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Developing the Instructor Satisfaction Scale for Emergency Remote Teaching

Mutlu Tahsin ÜSTÜNDAĞ[a] Seher ÖZCAN[b] Ebru SOLMAZ [c]

a: 0000-0001-6198-2819 Gazi University, Turkiye mutlutahsin@gazi.edu.tr
b: 0000-0001-8473-3807 Gazi University, Turkiye seherozcan@gazi.edu.tr
c: 0000-0003-4893-450X Gazi University, Turkiye ebrusolmaz@gazi.edu.tr

Abstract

The distance education process, which started without adequate preparation due to the COVID 19 pandemic, is called emergency distance education. The adaptation and satisfaction of the instructors to this process draws attention as an important variable. The aim of the study is to develop a valid and reliable measurement tool in order to determine the satisfaction levels of the instructors who teach in the emergency remote teaching process. The study started with the creation of the item pool with the literature review and continued with the evaluation of the items through expert opinion. As a result of the exploratory factor analysis made with the data obtained from 400 instructors, a scale containing 28 items in 5 factors was obtained. These factors are named as “the instructor's belief in distance education”, “the instructor's competence in distance education”, “ICT infrastructure”, “the student-instructor interaction”, “flexibility and opportunities”. The structure of the scale, which consists of 5 dimensions and 27 items, was confirmed by the confirmatory factor analysis verified with the data obtained from 446 instructors. The reliability of the scale was calculated as .93 with the 2022-2023 fall and spring semester data obtained from 340 instructors.

Keywords

Emergency remote teaching, satisfaction scale, instructor.

Ethics Committee Approval: Ethics committee permission for this study was obtained from Rectorate Gazi University Ethics Committee with the decision dated 22.11.2022 and numbered 19.

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INTRODUCTION

As of the beginning of March 2020, COVID-19, which has been accepted as a global epidemic by the World Health Organization, has affected all education levels from primary education to higher education. Due to the health precautions, as in many countries of the world, there has been a rapid transition to remote teaching as of March, when the first case of COVID-19 appeared in our country. In this process, while the Ministry of National Education tried to support the teaching processes of students through the Educational Information Network (EBA) TV, many institutions at the university level put online processes to work in order to reach their students.

The flexibility and accessibility provided by distance education is an opportunity for both employees and students living in remote areas. Due to these opportunities, even before the pandemic, some universities were offering distance or hybrid education programs to meet the educational needs of their students at various certificate, associate, undergraduate and graduate levels. Therefore, they have already distance education infrastructures for existing programs (Mishra et al., 2020; Al Lily et al., 2020). Therefore, it was sufficient for these universities to strengthen their infrastructure for the transition to emergency remote teaching. On the other hand, universities that did not have the necessary infrastructure had to establish their infrastructure from the beginning.

In addition to institutions, students and instructors have also been affected by this extraordinary situation. Many students who started their education life face-to-face before the emergency remote teaching had to continue with distance education. Similarly, instructors who have not been involved in online teaching before have also had to experience this transition. This sudden transition to the ERT process has been challenging, time consuming and resulted in more workload for instructors in terms of getting used to the new teaching environment, learning to use online technologies and designing new teaching materials (Wingo et al., 2017). This uncertainty and unpreparedness, along with the effect of the isolation and quarantine process, has led students and instructors to worry and stress (Bozkurt et al., 2020; Green et al., 2020; Trust & Whalen, 2020). The prolongation of the ERT and the transition to the new normal process caused distance education to become a part of our lives and made it necessary to get used to the new learning environment and technologies. Despite all the difficulties they faced, instructors were expected to adapt to the process, have more control over the teaching processes, and perform their roles successfully (Hodges et al., 2020). This situation has made the adaptation and satisfaction of the instructors, who are the determinants of quality in teaching, more important.

Faculty Satisfaction in The Process Emergency Remote Teaching

Distance education, which had a certain trend before the global pandemic process, has become a new paradigm with this process. With the changing paradigm, the duties and responsibilities of the instructors have also changed. In order for them to adapt to this situation and teach successfully, the satisfaction of the instructor appears as an important component (Blundell et al., 2020). As a matter of fact, the Online Learning Consortium (Quality Framework - OLC, n.d.) considers one of the five elements of quality online education to be the satisfaction of the instructors.

Job satisfaction is described as a positive job attitude that affects a person's job performance, retention or quitting behavior, and life satisfaction (Estrada Aguilar et al., 2022). In the context of online learning, instructor satisfaction is defined as “the perception that the online teaching process is efficient, effective and beneficial for the individual” (Bolliger et al., 2014; Quality Framework - OLC, n.d.).

Instructor satisfaction has a complex issue and it has seen that includes different components like interaction, motivation, competencies, supports etc. (Blundell et al., 2020; Bolliger et al., 2014; Marasi et al. 2020). The determination of these components is important in terms of ensuring quality in teaching. It is emphasized that the satisfaction of the instructor is closely related to the structure of the course design, the effectiveness of the course, and student satisfaction (Bolliger & Wasilik, 2009; Jaggars & Xu, 2016). At the same time, it is pointed out that the professional development opportunity and technical infrastructure to be provided by the institutions can support the satisfaction of the instructors (Quality Framework - OLC, n.d.).

In the literature, there are a number of studies examining the satisfaction of instructors in terms of different variables. Similar to this study, Bolliger and Wasilik (2009) developed a measurement tool to determine the factors affecting the perceived satisfaction of instructors in the context of online learning. They found instructor, student, and institution-related factors in the scale they developed.

El Refae et al. (2021), on the other hand, investigated the satisfaction of faculty members with their perception of institutional readiness and the opportunities and challenges of distance learning. According to the results of the research, the instructors expressed both high satisfaction with the institutional readiness for distance learning and their concerns about the difficulties they encountered, although they believed in the opportunities and advantages of distance learning.

Stickney et al. (2019) emphasized the positive contribution of institutional support, organizational policies, and educational support in their research on the satisfaction of instructors towards online teaching. A different research finding is that the instructors who are satisfied with the technical support in the online learning environment, however, have low satisfaction with online teaching.

Sayan et al. (2020) examined the views of instructors on the ERT process. Most of the instructors expressed the problems they experienced regarding technological support and the software used.

Özcan (2019) examined instructors' engagement with online teaching and found that instructor competencies, personal characteristics, student participation, interaction, institutional support, and opportunities provided by distance education contributed positively to their commitment.

As can be seen in the research, there are various factors that affect the attitudes and satisfaction of the instructors in online teaching. When the literature is examined in a holistic way, it is seen that research on satisfaction are mostly handled from a student perspective. It can be said that instructors, one of the stakeholders of the process, are relatively put in the background (Zizka & Probst, 2021). As for Turkish literature, a limited number of studies have been found on the satisfaction, attitudes and opinions of the staff in online teaching (Özdemir ve Gürbüz, 2020; Hotar vd., 2021, Zorluoğlu vd., 2021).

