#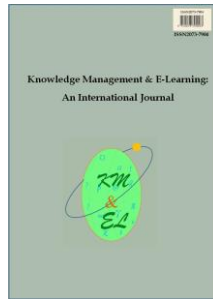 Examining university students' attitudes towards using web-conferencing systems in distance learning courses: A study on scale development and application

Bulent Basaran
Murat Yalman
The University of Dicle, Turkey

Examining university students' attitudes towards using web-conferencing systems in distance learning courses: A study on scale development and application

Bulent Basaran

Faculty of Education
The University of Dicle, Turkey
E-mail: basaranb@gmail.com

Murat Yalman*

Faculty of Education
The University of Dicle, Turkey
E-mail: mumanenator@gmail.com

*Corresponding author

Abstract: The study aimed to develop a scale to assess students' attitudes towards using interactive web conferencing systems in distance learning courses. An item pool was formed based on a review of the literature and the participants' written views. A draft scale was developed with 29 items selected from this item pool. It was applied to 1100 undergraduate students in a distance program in theology, who took courses using Adobe Connect as a video conference system, together with Moodle as a learning management system. After removing incomplete or improperly filled questionnaires, a total of 596 participants' responses were used for factor analysis. The scale was made up of four factors: user expectations on web-conference systems, user preferences for web-conferencing system, user attitudes towards using web-conferencing systems, and user problems experienced while using web-conferencing systems.

Keywords: Attitudes; Web conferencing system; Distance education; Synchronous; Asynchronous

Biographical notes: Dr. Bulent Basaran works at Dicle University Faculty of Education. He has studies on distance education and multi-level analysis.

Murat Yalman is a lecturer in the Faculty of Education, The University of Dicle. He has been involved in multiple disciplinary research in the areas of technology-enhanced learning, distant education and e-learning, machine learning, teacher education and hybrid learning. He has many studies published in international journals.

1.   Introduction

In recent years, fundamental changes have occurred in e-learning concepts and applications in the fields of learning and teaching in higher education institutions. e-

Learning applications allow students to take online courses from world-wide trainers at different schools; in other words, these applications facilitate studying and provide flexibility as well (Poole, 2000; Acharya, 2019). Over the last few years, researchers have focused on developing a preparation scale for e-learning to determine such advantages of these e-learning applications. Smith, Murphy, and Mahoney (2003) conducted a study with university students and determined two basic factors to predict their success. The researchers reported these factors to include self-management and ease of learning via e-learning. Another point made by the researchers in their study was that these scales and evaluations did not cover other dimensions including technical skills and student control, which are critical for students. As e-learning has become intensively popular in educational institutions, there will be a need for more comprehensive measurement tools to re-examine and determine the readiness of faculty students. Thanks to this measurement tool, faculty members can design their courses for better e-learning and direct their students towards successful and productive e-learning experiences. In this respect, for the purpose of better-understanding how to achieve effective e-learning, it is necessary to determine university students' levels of background knowledge about e-learning. Researchers state that technical skills regarding the Internet and computer have a relationship with students' performances in web-based learning environments (Peng, Tsai, & Wu, 2006). Similarly, students' perceptions of the Internet could shape their related attitudes as well as their e-learning behaviors (Tsai & Lin, 2004).

e-Learning environments, which are not teacher-centered, are expected to play a more active role in students' learning. Students are especially supposed to carry out their responsibilities and manage their own learning to keep up with the class and to achieve time management (Hill, 2002; Roper, 2007) (Hsu & Shiue, 2005). Up until today, use of online communication for learning has always focused primarily on such asynchronous technologies as discussion forums (McConnell, 2006). Asynchronous communication, besides its advantages like flexibility and facilities for students, brings about several disadvantages as well. Students feel lonely and think that they do not interact with their teachers or other students at all. Lack of interactions in a synchronous learning environment could mean that students fall behind their necessary learning activities. Students do not allocate time for interaction with students or with their teacher (De Freitas & Neumann, 2009). Limited interactions between the teacher and the student could lead to low rates of students' participation in asynchronous education given with the e-learning management system (Skinner, 2009). In order to provide solutions to these problems, faculty members use synchronous (real time) online communication within the e-learning management system. Synchronous technologies include a wide variety of methods ranging from chat rooms to instant messaging tools as well as to desktop video conference systems (Finkelstein, 2006). Thanks to web-conference technologies, the academician administrating the session can upload a course content (for example, PowerPoint presentations, image files, documents), publish a live video content using a web-camera and share the screen and audio with the participants. In addition, the academician using the system can use a digital whiteboard, give questionnaires and quizzes to the participants and carry out a group-work activity. The participants can interact with each other and with the academician, ask questions, share information about their current situations (I agree/disagree, happy/sad/surprised/confused, faster/slower) and use instant messaging to ask questions.

