

A Validity and Reliability Analysis of the Pre-service Teachers' Attitudes towards Virtual Classroom Environment Scale

Filiz ÇETİN¹

Gazi University

Özden DEMIRKAN²

Gazi University

Abstract

This study aims to develop a measurement tool to be used to determine the attitudes of pre-service teachers towards virtual classroom environments. For this purpose, the literature on the subject was examined, and student opinions were taken. As a result of these processes, a 50-item piloting form of the scale was prepared. The prepared scale items were presented to the expert opinion in terms of content validity, and after the feedback obtained from the experts, some items were rearranged with minor corrections and transformed into a 50-item scale. The scale was administered to 282 students, 234 female and 48 male, studying in different teaching programs and different grade levels at Gazi University Gazi Faculty of Education in the spring term of the 2021-2022 academic year. Validity and reliability analyses of the scale were made based on the data set obtained as a result of the application. Exploratory Factor Analysis (EFA) was performed for construct validity, and as a result of the Exploratory Factor Analysis (EFA), a scale consisting of 46 items and 2 sub-dimensions was obtained. The total variance explanation rate of the two factors in the structure of the scale was 62.79%. The reliability analysis results obtained for the scale revealed that the Cronbach's alpha reliability coefficient for the overall scale was .98, and the reliability coefficients for the sub-factors were .98 and .96, respectively.

Keywords: Virtual Classroom, Attitude, Pre-Service Teachers

DOI: 10.29329/epasr.2023.548.7

Submitted: 29 November 2022

Accepted: 01 March 2023

Published: 01 June 2023

¹Assoc.Prof.Dr., Gazi Faculty of Education, Gazi University, Ankara, Turkey, ORCID: 0000-0002-6806-0160
ficetin@gazi.edu.tr

²Assoc.Prof.Dr., Gazi Faculty of Education, Gazi University, Ankara, Turkey, ORCID: 0000-0002-7201-6410
oozden@gazi.edu.tr

Introduction

Learning environment refers to the different physical spaces, environments, and cultures in which students perform their learning. The term also describes the culture, i.e. the shared value and belief system or "spirit" of a school or classroom, how people interact with one another, how they treat each other, and how teachers organize an educational environment to facilitate learning (Glossary of Education Reform, 2014).

The virtual classroom, on the other hand, is a teaching and learning environment within a computer-mediated communication system (Turoff, 1995), where students come together in different places under the guidance of a teacher and provide two-way communication between the teacher and the learner through visual, auditory, and textual means. It is defined as an online learning environment where tools are used (Can, 2020).

Virtual classrooms are spaces that share some of the characteristics of classrooms operating in real space but differ in some aspects. For example, in a virtual classroom, teachers can interact with students in real time, and students can interact with their peers over the internet, just as they would in a regular classroom. In physical classrooms, seating is often limited so that students can sit comfortably and have enough space for themselves. In contrast, virtual classrooms allow more students to attend classes at the same time. This makes information much more accessible with higher engagement. Like classrooms in real spaces, students and teachers can be online at the same time to facilitate instant interaction in virtual classrooms, or they can also use pre-recorded components such as videos, presentations, and lecture slides offline to facilitate learning (Sam, 2020).

Yan defined the virtual classroom as follows: "Unlike a physical classroom where teachers and students are in the same environment, a virtual classroom is an environment where everyone comes together in a different environment but in front of the computer, where they can listen to and talk to each other over the internet." He states that virtual classrooms are very similar to physical classrooms, with some features added. For example, when one person speaks, other people in the virtual classroom can listen. To raise a hand, as in a physical classroom, it is enough to click a button on the screen. Like the blackboard in the physical classroom, the teacher can use the whiteboard in the virtual classroom (Yan, 2021).

In short, virtual classrooms are environments where teachers and learners do not have to be in the same environment, and the learning and teaching process is carried out synchronously or asynchronously. In other words, learners and teachers come together in a virtual environment for a specific purpose. Unlike traditional classrooms, virtual classrooms are an audio-visual, and interactive environment with a large group of learners under the direction and control of teachers through certain virtual classroom software. Teachers can carry out all kinds of instructional activities for learners in

virtual classrooms, as in traditional classrooms, can evaluate learner success, and can effectively provide feedback to learners' questions about teaching activities (Can, 2020).

