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Elementary School Teachers' Views Scale on the Using Zoom in Compulsory Distance Education During the Pandemic: Psychometric Properties

Ceyhun Memiş
Beş Temmuz İlkokulu, Turkey

Abstract: Just as important phenomena such as natural disasters, conflicts and pandemics have effects on people's lives, new technologies also have impacts on people's lives and lifestyles. As a part of COVID-19, many countries have been forced to practice distance education at almost all educational levels. The pandemic of COVID-19 inspired educators to schedule for online learning. To help students learn, educators have used a range of online synchronous meeting technologies (SMTs). Zoom is a widely used, immersive, and easy-to-use SMT. In order to integrate Zoom application effectively which has started to be used in many countries and at all levels of education, it is essential to determine the teachers' thoughts and attitudes about using Zoom in the distance education process. To assess teachers' views, a valid and reliable measuring tool is needed. This research sought to create a valid and reliable scale that would assess teachers' views on the use of Zoom in distance education based on this need. The scale validity and reliability analysis have used for content validity, EFA, CFA, Cronbach alpha, and Composite reliability. According to the study's findings the scale is valid and reliable. Future researchers will be able to apply the developed scale in our study, to teachers working at various educational levels. Furthermore, the scale can be adapted for teachers serving in a variety of countries and cultures.

Keywords: *Compulsory Distance Education; COVID 19; Elementary School Teachers' View Scale; Zoom.*

Introduction

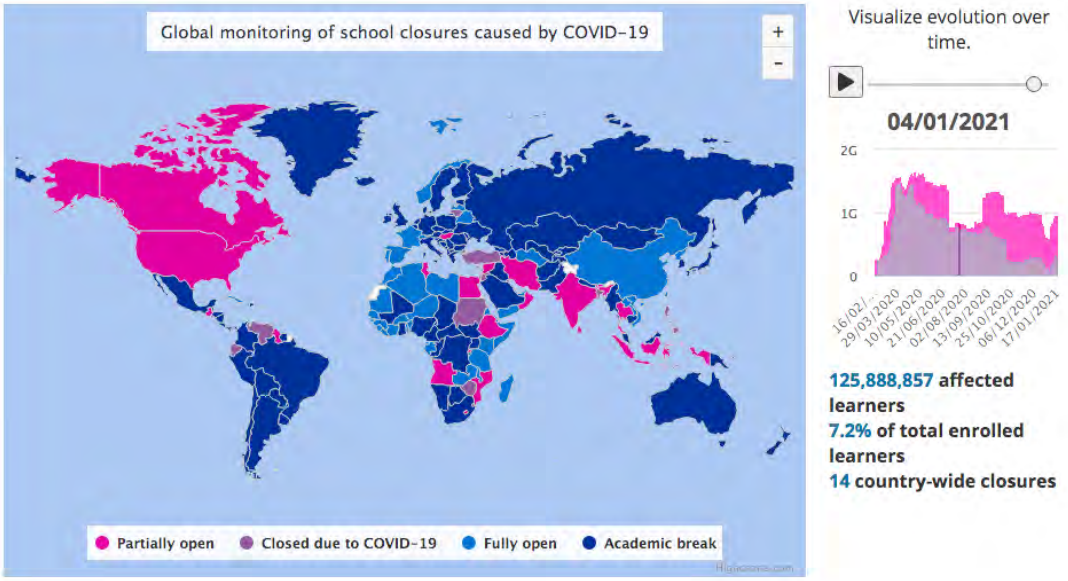
As new inventions affect human life and lifestyle, other important events like natural disasters, wars, and epidemics have enormous effects on people's lifestyles. Since many countries undergone one of such overwhelming events like COVID-19 in the last few years, these new conditions forced them to find some solutions for the implementation of distance education at nearly all educational levels. The COVID-19 causes not only health crises around the world but also affects all aspects of human life, education for example. One of the very effective ways to cope with this problem in the educational area for the educators and to be able to contact pupils was to use internet tools. Thus, Webinars, a useful internet tool, became a provisional school and parents were requested to track it at home. Also, students were deprived of social interaction among peers during this COVID-19 pandemic. To solve the problems that COVID-19 created, The World Health Organization (WHO) encouraged the teachers and the students to conduct alternative learning methods, by offering a reference list of the Edtech teams of the World Bank, which can be used during the pandemic (Lapada et al., 2020).

