Journal of Educational Technology & Online Learning
Volume 4 | Issue 2 | 2021
http://dergipark.org.tr/jetol

A valid and reliable scale development study to determine the problems encountered by teachers in the distance education process

Mustafa Metin [a*], Nurullah Korkman[b]

[a] Erciyes University, Turkey.
[b] Cumhuriyet Middle School, Turkey.

Suggested citation: Metin, M. & Korkman, N. (2021). A valid and reliable scale development study to determine the problems encountered by teachers in the distance education process, *Journal of Educational Technology & Online Learning*, 4(2), 215-235

Article Info

Keywords:

Technological development
Distance education
Teacher problems
Scale development

Research Article

Abstract

The aim of study is to develop a valid and reliable scale in order to determine problems encountered by teachers in distance education process. Survey research method was used in the study. The sample of research consists of 411 teachers working in different branches and recitation with distance education at the 2019-2020 academic years. In this study, it was used teachers' problems determination scale consist of 47 items as a data collection tool. In order to validity of the scale, content, construct and face validity was examined. Besides, the cronbach alpha coefficient was calculated for the reliability study. Expert opinion was taken for the content and face validity, and exploratory and confirmatory factor analysis was applied for construct validity. As a result of the exploratory factor analysis, thirteen items were removed and the scale consists of five-factor was confirmed by confirmatory factor analysis. As a result of confirmatory factor analysis, it was calculated values of RMSEA 0.046, GFI 0.83, CFI 0.93 and IFI 0.92. Besides Cronbach alpha internal consistency reliability coefficient of the scale was found 0.892. As a result, a valid and reliable scale consisting of 34-items was developed to determine problems encountered by teachers in distance education process.

1. Introduction

Rapidly developing technology enables the creation of environments that will affect all segments of life. Depending on the rapidly development of technology, it is seen that different applications have emerged in the field of education. In this context, applications such as computer-aided education, computer-based education, web-based education, education using web 2.0 technologies, and distance education can be evaluated as the effects of technology on education (Korkman, 2018)

Among these developments, distance education applications, which have been widely used recently, draw attention in this area. In fact, it is seen that distance education applications are not a new application and have been used before. Distance education was first mentioned in the 1892 Catalog of the University of Wisconsin and was used in an article written in 1906 by William Lighty, the director of the same university. Since the 1960s, the term has had an expanding user base in the light of technological developments (Adıyaman, 2002).

In this historical process, researchers have attributed different meanings to the concept of distance education and made different definitions. According to the definition made by the University of

* Corresponding author: Erciyes University, Turkey
e-mail addresses: mustafametin@erciyes.edu.tr

Doi: http://doi.org/10.31681/jetol.911074
Received 7 Apr 2021; Revised 29 May 2021; Accepted 29 May 2021;
ISSN: 2618-6586 .

Wisconsin Continuing Education Group, Distance education; prepared in a way to create student interaction and learning opportunities; It is the practice of creating and experiencing designed learning environments that use technological developments in order to bring together participants in different environments (Adıyaman, 2002). According to another definition, distance education is educational practices where students and teachers are located in different places, and learning materials are performed synchronously or asynchronously by using technological infrastructure (Akkoyunlu & Bardakcı, 2021). However, Bozkurt & Shamer (2020) describe education as distance education in cases where there is no space and time limit between the students.

Although there are different definitions of distance education, many researchers agree on the contribution of distance education to education. In the literature, it is stated that the concepts of time and space in distance education allow an education style independent of time and space (Akkoyunlu & Bardakcı, 2021). In addition, it is emphasized that with distance education, students can gain multidimensionality in both communication and research stages during education activities by having multiple interaction environments in the field of education with devices such as computers, tablets and smart phones (Haşlaman et al., 2008) In addition, distance education is claimed to give students an awareness of learning by placing them at the center of education (Kaya, 2002). In addition, it is stated that thanks to the asynchronous applications of distance education, students find opportunities to repeat the lessons as much as necessary, to follow the lessons whenever they want, and to learn according to their own progress (Aslan, 2006). In addition, it is emphasized that students can complete their incomplete educational achievements by interacting with other students or educated people that they do not fully understand during distance education activities (Aslan, 2006; Çelen, Çelik, & Seferoğlu, 2011). Students and researchers who conduct research with the distance education method can obtain information from people in different places and obtain the resources they want by spending a little time (Birişçi & Metin, 2009). In addition, distance education eliminates time and space limitations, enabling the student to learn in a less costly and comfortable environment. As a result, learning becomes more enjoyable (Aydın, 2002; Duyar, 2016). Changing conditions with distance education can be quickly adapted to the new situation and continuity in learning activities can be ensured. Besides, the student has the opportunity to test what they have learned by conducting assessment activities with distance education (Kaya, 2002). In addition, if there is incomplete learning, it can be overcome with the unlimited repetition opportunity offered by distance education (Aslan, 2006).

In addition to the advantages of distance education, there were some limitations (Korkman, 2018). One of these limitations is that very few teachers have sufficient knowledge, skills and experience skills for the development, design and implementation of distance education course materials (Kaya, 2002). In addition, teachers and students should have technological devices such as computers, tablets or smart phones required for distance education applications and have the skills to use these devices adequately (Aslan, 2006; Çelen et al., 2011; Duyar, 2016). In addition, the fact that the preparation and digitization of existing face-to-face training materials for distance education is difficult requires expertise and is a long time-consuming process can be expressed as another limitation of distance education (Demir, 2014). However, in distance education; since the evaluation cannot be done face to face, it causes problems in the evaluation process (Aslan, 2006; Duyar, 2016). In addition, teachers are required to gain expertise in providing individual feedback to students and evaluating student performance online (Demir, 2014).

2. Literature

Despite the advantages and limitations of distance education, it can be said that it is a preferred education application today. In this context, when the studies in the field of distance education / online education are examined in the literature, it is seen that there are different studies and research results. There are studies examining in literature; the effect of distance education on academic achievement (Başarmak, 2013; Gündüz 2005; Polat Çevik, 2010; Olpak 2010; Yılmaz, 2015; Korkman & Metin, 2021), its effect on teacher and student attitudes (Bodur 2010; Gümüş, 2007; Yılmaz, 2015), its effect on students' motivation

(Başarmak, 2013). In addition, with the pandemic process, it is seen that there is an increase in distance education applications.

In addition, in the process of the Covid-19 pandemic, Studies were carried out primary school students, (Bozkurt, 2020; Sirem & Baş, 2020) university students, (Aktaş, et al., 2020; Altuntaş Yılmaz, 2020; Çetin, 2020; Eroğlu & Kalaycı, 2020; Genç & Gümrükçüoğlu, 2020; Karadağ & Yücel, 2020; Karakuş & Yanpar Yelken, 2020; Karakuş et al., 2020; Karatepe, Küçükgençay & Peker, 2020; Keskin & Özer Kaya, 2020; Yolcu, 2020), teachers, (Bakioğlu & Çevik, 2020; Doğan & Koçak, 2020; Kocayiğit & Uşun, 2020; Özdoğan & Berkant 2020; Tekin, 2020) higher education institutions (Dikmen & Bahçeci, 2020) and review studies for distance education (Akyürek, 2020; Sarı, 2020; Telli Yamamoto & Altun, 2020).

When the studies conducted with teachers in the literature are examined, it is seen that teachers' opinions, attitudes, knowledge levels, thoughts about the education process are determined and examined the problems they encounter in distance education with a qualitative research. It is seen that there are a limited number of studies that identify or examine the problems encountered in the distance education process. Accordingly, teachers, who are the implementers of distance education, which has become compulsory with the Covid19 pandemic process, have recently started to use distance education applications, making it inevitable that they will have difficulties in this area. In order to determine the problems encountered by teachers in the distance education process and to propose solutions to these problems, it is necessary to conduct a generalizable study with a large sample. For this, there is a need for a valid and reliable scale that will determine the problems teachers encounter in the distance education process.

When the scale development studies related to distance education are examined in the literature, it was seen that the scale on distance education such as satisfaction scale (Parlak, 2007), social presence scale (Çakmak, Çebi, & Kan 2014;), community feeling scale (Aşkar & Ilgaz 2009;), perception scale (Eygü & Karman, 2013), attitude scale (Ağır, Gür & Okçu 2008; Arslan & Bircan, 2019; Demir & Akpınar 2016; Kışla 2016; Usta, Uysal & Okur, 2016), opinion determination scale (Yıldırım, et al., 2014; Özkul, et al., 2020). However, although there are a limited number of studies aimed at determining the problems encountered in distance education (Bakioğlu & Çevik, 2020; Özdoğan & Berkant, 2020), there are not studies on scale development.

In this context, it is desired to develop a valid and reliable scale to determine the problems teachers encounter in the distance education process. It is thought that the developed scale will play an active role in determining the problems caused by the teachers in the distance education process, which is increasing in importance with today's technological and social developments. Besides, it is assumed that training plans will be made to eliminate the deficiencies identified, and it is assumed that teachers' professional skills required for distance education will be increased. In addition to these, it is a fact that researchers who will carry out study in the field of distance education will contribute to the literature by using this scale as a data collection tool with the scale to be prepared with this study.