Murphy, Rodrigues, & Manzanares (2008) emphasized that the purpose of traditional classrooms and virtual classrooms is to teach students, but the tools and rules differ in achieving this goal. Intermediary elements in traditional classrooms are eye contact, body language, facial expressions, textbooks, asking for words by raising hands in a physical environment, a blackboard, and a pen. In virtual classrooms, the mediating elements are voice, e-mail, messaging, textbooks, asking for words by raising hands in a virtual environment, software, and a scanner. Silence, students sitting in rows and visually facing the teacher, informal planning, collective conversation, physical existence, simultaneous existence in the physical environment; freedom of speech, students facing a computer screen, formal planning, public and private speaking, anonymity, synchronous and asynchronous existence in the virtual environment (Murphy, Rodrigues, & Manzanares, 2008).

The goals of the virtual classroom are to improve access to advanced learning experiences by allowing students and educators to participate in distance learning communities from home or work using personal computers, and to improve the quality and effectiveness of education by using computers to support a collaborative learning process. (Bouton & Garth, 1983; Whipple, 1987).

According to Sam (2020), a virtual classroom should include the following features:

- Video conferencing: it is necessary to use the best web conferencing software to facilitate learner-teacher-learner communication.
- Digital whiteboards: real-time demonstrations and diagrams should be provided.
- Instant messaging: text conversations should be allowed.
- Participation controls: enable students to participate in discussions, muffle their surroundings, or raise their hands virtually.
- Sub-chats: opportunities should be provided to facilitate collaboration among students.
- Video recording: live lectures should be recorded as videos on demand for later viewing.
- End-to-end encryption: virtual classroom access should be restricted to authorized students.

Lessons conducted in virtual classrooms have some strengths compared to physical classrooms (Yılmaz, 2015; Xenos, 2018; Sam, 2020; Alhat, 2020; Can, 2020; Almuqbil, 2021; Can & Gündüz, 2021; Willermark, 2021; Soodtoetong & Rattanasiriwongwut, 2022). It provides intensive interaction with its feature of offering multiple communication channels such as virtual classrooms, online virtual meeting software, chat rooms, messaging, voice calls, and conference options. Digital whiteboards, file sharing, virtual meeting apps, and chats facilitate collaborative learning among students. This mimics the real-time atmosphere of classrooms without having to meet physically; it also increases knowledge retention by consolidation. Virtual classrooms focus on

students and their real-time education, as opposed to pre-recorded videos, which are teacher-centered with student-centered instruction. Students can ask questions, clarify concepts, and discuss topics in real time. It also offers the opportunity for personalized learning. With recorded live virtual classrooms, students can progress at their own pace using the pause, rewind, replay, and fast-forward features of recordings. In virtual classrooms, a variety of different content-media types can be used to present information in a way that appeals to a variety of student abilities and learning styles. These can include videos, presentations, animations, digital whiteboards, and webinars. Human interaction is critical to the success of an education system; virtual classrooms offer comfortable learning spaces, allowing students to interact and chat with their peers and teachers without compromise. It also supports students with class phobia. It allows students who are unable to attend classes on a regular basis for a variety of reasons to do so from anywhere in the world. It requires less effort and time to attend classes than physical classes. It also contributes to the development of digital skills and lifelong learning skills in individuals. It allows learners to take lessons from different field experts in their environment. It enables parents to participate more quickly and closely in the educational lives of learners. It makes the teaching-learning process more transparent. Learning in the virtual classroom can be perceived as a specific type of collaborative work. Studies on the virtual classroom environment have revealed that they support the view that learning in the virtual classroom environment can be more interactive and more effective than the physical classroom learning method for mature and motivated students (Welsch, 1982; Quinn et al., 1983; Davie & Palmer, 1984; Harasim et al., 1990; Hiltz, 1988, 1990, 1992, 1993, 1995; cited in Turoff, 1995).

Virtual classrooms have some weaknesses as well (Sam, 2020; Alhat, 2020; Can, 2020; Terada, 2020; Sage, Jackson, Fox, and Maurer, 2021; Can & Gündüz, 2021; Willermark, 2021; Greenan, 2021). One of the weakest aspects is that they require a computer and an internet connection, which poses a challenge for those who do not have sufficient infrastructure and equipment. It also requires technological literacy. The ability to record and replay virtual lessons may cause students to disregard the importance of the lessons and postpone their learning actions, or students can share computers and take care of sick family members, etc. They may face difficulties that can increase procrastination, so they may not be suitable for all disciplines. Efficiency may be reduced if courses focus on traditional methods and one-way presentations. Long-term use of technology can cause health problems. Technical problems may occur. If teachers do not have the required skills, there may be a lack of feedback and interaction. The classroom environment is a social environment where individuals communicate with each other; however, building relationships in online classes can be a bit of a challenge because cues and non-verbal information are limited. Physical and social distance can cause loneliness. It may not be suitable for students with special needs. It requires self-discipline in learners. Apart from these, there are additional limitations in virtual classrooms compared to physical classrooms. For example, teachers cannot navigate inside the virtual classroom to browse

and check students' work as they can in physical classrooms. A student cannot ask their teacher to pause when experiencing technical problems or there is not much a teacher can do if he or she is distracted by siblings or other distractors in the immediate environment.