On January 30, 2020, the (WHO) declared the outbreak of COVID-19 as an international emergency (Bozkurt et al., 2020). COVID-19 has had significant effects on education at all levels, from pre-school to university. Different countries, Germany and Italy, for example, have adopted various policies, including complete closures (Nicola et al., 2020; Radwan & Radwan, 2020). As far as we know, over 100 countries have already initiated the nationwide closure of schools in order to prevent the people from possible negative effects of COVID-19. According to a report released

by UNESCO, the closure of educational institutions in this process has influenced almost 900 million students. As it is seen in Figure-1, fourteen countries announced nationwide academic break.

Figure 1

Global Monitoring of Scholl Closures caused by COVID-19 (UNESCO)



According to the report published by the United Nations Educational, Scientific and Cultural Organization (UNESCO), information and communication technology (ICT) provides not only an access to knowledge anywhere and anytime, but also offers equal opportunities for networking and communication that enable knowledge sharing, participation, and life-long learning. Since they have the ability to strengthen and enhance teaching and learning, most countries have prioritized ICT adoption, incorporation and implementation in education (Lawrence & Tar, 2018).

One of the outcomes of this process especially on educators was that the COVID-19 pandemic stimulated educators to get prepared for distance education (Lapada et al., 2020). Components like training, attitude, technical competence, time constraints, pedagogy, and methodology were among the major distance learning education elements (Phan & Dang, 2017). In this process, these features may accelerate or hinder the distance education and the use of ICT. During this challenging period, schools received assistance from major corporations such as Microsoft, Google, Zoom, and Slack, which are providing many of their products' features for free (Basilaia & Kvavadze, 2020; Murphy et al., 2020).

According to Sherry and Gibson (2002), there are individual, technical, organizational, and/or institutional obstacles in the path of ICT implementation. From choosing tools to process planning, teachers have important roles in the integration of technology into learning processes (Demir, 2011). Becta (2004) proposes that individual (teacher-level barriers) and institutional (institutional-level barriers/school-level barriers) are the two types of barriers preventing teachers from adopting and integrating ICT into their classrooms. While lack of time, lack of trust, and resistance to change are among the teacher-level barriers, lack of adequate preparation to solve the technical issues and lack of

access to resources are among the school-level barriers (Ertmer, 2005). Pelgrum (2001) distinguishes two types of barriers to ICT adoption as material and non-material. The material condition is defined the lack of computers or software, and the non-material condition is the lack of teachers' ICT knowledge and skills, the challenge of implementing ICT-based teaching, and the lack of time for teachers (Lawrence & Tar, 2018). In addition, the limitations and possibilities of the technological tools used also affect the technology integration (Demir, 2011).

Educators have applied a variety of online synchronous meeting technologies (SMTs) to help students' understanding. One of these meeting technologies is Zoom and it is fairly common, immersive, and simple-to-use SMT (Kohnke & Moorhouse, 2020). It has several features, including annotation tools, polling, breakout rooms, and video and screen sharing. These functions promote communicative language learning in collaborative synchronous classes by using authentic language instruction (Tsarapkina et al., 2020). During face-to-face lessons, educators often look for paralinguistic clues to gauge students' interest, comprehension, and commitment. These signals also help students communicate and understand. Additionally, Zoom allows students to use nonverbal icons to signal whether they show approval, have a question, or want the instructor to speed up, slow down, or take a break. These symbols may provide valuable information about students' attention, enthusiasm, agreement, or confusion with the language content being addressed (Kohnke & Moorhouse, 2020; Spathis & Dey, 2020).

Zoom provides the teachers with two distinct functions in order to maintain control of the pupils. The first one is "attention tracker". A clock indicator is emerged on the attendee panel just next to the participant's name if Zoom was not the program that is displayed on the participant's screen for more than 30 seconds. The second one for this distinct control function is "Attentiveness score". The attentiveness score is used to provide a rundown of the tracker operation in the meeting papers. Participants are assigned a score based on how they spent in Zoom (Spathis & Dey, 2020).