However, the ERT process has also clearly shown that there is still much progress to be made in online teaching. Therefore, in order to overcome the existing problems, there is a need for research focusing on the feedback and opinions of key stakeholders involved in the process, as well as improvements to be made based on the feedback of the stakeholders. It is thought that determining the factors affecting the experience, attitudes, perceptions and satisfaction of instructors will contribute to the improvement of the existing online teaching applications and the development of future ones. In addition, a scale that addresses the satisfaction of the instructors in the ERT process has not been found in the Turkish literature. For this reason, the aim of the study is to develop a valid and reliable measurement tool in order to determine the satisfaction levels of the instructors who teach in the emergency distance education process. In addition, the study offers evaluation of levels of satisfaction

scores of the instructors by comparing the obtaines the scores in terms of some demographic variables (gender, field, title).

METHOD

Participants

The study was conducted at a state university. Ethics committee permission was obtained from the relevant university to conduct the research. The study was carried out with two groups of data sets obtained from the instructors who gave lectures in the fall and spring semesters of the 2021-2022 academic year. The data set used for exploratory factor analysis includes data collected from 406 instructors, and the data set used in confirmatory factor analysis includes data collected from 506 instructors were selected using the appropriate sampling method. Missing data were identified among the data obtained, and the study was carried out on the data of 400 instructors for EFA and 446 instructors for CFA.

The information of the group from which the data of the first data set of the study was collected is shown in Table 1. Of the 400 instructors, 245 (61.25%) are female and 155 (38.75%) are male. In the study 121 instructors (30.25%) work in Science (30.25%), 114 in Health (28.50), 165 in Social fields (41.25%). 104 instructors are Prof.Dr. (28.50), 67 Assoc.Prof.Dr. (16.75), 61 Asst.Prof.Dr. (15.25), 129 Lect.Dr./Lect. (32.25), 39 Research Assistant Dr./ Research Assistant (9.75%).

Table 1

Demographic information about the participants (Group 1)

	Gender					
	Female		Male			Total
F	245		155			400
%	61.25		38.75			100
	Field					
	Science	Health		Social		Total
F	121	114		165		400
%	30.25	28.50		41.25		100
	Title					
	Prof.Dr.	Assoc.Prof.Dr.	Asst.Prof.Dr.	Lect.Dr./Lect.	R.A.Dr./R.A.	Total

F	114	67	61	129	39	400
%	28.50	16.75	15.25	32.25	9.75	100

The information about the group from which the data of the second data set of the study were collected is presented in Table 2. Of the 446 instructors, 280 (62.8%) are female and 166 (37.2%) are male. 134 (30.0%) instructors work in Science, 134 (30.0%) in Health, and 178 (39.9%) in Social fields. 114 instructor (25.6%) are Prof.Dr., 82 (18.4%) Assoc.Prof.Dr., 65 (14.6%) Asst.Prof.Dr., 137 (30.7%) Lect .Dr./Lect., 48 (10.8%) Research Assistant Dr./Research Assistant.

Table 2

Demographic information about the participants (Group 2)

	Gender					
	Female		Male			Total
F	280		166			446
%	62.8		37.2			100
	Field					
	Science	Health		Social		Total
F	134	134		178		446
%	30.0	30.0		39.9		100
	Title					
	Prof.Dr.	Assoc.Prof.Dr.	Asst.Prof.Dr.	Lect.Dr./Lect.	R.A.Dr./R.A.	Total
F	114	82	65	137	48	446
%	25.6	18.4	14.6	30.7	10.8	100

Scale Development Process

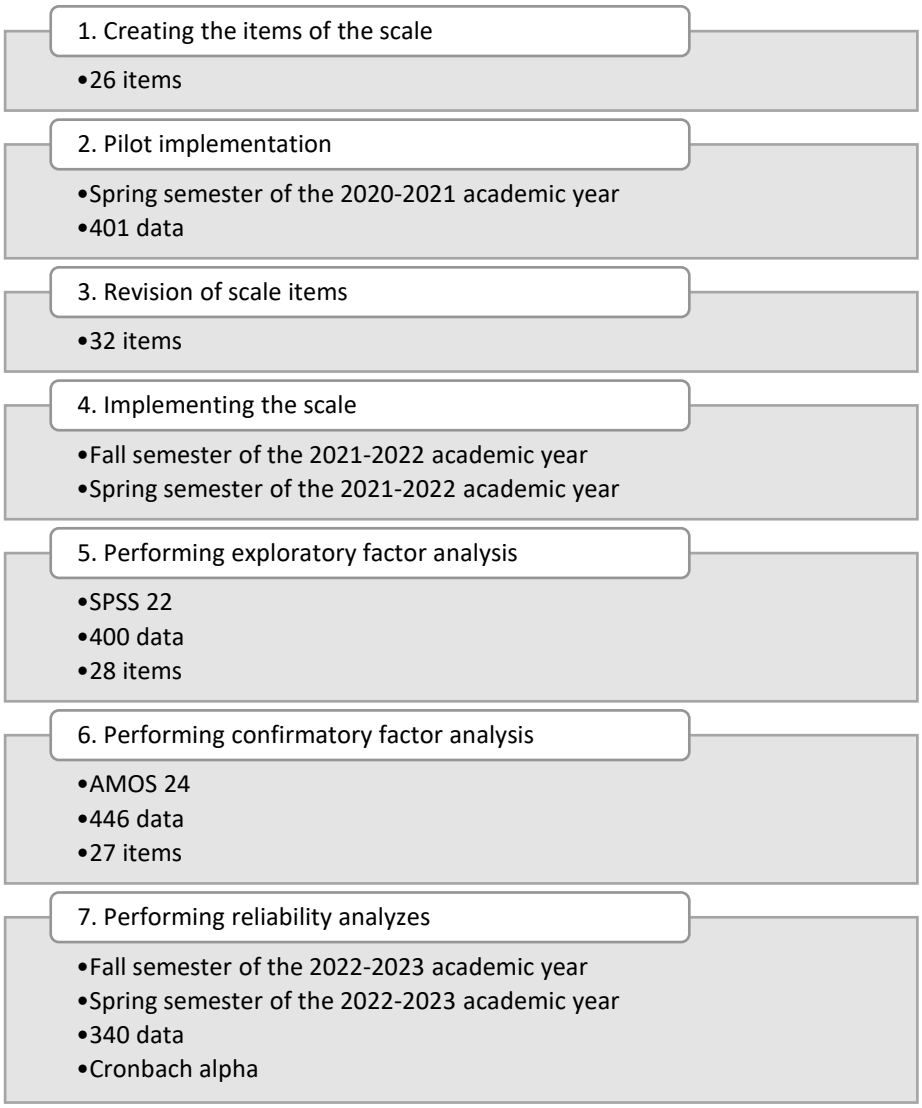
In order to develop a measurement tool that determines the satisfaction of the instructors for emergency remote teaching, the study was started with a literature review for the creation of scale items. Based on the keywords related to the subject such as "teacher satisfaction", "distance education/learning", "online learning/teaching", "emergency remote learning/teaching", the factors affecting instructor satisfaction in distance education were determined from the literature. In addition,

national and international scales used to measure factors such as the attitude, motivation, etc., which affect the satisfaction of the instructor or the satisfaction, were examined. As a result of these examinations, a tool consisting of 26 items was developed. The items express such dimensions as "attitude", "proficiency", "interaction", "technical support", "infrastructure", "opportunity", , which are among the factors that affect the satisfaction of instructors in distance education. In line with the opinions of 5 field experts, 2 assessment and evaluation experts and 1 language expert, the finalized items were applied to the instructors at the end of the spring semester of the 2020-2021 academic year (pilot implementation).

