi döneminde üç yarıyıl uzaktan eğitim uygulamaları yürütülmüş ve Şubat 2023'te Türkiye'yi vuran yıkıcı depremlerin ardından uzaktan eğitim bir kez daha yükseköğretim için tek eğitim aracı olmuştur. Öğrencilerin uzaktan eğitime yönelik tutumlarının değerlendirilmesi, uzaktan eğitimde karşılaştıkları sorunları tanımlamak ve öğrenme çıktılarını geliştirmek açısından önem kazanmıştır. Bu nedenle bu çalışmada Yükseköğretim Öğrencileri İçin Uzaktan Eğitim Tutum Ölçeğni geliştirmek amaçlanmıştır. Veriler, Türkiye'de devlet üniversitelerinden 875 lisans öğrencisinden toplanmıştır. Açıklayıcı Faktör Analizi (n_{EFA}= 583), toplam varyansın %57'sini açıklayan 16 maddeden oluşan iki faktörlü bir yapı ortaya koymuştur. Ölçek ve iki faktörü için Cronbach Alpha iç tutarlılık katsayısı (.917, .914, .807) ve McDonalds Omega katsayısı (.920, .925, .811) yeterli bulunmuştur. Doğrulayıcı Faktör Analizi (n_{CFA}= 292) model-veri uyumunu desteklemiş ve ulaşılan yapıyı doğrulamıştır. "Yükseköğretim Öğrencileri İçin Uzaktan Eğitim Tutum Ölçeğine ilişkin geçerlik güvenirlik kanıtları yeterli bulunmuştur. Ölçeğin, yükseköğretim uzaktan eğitim uygulamalarının kalitesine ve verimliliğine katkı sağlayacağı düşünülmektedir.
Anahtar Sözcükler: *Tutum, Eğitim, Uzaktan Eğitim, Yükseköğretim, Ölçek Geliştirme*

INTRODUCTION

Rapid changes in science and technology have entitled 21st century as the information age and knowledge isnowseen as the most important power. The variety of competencies expected from people has profoundly affected education and other areas of life. There have been and will be rapid developments and transformations in education, especially in the higher education, where competition has increased at the international level through globalization.

The advances in technology, the increasing number of students, the shortage of teaching staff, institutions' demand to provide faster and cost-effective in-service training opportunities to their employees, and the spatial and temporal freedom of learning offered by the lifelong learning approach (Ekici, 2003) have moved the societies away from the idea that education conducted in the traditional classroom can be sufficient on

its own. Distance education has emerged by giving the individuals the responsibility for their learning, offering different educational opportunities, and eliminating barriers and geographical restrictions.

The varying demands and technological developments over the years have transformed distance education – which, in the literature, is addressed as distance learning, online education, and Internet or Web-based instruction (Jung, 2001; Leonard, 1999). While there are many definitions, Moore and Kearsley (2005) define distance education as a planned and programmed procedure where students and teachers are in different places, using private lesson designs, applications, and various technologies. Peters (1973) also defined it as the material that makes it possible to teach countless students at the same time with the help of information technologies regardless of the place the students live.

Although its history is quite old, distance education has been constantly transformed and renewed with current technological developments. It is known that there were advertisements in the Boston Newspaper about the conduct of shorthand lessons through letters in 1728. The University of Queensland in Australia ran an off-campus open education program in the 1890s, and in the 1920s, Columbia University also conducted a similar program (Meşhur & Bala, 2015).

While the history of Turkish distance education practices stretches back to 70-80 years, the closest practice to the present applications of distance education officially began in 1982 (Alkan, 1998). Distance education in Türkiye, which was generally carried out by means of communication tools such as letters and videos until 1982, was established on a more planned and scientific basis in 1981 by Anadolu University. With the help of the Internet and digitalization, it aimed meeting the needs of the society and has become an education model that many universities conduct more professionally (Demir, 2014).

Distance education became a vital education and teaching model through which the education or training practices can be carried out during the COVID-19 pandemic breakout in March 2020. The rapid spread of COVID-19 in a short time and its' becoming a threat to the whole world affected the global economy and countries,

causing different measures to be taken in many areas, including education. Measures such as flight bans, declaration of state of emergency, and the closure of schools of all degrees were just a few of the social changes brought about by the pandemic. One of the areas most affected by those measures was education. Face-to-face education was suspended throughout the world, and many countries in the world switched to distance education – including Türkiye. However, the switch to online education did not fully reflect a distance education process because of both the social effects of the pandemic and the lack of experience and time to effectively implement an interactive online course design (Yurdal, Şahin, Aytug Koşan & Toraman, 2021). Scholars of distance education, instructional technologies, and related subjects – including Hodges, Moore, Lockee and Bond (2020) – have suggested that this period can be called "emergency distance education" to distinguish it from the distance education practices pursued under normal conditions.