The aim of both traditional classrooms and virtual classrooms is to provide quality learning for the student. However, there are many variables that play a role in the realization of quality learning. It is very important to determine these variables correctly so that learning retention and quality can be increased. One of these variables is students' attitudes towards the subject, learning, and learning environment (Karatay&Kartallıoğlu, 2012). Attitude, which is one of the affective components, is an important variable that affects learning in virtual environments where distance education takes place (Sanders & Morrison-Shetlar, 2001). For this reason, it is important to determine the attitudes towards virtual classroom environments, which we see intensely applied in education, especially during the COVID-19 pandemic, and to develop a measurement tool that will serve to determine the attitudes in this direction, which is the purpose of this research.

Although the COVID-19 pandemic has a weaker global impact today, emergency distance education was a lifesaver during the pandemic. Millions of students at all levels of education were able to continue their education in this way. To minimize the negative effects of similar extraordinary events on the education process and to facilitate the adaptation of individuals and societies to technological developments, the continuity of studies becomes mandatory. In addition, the fact that the pre-service teachers were taught in virtual classrooms for three years is another important factor guiding current educational practices.

Method

Research Design

The survey was used to describe the existing situation as it is. In this respect, this study is descriptive and aimed to develop a measurement tool to determine the attitudes of pre-service teachers towards virtual classrooms.

Population & Sample

The population of the research consists of 6400 students studying at different teaching programs and different grade levels at Gazi University Gazi Faculty of Education in the spring term of 2020–2021. Due to some limitations that prevent reaching the whole population, sampling was preferred. The data were collected from a total of 282 students, 234 female and 48 male, studying in 4 teaching programs randomly selected from among twenty-four teaching programs. Purposive sampling was used in the research. Purposeful sampling is preferred when it is desired to work in one or more special cases that meet certain criteria or have certain characteristics (Büyüköztürk et al., 2012).

Regarding the size of the sample to administer the scale, including a sample of 100 participants is found as weak, 200 as moderate, 300 as good, 500 as very good, and 1000 as excellent (Tabachnick&Fidell, 2007; Field, 2013).

Scale Development Process

The scale of the items on the scale was created using a five-point Likert type. The following stages were followed in the development of the scale (Tezbaşaran, 2008; DeVellis, 2017):

1. Establishing the item pool
2. Obtaining expert opinions
3. Creating the pilot form and pre-testing
4. Making an item analysis

In order to determine the items to be included in the scale and to create a related item pool, first of all, a literature review was conducted and relevant studies were determined. With this process, students' opinions on the subject were taken, and 50 items in the item pool created in these ways were presented to a group of five field experts in terms of content validity. Some items were rearranged in line with the common opinions of the experts. The scale form, which was arranged as "strongly agree," "strongly disagree," "partially agree," "disagree," and "strongly disagree," was presented to 25 pre-service teachers to find out whether there were any items that could not be understood. Based on the feedback received from the pre-service teachers, the scale, consisting of 25 negative and 25 positive items, was revised and finalized.

The data obtained were transferred to the computer environment through the SPSS 22 program, negative items were scored in reverse, and analyses based on validity and reliability were carried out on the data set of 282 students.

First, the Kaiser-Meyer-Olkin (KMO) test and the Bartlett Sphericity test were performed to check the suitability of the data set, which was created based on the opinions of 282 students, for exploratory factor analysis. Thus, evidence for factor analysis was obtained, and varimax axis rotation was applied to make the factors clearer. After the EFA, four scale items were removed from the scale on the grounds that they did not meet the criteria. The final version of the scale consisted of two sub-dimensions and 46 items.

Regarding the reliability of the scale, Cronbach's Alpha reliability coefficient and item-total correlations were examined to determine the distinctiveness of the attitudes of the pre-service teachers towards the virtual classroom environment. The upper-lower 27% group scores were compared for the

t-test for independent groups and the two equal halves of the scale. The Spearman-Brown internal consistency coefficient was calculated.