The data collected from 401 instructors with the pilot implementation were evaluated by factor analysis in the SPSS 22 program. When the results of the analysis were examined, it was seen that the scale basically consisted of 5 dimensions, and it was determined that the number of items was not enough to represent some of the dimensions, and some items had to be removed or changed. For this reason, 4 items were completely removed from the scale, while 10 new items were added before the analysis. The measurement tool, which was obtained by making the necessary changes, was presented to the expert opinion again, and updates were made in line with the feedback. As a result, a 5-point Likert-type measurement tool consisting of 32 items was obtained. Four of these items are negative and 28 items are positive. Scale items are answered and scored as “strongly disagree” 1, “disagree” 2, “undecided” 3, “agree” 4, “strongly agree” 5. There are 4 reverse items in the scale. These items are scored as “Strongly disagree” 5, “Disagree” 4, “undecided” 3, “Agree” 2, “Strongly agree” 1. In addition, before the scale was applied, it was sent to the Education Commission affiliated to Education and International Relations Office of The University and presented to the commission members, who are instructors working in various departments of the university. The scale was revised with the feedback received. However, the commission was approved for the application of the scale to the instructors at the university. The 32-item scale was applied to the instructors who gave online lectures on the learning management system in the fall and spring semesters of the 2021-2022 academic year. The whole implementation process of the research is shown in Figure 1 with the details.

Figure 1

Implementation Process



Data Analysis

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed for the validity studies of the developed measurement tool. EFA is used in scale development studies to transform large item pools into a more concise, reliable and conceptually sound measurement tool (Hooper, 2012). This analysis is preferred to discover unknown variable groups and to search for underlying patterns, clusters and groups (Cohen et al., 2007). On the other hand, CFA is carried out to confirm the structure formed by the theoretically predicted or predicted relations with previous analysis results (DeVellis, 2003). While SPSS 22 program was used for EFA and reliability analysis, CFA was performed in AMOS 26 program.

Before starting the analysis process, the z-scores of the items were calculated to remove outliers in the data set to be used for EFA. A total of 106 data with z scores of 3 and above were excluded from the data setof the sample EFA. After 106 data sets were extracted, analyzes were performed on 400

data sets for EFA. Addition to this, the extreme values were also checked to meet the assumption of normality with the multicollinearity values between the dependent variables. To do this, VIF and tolerance values, and Cook's distance and Leverage values were controlled. The computed analysis showed that the dataset obtained for EFA sample was met the assumptions. Accordingly, the ranged values for skewness and kurtosis coefficients between +2.5 and -2.5 indicates that distribution does not deviate extremely from a normal distribution (Mertler & Vannatta, 2005). Other assumptions of outliers were detected with Mahalanobis Distance value considering the independent variables in the dataset ($p<0.01$) (Buyukozturk, 2005, p.99), and seen that the multicollinearity and singularity values were seen at moderate levels (Akbulut, 2010, p.158; Buyukozturk, 2005, p.100; Pallant, 2005). Additionally, VIF values were smaller than 10 and computed between 1.143-1276. The tolerance values were higher than zero and computed between 0.497 and 0.875. Finally, Cook's distance should be smaller than 1 and Leverage values should be smaller than 0.02 to meet the assumptions., and for this dataset it has seen between 0-0.04 and 0-0.02, respectively. Considering the independent variables in the data set to be used for CFA, Mahalanobis Distance value and other outlier assumptions were determined ($p<0.01$) (Büyüköztürk, 2005, p.99) and 7 extreme values were removed from the data set. After removing the extreme values, the analyzes were continued with 446 data sets. Computational analysis showed that the data set obtained for the CFA sample met the assumptions. Accordingly, the fact that the skewness and kurtosis coefficients vary between +2.5 and -2.5 indicates that the distribution does not deviate much from the normal distribution (Mertler and Vannatta, 2005). In addition, VIF values are less than 10 and were calculated between 1.143 and 2.83. Tolerance values were higher than zero and were calculated between 0.353 and 0.954. Finally, in order to meet the assumptions, Cook distance should be less than 1 and Leverage values should be less than 0.02, and it was seen between 0-0.018 and 0-0.02 for this data set, respectively. According to these results, the data met the multivariate normality assumption. The data set shown in Figure 1, used for EFA and CFA was obtained in this way.

For the reliability studies of the scale, Cronbach alpha coefficient and Spearman Brown coefficient within the scope of split-half analysis were calculated. Cronbach alpha is widely used to measure reliability (DeVellis, 2017). A measuring tool is reliable and accurate, if users' scores have internal consistency between items. One of the ways to examine the consistency of the answers is split-half analysis (Creswell, 2012).

Ethical Principles

Ethics committee permission for this study was obtained from Rectorate Gazi University Ethics Committee with the decision dated 22.11.2022 and numbered 19.

FINDINGS

Exploratory Factor analysis (EFA)

In the study, EFA was conducted to determine the dimensions and structure of the items of the scale with the data collected from 400 instructors. Varimax rotation was used for factor analysis, as it maximizes the variance between factors and thus helps to distinguish them from each other (Cohen et al., 2007).

Before the analysis, the suitability of the data for factor analysis was examined by the Kaiser-Meyer-Olkin (KMO) coefficient and the Barlett sphericity test. While the KMO coefficient was calculated as

.902, the Barlett test was significant (p=.000). The fact that the KMO coefficient is greater than .60 and the Bartlett's test is significant indicates that the data are suitable for factor analysis (Cohen et al., 2007).

During the analyses, the factor loads and communality values of the items were examined. The factor loads of the items in the scale should be .32 and above, and the communality values should be .40 and above. In addition, it is one of the points to be considered in the evaluation of the items that the factor loadings of the items in more than one factor at the same time should not exceed .32 (Carpenter, 2018). While no problem was observed in the factor loading and communality values of the items, it was decided to remove the items M17, M18, M22 and M27 from the scale because they had high loadings in more than one factor. As a result, a scale consisting of 5 dimensions and 28 items was acquired. The number of dimensions was determined based on the components with eigenvalues above 1 and the scree plot graphic (Büyüköztürk, 2008). The distribution of the items of the scale to the factors and their factor loadings are shown in Table 3.

