Original Article

Quality of virtual education from the perspective of students and professors during the covid-19 pandemic

Sara Mohammadi [1], Masoumeh Shohani [2], Leili Abedi [3], Saleh Arizavi [4], Aghil Rostami [*5]

[1] Department of Operating Room, School of Allied Medical Sciences, Ilam University of Medical Sciences, Ilam, Iran
[2] Department of Nursing, Faculty of Nursing and Midwifery, Ilam University of Medical Sciences, Ilam, Iran
[3] Noncommunicable Diseases Research Center, Bam University of Medical Sciences, Bam, Iran
[4] Center for Preparatory Studies, Department of English for Sciences, Sultan Qaboos University, Muscat, Sultanate of Oman
[5] Student Research Committee, School of Allied Medical Sciences, Ilam University of Medical Sciences, Ilam, Iran

Article Info

Article history:
Received 12 June 2022
Accepted 6 September 2022
Published 18 September 2022
Keywords:
COVID-19
E-Learning
Medical Education
Distance Education
Students
Faculty

***Corresponding author:**
Aghil Rostami
Student Research Committee,
School of Allied Medical Sciences,
Ilam University of Medical Sciences,
Ilam, Iran
Email: Aghil.Rostamii@yahoo.com

Abstract

Background & Objective: Soon after the outbreak of COVID-19, Universities of medical sciences was forced to shift from face-to-face education toward online educational activities according to WHO recommendation to observe physical distancing. Therefore, the present study was conducted to determine the quality of virtual education classes from the perspective of students and professors at Ilam University of Medical Sciences.

Materials & Methods: This cross-sectional study was conducted in five faculties of Ilam University of Medical Sciences in 2020. Thirty professors and 370 students participated in the study by convenience sampling. Data were collected using a researcher-made questionnaire based on the viewpoint of university professors and students about the quality of virtual classes. The questionnaire included 30 questions in four sections: the ability to use the educational system, feelings and attitudes towards the virtual class, learning and educational environment, interactive learning and perceived effectiveness, plus five questions addressing satisfaction with the training course. The data were analyzed using independent t-test at a significance level of P <0.05 by SPSS 22 software.

Results: The mean and standard deviation (SD) score of the quality of virtual education classes from the perspective of professors and students was 48.6(16.2) and 47.9(25.9), respectively, which is considered moderate. There was a significant difference between professors' and students' viewpoints about satisfaction with virtual education classes (P= 0.004), indicating that the professors were more contented than students.

Conclusion: Generally, professors and students rated the overall quality of virtual classes as moderate, and they were also relatively satisfied with the course.

Copyright © 2021, This is an original open-access article distributed under the terms of the Creative Commons Attribution-noncommercial 4.0 International License which permit copy and redistribution of the material just in noncommercial usages with proper citation

Introduction

In late 2019, COVID-19 emerged in Wuhan, Hubei Province of China and spread rapidly both nationally and internationally (1). The virus was declared a global pandemic by WHO on March 11, 2020 (2). To reduce the rate of virus transmission, most countries recommended physical distancing protocols (e.g., shutting down public, cultural, and educational institutions) in their agenda (3). As a result of social distancing and the closure of universities, distance e-learning arose as a new method of education to maintain the continuity of medical education during this time because of COVID-19 pandemic (4). However, due to the nature of various fields of medicine, distance e-learning faced many challenges because medical education includes in-person didactic lectures, laboratory experience, exposure to clinical rotation, observing and assisting relevant medical and surgical procedures (5), and online education alone could not meet these needs in the era of COVID-19. Regardless of the benefits associated with e-learning, its implementation leads to a series of complications in the education system (6) because Iranian students rarely used e-learning before COVID-19 epidemic (7). For this reason, students and institutions faced the following challenges: management of time, use of technology devices, student assessment, communication and the absence of face-to-face interaction (8), impact on student mental health, lack of students' motivation, difficulty in adapting to remote e-learning methods, technical problems, internet bandwidth and preparation of course content for online training, especially for applied sciences and laboratory courses (9). According to literature review, contradictory results have been reported regarding

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

the efficiency and quality of virtual classes. A study by Stukalo et al. showed that the majority of students were satisfied with the quality of virtual education held at their university during the COVID-19 closure (10). Similarly, based on the findings of a study by Alqudah et al., the majority of professors indicated that they had good and very good teaching experience in virtual learning (11). While in the study by Abbasi et al., a majority of students indicated a negative perception of virtual classes and believed that virtual learning has a negligible effect on their learning (12). Therefore, the purpose of this study was to determine the quality of virtual education classes held at Ilam University of Medical Sciences at the time of COVID-19 pandemic from the perspective of students and professors.

Material & Methods

Design and setting(s)

This cross-sectional study was in five faculties of Ilam University of Medical Sciences during COVID-19 pandemic in 2020. The sample population included professors (183 samples) and students of medical, dentistry, nursing and midwifery, paramedical, and health colleges (1615 samples) from Ilam University of Medical Sciences.

Participants and sampling

To estimate the sample size among students based on the study of Mehrdad et al. (13) with 33% satisfaction rate from virtual education, confidence level of 95%, and an acceptable error in estimating the ratio (d = 0.05) as well as considering 10% drop, 400 students were invited for the study using the following formula.

$$n = \frac{z^2.p(1-p)}{d^2}$$

Convenience sampling was done, and data collection continued until the number of samples was completed, which was done in 15 days.

In the present study, 30 out of 183 university professors practiced online teaching, and all of them entered the study. The inclusion criterion was the consent of students and professors of Ilam University of Medical Sciences to participate in the study, and the exclusion criterion was incomplete completion of the researcher-made questionnaire consisting of four sections based on quality of virtual classes plus five questions addressing satisfaction.

