International Review of Research in Open and Distributed Learning

THE INTERNATIONAL REVIEW
OF RESEARCH IN OPEN AND
DISTRIBUTED LEARNING

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Résumé de l'article

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Design and Validation of the Virtual Classroom Management Questionnaire

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Abstract

Effective classroom management methods are well known, but effective ways of managing classes of beginner teachers remain elusive. Classroom management refers to the wide range of skills and techniques that teachers use to ensure that classes are conducted without destructive student behavior. The present study is applied nonexperimental research. The purpose of this study was to design a tool to measure the effective management of the virtual classroom from the perspective of professors and students in e-learning and evaluate its validity and reliability. The research sample was taken randomly from all universities that make use of e-learning in Tehran, Iran, during the 2019–2020 semesters. The results show that the professional development of online classroom management is necessary for preparing teachers to teach in digital environments. The results of this research in the form of a validated questionnaire can be considered as an indicator for educators and students working in online environments, and this tool can be used for effective teaching and learning in the digital age.

Keywords: classroom environment, classroom management, questionnaire, virtual classroom management

Design and Validation of the Virtual Classroom Management Questionnaire

Today, in the digital age, one of the main attributes that learners need to have is the skills to learn in new digital environments. For this reason, teachers must be familiar with digital-age teaching skills and techniques to manage and lead online classes (Keshavarz & Ghoneim, 2021). Among the various elements and components of the educational system, priority is given to the teacher, because it is through the teacher that educational goals in different dimensions are achieved. Various factors can be considered as effective in the promotion of quality teaching–learning processes in the higher education system. One of these factors is classroom management. The classroom environment is of special importance and sanctity. Classroom management skills are the cornerstone of overall teaching success. Despite one's scientific abilities, if a teacher cannot use the skills of classroom management, the realization of effective teaching will be difficult to achieve. Research shows that not only classroom management but also classroom management dynamics are important for effective teaching and learning (Levin & Nolan, 2014). The result of effective management is the creation of a democratic community in the classroom and thus effective learning (Konti, 2011; Muijs & Reynolds, 2017).

Classroom management is an important skill for the academic, social-emotional, and motivational development of students and the health of teachers (Gold et al., 2021). *Classroom management* refers to a wide variety of skills and techniques that teachers use to keep students organized, focused, and academically productive during a class (Babadjanova, 2020). Teachers must have classroom management skills the to successfully build a secure and effective learning environment for pupils' quality education (Adedigba & Sulaiman, 2020). As mentioned by Malik et al. (2020, p. 260), "management of classroom is a strong combination of the management of content and also the conduct of the teacher. Effective management means the management of students' attitudes, personalities, vitalities, competencies and passions." When classroom management strategies are executed effectively, teachers minimize behaviors that impede learning for both individual students and groups while maximizing behaviors that facilitate or enhance learning (Hapsari, 2020).

Many teachers enter the field of education without the necessary skills to implement an effective classroom management program and respond appropriately to student behavior (Greenberg et al., 2014). Various research has been done on this topic. For example, Akman (2020) collected data with a classroom management scale developed by Özcan and Gülözer (2017). This scale contains 18 items and three factors (human management, course management, and behavior management). The study was aimed at analyzing the correlations between teachers' classroom management efficacies, students' confidence in teachers, and the perception of educational stress (Akman, 2020). Additionally, Berger and Girardet (2020) show that the more vocational teachers felt responsible for the quality of their teaching, the more they tended to endorse adaptive or beneficial classroom management styles.

Classroom management includes managing students in the classroom with discipline and creating a conducive environment to facilitate learning and behavior change (Ghiasvandian et al., 2017). This is a cyclical process that includes the following steps: advanced design, implementation, evaluation during implementation, and final evaluation. The instructor must also consider learners and the environment as

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factors. Curzon (2003) considers a teacher's managerial responsibilities to include creating and maintaining a classroom environment in which effective learning takes place, compiling and explaining outlines, articulating goals, teaching with appropriate methods, motivating the class, evaluating learner performance, and providing feedback.

Effective classroom management also improves students' disciplinary behaviors (Kayıkçı, 2009). Classroom management is the component of teaching and learning, and it seems to be the most common concern of both preservice and experienced teachers (Yılmaz & Çavaş, 2008). Classroom management is the strategy that teachers use to maintain the environment in which teaching and learning be accomplished (Wong & Wong, 2001).