Table 3

Distribution of the items of the scale to the factors and their factor loadings

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
M1	.810				
M2	.720				
M3	.825				
M4	.641				
M7	.745				
M23	.720				
M28	.816				
M29	.562				
M5		.802			
M6		.774			
M8		.817			
M9		.803			
M10		.658			
M11		.759			

M13	.684			
M14	.628			
M15		.649		
M16		.636		
M19		.818		
M20		.850		
M21		.747		
M25			.659	
M30			.681	
M31			.804	
M32			.863	
M12				.605
M24				.715
M26				.767

It is seen that the each of 1st and 2nd factors of the scale contain 8, 3rd factor 5, 4th factor 4, and 5th factor 3 items. At this stage, the factors were named in line with the literature and expert opinions. Accordingly, the name of the first factor was determined as "the instructor's belief in distance education", the name of the second factor as "the competence of the instructor for distance education", the name of the third factor as "ICT (Information and Commnunication Technologies) infrastructure", the name of the fourth factor as "the student-instructor interaction", and the name of the 5th factor as “flexibility and opportunities”.

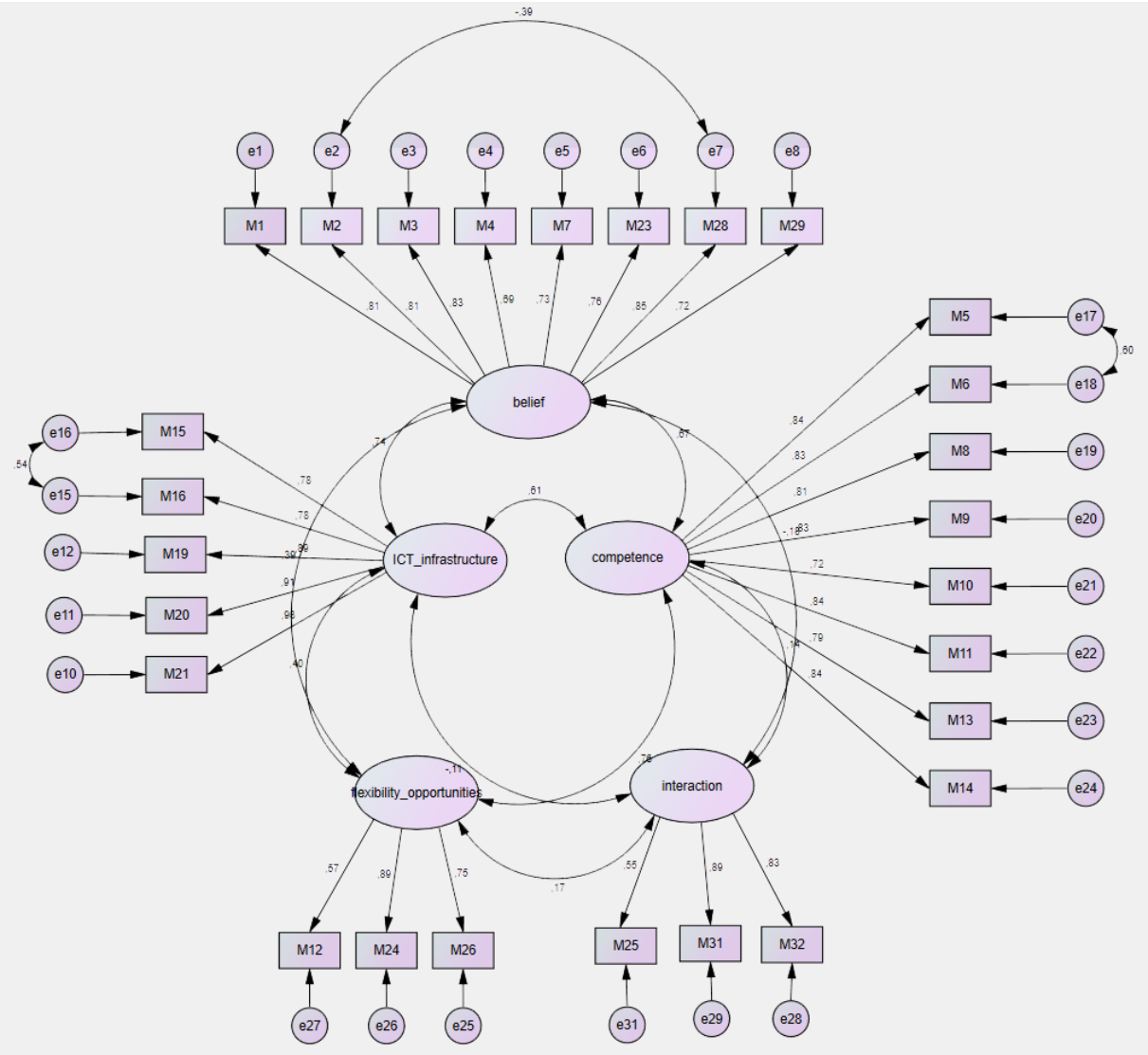
Confirmatory Factor analysis (CFA)

In order to determine construct validity of the scale, whose factor structure was determined by EFA, CFA was performed with the data collected from 446 instructors. When the factor loads of the items were controlled in the CFA results, it was seen that the factor load of the M30 item under the "student-instructor interaction" factor was below .50. Farooq (2016) states that standardized factor loads of items in structural equation modeling should be above .50. For this reason, it was decided to remove item M30 from the scale. In structural equation modeling, it is not required and impracticable to include all indices in the program output, although different indexes do indicate various aspects of model fit, according to Hooper et al. (2008). The Chi-Squared test, RMSEA, CFI, and TLI values included in two of the three index categories specified in Hooper et al. (2008) were employed. Afterwards,

CMIN/df, RMSEA and SRMR values and fit indices of the model were examined. Since these values were not in the desired standards, modification suggestions were examined and three modifications were made on the model. The resulting model of scale is shown in Figure 2.

Figure 2

The structural model of instructor satisfaction scale for emergency remote teaching and standard values of the model



The CMIN / df was calculated as 3.43, the RMSEA as .074, the CFI as .912, the IFI as .913, the TLI as .901, and the SRMR as .078. In structural equation modeling, RMSEA between .05 and .08 and CFI, TLI and IFI higher than .90 indicate an acceptable fit (Baumgartner & Homburg, 1996). SRMR between 0 and .05 indicates a good fit, and a value between .05 and .10 indicates an acceptable fit (Schermelleh-Engel et al., 2003). Although Schermelleh-Engel et al. (2003) stated that the CMIN/df should be between 2 and 3 for acceptable fit, Yaşlıoğlu and Toplu Yaşlıoğlu (2020) stated that if the sample size is over 300, the cut-off point for acceptable fit can be taken as 5. In this case, it can be said that the scale shows an acceptable fit because the CMIN/df is below 5. As a result, considering all the values, it

can be said that the scale has an acceptable fit in general. The standardized regression weights of the items of the 27-item scale are shown in Table 4.