In this respect, synchronous communication could increase the participants' feeling of becoming a social being (Short, Williams, & Christie, 1976). Synchronous communication can also help students develop the feeling of belonging (Haythornthwaite et al., 2000; Watts, 2016). Such richer synchronous technologies as audio or video conferences contribute considerably to participants' socialization by creating a more

human feeling in the communication process (Loch & Reushle, 2008). Current synchronous conference technologies are now available on desktop or laptop computers, and they can also be used with web-based communicative interfaces. This fact reveals a number of possibilities for real-time online learning and teaching. Web-based audio and video conference systems can also be called web conference systems (Hampel, 2006). These systems allow using videos and audios and provide multi-user communication. Web-conference systems could provide an alternative to face-to-face learning for those who have to travel constantly as well as for those who are distant from the teaching center (Barron et al., 2005). Therefore, these technologies have important advantages in terms of the related facilities, savings and environment-friendliness.

1.1. Literature review

Online learning is divided into two: synchronous and asynchronous. Synchronous distance learning includes an e-class which the teacher and all students attend at certain times and which allows holding a conference as in a physical classroom setting. In such an education system, each student has the opportunity to ask questions to the teacher and receive a real-time response. On the other hand, in asynchronous distance education, lessons are recorded in advance, and each student can join these lessons whenever they want to. One possible disadvantage of these lessons includes lack of real-time cooperation and lack of an opportunity to ask a question. These deficiencies are generally compensated with the establishment of communication with the teacher and other students via forums, e-mail and other similar communication tools (Ruiz, Mintzer, & Leipzig, 2006; Zhang et al., 2004).

Several studies carried out in related literature revealed the benefits of synchronous learning and teaching for online courses (Hastie et al., 2010; Wang, Chen, & Levy, 2010; Francescucci & Rohani, 2019). Hastie and colleagues (2010) point out that online synchronous learning and teaching allow teachers and students to establish communication with each other, to feel themselves as social beings and to make discussions regarding educational contents. Chen et al. (2005), in their study, state that in many cases, synchronous solutions for teaching demonstrate better performance when compared to online asynchronous courses and traditional face-to-face education. In addition, the advantages of synchronous courses could also remove certain difficulties created by asynchronous and traditional courses. In this respect, in studies carried out with students, researchers report that students sometimes face technology-related difficulties due to the poor Internet speed during online synchronous learning; that they fail to hear the audios clearly; and that they encounter problems with video-streaming (Chen et al., 2005; Hastie et al., 2010; Wang et al., 2010). Education given online or with the asynchronous method is generally used to prepare contents for students and to facilitate and determine their learning levels (Chhanda, 2019). Traditional education is planned for a certain number of students in class environment. Teachers aim to determine students' levels of learning with the help of comments made by students regarding the lessons in class or with the help of their responses to the questions directed. In online learning, the number of students taking part in trainings is generally determined independently of place and in a way to address more students when compared to traditional educational settings. In this method, since learning occurs in line with the learning contents prepared, teachers consume more time and energy. Therefore, teachers giving online lessons have to communicate more with students and constantly control and check the learning environment throughout the education process. Teachers' ability to apply online learning methods (getting feedback from students concerned, making them

involved in the learning process by asking them questions, and so on) decreases the probable fact that some evil-minded students may avoid participating in the trainings thought they are included in the study (Keir & Elizondo, 2010).