Online learning refers to educational delivered over the Internet. It includes a wide range of online applications to access educational materials, as well as to facilitate teacher–student interaction. *Online learning* is a term that is often equivalent to *distance learning* and *e-learning* (Bakia et al., 2012). Langdon (1997) indicates that 58 percent of teachers reported that students were constantly disruptive, and 50 percent of teachers expressed concern about learners' disobedience. In an analysis of 135 student–teacher experiences, Tulley and Chiu (1995) report that 15 percent of students regularly break the rules, and an additional 5 percent are chronic offenders. As a result, teachers are actively seeking information on effective classroom management practices (Hardman & Smith, 2003).

The purpose of this study was to design a tool to measure the effective management of the virtual classroom from the perspective of professors and students in e-learning and evaluate its validity and reliability.

Methodology

The present study is applied research in terms of its purpose, and it is nonexperimental research in terms of data collection: the design and psychometric analysis of the questionnaire were done in four stages based on Waltz et al.'s (2010) method. In the first step, to get acquainted with the concept of online classroom management, a review of relevant texts and resources to identify components of classroom management was performed. Then, the initial questions and questionnaire items were designed; the initial version of the questionnaire included 64 items. The present questionnaire consists of two parts. The first part consists of demographic information, and the second part includes the questionnaire items. A total of 64 items were designed; they are measured on a 5-point Likert from very high (5) to very low (1). In the next step, to evaluate and determine the validity of the questionnaire, content validity and construct validity methods were used. To assess the validity of the content, the questions were examined by 15 experts in the field of e-learning, medical education, and educational technology. These experts were asked to comment on whether the questions were necessary and useful. Finally, their information and opinions were collected and the necessary changes were made. After reviewing the opinions of experts, 39 options were approved in the form of a questionnaire, and five factors were determined: managing supportive interactions and behaviors, course management, meta-cognitive skills management, conflict management, and time management. If the number obtained from the Lawshe (1975) table (to determine the minimum value of the index) was

greater than 0.49 (based on the evaluation of 15 experts), this indicated that the presence of the items in this tool was necessary and important (Figure 1).

Figure 1

The Content Validity Ratio (CVR) Formula

$$CVR = \frac{n - \left(\frac{N}{2}\right)}{\frac{N}{2}}$$

Note. The CVR proposed by Lawshe (1975) is a linear transformation of a proportional level of agreement on how many experts within a panel rate an item as essential. n = total number of experts divided by the number of experts saying item essential; N = total number of experts on the panel. From "A Quantitative Approach to Content Validity," by C. H. Lawshe, 1975, *Personnel Psychology*, *28*(4), 563–575 (https://doi.org/10.1111/j.1744-6570.1975.tb01393.x). Copyright 1975. by C. H. Lawshe, A paper presented at Content Validity II, A conference held at Bowling Green State University.

Exploratory factor analysis was used to evaluate the validity of the structure. For this purpose, our research community was divided into two groups: students who had been through at least two semesters virtually using the learning management system and professors who had at least two years of virtual teaching experience. Regarding the minimum size of the sample required for performing the factor analysis, the ratio of the variable to the subject should at least one to five: according to the number of items entered to perform the exploratory factor analysis, the sample size (35 items) for the study (190 people) was sufficient. To compensate for the loss of samples, 10 samples were added to the total number received. Therefore, 200 questionnaires were considered for completion. The research sample was taken randomly from all e-learning executor universities in Tehran city, Iran.

Finally, the reliability of the questions was determined. The questions were examined from two dimensions of internal and external reliability. Internal consistency was obtained by calculating Cronbach's alpha (α), and the Pearson correlation coefficient was used to determine the external reliability of the questionnaire (Appendix). The SPSS 21 software package was used for statistical analysis of data. The significance level in this study is $p < 0.001$.

Results

The mean age of participants in the present study was 59.41, with a standard deviation was 32.8. Participants included 81 men and 119 women (40.5% and 59.5%, respectively). Regarding education level, 46% participants had a master's degree, 40% had a specialized doctorate, and 9% had a specialist degree. Of the participants, 57% were faculty members, 38% were experts, 68% had teaching experience, and 32% had no teaching experience. Regarding whether participants had a history of e-learning, 65% did and 37% did not.

