INVESTIGATING FACTORS AFFECTING THE QUALITY OF E-LEARNING AT ISLAMIC AZAD UNIVERSITY TEHRAN MEDICAL SCIENCES MASOUD KARIMLOO, YASIN RAMEZANPOUR, EHSAN EBADIAN, ZIBA GHASEMI

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**** An Author Contribution Statement:**
All authors have made substantial contributions to the conception and design of the study. E. Abadian and Y. Ramezan pour have been involved in data collection and data analysis. Z. ghasemi and M. Karimloo have been involved in data interpretation, drafting the manuscript and revising it critically and have given final approval of the version to be published.

Conflict of interest
This article is article research and the authors have no financial conflict with any company or institution.

Data availability
The datasets used and/or analyzed during the current study available from corresponding author or reasonable request.

Abstract:

Introduction: *Following the ever-increasing growth of technology, education also went towards using this development, and virtual education replaced traditional face-to-face education as a part of education. With the sudden outbreak of the Covid-19 pandemic, in many countries of the world, virtual education has completely replaced face-to-face education, and the opinion of users is crucial for the continuation of this type of education, at least as a part of the educational system.*

Method: *In this study, the opinions of users of virtual education were investigated in two parts, teachers and learners in Tehran Islamic Azad University of Medical Sciences.*

Results: *In general, users were satisfied with virtual training and believed that this type of training is economical and time-saving. Also, the students believed that the existence of the recorded videos of the class is beneficial in their understanding of the lessons and in the exams.*

Conclusions: *the results of the opinions of users, both teachers and students, about the process of virtual education show the relative satisfaction of the participants in the survey, and in most cases, the sum of positive and neutral opinions is much more than the negative opinions.*

Keywords: *Virtual Education, Electronic Education, Pandemic, Covid-19.*

INTRODUCTION:

By advances in science and technology in the new era, and following that, the creation of new occupation opportunities and using technology to promote occupations and facilitation affairs, the think of using the unlimited capabilities of technology in education was created.

For the first time, Kerass introduced the virtual education by defining the term "using information technology (IT) to learn".

Virtual education includes a wide range of using technology in education, like using web-based education, computers and holding virtual and digital courses.

In this condition, we can use the internet, intranet, extranet, satellite broadcasting, satellites TV, audio and videos, CDs to provide and present contents (1).

Virtual education has advantages and disadvantages, that among its advantages, the following can be mentioned:
No time-space limits (2), can be used and implemented in organizations and departments that can update information and improve staff knowledge (3), provide education for people who don't have the opportunity of attending universities and classes like housewives, elderly, prisoners, inpatients and travelers (4).

The presence of the students individually next to the system induced them that they are in a complete private session and made them feel important and pay more attention and participate in questions and answers (5).

Saving time and travel costs are some other advantages of this type of education.

Therefore, in order to achieve an effective virtual education system with appropriate productivity and desire and progressive quality, it is necessary that this type of education should be evaluated continuously.

The evaluation to improve the level of virtual education can include the following:
Quality of system, quality of information and content, facilitating factor, professors' quality, student-professor interaction, user tendency, the success of virtual education (6)

To ensure the quality of provided education, it is necessary to hold accurate quantitative tests at the end of each course. Holding quantitative, high quality and accurate exams is considered as one of the requirements for virtual education quality assurance. (7)

It should be mentioned that due to the unique methods of medical education and especially face to face and practical learning in clinical education, using the technology in medical education requires paying more attention and choose its special methods. (8)

When a new mutated coronavirus became pandemic and the pandemic's effect on increasing mortality rates started, all the global activity, including face-to-face classes were deeply affected.

With the closure of education centers and implementation of social distancing, establishing classes and the gathering of students during the pandemic seemed unattainable. Since the continuous training process, especially in medical science, is inevitable, measures should have been taken immediately to prevent disruption of education.

The use of social media and cyberspace, which until then was considered as a complementary way to face-to-face education, became one of the best options for replace and continue the education process and immediately, it received worldwide attention.

In a study that was conducted to investigate the status of virtual education in Ecuador, students generally did not have a positive view of virtual education and preferred traditional education. (9).

Although developing countries such as Guyana forced to develop the structure of virtual education due to this pandemic with all the problems, (10).

In 2021, amid the Corona crisis, Georgiadou conducted a comprehensive survey on the challenges (technological, economic and psychological) in 26 countries (Asia, Europe, Africa and America) by 36 universities from 29 academic institutions (11).

According to the students, among the most important challenges are disconnection between students, lack of equal access to digital technologies, creation of social gap and psychological consequences, lack of motivation, internet network problems, distance from society and isolation and anxiety, reduction of activities Physical and increased screen time, risks of cybercrime and fake information, (11).

In Iran, also establishing online classes and virtual education was considered from the very first day of the coronavirus pandemic beginning.