Findings

Findings Regarding the Validity of the Scale

The findings obtained from the analyses on the construct validity of the scale are given below.

Exploratory Factor Analysis

The Kaiser-Meyer-Olkin (KMO) value used to determine the scale application data set's suitability for factor analysis is .97. This value shows that the Kaiser-Meyer-Olkin (KMO) value is sufficient at the "perfect" level. The Bartlett Sphericity value is [$X^2 = 13106,946$; $p < .001$] as a result of the Bartlett test. The significant significance value obtained as a result of Bartlett's Test of Sphericity indicates that factor analysis can be performed and the data set has a multivariate normal distribution. In this sense, these values determined about the scale constitute sufficient evidence for the application of factor analysis to the existing data set (Kalaycı, 2006; Field, 2013).

In order to determine whether the sub-dimensions (factors) to be formed are related to each other, first of all, axis rotation was applied with the "Varimax" method. After obtaining the proof of correlation, the rotation method was again performed with the "Direct Oblimin" method. After varimax rotation, a scale structure consisting of two sub-dimensions with eigenvalues greater than 1 was determined. The 2 sub-dimensions identified explain 62.79% of the total variance. A value between 40% and 60% is acceptable for social sciences (Özdamar, 2013, Tavşancıl, 2014). Figure 1 shows the Scree Plot shaped according to the eigenvalues of the scale sub-dimensions.

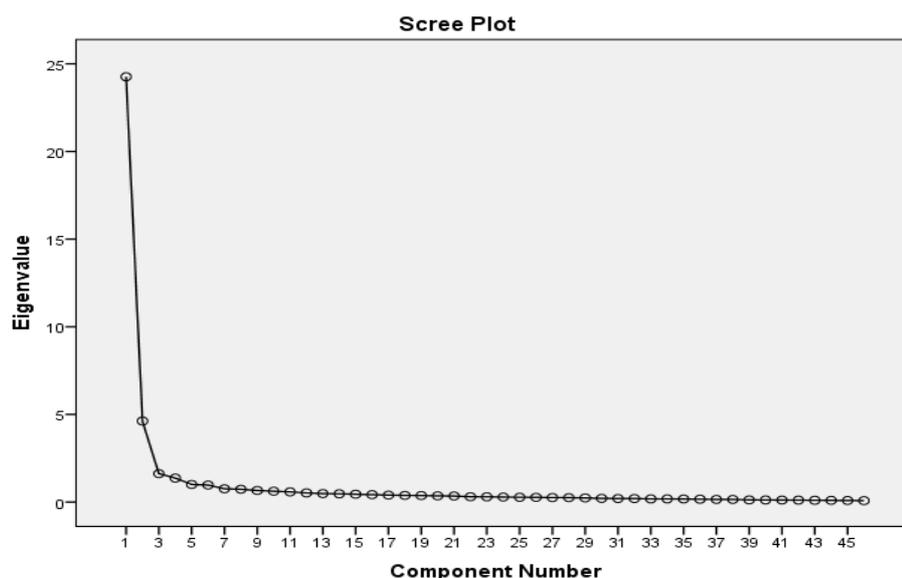


Figure 1. Scale Eigenvalue Factor Plot

The EFA values regarding the scale are given in Table 1.

Table 1. Exploratory Factor Analysis Results of Attitudes towards Virtual Classroom Environment Scale