Tools/Instruments

In this research, a researcher-made questionnaire was used based on the objectives of online virtual educational program. This questionnaire was designed based on previous studies and the objectives of the present study as well as the virtual education system of Ilam University of Medical Sciences (IUMS).

The first part of the questionnaire includes demographic information of professors and students. The second part consists of 30 questions, through which the quality of virtual classes was evaluated in four dimensions: the ability to use the educational system (5 questions), educational priorities, feelings and attitudes towards virtual class (8 questions), learning and educational environment (6 questions), and interactive learning and perceived effectiveness (11 questions). The third section consisting of five questions examined the satisfaction of the two groups with virtual classes.

The second and third parts of the questionnaire targeted participants' responses based on five-point Likert scale (strongly disagree to strongly agree) with the following scoring method: strongly disagree (0 points), disagree (1 point), neutral (2 points) agree (3 points) and strongly agree (4 points). It should be noted that questions 12, 13, 15, and 26 were scored in reverse. The minimum and maximum quality scores of all virtual education classes were 0 and 120, respectively; then, similar to previous studies, the score was divided into four subgroups from poor to excellent (0-30 poor, 30-60 average, 60-90 good, 90-120 excellent) (7, 14).

In addition, minimum and maximum total scores for satisfaction with virtual education classes were 0 and 20, respectively. Afterward, similar to previous studies, this score was also divided into three subgroups from dissatisfied to completely satisfied (0-7 dissatisfied, 7-14 relative satisfaction, 14-20 completely satisfied) (10). The face validity of the questionnaire items was accepted by ten professors and experts in the field of e-learning (nursing, operating room, anesthesia, medical physics, information technology, virology, and mycology). In addition, the content validity ratio (CVR) and content validity index (CVI) for this scale were 0.94 and 0.98, respectively, which were confirmed because they were >0.60.

After assessing the validity and reliability of the questionnaire, the structural validity was evaluated by exploratory factor analysis (EFA), which is a fundamental tool to define the optimal count of latent variables in the validation of a 35-item questionnaire completed by 400 participants. To test the assumptions of EFA, overall KMO (Kaiser–Meyer–Olkin) value for sampling adequacy was 0.96, and Bartlett's test of sphericity proved an appropriate model (X2 = 8814.760 and P < 0.0001). We retained five factors based on multiple criteria. Based on the cumulative percentage of the variance, the first five factors account for 0.75% of the total

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

variance. According to analysis of scree plot, it was determined that a five-factor solution was optimal for distinguishing the underlying factors. In terms of instrument reliability, Cronbach's alpha was exactly 0.9 for the whole questionnaire, and Cronbach's alpha values for subscales ranged from 0.72 to 0.94 (Table 1).

Table 1. Five factors comprised the subscales of the questionnaire

Subscales	Variance	Cronbach's alpha
Educational system (factor 1)	0.49	0.8
Educational priorities and feelings and attitude (factor 2)	0.52	0.83
Learning and educational environment (factor 3)	0.57	0.72
Interactive learning and perceived effectiveness (factor 4)	0.65	0.94
The rate of satisfaction (factor 5)	0.75	0.91

Data collection methods

This questionnaire was only meant for the evaluation of theoretical courses. After obtaining the final approval of questionnaire and permission from ethics committee of Ilam University of Medical Sciences (Ethical approval ID: IR.MEDILAM.REC.1399.121, Approval date: 2020-06-22), the questionnaire was distributed online among all the participants. A link to the questionnaire was sent to students via all information channels available at the university such as the main education information channel of Ilam University of Medical Sciences, Students' Guild Council channel, Students' Research Committee channel, etc. Besides, a questionnaire link was located in the information channel of university professors.

Data analysis

After completion of the questionnaires, the extracted data were entered into SPSS 22 software. Descriptive statistics for quantitative variables were described as Mean and standard deviation (SD) and qualitative variables as frequency (percentage). Normality was assessed using Kolmogorov-Smirnov test. In this study, the significance level was $P < 0.05$. An Independent t-test and chi-square test were used to compare the mean scores of satisfaction and quality of virtual classes and their dimensions, respectively.

Results

Thirty hundred and seventy students and 30 faculty members of Ilam University of Medical Sciences participated in the present study. The mean (SD) of the age of faculty members and students were 40.1 (7.8) and 24.3 (8.6) years, respectively. About 70% of the faculty members (21 participants) and 49% of the students (179 samples) were males (Table 2).

Table 2. Distribution of significant demographic variables of professors and students

variables		professors	students
Age, *M(SD)		40.1(7.8)	24.3(8.6)
Sex, **F(%)	Male	21(70%)	179 (48.8%)
	Female	9 (30%)	188 (51.2%)
Education level, F(%)	AM	-	14(3.8)
	Bachelor	-	244(65.9)
	MA	5(16.7)	4(1.1)
	Ph.D.	22(73.3)	-
	Professional Doctorate	-	108(29.2)
	Clinical Specialist	3(1)	-
Marital status, F(%)	Single	7(23.3)	320(87)
	Married	23(76.7)	48(13)
College, F(%)	Medical	13(43.3)	73(19.7)
	Dentistry	1(3.3)	44(11.9)
	Paramedical	5(16.7)	92(24.9)
	Nursing and Midwifery	5(16.7)	93(25.1)
	Health	6(20)	68(18.4)
Semester, F(%)	first	-	33(9)
	second	-	105(28.5)
	third	-	20(5.4)
	forth	-	60(16.3)
	fifth	-	52(14.1)
	sixth	-	59(16)
	seventh	-	15(4.1)

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

	eighth	-	13(3.5)
	Eighth and above	-	11(3)
Field of study, F(%)	Medical	-	70(19)
	Dentistry	-	44(11.9)
	Nursing / Midwifery	-	80(20.7)
	Operating room /Anesthesia	-	67(18.2)
	Lab science	-	25(6.8)
	Environment Health	-	29(7.9)
	Public Health	-	31(8.4)
	Medical Emergency	-	14(3.8)
	Biology	-	9(2.4)
Professors work experience, F(%)	Below 5 years	13(43.3)	-
	5- 10 years	7(23.3)	-
	Above 10 years	10(33.3)	-
Professors' employment Status, F(%)	Permanent	20(66.7)	-
	Experimental/Conscription	10(33.3)	-

* Mean(Standard deviation) ** Frequency

Educational videos were the most widely used method of virtual education by professors (60 %), followed by discussing with students during online teaching (56 %) and presenting subject matters to students and their presence with prior readiness in class (56.7 %) (Figure 1).