Studies conducted on synchronous teaching point out that synchronous teaching may involve interactions in various important respects, and most of these studies focus on the text-based chats between students and teachers (Chen & Wang, 2008; Khan, Sun, & Ifeachor, 2012; Knoche & Sasse, 2008). Chats and discussions between students during online education are reported to increase students' satisfaction and the quality of learning (Li & Akins, 2005; Hiltz & Turoff, 2005). Most teachers and students find it more appropriate to organize such discussion environments in asynchronous manner (Vonderwell & Zachariah, 2005). In addition, in asynchronous courses, teachers and students also prefer written texts besides verbal communication. This type of text-based communication can be intensively used in cases of poor-quality audios. In addition, text-based chats also allow both teachers and students to revise the previously mentioned subjects and to summarize the main points of the related subjects. As pointed out by Hackman and Walker (1990), there will be better teacher-student xx communication and faster learning in these environments, where students can freely and easily express themselves. Li and Akins (2005) state that the interaction to be established between the teacher and students constitutes the basis of online education. Web conference systems are more developed when compared to other methods of distance education as these systems provide such advantages as real-time interactions, relationships, motivation and cooperative learning (Bates, 2005; Wheeler, 2005; Hart, Bird, & Farmer, 2019). Durrington, Berryhill, and Swafford (2006) found in their study that in cases where there are positive interactions between students, online learning contributes to their learning experiences and becomes a basic key to learning. The quality of web conference systems changes depending on the technology used as well as on the bandwidth and influences the quality of education and the level of interaction between students and teachers (Martin, 2005). In addition, it is important to encourage students' active participation in terms of creating an effective learning environment. Coffey (2010) gave interactive trainings to postgraduate students by using the software of zoom in an online learning environment. The students established learning interactions via audio-visual communication in the chatrooms prepared for them. Thanks to this method, the postgraduate students had high levels of motivations in learning. Online environments aim to present learning environments for students with the help of synchronous web conference tools, slides, files and applications. Also, related studies revealed that students are not sufficiently encouraged for learning via web conference applications (Newman, 2008). One of the frequent mistakes made while evaluating web conference applications is to equalize the learning environment with face-to-face traditional class environment (Anastasiades et al., 2010). Web conference applications provide opportunities like synchronous following and listening as well as establishing communication with other participants, yet these applications are not as effective in terms of human interactions as they are in a traditional education process (Schweizer, Paechter, & Weidenmann, 2003). Studies conducted to investigate the effectiveness of web conference in education demonstrate that participants' expectations have not been fully met, yet (Delaney et al., 2004). This situation affects students' attitudes and their learning in accordance with their perceptions. Students think that such technical problems related to applied technologies as audio-video and connection problems, in-class and out-of-class interaction, teachers' use of body language and durations of lessons have influence on their views about synchronous learning (Marsh, Mitchell, & Adamczyk, 2010; Koppelman & Vranken, 2008). Distance learning has a great advantage as it easily helps overcome the long distances between

teachers and students. Therefore, distance education is fairly suitable for giving education to students especially who live in far away from the teacher (Tseng, Cheng, & Yeh, 2019).

The cognitive nature of learning generally requires sharing by creating consensus among group members. There is a need for an effective environment in online learning for students (Al-Samarraie, 2019). In order to increase students' online learning experiences, it is necessary to keep up constantly with new technologies. Studies conducted on the effectiveness of the use of the web conference method in the field of education demonstrate that students' computer-use skills and their attitudes towards distance education influence their learning skills (Ghazal, Al-Samarraie, & Aldowah, 2018; Al-Samarraie, 2019), while there are other studies revealing that the video conference method is widely used as a learning technology (Fischer et al., 2017; Reese & Chapman, 2017). In one study titled "Role of Video Conference in Distance Learning" carried out by Martin (2005), students from North Ireland examined the presentation of the American Constitution by an American Congress member with the help of web conference system, and it was found in the study that the students had positive views about distance education given via video-conferencing as they were provided with the opportunity to interact with famous American politicians and to see and listen to these politicians living in distance. Lewis et al. (2019) conducted a study on the use of web conference methods in radiology teaching and reported that the conferences held via traditional face-to-face interviews were replaced by audio-visual technologies in line with the development of the web conference method.

In another study titled "Quality of Learning and Teaching via Video Conference", Knipe and Lee (2002) examined the quality of teaching and learning activities carried out via video conference. Among the 66 students participating in the study, 45 of them took the course with the traditional face-to-face method, while 21 of them took the course using the distance education method. According to the results, the students taking the course via distance education reported that they felt themselves lonely; that they did not have the opportunity to establish eye-contact with other students and teachers; and that they did not consider themselves to be a part of a class. This situation disturbed their concentration and had bad influence on their learning.

Based on the literature, researcher have investigated the factors that may determine the education quality or student achievements in distance learning courses in the following aspects.

1.2. User demands

In distance education, it is quite important to design the learning environment in accordance with students' needs. Users' demands have direct influence on the performance of the system (Ghazal et al., 2018). In one study on online learning, Yılmaz (2015) pointed out that the students wanted to have the course contents in virtual classrooms recorded and that they believed these recordings would make learning flexible. Bolliger, Supanakorn, and Boggs (2010) found that the use of the media tools in online learning environments increased the students' motivations in learning.

1.3. User attitudes

Online learning is defined as educational materials designed in computer or as environments that provide distant users with the opportunity to take education (Carliner, 1999; Küçük, 2010). Palmer and Holt (2010) state that students' motivations in learning

have positive influence on their attitudes towards e-learning. Students' levels of technology acceptance and technology use affect their attitudes towards online learning (Yalman, 2013). In cooperative learning, courses given with traditional methods are supported with online learning environments (Doymuş, Şimşek, & Bayrakçeken, 2004). In such a learning environment, users have more positive attitudes (Lee & Rha, 2009; Ilgaz, 2008).