Since it was the first time that online classes and virtual education were experimented in Islamic Azad University of Tehran medical science for all students, definitely there were some problems that detecting them and choosing the best and most effectiveness way to solve them, make virtual education more efficient for future.

Also, even after the coronavirus pandemic, there is always the risk of another pandemic or other reasons for not attending the classes in person.

So, we designed this study to evaluate the quality of virtual education in Islamic Azad University of Tehran medical science to recognize disadvantages and advantages and help the universities in subsequent decisions.

From the very first years of virtual education, it was obvious to everyone that to reach the optimal effectiveness of this type of education, accurate studies should be done to determine the quality of this type of training; and strategies to increase the effectiveness of e-learning should be identified and presented. In a study that was conducted at the Faculty of Dentistry of the Islamic Azad University of Medical Sciences in Tehran during this period, the students generally described the quality of virtual education as favorable (12).

Materials and methods:

Methods of study:

This is a retrospective descriptive cross-sectional study.

In this study, we designed two questionnaires for students and professors to determine: 1) the quality of e-learning, 2) its advantages and disadvantages and 3) suggestions for improving the quality of e-learning. The responses were analyzed. By considering respondents' perceptions and utilization of the executive methods of world standard electronic universities, we provide solutions to increase the productivity of online classes.

Instruments and procedure:

We designed both questionnaire questions by: 1) deliberating related researches in the field of evaluation of quality of evaluating systems, 2) adaptation of the questionnaire which was available on the e-learning website of Tehran Islamic Azad university of medical science and 3) interviewing with expert professors in this field.

These two questionnaires have 40 close-ended questions in each, with five-point Likert scale and investigate the quality of virtual education of Tehran Islamic Azad university of medical science in fields including: 1) content effectiveness, 2) evaluation of the quality of performance, 3) professors-student's interaction, 4) quality of virtual environment and 5) quality of students' support.

The reliability and validity of these questionnaires were approved by ten expert professors in e-learning. Questionnaires were uploaded on porsline.ir (an online Persian website for designing questionnaires and collecting data) and the links of them were placed on the input page of vadana website and also these links were provided to all professors and students of Tehran Islamic Azad university of medical science through administrative letters and informing on virtual systems.

Population and sample:

The source population of our study were: 1) all students of Tehran Islamic Azad university of medical science who were studying in two consecutive semesters in the academic years 2020-2021 and participated in whole classes through vadana website and 2) all professors who taught through vadana website in the academic years 2020-2021.

Due to the type of our study, the more respondents participate, the more accurate the information will be.

Data were analyzed by SPSS software and logistic regression statistical method was determined to examine the question (Poisson polynomial distribution).

Result:

In the present study, two questionnaires with 6 domains of the structure of Vadana virtual system, evaluation of interaction between professor and student, effectiveness of content, evaluation of test, evaluation of performance and overall quality of virtual education were asked for students and professors, and in each domain five Eight questions explored the details, Then the results were analyzed in SPSS software and the corresponding graphs and tables were prepared. The results indicated the overall satisfaction of the users.

A total of 1701 students of Tehran Islamic Azad University of Medical Sciences participated in this survey, of which 29% were male and 71% were female. Also, the participation rate of students of each faculty was calculated (Table-1). considered the faculty also, 157 lecturers of Tehran Islamic Azad University of Medical Sciences participated in this survey, of which 37% of the responding professors were male and 63% were female, also the participation rate of the professors of each faculty was calculated Of course, the number of lecturers in each faculty should be taken into account in this percentage.

Table 2 shows the level of participants' satisfaction with the structure of the e-learning system in each Faculty. Overall, 59.2% of professors and 43.4% of students were satisfied with the structure of the e-learning system and reported it as being user-friendly. The highest rate of satisfaction with the e-learning structure was among the Medicinal Chemistry faculty professors who were fully satisfied, and among the students of the Dental school (54.0%). Professors affiliated with the faculty of Advanced Sciences and Technologies (36.4%) followed by the Dental school (35.3%) had the highest rates of dissatisfaction.

The results of the quality of teacher-student interactions in the e-learning system are shown in table 3. The highest rate of satisfaction was among the Medicinal Chemistry students (48.9%), whereas the students of the Health and Biomedical engineering faculty were the most dissatisfied group (30.0%). Professors were generally more convenient to interact with students, and only 10% reported that it was difficult to interact with students in the e-learning system efficiently.

As shown in table 4, more than half of the professors believed that they were able to prepare high-quality content using the e-learning system, while fewer students scored the prepared content as being high quality (30.3%). From the students' point of view, online courses prepared in the faculty of Paramedical Sciences had the highest rate of dissatisfaction (44.9%), whereas, among the professors, those who were affiliated with the faculty of Nursing and Midwifery were the most dissatisfied group with the quality of prepared online content (18.2%).