It can be difficult for the teachers to keep the students engaged during a longer live online session. To counter this, Zoom suports the teachers to incorporate polls and surveys, which can be employed to engage students, collect responses, perceptions, and ideas. These methods may be used for formative testing, such as entry and exit tickets to determine what students already know about the material or to double-check students' comprehension before moving on. Teachers can take advantage of student response systems like Mentimeter and GoSoapBox to exploit the virtual environment, and promote active learning by using Zoom, which enables teachers and students to share browser screens synchronously (Kohnke & Moorhouse, 2020; Spathis & Dey, 2020).

Like other SMTs, along with the pedagogical advantages for language classrooms and teacher education, Zoom has also drawbacks as compared to face-to-face classes. For example, group discussions last longer and become harder to follow; students are less likely to self-nominate to respond to questions or provide opinions because of a lack of paralinguistic cues; it can be difficult to track learners' interest in larger classes and students can get "screen fatigue," making shorter sessions preferable (Kohnke & Moorhouse, 2020). According to Spathis and Dey (2020), the

drawbacks of Zoom app are as follows: a) free conferences take only 40 minutes, b) It takes time to understand all the functions and nuances of the application, c) the risk of personal data leakage and d) the need to save the link or ID to log in to the conference.

Many studies indicate the fact that the teachers have used Zoom for distance education. In these studies, however, we did not find out the the opinions of the especially primary school teachers on standardized scaleregardind Zoom. For this reason, it is predicted that developing a standard scale contributes to the field.

To use Zoom effectively, it is important to determine the teachers' opinions on the compulsory distance education process. We need valid and reliable measurement tools to do so. In this context, we aimed to develop these measurement tools to find out, especially primary school teachers' thoughts and attitudes concerning the use of Zoom on the distance education process.

Method

The objective of this study is to develop a scale about the elementary school teachers' views on the use of Zoom on compulsory distance education during COVID-19. The study was carried out in the fall semester of the 2020-2021 academic year in Turkey.

Sample

Teachers working in primary schools have been determined as the target audience. We used an easily accessible sampling technique in the sample determination process. The researcher has selected the schools located in one of the metropolitan cities where he worked in the south of Turkey. We have divided the samples into two groups: Explanatory Factor Analyses (EFA) and Confirmatory Factor Analyses (CFA). EFA sample is made up of 206 teachers, and 35.4% of the group consists of males and 64.6% of females who came from diverse teaching experiences. 7.8% of the group have the teaching experience of 1-5 years, 11.7% of 6-10 years, 22.8% of 11-15 of years, 19.4% of 16-20 years and 38.3% have more than 20 years of the teaching experience. CFA sample comprises 212 teachers, of which 43.4% are male and 56.6% are female. They also have different teaching experiences: 6.6% of them have an experience of 1-5 years, 15.6% of 6-10, 17.5% of 11-15, 23.1% of 16-20 and 37.3% have over 20 years of teaching experiences.

The Stage for The Development of Scale

Item Pool

In the study, firstly related literatures (Bakioğlu & Çevik, 2020; Phan & Dang, 2017; Tsarapkina et al., 2020) have been reviewed. Then, the open-ended question of "What do you think about the use of Zoom in your lessons during COVID-19" was asked the teachers in the target audience. In the first form, we created a total of 49 items from the written expressions of teachers and related literature.

Content Validity

Examination of content validity is the stage where the contribution is made to the development of the measurement tool. Content validity is the stage in which the measurement tool includes the structures that intend to cover on the one hand (Cohen et al., 1994), and on the other hand tries to ensure that it is a high-quality and a meticulously developed tool (Polit et al., 2007). Item - Content Validity Index (I-CVI), Scale level - Content Validity Index Mean (S-CVI/Avg) and Scale - Content Validity Index Universal Agreement (S-CVI / UA) were analyzed in order to determine the content validity of the measurement tool. For validating the process of measurement tool, we invited three experts and asked them to evaluate the clarity, relevance, accuracy, excess and the "appropriateness" of the structure through a 3-point scale (1=irrelevant and should be omitted, 2 = appropriate but the wording should be corrected, 3 = appropriate). I-CVI is calculated by dividing the number of experts who gave 3 or 2 by the total number of experts. When evaluators are between three and five, it is suggested that I-CVI should be equal to 1 (Yusoff, 2019). If the experts have suggestions regarding the items, suggestions would be taken into consideration. Calculations of S-CVI / Av and S-CVI/AU are to establish the content validity at the scale level. To calculate S-CVI /Av, scores of all items are added and divided by the total number of items (Kovacic, 2018). To calculate S-CVI / Av, I-CVI items which are equal to 1 should be divided by the total number of items (Ghahramanian et al., 2015). The acceptable range should be S-CVI/Av $\geq$0.90 and S-CVI / AU $\geq$ 0.8 (Polit et al., 2007).