1.4. User preferences

Since their early phases, Internet-based educational platforms have been developed in a way to help meet students' learning needs. For this reason, online learning environments have not received the necessary support for a long time. There is a false impression that giving education to students in a way different from face-to-face method (traditional methods) is not efficient. These needs of students have not been taken into consideration at all, and traditional educational contents, which adopt the views and suggestions of academicians who are pioneers of the cliché education system, have continued their popularity. Today, the way of determining the educational needs and activities related to learning have totally changed in line with the spread of the Internet. Employers no longer expect employees to develop their knowledge as they did in the past. Instead, employers try to select their employees among individuals who have developed their knowledge in a short period of time. Therefore, online learning environments, which bring information to users, have gradually gained more importance.

Online learning environments designed to meet local learning needs (institutions, universities, private companies and so on) are prepared in a way to focus on the success of the course rather than to respond to students' needs. Most students who make use of these free-of-charge online courses do not complete their online education process and drop the courses not only because the course contents do not appeal to their needs but also because there is no user-friendly interface (Polat, 2016). In one study conducted to determine the views of school principals about distance education, Kitiş (2010) found that the participants considered online learning supported with face-to-face education was a more effective method of teaching. In the study, the school principals reported that giving in-service trainings via online learning had great economic advantages. In another study conducted by Özonur (2013) on online learning, the students preferred virtual class environments thanks to their benefits such as allowing communication, being visually rich, supporting learning and motivating learners. Gülbahar (2005) examined individual preferences observed in web-based education and pointed to the importance of the use of different sources of information enriched in content.

1.5. User problems

The increasing use of technological tools in education has increased the popularity of distance education. In addition, trainers prefer to use distance education as a learning method for helping the education process rather than to use it as a learning tool alone (Yalman, 2013). One of the basic problems with the use of distance education systems at universities and schools as well as in other public institutions is related to the Internet connection speeds. The increased use of video conferences in online lessons has also increased the need for the bandwidth required (Al-Samarraie, 2019). The computer and Internet connection speeds in many developing countries have increased, yet this increase has not help overcome users' problems and complaints. The basic reason for such complaints is that the video-conference systems used in online courses require different user experiences appropriate to the usage purpose and environmental conditions.

Although literature on distance education has focused on the comparison of the differences between distance education and face-to-face education (Giancola, Grawitch, & Borchert, 2009; Jaques & Salmon, 2012), there is a limited number of studies comparing only the distance education methods, the related solutions and especially students' viewpoints. In one study, Johnson (2008) focused only on Internet-based discussions and concluded that both asynchronous and synchronous ways of learning contribute to students' cognitive and affective learning. Somenarain, Akkaraju, and Gharbaran (2010) found a considerable difference between the satisfaction levels of the students participating in asynchronous and synchronous learning environments. In these studies, the focus was mostly on comparing different conditions, yet they did not develop a scale whose validity and reliability were confirmed to evaluate the perceptions of students in synchronous environments. This study aimed to address the gap by developing the scale mean suing student attitudes towards web conference systems, which are synchronous environments for distance education.

2. Method

In this study, a scale was developed to determine the participants' attitudes towards web conference systems. In the study, factor analysis was applied to the data collected in the scale development process, and a uni-dimensional model was formed for the relationship between the observed and latent variables. As the research method, the general survey modal was used. The survey model is used to get an overall view about the universe by covering the whole universe or a sample group (Karasar, 2000).

2.1. Participants

The participants of the study were 612 students attending the Theology Distance Undergraduate Education Program executed via the learning management system by the distance education center. For the analysis of the research data, the questionnaire forms filled out by 597 participants (304 female and 293 male) were taken into account (see Table 1).

Table 1
Frequency and percentage distributions of the participants with respect to their gender

Gender	F	%
Female	304	51
Male	293	49
Total	597	100

2.2. Data collection process and data analysis

The research data were collected on face-to-face basis using printed forms during the end-of-term exams. In this process, the scale forms left incomplete by the participants were excluded from the study. The data collected from the participants who responded fully to the scale forms were analyzed using SPSS 20 for Exploratory Factor Analysis (EFA) and AMOS 21 for Confirmatory Factor Analysis (CFA).

2.3. Demographic variables

Gender, class, year of computer use, frequency of internet usage, and the purpose of using the internet were included in the study. The frequency of internet connection and internet usage of the students can help to solve the problems arising from the internet in the web conferencing system. Computer usage experience will enable students to determine the adaptation process of the web conferencing system.

2.4. Research ethics

Prior to the study, the directorships concerned were asked for their consents to apply the questionnaire for data collection. In addition, participation in the study was on voluntary basis. Lastly, for the privacy of the participants, they were ensured that their personal information would be kept confidential.