With the help of the internet, many distance education programs have been developed for higher education in response to the demand for flexible learning environments, continuous education, and lifelong learning (Gunawardena & McIsaac, 2013). In fact, distance education is on the way to become a much preferred and widespread model, especially in higher education, since it has enabled reaching out to larger populations and eliminated the time and space constraints - even before the COVID-19 pandemic. In Türkiye, 123 universities adopt distance education application and research centers while many universities have distance education programs and courses, most of which are at the graduate level in Türkiye (Saraç, 2020). Those existing experiences and applications eased the transition to distance education in tertiary settings during the pandemic.

Deniz and Bağçeci (2021) stated that distance education is used as an option to continue education during regional and national problems the countries face. Distance education has shown its existence throughout the pandemic not as the last choice but the only choice in education (Can, 2020). The devastating earthquakes that hit Türkiye on February 6, 2023, forced Turkish higher education to switch to distance education once

again. Due to the destruction and fatality caused by the earthquakes, Turkish Council of Higher Education declared that higher education programs in Turkiye continue through distance education during the Spring 2023 semester – except for the programs which include apprenticeship, internship, teaching practice, or hands-on training such as medicine, dentistry, veterinary medicine, nursing, midwifery, teaching, and some engineering programs (Yükseköğretim Kurulu, 2023, February 17).

Since distance education secured its position in the future of education, the contribution of the distance education to the education practices, the opinions of the stakeholders, and the long-term effects of distance education on societies are now the main concerns of scientific research. With the developing and changing technologies, distance education can reach large masses in a short time (Eroğlu & Kalaycı, 2020). There are many advantages of distance education including providing flexibility to all parties (Nieuwoudt, 2020), lower cost compared to traditional education, easier to follow the course and faster grade sharing (Thompson & Ku, 2005), the ability to connect to the course from anywhere with the internet (Angelova, 2020), and positive affect on the acquisition of cognitive behaviors (Bergdahl & Nouri, 2021). In contrast, there are studies which suggest that lack of student interaction and collaboration (Dumford & Miller, 2018; Felix, 2001; Lee et al., 2011), absence of face-to-face interaction with the instructors, delayed responses, and lack of traditional classroom interaction and socialization (Adnan & Anwar, 2020; Eygü & Karaman, 2013; Keskin & Özer Kaya, 2020; Yalman, 2013), technical problems (Bakhmat et al., 2021; Bergdahl & Nouri, 2021; Muthuprasad et al., 2021), lack of necessary resources and infrastructure (Doyumağaç et al., 2020; Qashou, 2022; Sun, Tang, & Zuo, 2020), or the lack of technical experience in using the distance education tools (Sari & Nayır, 2020; Smidt et al., 2014) are among the disadvantages of distance education.

Examining the views of the main stakeholders of distance education – namely the students and teachers – also gained importance as they vitally contribute to the distance education practices. Since the applications of distance education in Türkiye reached its peak during the pandemic, several instruments were developed by researchers to

investigate the attitudes of students towards distance education (Deniz & Bağçeci, 2021; Yıldız et al., 2021; Demirel, 2022). However, distance learning was already in use in the Turkish higher education context before the pandemic, so there were some instruments existed in the literature to examine its efficiency through student attitudes. As an example, Ağır et al. (2007) developed a one-factor attitude scale toward distance education consisting of 21 items to determine the attitude of secondary teachers towards distance education. Haznedar and Baran (2012) developed the General Attitude Scale Towards e-Learning for Faculty of Education students. Their scale consists of 20 items and two factors called tendency to e-learning and avoidance of e-learning. Yıldırım et al. (2014) developed a distance education attitude scale for nursing undergraduate completion program. The four-factor scale consists of 18 items and the domains include personal suitability, effectiveness, instructiveness, and familiarity to distance education. Arslan et al. (2019) also developed an attitude scale towards distance learning for undergraduate students. Their scale consists of 36 items with five dimensions called advantages for participants, technical dimension, desire for education, efficiency of instruction, and problems faced. Basaran and Yalman's (2020) attitude scale for web conference systems also aimed to examine the attitudes of students towards distance education. The scale consists of 17 items with four factors called user demands, user attitudes, user preferences, and user problems. Çelik and Uzunboylu (2022) developed and Attitude Scale Towards Distance Learning with 16 items and four dimensions named usefulness, communication, preference for distance learning, preference for face-to-face learning.

When the years the aforementioned scales were developed considered, it is seen that the studies were relatively few until 2012, but they gained momentum after 2012 until 2020 by the help of technological developments and globalization of education. With the pandemic, there is another increase in the scale development studies conducted in Türkiye. Deniz and Bağçeci (2021) developed a distance education attitude scale for teachers which consisted of 20 items with two dimensions called benefits of distance education and limitations of distance education. Yıldız et al. (2021) developed a 24-item

Attitude Scale Regarding the Use of Distance Education Environments in the Pandemic Process to examine the attitudes of associate degree students towards distance education practices during the pandemic. Demirel (2022) developed the Students' Attitude Scale for the Online Education which has 30 items under six dimensions named efficiency, functionality, necessity, effectiveness, competence, and attitude toward trainers in online education.