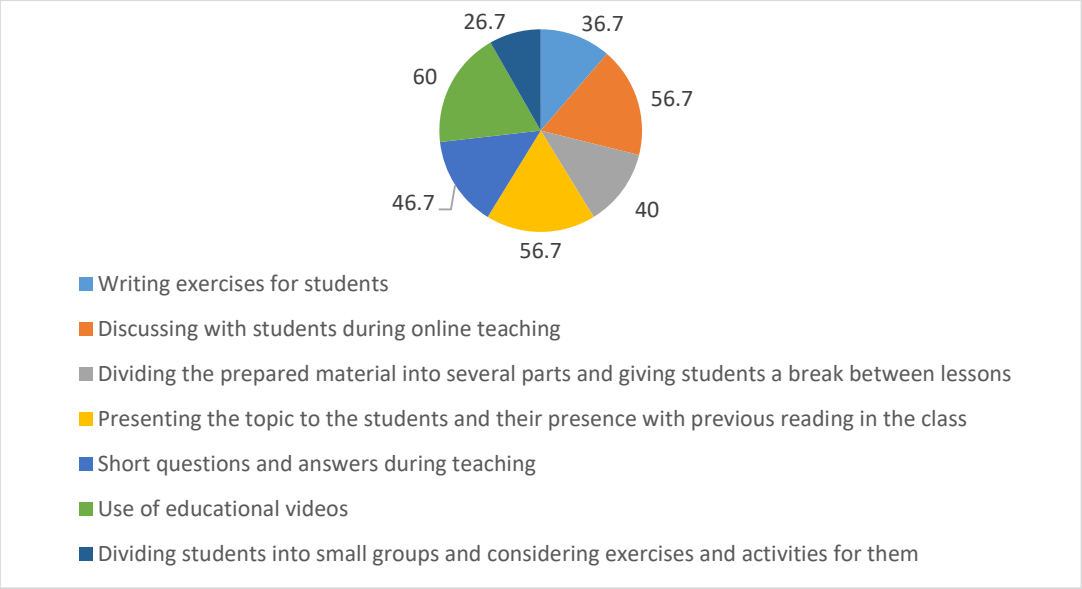


Figure 1. Distribution of the type of virtual education implementation method by professors

Getting help from colleagues (31%) and using a university education (38.1%) were the most common sources of information related to how to act in the virtual education system among professors, while among students, the most important sources of information were receiving help from friends in 49% and the use of university education in 31.4% of cases (Figure 2).

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

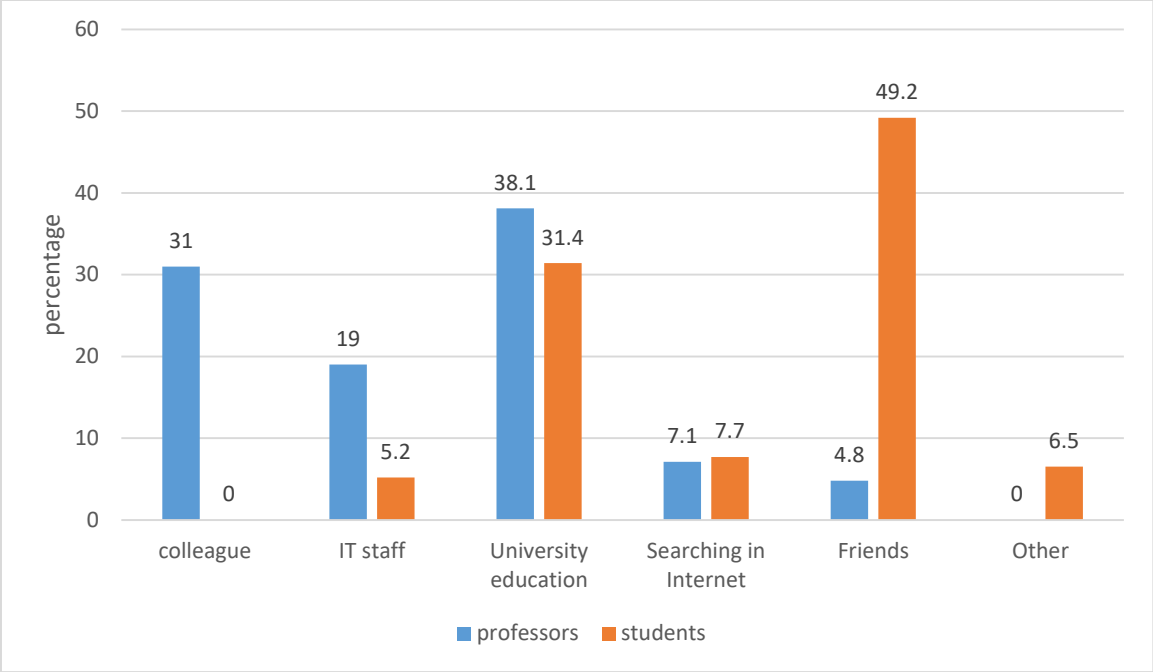


Figure 2. Distribution of the percentage of information resources about how to act in the virtual education system from the point of view of professors and students

Comparison of satisfaction and quality of virtual classes

The Mean (SD) of the quality score of virtual education classes from professors' and students' points of view was 48.6 (16.2) and 47.9 (25.9), respectively. The ability to use the virtual system was higher among professors than students (P <0.05). However, there was no difference between the viewpoints of professors and students in the rest of dimensions. The Mean (SD) of satisfaction with holding virtual education classes for professors 10.5 (3.7) was higher than that of the students 8.2 (5.9) (P <0.05). Over two-thirds of the professors (93%) and students (77%) had experienced the virtual education system before COVID-19 pandemic, and professors probably had more experience than students (P <0.05) (Table 3).