Determination of Factors

The researcher reviewed the factorizability of the collected data prior to performing factor analysis; it was done to decide whether the collected data was adequate to produce a series of factors. Kaiser-Mayer-Olkin (KMO) Sampling Adequacy Measurement and Bartlett Sphericity Test were conducted to test factoriality. The recommended KMO index is 0 to 1. Factor analysis is indicated by an index greater than 0.50 (Williams et al., 2010). Moreover, Bartlett's Test of Sphericity ensures that there is no overlap between variables with factors (Hair et al., 2014) and should give a significant level of $p < 0.5$ to allow factorial analysis (Williams et al., 2010).

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed to improve the scale. EFA is a multivariate statistical method (Edwards & Bagozzi, 2000; Watkins, 2018). Exploratory Factor Analysis, as a factor rotation method, varimax with Kaiser normalization was used. The parallel analysis method was employed to determine the number of factors. In a parallel analysis, we compared actual eigenvalues with random order eigenvalues. Factors are retained when actual eigenvalues surpass random ordered eigenvalues (Williams et al., 2010). In addition, if the items (a) loaded on more than one factor, (b) the loaded factor was not consistent with the meaning of the other items, and (c) obtained a factor load of <0.4 (Deng et al., 2017)**.**

During scale development and validation, CFA is conducted to improve items while examining the nature and relationships of structures. Since the structural model is created with CFA, a definite hypothesis can be formed about the cases studied (Jackson et al., 2009). There is a need to analyze indices such as the chi-square goodness of fit test,

comparative fit index (CFI), Tucker-Lewis index (TLI), Standardized Root Mean Square Residual (SRMR) and Root mean squared error of approximation (RMSEA) to evaluate model fit.

Reliability Calculations

To determine the reliability of the newly developed tool, Cronbach alpha coefficient analysis was performed. For a perfect reliability level, alpha values should be above 0.70 (Kline, 2005) and should not exceed 0.94 (Taber, 2018). In addition, composite reliability calculations were made as well.

Data Analyses

In the study, Jamovi (The jamovi project, 2020) software was used for EFA, CFA and inferential analyses during the psychometric examinations of the scale. It must be stated that Jamovi is an open-source free software for basic statistics. The statistical significance level was accepted as 0.05.

Findings

Content Validity

There are 49 items in the first version of the scale. According to the opinions of the experts, each item was examined separately. Result of the content validation analyses is given in table 1.

Table 1.

Content Validity Index Results

Item#	I-CVI	CVI/AU	Item#	I-CVI	CVI/AU
1	0.67	0	26	1	1
2	0.67	0	27	1	1
3	1	1	28	1	1
4	1	1	29	1	1
5	1	1	30	1	1
6	1	1	31	0.67	0
7	1	1	32	0.67	0
8	1	1	33	1	1
9	1	1	34	1	1
10	1	1	35	1	1
11	1	1	36	1	1
12	1	1	37	1	1
13	1	1	38	1	1
14	1	1	39	0.67	0
15	0.33	0	40	1	1
16	1	1	41	1	1
17	1	1	42	1	1
18	1	1	43	1	1
19	1	1	44	1	1
20	1	1	45	1	1
21	0.67	0	46	1	1
22	0.67	0	47	1	1
23	0.67	0	48	1	1
24	1	1	49	1	1
25	0.67	0			

Since items 1,2,15,21,22,23,25,31,32,39 are below 1, they are eliminated. CVI/Av is calculated as 0.93 and CVI/AU is calculated as 0.8. After this elimination, total of 39 items remained on the scale. Before starting a further analysis, we renumbered the scale items in a mixed way with negative items. The language suitability of the items also was double-checked. The scale was applied to 10 teachers from the target participants, and they were asked to make sure whether they understood the items well. All the teachers stated that the items of the scale were quite understandable. Then it was applied to primary school teachers who were also target participants.