In table 5, the participants' perception about the remote examinations in the e-learning system is shown. Totally, one-third of professors confirmed the acceptable quality of remote examinations in the e-learning system, and only 10% believed that it could not properly assess the knowledge. The highest rate of disagreement was among the professors of the Dental school (23.5%). Half of the students believed that remote examinations were eligible to properly evaluate their knowledge, while 17.5% disagreed.

Table 6 shows the performance of students and teachers from each other's point of view in the e-learning system. 61.8% of professors were disappointed with the students' performance. The highest rates of dissatisfaction with the students' performance were in Dental school (76.4%), followed by the school of Medicine (70.8%). In the students' point of view, professors affiliated with the faculty of Nursing and Midwifery had the most satisfying performance (43.2%). The highest dissatisfaction was among the students of the Paramedical Sciences faculty. In general, 40.6% of the students were satisfied with the performance of professors in the e-learning system, and only 22.9% were unsatisfied.

Overall satisfaction with the e-learning system is shown in table 7. Professors were mostly satisfied (56.0%), and only about 23% were not happy with the developed e-learning system. Nearly half of the students were not satisfied nor dissatisfied with the e-learning system. Highest rates of general satisfaction were among professors in the faculty of Medicinal Chemistry (90.0%) and the faculty of Nursing and Midwifery (72.7%), and also students of Dental school (38.0%) and medical school (30.9%).

Discussion:

Paying attention to the use of technology in education is more than a century old, but considering the significant changes in the type of technology, it is better to focus on the research that has been carried out in the last one or two decades.

In this context, Cao in 2005 provided comprehensive definitions of virtual education, the environments used, types of content and other related matters, which are a guide for many researchers (1). In 2000, Keegan, by examining virtual education, stated that non-dependence on place and freedom in time are among the most important features of virtual education (2). In 2001, Bentley examined the goals of establishing a virtual university in offices and organizations and stated that training along with work will improve employees, increase customer satisfaction, and increase the productivity of organizational goals (3). Bolliger and wasilik in 2009 said that quality of teaching, especially in virtual teaching and following that, students' satisfaction, play an important role in continuing education of students or leaving education. This issue has repeatedly been stated by other researchers 12, 13, 14, 15.

In 2008, Rachel and Ken discussed the use of electronic space in medical education in detail and addressed the requirements of this type of education (planning, avoiding any kind of haste, recognizing the advantages and limitations, justifying the audience and using from a strong support team), They also explained the characteristics of a standard educational space, including the ability to hold offline and online classes, the ability to hold tests, quizzes, the ability to upload assignments and files, the possibility of attendance and the online date of meetings (16). In continuation and before the corona pandemic, many researchers worldwide have researched the beneficial effects of using technology in education among different populations, and in some cases, virtual education has even replaced face-to-face education. In 2017, Bo offers this training for people who don't have the chance to attend university and class, such as housewives, the elderly, prisoners, inpatients, and travelers (4). Of course, due to the many such studies, the description of such studies is omitted. With the start of the epidemic of the Covid-19 virus and the inevitable use of virtual education by different countries, a lot of research was done in this field. these researches mostly focus on the challenges of distance education. In a study conducted by Carlos and colleagues in Ecuador in 2020, they investigated the quality of virtual education due to the Corona pandemic. students were not successful with virtual education and still preferred traditional education based on face-to-face education (9). According to the author, changing the approach to virtualization requires fundamental changes

(9). In 2021 Georgiadou conducted a comprehensive survey on the challenges (technological, economic and psychological) in 26 countries (Asia, Europe, Africa and America) by 36 universities from 29 academic institutions (11). According to the comments of students, according to the students, among the most important challenges are disconnection between students, lack of equal access to digital technologies, creation of social gap and psychological consequences, lack of motivation, internet network problems, distance from society and isolation and anxiety, reduction of activities Physical and increased sitting in front of the screen, risks of cybercrime and fake information, Lack of familiarity with this type of training, The authors suggest that by creating innovation and creativity in virtual education, anxiety should be reduced (using animation, simulation, film, etc.) and motivation should be improved (11).