Table 3. Comparison of satisfaction and quality of virtual classes from the standpoint of professors and students

Variables			**Professors F (%)**	**Students F (%)**	**P**
Experience of virtual education-F(%)		yes no	28(93.3) 2(6.7)	281(77) 84(23)	0.04*
	Quality of virtual education				
Dimensions of Virtual education quality	Total quality of virtual education	M(SD)	48.6(16.2)	47.9(25.9)	0.8
	Ability to use the virtual system	M(SD)	9.4(3.2)	7.7(4.6)	0.01*
	Educational priorities, feelings, and attitudes toward virtual education	M(SD)	14.7(5.9)	14.4(7.8)	0.8
	The learning and education environment	M(SD)	10.2(3.4)	9.3(4.7)	0.2
	Interactive learning and perceived efficiency	M(SD)	14.3(7.3)	16.4(11.8)	0.1
Satisfaction with virtual education classes		M(SD)	10.5(3.7)	8.2(5.9)	0.004**

†Using independent t-test
‡F: frequency & M (SD): Mean (Standard deviation)
*P<0.05; **P<0.01

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

About 53% of professors and 40% of students say that the quality of virtual education classes was average, but these differences didn't have significant relationship (P >0.05). Also, 70% of professors and 52% of students were satisfied with virtual education classes, and these differences had no significant relationship (P >0.05) (Table 4).

Table 4. Comparison the quality and satisfaction of virtual classes among professors and students

Variables		Professors F(%)	Students F(%)	P
Total quality of virtual education	Poor	5(16.7)	110(29.7)	0.12
	Average	16(53.3)	147(39.7)	
	Good	9(30)	85(23)	
	Excellent	-	28(7.6)	
Satisfaction with virtual education classes	dissatisfied	9(30)	177(47.8)	0.15
	relative satisfaction	13(43.3)	128(34.6)	
	completely satisfied	8(26.7)	65(17.6)	

†Based on Chi-Square test
‡F: frequency

Ability to use the virtual system

Nearly half of the professors and students (49.8%) believed that they were capable of performing their tasks and duties through the virtual education system (Table 5).

Table 5. Ability to use the virtual system

Items	Strongly Disagree F(%)	Disagree F(%)	Neutral F(%)	Agree F(%)	Strongly Agree F(%)
Before the epidemic, I participated in virtual training courses and I mastered working in a virtual environment	131(33.2)	113(28.6)	67(17.0)	66(16.7)	18(4.6)
Using the virtual education system, I am capable of doing my tasks/homework	58(14.9)	88(22.6)	50(12.8)	147(37.7)	47(12.1)
College professors and students are all trained to use a virtual environment to conduct classes	123(31.5)	136(34.8)	62(15.9)	50(12.8)	20(5.1)
Professors properly use online and offline virtual teaching environments (video and audio files simultaneously)	102(26.0)	100(25.5)	69(17.6)	92(23.5)	29(7.4)
Students properly use online and offline virtual learning environments	81(20.8)	102(26.2)	71(18.2)	101(25.9)	35(9.0)

†F: frequency

Educational priorities, feelings, and attitudes toward virtual education

The majority of faculty members and students (59.1%) did not prefer virtual classes to face-to-face classes. More than half of both groups (54%) were inclined to have a combination of face-to-face and virtual education (offline and online) (Table 6).

Table 6. Educational priorities, feelings, and attitudes toward virtual education

`	Strongly Disagree F(%)	Disagree F(%)	Neutral F(%)	Agree F(%)	Strongly Agree F(%)
In case of an epidemic wipeout and proper conditions, I would like future classes to be held virtually.	118(29.7)	88(22.2)	43(10.8)	92(23.2)	56(14.1)
In case of an epidemic wipeout, I want all classes in the future to be a combination of virtual classes and face-to-face classes	94(23.9)	65(16.5)	41(10.4)	145(36.8)	49(12.4)
I prefer presenting audio-mixed PowerPoint files (educational content) in offline mode to the face-to-face class	103(26.4)	70(17.9)	46(11.8)	98(25.1)	73(18.7)

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

I would rather participating in virtual education classes than in face-to-face classes	130(33.1)	102(26.0)	40(10.2)	74(18.8)	47(12.0)
I give priority to a combination of classes (attendance, online and offline) due to the current circumstances	57(14.7)	48(12.4)	44(11.3)	170(43.8)	69(17.8)
I prefer attending face-to-face classes rather than using virtual education systems	68(17.5)	61(15.7)	50(12.9)	108(27.8)	102(26.2)
Professors are inclined to apply the online virtual teaching method	76(19.3)	67(17.0)	121(30.8)	83(21.1)	46(11.7)
Students tend to use online learning methods	117(29.8)	80(20.4)	61(15.6)	84(21.4)	50(12.8)

†F: frequency

Interactive learning and perceived efficiency

Most of the professors and students (69.1%) stated that their proficiency in virtual classes is less than in face-to-face classes. The majority of faculty members and students (64.8%) indicated that student participation in virtual classes is less than in face-to-face classes. More than half of the students and professors (54.4%) argued that the virtual learning environment made facilitated discussion sessions with professors/students. Over half of the professors and students (53.3%) believed that they hardly received feedback from professors/students. A large number of the participating professors and students (60.3%) believed that the evaluation of students by professors in the virtual education method was inferior to face-to-face education. The majority of faculty members and students (64.2%) mentioned that the enthusiasm to learn in virtual education is lower than in face-to-face classes. More than half of faculty members and students (56.2%) believed that students have a lower concentration in virtual classes compared to face-to-face classes. Many of the professors and students (59.3%) pointed out that virtual education does not improve the quality of education. Lastly, 59.5% of both groups believed that in virtual classes, transferring the material was not done appropriately and that students' learning process was sometimes interrupted (Table 7).