3. Methodology

The survey method, one of the quantitative research approaches, was used in this study. Quantitative research is a research approach in which variables can be determined with precise limits, the relationship between them can be measured, and aims to reach generalizations (Yıldırım & Şimşek, 2016). Survey research method includes studies aiming to collect data to determine certain characteristics of a group. The reason for using the survey method in this study is that the survey studies can provide us with information that can be obtained from a sample that can consist of a large number of individuals in order to determine the validity and reliability of the developed opinion scale (Büyüköztürk et al., 2015).

3.1. Research Sample

The universe of this study consists of teachers who work in different provinces and teach lessons to their students through distance education in Turkey. Since reaching all of these teachers is very costly and time consuming, the sample was selected in the study. The sample of the study consists of 411 teachers from different branches who are selected by using random sampling method among teachers who teach students with distance education and want to participate voluntarily in the research. While determining the sample number, the rule of at least ten times the number of questions in the test was applied. The demographic characteristics of the teachers who participated in the study are given in Table 1.

Table 1.

Demographic Characteristics of Teachers Participating in the Study

Sex	**f**	**%**	**Branch**	**f**	**%**
Female	222	%54	Turkish	52	%12.65
Male	189	%46	Maths	55	%13.38
Age	**f**	**%**	Science	65	%15.82
20-25	41	%10	Social Science	45	%10.95
26-30	90	%21.9	English	42	%10.22
31-35	106	%25.8	Class Teacher	53	%12.90
36-40	66	%16.1	Other branches	99	%24.09
41-45	66	%16.1	**Profess Expert.**	**f**	**%**
46-50	24	%5.8	Less than 5 year	129	%31.4
51-55	13	%3.2	6-10 years	109	%26.5
56-60	5	%1.2	11-15 years	59	%14.4
Place of Duty	**f**	**%**	16-20 years	55	%13.5
City Center	185	%45.0	21-25 years	34	%8.3
District	160	%38.9	26-30 years	14	%3.4
Town/Village	66	%16.1	Over the 30 year	11	%2.7

According to Table 1, when the teachers participating in the study are examined it was seen that in terms of gender, 54% are women and 46% are men, besides It is seen that in terms of ages; 10% of them are between 20-25, 21.9% of them 26-30, 25.8% of them 31-35, 16.1% of them 36-40, 16.1% of them 41-45, 5.8% of them 46-50, 3.2% of them 51-55 and 1.2% of them between the ages of 56-60. In addition, when the teachers were examined in terms of their place of duty, 45% were working in the city center, 38.9% in the district and 16.1% in the village / town. It was seen that in the term of branches; 12.65% of them Turkish, 13.38% of them maths, 15.82% of them sciences, 10.95% of them social studies, 10.22% of them English, 12.90% of them classroom and 24.09% other branch teachers. In addition, when teachers are examined according to professional experience, 31.4% of them less than 5 years, 26.5% of them 6-10 years, 14.4% of them 11-15 years, 13.5% of them 16-20 years, 8.3% of them 21-25 years, 3.4% of them 26-30 years and 2.7% of them over 30 years have professional experience

The sample in the CFA application, which was conducted to verify the factor structures of the scale obtained as a result of the exploratory factor analysis in the study, consists of 230 teachers who were outside the sample that was previously applied to the scale. While choosing these teachers, it was taken into consideration that the teachers lectured by distance education, were in different branches and voluntarily participated in the research. The sample required for CFA application was determined by randomly choosing among the teachers who had these characteristics.

Considering the characteristics of the teachers participating in the confirmatory factor analysis, when the teachers are examined in terms of gender, 52% are women and 48% are men, besides It is seen that in terms of ages; 5.6 % of them are between 20-25, 16.8% of them 26-30, 22.8% of them 31-35, 29.4% of

them 36-40, 17 % of them 41-45, 4.38% of them 46-50, 3.4% of them 51-55 and 0.62 % of them between the ages of 56-60. In addition, when the teachers were examined in terms of their place of duty, 58% were working in the city center, 29.4% in the district and 11.8% in the village / town. It was seen that in the term of branches; 15.2% of them Turkish, 18.4% of them maths, 24.6% of them sciences, 10.2% of them social studies, 11.6 % of them English, 10.20% of them classroom and 9.8% other branch teachers. In addition, when teachers are examined according to professional experience, 13.4% of them less than 5 years, 24.3% of them 6-10 years, 27.6% of them 11-15 years, 17.6% of them 16-20 years, 11.6 % of them 21-25 years, 3.6% of them 26-30 years and 1.9 % of them over 30 years have professional experience

3.2. Development of the Measurement Tool

Within the scope of the research, a five-stage process was followed while developing the scale for determining the problems encountered by teachers in the distance education process. While determining this five-stage process, the scale development steps of many researchers in the literature were taken into consideration (Aksu, Metin & Konyalıoğlu, 2014; Büyüköztürk et al. 2015; Balcı, 2007; Metin, 2010; Metin, 2014; Metin, Birişçi, Coşkun ve Kolomuç, 2012; Metin, Kaleli Yılmaz, Coşkun ve Birişçi, 2012; Tavşancı, 2002; Tezbaşaran, 2002). Five stages such as item pooling, consulting expert opinions, pre-trial, factor analysis and reliability analysis are explained in detail below.

3.2.1. The Stage of Establishing the Item Pool: At this stage, a literature review was conducted regarding the need to write items to determine teachers' encountered problems on distance education. In this literature review Altun-Ekiz (2020), Aktaş, et al., (2020), Alam (2020), Almaghaslah & Alsayari (2020), Alpaslan (2020), Andoh, Appiah & Agyei (2020), Edelhauser & Lupu-Dima (2020), Eroğlu & Kalaycı (2020), Fidan (2020), Kaden (2020), Keskin & Özer Kaya (2020), Koçyiğit & Uşun (2020), Kürtüncü & Kurt (2020), Kurnaz & Serçemeli (2020), Ramos-Morcillo et al., (2020), Serçemeli & Kurnaz (2020) and Yolcu (2020), researches on the issues of views on distance education have been examined. In line with these investigated sources, scale items were determined to determine the opinions of teachers, who are directly related or related to distance education, towards distance education. In addition, face-to-face interviews were held with 10 teachers. In the interviews to the teachers; “What are the negative effects of distance education on students and teachers” and “what are the problems encountered in distance education practices (infrastructure, communication, use of the program and pedagogical evaluation) were asked. As a result of the literature review and the interviews with the teachers, a five-point Likert-type draft scale with 47 items of "Strongly Disagree", "Disagree", "Undecided", “Agree" and "Strongly Agree" was developed

3.2.2. The Stage of Consulting Expert Opinion: The reason for consulting experts is to ensure the Content and face validity of the scale. Content validity is an indicator of whether the items of the scale adequately reflect the behavior desired to be measured (Büyüköztürk et al., 2015). Second, face validity was provided. Face validity shows what the measuring tool appears to measure rather than what it measures. The face validity of a scale is that it seems to measure the characteristics that it actually wants to measure (Öncü, 1994).

The draft scale, which has 47 items developed within the study, was sent to two academicians who had studies in the field of distance education in order to evaluate the content validity. Academicians were asked to review the items in the scale on whether they fully measure the problems teachers encounter in the distance education process. As a result of the academicians' examination, five items were removed from the scale and four items were rearranged. In addition, in line with the suggestions of the academicians, two items were added to the scale and the items of the scale were divided into categories. After making the necessary arrangements, the scale consisting of 41 items was sent to an academic who is a measurement and assessment expert. The measurement and assessment expert was asked to evaluate the content validity of the scale, the face validity, and whether the items were suitable for the desired characteristics to be measured. As a result of the arrangement made in line with the opinions of the

measurement and assessment expert, a five-point Likert-type scale consisting of 46 items was obtained. In addition, this scale was examined by a Turkish language expert in terms of spelling, understandability and suitability, and the scale was finalized.

3.2.3. Pre-Trial Phase: In the pre-trial phase, the developed draft scale was applied to a group of 20 teachers. The teachers were informed about the response time of the scale, the comprehensibility of the items and whether it was suitable for the teacher group. From the opinions of the teachers; it was concluded that the scale with 41 items is understandable, the number of items in the scale and the expressions in the item are suitable for teachers, and the scale can be completed in 20 minutes.

3.2.4. Factor Analysis Phase: The scale, which was prepared after taking expert opinions and performing the pre-trial procedures, was applied to a group of 490 teachers. It is concerned with the normal distribution of the data obtained from the teachers' responses to the scale. For this, Skewness and Kurtosis value, histogram graph, Q-Q plot test, Kolmogorov-Smirnov values were examined. As a result of this application, exploratory and confirmatory factor analysis was applied to the scale data, which was determined whether it exhibits normal distribution or not.