Table 4

Standardized regression weights of the items of the scale

Items	Factor 1 (belief)	Factor 2 (competence)	Factor 3 (ICT infrastructure)	Factor 4 (student-instructor interaction)	Factor 5 (flexibility and opportunities)
M1	.751				
M2	.778				
M3	.780				
M4	.650				
M7	. 650				
M23	.713				
M28	.810				
M29	.688				
M5		.840			
M6		.819			
M8		.814			
M9		.800			
M10		.687			
M11		.803			
M13		.781			
M14		.823			
M15			.738		
M16			.739		

M19	.880		
M20	.898		
M21	.913		
M25		.504	
M31		.871	
M32		.829	
M12			.563
M24			.894
M26			.745

As a result of confirmatory factor analysis, a scale containing 5 factors and 27 items with an acceptable model fit was obtained. While the total variance explained by the final version of the scale was 73.15%, the first factor explained 44.65% of the total variance, the second factor 12.89%, the third factor 6.45, the fourth factor 5.30%, and the fifth factor 3.86%.

Reliability

For reliability, the data obtained from 340 instructors by applying the same scale in the fall and spring semesters of the 2022-2023 academic year were used. The reliability studies of the scale that measures instructor satisfaction for emergency remote teaching, the Cronbach alpha and the Spearman Brown coefficients was calculated. These coefficients take a value between 1 and 0. If the value is above .90, the measurement tool is very highly reliable, between .80 and .90 highly reliable, between .70 and .79 reliable, between .60 and .69 marginally/minimally reliable, and below .60 unacceptable low reliability (Cohen et al., 2007).

Table 5

Cronbach alpha coefficients for the scale and factors

	Scale	Factor 1 Belief	Factor 2 Competence	Factor 3 ICT infrastructure	Factor 4 Student-instructor interaction	Factor 5 Flexibility and opportunities
Cronbach alpha	.93	.87	.93	.91	.70	.60

The Cronbach alpha coefficient of the scale is .93, indicating a very high reliability. The same is true for the first factor “belief” (α=.87), the second factor “competence” (α=.93), and the third factor “ICT infrastructure” (α=.91). The alpha coefficient of the fourth factor "student-instructor interaction" is .70, and the alpha coefficient of the fifth factor "flexibility and opportunities" is .60. These values indicate a reliable measurement.

In order to reinforce the reliability of the scale, Split-half analysis, which is one of the analyses that determines the internal consistency, was performed and the Spearman Brown coefficient was found to be .846. Based on the above information, it is seen that this value shows a high reliability.

Findings Related to the Participants' Satisfaction

In the study, it was also aimed to evaluate the satisfaction scores of the instructors. For this aim, the levels of the satisfaction scores from the scale were determined as 3 levels (low, medium and high) for the scales’ each factor as seen in Table 6.

Table 6

The levels of instructor satisfaction for the each factor of the scale

Factors of Scale	The Levels of Instructor Satisfaction		
	Low	Medium	High
The instructor's belief in distance education	8-18	19-29	30-40
The competence of the instructor for distance education	8-18	19-29	30-40
ICT infrastructure	5-11	12-18	19-25
The student-instructor interaction	3-7	8-11	12-15
Flexibility and opportunities	3-7	8-11	12-15

In the scale, 3 items belonging to the "the student-instructor interaction" factor are negative (reverse) items. For these items, “Strongly agree” was scored as 1, “Agree” as 2, “Undecided” as 3, “Disagree” as 4, “Strongly Disagree” as 5.

The averages and standard deviation values of the scores of 446 instructors, who constitute one of the sample of the research, were calculated and presented in Table 7.

Table 7

Mean and standard deviation values of satisfaction scores according to the each factor

Factors of Scale	Average Scores	Standard Deviation	Result
The instructor's belief in distance education	33.67	4.64	High
The competence of the instructor for distance education	27.75	6.85	Medium
ICT infrastructure	20.40	3.76	High
The student-instructor interaction	6.47	2.62	Low
Flexibility and opportunities	8.37	3.08	Medium

The mean of their scores from first factor was 33.67; the mean of their scores from second factor was 27.75; the mean of their scores from the third factor was 20.40; the mean of their scores from fourth factor was 6.47; the mean of their scores from the fifth factor was 8.37. When these values are evaluated according to Table 6, the satisfaction level of the instructors and the level of the "the competence of the instructor for distance education" are medium, but close to high; the levels of the "the instructor's belief in distance education" and "ICT infrastructure" are high, the level of “the student-instructor interaction” is low, and the scores of the "flexibility and opportunities" are medium.

Findings Related to the Participants' Satisfaction in Terms of Gender, Field, and Title

In the research, it was also examined whether the satisfaction of the instructors towards emergency remote teaching changed according to the variables of gender, field and title. In order to decide on the analyses to be made to determine whether the satisfaction scores of the instructors show a significant difference according to these variables, it was primarily explored whether the data were normally distributed or not. The skewness and kurtosis values of the data are the features used to evaluate the normal distribution of the data (Morgan & Driego, 1998). For this purpose, the skewness and kurtosis values of the satisfaction scores of the subgroups of each variable were calculated in the SPSS 22 program.

Table 8

Skewness – kurtosis values of instructors' satisfaction scores according to gender, field, and title

		Gender		Field			Title					
		Female	Male	Science	Health	Social	Prof. Dr.	Assoc. Prof.Dr.	Asst. Prof.Dr.	Lect.Dr. /Lect.	R.A.Dr. /R.A.
The instructor's belief in distance education	Skewness	-.735	-.618	-.383	-.664	-.840	-.954	-.579	-.855	-.663	-.208
	Kurtosis	1.326	-.014	-.165	.467	1.042	1.184	.438	1.037	.770	-.642
The competence of the instructor for distance education	Skewness	-.213	.010	-.067	-.041	-.256	-.089	.123	.095	-.337	-.213
	Kurtosis	-.066	-.626	-.010	-.191	-.470	.005	-.200	.106	-.456	-.578
ICT infrastructure	Skewness	-.650	-.499	-.468	-.761	-.570	-.542	-.505	-.885	-.583	-.598
	Kurtosis	-.005	-.502	-.414	.329	-.333	-.260	-.129	.697	-.392	-.178
The student-instructor interaction	Skewness	.337	.489	.486	.144	.516	.226	.661	.035	.530	.163
	Kurtosis	-.575	-.636	-.350	-.639	-.662	-.549	-.067	-.794	-.810	-.744
Flexibility and opportunities	Skewness	.461	.447	.621	.331	.457	.681	.850	.848	.229	-.292
	Kurtosis	.146	-.211	.056	-.499	-.266	.512	.311	.606	-.725	-.116

Tabachnick & Fidell (2013) states that skewness and kurtosis values between -1 and +1 indicate a normal distribution. When the values in Table 8 are examined, it is seen that sub-dimensions of the satisfaction scores for all variables are within the required range. In this case, it was accepted that the data showed a normal distribution and parametric tests were preferred for the analyses.