Exploratory Factor Analysis Result

KMO (0.810) and Barlett's test (χ^2=2761, df= 741, p<0.001) were significant level. So, they appear to be supportive of the validity of the factor analysis usage for this study. The validity of the factor analysis utilized for this data is supported by KMO and Bartlett's test. Primarily, EFA was applied with no rotation. The relevant data are presented in Table 2.

Table 2

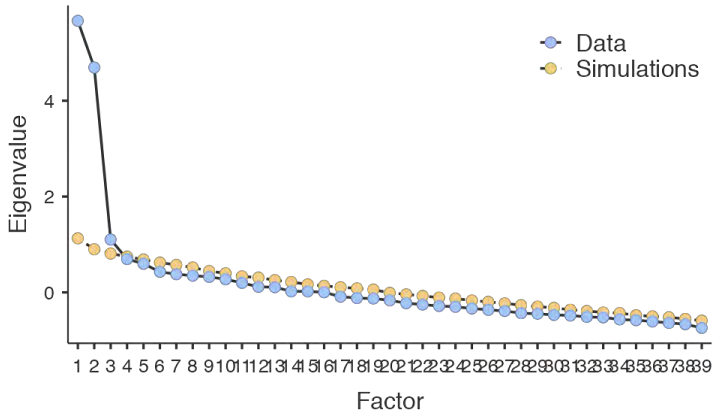
Factor Loading Initial Analyses

Item #	Factor 1	Factor 2	Factor 3	Uniqueness	Item #	Factor 1	Factor 2	Factor 3	Uniqueness
25	0.707			0.426	10		0.648		0.49
27	0.623			0.551	9		0.601		0.599
19	0.613			0.548	29		0.564		0.553
16	0.543			0.633	38		0.54		0.587
11	0.536			0.664	26		0.512		0.61
8	0.534			0.551	7	-0.438	0.49		0.501
15	-0.47			0.657	18		0.479		0.731
36	0.462			0.748	12		0.466		0.76
37	0.449			0.69	33		0.427		0.681
5	0.447			0.688	28		0.394		0.724
30	-0.444			0.722	2		0.384	0.365	0.703
17	0.443			0.721	21	-0.354	0.367		0.72
1	0.441			0.732	22		0.362		0.849
6	0.436		0.369	0.641	14		0.357		0.795
4	-0.432	0.365		0.609	24		0.356		0.778
13	-0.406			0.807	34				0.823
23	-0.389			0.791	39				0.888
31	0.382			0.756	35				0.873
20	0.357			0.72	3				0.872
32				0.78					

To generate a stronger and more organized structure, we have decided to implement a transformation. Varimax rotation has been applied and the threshold value for loading factor was accepted as 0.4.

Figure 1

Initial Solution of Scree Plot

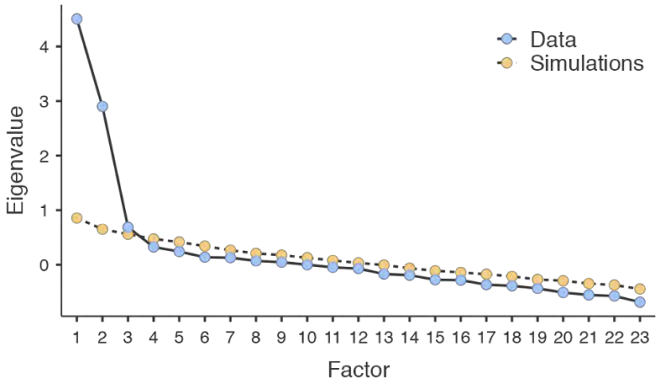


According to parallel evaluations result, 3 factors determined. Initial eigen values of the first 3 factors (5.66, 4.69 and 1.10) are higher than simulations eigen values. As seen in the Scree plot, the first eigen values in the first 3 factors are greater than that of randomly calculated simulation. Items below 0.4 loading values were removed and then the analyses repeated. As a result, only 23 items remained after the items 1, 2, 3, 12, 13, 14, 15, 18, 21, 22, 23, 25, 30, 32, 34, 35, 39 were removed.