In the end, they point out that virtual education increases individual skills, and overall, it is better to use blended education (11). In a similar study that Shivanji Dhawan conducted in 2020 and during the Corona period in East Asia, she clearly states that resistance to virtual education today will not help any country and the discussion on how to use virtual education for efficiency More and removing the existing challenges in this direction, she also states that although the flexibility of virtual education is a significant advantage, it can cause the user to become complacent so that he never gets the chance to attend the training (17). Oyedotun, T, D considers the problems of public virtual education as a result of the Corona pandemic to be the lack of facilities and infrastructure, the reduction of social interactions, laziness in doing homework, distraction due to not being in class, depression, cyber threats and security problems. The author's elite mentions benefits such as increasing skills, sharing materials by professors, improving technology and using new technologies. He also suggests that distributing free SIM cards, preparing step-by-step instructions, preventing loading of heavy and repetitive content, using videos and various models to reduce the workload of students can make this type of training more useful (10). Daniel Gabaldon-Esteven with a critical view, points out the deep digital gap, inequality and injustice in accessing distance education facilities in Spain (18). In Iran, according to Sarlak et al., in 2012, virtual education started in 2010 with the launch of the Tehran University Virtual University website, along with the gradual progress and use of this ability by other universities, various studies on the effectiveness and the quality of this type of education was done to help improve the quality of this new educational method (19). In 2009, Rabiei et al evaluated the internal quality of the virtual education curriculum of Ferdowsi University of Mashhad and evaluated the quality of this education as favorable, although the learning activities needed further improvement (20). Akbari et al. evaluated the quality of e-learning in Iran's universities in 2013, and described the method of this education as poor, and mentioned ways to improve the quality of e-learning, including research and providing more workshops (21).

In 2018, Ghanbari et al., during comprehensive research on the students of Islamic Azad University, presented a model for evaluating electronic education in the electronic unit of Islamic Azad University and acknowledged that the use of the educational space and electronic classroom should be made easier and the possibility of more interaction. To be provided for students in the virtual space of the university and electronic class (6). In one of the few studies that have been conducted in the field of the quality of virtual education tests, Azimi et al.'s study in 2015 compared the quality of student performance evaluation system in virtual education in Iran (Isfahan) and Russia (Kazan). They showed that in Russia, by adapting from international standard universities, for the accuracy of the test implementation and to achieve reliable measurement criteria of the pre-test and to provide assignments according to the results of the pre-test at two levels with different difficulty, use from several different types of questions, the use of anti-plagiarism software and everyone's access to these software, presenting the project and measuring the level of activity during the half year, and finally referring to the reports of the group members on the level of activity Members are used (7).

In 2008, Emami et al, by reviewing nearly 100 foreign articles and 10 Iranian articles, emphasized that due to the rapid growth of new findings and the production of science in the fields related to medical sciences, on the one hand, and the need to examine and communicate with The patient, on the other hand, the use of virtual education in universities of medical sciences, especially in the clinical department, faces its own challenges and it is necessary to use the experience of world-renowned universities and use special software. It is possible to overcome these challenges and take the right steps in the field of progress and implementation of electronic medical education, especially in the clinical field (8).

In 2004, Zandi et al. pointed out the problems in the process of electronic education at the clinical level, using computer simulation and smart mannequins, along with the use of the web and online education, video conference. Telemedicine and other facilities have been mentioned (22).

Conclusion:

As can be seen, most of the studies before the Corona pandemic had a positive attitude towards virtual education, While the studies that have been conducted during the corona pandemic mostly refer to the shortcomings of this type of education. Several reasons can be considered for this change in the results of the studies, which according to the authors of this article, the following may be mentioned:

1. The forced and sudden change from face-to-face education process to digital education without previous infrastructure and justifications and the lack of previous training for digital skills caused confusion, anxiety and resistance among users.
2. In pre-pandemic studies and under normal conditions, users were active in virtual education with full knowledge and choice and interest, so the opinions were more unbiased and about the structure of virtual education itself.

3. Everyone's use of the virtual structure in the era of Covid-19 caused disruptions in the speed of the Internet network in many countries, which was also considered one of the important reasons for dissatisfaction, which was not related to the nature of virtual education.
4. Fear, anxiety, and depression caused by the spread of a deadly virus worldwide and long-term quarantines at home were also other factors that caused people's unconscious bias against virtual education.

These reasons prompted the authors of this article to delay their survey until later in the pandemic, when users' opinions are less affected by the fear, anxiety and despair caused by the pandemic.

Also, during the two years of using virtual education, most of the users had found an acceptable familiarity with the educational system and no longer had the stress of lack of skills in this approach. For this reason, the users' answers to the questions in the questionnaire seemed more realistic.

In the Islamic Azad University of Medical Sciences of Tehran, due to the forced replacement of virtual education due to the crisis caused by Corona during four semesters, conducting such research to obtain detailed information on the performance and satisfaction of students and professors in education and testing and to make decisions for sure, it seemed necessary to continue.

In 2019, Rahmat-zadeh and his colleagues at the Faculty of Dentistry of the Islamic Azad University of Medical Sciences in Tehran, during a study and survey of the students of the Faculty of Dentistry, reported that the quality of virtual education in this faculty was favorable from the users' point of view (23).

In this study, the results of the opinions of users, both teachers and students, about the process of virtual education show the relative satisfaction of the participants in the survey, and in most cases, the sum of positive and neutral opinions is much more than the negative opinions.

The virtual education system used in Tehran Islamic Azad University of Medical Sciences is the Vadana system based on Adobe Connect, and in accordance with the standards of a virtual education system, it has the ability to hold online and offline classes, and the ability to record and view classes. The activities that were held are the ability to upload files and assignments, hold tests and quizzes, attendance and online surveys, and as expected, most of the professors and students were satisfied with the structure of the system.