Principal Component Analysis (PCA) was used in the exploratory factor analysis. In this study, It was take an account that the KMO (Kaiser-Meyer-Olkin) value which gives an idea about whether the factor analysis is good or not and the Bartlett Test (Bartlett Test of Sphericity) which gives an idea about whether correlation between the variables. (Field, 2005; Kline. 2005; Pallant, 2020). In addition, it was considered the information that the number of factors included in the model is equal to the number of factors with an eigenvalue greater than one and that the conditions should be accepted such that the factor loadings are at least 0.30 (Turgut & Baykul, 1992; Seçer, 2015). For the determination of the ideal factor structure, the necessary rotation operations were performed and the "oblimin" rotation method was preferred. As a result of the rotation, it was considered that the load value is less than 0.30 and not overlapping in the distribution of the data to the factors. In addition, the factors were named by considering the factors in which the scale items were collected. However, the suitability of the factor structure obtained by EFA analysis was tested with Structural Equation Models.

In this context, the appropriateness of the model obtained in the Confirmatory Factor Analysis method and Exploratory Factor Analysis was examined. In the Confirmatory Factor Analysis, RMSEA (Root Mean Square Error of Approximation), CFI (Comparative Fit Index), GFI (Goodness of Fit Index) and X^2 criteria were used as criteria. While Exploratory Factor Analysis for the scale was tested with SPSS 13.0 package program, Lisrel 8.5.1 package program was used for Confirmatory Factor Analysis.

3.2.5. Reliability Calculation Stage: After the factor analysis was done, the reliability coefficients of the Cronbach alpha internal consistency coefficient and sub-factors of the scale (UZEÖD) were calculated. This value is required to be above 0.7. Low values are generally reached in scales with few items. Therefore, the cronbach alpha value is closely related to the number of items in the scale (Büyüköztürk et al., 2015).

4. Finding

The findings of the study were obtained from a valid and reliable scale to determining the problems encountered by teachers in the distance education process, applied to 411 teachers working in distance education in the 2019-2020 academic years.

This section is presented four headings in order to present the results obtained in line with the analysis in a more systematic structure:

- Findings Regarding the Distribution of Scale Data
- Findings Regarding the Validity of the Scale

• Findings Regarding the CFA Results of the Scale

• Findings Regarding the Reliability of the Scale

Detailed explanations of these topics are given in the following sections.

4.1. Findings Regarding the Distribution of the Scale Data:

Before performing the factor analysis of the applied scale, it is important to determine whether the scale data exhibit a normal distribution or not. Skewness and Kurtosis value, histogram graph, Q-Q plot test, Kolmogorov-Smirnov value are examined to determine the distribution of the data obtaining the scale applied to 411 teacher (Field, 2005).Skewness and Kurtosis value is between +1 and -1, the histogram plot clustered is in the middle, the QQ plot test is being collected on the line, and the Kolmogorov-Smirnov value p> 0.05 are indicators of the symmetrical data distribution (Field, 2005; Kline 2005; Pallant 2020). The values related to the distribution of the data from obtained scale applied are given below.

Table 2.

Descriptive statistic of scale item

	Mean	Median	Variance	Std. Deviation	Skewness	Kurtosis
Statistic	158.608	158.000	334.385	18.286	.144	.064
Std. Error	.902				.120	.240

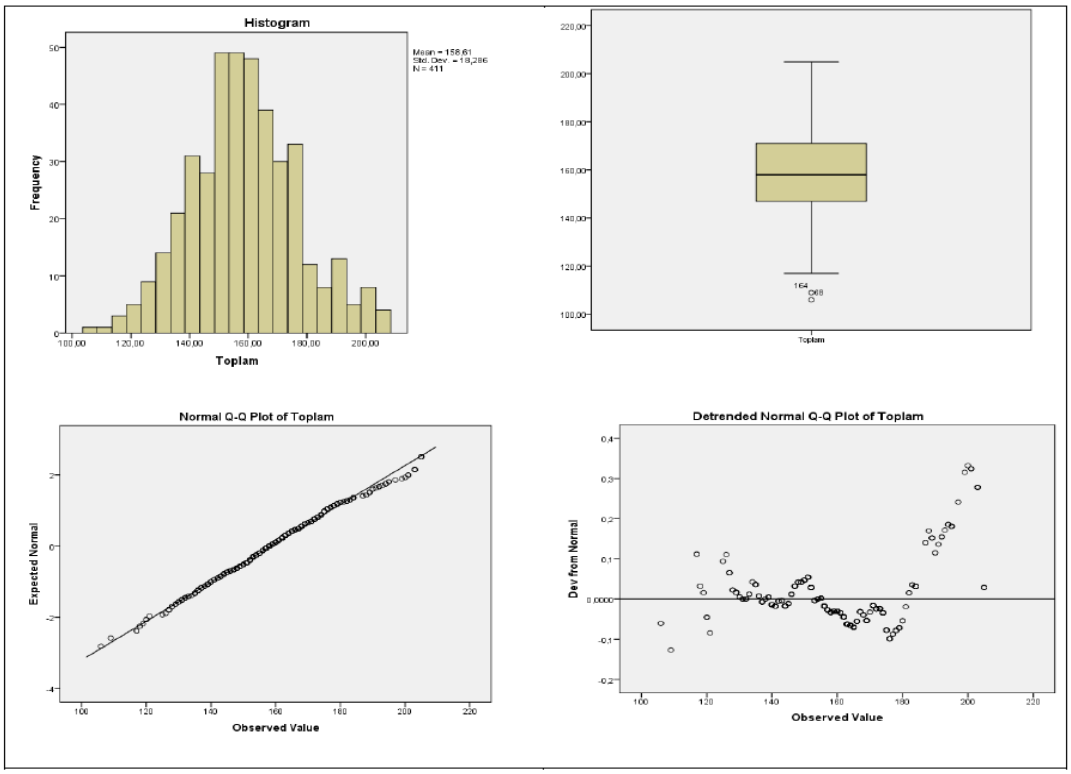

Figure1. *Normal Distribution Plots of Scale Items*

Table 3.

Tests of Normality

	Kolmogorov-Smirnov			**Shapiro-Wilk**		
	Statistic	df	Sig.	Statistic	df	Sig.
Total	.037	411	.186	.994	411	.084

When the tables and graphs are examined, it is observed that the Skewness and Kurtosis value is between -1 and +1 value, the data set in the histogram graph is mostly clustered in the middle, the data is collected on the line in the Q-Q plot test and the Kolmogorov-Smirnov value is higher than 0.05. According to these values, it can be stated that the data from obtaining the scale applied to 411 people show a normal distribution.

4.2. Findings Regarding the Validity of the Scale:

In order to the scale developed within the scope of the research to be valid, the context, face and structure validity were provided. Within the context of the research, the context and face validity of the scale were provided by field, measurement and assessment and language experts. Before the analysis, KMO and Bartlett Test results were examined in order to determine the suitability of the data obtained from the research to the exploratory factor analysis. After that, exploratory factor analysis was applied to ensure the construct validity of the scale consisting of 41 items.

Table 4.

KMO and Bartlett Test Results of the Scale

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.876
Bartlett's Test of Sphericity	Approx. Chi-Square	4511.017
	df	561
	Sig.	.000

According to Table 4, exploratory analysis was performed because the KMO value was greater than 0.7, the Bartlett Test result was greater than 1 and statistically significant (KMO: 0.876; $\chi 2 = 4511.017$; sd = 561, $p < 0.05$). According to Tavşancıl (2002), KMO value is seen as perfect as it approaches 1 and unacceptable when it is 0.5.According to Table 4, The KMO value calculated as 0.876 indicates that the sample of research is suitable for exploratory analysis because of it is greater than 0.7.

In determining the number of factors, the eigenvalue is greater than one, when looking at the breaking point of the slope in the line graph, the explained variance ratio and the factor's contribution to the total variance ratio are taken into account (Pallant, 2020; Tabachnick & Fidell, 2007). As a result of the first exploratory factor analysis, the overlapping 3rd, 5th, 6th, 10th and 19th items were removed from the scale. As a result of the second factor analysis consisting of 36 items, the eigenvalues of the scale items and the line graph were examined to determine the number of factors.

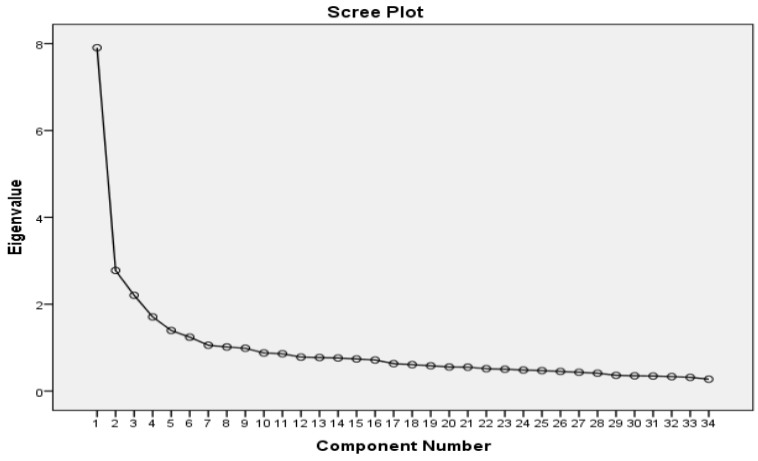

Figure 2. *Line graphic of the eigenvalues of scale items*

When figure 2 is examined, since breakage occurs after five factors, the factor number was limited to five and factor analysis was applied for the third time. Items 28th and 38th were removed from the scale, and as a result of the analysis applied to the 34 item scale for the fourth time as a result of the factor, the eigenvalues and variance values of the five-factor scale are shown in Table 5.