In the third analysis, KMO (0.836) and Barlett's test (χ^2=1506, df= 253, p<0.001) were calculated. They also are on the significant level. So, they are proved to be supportive of the validity of the factor analysis usage for this study. The validity of the factor analysis employed for this data is supported by KMO and Bartlett's test.

Figure 2

Final Solution of Scree Plot



Once again, we determined 3 factors according to the result of parallel analysis. As seen in the Scree plot (figure -2), the first eigen values in the first 3 factors are greater than the randomly calculated simulation values. All items were collected under 3 factors. Factor and load values are as in the table 3.

Table 3

Factor Loading Result

Item#	Items	**Factor 1**	**Factor 2**	**Factor 3**
25	Students' inability to adapt to the lesson	0.710		
37	Students' feeling of loneliness while in front of the screen	0.600		
27	Not being able to give enough voice to every student	0.581		
19	Difficult to get feedback	0.577		
16	Cyber security risk	0.537		
17	Increasing students' technology addiction	0.534		
36	Students chatting among themselves and not following the lesson	0.523		
11	Inability to make peer learning	0.441		
31	Inability to make eye contact with students	0.432		
28	Lack of physical contact with students (in terms of physical skills)	0.413		
10	Many file types can be shared with screen sharing		0.711	
9	Rasing hand feature		0.681	
38	Informing the meeting deadline		0.654	
29	Using board feature		0.652	
26	With screen sharing		0.588	
7	Providing two-way communication		0.581	
33	Integrating with EBA		0.550	
4	Good video call quality		0.446	
24	Having the option to record lesson/meeting		0.442	
8	Lack of regular course follow-up			0.583
6	Documents not being on the zoom platform			0.549
20	Lack of file and document upload feature			0.503
5	Lack of control in students without self-discipline			0.437

Factor loadings differ between +0.413 and +0.711. In the first factor, there are 10 items. Having analysed the items in first factor it has been found all items have negative views or attitudes towards Zoom. So, the first factor may be called as “General Disadvantages of Zoom”. Second factor has 9 items. All items in the second factor have positive opinions about Zoom. Therefore, the second factor may be labeled as “Advantages of Zoom”. The third factor has 4 items and all of them are negative and related to the lack of Zoom. As a result, we may classify the third factor as “Lack of Zoom in Teaching Process”.

Table 4

The Variances and Total Variances of the Factors

Factors	**SS Loadings**	**% of Variance**	**Cumulative %**
General Disadvantages of Zoom	3.55	15.3	15.3
Advantages of Zoom	3.32	14.4	29.7
Lack of Zoom in Teaching Process	1.87	8.2	37.9

When looking at the factor structures in Table 4, the scale of three factors and 23 items accounts for 37.9 percent of the overall variance. These factors compute various structures, according to the correlation calculation between the factors. Since the correlation coefficients are r = 0.00, they are not statistically important. Consequently, "Disadvantages of Zoom", "Advantages of Zoom", and "Lack of Zoom in Teaching Process" measure different structures.

Confirmatory Factor Analysis

That the Latent Variable is true and can be further processed to validate the structural model was determined via a CFA test model analysis.

Table 5

Fit Indices for The Initial Model And Final Model

						RMSEA 90% CI	
	χ^2/df	**CFI**	**TLI**	**SRMR**	**RMSEA**	**Low**	**High**
Cutoff criteria	**≤ 2: good**	**>0 .90**	**> 0.90**	**< 0.08**	**< 0.05**		
Initial Model	345/206=1.67	0.859	0.842	0.0713	0.0564	0.0458	0.0666
Final Model	278/197=1.4< 1.5	0.918	0.903	0.0670	0.0440	0.0313	0.0556

Note: degree of freedom(df), Comparative fit index (CFI), Tucker-Lewis index (TLI), Standardized Root Mean Square Residual (SRMR), Root mean squared error of approximation (RMSEA).

Initial model fit indices are not at an acceptable level because CFI and TLI are smaller than cutoff values on the one hand and RMSEA is bigger than cutoff values on the other. The new model has been created by means of adding the covariance links suggested by the software (Shown in Figure 2). When we examine the final model fit indices, it is noticed that the CFI and TLI values are above 0.9, the value of SRMR is lower than 0.08 and the RMSEA value is less than 0.05 (Hair et al., 2014). According to the CFA results, the scale is at an acceptable level.