Factors	Factor Loads	Eigenvalue	Explained Variance %
Factor 1: Resistance to the Virtual Classroom Environment		24,262	34,409
33. The virtual classroom implementation gives me bad feelings.	,787		
40. The virtual classroom environment is the address of non-interaction.	,734		
23. Teaching in a virtual classroom environment is boring.	,710		
26. Virtual classroom lessons do not interest me.	,681		
35. Even if there is no virtual classroom implementation.	,646		
37. Virtual classroom is boring.	,633		
18. Teaching in the virtual classroom reduces the quality of education.	,603		
24. Listening in a virtual classroom is against the nature of learning.	,593		
22. I do not want to attend the class in the virtual classroom environment.	,572		
34. Virtual classroom implementation is a big nothing for me.	,556		
36. The lesson in the virtual classroom environment means nothing but a wasted time.	,549		
17. Virtual classroom lessons are the reflection of despair on education.	,542		
7. I think that listening to lectures in a virtual classroom environment makes me passive.	,521		
29. I would not recommend anyone to listen to lectures in a virtual classroom environment.	,519		
25. I do not think it is necessary to teach in the virtual classroom.	,714		
32. I don't think there is a need for a virtual classroom when there is face-to-face education.	,696		
31. The virtual classroom environment makes me feel empty.	,687		
6. Teaching in a virtual classroom environment gets on my nerves.	,679		
15. Education given in virtual classroom environments is useless.	,647		
5. I cannot adapt to the virtual classroom environment.	,640		
16. The virtual classroom environment is for saving the day.	,543		
27. Virtual classroom environments are tiring.	,520		
21. Virtual classroom environments limit students.	,714		
4. I feel like an outsider in the virtual classroom environment.			
Factor 2: Positive Belief in the Virtual Classroom Environment		4,623	28,384
42. I support the virtual classroom implementation.			
41. The virtual classroom experience is a good opportunity.			
46. Virtual classroom implementations should be included in educational plans.			
49. Virtual classroom implementations are among the topics that interest me.			
43. I do not hesitate to defend the virtual classroom implementation as it stands.			
45. Virtual classroom implementations should be continued after adverse events such as the pandemic.			
12. I willingly attend classes in virtual classrooms.			

14. The virtual classroom environment is meaningful to me.	
13. I care about virtual classroom lessons.	
48. It is a privilege to have taken lessons in a virtual classroom environment.	
39. Every student should experience teaching in a virtual classroom environment.	
8. I am interested in teaching in a virtual classroom environment.	
11. The learning opportunities offered by the courses in virtual classrooms are valuable to me.	
2. I like the virtual classroom environment.	
20. I think virtual classroom environments offer a different learning experience.	
9. Virtual classroom environments are environments where learning outcomes are achieved.	
50. The effort spent on virtual classroom implementations is valuable to me.	
3. I think that I spend a productive time in the virtual classroom environment for education.	
44. The number of studies on virtual classroom implementations should be increased.	
28. I have a good time in the virtual classroom environment.	
30. The virtual classroom environment is an environment that I can look for in its absence.	
10. I don't mind at all that all lessons are held in a virtual classroom environment.	
Scale Total	62,793

Findings Related to the Reliability of the Scale

The table showing the analysis procedures and the results obtained as a result of the reliability of the scale is given below. In Table 2, Cronbach's alpha reliability coefficients for the whole scale and its sub-dimensions, item test total correlation coefficients for each scale item, and the t-test for upper-lower 27% independent groups were used to determine the significance of the difference between the mean scores of the lower and upper groups.

Table 2. Reliability Analysis Results of Attitudetowards Virtual Classroom Environment Scale

Factor-Item no	Item Total Correlation	Lower %27 – Upper%27 t	Cronbach Alpha Coefficient of Internal Consistency
Factor I			,98
Item 33	,854	16,929***	
Item40	,839	22,280***	
Item23	,864	21,632***	
Item 26	,862	24,953***	
Item 35	,856	23,380***	
Item 37	,875	27,734***	
Item 18	,817	17,013***	
Item 24	,818	17,014***	
Item 22	,869	25,791***	
Item 34	,833	19,641***	
Item 36	,842	22,737***	
Item 17	,780	15,246***	

Item 7	,764	13,416***	
Item 29	,816	18,101***	
Item 25	,780	15,052***	
Item 32	,781	19,438***	
Item 31	,757	13,774***	
Item 6	,764	14,572***	
Item 15	,768	14,951***	
Item 5	,764	14,733***	
Item 16	,718	12,960***	
Item 27	,731	12,683***	
Item 21	,712	13,487***	
Item 4	,668	10,451***	
Factor II			,96
Item 42	,870	19,372***	
Item 41	,842	18,435***	
Item 46	,797	14,694***	
Item 49	,827	15,007***	
Item 43	,823	16,324***	
Item 45	,819	18,171***	
Item 12	,801	16,518***	
Item 14	,794	15,420***	
Item 13	,737	11,144***	
Item 48	,752	13,500***	
Item 39	,713	12,396***	
Item 8	,782	17,041***	
Item 11	,726	12,406***	
Item 2	,703	11,879***	
Item 20	,681	9,980***	
Item 9	,721	12,175***	
Item 50	,648	10,289***	
Item 3	,658	10,210***	
Item 44	,587	8,034***	
Item 28	,567	7,439***	
Item 30	,566	7,598***	
Item 10	,637	10,845***	
Scale Total			,98