2.5. Attitude scale for web conference systems

In related literature, there are a number of scales developed by researchers to investigate the quality of the education given via the web or to determine the related achievements of the students. In the present study, an item pool was formed by examining the related studies in literature. Based on the views of three faculty members expert in the field, items from the item pool were selected for the scale. In addition, in relation to intelligibility of the scale items and accurateness of the language used in the scale, two Turkish Language experts were asked for their help. In the study, the scale made up of 23 positive and six negative items making 29 items in total was piloted. Following this, exploratory factor analysis was conducted on the data collected via the pilot application. Based on the results, 12 items were excluded to finalize the scale. The new version of the scale including 15 items was re-applied, and the data were collected again. In this final scale, there were six items in the dimension of "User Demands", five items in the dimension of "User Attitudes", four items in the dimension of "User Preferences", and two items in the dimension of "User Problems". The Likert-type five-point scale was graded as 1- Completely Disagree, 2- Disagree, 3- Partly Agree, 4- Agree, and 5- Completely Agree. When the related literature is examined, it is seen that the scale development phases were as follows (Tavsancıl, 2002; Dunn-Rankin, 2004; Devellis, 2003; Karasar, 1995):

1) forming the item pool
2) asking for expert views
3) conducting the pilot application
4) applying the draft scale to the study group and carrying out the factor analyses
5) calculating the scale reliability

In order to determine the factor loads predicted for the development of the scale, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted. Also, after getting the results of these two analyses, confirmatory factor analysis was conducted for the model-data fit. The fit indices used in the study included Chi-Square fit test, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Errors (RMR or RMS and Root Mean Square Error of Approximation (RMSEA). Table 2 presents the results obtained via the analysis of the research data.

Table 2
Fit indices and values obtained in the study

Model Fit Indices	Criterion	Value	
x^2/sd	< 5/1	3.69	Should be above 5 (Anderson & Gerbing, 1984);
GFI	> 0.90	0.94	Should be above 0.95 (Shevlin & Miles, 1998);
AGFI	> 0.90	0.91	0.90 and above shows a good fit (Hooper, Coughlan, & Mullen, 2008)
RMSEA	< 0.08	0.06	Below 0.08 is acceptable (Browne & Cudeck, 1993)
S-RMR	< 0.05	0.038	Below 0.05 means a good fit (Byrne, 1998)
CFI	> 0.90	0.97	Close to or above 0.95 shows a good fit (Hu & Bentler, 1998, 1999)
NNFI	> 0.90	0.96	Should be close to or above 0.95 (Hu & Bentler, 1998, 1999)
IFI	> 0.90	0.97	0.90 and above shows a good fit (Marsh & Hau, 1996)

In related literature, the ratio of x^2/sd lower than 3 is generally thought to show good fit, while values between 3 and 5 are considered to be acceptable (Tabachnick & Fidell, 2001). In addition, as the value of x^2/sd is sensitive to the sample size, the value is suggested to be evaluated together with other fit indices (Jöreskog & Sörbom, 1999). According to the model data fit, the GFI value of 0.95 was higher than 0.90; the AGFI value of 0.93 was higher than 0.90; the RMSEA value of 0.048 was lower than 0.05; and the S-RMR value of 0.049 was lower than 0.05. All these results demonstrate that the data collected in the study had a good level of model fit.

3. Findings

3.1. Exploratory factor analysis

In literature, it is reported that for the research data to demonstrate a normal distribution, the values of kurtosis and skewness should range between -1.96 and +1.96 (Can, 2014). In the present study, skewness was calculated as -.045, and kurtosis as .582. Since the values of skewness and kurtosis were between -1.96 and 1.96, the distribution was considered to be normal. Therefore, the data demonstrated a normal distribution and were appropriate to factor analysis. For the scale used in the study, Kaiser-Mayer-Olkin (KMO) value (0.790) and Bartlett's test result were both found significant ($p < 0.01$). The results of the exploratory factor analysis revealed that the 17 items in the scale constituted four factors in total. Table 3 presents the results of the exploratory factor analysis. For the purpose of determining the number of the factors to reveal the relationship between the items in the scale, a line chart together with eigenvalues and variance percentages was used. In this respect, for the factor analysis conducted in the study, Eigenvalue and variance percentages were examined. Eigenvalue is the sum of squares of the factor loads of the items that constitute a factor (Gürbüz & Şahin, 2016). In the present study, the eigenvalues were calculated as 3.893 for the first dimension, 2.414 for the second dimension, 1.534 for the third dimension and 1.207 for the fourth dimension, and the eigenvalue for the fourth dimension was found to be lowest. Following the analysis

regarding the eigenvalues, the variance percentages for the dimensions of the scale were examined. In factor analysis, the variance explained shows the amount of the variance explained by each factor, and the amount of the variance explained by the factors with eigenvalues higher than 1 is taken into account while deciding on the number of the factors in the measurement tool (Gürbüz & Şahin, 2016). In the variance analysis conducted, the first dimension was found to explain 17.279% of the total variance, the second dimension to explain 15.309%, the third dimension to explain 11.043% and the fourth dimension to explain 9.597% of the total variance. Eventually, the measurement tool was considered to be made up of four dimensions. Only the fourth factor included two items, and according to some researchers, each factor should include at least two items (Durmuş, Yurtkoru, & Çinko, 2013). Therefore, based on the related literature (Büyüköztürk, 2017; Tavşancıl, 2002), the four-factor scale in the present study could be said to be sufficient with its total variance of 53.227%.