When Table 5 is examined, it is seen that 34 items in the scale are grouped under five factors with eigenvalues greater than 1.

Table 5.

Eigenvalue and Variance Percentages of the Items in the Scale

Factors	Eigenvalues	% of Variance	Cumulative %
Factor 1	4.142	12.182	12.182
Factor 2	3.864	11.365	23.547
Factor 3	3.439	10.115	33.663
Factor 4	2.311	6.799	40.461
Factor 5	2.237	6.578	47.040

The total variance value explained by the five factors for the scale is % 47. 040. This value is at an acceptable level according to Kline (2005), Scherer, et al., (1988). In order to determine the factor items of the scale consisting of five factors, the "Oblimin" oblique rotation method was applied to the data obtained from 411 teachers. This method is preferred when factors are interrelated (Tabachnick & Fidell, 2007). In studies conducted in the field of social sciences, it is not a very realistic situation to claim that the factors have no relationship with each other. In this respect, it is considered appropriate to prefer Oblimin 'oblique rotation method within the scope of this study.

In Table 6,

Factor items and loadings formed as a result of oblimine rotation method are given.

Item Number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
36	.678				
32	.649				
31	.648				
29	.624				
23	.619				
40	.588				
27	.537				
34	.527				
39	.471				
18		.740			
13		.719			
17		.674			
9		.661			
21		.653			
11		.591			
7		.497			
25		.496			
14			.755		
2			.714		
26			.689		
37			.581		
12			.536		
1			.456		
20			.440		
41			.412		
22			.409		

33	.698		
30	.621		
35	.541		
15		.677	
16		.527	
24		.490	
8		.484	
4		.415	

According to Table 6, there are nine items under the first and third factors, eight items under the second factor, three items under the fourth factor and five items under the fifth factor.

Accordingly, the names of the factors; first factor: "Problems with Students in Distance Education (PSDE)", second factor: "Problems with content preparation and transferring in distance education (PCTDE)", third factor: "Problems with parents in distance education (PPDE)", fourth factor: "Problems Encountered in the Use of the Program (PEUP) and fifth factor: "Problems with the distance education application program (PDEAP).

Correlation values that determine the relationship between the factors determined in the scale are shown in Table 7.

Table 7.

Correlations between Scale Factors

	PSDE	PCTDE	PPDE	PEUP	PDEAP
PSDE	1	.394**	.516**	.427**	.391
PCTDE	.394**	1	.365	.407**	.378**
PPDE	.516**	.365**	1	.315**	.440**
PEUP	.427**	.407**	.315**	1	.293**
PDEAP	.391**	.378**	.440**	.293**	1

The Pearson's correlation coefficient between the two variables or factors is between 0.70-1.00 at a high level; it is between 0.30-0.69 at medium level; there is a low level relationship between 0-0.29; if this coefficient is negative, it indicates a negative relationship, while positive indicates a positive relationship (Büyüköztürk, 2008). In Table 7, it was shows that there is a medium-level correlation between all factors. According to these results, since the correlation between the factors is over 0.3, it can be said that it is appropriate to use "oblimin" instead of "varimax" as a rotation method.

4.3. Findings Related to CFA Results of the Scale:

Factors determined as a result of the exploratory factor analysis, Confirmatory Factor Analysis was applied with the data collected from 230 teachers who worked in different branches, had distance education experience and different from the sample group. The CFA result of the 34-item scale consisting of a five-factor structure is shown in Figure 1.

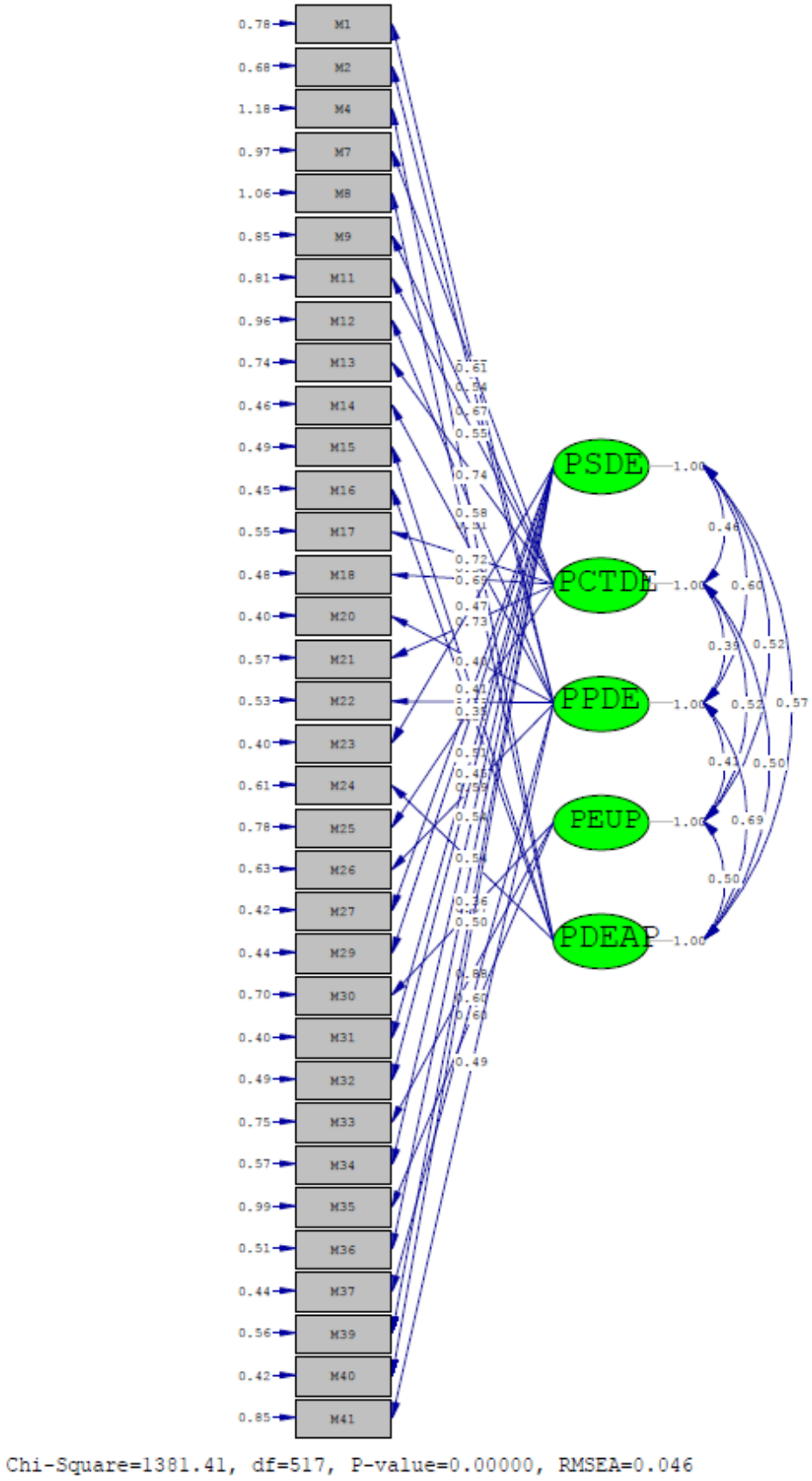

Figure 1. *Confirmatory Factor Analysis Model of Scale Items*

When Figure 1 is examined, Chi-square values and degrees of freedom as a result of CFA; It is seen that the ratio of $\chi 2 = 1381.41$ df = 517, $p < .05$ and $\chi 2$ / df = 2.67 was obtained. This ratio was obtained from the sample group in which the study was conducted and the ratio below 3 indicates perfect fit (Jöreskog & Sörbom, 1993; Sümer, 2000; Kline, 2005). In addition, according to the DFA result obtained from the research, it is seen that the RMSEA value is 0.046. An RMSEA value between 0.05 and 0.08 is an acceptable value indicating good model fit. In the confirmatory factor analysis, it is assumed that the RMSEA value is acceptable between 0.050-0.080, perfect between 0.000-0.050, and above 0.080 unacceptable (Pallant, 2020).