In order to determine whether the satisfaction scores of the instructors changed significantly by gender, t-test for independent samples was carried out.

Table 9

T-test results of the instructors satisfaction sub-dimensions scores by gender

		N	Mean	Standard deviation	df	t	p
The instructor's belief in distance education	Female	280	33.93	4.360	444	1.524	.034
	Male	166	33.24	5.055			
The competence of the instructor for distance education	Female	280	27.84	6.741	444	.385	.185
	Male	166	27.58	7.039			
ICT infrastructure	Female	280	20.41	3.742	444	.078	.548
	Male	166	20.39	3.796			
The student-instructor interaction	Female	280	6.60	2.657	444	1.362	.399
	Male	166	6.25	2.555			
Flexibility and opportunities	Female	280	8.27	3.098	444	-.878	.581
	Male	166	8.54	3.044			

*p>.05

Table 9 shows the average scores of women and men regarding the sub-dimensions of the scale. When the scores related to the sub-dimensions are examined in line with the results obtained from the t-test, it is seen that only the belief dimension shows a significant difference according to gender (t(444)=0.034; p<.05). In other sub-dimensions, it was determined that although the mean score of women was higher than the mean score of men, this difference was not significant ("The competence of the instructor for distance education (t(444)=0.185, p>.05)", "ICT infrastructure (t(444)=0.548, p>.05)", "The Student-Instructor Interaction (t(444)=0.399, p>.05)", "Flexibility and Opportunities (t(444)=0.581, p>.05)).

As a result, no significant relationship was found between the genders of the instructors and their satisfaction's sun-dimension for emergency distance education. One Way ANOVA was performed to evaluate whether the fields (science, health, social) made a significant difference on the satisfaction scores of the instructors.

Table 10

ANOVA results of instructors' satisfaction sub-dimensions scores by field

Sun-dimension	Source	Sum of squares	df	Mean Square	F	p
The instructor's belief in distance education	Between Groups	58.521	2	29.261	1.363	.257
	Within Groups	9511.337	443	21.470		
	Total	6569.859	445			
	*p>.05					
The competence of the instructor for distance education	Between Groups	107.146	2	53.573	1.144	.320
	Within Groups	20753.224	443	46.847		
	Total	20860.370	445			
	*p>.05					
ICT infrastructure	Between Groups	6.279	2	3.139	.222	.801
	Within Groups	6277.075	443	14.169		
	Total	6283.354	445			
	*p>.05					
The student-instructor interaction	Between Groups	12.302	2	6.151	.894	.410
	Within Groups	3046.694	443	6.877		
	Total	3058.996	445			
	*p>.05					
Flexibility and opportunities	Between Groups	48.670	2	24.335	2.588	.076
	Within Groups	4165.288	443	9.402		
	Total	4213.957	445			
	*p>.05					

Table 10 shows the ANOVA results for each dimension. According to the results of the analysis, the sub-dimensions of satisfaction ("The instructor's belief in distance education (F (2-443)=1.363, p>.05)", "The competence of the instructor for distance education (F (2-443)=1.144, p>.05)", "ICT infrastructure (F (2-443)=0.222, p>.05)", "The Student-Instructor Interaction (F (2-443)=0.894, p>.05)", "Flexibility and Opportunities (F (2-443)=2.588, p>.05)) are no significant difference according to the field.In this case, there is no significant relationship between the fields of the instructors and their satisfaction's sub-dimension towards emergency remote teaching.

In order to determine whether the satisfaction scores of the instructors show a significant difference by the titles (Prof.Dr., Assoc.Prof.Dr., Asst.Prof.Dr., Lect. Dr./Lect., R.A.Dr./R.A), One Way ANOVA was performed.

Table 11

ANOVA results of instructors' satisfaction sub-dimensions scores by title

Sun-dimension	Source	Sum of squares	df	Mean Square	F	p
The instructor's belief in distance education	Between Groups	99.442	4	24.860	1.158	.329
	Within Groups	9470.417	441	21.475		
	Total	9569.859	445			
	*p>.05		441			
The competence of the instructor for distance education	Between Groups	332.680	2	83.170	1.787	.130
	Within Groups	20527.690	441	46.548		
	Total	20860.370	445			
	*p>.05					
ICT infrastructure	Between Groups	8.604	4	2.151	.151	.962
	Within Groups	6274.750	441	14.228		
	Total	6283.354	445			
	*p>.05					
The student-instructor interaction	Between Groups	38.555	4	9.639	1.407	.231
	Within Groups	3020.440	441	6.849		
	Total	3058.996	445			

	*p>.05					
Flexibility and opportunities	Between Groups	120.166	4	30.042	3.236	.012
	Within Groups	4093.791	441	9.283		
	Total	4213.957	445			
	*p>.05					

Table 10 shows the ANOVA results for each dimension. According to the results of the analysis, the sub-dimensions of satisfaction (“The instructor's belief in distance education (F (4-441)=1.158, p>.05)”, “The competence of the instructor for distance education (F (4-441)=1.787, p>.05)”, “ICT infrastructure (F (4-441)=0.151, p>.05)”, “The Student-Instructor Interaction (F (4-441)=1.407, p>.05)”, “Flexibility and Opportunities (F (4-441)=3.236, p>.05)) are no significant difference according to the title. In this case, there is no significant relationship between the title of the instructors and their satisfaction sun-dimensiond towards emergency remote teaching.

RESULTS, DISCUSSIONS, AND SUGGESTIONS

In this research, a scale was developed in order to determine the satisfaction levels of the instructors who teach in the ERT process. In the final version of the scale, there are five dimensions: "the instructor's belief in distance education ", "the competence of the instructor for distance education ", "ICT infrastructure", "the student-instructor interaction" and "flexibility and opportunities". When the Turkish literature is examined, it is noteworthy that studies on satisfaction mostly focus on student satisfaction (Çelik Eren et al., 2021; Eren et al., 2022; Kafes & Yıldırım, 2021; Yalman, 2013; Yildiz et al., 2021). When the literature is examined, it is seen that there are scale development studies for instructor satisfaction, but these studies are very few. There is a similar situation in the international literature, and more research on student satisfaction has been found. When the research on the satisfaction and attitudes of the instructors are examined, it is seen that some of them are for face-to-face education processes (Daumiller et al., 2022; Estrada Aguilar et al., 2022) and some are for online teaching processes before the pandemic (Bolliger & Wasilik, 2009; Luongo, 2018; Metin et al., 2021; Stickney et al., 2019; Walters et al., 2017).