Table 7. Interactive learning and perceived efficiency

Items	Strongly Disagree F(%)	Disagree F (%)	Neutral F (%)	Agree F (%)	Strongly Agree F(%)
Virtual classes are more efficient than face-to-face classes	165(41.6)	109(27.5)	44(11.1)	46(11.6)	33(8.3)
Students are more focused in virtual classes than in face-to-face classes	157(39.8)	104(26.4)	42(10.7)	55(14.0)	36(9.1)
Students participate in online virtual education classes more frequently than in traditional classes.	149(38.0)	105(26.8)	46(11.7)	57(14.5)	35(8.9)
The virtual learning environment has made it easier for me to participate in discussions with professors/students.	94(24.0)	119(30.4)	72(18.4)	77(19.7)	29(7.4)
The virtual education system has made it easier for me to access the materials sent by professors or other students.	64(16.4)	89(22.8)	49(12.6)	141(36.2)	47(12.1)
I easily get feedback on my opinions and conversations from professors and other students.	96(24.6)	112(28.7)	66(16.9)	83(21.3)	33(8.5)
Student's assessment by professors in virtual education is easier than in traditional classes	130(33.1)	107(27.2)	58(14.8)	64(16.3)	34(8.7)
I feel that in virtual education, the transfer of concepts is more convenient and that there is no disruption in the student's learning.	123(31.8)	108(27.7)	41(10.5)	79(20.3)	39(10.0)
The virtual education system improves the quality of teaching.	128(32.6)	105(26.7)	47(12.0)	75(19.1)	38(9.7)
Incentives in learning with virtual classes are higher than face-to-face classes	138(35.0)	115(29.2)	46(11.7)	58(14.7)	37(9.4)
Virtual classes do not increase the workload	81(20.6)	80(20.4)	56(14.2)	120(30.5)	56(14.2)

†F: frequency

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

The learning and education environment

A significant number of professors and students (83.6%) believed that virtual education must build a suitable platform and develop infrastructure such as Internet bandwidth, training for appropriate use of the system, software design, assessment methods, and so on. Over half of the students and professors (54.4%) had problems with the design of websites and software to enter the virtual classes. The majority of professors and students (61.4%) believed that they missed parts of the classes due to low internet speeds. More than half of professors and students (53.3%) had difficulty entering the virtual classes, and over half of them (54.6%) were disinclined to participate in virtual classes because of their high expenses (Table 8).

Table 8. Learning and education environment

Items	Strongly Disagree F(%)	Disagree F(%)	Neutral F(%)	Agree F(%)	Strongly Agree F(%)
Virtual education needs planning and developing of the infrastructures such as extending Internet bandwidth, training the proper methods of surfing websites, and designing up-to-date programs and efficient evaluation methods	23(5.9)	19(4.9)	22(5.6)	130(33.2)	197(50.4)
The coloring, backgrounds, and settings of the virtual education website are satisfactory	53(13.6)	69(17.7)	103(26.4)	135(34.6)	30(7.7)
Due to inaccurate login design, I often cannot attend classes on time	49(12.5)	82(20.9)	48(12.2)	142(36.1)	72(18.3)
I log in to virtual classes easily and without any problem	102(25.8)	109(27.5)	35(8.8)	101(25.5)	49(12.4)
I often miss some parts of the virtual classes due to slow internet speed	52(13.2)	61(15.5)	39(9.9)	137(34.9)	104(26.5)
Virtual education classes are not expensive and that is why I am inclined to use them	110(27.8)	102(25.8)	52(13.1)	80(20.2)	52(13.1)

†F: frequency

Discussion

The overall quality of e-learning classes at Ilam University of Medical Sciences indicated that the professors and students of Ilam University of Medical Sciences rated the overall quality of virtual classes during COVID-19 pandemic as moderate. This finding was in agreement with the research by Afshari et al. (7). The results of this study were not in line with three studies conducted in other countries (10, 14, 15), in which the majority of students were satisfied with the quality of virtual education at the university. By clarifying this finding and comparing it with previous studies, it can be seen that Iran is a developing country and that Ilam University of Medical Sciences does not have enough infrastructure to quickly change to virtual education during COVID-19 pandemic. Therefore, virtual education is acceptable at an average level. Of course, it should be noted that one of the reasons for the difference between the results of this study and previous researches like Stukalo et al.(10) may be the difference between medical courses and other courses as well as the practical nature of medical fields (16).

Investigating four dimensions of virtual education quality in the current study showed that there is a significant difference in the ability to use the virtual educational system between professors and students, suggesting that professors' viewpoint regarding the use of virtual education was more positive than that of students. This can be attributed to the fact that there was a significant difference between the experiences of professors and students in using the virtual education system, where most professors indicated they have already implemented virtual teaching, while this was true only about 75% of the students. It should also be noted that the mean score of both groups was moderate in terms of virtual training. The results of this study are inconsistent with the study of Stukalo et al., in which 86% of teachers did not have significant experience in virtual education before COVID-19 pandemic (10). The findings of this study illustrated that about half of the professors and students believed that they are capable of doing their tasks through the virtual education system, which was not consistent with the result of some studies (5, 8, 11). The findings, however, are consistent with Schlenz et al. who stated that most professors quickly adjust to the virtual environment and that most students felt they were technically well-prepared for the virtual education system (3).