Recently, natural disasters and outbreaks such as Covid-19 pandemic has greatly affected formal education and higher education systems in all countries. Many brick-and-mortar institutions had been forced to choose distance education over the traditional face-to-face education in order to continue education. For this reason, to increase the quality of distance education and to offer permanent solutions for the future applications, it is important to assess the attitudes of the main stakeholders. Accordingly, this study aimed to develop a scale to assess the attitudes of higher education students towards distance education.

This study introduces a new scale that differs from previous instruments in the literature in several ways. Firstly, unlike many existing scales that focus on specific student groups or academic disciplines, this instrument is designed to be applicable to university students across all programs in Türkiye, acknowledging the diverse needs and experiences of learners from various academic backgrounds. Secondly, the scale's development process involved participants from diverse demographic backgrounds, ensuring that the instrument is sensitive to the unique challenges and perspectives of students from different socioeconomic, cultural, and geographical contexts within Türkiye. Thirdly, recognizing the potential for distance education to be implemented in various scenarios, the scale items are not explicitly tied to any specific disaster, emergency, or incident that necessitates a transition to remote learning. This flexibility allows the scale to be utilized in assessing the distance education experience regardless of the circumstances, making it a valuable tool for evaluating both planned and unplanned implementations of this learning modality.

METHOD

This research is designed as a scale development study. In this section, the scale development process is explained in detail through the following sub-headings.

Participants

In the research, convenience sampling (Creswell & Creswell, 2018) was used to choose the participants who were 875 undergraduate students from 27 public universities in Türkiye. The collected data set was randomly split into two groups to conduct exploratory and confirmatory factor analysis. The exploratory factor analysis (EFA) file involved the data of 583 students and the confirmatory factor analysis (CFA) file involved the data of 292 students. According to Kline (1994) the recommended minimum sample size for conducting exploratory factor analysis (EFA) should be at least 100. The descriptive statistics of the participants and data are as given in Table 1.

Table 1. Descriptive Statistics of Participants

Variable		EFA group	CFA group		
		f	%	f	%
Gender	Female	452	77.5	223	76.4
	Male	131	22.5	69	23.6
Year	Prep student	18	3.1	11	3.8
	1st year	268	46.0	134	45.9
	2nd year	188	32.2	88	30.1
	3rd year	74	12.7	38	13.0
	4th year	35	6.0	21	7.2
Faculty	Aeronautics and Astronautics	-	-	1	.3
	Agriculture	19	3.3	12	4.1
	Architecture	2	.3	4	1.4
	Arts and Sciences	10	1.7	5	1.7
	Communication	2	.3	2	.7
	Economics and Administrative Sciences	14	2.4	10	3.4
	Education	502	86.1	236	80.8
	Engineering	1	.2	1	.3
	Engineering and Natural Sciences	1	.2	1	.3
	Fine Arts	15	2.6	8	2.7

Letters	7	1.2	4	1.4
Medicine	4	.7	2	.7
Political Sciences	-	-	1	.3
Tourism	1	.2	1	.3
Transportation and Logistics	1	.2	1	.3
Veterinary Medicine	4	.7	4	1.4
Total	583	100	292	100

As presented in Table 1, 77.5% of the participants were female (n=452) while 22.5% of them were male (n=131). 3.1% (n=18) of the participants were in their preparatory year while 46% (n=268) were in 1st year, 32.2% (n=188) in 2nd year, 12.7% (n=174) in 3rd year, and 6% (n=35) in 4th year. Participants were from 27 different universities and 16 different faculties.

Developing the Scale

To create an item pool and to develop the draft scale, the researchers reviewed the existing distance education literature and planned semi-structured interviews to reveal the thoughts and experiences of undergraduate students with distance education during the COVID-19 pandemic. A semi-structured interview form, which consisted of 7 open ended questions was created, and e-mailed to 16 undergraduate students at the end of 2020-2021 Fall Semester. Each student replied to the form with detailed comments.

To form the item pool, literature review, students' comments on the interview form, and professional experience gave insight to the researchers. The item pool was carefully constructed to include the theoretical dimensions of attitude: cognitive, affective, and psychomotor components. As Karasar (2020) emphasizes, attitude statements should comprehensively capture the intellectual, emotional, and action-oriented elements pertaining to the attitude object or the specific dimension being measured. Accordingly, this research considered the theoretical foundations of attitude and its multidimensional nature, ensuring that the item pool reflected all aspects of attitude (cognitive, affective, and behavioral) as suggested by Karasar (2020) and Kan and Akbaş (2005). Furthermore, to enrich the item pool, the researchers reviewed and drew insights from other scale development studies related to attitudes. By integrating theoretical foundations and existing literature, the attitude statements were methodically crafted

and incorporated into the item pool, resulting in a comprehensive and well-grounded instrument for assessing higher education students' attitudes towards distance education.