When Table 2 is examined, the Cronbach Alpha reliability coefficient for the overall scale is .98 and the Cronbach Alpha reliability coefficient values for its sub-dimensions are .98 and .96, respectively. These values indicate a high degree of reliability in the range of $0.80 \leq \alpha < 1.00$. The item-total correlation coefficients related to the scale items ranged between 0.57 and 0.88. Whether the items exemplify similar behaviors and that these values, which are an indicator of the internal consistency of the test, are above the reference value of 0.30 is considered sufficient evidence (Fraenkel, Wallen, & Hyun, 2012; Büyüköztürk, 2013; Tavşancıl, 2014). Furthermore, the t-test results between the upper and lower 27% groups differ at the $P < .001$ significance level. Spearman-Brown internal consistency coefficient was calculated for the two equal halves of the scale, which is quite high: "0.96". The correlation values between each sub-factor and the overall scale are given in Table 3.

Table 3. Correlation Values between Attitude towards Virtual Classroom Environment Scale, Overall Scale, and Its Sub-Dimensions

	Scale Overall	Factor I
Factor I	,934**	-----
Factor II	,894**	,676**

**P<.01

Table 3 shows the correlation values for the overall scale and sub-factors related to the attitude scale towards the virtual classroom environment. When the correlation values are examined, the values are found to be between 0.68 and 0.93, and they are at a moderate and high level of positive correlation at the $\alpha=0.01$ significance level.

There are 24 negative and 22 positive items in the scale, which consists of 46 items and 2 sub-dimensions, in line with the data obtained on the validity and reliability of the scale and the analyses based on it. The highest attitude score that can be obtained from the scale application is 230, and the lowest is 46. The negative items on the scale are scored in the opposite direction of positive items. The high score obtained from the scale indicates that the attitude towards the virtual classroom environment is positive, and the low score, on the contrary, indicates that the attitude towards the virtual classroom environment is negative.

Discussion, Conclusion and Recommendations

This study aimed to develop an attitude scale with the necessary psychometric properties to be used to determine the attitudes of pre-service teachers towards the virtual classroom environment. To this end, an item pool of 50 items was created in a 5-point Likert style, taking into account the scale development stages. The items in this item pool were arranged in line with the opinions of five experts and transformed into an application form. The scale was applied to a group of 282 pre-service teachers, and validity and reliability analyses were made on the resulting data set. The item was removed from the scale as a result of the exploratory factor analysis and reliability analyses performed on the data set 4 because it did not meet the criteria. With this analysis, a scale structure consisting of 46 items and two factors was obtained. The two sub-dimensions obtained were named "Resistance towards the Virtual Classroom Environment" and "Positive Beliefs in the Virtual Classroom Environment", respectively.

As a result of the EFA conducted for construct validity, a scale form consisting of 46 items and two sub-dimensions emerged. The total variance explanation rate of the two factors in the structure of the scale is 62.79%. The reliability analysis results obtained for the scale determined that the Cronbach alpha reliability coefficient for the overall scale is .98, and the reliability coefficients for the sub-factors are .98 and .96.

The Kaiser-Meyer-Olkin (KMO) value, which was performed to determine the suitability of the data set for factor analysis as a result of the EFA performed on the measurement tool, was .97 and the BarlettSphericity value as a result of the Barlett test [$X^2= 13106,946$; $p<.001$]. The Cronbach Alpha reliability coefficient for the overall scale is .98 and the Cronbach Alpha reliability coefficient values for its sub-dimensions are .98 and .96, respectively. Furthermore, the t-test results between the upper and lower 27% groups differ at the $P<.001$ significance level. The Spearman-Brown internal consistency coefficient was calculated for two equal halves of the scale, which was observed to be quite high, with "0.96".

The results of the analysis regarding the validity and reliability of the said attitude scale reveal that it is a measurement tool with the necessary psychometric properties that can be used to determine the attitudes of pre-service teachers towards the virtual classroom environment.

When the literature was reviewed, no scale development study on the attitudes of pre-service teachers towards the virtual classroom environment was found. The studies carried out aimed to determine the effect of virtual learning environments on student achievement and attitudes, the views of students and teachers towards the virtual classroom, the undesirable behaviors of students in virtual classrooms, and the relationship between teachers' techniques and various classroom communication processes and outputs (Atıcı, 2004; Li, 2012; Yılmaz, 2015; Kalelioğlu et al., 2016; Yaşlıca, 2019).