Also, the users, including both students and professors, were satisfied with the ability to interact between professors and students, create communication between professors and students, and ask and answer questions.

However, this satisfaction was less in cases such as the use of video communication (webcam), which of course is largely affected by the country's internet speed, and this issue was also expressed in internet speed. The professors were satisfied with the educational facilities such as using the blackboard screen (whiteboard) or sharing the screen of the computer system and playing the video, and the students were also satisfied with the way of uploading the assignment. There was also satisfaction regarding the support within the faculty, although some users complained about the weak support team of the electronics department.

In practical courses and clinical training, the majority of users, both students and professors, believed that virtual education alone does not meet the educational needs of practical or clinical courses, and blended training is needed for acceptable effectiveness.

Also, all the users, both students and professors, welcomed the formative assessment seriously. The main difference in the review of the virtual test was the opinion of the two groups of users. The majority of students believed that when the education is virtual, the tests should also be virtual.

In this regard, the most desire was to hold multiple-choice tests; Although a small group of students believe that the virtual exam seriously questions educational justice. In the opposite group, most of the lecturers believed that the virtual exam is not a reliable criterion for the scientific evaluation of students, and it is necessary to hold an in-person exam.

In the field of virtual exam, although the professors follow the virtual exam guidelines of Tehran Islamic Azad University of Medical Sciences, which confuses the order of the options and the order of the questions, for each four-choice question, 45-60 seconds have been considered. and only one question is placed on each page. However, according to the professors, observing these points is insufficient to prevent academic plagiarism, and on the other hand, students also believe that the insufficient speed of the Internet at peak times and during exams wastes a lot of time for students to go from one page to another and this the problem actually lowers the efficiency of students.

Some students also considered the confusion of the order of questions against educational justice and believed that some students may see difficult questions first and others face easy questions first, which affects the overall results of the exam.

Another thing that caused some professors to complain, from their point of view, loading four-choice questions is difficult and time-consuming.

In the evaluation of the professors from the students' point of view, some professors are well familiar with the system's facilities and try compassionately to understand the content in the non-attendance classroom. Unfortunately, a small number of professors are not very familiar with the environment and the system, and without establishing sufficient communication with the participants, they only explain and do not even pay attention to the questions of the audience, or due to the poor speed of the net, the classes of a teacher have been repeatedly canceled. And at the wrong time, compensation is given. In this case, the students request that the professors be evaluated separately and that training courses be held for the professors who perform poorly.

Among the other items that users mentioned as a positive option are distance education and saving time and being economical, the suitability of this teaching method for theory courses and especially general courses in the future semesters and the availability of special educational videos. It was during the exams. At the end, comments such as changing the color of the gray background of the classroom, the option of recording the sessions by the professor, having a continuously movable page marker, preparing a bank of recorded videos of the professors' lessons for students to use in comprehensive exams, the program's support for Persian typing (Currently, the written language is Arabic type and it does not support some letters and the user must choose Shift + X instead of the key letter, which is not convenient for users) and the inappropriateness of mobile phones for teaching were other issues that It was expressed as a suggestion by users.

Students and professors expect that now that the virtual education has forced them to increase their personal skills and improve their digital usage, they can complete the work that may take several years under normal conditions in a few months, even with the end of the Corona pandemic. virtual education should continue as a part of education, although it is necessary to mention that about ten percent of professors and 20 percent of students are against virtual education and if this educational process is to become part of regular education This percentage, even though it is low, should be considered and rooted, and on the other hand, it should be noted that these opinions are related to a part of professors and students who participated in the survey and do not reflect the opinion of all users of the system.

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References:

[1]. Cao J. Learning with virtual mentors: how to make e-learning interactive and effective. 2005, Available at: http: // ProQuest. Umi. Com.
[2]. Keegan D, From d-Learning to e-Learning to m-Learning. 2000, Available at: WWW. Nettskolen. Com/forskning/From%٢٠d%٢٠learning.doc
[3]. Bently JPH., Learning Orientation Questionnaire Correlation with the Hermann Brain Dominans Instrument Brigham Young University. Brigham Young University. 256 pages.
[4]. Bohme K, Heppt B, Haag N, Inclusive Literacy Education and Reading assessment for language-minority students and students with special educational needs in German elementary schools. Inclusive Principles and Pract in Literacy Edu. 2017; (11): 69-86. https://doi.org/10.1108/s1479-363620170000011005
[5]. Agius, HW, Angelides, MC, Developing Knowledge-based intelligent multimedia tutoring Systems using Semantic content-based modelling, Arti Intel Rev. 1999; (13): 55-83.
[6]. Ghanbari S, Rezghi H, Ziaee MS, Presentation of e-learning evaluation model in Islamic Azad University's electronic unit, edu management res quarterly. 2018; 7(1):76-99.
[7]. Azimi SA, Zamani SA, Soleimani N, Investigating he quality of assessment System of Students performance in virtual education in Iran and Russia. Edu Strategies in Med. 2016; 9 (3): 214-223.
[8]. Emami H, Aghdasi M, Asooshe A, Electronic learning in medical education. research in med. 2008; (33):102-111.
[9]. Torres-Díaz JC, Rivera-Rogel D, Beltrán-Flandoli MA, et al. Effects of COVID-19 on the Perception of Virtual Education in University Students in Ecuador; Technical and Methodological Principles at the Universidad Técnica Particular de Loja. Sustainability. 2022; 2(14): 3204. https://doi.org/10.3390/su14063204,
[10]. Oyedotun TD, Sudden change of pedagogy in education driven by COVID-19: Perspectives and evaluation from a developing country, Research in Golabalization. 2020; (2): 100-104, https://doi.org/10.1016/j.resglo.2020.100029.
[11]. Georgiadou E, Lampropoulos G, Siakas E, et.al., Rapid migration from traditional or hybrid to fully virtual education in the age of the coronavirus pandemic: Challenges, Experiences and Views of College and University students. Middlesex University Research Repository, 2021; http://eprints.mdx.ac.uk
[12]. Bolliger DU, Wasilik O, Factors Influencing Faculty Satisfaction with Online Teaching and Learning in Higher Education. Distance Edu. 2009; (30):103-116. https://doi.org/10.1080/01587910902845949.
[13]. Walters SH, Grover KS, Turer RC, et al. Faculty Perceptions Related to Teaching Online: A Starting Point for Designing Faculty Development Initiatives. Distance Edu. (18): 4-19. https://doi.org/10.17718/tojde.340365.
[14]. Udo GJ, Bagchi KK, Kris PJ, Using SERVQUAL to assess the quality of e-learning experience. Compu. in Human Behavior, 2011; (27): 1272-1283. https://doi.org/10.1016/j.chb.2011.01.009.
[15]. Cidral, WA, and Oliveria T, Felice MD, E-learning success determinants: Brazilian empirical study. Compu. & Edu. 2018; 29 (5): 273-290. https://doi.org/10.1016/j.compedu.2017.12.001

https://doi.org/10.1016/j.compedu.2017.12.001
[16]. 16. Rachel E, Ken M, "e-Learning in Medical Education. Northern Ontario Scholl of Medicine, www.amee.org, ISBN:9781-903934-41-8.
[17]. 17. Shivangi Dhawan, A Panacea in the Time of COVID-19 Crisis. J of Edu. Tech. 2020; 49(1) 5–22.
[18]. 18. Gabaldón-Estevan D, Vela-Cerdá S,The Limitations of Distance Education in Spain During the 2020 Covid-19 Pandemic, 2020, Available at: http//silvecer@alumni.uv.es.
[19]. 19. Sarlak MA, Abedi Jafari H, Virtulization of universities in Iran. IRMA Int. 2008; (23): 45-51. DOI: 10.4018/978-1-59140-261-9.ch084.
[20]. 20. Rabieei M, Mohebi Amin S, Haji Khajeloo SR, Evaluate the internal quality of the virtual education curriculum Mashhad Ferdowsi University. Horizons of Med Edu Develop. 2010; 4(1): 29-35.
[21]. 21. Akbari Pourrang M, Jafari Sani H, Ahanchian MD, et al. Evaluation of the quality of e-learning in Iranian universities based on curriculum orientations and teachers' experience. research and planning quarterly in higher education. 2012; (66): 75-97.
[22]. 22. Zandi A. Abedi D, Yosefi AR, Introduction of E-learning at new education technology and merge that in medical education planning. Iranian Journal of Medical Edu. 2004; (11): 61-66.
[23]. 23. Rahmatzade A, Lavvaf SH, Azizi A, Evaluating the Quality of E-Learning in Students of Dentistry faculty, Terhan Medical Sciences, Islamic Azad University in 2020. Jour of Res in Dental Sciences. 2021; (1):109-118. https://doi.org/10.52547/jrds.18.2.109.