The online instructor satisfaction survey developed by Bolliger and Wassilik (2009) confirms that there are three factors affecting the satisfaction of instructors in the online environment. These are student-related, instructor-related, and institution-related factors. Luongo (2018) has focused on the factors that influence instructor satisfaction and dissatisfaction with distance learning. According to the results of the research, it was emphasized that while the obstacles (workload, insufficient education, lack of technical support and experience) perceived by the instructors negatively affected their satisfaction, the trainings to be given for their professional development would contribute positively. Blundell et al. (2020) validated a previously developed scale by Blundell (2015) and revealed that instructor satisfaction is affected by three main factors: instructor-student interaction, the role of technology, and institutional support.

There are studies conducted in the ERT process regarding instructor satisfaction. In the research conducted by Jarab et al. (2022), the satisfaction of the instructors towards online teaching during the COVID-19 process was examined. The researchers developed a scale consisting of 3 factors and 21 items as a result of factor analysis. These three factors are the student-related factor, the institution-related factor, and the technology-related factor. Another result of the research is that the satisfaction levels of the instructors who received training for online teaching were high. In their study, Joshi et al. (2022) aimed to explore the factors that contribute to instructor satisfaction in the ERT process, the difficulties encountered, and suggestions for improving online teaching. In order to increase the satisfaction of the instructors, four important factors were identified as instructor-student interaction, instructor-information technology interest, preparedness of the instructor, and finally, the education of the instructor on the subject.

When the Turkish literature is examined, there are studies on instructor satisfaction in the ERT process, but no scale has been found. In the study conducted by Hotar et al. (2021) the views of instructors and students on distance education teaching processes were examined comparatively. According to the results of the research, it was seen that the instructors preferred online and hybrid learning more than students. Similarly, in the study conducted by Ergönül et al. (2020), it was seen that educators were more satisfied with the ERT process than students, but this situation was not affected by variables such as gender, experience, and duration of education.

When the scales developed during the pandemic and the researches are examined, it is noteworthy that these studies are generally in the international literature. In the study, it was desired to develop a unique scale that deals with the satisfaction of the instructors in the context of our country, instead of making an adaptation study, since there may be cultural differences and the approach of each country to the pandemic may be different. In addition, when the Turkish literature is examined, it is clear that there is a need for studies in which satisfaction is discussed in the context of the instructor. Instead, it was desired to develop a unique scale that deals with instructor satisfaction in the context of our country. As a matter of fact, while there was no scale directly related to instructor satisfaction during the pandemic period, a scale study was found to determine primary school teachers' views on the ERT process (Metin et al., 2021). In this study conducted by Metin et al. (2021) with the participation of 490 teachers from different cities, a scale consisting of 37 items and six factors was developed. The names of the factors are determined in order as follows, “General problems in distance education”, “Opportunities provided by distance education to teachers and students”, “Problems encountered during lessons in distance education”, “Positive aspects of distance education”, “Working conditions of teachers in distance education”, and “The use of technology in distance education”. However, no scale was found regarding the satisfaction of the instructors for online teaching from the pre- or post-ERT period. However, in the Turkish literature, there are also studies that determine the satisfaction levels of the instructors with the learning management systems (Ateş, & Güyer2016), and the opinions and satisfaction levels of the instructors participating in the online training of trainers’ certificate program (Sakal & Adnan, 2013).

In the study, a five-dimensional satisfaction scale consisting of 27 items was developed. The final version of the scale explains 73.15% of the total variance. The "belief" dimension, which is one of the sub-dimensions of the scale, explains 44.65% of the total variance. When this dimension is compared with similar scale studies, it is seen that it is named in different ways. For example; Walters et al. (2017) expressed similar items as personal factors in their study and in the study of Joshi et al. (2022), similar items were expressed as student-instructor interaction. In this study, especially the positive self-

perceptions of the instructor were gathered under this factor, so the factor was expressed as "belief". In the literature, the belief that one can fulfill the requirements of a job is defined as self-efficacy (Bandura, 1977; Zimmerman, 1995). This variable can be evaluated as the individual's belief about being able to cope with the situations they encounter or succeeding in a job. Studies show that high self-efficacy for teaching is significantly positively associated with satisfaction (Ismayilova & Klassen, 2019; Türkoglu et al., 2017). Although this factor can also be expressed as self-efficacy, since our second factor is also expressed as competence, it is expressed as belief in order not to cause confusion.

The second factor, "competence", explains 12,89% of the total variance. When the literature is examined, Joshi et al. (2022) interpreted the factor with similar items as student-instructor interaction. However, this factor also includes items related to the classroom management of the instructor. For this reason, it is named as competence with a more general expression. When the qualification is considered in terms of the instructor, it ensures the efficient use of resources to achieve the desired result (Caena & Redecker, 2019). Instructors must have certain competencies in order to respond to the needs of learners with the changing paradigm in learning environments (Zhao, 2022).

Another factor, ICT infrastructure, is similarly expressed in many studies on faculty satisfaction (Blundell et al., 2020; Jarab et al., 2022; Joshi et al., 2022). Previous studies also show that the institutional support provided to the instructors and the easy and convenient use of the system contribute positively to their satisfaction and engagement to teaching (Hampton et al., 2020; Özcan, 2019).

In another factor there are items about the negative thoughts of the instructors towards online teaching. It is seen that these statements are generally related to the interaction and communication of the instructors with the students. So the factor with these items was expressed as student-instructor interaction. Compared to some studies in the literature, there are studies with similar items named as "Instructor-ICT related" or "Instructor-student related" (Jarab et al., 2022; Joshi et al., 2022). Due to the different opinions in the results of the studies, expert opinion was sought and it was decided that the expression "the student-instructor interaction" was more appropriate for the items.

The last factor was expressed as flexibility and opportunities, as the opportunities offered by online distance learning compared to face-to-face teaching were included. Stickney et al. gathered similar items under the heading of flexibility in their study to learn about their online teaching experiences and to examine the factors that may affect their satisfaction. In online teaching, instructors face many difficulties. On the other hand, it can also offer opportunities to balance work and personal life, offer different interaction possibilities, and experience more flexibility in terms of time and space independence (Stickney et al., 2019).

In the study, the satisfaction levels for the factors are examined, the satisfaction levels for the “the instructor's belief in distance education” and “ICT infrastructure” are high, while the satisfaction scores for the “the instructor's competence in distance education” and “flexibility and opportunities” are at medium levels. In “the student-instructor interaction”, it is seen that the instructors have a low level of satisfaction. This situation can be interpreted that the instructors have positive thoughts and feelings about the situations that affect their beliefs about distance education and the infrastructure offered by the university in the ERT. In addition to this, it can be said that the instructors are not satisfied with their competencies in distance education and the flexibility and opportunities offered by distance education, and they think that they cannot interact with their students efficiently in the process, and they have difficulty in interaction.