In addition, the calculation of the GFI (goodness of fit index) value close to 1 is an indication of the suitability of the factor model and the high level of explaining the data. The fact that the GFI value is higher than 0.70, indicates the applicability of the determined factor model (Durkan, 2017). In this study, GFI value found 0.83 as a result of DFA is within the acceptable range. If CFI and IFI values determined in DFA are 0.95 and above, it means that the fit between the data of the factor model is perfect (Bentler, 1990; Hu & Bentler, 1999; Sümer, 2000; Çokluk, Şekercioğlu, & Büyüköztürk, 2010). However, CFI and IFI values of 0.80 and above are at acceptable levels (Jöreskog & Sörbom, 1993). As a result of DFA, the CFI value is 0.93 and the IFI value is 0.92. According to these results, it can be said that the data fit of the factor model determined is acceptable. The harmony values obtained as a result of DFA are given in Table 8.

Table 8.

Fitting Values Obtained as a Result of CFA

$\chi 2$	df	$\chi 2$/sd	RMSEA	GFI	CFI	IFI
1381.41	517	2.67	0.046	0.83	0.93	0.92

As a result of the factor analysis, it was determined that the five-factor structure of the 34 item scale aimed at determining the problems encountered by teachers in the distance education process was confirmed by CFA. The reliability analysis of the 34 item scale, which was created as a result of exploratory and confirmatory factor analyzes, was examined.

4.4. Findings Related to the Reliability of the Scale:

After the construct validity was provided in the study, Cronbach Alpha reliability coefficient was found as $\alpha = 0.892$ in the calculation of the reliability analysis of the scale consisting of 34 items, and since this value was above 0.7, it was concluded that the whole scale was reliable. Reliability coefficient results of each factor in the scale are given in Table 9.

Table 9.

Reliability Coefficients of the Factors

	Factor Names	Number of Item	Cronbach Alpha Values
Factor 1	Problems with Students in Distance Education	*9*	0.818
Factor 2	Problems with content preparation and transferring in distance education	*8*	0.822
Factor 3	Problems with parents in distance education	*9*	0.794
Factor 4	Problems Encountered in the Use of the Program	*3*	0.704
Factor 5	Problems with the distance education application program	*5*	0.700
	Overall of The Scale	*34*	0.892

When Table 9 is examined, it can be said that the scale is reliable in order to the cronbach alpha value is above 0.70 as a result of the reliability calculation made for each factor of the scale

5. Conclusion

In this study, a valid and reliable scale was developed to determine the encountered problems by teachers in the distance education process. Validity and reliability study of the draft scale with 47 items; it was conducted with 410 teachers experienced in distance education. For each item in the scale; It is presented with the options of "Strongly Disagree, Disagree, Undecided, Agree, Strongly Agree". Content, face and construct validities were tried to be provided for the validity study of the draft scale.

Arrangements have been made for the content and face validity in line with the expert opinion. Exploratory and confirmatory factor analyzes were applied for the construct validity study. The KMO value for the scale was calculated as 0.876 and the suitability of the sample size for exploratory factor analysis was determined. If the KMO value is greater than 0.7, it means that the adequacy of the sample is at a good level, and if it is greater than 0.8, it means that it is very good (Çokluk et al., 2010). Exploratory factor analysis was applied after the results that were found to be meaningful according to the Bartlett Test results. As a result of the exploratory factor analysis, the total variance value of the scale with five factors, 34 items, was calculated as 47.04%. It is at an acceptable level according to this value (Scherer, et al., 1988; Kline, 2005). As a result of factor analysis, each factor should have at least 2 items that are acceptable, the more items there are in each factor, the more reliability and the factor explanation of the scale (Seçer, 2015). The scale consists of 34 items with nine items under the first and third factor, eight items under the second factor, three items under the fourth factor and five items under the fifth factor, which indicates that the factors of the scale are acceptable. Accordingly, the names of the factors are; first factor: "Problems with Students in Distance Education (PSDE)", second factor: "Problems with content preparation and transferring in distance education (PCTDE)", third factor: "Problems with parents in distance education (PPDE)", fourth factor: "Problems Encountered in the Use of the Program (PEUP) and fifth factor: "Problems with the distance education application program (PDEAP).

In order to verify the five factors determined as a result of the exploratory factor analysis, it has been determined suitability; the ratio of $\chi 2$ / df = 2.67 was obtained as a result of CFA carried out with different teachers from the EFA sample group, the RMSEA value are 0.046, the GFI value are 0.83, the CFI value are 0.93 and the IFI value are 0.92. In the confirmatory factor analysis, RMSEA value is considered to be between 0.050-0.080, it is considered perfect to be between 0.000-0.050, and unacceptable to be above 0.080 (Pallant, 2020). The fact that the GFI value is higher than 0.70, indicates the applicability of the determined factor model (Durkan, 2017). CFI and IFI values of 0.80 and above are at acceptable levels (Özdamar, 2013).

After determining the appropriateness of the CFA model, the cronbach alpha coefficient was examined to determine the reliability of the scale consisting of 34 items. This coefficient value is calculated as 0.892 for the whole scale and over 0.7 for each factor. In order for a scale to be accepted as reliable, it is suggested that the cronbach alpha reliability coefficient value of the whole scale and the sub-factors of the scale should be 0.70 and above (Anastasi, 1982; Büyüköztürk, 2007). Since the reliability coefficient value of the whole scale and its sub-factors is above 0.70, it can be said that the prepared scale is reliable. When similar scale development studies in the literature are examined,

Consequently, in this study, a valid and reliable scale consisting of 34 items and a five-factor structure was developed to determine the problems teachers encounter in the distance education process. It can be said that the developed scale can be used to determine the problems teachers encounter in the distance education process.

Since this scale was developed during the Covid-19 pandemic process, many different variables such as health problems, anxiety, priorities and attitudes may have affected the views of the participants. For this reason, it can be discussed whether the internal and external variables in the pandemic process have an effect by conducting studies that reveal the problems encountered in distance education during and after

the pandemic process. For this, this scale can be applied at different times and the problems encountered during and after the pandemic can be compared and focus on solutions.

References

Adıyaman, Z. (2002). Uzaktan eğitim yoluyla yabancı dil öğretimi. *The Turkish Online Journal of Educational Technology, 1* (1),92-97.

Ağır, F., Gür, H. & Okçu, A. (2008). Özel okullarda ve devlet okullarında çalışan ilköğretim öğretmenlerinin uzaktan eğitime karşı tutumlarını belirlenmesi. http://ietc2008.home.anadolu.edu.tr/ietc2008/65.doc. adresinden erişilmiştir.

Akkoyunlu, B., & Bardakcı, S. (2021). Yüksek Öğretimde uzaktan eğitim ve kalite güvencesi sistemi. Ankara Yıldırım Beyazıd Üniversitesi: https://aybu.edu.tr/aybuzem/contents/files/Yuksekogretimde_Uzaktan_Egitim_ve_Kalite_Guvencesi_Sistemi.pdf adresinden alındı

Aksu, Z., Metin, M., & Konyalioğlu, A. C. (2014). Development of the pedagogical content knowledge scale for pre-service teachers: The validity and reliability study. *Mediterranean Journal of Social Sciences, 5*(20), 1365–1377.

Aktaş, Ö., Büyüktaş, B., Gülle, M., & Yıldız, M. (2020). Covid-19 virüsünden kaynaklanan izolasyon günlerinde spor bilimleri öğrencilerinin uzaktan eğitime karşı tutumları. *Sivas Cumhuriyet Üniversitesi Spor Bilimleri Dergisi, 1*(1), 1-9.

Akyürek, M. İ. (2020). Uzaktan eğitim: Bir alanyazın taraması. *Medeniyet Eğitim Araştırmaları Dergisi, 4*(1), 1-9.

Alam, A. (2020). Challenges and possibilities of online education during Covid-19. Preprints. (doi: 10.20944/preprints202006.0013.v1).

Almaghaslah D, & Alsayari A (2020). The effects of the 2019 novel coronavirus disease (COVID-19) outbreak on academic staff members: A case study of a pharmacy school in Saudi Arabia, *Risk Manag Healthc Policy. 13*; 795–802.

Alpaslan, M. (2020). Öğretim üyelerinin özel yeteneklilerin eğitiminde uzaktan eğitimin kullanımına yönelik görüşleri. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi, 6*(1), 126-147.

Altun-Ekiz, M. (2020). Beden eğitimi ve spor yüksekokulu öğrencilerinin karantina dönemindeki uzaktan eğitim ile ilgili görüşleri (nitel bir araştırma). *Spor ve Rekreasyon Araştırmaları Dergisi, 2*(Özel Sayı 1), 1-13

Altuntaş Yılmaz, N. (2020). Yükseköğretim kurumlarında Covid-19 pandemisi sürecinde uygulanan uzaktan eğitim durumu hakkında öğrencilerin tutumlarının araştırılması: Fizyoterapi ve Rehabilitasyon bölümü örneği. *Necmettin Erbakan Üniversitesi Sağlık Bilimleri Fakültesi Dergisi,* 3(1), 15-20.

Anastasi, A. (1982). *Psychological testing.* New York: Mcmillan Publishing Co.