Table 1. The percentage of participation of students and professors classified by the affiliated faculty

Faculty	Participants	
	Students	Professors
Medicine	559 (32.9%)	72 (45.8%)
Dentistry	50 (2.9%)	17 (10.8%)
Pharmacy	225 (13.2%)	8 (5.1%)
Medicinal Chemistry	88 (5.2%)	10 (6.4%)
Advanced Sciences and Technologies	339 (19.9%)	11 (7.0%)
Paramedical Sciences	118 (6.9%)	11 (7.0%)
Nursing and Midwifery	162 (9.5%)	11 (7.0%)
Health and Biomedical Engineering	160 (9.4%)	17 (10.8%)
Total number of participants	1701	157

Table 2. Quality of e-learning system structure

Faculty	Professors' perception			Students' perception		
	Satisfied	**Neutral**	**Dissatisfied**	**Satisfied**	**Neutral**	**Dissatisfied**
Medicine	25 (34.7%)	36 (50.0%)	11 (15.3%)	217 (38.8%)	225 (40.3%)	117 (20.9%)
Dentistry	8 (47.1%)	8 (47.1%)	1 (5.9%)	21 (42.0%)	16 (32.0%)	13 (26.0%)
Pharmacy	4 (50.0%)	4 (50.0%)	0 (0%)	92 (42.0%)	76 (33.8%)	57 (25.3%)
Medicinal Chemistry	8 (80.0%)	2 (20.0%)	0 (0%)	43 (48.9%)	26 (29.5%)	19 (21.6%)
Advanced Sciences and Technologies	5 (45.5%)	6 (54.5%)	0 (0%)	149 (44.0%)	109 (32.2%)	81 (23.9%)
Paramedical Sciences	4 (36.4%)	6 (54.5%)	1 (9.1%)	51 (43.2%)	36 (30.5%)	31 (26.3%)
Nursing and Midwifery	6 (54.5%)	3 (27.3%)	2 (18.2%)	63 (38.9%)	52 (32.1%)	13 (26.0%)
Health and Biomedical Engineering	9 (52.9%)	7 (41.2%)	1 (5.9%)	62 (38.8%)	50 (31.2%)	48 (30.0%)
Total	69 (44.0%)	72 (45.8%)	16 (10.2%)	698 (41.0%)	590 (34.7%)	379 (22.3%)

Table 3. Quality of teacher-student interactions in e-learning system

Faculty	Professors' perception			Students' perception		
	Satisfied	**Neutral**	**Dissatisfied**	**Satisfied**	**Neutral**	**Dissatisfied**
Medicine	29 (40.3%)	37 (51.4%)	6 (8.3%)	165 (29.5%)	239 (42.8%)	155 (27.7%)
Dentistry	9 (52.9%)	6 (35.3%)	2 (11.8%)	20 (40.0%)	18 (36.0%)	12 (24.0%)
Pharmacy	6 (75.0%)	2 (25.0%)	0 (0%)	66 (29.3%)	82 (36.4%)	77 (34.2%)
Medicinal Chemistry	10 (100%)	0 (0%)	0 (0%)	34 (38.6%)	32 (36.4%)	22 (25.0%)
Advanced Sciences and Technologies	8 (72.7%)	3 (27.3%)	0 (0%)	92 (27.1%)	127 (37.5%)	120 (35.4%)
Paramedical Sciences	8 (72.7%)	2 (18.2%)	1 (9.1%)	40 (33.9%)	25 (21.2%)	53 (44.9%)
Nursing and Midwifery	4 (36.4%)	5 (45.5%)	2 (18.2%)	50 (30.8%)	51 (31.5%)	61 (37.7%)
Health and Biomedical Engineering	14 (82.4%)	3 (17.6%)	0 (0%)	48 (30.0%)	44 (27.5%)	68 (42.5%)
Total	88 (56.0%)	58 (36.9%)	11 (7.0%)	515 (30.3%)	618 (36.3%)	568 (33.4%)

Table 4. Quality of the prepared content the in e-learning system

Faculty	Professors' perception			Students' perception		
	Satisfied	Neutral	Dissatisfied	Satisfied	Neutral	Dissatisfied
Medicine	11 (15.3%)	53 (73.6%)	8 (11.1%)	271 (48.5%)	196 (35.1%)	92 (16.5%)
Dentistry	5 (29.4%)	8 (47.1%)	4 (23.5%)	29 (58.0%)	12 (24.0%)	9 (18.0%)
Pharmacy	5 (62.5%)	2 (25.0%)	1 (12.5%)	120 (53.3%)	60 (26.7%)	45 (20.0%)
Medicinal Chemistry	10 (100%)	0 (0%)	0 (0%)	51 (58.0%)	27 (30.7%)	10 (11.4%)
Advanced Sciences and Technologies	4 (36.4%)	6 (54.5%)	1 (9.1%)	167 (49.3%)	107 (31.6%)	65 (19.1%)
Paramedical Sciences	6 (54.5%)	4 (36.4%)	1 (9.1%)	63 (53.4%)	32 (27.1%)	23 (19.5%)
Nursing and Midwifery	5 (45.5%)	6 (54.5%)	0 (0%)	78 (48.1%)	56 (34.6%)	28 (17.3%)
Health and Biomedical Engineering	7 (41.2%)	9 (52.9%)	1 (5.9%)	84 (52.5%)	51 (31.9%)	25 (15.6%)
Total	53 (33.7%)	88 (56.1%)	16 (10.2%)	863 (50.7%)	541 (31.8%)	297 (17.5%)