The correlation, mean, standard deviation, and Cronbach's α of each of the factors obtained in the present study are presented in Table 1.The correlation between each of factors of research with the other factors such as Anaging Supportive Interactions and Behaviors, Course Management, Meta-cognitive Skills Management, Conflict Management, and Time Management showed an appropriate and high-scale correlation. Therefore, the questions were not changed, and none of the questions were deleted. Cronbach's α of all components of the questionnaire is 0.7, and the reliability of the whole set of 35 questions is equal to 0.93, which indicates high reliability of the questionnaire.

Table 1

Agents' Descriptive Statistics and Cronbach's Alpha

Row	Factor	1	2	3	4	5	Mean	*SD*	Cronbach's α
1	Time management	1	-	-	-	-	17.79	7.99	0.74
2	Course management	0.43**	1	-	-	-	37.44	9.31	0.9
3	Conflict management	0.45**	0.67**	1	-	-	8.56	3.15	0.75
4	Managing supportive interactions and behaviors	0.49**	0.71**	0.79**	1	-	36.01	11.65	0.94
5	Meta-cognitive skills management	0.41**	0.63**	0.64**	0.85**	1	6.78	2.78	0.84

Note. ** indicate the significance level in this study is $p < 0.001$

After examining the statistical characteristics of the scales and their alpha, exploratory factor analysis was performed on the factors. Bartlett's sphericity test was used to perform the principal component analysis method and to show that the data correlation matrix was not zero in the population. The results were statistically significant ($p < 0.001$ and KMO = 0.763). It should be noted that the Kaiser-Meyer-Olkin (KMO) Test is a measure of how suited your data is for Factor Analysis. The test measures sampling adequacy for each variable in the model and for the complete model. The results of Bartlett's sphericity test show that that the implementation of factor analysis based on the obtained correlation matrix is explainable. To determine that the measurement tool under study (set of questions) is made up of several factors, three eigenvalue indices, the ratio of variance explained by each factor, and a rotated eigenvalue diagram were examined.

To extract the appropriate factors, factor analysis was performed several times. Finally, it was found that according to the main structure of the questionnaire and the results of exploratory factor analysis, the five-factor is more sufficient, and this five factor was used. The results showed that the eigenvalues (Table 2) of five factors are greater than one and explain the percentage of common variance coverage between variables, among which the first factor (management of interactions and supportive behaviors) with an eigenvalue of 7.82 about 20.07%, and the fifth factor (management of interactions and supportive

behaviors) with a specific value of 3.65 explains about 9.37% of the total variance. A total of five factors explain 64.9% of the total variance of the variables. The values of special value, percentage of variance and percentage of the cumulative variance of the five factors are shown in Table 2.

Table 2

Amounts of Special Value, Percentage of Variance, and Percentage of the Cumulative Variance

Factors	Special value	Variance (%)	Cumulative variance (%)
Time management	7.82	20.07	20.07
Course management	4.9	12.57	33.65
Meta-cognitive skills management	4.74	12.15	44.8
Conflict management	4.18	10.72	55.53
Managing supportive interactions and behaviors	3.65	9.37	64.9

Figure 2

Rotated Factor Special Value (Scree Plot)
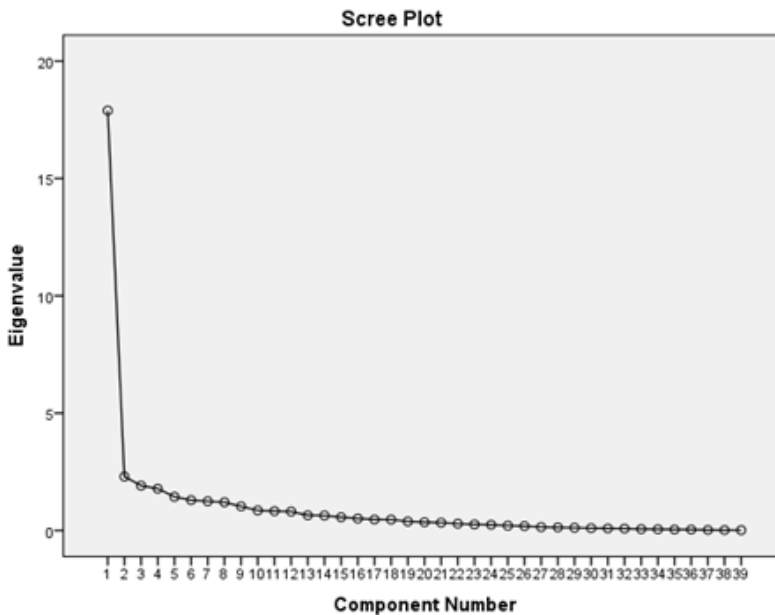
The share of the first to fourth factors in the variance of the total variables is significant and different from the share of other factors (Figure 2). Also, from the fifth factor onward, the slope of the graph is cut and