Andoh, R. P. K., Appiah, R., & Agyei, P. M. (2020). Postgraduate distance education in University of Cape Coast, Ghana: Students' perspectives. *International Review of Research in Open and Distributed Learning, 21*(2), 118-135.

Arslan, R., & Bircan, H. (2019). Cumhuriyet Üniversitesi'nde uzaktan eğitimde sunulan derslere yönelik tutum ölçeğinin geliştirilmesi. *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi, 20*(2), 409-427.

Aslan, A. (2006). Bilgisayar destekli eğitim yapmaya ilişkin tutum ölçeği. *Yüzüncü Yıl Üniversitesi, Eğitim Fakültesi Dergisi*, 24-33.

Aydın, C. H. (2002). Çevrimiçi (Online) öğrenme toplulukları. *Açık ve Uzaktan Eğitim Sempozyumu*. Eskişehir: Anadolu Üniversitesi.

Bakioğlu, B., & Çevik, M. (2020). COVID-19 pandemisi sürecinde fen bilimleri öğretmenlerinin uzaktan eğitime ilişkin görüşleri. *Turkish Studies 15*(4):109-129, DOI: 10.7827/TurkishStudies.43502

Balcı A. (2007). *Sosyal Bilimlerde Araştirma Yöntem Teknik ve Ilkeler*. Ankara: PegemA Yayıncılık.

Başarmak, U. (2013). Karikatür animasyonuna dayalı çevrim içi öğrenme ortamının öğrencilerin başarısına, fen öğrenmeye yönelik motivasyonuna ve mizaha yönelik tutumuna etkisi. Yayınlanmamış Doktora Tezi, Gazi Üniversitesi Eğitim Bilimler Enstütüsü, Ankara.

Bentler P. M. (1990). Comparative fit indexes in structural models. *Psychol Bull, 107* (2), 238-246.

Birişçi, S., & Metin, M., (2009) Fen konularına yönelik web sayfası hazırlamak öğretmen adaylarının bilgisayar teknolojisini kullanabilme becerilerini nasıl etkiler, *Necatibey Eğitim Fakültesi Elektronik Fen ve Matematik Eğitimi Dergisi, 3*, (2), 74-93

Bodur, E. (2010). Ağ günlüklerinin (blogların) işbirliği fen ve teknoloji dersindeki başarı ve tutumlara etkisi: ilköğretim ii. kademe öğrenceleri üzerine bir uygulama. Yayımlanmamış Yüksek Lisans Tezi, Ege Üniversitesi Eğitim Bilimler Enstitüsü, İzmir.

Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to coronavirus pandemic. *Asian Journal of Distance Education*, *15*(1), 1-6. https://doi.org/10.5281/zenodo.3778083

Büyüköztürk, Ş. (2007). *Sosyal Bilimler İçin Veri Analizi El Kitabı.* Ankara: Pegema Yayıncılık.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş. & Demirel, F. (2015). *Bilimsel Araştırma Yöntemleri* (19. Baskı). Ankara: Pegem Akademi.

Çakmak, E. K., Çebi, A., & Kan, A. (2014). E-Öğrenme ortamlarına yönelik "sosyal bulunuşluk ölçeği" geliştirme çalışması, *Kuram ve Uygulamada Eğitim Bilimleri*, *14*(2), 755-768.

Çelen, F. K., Çelik, A., & Seferoğlu, S. S. (2011). Yüksek öğretimde çevrim içi öğrenme: sistemde yaşanan sorunlar ve çözüm önerileri. *Journal of European Education, 1*(1), 25-34.

Çetin, E. (2020). Uzaktan eğitimde uzamsal görselleştirme: 3 boyutlu tasarım sürecinin uzamsal yeteneğe etkisi. *Kastamonu Eğitim Dergisi*, 28(6), 2295-2304.

Çokluk, Ö., Şekercioğlu, G., & Büyüköztürk, Ş. (2010). *Sosyal Bilimler İçin Çok Değişkenli İstatistik.* Ankara: Pegema Akademi.

Demir, E., (2014). Uzaktan eğitime genel bir bakış, *Dumlupınar üniversiyesi sosyal Bilimler Dergisi, 39*, 203-212.

Demir, K., & Akpınar, E. (2016). Mobil öğrenmeye yönelik tutum ölçeği geliştirme çalışması. *Eğitim Teknolojisi Kuram ve Uygulama*, *6*(1), 59-79.

Doğan, S., & Koçak, E. (2020). EBA sistemi bağlamında uzaktan eğitim faaliyetleri üzerine bir inceleme. *Ekonomi ve Sosyal Araştırmalar Dergisi, 7*(14), 111-124.

Durkan, E. (2017). İlkokul Dördüncü Sınıflarda Görev Yapan Sınıf Öğretmenlerinin Türkçe Derslerinde Öğrencilerinin Üstbilişsel Okuma Stratejileri Kullanmalarını Sağlayan Uygulamalarının Değerlendirilmesi: Giresun İli Örneği. Yayınlanmamış Yüksek Lisans Tezi. Giresun Üniversitesi, Sosyal Bilimler Enstitüsü, Giresun.

Duyar, A. (2016). http://ahmetduyar.blogcu.com/uzaktan-egitim-in-avantajlari-ve-zavantajlari/9852174. Ahmet Duyar: http://ahmetduyar.blogcu.com/uzaktan-egitim-in-avantajlari-ve-zavantajlari/9852174 adresinden alındı

Edelhauser, E., & Lupu-Dima, L. (2020). Is Romania prepared for elearning during the COVID-19 pandemic? *Sustainability*, *12*(13), 1-29.

Ekiz, M. A. (2020). Beden Eğitimi ve Spor Yüksekokulu Öğrencilerinin karantina dönemindeki uzaktan eğitim ile ilgili görüşleri (Nitel Bir Araştirma). *Spor ve Rekreasyon Araştırmaları Dergisi*, *2*(Özel Sayı 1), 1-13.

Eroğlu, F., & Kalaycı, N. (2020). Üniversitelerdeki zorunlu ortak derslerden Türk Dili dersinin uzaktan ve yüz yüze eğitim uygulamalarının karşılaştırılarak değerlendirilmesi. *Ana Dili Eğitimi Dergisi*, 8(3), 1001-1027.

Eygü, H., & Karaman, S. (2013). Uzaktan eğitim öğrencilerinin memnuniyet algıları üzerine bir araştırma. *Kırıkkale Üniversitesi Sosyal Bilimler Dergisi*, *3*(1), 36-59.

Fidan, M . (2020). Covid-19 belirsizliğinde eğitim: İlkokulda zorunlu uzaktan eğitime ilişkin öğretmen görüşleri. *Uşak Üniversitesi Eğitim Araştırmaları Dergisi, 6*(2), 24-43.

Field, A. (2005). *Discovering statistics Using SPSS,* Nd2 Edition, London: Sage Publications.

Genç, M. F., & Gümrükçüoğlu, S. (2020). Koronavirüs (Covıd-19) sürecinde ilâhiyat fakültesi öğrencilerinin uzaktan eğitime bakışları. *Turkish Studies*, *15*(4), 403-422

Gümüş, S. (2007). Çevrimiçi işbirliği ekiplerinde öğrenenlerin sorun çözerek öğrenmeyle ilgili tutum ve görüşleri. Yayımlanmamış Yüksek Lisans Tezi, Anadolu Üniversitesi Eğitim Bilimler Enstitüsü, Eskişehir.

Gündüz, Ş. (2005). Geleneksel-Çevrimiçi ve Bireysel-İşbirliğine dayalı ödev uygulamalarının lisans öğrencilerinin akademik başarılarına ve ödeve ilişkin tutumlarına etkisi, . Yayımlanmamış Doktora Tezi, Anadolu Üniversitesi Eğitim Bilimler Enstitüsü, Eskişehir..

Haşlaman, T., & Ark. (2008). Çevrimiçi ortamda yapılan grup tartışmasındaki iletişim örüntülerinin söylem çözümlemesi yoluyla incelenmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, *35*, 162-174.

Hu, LT & Bentler, PM (1999). Kovaryans yapısı analizinde uyum indeksleri için kesim kriterleri: yeni alternatiflere karşı geleneksel kriterler. *Yapısal Eşitlik Modellemesi: Multidisipliner Bir Dergi*, *6* (1), 1-55.

Ilgaz, H. & Aşkar, P. (2009). Çevrimiçi uzaktan eğitim ortamında topluluk hissi ölçeği geliştirme çalışması, *Türk Bilgisayar ve Matematik Eğitimi Dergisi, 1*(1), 27-35.

Jöreskog, K. G. & Sörbom, D. (1993). *Lisrel 8: Structural Equation Modeling With The Simplis Command Language.* Hillsdale: Erlbaum Associates Publishers.

Kaden, U. (2020). COVID-19 school closure-related changes to the professional life of a k–12 teacher. *Education Sciences*, *10*(6), 165; https://doi.org/10.3390/educsci10060165.