An item pool consisting of 38 items was created and the developed draft scale was e-mailed to two professors of Educational Sciences, one of Computer Education and Instructional Technologies, and one of Measurement and Evaluation in Education. They were asked to evaluate each item as “very suitable”, “suitable with changes”, and “not suitable.” In line with their reviews, three items were crossed out of the scale and some alterations were made on certain items. The final form was a 5 Likert type consisting of 35 items. Nine items of the scale were reverse coded as they reflect positive attitude towards online learning.

Data Collection and Analysis

The scale form was uploaded to an online survey website and sent to participants via e-mail and on social media platforms. Data collection lasted three months throughout 2020-2021 Spring Semester. During this process, a total of 897 participants volunteered to fill out the form.

Before starting the analysis, missing or wrong values were omitted from the data set. The forms filled out by a total of 875 undergraduate students were considered for analysis. Then, validity and reliability studies were performed. Participants were divided into two groups randomly (n1=583; n2=292). EFA was performed on the first group, while CFA was performed on the other. For internal consistency, Cronbach Alpha, and McDonald’s Omega coefficient values for the whole test and for each of the factors were calculated. In order to determine the items of the scale, Cronbach's alpha (coefficient of reliability ≥ .70) and item-total correlation (correlation coefficient ≥ .30) were tested (DeVellis, 2017; Karasar, 2016).

The construct validity of the scale was investigated by EFA. Principal component analysis was conducted using varimax rotation. Kaiser–Meyer–Olkin factor analysis was implemented to decide the fittingness of data for factor analysis, and to designate, rotate, and name the factors.

All statistical analyses were executed using IBM Statistical Package for the Social Sciences (SPSS) 25. CFA was performed using SPSS AMOS. All statistical analyses were conducted with a significance level of $p<.05$. McDonald's Omega coefficient, average variance extracted (AVE), and composite reliability (CR) values were obtained using JAMOVI Statistical Software.

FINDINGS

Exploratory Factor Analysis

At the beginning, the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's test of Sphericity were implemented to find out the appropriateness of the scale for principal component analysis. After the analysis, the dataset was found fitting for dimensional structure analysis (KMO = .939, X2 = 4689.728; $p<.01$). For the dataset to be factored, the KMO value expected to be greater than .60 (Büyüköztürk, 2013; Tabachnick & Fidell, 2019). Thus, the dataset was found to be suitable for dimensional structure analysis. In order to obtain the dimensional structure, EFA was conducted with varimax with Kaiser normalization rotation method (see Table 2).

Table 2. Factor Loads of the Distance Education Attitude Scale for Higher Education Students

Factor Name	Item No	Item	Factor Load
Constraints of Distance Education Includes 10 items. 8 reverse coded items. The score that can be obtained from the scale varies between 10-50.	33	I think that the fatigue caused by constantly looking at the screen makes it difficult for me to learn. (-)	.832
	35	In the distance education, technical problems of the system negatively affect my motivation. (-)	.824
	31	I think that staying in front of the computer in distance education will negatively affect my health. (-)	.795
	34	Not being able to make eye contact with the instructor in distance education bothers me. (-)	.720
	25	Distance education limits my verbal communication with my classmates and lecturers. (-)	.714
	18	I find it difficult to concentrate in distance	.708

		education classes. (-)	
	12	Distance education is not suitable for applied courses. (-)	.686
	3	The quality of the education I receive decreases in distance education. (-)	.635
	14	Distance education offers students equal learning opportunities.	.621
	23	I am more active in distance education classes than face-to-face education.	.587
Strengths of Distance Education Includes 6 items. 1 reverse coded item. The score that can be obtained from the scale varies between 6-30.	22	Different teaching methods-techniques in distance education courses keep me motivated.	.744
	15	I take responsibility for my own learning in distance education	.734
	2	One of the best things about distance education is that the lessons are recorded, and I can watch them again whenever I want.	.710
	4	Distance education allows me to progress at my own pace.	.638
	17	I freely express my views in distance education classes.	.596
	6	Learning is not permanent in distance education (-)	.592

As suggested by Büyüköztürk (2013), 16 items which loaded on more than one factor, had less than .20 factor load difference between factor loads, or had less than .40 factor load were removed from the scale (items 1, 5, 7, 9, 10, 11, 13, 16, 19, 20, 21, 24, 26, 27, 28, and 32). According to the data obtained from the first factor analysis, it was determined that 52.16% of the variance in the scale scores was explained under 2 factors with an eigenvalue above 1.00. The variance data obtained from the first factor analysis and the scree plot were examined. Scree plot, which is used to determine the number of dominant factors (Çokluk, Şekercioğlu, and Büyüköztürk, 2010), showed that the scale was gathered under 2 factors. The remaining 19 items were re-analyzed by limiting them to 2 factors. Looking at the factor analysis performed after the limitation, items with a difference of less than .10 in two factors (8, 29, 30) were removed from the scale and 16 items remained on the scale. A two-factor structure ('Constraints of Distance Education' and 'Strengths of Distance Education') remained by comprising of 16 items which had an eigenvalue greater than 1.