In this study, a measurement tool with measurement reliability was developed to determine the attitudes of pre-service teachers towards the virtual classroom environment. However, virtual classroom practices are not only for pre-service teachers. Attitude scale development studies can be carried out on a variety of samples and student groups. The fact that the practices related to the scale development study were carried out during the COVID-19 pandemic is a limitation of the study. The study can be renewed on a larger sample when the effect of the pandemic completely disappears. In addition, to have a more accurate assessment of the validity and reliability of the scale, it can be administered to a wider group of participant teaching or learning at various levels of education.

Policy Implications

Not only the rapid and dramatic improvements within the scope of technology and the necessities arising from them, but also epidemics that have a deep influence on human life bring different educational settings to the agenda with regard to the adaption process to the conditions in terms of education. Thus, naturally, as the most functional education tool, the implementation of virtual classrooms is in the focus. As in the whole world, the education system in our country has got its place rapidly in line with this global change by adopting distance education and set to work. Particularly, through the long process of the Covid-19 epidemic, approaches regarding distance education and virtual classroom were applied within in the education context. In spite of being used

with an extensive amount, it is striking that the studies conducted on the virtual classroom environment is scarce in number. Especially, the rareness of studies with the purpose of revealing attitudes towards virtual classroom setting or virtual classroom practices makes the significance of this study or similar-focused studies higher. Furthermore, enhancing data collection tools that will help describe the situation in this perspective and bringing them into the literature will light the way for doing new researches and developing or redesigning the existing ones. Within this context, it is considered that the research will be effective in closing the gap on above-mentioned the subject as well as providing variety in literature.

Conflict of Interest

No potential conflict of interest was declared by the authors

Funding details

No funding or grant was received from any institution or organization for this research.

Credit Author Statement

Author 1: Conceptualization, Investigation, Data Collection, Methodology, Formal Analysis, Project Administration, Writing

Author 2: Conceptualization, Data Collection, Data Curation, Formal Analysis, Project Administration, Writing

References

- Alhat, Swapnil. (2020). *Virtual Classroom: A Future of Education Post COVID-19*. Shanlax International Journal of Education, vol. 8, no. 4, pp. 101-104. DOI: <https://doi.org/10.34293/education.v8i4.3238>
- Almuqbil, N.S.M. (2021). *The Impact of a Training Program Using Virtual Classroom On The Teaching Competencies And The Development Of Virtual Classroom's Skills Among Female Student-Teachers*, İlköğretim Online-Elementary Education Online, Year; Vol 20 (Issue 4): pp. 2629-2638 <http://ilkogretim-online.org> DOI: 10.17051/ilkonline.2021.04.301
- Atıcı, B. (2004). *Sosyal bilgi inşasınadayaalı sanal öğrenme çevrelerinin öğrenci başarısı ve tutumlarına etkisi*. Yayınlanmamış doktora tezi. Fırat Üniversitesi Sosyal Bilimler Enstitüsü. Eğitim Bilimleri Anabilim Dalı, Elazığ.
- Büyüköztürk, Ş. vd. (2012). *Bilimsel araştırma yöntemleri* (11. Baskı). Ankara: Pegem Akademi
- Can, E. (2020). *Sanal sınıf yönetimi: İlkeler, uygulamalar ve öneriler*, Açıköğretim Uygulamaları ve Araştırmaları Dergisi AUAD, 2020, Cilt 6, Sayı 4, 251-295.