It was also investigated whether the satisfaction's sub-dimensions of the instructors differed according to gender, field and title, but no significant difference was found. Unlike the research conducted by Joshi et al. (2022), they classified the type of faculty as technical-non-technical and found a significant difference. On the other hand, Ergönül et al. (2020), it is stated that the satisfaction of the instructors in the ERT process is not affected by variables such as gender, experience and training period, supporting the results of the research. El Refae et al. (2021), on the other hand, found that satisfaction by gender showed a significant difference in favor of male instructors. In addition, the satisfaction levels of the instructors in the department of communication and media towards distance education were higher. This situation can be interpreted as the attitudes of disciplines with similar work processes or experience towards the distance education process are more positive.

In the current study carried out to develop a measurement tool to measure and evaluate the satisfaction levels of the instructors for emergency remote teaching, a highly reliable and acceptably valid satisfaction scale consisting of 5 dimensions and 27 items was obtained. The five dimensions are named as "the instructor's belief in distance education", "the competence of the instructor for distance education", "ICT infrastructure", "the student-instructor interaction", "flexibility and opportunities". It has been observed that these factors are similar to the factors that are thought to represent satisfaction, which have been revealed in previous studies. The factors include 8, 8, 5, 3 and 3 items, respectively. The lowest score that can be obtained from the scale designed as a 5-point Likert scale is 27, and the highest score is 135. If the total score obtained from the scale is in the range of 27-62, it means low, if it is in the range of 63-98, it means medium, and if it is in the range of 99-135, it means high level of satisfaction.

Although the scale is called "the satisfaction scale for emergency remote teaching" because it emerged as a result of the analysis of the data collected during the pandemic, it can be thought that the scale can also be used for distance education programs carried out under normal conditions, since it includes items in the literature that evaluate the factors affecting the satisfaction of instructors in online education. In this context, repeating the validity and reliability studies by applying the scale to the instructors working in different distance education programs of universities will test the accuracy of the inference on this issue. In addition, the research was carried out with data collected from instructors from various fields at a state university. In future studies, the scale can be evaluated with participant groups consisting of instructors from different state and private universities.

The results of the research revealed that the model fit of the scale was at an acceptable level. It is thought that new items can be added to the scale by considering the different dimensions in the literature but not included in the structure of the scale in order to improve the model fit, with the studies to be done. In addition, existing dimensions can be improved by adding new items. In this context, qualitative research can be carried out and new items can be determined based on the views of the instructors.

It is seen that the instructors' satisfaction sub-dimensions score is different from each other. It can be presented as a suggestion that will guide future research in which the reasons for the medium level of general satisfaction and the change in satisfaction levels among factors, and in particular, the problems, negative situations and features affecting the instructors related to the factors whose satisfaction level is medium or low are investigated in depth. Additionally, in the study, it was determined that the sub-dimensions of their satisfaction scores of the instructors did not change according to the variables of gender, field and title. It is seen that there are different results supporting

and not supporting these results in the studies in the literature. In order to contribute to the generalizability of the results, it may be suggested to apply the scale to the instructors in other higher education institutions, from different fields and with different titles, and to compare the results of the current research.

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APPENDIX

Instructor Satisfaction Scale for the Emergency Remote Teaching in Higher Education

Boyut	Maddeler		1	2	3	4	5
Uzaktan Eğitime Yönelik Öğretim Elemanı İnancı	1	Çevrim içi dersler konusunda kendime güvenirim.					
	2	Çevrim içi derslerde kendimi istekli ve enerjik hissederim.					
	3	Öğrencilerin çevrim içi dersime her zaman ve her yerden erişebilmeleri benim için değerlidir.					
	4	Çevrim içi derslerde, kullanılan kaynaklar bakımından daha yaratıcı olabilirim.					
	5	Öğrencilerim istedikleri zaman benimle iletişim kurabilir.					
	6	Çevrim içi ortamın sağladığı esneklik benim için önemlidir.					
	7	Çevrim içi içeriklerin (ders, kaynak, materyal vb.) her zaman ve her yerden erişilebilir olması benim için önemlidir.					
	8	Çevrim içi derslerimde erişilebilir içerikler (özel gereksinimi olan bireylere yönelik) hazırlamaya dikkat ederim.					
Uzaktan Eğitime Yönelik Öğretim Elemanı Yeterliliği	9	Çevrim içi eğitimde öğrencilerimin performansını kolaylıkla ölçebilirim.					
	10	Öğrencilerimin performansları hakkında etkin geri bildirim sağlayabilirim.					
	11	Çevrim içi eğitimde öğrencilerimi yeterince tanıyabilirim.					
	12	Öğrencilerim sanal sınıf aktivitelerine etkin bir şekilde katılır.					
	13	Öğrencilerim derslerin içeriği ile ilgili olarak benimle etkin bir şekilde iletişim kurar.					
	14	Çevrim içi derslerde öğrencilerim verilen etkinliklerde ellerinden gelenin en iyisini yapar.					
	15	Derslerimde öğrencilerim birbirleriyle etkili iletişim kurabilir.					
	16	Çevrim içi olarak verdiğim derslerin öğrencilerime gerekli becerileri kazandırdığını düşünürüm.					
BIT altyapısı	17	Öğrenme yönetim sistemine sorunsuz bağlanabilirim.					
	18	Öğrenme yönetim sisteminin kullanımı kolaydır.					

	19	Üniversitem çevrim içi eğitim için gerekli olan teknolojik imkânları sağlamaktadır.					
	20	Üniversitemden uzaktan eğitim sürecine yönelik yeterli düzeyde teknik destek alabilirim.					
	21	Üniversitemin çevrim içi eğitim uygulamalarından memnunum.					
Öğrenci-Öğretim Elemanı Etkileşimi	22	Çevrim içi ders verirken öğrencilerle yüz yüze görüşmeyi özlerim.					
	23	Öğrencilerimin çevrim içi ortamda sınıf içi tartışmalara katılım düzeyi yüz yüze olandan daha düşüktür.					
	24	Öğrencilerimi çevrim içi ortamda motive etmek benim için yüz yüze ortamdan daha zordur.					
Esneklik ve Fırsatlar	25	Çevrim içi dersler için yaptığım hazırlık yüz yüze eğitim ortamına göre daha az iş yükü getirir.					
	26	Çevrim içi derslerde öğrencilerle olan etkileşim düzeyi yüz yüze derslerden daha yüksektir.					
	27	Yüz yüze ders vermek yerine çevrim içi ders vermeyi tercih ederim.					

Author Contributions

All the application process details of the research are given below, and all authors took part in all stages.

•Planning, literature review, Creating the items of the scale, Pilot implementation, Revision of scale items, Implementing the scale, performing exploratory factor analysis, confirmatory factor analysis and reliability analyzes. In the last stage, the research was prepared in a holistic way.

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