Table 3
Exploratory factor analysis for the "Web Conference System Attitude Scale"

Item Number	User Expectations (UE)	User Preferences (UP)	User Attitudes (UA)	User Problems (UPR)
UE1	.710			
UE2	.688			
UE3	.622			
UE4	.629			
UE5	.739			
UE6	.593			
UP1		.679		
UP2		.753		
UP3		.518		
UP4		.607		
UA1			**.606**	
UA2			.679	
UA3			.667	
UA4			.683	
UA5			.759	
UPR1				**.869**
UPR2				**.840**
Eigen Value (Total = 7.102)				
Cumulative Variance (%)				
(Total = %53.227)				

After determining the factor structure of the scale, the variables in these factors and their factor loads were determined. The purpose was here to obtain the factors to be named and evaluated (Kalaycı, 2010). In this respect, by using the line-chart with the eigenvalues and variance percentages, the distribution of the items in the four-factor scale to the factors was examined with the Varimax rotation procedure. In the study, the lower limit for the factor load values of the items was determined as 0.45 in line with the related literature (Büyüköztürk, 2017; Comrey & Lee, 1992; Chiu & Henry, 1990), and in the analysis conducted to determine the factor items, there was no item with a factor load value lower than 0.45.

According to Table 3, as a result of the Varimax rotation procedure applied to determine the factor load values of the scale, all the items in the scale (17) had a factor load higher than 0.45, which meant all the items in the measurement tool had a sufficient factor load. Table 3 presents the four dimensions and the related items obtained via the exploratory factor analysis, The entire scale obtained is given in Appendix I..

3.2. Confirmatory factor analysis (CFA)

Fig. 1 shows the Confirmatory Factor Analysis (CFA) conducted to determine the fit between the factors and the items found in the scale.
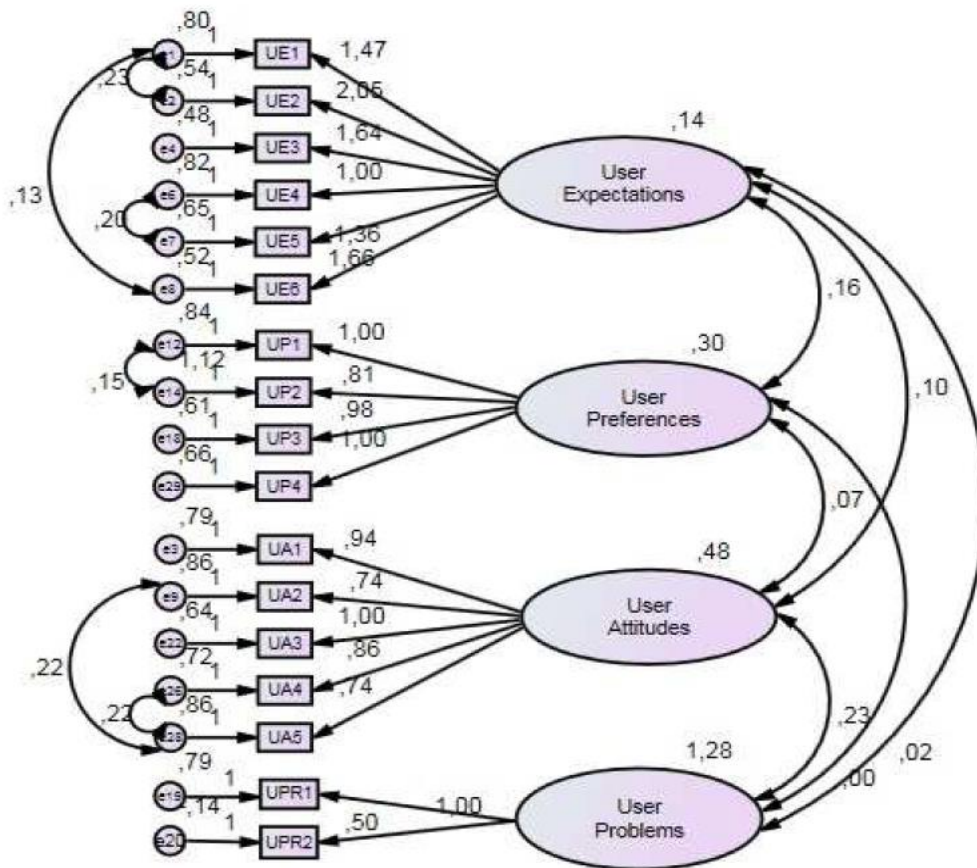