Additionally, to examine the internal consistency of the scale, Cronbach's alpha coefficient, McDonald's Omega coefficient, average variance extracted, composite reliability, item-total, and inter-item correlation analyses were implemented (see Table 3). Reliability analyses has shown that the internal consistency reliability of the scale and sub-scales were found to be satisfactory (Cronbach Alpha: DEAS-HE=.917, Constraints of Distance Education=.914, Strengths of Distance Education=.807; McDonald's Omega DEAS-HE=.920, Constraints of Distance Education=.915, Strengths of Distance Education= .811). For Strengths of Distance education sub-scale, average variance extracted (AVE) was found to be .437 while it was .359 for Constraints of Distance Education sub-scale. Composite reliability (CR) was found .768 for Constraints of Distance Education while it was .892 for Strengths of Distance Education.

Table 3. Validity and reliability coefficients of the Distance Education Attitude Scale for Higher Education Students

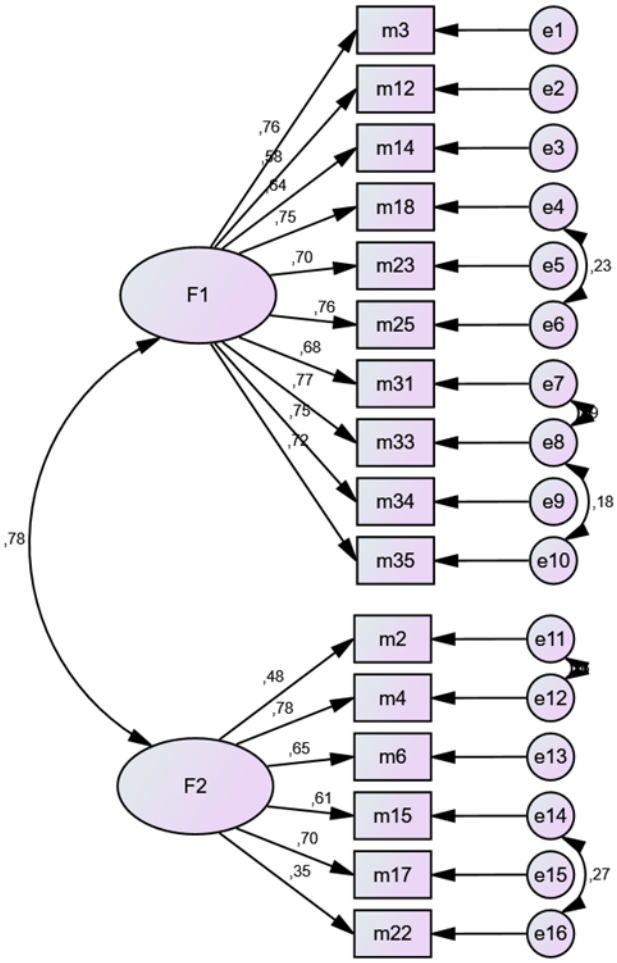
Factor Name	**Cronbach's alpha**	**McDonald's Omega**	**AVE**	**CR**
Distance Education Attitude Scale for Higher Education Students	.917	.920		
Constraints of Distance Education Sub-Scale	.914	.915	.359	.768
Strengths of Distance Education Sub-Scale	.807	.811	.437	.892

The results showed that item-total correlations of 16 items ranged from .342 to .726. Also, 57,162% of total variance (Constraints of Distance Education = 45,349%, Strengths of Distance Education = 11,814%) was explained by the two factors.

Confirmatory Factor Analysis

CFA was performed on the two-factor structure that was acquired with the EFA. The diagram found through the CFA is presented in Figure 1.

Figure 1. Path diagram (standardized values) of the CFA for Distance Education Attitude Scale for Higher Education Students (DEAS-HE: YUETÖ in Turkish) F1: Constraints of Distance Education, F2: Strengths of Distance Education



The fit indexes of the path diagram (Figure 1) were calculated as: X2/sd=2.75 and p>.05, root mean square error of approximation (RMSEA)=.078, normed fit index (NFI)=.889, incremental fit index (IFI)=.926, comparative fit index (CFI)=.925, adjusted goodness of fit index (AGFI)=.849, and goodness of fit index (GFI)=.891. These values are recommended as fitting in the previous studies (Table 4).