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

Regarding the element of educational priorities, feelings, and attitudes toward virtual education, the current study shows that the majority of professors and students do not prefer virtual learning classes to face-to-face classes. This finding is in line with the results of previous studies (12, 17). More than half of the professors and students stated that after the end of COVID-19 pandemic, future classes should be conducted as a combination of face-to-face and virtual education (offline and online), which is in agreement with many previous studies (3, 4, 8, 18, 19).

Furthermore, in relation to the learning and educational environment, the results showed that the majority of professors and students believe that for better virtual education, we need to be prepared and develop infrastructures such as internet bandwidth, train the users toward the proper use of the virtual system, design more applicable software and reliable assessment methods, and so on. The findings of this study are in accordance with some other studies (5, 20). Also, our results are not consistent with the study by Amelie Schlenz et al., in which 95% of students had no problem connecting to the Internet (3). Also, in this study, the majority of professors and students indicated that they missed part of the classes due to low network connection speed, which is in line with the results of previous studies (21, 22). The findings of our study showed that more than half of the professors and students had trouble regarding the design of the website and software to enter the virtual classes, which confirms the study of Sarwar et al., in which students were displeased with the organizational LMS (22). The main reason for this is the lack of time to design the website and suitable software, which seems to be eliminated over time. The results of this study also specified that over half of the professors and students had trouble entering the virtual classes, which substantiates the findings of a study by Chen et al. (23). The findings of this study demonstrated that over 50% of the professors and students were unwilling to participate in virtual classes due to the high expenses. This finding corroborates some prior studies (4, 20, 21). However, this research is not consistent with other studies (19, 24), in which the majority of respondents indicated the economic benefits of virtual learning. The main reason for this issue can be related to the cost of the Internet and other related services in Iran.

The results of the present study in the dimension of interactive learning and perceived efficiency showed that the majority of professors and students consider the efficiency of virtual classes to be lower than face-to-face classes, which is in agreement with a number of studies (17, 20, 22). The majority of professors and students believe that student contribution to virtual classes is lower than in face-to-face classes. This finding is consistent with the results of the study of Almaghaslah et al. (25) but is not in line with the study of Alqudah et al. (11) who found that over 80% of the professors rated students' contributions as good and very good. Our study showed that more than half of the professors and students did not believe that the virtual learning environment facilitated the discussion sessions with professors/students, which is in line with the study by Kaur et al. (26). This research also indicated that over 50% of the professors and students believe that they cannot easily receive feedback from professors/students, which is in line with the study by Almaghaslah et al. in which sending feedback was considered a challenge (25). The results of this study revealed that more than half of the professors and students believe that the assessment of students by professors in virtual education is not better than face-to-face education, confirming the findings of the study by Sharadgah et al. (27). Like the research done by Adnan et al. (20), the results of this study suggest that the majority of professors and students view the enthusiasm to learn in virtual classes to be less than in face-to-face classes. However, these findings stand in stark contrast with the study of Puljak et al., where half of the participants reported higher enthusiasm to attend exclusive virtual classes than face-to-face ones (18). Results of this study indicated that over half of the professors and students believe that the student's concentration is lower in virtual classes than in face-to-face classes. This finding is consistent with the results of other studies (28, 29), in which students stated that the problem of concentration in the virtual environment is challenging. The results of the present study showed that the majority of professors and students believed that virtual classes did not improve the quality of education, which was in agreement with some previous studies (4, 17, 30). The majority of professors and students of this study reported that in virtual classes, the transfer of content is not done appropriately and that students' learning is interrupted. These findings are consistent with the study by Abbasi et al. where the majority of students approved that e-learning has a slight effect on their education (12).

The results of the present study indicated relative satisfaction of professors and students with virtual education, which was in agreement with the results of studies carried out by Demuyakor (21) and Puljak et al. (18). In contrast, the results were not consistent with other studies in which students expressed dissatisfaction with virtual education (22, 25, 26,

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

31). The findings of this study also were different from prior studies that evaluated the level of satisfaction with virtual education as high and strong (32-34). This study showed that there was a significant difference between the mean and standard deviation of satisfaction scores of virtual education classes between professors and students. To clarify this research finding, we should once again point to the increasing experience of professors in applying virtual systems before the beginning of COVID-19 crisis. This finding is not in agreement with the study of Essilfie et al., in which the overall satisfaction with learning in the virtual environment was higher among students than among professors (28).

The study had a number of limitations; The use of self-report questionnaires to evaluate the variables, review and cross-sectional collection of data, and the difference between the number and content of the questions presented in each dimension in this research and its difference with previous research were the limitations of this study. On the other hand, one of the strengths of the study was the simultaneous examination of professors' and students' views on the quality of virtual classes. Finally, it is recommended that to generalize the findings of this study to all universities in the country, more research should be conducted on this ground with larger sample sizes, especially with more professors.

Conclusion

Professors and students of Ilam University of Medical Sciences rated the overall quality of virtual classes held at the time of the COVID-19 pandemic as moderate, and they were also relatively satisfied with the course. Given that the COVID-19 crisis happened unexpectedly, the professors and students did not receive special training to use the virtual system and because the university did not have the necessary infrastructure and facilities, the results of this study can be considered logical and fairly anticipated. Also, professors and students of Ilam University of Medical Sciences confirmed that virtual education cannot replace face-to-face education and that it should play a complementary role. In the end, both groups are inclined that after the end of COVID-19 crisis, university classes need to be held in a combined manner, i.e., face-to-face and virtual (online and offline) modes together.