Fig. 1. Factor loads and path diagram regarding the web conference system

According to the results of the Confirmatory Factor Analysis (CFA), the Chi-square value of $x^2(107, N = 597) = 253.13$ calculated for the model-data fit was found significant at the significance level of $p < .00$. The fit statistics values calculated via the analysis carried out using the software of Lisrel were as follows: RMSEA = 0.048, RMR = 0.049, GFI = 0.95, AGFI = 0.93, CFI = 0.94, NNFI = 0.90, and IFI = 0.94. As these values were in appropriate ranges, there was no need for any modification.

3.3. Results of reliability analysis

The reliability coefficients for each of the factor in the scale can be seen in Table 4. The Cronbach Alpha value for the whole scale was calculated as .760. The Cronbach Alpha values calculated for the scale factors were found to be .783 for "User Expectations (UE)" .732 for User Attitudes (UA), .607 for User Preferences and .727 for User Problems (UPR), respectively. Considering the related criteria in literature, the Cronbach alpha values obtained in relation to the sub-factors demonstrate that the scale was reliable (Brownlow, 2004).

Table 4
Cronbach's alpha values regarding the sub-factors of the web-based conference system attitude scale

Factors	Number of Items	Reliability Coefficient (α)
User Expectations (UE)	6	.782
User Preferences (UP)	4	.607
User Attitudes (UA)	5	.732
User Problems (UPR)	2	.727

4. Discussion

Video conference systems could be a productive teaching and learning tool when students and especially faculty members are integrated into educational activities. In this process, faculty members' performances play an important role. Faculty members are expected to adapt their teaching methods and materials to technology during educational activities. For this reason, as a teaching tool, one of the conditions necessary to increase the productivity of Video conferencing is to give good-quality education to students and faculty members. Similarly, students should not only know how to learn with this new learning tool but also adapt themselves to the system and interact with each other. According to the synchronous learning model, pedagogies encouraging interaction and cooperation between students should develop students' experiences as well as their learning. In addition, if the design of learning can focus on cooperative group work, on higher-order thinking and on combining the interaction-requiring tasks, then the design could help structure the information better (Partlow & Gibbs, 2003).

Technical problems or lack of appropriate equipment could prevent some students from using audios. In order to solve such problems, students should be encouraged to use the text-based chat module and to interact with each other. Also, the fact that written messages have to be followed by the teacher and that these tools include synchronous speaking could be said to increase the number of duties to be managed by teachers. Teachers need to have the necessary knowledge and skills and to ensure security in web conference environments.

In studies examining the reliability of technology and related performance problems, it was found that teachers had to repeat most of their explanations for several reasons as follows: There were a number of audio-related problems; inappropriate microphones were used; the students avoided telling their course-related comments; and the students hesitated to speak (Chakraborty & Victor, 2004; Pope, 2010; Stewart, Harlow, & DeBacco, 2011; White et al., 2010). All these factors lead to a potential loss of information and a decrease in the positive attitudes towards synchronous virtual

environments. In some cases, other different technological problems occur such as delays in video streaming, students losing their access to the online environment, slides failing to proceed, software malfunction and audio feedback cycles. Although audios and videos are visually effective to a certain degree in web-based education, they may fail to solve students' needs fully. In one study, Ng (2007) compared web-based and face-to-face learning methods and concluded that instant reactions are important for communication and that responses are more natural in face-to-face class environments. Anderson and Garrison (1998) report that it will not be efficient to interact only with learning materials. Good-quality interactions between the teacher and students as well as between students themselves are the main elements of a successful learning process, and these interactions are more common in face-to-face learning. Most researchers hold the belief that web-based synchronous sessions could provide a reasonable level of interaction by integrating them into course designs since interaction is a fundamental part of a well-established teaching process (Ng, 2007; Sims, 2003). Anderson (2003) points out that certain synchronous technologies including web conference allow a relatively lower level of interaction between students and teachers. Even though it is reported in studies that technological tools to be used in education will have direct influence on the quality of education, e-learning environments and synchronous learning could be said to constitute the future of education. Problems that result from inappropriate use of technological tools should not be allowed to hinder the development of synchronous learning environments. One way of avoiding such problems is to provide students and teachers with related trainings. The feedback to be given by students and teachers in relation to synchronous learning could allow determining and overcoming such deficiencies and problems in advance.