Table 4. Fit Indexes

Index	Criterion	Value	Reference
x2/df	≤ 3	2.750	Schermelleh-Engel et al., 2003
RMSEA	.00<RMSEA<.10	.078	Browne & Cudeck, 1993; MacCallum et al.,1996
NFI	.90 <NFI <1.00	.889	Schermelleh-Engel et al., 2003
IFI	.90 <IFI <1.00	.926	Bentler, 1990; Hu & Bentler, 1999; Sümer,
CFI	.90 <CFI <1.00	.925	2000
AGFI	.80 <AGFI <1.00	.849	Anderson & Gerbing, 1984; Jöreskog & Sörbom, 1993; Marsh et al., 1988
GFI	.85 <GFI <1.00	.891	Jöreskog & Sörbom, 1993

CONCLUSION, DISCUSSION AND SUGGESTIONS

Through this study, the researchers aimed to develop a valid and reliable scale that will reveal higher education students' attitudes towards distance education. With the pandemic that broke out at the beginning of 2020, educational institutions in Türkiye, as in all countries in the world, had to switch to emergency distance education. Although distance education allows learning to be carried out independently of time and space, teacher-learner interaction decreases and if the necessary support and feedback is not provided, the student may feel lonely.

The attitudes of the students are among the most important factors affecting the quality and success of distance education practices. Investigating students' attitudes regarding the strengths and limitations of distance education can guide considerations for future applications. It can be said that distance education will become a fundamental part of the education processes because of the gradual development of technology as well as unexpected global situations including pandemics (Deniz & Bağçeci, 2021; Palvia et al., 2018). There are also some arguments about the permanency of distance education that in the future it will replace the formal education (Mishra, Gupta, & Shree, 2020). For these reasons, this study aims to develop a valid and reliable scale that will reveal the attitudes of higher education students toward distance education.

In the study, 875 students from different universities in Türkiye voluntarily filled in the online scale. To test the validity and reliability of the scale, exploratory factor analysis

was applied to the dataset of the group consisting of 583 students, and confirmatory factor analysis was applied to the dataset of the second group consisting of 292 students. The scale items were created in line with the answers written by a group of 15 students to open-ended questions, the literature review, and the comments of field experts. Accordingly, there were 35 items in the pilot application of the scale. The scale items are in the form of a 5-point Likert scale with the choices ascending from strongly disagree (1) to completely agree (5).

Through the exploratory factor analysis, a 16-item scale consisting of two structures was reached. The highest score that can be obtained from the scale is 80 while the lowest is 16. The variance ratio explained by the two sub-dimensions is 57,162%. The factor loading values of the items are between .587 and .832. Two structures with eigenvalues greater than 1 were also confirmed with the CFA. According to the CFA results, it was determined that all fit indices had acceptable values (GFI:.891, NFI:.889, RMSA: .078). The sub-dimensions of the scale were named as "constraints of distance education" and "strengths of distance education". The Cronbach Alpha value was found as .917 for the whole scale, .914 for the constraints of distance education sub-dimension, and .807 for the strengths of distance education sub-dimension. McDonald's Omega was calculated .920 for the constraints of distance education, .915 for the strengths of distance education, and .811 for the whole scale. AVE was found to be .437 for the strengths of distance education dimension, and .359 for constraints of distance education. CR was .768 for constraints and .892 for strengths of distance education. As a result of those analyses, it has been concluded that the scale is valid, reliable, and can be utilized to reveal the attitudes of university students towards distance education.

This study differs from the previous scales in the literature mainly with its target population and the demographics of participants. The findings of the scale development studies conducted before the pandemic (Ağır et al., 2007; Arslan et al., 2019; Başaran & Yalman, 2020; Çelik & Uzunboylu, 2022; Haznedar & Baran, 2012; Kışla, 2016; Usta et al., 2016; Yıldırım et al., 2014) are not discussed in this study since distance education was not conducted in all Turkish higher education institutions and the number

of students with distance education experience were limited. Among the distance education attitude scales developed in Türkiye during or after pandemic, Deniz and Bağçeci's (2021) were excluded in discussion since it targeted K-12 teachers not higher education. The scale development studies conducted in higher education setting include Yıldız et al. (2021) who conducted their study at a specific institution with 321 associate degree students. Although Demirel (2022) stated that the scale did not target a specific local community, 341 participants of that study were limited to one city and three universities and faculties. The participants of this study were 875 voluntary students from 27 different universities and 16 different faculties in Türkiye to ensure a broader participation and perspective.