As Table 6 proves, all Z values are at the statistically significant level of 0.01. Hence, all the involved items are related to the factors. The validity of the 3-factor scale structure revealed by confirmatory and exploratory factor analysis has been confirmed.

Figure 3

Path Diagram of CFA

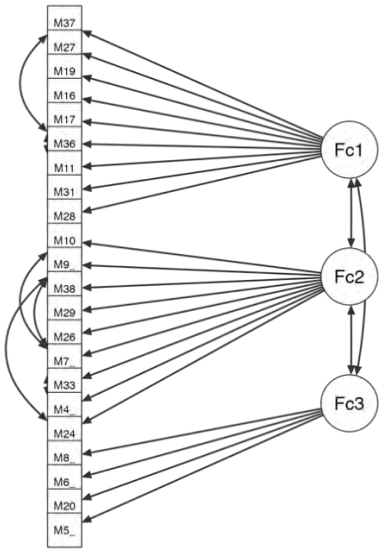


Table 6.

Factor Loading Values, Z and P Values.

Factor	Indicator	Estimate	SE	Z	p	Stand. Estimate
General Disadvantages of Zoom	37	0.449	0.0733	6.13	< .001	0.439
	27	0.660	0.0758	8.71	< .001	0.592
	19	0.617	0.0620	9.96	< .001	0.659
	16	0.578	0.0630	9.18	< .001	0.619
	17	0.590	0.0761	7.75	< .001	0.549
	36	0.424	0.0777	5.46	< .001	0.394
	11	0.649	0.0705	9.21	< .001	0.628
	31	0.587	0.0712	8.25	< .001	0.567
	28	0.332	0.0624	5.32	< .001	0.389
Advantages of Zoom	10	0.505	0.0720	7.02	< .001	0.530
	9	0.441	0.0738	5.97	< .001	0.475
	38	0.553	0.0654	8.45	< .001	0.614
	29	0.551	0.0700	7.87	< .001	0.577
	26	0.448	0.0656	6.82	< .001	0.507
	7	0.480	0.0757	6.34	< .001	0.486
	33	0.505	0.0653	7.74	< .001	0.569
	4	0.292	0.0796	3.66	< .001	0.289
	24	0.473	0.0736	6.42	< .001	0.486
Lack of Zoom in Teaching Process	8	0.811	0.0761	10.66	< .001	0.758
	6	0.548	0.0793	6.91	< .001	0.510
	20	0.467	0.0767	6.08	< .001	0.459
	5	0.514	0.0824	6.23	< .001	0.462

Reliability Analysis

Table 7

Reliability Results for Sub-dimension and Total Scale

Factors Name	Number of Items	Cronbach α	McDonald's ω
Disadvantages of Zoom	10	0.800	0.788
Advantages of Zoom	9	0.823	0.770
Lack of Zoom in Teaching Process	4	0.683	0.648
Total Scale	23	0.788	0.766

Being above 0.7 for both reliability measurements is considered sufficient. According to Taber (2018) over 0.64 is an adequate level for Cronbach Alpha. Value of composite reliability must be greater than 0.7. However, the value of 0.6 was acceptable for an exploratory research (Hair et al., 2014). Table 7 shows that each factor of Cronbach alpha and McDonald's value are both greater than 0.6. It was also discovered that the total scale of Cronbach alpha value is 0.788, and of McDonald is 0.766.

Discussions

The aim of this study was to develop a trustworthy scale to assess the opinions of primary school teachers and their attitudes towards using Zoom for the distance education process. In order to determine the content validity of the measurement tool, I-CVI, S-CVI/Av and S-CVI / UA have been analyzed. According to Yusuoff (2019), I-CVI should be equal to 1 if the assessors are between three and five. Due to there are three evaluators in the content validity, I-CVI equal to 1are selected. CVI/Av is calculated as 0.93 and Average CVI/AU is determined as 0.8. S-CVI/Av 0.90 and S-CVI/AU 0.8 should be considered suitable ranges (Polit et al., 2007). We made calculations for each item as a result of expert reviews, and a 39-item draft version of the scale has been developed.