- Can, E. Ve Gündüz, Y. (2021). *Öğretmenlerin Sanal Sınıf Yönetimi Yeterlikleri*, ISSN: 1304-4796
Manisa Celal Bayar Üniversitesi Sosyal Bilimler Dergisi Manisa Celal Bayar University
Journal of Social Sciences 2021; 19 (3); 49-68. DOI: 10.18026/cbayarsos.875435
- DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Thousand Oaks CA:
Sage.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4. edition). London: Sage.
- Fraenkel J., Wallen N., & Hyu, H. (2012). *How to design and evaluate research in education*.
New York: McGraw-Hill
- Greenan, K.A. (2021). *The Influence of Virtual Education on Classroom Culture*. Front. Commun.
6:641214. DOI: 10.3389/fcomm.2021.641214
- Glossary of Education Reform, (2014). *Learning Environment Definition*,
www.edglossary.org/learning-environment/
- Kalaycı, Ş. (2006). *SPSS uygulamalı çok değişkenli istatistik teknikleri* [Multivariate statistical
techniques with SPSS application]. Asil.
- Kalelioğlu, F., Atan, A. Ve Çetin, Ç. (2016). *Sanal Sınıf Ortamında Öğretmen ve Öğrenen Deneyimleri*.
Mersin Üniversitesi Eğitim Fakültesi Dergisi, 2016; 12(2): 555-568
- Karatay, H. ve Kartallıoğlu, N. (2012). *Kırgız öğrencilerin Türkiye Türkçesi öğrenmeye ilişkin
tutumları*. Türkçe Eğitimi ve Öğretimi Araştırmaları Dergisi, 2(4).
- Li, L. (2012). *Student Misbehaviors and Teacher Techniques in Online Classrooms: Instrument
Development and Validation*. PhD Thesis, Ohio University.
- Murphy, E., & Rodrigues-Manzanares, M.A. (2008). *Contradictions between the virtual and physical
high school classroom: A third-generation activity theory perspective*. British Journal of
Educational Technology, 39(6), 1061-1072. doi:10.1111/j.1467- 8535.2007.00776.x.
- Özdamar, K. (2013). *Paket programlar ile istatistiksel veri analizi* 1. cilt. Eskişehir: Nisan
- Sage, K., Jackson, S., Fox, E. and Maurer, L. (2021). *The virtual COVID-19 classroom: surveying
outcomes, individual differences, and technology use in college students*. Smart Learn.
Environ. 8, 27 <https://doi.org/10.1186/s40561-021-00174-7>
- Sanders, D. W. & Morrison-Shetlar, A. I. (2001). *Student attitudes Toward Web-Enhanced
Instruction in an Introductory Biology Course*. Journal of Research on Computing in
Education, 33(3), 251-262
- Sam, A. (2020). *What Is a Virtual Classroom and Why Is It the Future of Online Learning?* eLearning
Industry <https://elearningindustry.com/live-online-learning-webinar-vs-virtual-classroom>

- Soodtoetong, N. and Rattanasiriwongwut, M. (2022). *Educational Transformation with Virtual Classroom: Integrated between TTF and Social Motivation*, TEM Journal. Volume 11, Issue 1, pages 439-445, ISSN 2217-309, DOI: 10.18421/TEM111-56 <https://doi.org/10.18421/TEM111-56>
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics*. Boston: Allyn and Bacon.
- Terada, Y. (2020). *Reading the Virtual Classroom Is Hard, but It Can Be Done*, edutopia, George Lucas Educational Foundation, <https://www.edutopia.org/article/reading-virtual-classroom-hard-it-can-be-done>
- Tavşancıl, E. (2014). *Tutumların Ölçülmesi ve SPSS İle Veri Analizi*. Nobel Yayıncılık. Ankara. 48.
- Tezbaşaran, A. (2008). *Likert Tipi Ölçek Hazırlama Kılavuzu*. Mersin Türk Psikologlar Derneği.
- Turoff, M. (1995). *Designing a Virtual Classroom*, 1995 International Conference on Computer Assisted Instruction ICCAI'95, March 7-10, 1995, National ChiaoTung University, Hsinchu, Taiwan.
- Xenos M. (2018). *The Future of Virtual Classroom: Using Existing Features to Move Beyond Traditional Classroom Limitations*. In: Auer M., Tsiatsos T. (eds) Interactive Mobile Communication Technologies and Learning, pp. 944- 951. IMCL 2017. Advances in Intelligent Systems and Computing, vol 725. Springer.
- Willermark, S. (2021). *Who's There? Characterizing Interaction in Virtual Classrooms*, Journal of Educational Computing Research 2021, Vol. 59(6) 1036–1055 DOI: 10.1177/0735633120988530
- Yan, A. (2021). *Virtual Classroom*, <https://english.best/articles/articles/virtual-classroom>
- Yaşlıca, E. (2019). *Sanal Sınıf Ortamında Etkileşimli Öğretim Materyalinin Başarıya ve Tutuma Etkisi*. Yayımlanmamış doktora tezi. Maltepe Üniversitesi Sosyal Bilimler Enstitüsü. İletişim Bilimleri Anabilim Dalı, İstanbul.
- Yılmaz, Ö. (2015). *The Effects of “Live Virtual Classroom” On Students’ Achievement and Students’ Opinions About “Live Virtual Classroom” At distance Education*. TOJET: The Turkish Online Journal of Educational Technology – January 2015, volume 14 issue 1. <https://www.researchgate.net/publication/282889631>