When the items and dimensions of the scales are compared, it is concluded that the present scale shares some items concerning student motivation, communication with peers and teachers, permanence of learning, and technical issues with Yıldız et al.'s (2021) and Demir's (2022) scales. However, Yıldız et al.'s (2021) scale differs from the two as all the items of their scale concern the distance education platform. In Demir's (2022) attitude scale, all the items under necessity dimension focus only on health issues and pandemic. It is considered that those items may limit the use of the scale only to distance education practices during pandemic. In order to broaden the scope, the items of the scale developed in this study was intended not to include any specific attributions to disasters or other incidents that force a switch to distance education.

As a conclusion, it can be stated that Distance Education Attitude Scale for Higher Education developed through this study is valid and reliable, and it can be used in future research to contribute to the efforts to achieve a more qualified conduct of distance education practices. As for future research, the scale can be adapted to different levels of education in different settings.

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GENİŞ ÖZET

Giriş

Bilginin en önemli güç olarak görüldüğü çağımızda, bireylerin çağın gerektirdiği şekilde kendini geliştirmesi ve sürekli öğrenen durumunda olması toplumların en büyük ihtiyaçlarından birisi haline gelmiştir. Teknolojik gelişmeler, küreselleşme, dijitalleşme gibi etkenler, eğitimin her kademesi gibi yükseköğretimde de birçok yeniliğe öncülük etmiştir. Eğitim alanında yaşanılan değişimin ve yeniliğin en önemli ürünlerinden birisi uzaktan eğitim olmuştur. Öğrenene zamandan ve mekandan yana özgürlük tanıyan uzaktan eğitim modeli bireylerin öğrenme yolculuğuna eşlik eden en önemli araçlardan birisi haline gelmiştir. Uzaktan eğitim modeli yüz yıllardır teknoloji ve toplumsal ihtiyaçlar dahilinde sürekli gelişmeye devam ederken, 2019 yılının son günlerinde tüm dünyayı etkisi altına alan ve bir salgına dönüşerek dünya çapında etkisini sürdüren COVID-19 pandemisi nedeniyle eğitim sisteminin tek ve son çaresi haline gelmiştir. Bu süreçte birçok ülke, salgını kontrol altına almak amacıyla yüz yüze eğitimlerine ara verip, eğitim ve öğretim faaliyetlerine uzaktan eğitimle devam etme kararı almıştır. Salgın, ülkemizde de tüm eğitim kademelerinde acil uzaktan eğitim kararlarının alınmasına neden olmuş, Türkiye'de birçok üniversitenin uzaktan eğitim sistemlerinin halihazırda var olması, uzaktan eğitime geçişi hızlandırmış ve kolaylaştırmıştır. Pandemi süreci etkisini yitirip eğitim tekrardan yüz yüze devam ederken 2023 yılı şubat ayında Türkiye'yi arka arkaya vuran depremler oldukça derinden etkilemiştir. Söz konusu depremin şiddeti ve 10 ilden daha fazla ilde yaratmış olduğu yıkım ve etki sebebi ile Türkiye'de yeniden yükseköğretimde uzaktan eğitime geçilmiştir. Eğitim sisteminin uzaktan eğitime entegrasyonu konusunda birtakım avantajların yanında dezavantajların yaşandığı da bilimsel araştırmalar dahilinde tespit edilmeye çalışılmıştır. Bu kapsamda ülkemizde yükseköğretimde acil uzaktan eğitim sürecinin ve öğrencilerin bu süreçte ne tür sıkıntılarının olduğunun, uzaktan eğitime karşı tutumlarının ve algılarının ne yönde olduğunun tespit edilmesi, eğitimin kalitesinin, niteliğinin artırılması ve ileriye yönelik daha kalıcı çözüm önerilerinin getirilmesi açısından önemlidir. Ayrıca uzaktan eğitimin başarıya ulaşmasında öğrencilerin tutumunun etkili olduğu yadsınamaz bir gerçektir. Bu bağlamda, araştırma kapsamında yükseköğretim öğrencilerinin uzaktan eğitime yönelik tutumlarını belirleyebilmek için bir ölçek geliştirmek amaçlanmıştır.

Yöntem

*Bu araştırma bir ölçek geliştirme çalışması olarak tasarlanmıştır**.** Araştırmanın evrenini Türkiye'deki devlet üniversitelerinin lisans öğrencileri oluştururken; araştırmanın örneklemini kolay ulaşılabilir örnekleme yöntemi ile çevrimiçi ortamda ulaşılan 875 katılımcı oluşturmaktadır. Madde havuzunun oluşturulması amacıyla alanyazın taraması yapılarak uzaktan eğitimle ilgili anahtar kavramlar belirlenmiş, görüşme soruları hazırlanmış ve uygulamadan önce uzmanlar tarafından görüşme sorularına dönüt verilmiştir. 2020-2021 güz eğitim-öğretim dönemi sonunda 16 lisans öğrencisine 7 açık uçlu sorudan oluşan yarı yapılandırılmış görüşme formu e-posta yoluyla gönderilmiştir. Görüşme formlarının analizi, araştırmacılar tarafından yapılan geniş alan yazın taraması ve mesleki deneyimleri araştırmacıların 38 maddelik bir madde havuzunun oluşturulmasına yardımcı olmuştur. Bu maddelerden geliştirilen taslak ölçek, Eğitim Bilimleri alanından dört, Bilgisayar ve Öğretim Teknolojileri Eğitimi alanından bir uzmana ve*