Ethical considerations

Ethical approval was taken from the Research Ethics Committee of Ilam University of Medical Sciences (Ethical approval ID: IR.MEDILAM.REC.1399.121, Approval date: 2020-06-22).

The research meets all applicable standards regarding the ethics of experimentation and research integrity.

Conflict of Interests

The authors have no conflicts of interest associated with the material presented in this paper.

Acknowledgment

We sincerely appreciate Ilam University of Medical Sciences and all participants in this study for their support and cooperation.

Contribution

Sara Mohammadi: Concepts, Design, Manuscript editing, Manuscript review.

Aghil Rostami: Concepts, Manuscript preparation, Manuscript review.

Masoumeh Shohani: Manuscript editing, Manuscript review.

Leili Abedi: Data analysis, Statistical analysis, Manuscript review.

Saleh Arizavi: Manuscript editing, Manuscript review.

References

1. Zhou T, Huang S, Cheng J, Xiao Y. The distance teaching practice of combined mode of massive open online course micro-video for interns in emergency department during the COVID-19 epidemic period. Telemed e-Health. 2020; 26(5): 584-8. [https://doi.org/10.1089/tmj.2020.0079]

2. Al-Ahmari AN, Ajlan AM, Bajunaid K, Alotaibi NM, Al-Habib H, Sabbagh AJ, et al. Perception of Neurosurgery Residents and Attendings on Online Webinars During COVID-19 Pandemic and Implications on Future Education. World Neurosurg. 2021; 146: e811-e6. [https://doi.org/10.1016/j.wneu.2020.11.015]

3. Schlenz MA, Schmidt A, Wöstmann B, Krämer N, Schulz-Weidner N. Students' and lecturers' perspective on the implementation of online learning in dental education due to SARS-CoV-2 (COVID-19): A cross-sectional study. BMC Med Educ. 2020;20(1):1-7. [https://doi.org/10.1186/s12909-020-02266-3]

4. Al-Balas M, Al-Balas HI, Jaber HM, Obeidat K, Al-Balas H, Aborajooh EA, et al. Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. BMC Med Educ. 2020;20(1):1-7. [https://doi.org/10.1186/s12909-020-02257-4]

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

5. Gismalla MD-A, Mohamed MS, Ibrahim OSO, Elhassan MMA, Mohamed MN. Medical students' perception towards E-learning during COVID 19 pandemic in a high burden developing country. BMC Med Educ. 2021; 21(1): 1-7. [https://doi.org/10.1186/s12909-021-02811-8]
6. Shafiei Sarvestani M, Mohammadi M, Afshin J, Raeisy L. Students' experiences of e-Learning challenges; a phenomenological study. IJVLMS. 2019;10(3):1-10. [https://doi.org/10.30476/ijvlms.2019.45841]
7. Afshari P, Abedi P, Eslami K, Rokhafrooz D, Maraghi E, Beheshtinasab M. The views of medical students about e-learning during pandemic of COVID-19 in Iran. Res Sq. 2020. [https://doi.org/10.21203/rs.3.rs-47582/v1]
8. Rajab MH, Gazal AM, Alkattan K. Challenges to online medical education during the COVID-19 pandemic. Cureus. 2020;12(7). [https://doi.org/10.7759%2Fcureus.8966]
9. Shawaqfeh MS, Al Bekairy AM, Al-Azayzih A, Alkatheri AA, Qandil AM, Obaidat AA, et al. Pharmacy students perceptions of their distance online learning experience during the COVID-19 pandemic: a Cross-Sectional Survey Study. J Med Educ Curric Dev. 2020;7:1-9. [https://doi.org/10.1177/2382120520963039]
10. Stukalo N, Simakhova A. COVID-19 impact on Ukrainian higher education. Univers J Educ Res. 2020;8(8):3673-8. [https://doi.org/10.13189/ujer.2020.080846]
11. Alqudah NM, Jammal HM, Saleh O, Khader Y, Obeidat N, Alqudah J. Perception and experience of academic Jordanian ophthalmologists with E-Learning for undergraduate course during the COVID-19 pandemic. Ann Med Surg. 2020;59:44-7. [https://doi.org/10.1016/j.amsu.2020.09.014]
12. Abbasi S, Ayoob T, Malik A, Memon SI. Perceptions of students regarding E-learning during Covid-19 at a private medical college. Pak J Med Sci. 2020; 36(COVID19-S4): S57. [https://doi.org/10.12669/pjms.36.COVID19-S4.2766]
13. Mehrdad N, Hooshmandbahabadi A, Yaghoobi N, Aalaa M, Zolfaghari M. Evaluation of perceived satisfaction, usefulness and efficiency of virtual workshops from the perspective of faculty members and postgraduate students of Tehran University of Medical Sciences. J Med Educ Dev. 2015; 8(18): 125-36.
14. Durfee SM, Goldenson RP, Gill RR, Rincon SP, Flower E, Avery LL. Medical student education roadblock due to COVID-19: virtual radiology core clerkship to the rescue. Acad Radiol. 2020;27(10):1461-6. [https://doi.org/10.1016/j.acra.2020.07.020]
15. Fatani TH. Student satisfaction with videoconferencing teaching quality during the COVID-19 pandemic. BMC Med Educ. 2020;20(1):1-8. [https://doi.org/10.1186/s12909-020-02310-2]
16. Zhalehjoo N, Arabi M, Momeni Z, Akbari Kamrani M, Khalili A, Riahi S, et al. Virtual education status from the perspective of students at Alborz University of Medical Sciences in the Covid-19 pandemic period. Journal of Medical Education Development. 2021;14(42):37-45.
17. Nepal S, Atreya A, Menezes RG, Joshi RR. Students' perspective on online medical education amidst the COVID-19 pandemic in Nepal. J Nepal Health Res Counc. 2020; 20(40): 17-7. [https://doi.org/10.33314/jnhrc.v18i3.2851]
18. Puljak L, Čivljak M, Haramina A, Mališa S, Čavić D, Klinec D, et al. Attitudes and concerns of undergraduate university health sciences students in Croatia regarding complete switch to e-learning during COVID-19 pandemic: a survey. BMC Med Educ. 2020; 20(1): 1-11. [https://doi.org/10.1186/s12909-020-02343-7]
19. Turner S, Pham T, Robledo K, Turner S, Brown C, Sundaresan P. Rapid adaptation of cancer education in response to the COVID-19 pandemic: evaluation of a live virtual statistics and research skills workshop for oncology trainees. J Cancer Educ. 2020 Oct 21:1-6. [https://doi.org/10.1007/s13187-020-01898-9]
20. Adnan M, Anwar K. Online Learning amid the COVID-19 Pandemic: Students' Perspectives. J Pedagog Sociol Psychol. 2020;2(1):45-51. [http://doi.org/10.33902/JPSP.2020261309]
21. Demuyakor J. Coronavirus (COVID-19) and online learning in higher institutions of education: A survey of the perceptions of Ghanaian international students in China. Online J Commun Media Technol. 2020; 10(3): e202018. [https://doi.org/10.29333/ojcmt/8286]
22. Sarwar H, Akhtar H, Naeem MM, Khan JA, Waraich K, Shabbir S, et al. Self-reported effectiveness of e-Learning classes during COVID-19 pandemic: A nation-wide survey of Pakistani undergraduate dentistry students. Eur J Dent. 2020;14:S34-S43. [https://doi.org/10.1055/s-0040-1717000]
23. Chen T, Peng L, Yin X, Rong J, Yang J, Cong G. Analysis of User Satisfaction with Online Education Platforms in China during the COVID-19 Pandemic. Healthcare (Basel). 2020;8(3). [https://doi.org/10.3390/healthcare8030200]
24. Desai D, Sen S, Desai S, Desai R, Dash S. Assessment of online teaching as an adjunct to medical education in the backdrop of COVID-19 lockdown in a developing country–An online