Table 5. Quality of remote examinations in e-learning system

Faculty	Professors' perception			Students' perception		
	Satisfied	Neutral	Dissatisfied	Satisfied	Neutral	Dissatisfied
Medicine	9 (12.5%)	12 (16.7%)	51 (70.8%)	217 (38.8%)	213 (38.1%)	129 (23.1%)
Dentistry	2 (11.8%)	2 (11.8%)	13 (76.4%)	21 (42.0%)	19 (38.0%)	10 (20.0%)
Pharmacy	2 (25.0%)	3 (37.5%)	3 (37.5%)	89 (39.6%)	85 (37.8%)	51 (22.6%)
Medicinal Chemistry	8 (80.0%)	1 (10.0%)	1 (10.0%)	37 (42.0%)	33 (37.5%)	18 (20.5%)
Advanced Sciences and Technologies	1 (9.1%)	3 (27.3%)	7 (63.6%)	142 (41.9%)	124 (36.6%)	73 (21.5%)
Paramedical Sciences	5 (45.5%)	1 (9.1%)	5 (45.5%)	48 (40.6%)	35 (29.7%)	35 (29.7%)
Nursing and Midwifery	2 (18.2%)	4 (36.4%)	5 (45.5%)	70 (43.2%)	56 (34.6%)	36 (22.2%)
Health and Biomedical Engineering	2 (11.8%)	3 (17.6%)	12 (70.6%)	66 (41.2%)	56 (35.0%)	38 (23.8%)
Total	31 (19.7%)	29 (18.5%)	97 (61.8%)	690 (40.6%)	621 (36.5%)	390 (22.9%)

Table 6. Performance of students and teachers from each other's point of view in e-learning system

Faculty	Professors' perception			Students' perception		
	Satisfied	**Neutral**	**Dissatisfied**	**Satisfied**	**Neutral**	**Dissatisfied**
Medicine	33 (45.8%)	21 (29.2%)	18 (25.0%)	173 (30.9%)	276 (49.4%)	110 (19.7%)
Dentistry	9 (52.9%)	2 (11.8%)	6 (35.3%)	19 (38.0%)	21 (42.0%)	10 (20.0%)
Pharmacy	5 (62.5%)	1 (12.5%)	2 (25.0%)	55 (24.4%)	114 (50.7%)	56 (24.9%)
Medicinal Chemistry	9 (90.0%)	1 (10.0%)	0 (0%)	22 (25.0%)	46 (52.3%)	20 (22.7%)
Advanced Sciences and Technologies	6 (54.5%)	1 (9.1%)	4 (36.4%)	85 (25.1%)	171 (50.4%)	83 (24.5%)
Paramedical Sciences	6 (54.5%)	4 (36.4%)	1 (9.1%)	36 (30.5%)	51 (43.2%)	31 (26.3%)
Nursing and Midwifery	8 (72.7%)	1 (9.1%)	2 (18.2%)	47 (29.0%)	79 (48.8%)	36 (22.2%)
Health and Biomedical Engineering	12 (70.6%)	2 (11.8%)	3 (17.6%)	39 (24.4%)	72 (45.0%)	49 (30.6%)
Total	88 (56.0%)	33 (21.0%)	36 (23.0%)	476 (28.0%)	830 (48.8%)	395 (23.2%)

Table 7. Overall satisfaction with e-learning system

Faculty	Professors' perception			Students' perception		
	Satisfied	**Neutral**	**Dissatisfied**	**Satisfied**	**Neutral**	**Dissatisfied**
Medicine	30 (41.7%)	34 (47.2%)	8 (11.1%)	228 (40.8%)	256 (45.8%)	75 (13.4%)
Dentistry	11 (64.7%)	4 (23.5%)	2 (11.8%)	27 (54.0%)	20 (40.0%)	3 (6.0%)
Pharmacy	6 (75.0%)	2 (25.0%)	0 (0%)	84 (37.3%)	106 (47.1%)	35 (15.6%)
Medicinal Chemistry	10 (100%)	0 (0%)	0 (0%)	36 (40.9%)	38 (43.2%)	14 (15.9%)
Advanced Sciences and Technologies	7 (63.6%)	3 (27.3%)	1 (9.1%)	154 (45.4%)	137 (40.4%)	48 (14.2%)
Paramedical Sciences	8 (72.7%)	2 (18.2%)	1 (9.1%)	56 (47.5%)	47 (39.8%)	15 (12.7%)
Nursing and Midwifery	5 (45.5%)	5 (45.5%)	1 (9.0%)	75 (46.3%)	60 (37.0%)	27 (16.7%)
Health and Biomedical Engineering	16 (94.1%)	1 (5.9%)	0 (0%)	79 (49.4%)	56 (35.0%)	25 (15.6%)
Total	93 (59.2%)	51 (32.5%)	13 (8.3%)	739 (43.4%)	720 (42.3%)	242 (14.2%)