ölçek geliştirme çalışmaları yapan istatistik alanında bir uzmana gönderilerek taslak ölçekte yer alan her bir maddeyi "çok uygun, değişikliklere uygun ve değişikliklere uygun değil" şeklinde değerlendirmeleri istenmiştir. Uzmanların görüşleri doğrultusunda ölçekten üç madde çıkarılmış ve bazı maddeler üzerinde düzenlemeler yapıldıktan sonra 35 maddeden oluşan "kesinlikle katılmıyorum (1) ile tamamen katılıyorum (5) arasında değer alan beşli likert tipi bir ölçek form elde edilmiştir. Ölçeğin dokuz maddesi uzaktan eğitime yönelik olumlu tutumu yansıttığı için ters odlanmıştır. Ölçek formu 2020-2021 bahar döneminde çevrimiçi ortamda katılımcılara gönderilmiş ve ölçek için veri toplama süresi üç ay sürmüştür. Ölçek geliştirme çalışması için katılımcılara gönderilern veri toplama aracını 897 kişi yanıtlasa da eksik verilerden ötürü araştırmaaya 875 lisans öğrencisi tarafından doldurulan veri dahil edilmiştir.

Sonuç

Katılımcılardan gelen veriler rastgele iki gruba ayrıldıktan sonra birinci grup için Açıklayıcı Faktör Analizi (nAFA= 583), ikinci grup için Doğrulayıcı Faktör Analizi (nDFA= 292) yapılmıştır. Açıklayıcı faktör analizi sonucunda "Uzaktan Eğitimin Sınırlılıkları" ve "Uzaktan Eğitimin Güçlü Yönleri" olarak adlandırılan iki faktör ve toplam 16 madden oluşan, toplam varyansın ise %57'sini açıklayan bir yapıya ulaşılmıştır. Cronbach Alfa iç tutarlılık katsayısının testin tamamı (.91) ve faktörleri (.91, .80) için tatmin edici olduğu belirlenmiştir. Doğrulayıcı faktör analizi sonucunda ulaşılan değerlerin model veri uyumunu desteklediği ve ulaşılan yapıyı doğruladığı görülmüştür. Ölçeğin yapı geçerliği varimax döndürmeli temel bileşen kullanılarak AFA ile araştırılmıştır. Verilerin faktör analizi, faktörlerin belirlenmesi, faktörlerin döndürülmesi ve faktörlerin adlandırılması için uygun olup olmadığına karar vermek için ise Kaiser-Meyer-Olkin faktör analizi uygulanmıştır. Tüm istatistiksel analizler SPSS 25 paket programı kullanılarak yapılmıştır. DFA için ise SPSS AMOS kullanılmıştır. Tüm istatistiksel analizlerin anlamlılık düzeyinin $p<.05$ olduğu tespit edilmiştir.

Öğrencilerin uzaktan eğitimin güçlü ve sınırlı yönlerine dair tutumlarının ne olduğunun bilinmesi eğitimin kalitesi ve niteliği açısından birtakım önlemlerin alınabilmesinde oldukça önemlidir. Ayrıca teknolojinin ve dijitalleşmenin giderek arttığı günümüzde uzaktan eğitim için eğitimin ayrılmaz bir parçası olacağı yönünde bir hayli fazla görüş bulunmaktadır. Bu nedenlerle bu çalışmada yükseköğretim öğrencilerinin uzaktan eğitime yönelik tutumlarını ortaya çıkaracak geçerli ve güvenilir bir ölçek geliştirilmesi amaçlanmış ve araştırma kapsamında geliştirilen "Uzaktan Eğitim Tutum Ölçeğinin" geçerli ve güvenilir olduğu sonucuna ulaşılmıştır. Bu ölçeğin, uzaktan eğitim faaliyetleri yürüten üniversitelerde deneyimlenen problemleri belirleyerek eğitimin niteliğini geliştirmeye ve verimliliğini artırmaya katkı sağlayacağı düşünülmektedir.

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Contribution of Researchers

The authors contributed equally to the planning, execution and writing of this study.

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Conflict of Interest

The authors declare that they have no conflict of interest, neither financial nor nonfinancial.

Ethics

This study was conducted with the approval of Gazi University Ethics Commission dated 16.02.2021and numbered E- 77082166-604.01.02-33921.