Karadağ, E., & Yücel, C. (2020). Yeni tip Koronavirüs pandemisi döneminde üniversitelerde uzaktan eğitim: Lisans öğrencileri kapsamında bir değerlendirme çalışması. *Yükseköğretim Dergisi*, *10*(2), 181-192.

Karakuş, İ., & Yelken, T. Y. (2020). Uzaktan eğitim alan üniversite öğrencilerinin sosyal bulunuşluk ile işlemsel uzaklıkları arasındaki ilişkinin incelenmesi. *Kastamonu Eğitim Dergisi*, *28*(1), 186-201.

Karakuş, N., Ucuzsatar, N., Karacaoğlu, M. Ö., Esendemir, N., & Bayraktar, D. (2020). Türkçe öğretmeni adaylarının uzaktan eğitime yönelik görüşleri. *Rumelide Dil Ve Edebiyat Araştırmaları Dergisi,* (19), 220-241.

Karatepe, F., Küçükgençay, N., & Peker, B. (2020). Öğretmen adayları senkron uzaktan eğitime nasıl bakıyor? Bir anket çalışması. *Journal Of Social And Humanities Sciences Research*, *7*(53), 1262-1274.

Kavrat, B., & Türel, Y. K. (2013). Çevrimiçi Uzaktan Eğitimde Öğretmen Rollerini ve Yeterliliklerini Belirleme. *The Journal of Instructional Technologies &Teacher Education*, *2*(2), 23-33.

Kaya, Z. (2002). *Uzaktan Eğitim*. Ankara: Pegem A Yayıncılık.

Keskin, M., & Özer Kaya, D. (2020). Covıd-19 sürecinde öğrencilerin web tabanlı uzaktan eğitime yönelik geri bildirimlerinin değerlendirilmesi. *İzmir Katip Çelebi Üniversitesi Sağlık Bilimleri Fakültesi Dergisi, 5*(2), 59-67.

Kışla, T. (2016). Uzaktan eğitime yönelik tutum ölçeği geliştirme çalışması. *Ege Eğitim Dergisi*, *17*(1), 258-271.

Kline, R.B. (2005). *Principles And Practice Of Structural Equation Modeling*. New York: The Guilford Press.

Kocayiğit, A. & Uşun, S. (2020). Milli Eğitim Bakanlığına bağlı okullarda görev yapan öğretmenlerin uzaktan eğitime yönelik tutumları (Burdur İli Örneği). *Avrasya Uluslararası Araştırmalar Dergisi, 8*(23), 285-299.

Korkman, N. (2018). Sorgulama temelli farklı öğretim yöntemlerinin öğrencilerin akademik başarısına etkisinin kıyaslanması: kimyasal bağlar örneği. Yayımlanmamış Yüksek Lisans Tezi, Bozok Üniversitesi Fen Bilimleri Enstitüsü, Yozgat.

Korkman, N. & Metin, M. (2021). The Effect of Inquiry-Based Collaborative Learning and Inquiry-Based Online Collaborative Learning on Success and Permanent Learning of Students, *Journal of Science Learning, 4* (2), 151-159

Kurnaz, E., & Serçemeli, M. (2020). Covid-19 Pandemi döneminde akademisyenlerin uzaktan eğitim ve uzaktan muhasebe eğitimine yönelik bakış açıları üzerine bir araştırma. *Uluslararası Sosyal Bilimler Akademi Dergisi, 3*, 262-288.

Kürtüncü, M., & Kurt, A. (2020). Covid-19 pandemisi döneminde hemşirelik öğrencilerinin uzaktan eğitim konusunda yaşadıkları sorunlar. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi, 7*(5), 66-77.

Metin, M. (2010) A study on developing a general attitude scale about environmental issue for students in different grade level, *Asia-Pacific Forum on Science Learning and Teaching, 11* (2),1-19

Metin, M. (2014) Nicel veri toplama araçları, S 161-214, Metin, M (Ed.). *Kuramdan Uygulamaya Eğitimde Bilimsel Araştırma Yöntemleri*. 1 Baskı, Pegem Akademi.

Metin, M., Birişçi, S., Coşkun, K. & Kolomuç, A. (2012) A study on developing "basic computer use performance scale (BCUPS)" for primary students, *Procedia Social and Behavioral Sciences, 46*, 1771 – 1775

Metin, M., Kaleli Yılmaz, G., Coskun, K. & Birişçi, S. (2012) Developing an attitude scale towards using instructional technologies for pre-service teachers, *The Turkish Online Journal of Educational Technology (TOJET), 11* (1), 36-45

Olpak, Y. Z. (2010). Çevrimiçi öğrenme ortamlarında kullanılan farklı etkileşim araçlarının öğrencilerin başarılarına ve sosyal bulunuşluk algılarına etkisi. Yayımlanmamış Yüksek Lisans Tezi, Gazi Üniversitesi Eğitimi Bilimler Enstitüsü, Ankara.

Öncü H. (1994). *Eğitimde Ölçme ve Değerlendirme.* Ankara: Matser Basım San. Ve Tic. Ltd. Şti.

Özdamar, K. (2013). *Eğitim, Sağlık ve Davranış Bilimlerinde Ölçek ve Test Geliştirme Yapısal Eşitlik Modellemesi.* Eskişehir: Nisan Kitapevi.

Özdoğan, A. Ç., & Berkant, H. G. (2020). Covıd-19 Pandemi dönemindeki uzaktan eğitime ilişkin paydaş görüşlerinin incelenmesi. *Milli Eğitim Dergisi*, *49*(1), 13-43.

Özkul, R., Kırnık, D., Dönük, O., Altunhan, Y., & Altunkaynak, Y. (2020). uzaktan eğitim uygulamalarına ilişkin öğretmen görüşleri: Ölçek çalışması. *Electronic Turkish Studies*, 15(8), 3655-3667.

Parlak, O. (2007). Student satisfaction scale on internet based distance education. *Educational Sciences and Practices, 6*(11): 53-72.

Pallant, J. (2020). *Spss Survival Manual: A Step By Step Guide To Data Analysis Using Ibm Spss. Routledge.* (Çev.Balcı S. Ve Ahi B.)

Polat Çevik, Ö. (2010). Çevrimiçi araçların eğitsel kullanımının öğrenci başarısı ve görüşlerine etkisi. Yayımlanmamış Yüksek Lisans Tezi, Fırat Üniversitesi Eğitim Bilimler Enstitüsü, Elazığ

Ramos-Morcillo A.J, Leal-Costa, C., Moral-García J.E & Ruzafa-Martínez, M. (2020). Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19 in Spain. *International Journal of Environmental Research and Public Health, 17*(15), 5519. doi:10.3390/ijerph17155519.

Sarı, H . (2020). Evde kal döneminde uzaktan eğitim: ölçme ve değerlendirmeyi neden karantinaya almamalıyız? *Uluslararası Eğitim Araştırmacıları Dergisi, 3* (1), 121-128

Scherer, R. F., Wiebe, F. A., Luther, D. C., & Adams, J. S. (1988). Dimensionality of coping: Factor stability using the Ways of Coping Questionnaire. *Psychological Reports, 62*(3), 763–770. https://doi.org/10.2466/pr0.1988.62.3.763

Seçer, İ. (2015). *Spss ve Lısrel İle Pratik Veri Analizi* (Genişletilmiş 2. Baskı). *Ankara: Anı Yayıncılık.*

Serçemeli, M., & Kurnaz, E. (2020). Covid-19 pandemi döneminde öğrencilerin uzaktan eğitim ve uzaktan muhasebe eğitimine yönelik bakış açıları üzerine bir araştırma. *Uluslararası Sosyal Bilimler Akademik Araştırmalar Dergisi, 4*(1), 40-53

Sümer, N. (2000). Yapısal Eşitlik Modelleri: Temel Kavramlar ve Örnek Uygulamalar. *Türk Psikoloji Yazıları, 6*(3), 49-73.

Tabachnick, B., & Fidell, L. (2007) *Using Multivariate Statistics,* Boston: Allyn & Bacon.

Tavşancıl E., (2002*). Tutumların Ölçülmesi ve Spss ile Veri Analizi*. Ankara: Nobel Yayınevi, 1.Baskı.

Tekın, O. (2020). Uzaktan eğitim kullanılan hizmet içi eğitim programlarına yönelik öğretmen görüşlerinin incelenmesi. *Eğitimde Kuram ve Uygulama*, *16*(1), 20-35.

Yamamoto-Telli, G. & Altun, D. (2020). Coronavirüs ve çevrimiçi (online) eğitimin önlenemeyen yükselişi. *Üniversite Araştırmaları Dergisi,3*(1),25-34.

Tezbaşaran, A. (2002). A., *Likert Tipi Ölçek Geliştirme Kılavuzu,* Türk Psikologlar Derneği, Ankara,

Turgut, M.F. & Baykul, Y. (1992). *Ölçekleme Teknikleri,* Ankara: ÖSYM Yayınları.

Usta, İ., Uysal, Ö., & Okur, M. R. (2016). Çevrimiçi öğrenme tutum ölçeği: geliştirilmesi, geçerliği ve güvenirliği. *Journal Of International Social Research*, *9*(43).