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]

survey. Indian J Ophthalmol. 2020;68(11):2399. [https://doi.org/10.4103/ijo.IJO_2049_20]
25. Almaghaslah D, Alsayari A. The effects of the 2019 novel coronavirus disease (COVID-19) outbreak on academic staff members: a case study of a pharmacy school in Saudi Arabia. Risk Manag Healthc Policy. 2020; 13: 795. [https://doi.org/10.2147/RMHP.S260918]
26. Kaur N, Dwivedi D, Arora J, Gandhi A. Study of the effectiveness of e-learning to conventional teaching in medical undergraduates amid COVID-19 pandemic. Natl J Physiol Pharm Pharmacol. 2020;10(7):563-7. [http://doi.org/10.5455/njppp.2020.10.04096202028042020]
27. Sharadgah T, Sa'di R. Preparedness of institutions of higher education for assessment in virtual learning environments during the Covid-19 lockdown: Evidence of bona fide challenges and pragmatic solutions. J Inf Technol Educ Res. 2020;19(1):755-74. [https://doi.org/10.28945/4615]
28. Essilfie AA, Hurley ET, Strauss EJ, Alaia MJ. Resident, fellow, and attending perception of E-learning during the COVID-19 pandemic and implications on future orthopaedic education. J Am Acad Orthop Surg. 2020;28(19):e860-e4. [https://doi.org/10.5435/JAAOS-D-20-00579]
29. Azlan CA, Wong JHD, Tan LK, Huri MSNA, Ung NM, Pallath V, et al. Teaching and learning of postgraduate medical physics using Internet-based e-learning during the COVID-19 pandemic–A case study from Malaysia. Phys Med. 2020;80:10-6. [https://dx.doi.org/10.1016/j.ejmp.2020.10.002]
30. Chatziralli I, Ventura CV, Touhami S, Reynolds R, Nassisi M, Weinberg T, et al. Transforming ophthalmic education into virtual learning during COVID-19 pandemic: a global perspective. Eye (Lond). 2021; 35(5): 1459-66. [https://doi.org/10.1038/s41433-020-1080-0]
31.Fawaz M, Samaha A. E-learning: Depression, anxiety, and stress symptomatology among Lebanese university students during COVID-19 quarantine. Nurs Forum. 2021;56(1):52-7. [https://doi.org/10.1111/nuf.12521]
32. Laloo R, Giorga A, Williams A, Biyani CS, Yiasemidou M. Virtual surgical education for core surgical trainees in the Yorkshire deanery during the COVID-19 pandemic. Scott Med J. 2020;65(4):138-43.
33. Elzainy A, El Sadik A, Al Abdulmonem W. Experience of e-learning and online assessment during the COVID-19 pandemic at the College of Medicine, Qassim University. J Taibah Univ Med Sci. 2020;15(6):456-62.
34. Malkawi E, Bawaneh AK, Bawa'aneh M. Campus Off, Education On: UAEU Students' Satisfaction and Attitudes Towards E-Learning and Virtual Classes During COVID-19 Pandemic. Contemp Educ Technol. 2020;13(1):ep283. [https://doi.org/10.30935/cedtech/8708]

Sara Mohammadi, Masoumeh Shohani, Leili Abedi, Saleh Arizavi, Aghil Rostami. Quality of virtual education from the perspective of students and professors during the covid-19 pandemic. J Med Educ Dev. 2022; 15(46): 29-40.

[Downloaded from edujournal.zums.ac.ir on 2026-11-09]

[DOI: 10.52547/edcj.15.46.29]