Distance education systems used at universities are being gradually updated in a way to cover traditional learning methods. Students want to obtain the correct information independently of time and place. In the study, it was found that the students were satisfied with learning via the web-conference system. Most university students do not consider taking education via online learning platforms due to their lack of computer technology use skills (Palmer & Holt, 2010; Bolliger et al., 2010; Ghazal et al., 2018). Helping students avoid their fear of taking education via such platforms will make it easier for them to take education via distance education systems in the long term. The feedback to be provided by users regarding online education will play an important role in the development of these systems.

In literature, there are a number of studies conducted by researchers from various fields to investigate e-systems, and the results have been discussed (education, business, government and so on) (Chen, 2002; Yang, Newby, & Bill, 2008; Ng, 2007; Yalman, 2013; Yalman & Aydemir, 2013). The feedback obtained via users of these systems has great importance for the development and spread of such systems. In contrast to expectations, it is inevitable for students to go through an adaptation period at the beginning of their process of taking education via either traditional or distance education methods (Guspatni, 2018). A shorter period of time in this process will have positive influence on students' success, and a longer period will lead to a decrease in learners' motivation and consequently to a failure. Learning is a process, and making this process prominent will help determine the learning needs.

5.   Conclusion

The Adobe Connect platform is an effective web conference tool which allows online students to better handle their learning. In the studies, students emphasized the user-friendliness of web conference systems and claimed that trainers could facilitate learning in online class environments (Chen, 2002; Yang et al., 2008). Due to the fact that students can join lessons at home or at work without having to cope with the financial burden of travelling (Gegenfurtner, Zitt, & Ebner, 2019; Lakhal & Khechine, & Pascot, 2013), they feel satisfied with and have positive attitudes towards participating in lessons given with web conference method (Cornelius & Gordon, 2013; Gegenfurtner, Schwab, & Ebner, 2018; Kear et al., 2012; Wang & Hsu, 2008). In order to provide students and teachers with the opportunity to interact with each other in an asynchronous environment and to discover such environments, discussion forums are generally used (Hauben, 1993; Sahu, 2008). In the present study, according to most of the students, the previously defined asynchronous learning contents were useful for their learning, yet it was also seen that a considerable number of students experienced difficulty understanding these ready-made instructional materials. In such cases, Adobe Acrobat Connect sessions provide an effective alternative for students to participate actively in lessons by interacting with each other, with faculty members and with the course material. Facilitative feedback demonstrates that cooperation between students and active learning constitute an important part of web conferences. Conference tools like Adobe Connect provide new opportunities to meet students' needs. Teachers keep using teaching techniques that develop problem solving skills via interactions and critical thinking, while web conference techniques like Adobe Connect help students both share their experiences and work in cooperation. In web conference sessions, students are more likely to be motivated because they have the opportunity to cooperate with other students synchronously by sing audio-visual communication tools during an activity (Gillies, 2008). Studies carried out on the use of web conference to facilitate cooperation between students demonstrate that it is possible for students to share their learning experiences in a synchronous environment (Winter & McGhie-Richmond, 2005; Diziol et al., 2009). In addition, there is a need for further research on the correlation between this type of learning and various other learning styles (Tucker & Neely, 2010).

ORCID

Bulent Basaran https://orcid.org/0000-0002-8850-5454

Murat Yalman https://orcid.org/0000-0003-3122-4181

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Appendix I

		Completely Agree	Agree	Partly Agree	Disagree	Completely Disagree
1. User Expectations (UE)						
UE1	I can ask questions easily by using the web conference system.					
UE2	Thanks to the web conference system, I feel myself as if I were in class environment.					
UE3	As the web conference system is easy to understand, I want to use it.					
UE4	I would like the course teacher to use the multimedia tools of the web conference system during my learning process.					
UE5	Use of the web conference system encourages me to take part in the discussions.					
UE6	I would like the course teacher to communicate with the participants via the web conference system.					
2. User Preferences (UP)						
UP1	To me, there is no difference between teaching the course via the web conference system and teaching it on face-to-face basis.					
UP2	You don't have to go to school if you take courses via the web conference system.					
UP3	I don't have any problems with the courses I take via the web conference system.					
UP4	I feel more pleased with the courses I take via the web					

	conference system.					
3. User Attitudes (UA)						
UA1	The web conference system is an obstacle for me to interact with the course teacher.					
UA2	If I had known that the courses would be taught via the web conference system, I wouldn't have preferred this department.					
UA3	The web conference system prevents me from asking questions.					
UA4	I lose my motivation in the web conference system.					
UA5	Following the courses given via the web conference system is disturbing for me.					
4. User Problems (UPR)						
UPR1	The quality of the audios in courses taught via the web conference system are problematic.					
UPR2	The quality of the videos in courses taught via the web conference system are problematic.					