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almost smoothed. The varimax rotation method was used to simplify the extraction of agents and their naming. The factor matrix created by the varimax rotation is shown in Table 3. Based on the results of factor analysis of the questionnaire materials, implementing the principal components analysis method, five factors were determined based on the final characteristics.

Table 3

Structure Matrix of 35 Questions With Varimax Method

Item	Time management	Conflict management	Meta-cognitive skills management	Course management	Managing supportive interactions and behaviors	CVR
32	-	-	-	-	0.79	0.80
34	-	-	-	-	0.76	0.75
35	-	-	-	-	0.73	0.75
33	-	-	-	-	0.71	0.87
36	-	-	-	-	0.66	1
29	-	-	-	-	0.55	1
26	-	-	-	-	0.54	1
25	-	-	-	-	0.51	0.62
28	-	-	-	-	0.50	0.75
31	-	-	-	-	0.49	0.80
30	-	-	-	-	0.45	0.87
27	-	-	-	-	0.3	1
22	-	-	-	0.7	-	1
16	-	-	-	0.68	-	0.75
13	-	-	-	0.61	-	0.75
15	-	-	-	0.61	-	0.75
21	-	-	-	0.6	-	0.87
10	-	-	-	0.58	-	0.80
20	-	-	-	0.56	-	0.62
14	-	-	-	0.52	-	0.80
19	-	-	-	0.39	-	0.87
17	-	-	-	0.38	-	1
12	-	-	-	0.31	-	0.80
38	-	-	0.64	-	-	0.75
39	-	-	0.64	-	-	0.87
37	-	-	0.33	-	-	1
18	-	0.69	-	-	-	0.62
24	-	0.48	-	-	-	0.75
23	-	0.32	-	-	-	1
3	0.72	-	-	-	-	0.87
2	0.67	-	-	-	-	1

5	0.63	-	-	-	-	0.62
1	0.6	-	-	-	-	0.75
6	0.48	-	-	-	-	1
4	0.33	-	-	-	-	0.75

Note. CVR = content validity ratio.

Discussion

The purpose of this study was to design a tool to measure the effective management of the virtual classroom from the perspective of professors and students in e-learning and to evaluate this tool's validity and reliability. Cronbach's α of all components of the questionnaire is 0.7, and the reliability of the whole set of 35 questions is equal to 0.93, which indicates the questionnaire has high reliability. The study revealed no significant difference in teachers' leadership styles based on gender or age; this is consistent with Adedigba and Sulaiman's (2020) results.

The results show that the eigenvalues of five factors are greater than one and explain the percentage of common variance coverage between variables, among which the first factor (management of interactions and supportive behaviors) with an eigenvalue of 7.82, about 20.07%, and the fifth factor (management of interactions and supportive behaviors) with a specific value of 3.65 explains about 9.37% of the total variance. A total of five factors explain 64.9% of the total variance of the variables. This corroborates Jones and Jone's (2012) assertion that effective classroom management is characterized by a safe environment and respect for pupils' opinions, creates confidence that students' ideas and opinions are valued, and gives them motivation to learn (Adedigba & Sulaiman, 2020). Lettink's (2020) results also indicate that the Classroom Management Questionnaire had a high construct validity as well as high reliability, in the sense that classes of students awarded their teachers similar scores. This is consistent with our study.

Classroom management guidelines are implemented to enhance students' behavior and increase academic achievements across all grade levels (Emmer & Sabornie, 2015). Online environments continue to be a popular career development option in education (Burkman, 2012; Herbert et al., 2016). The Internet and advances in information technology enable the creation of online spaces that provide instant access to research material and real-time interaction between faculty and students (Dash et al., 2012). Online professional development is flexible, allows participants to manage their educational and professional activities with personal responsibilities, and often increases access to resources that may not be otherwsie available (Vu et al., 2014).