Exploratory Factor Analysis (EFA) was performed on 206 teachers to improve the scale. EFA is a multivariate statistical method (Edwards & Bagozzi, 2000; Watkins, 2018). In exploratory Factor Analysis, varimax with Kaiser normalization was used. To determine factors number, we made use of the parallel analysis method. Factors are retained when the actual eigenvalues surpass the random ordered eigenvalues (Williams et al., 2010). In addition, if the items (a) loaded on more than one factor, (b) the loaded factor would not be consistent with the meaning of the other items, and (c) obtained a factor load of <0.40 (Deng et al., 2017). Items 1, 2, 3, 12, 13, 14, 15, 18, 21, 22, 23, 25, 30, 32, 34, 35, 39 were eliminated because their factor loadings were below 0.4.

KMO (0.827) and Barlett's test (χ^2=2265, df= 496, p<0.001) were employed for the calculation in the third analysis. They are at a significant level (Yong & Pearce, 2013). According to scree plot and parallel analysis, all items were collected under 3 factors.

Factor loadings vary between +0.413 and +0.711. There are 10 items in the first factor. Having analyzed the items in this factor, we realized that all items are of negative views or attitudes concerning Zoom. Because of this reason, the first factor can be named “Disadvantages of Zoom”. Since the Zoom app has some deficits (Kohnke & Moorhouse, 2020; Spathis & Dey, 2020), it is quite normal that teachers may have had negative feelings about it.

In the second factor, there are 9 items as well. The second factor displays the optimistic perspectives on Zoom (Kohnke & Moorhouse, 2020; Spathis & Dey, 2020; Tsarapkina et al., 2020). For this reason, the second factor can be named "Advantages of Zoom." As to the third factor, it has 4 items related to the lack of Zoom. Therefore, we named the third factor “Lack of Zoom in Teaching Process”. Since the correlation coefficients are 0.00, we did not take them into consideration, to be exact, they are not statistically significant. According to the correlation calculation between variables, these factors evaluate different structures. Consequently, the terms "Disadvantages of Zoom", "Advantages of Zoom" and “Lack of Zoom in Teaching Process” refer to three unique structure.

Wheter the Structure in scales is true and can be further processed to validate the structural model was determined via a CFA test model analysis. There is a need to analyze indices such as the chi-square goodness of fit test, comparative fit index (CFI), Tucker-Lewis index (TLI), Standardized Root Mean Square Residual (SRMR) and Root Mean Squared Error of Approximation (RMSEA) to evaluate model fit.

The last model fit indexes show the fact that values for CFI and TLI are higher than 0.9, the value for SRMR is lower than 0.08 and the value for RMSEA is less than 0.05 (Hair et al., 2014). When the final model fit indices are examined, it is seen that the CFI and TLI values are above 0.9, the SRMR value is lower than 0.08 and the RMSEA value is less than 0.05 (Hair et al., 2014). The scale conforms to CFA findings.

In all reliability calculations, it is expected to exceed 0.7. Each factor is greater than 0.7 in the Cronbach alpha and McDonald's value (Kline, 2005; Taber, 2018). The cumulative scale of Cronbach alpha value was also found to be 0.809 and McDonald's value 0.820.

Conclusions

Determining the teachers' thoughts and attitudes on the subject of the use of Zoom in the distance education process is important in terms of integrating the Zoom application successfully, a technology already applied in many countries and education levels, into distance education. In order to accomplish this goal, it is necessary to have a valid and reliable measurement tool to determine teachers' opinions. Based on this need, this study aimed to develop a valid and reliable measurement tool that is going to clarify teachers' opinions about the use of Zoom application in distance education. The measurement tool developed in the light of the outcomes of the analyses, has demonstrated to be valid and reliable. That the study was built only for primary school teachers and it covers the teachers working within Turkish cultural area were the limitations of the study. Future researchers can adapt the scale that we developed, to

teachers working at different educational levels. In addition, the scale can be adapted for teachers who work in different countries and in different cultures.

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Corresponding Author Contact Information:

Author name: Ceyhun Memiş

Institution, Country: Beş Temmuz İlkokulu, Turkey

Email: ceyhunmemis@hotmail.com

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