Yıldırım, A. & Şimşek, H. (2016). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri*. (10. Baskı). Seçkin Yayıncılık

Yıldırım, S., Yıldırım, G., Çelik, E., & Karaman, S. (2014). Uzaktan Eğitim Öğrencilerinin Uzaktan Eğitime Yönelik Görüşleri: Bir Ölçek Geliştirme Çalışması. *Eğitim ve Öğretim Araştırmaları Dergisi*, *3*(3), 365-370.

Yılmaz, E. (2015). Çevrim içi ileri düzenleyici kavram öğretim materyali ile desteklenen öğretim yöntemlerinin kuvvet-hareket ünitesinde başarı, tutum ve kalıcılığa etkisi. Yayımlanmamış Yüksek Lisans Tezi, Mehmet Akif Ersoy Üniversitesi Eğitim Bilimler Enstitüsü, Burdur.

Yolcu, H. H. (2020). Sınıf öğretmeni adaylarının uzaktan eğitim deneyimleri. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi*, *6*(4), 237-250.

Appendix 1. The Scale Items about Problems Encounter by Teachers in the Distance Education Process (***English Version***)

	Strongly Disagree **(1)** Disagree **(2)** Undecided **(3)** Agre**e (4)** Strongly Agree **(5)**	**1**	**2**	**3**	**4**	**5**
	Factor 1: Problems with Students in Distance Education (PSDE)					
1	In the distance education application, the student's not attending the lessons on time affects the flow of the lesson.					
2	If the student cannot participate in the practice during the lesson, there are difficulties in repetition of lesson.					
3	The lack of technological tools required for the application of distance education makes it difficult for students to participate in the lesson.					
4	In the distance education application, in-class communication with the student remains limited.					
5	The irrelevant behavior of the student in the distance education application decreases the motivation of the teacher.					
6	In distance education practice, there is a problem in giving feedback to students regarding their learning levels.					
7	Group work with students in distance education practice would be troublesome					
8	In distance education practice, the teacher has problems in providing classroom discipline					
9	In the distance education application, it is difficult to control the behavior of the student during the lesson.					
	Factor 2: Problems with content preparation and transferring in distance education (PCTDE)					
1	Difficulty using video in distance education application					
2	There is a problem in using the content we want in the distance education application.					
3	Distance education practice limits content preparation using different teaching methods and techniques.					
4	There are difficulties in assigning courses in the distance education application.					
5	It takes a long time to determine the content for the distance education application					
6	It is difficult to find content that we can make changes to the distance education application.					
7	The content to be used in the distance education application is limited.					
8	Preparing content for distance education applications would be costly					
	Factor 3: Problems with parents in distance education (PPDE)					
1	Parents are insufficient to direction of students to the live lesson					
2	Parents' requests from students during distance education are a problem					
3	Parents' intervention to lessons with distance education has increased					
4	Parents' behavior in distance education process in a way that affects the teaching of the lesson creates difficulties					
5	When the lesson is teaching in distance education, the noise of the parents affects the teaching of the lesson.					
6	Parents experience difficulties in Internet procurement for distance education application					
7	In distance education, it would be a problem, parents to answer the questions asked in the lesson instead of the student					
8	In distance education, it is a problem for parents to communicate unnecessarily with the teacher, while lecturing					
9	Parents communicating more than expected with the distance education process overwhelms us.					
	Factor 4: Problems Encountered in the Use of the Program (PEUP)					
1	Screen freezing is a problem when making changes on the contents of the distance education application.					
2	In the distance education application, the fact that sound and image come at different times creates a problem in the lessons.					
3	It would be a problem for the distance education application to kick out student from the lesson untimely.					
	Factor 5: Problems with the distance education application program (PDEAP)					
1	The fact that the menus of the distance education application are in English makes it difficult to use the program.					
2	The use of distance education application in old technological devices (computer, tablet, phone) becomes difficult.					
3	New technological tools should be purchased to use distance education applications					
4	Difficulty of menu access in the distance education program prevents immediate intervention in unwanted situations.					
5	It becomes difficult to control the study done by the student in the distance education application.					

Appendix 2. The Scale Items about Problems Encounter by Teachers in the Distance Education Process (***Turkish Version***)

	Kesinlikle Katılmıyorum **(1)** Katılmıyorum **(2)** Karasızın **(3)** Katılıyorum **(4)** Kesinlikle Katılıyorum **(5)**	**1**	**2**	**3**	**4**	**5**
	Faktör 1: Uzaktan Eğitimde Öğrencilerle İlgili Karşılaştığı Sorunlar					
1	Uzaktan eğitim uygulamasında öğrencinin derslere zamanında katılmaması dersin akışını etkiler					
2	Öğrenci ders süresince uygulamaya katılamazsa dersi telafi etmede sıkıntı yaşanır					
3	Uzaktan eğitime uygulaması için gerekli teknolojik aletlerin öğrencilerde olmaması derse katılımı güçleştirir					
4	Uzaktan eğitim uygulamasında öğrenci ile ders içi iletişim sınırlı kalır					
5	Uzaktan eğitim uygulamasında öğrencinin ilgisiz davranışı öğretmenin motivasyonunu düşürür					
6	Uzaktan eğitim uygulamasında öğrencilere öğrenme düzeylerine yönelik geri dönüt verilmede sıkıntı yaşanır					
7	Uzaktan eğitim uygulamasında öğrencilerle grup çalışması yapmak sıkıntılı olur					
8	Uzaktan eğitim uygulamasında öğretmen sınıf disiplinini sağlamada sorun yaşar					
9	Uzaktan eğitim uygulamasında öğrencinin ders esnasında davranışlarını kontrol etmek zor olur					
	Faktör 2: İçerik Hazırlama / Programa Aktarma ile İlgili Sorunlar					
1	Uzaktan eğitim uygulamasında video kullanımında güçlük yaşanır					
2	Uzaktan eğitim uygulamasında istediğimiz içeriği kullanmada sıkıntı yaşanır					
3	Uzaktan eğitim uygulaması farklı öğretim yöntem ve teknikleri kullanarak içerik hazırlamayı sınırlandırır					
4	Uzaktan eğitim uygulamasında ders ataması yapmakta sıkıntılar yaşanır					
5	Uzaktan eğitim uygulamasına yönelik içeriği belirlemek uzun sürer					
6	Uzaktan eğitim uygulamasına üzerinde değişiklik yapabileceğimiz içerikleri bulmada zorlanılır					
7	Uzaktan eğitim uygulamasında kullanılacak içerikler sınırlı kalmaktadır					
8	Uzaktan eğitim uygulamalarına yönelik içerik hazırlamak maliyetli olur					
	Faktör 3: Velilerle ile İlgili Sorunlar					
1	Velilerin öğrencileri canlı derse yönlendirmesi yetersiz kalmaktadır					
2	Uzaktan eğitimde ders sırasında velilerin öğrenciden taleplerde bulunması sorun oluşturur					
3	Velilerin uzaktan eğitimle derse olan müdahaleleri artmıştır					
4	Uzaktan eğitimde velilerin dersin islenişini etkileyecek şekilde davranması sıkıntı oluşturur					
5	Uzaktan eğitimde ders yapılırken velilerin gürültü çıkarması dersin işlenişini etkiler					
6	Veliler Uzaktan eğitim uygulaması için internet tedarikinde sıkıntı yaşarlar					
7	Uzaktan eğitimde velilerin derste sorulan sorulara öğrenci yerine cevap vermesi sorun olur					
8	Uzaktan eğitimde velilerin ders anlatırken öğretmenle dersle ilgisiz iletişim kurması sıkıntı oluşturur					
9	Uzaktan eğitim süreciyle birlikte velilerin beklenenden fazla iletişim kurması bizleri bunaltır					
	Faktör 4: Programın Kullanımında Karşılaşılan sıkıntılar					
1	Uzaktan eğitim uygulamasında içerikler üzerinde değişiklik yaparken donmaların yaşanması sıkıntı oluşturur					
2	Uzaktan eğitim uygulamasında ses ve görüntü farklı zamanda gelmesi derslerde sıkıntı oluşturur					
3	Uzaktan eğitim uygulamasının zamansız bir şekilde dersten atması sorun oluşturur					
	Faktör 5: Uygulama Programıyla İlgili Karşılaşılan sorunlar					
1	Uzaktan eğitim uygulamasının menülerinin İngilizce olması programı kullanmayı zorlaştırır					
2	Uzaktan eğitim uygulamasının eski teknolojik (Bilgisayar, tablet, telefon) aletlerde kullanımı zor olur					
3	Uzaktan eğitim uygulamalarını kullanabilmek için yeni teknolojik araçların alınması gerekir					
4	Uzaktan eğitim programında menülerin kolay ulaşılabilir olmaması istenilmeyen durumda anında müdahaleyi engeller					
5	Uzaktan eğitim uygulamasında öğrencinin yapmış olduğu çalışmaların kontrolü zorlaşır					