Research on online professional development research shows that online environments are useful for those who take advantage of this opportunity and that there is demand for it (Acar & Yıldız, 2016; Baker et al., 2016). Teachers need efficient classroom management skills to cope with day-to-day challenges, but the time, money, and resources needed for comprehensive professional development are not always available. For this reason, many universities focus on the professional development of classroom management in their teacher training programs (Stobaugh & Houchens, 2014).

Conclusion

Classroom management refers to the wide range of skills and techniques that teachers use to organize, focus, perform tasks, and produce academically throughout the classroom (Glossary of Education Reform, 2018). Classroom management can be a difficult topic because the term implies that teachers must take on an authoritative role as a manager. As more and more classrooms embrace a blended learning environment, we must talk about strategies for classroom management. For the past few years, we hve seen a huge growth in distance learning. It has been suggested that despite the unique nature of the online learning environment, many of the same features that are essential to the success of a traditional classroom management plan also apply to the online classroom (Stewart, 2008). Virtual classes can be as productive and convenient as traditional classes. If possible, barriers are considered and preventive strategy management is used. These barriers include the special needs of students in cyberspace, the feelings of isolation, and the lack of face-to-face interaction with the teacher and other learners (Wilson, 2004). An essential aspect of teaching quality is classroom management, as it is a prerequisite for effective student learning. However, as far as we know, no instruments specifically measure this in Iran yet.

In this study, we were able to design a tool to measure the effective management of the virtual classroom from the perspective of professors and students in e-learning, and an approved tool for the use of educators and students in online environments was introduced. This tool is valid and reliable. It could be used during the teacher activities to indicate how to be efficient online classroom management is.

Acknowledgments

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Appendix

Questionnaire on How to Manage Virtual Classes

Biographical information

Age: ....

Gender: male/female

Degree: ....

Field of study: ....

Job status: employed/unemployed

Job category: bachelor's/master's/faculty member

Years of work: less than 5 years/between 5 and 10 years/more than 10 years

Have you ever had teaching experience at a university? Yes/No

Have you had an e-learning experience? Yes/No

Row	Item	Strongly Agree	Agree	No idea	Disagree	Strongly Disagree
1	Content is uploaded regularly and according to a predetermined schedule.					
2	A specific day and time for online responses are set by professors.					
3	A specific date has been set for face-to-face meetings with professors.					
4	There is a good time frame for submitting assignments.					
5	Course time is provided online and offline at the beginning of the semester.					
6	If the curriculum is changed, an alternative date will be announced.					
7	If you take the test online, the time will be determined in advance.					
8	Course topics are fully introduced and described.					

9	Teachers are well versed in the subjects.
10	Prerequisite knowledge is assessed before the start of the course.
11	The expectations and evaluation criteria of the student are announced orally at the beginning of the semester.
12	The evaluation criteria at the end of each semester are clearly stated.
13	Training is provided clearly and transparently.
14	Content presented with a logical structure.
15	The volume of content and assignments requested is proportional to the number of courses.
16	The course content is presented by the different ways of learning of learners.
17	New technologies (social networks, animation, simulation, etc.) are used for education.
18	All student assignments are given feedback.
19	The tutorials provided are useful and practical.
20	A variety of educational resources are provided for learners to learn.
21	The capabilities of the e-learning system are well used.
22	Periodic assessments of learners' learning are done throughout the semester.
23	The students can freely express their views on the e-learning course.
24	Group conflict management is well done among learners during the course.
25	Group activities and interactions in the e-learning environment are considered and encouraged.
26	During the course, professors have friendly interactions and show supportive behaviors.

27	Friendly interactions between professors and students are done through social networks, e-mails, wikis, etc.	
28	Professors provide guidance and design for educational activities.	
29	Professors make their personal information and educational records available to students.	
30	In the e-learning course, the real presence of the teacher–student is felt.	
31	There are incentive strategies to improve the quality of learners' learning.	
32	There are certain rules and regulations for managing the e-learning environment between student and teacher.	
33	All rules and requirements of virtual communication are observed.	
34	Professors and students are required to follow educational rules.	
35	Professors and students are required to observe ethical principles in the educational environment.	
36	I became acquainted with the principles of communication in cyberspace by the professors of the course.	
37	Teaching methods challenge professors and students.	
38	Homework is based on problem-solving and high-level mental activities.	
39	Student self-assessment is one of the final assessment criteria in e-learning courses.	

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