

# Evaluation of Factors Affecting the Quality of Virtual Education During the COVID-19 Pandemic

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**Abstract-** The prevalence of Corona virus Disease 2019 (COVID-19) has affected the university education system. Due to the development of technology in recent decades and the need for social distance to prevent the spread of the disease and to prevent interruptions in student education, education has changed to virtual. Considering the importance of education and its decisive role in improving the academic level of students, we tried to review the challenges of virtual education and the factors affecting its quality. This review study was performed by searching databases such as Pubmed, Scopus, SID, and Magiran using keywords including virtual teaching, virtual learning, COVID-19, and Medical Sciences and limiting the search to the keywords in the title and abstract and also according to PRISMA guidelines. In the present study, the advantages and disadvantages of e-learning were investigated. Findings showed that the factors affecting the quality of e-learning are classified into four main sections, which include: the existence of appropriate infrastructure, Class control and administration, Necessary training for using software for professors and students, and the Proportion of the volume of taught content with its evaluation. One of the most important disadvantages of e-learning in the past year is the lack of proper infrastructure for training and exams, high internet interruption, the impossibility of student interaction, and the large volume of content. Due to the existence of barriers to the formation of classes in person, it is possible to help increase the educational quality of students and advance learning by using the necessary and appropriate measures in the correct use of virtual education and increasing the quality of the required infrastructure.

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## Introduction

In December 2019, the Novel Corona virus was discovered in Wuhan, China, and after a while, it spread around the world; the World Health Organization declared the disease by this virus as a pandemic on March 11, 2020 (1,2).

The virus affected all aspects of life, causing lifestyle changes and creating various problems and crises in economic, educational, social, etc., aspects (1,3,4).

The educational system of the universities was also affected, and there was a change in the teaching methods of the students; so that after a short break and periodic closure of university education at the beginning of the virus; university centers tried to change the teaching

method to virtual and online education by applying the necessary and appropriate standards (2).

Virtual education is based on multimedia resources, video conferencing, etc. which students communicate with the instructor virtually, not in person (5).

In recent decades, e-learning in universities has grown significantly, but the infrastructure of this method of education is still flawed. In a way, the communication that was established between the student and the teacher during face-to-face training was lost, and telecommunication was replaced in this type of training (3,5). Available online and free platforms challenged traditional teaching approaches and facilitated students' need for a creative-minded classroom. These platforms included Skype, Google Meet, and Zoom, each of these

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platforms was used because of the special facilities offered to the professor and the student, each of which has its own advantages and disadvantages, but in terms of the overall structure, they act almost the same (6,7).

The benefits of this training include: eliminating unnecessary traffic, increasing time and reducing time wastage, and access to educational content regardless of time and place. This education also has disadvantages, such as the decrease in the communication of students with each other and with professors, the decrease in the emotional aspect between the teacher and the students, and so on; there are even more advantages and disadvantages, which in general include the things that have been said, which are interesting in their own way (5).

Due to the prevalence of coronavirus in the last two years and the need to observe social distance to prevent the spread of the virus, the issue of teaching online and offline has been raised. In this review study, we tried to investigate the challenges of virtual education and the factors affecting its quality, especially in medical students in the COVID-19 epidemic, to make better use of this method of education.

## Materials and Methods

### Search strategy

The search was carried out on 4 different databases: Pubmed, Scopus, Magiran, and SID, which include all articles between 2020 to 2021. In this study, the search strategy was a combination of keywords: COVID-19, Sars Nov-2, virtual learning, virtual teaching, online distance learning, and students.

These keywords were searched in Persian and English in the title and abstract of the articles.

### Eligibility criteria

The inclusion criteria for this study included:

Article published in indexed journals in Persian and English language between 2020 and 2021.

The Exclusion Criteria of articles were articles that were unrelated to the topic.

### Removing and analyzing data

After completing the search, two reviewers independently analyzed the articles and then summarized the article information; the abstract and title of the articles were reviewed. After this, from 60 of the initial article, 15 articles for the final review were

included in the study.

## Results

### Virtual education infrastructure

With the advent of COVID-19 and the limitations it has placed on the entire system, the need for some infrastructure in society has increased, and one of these sectors is the education sector, which needs to build virtual infrastructure, especially with the expectation of communities from science centers (1,3).

Virtual education has become the main need of society for scientific education, and this education has its disadvantages and advantages and has created a new challenge. One of its most important challenges, especially in Iran, is the lack of familiarity of students and professors with virtual education systems (1,2).

For virtual learning, many tools such as the NAVID system and social networks have been provided to professors and students who can simulate the classroom space based on the communication, they establish with each other. The space has been enjoyable for some people, but for some, it has been painful. They have not been able to adapt to it and have not been able to create that simulation (1,7).

According to some surveys, e-learning is very suitable for basic science courses, but in the field of clinical courses for medical students, it has many weaknesses and cannot teach the whole subject (8).

Of course, opinions about the virtual teaching of clinical courses are different, and there are many differences between students in terms of effectiveness and even time management (8).

There is a point that virtual education can be as effective as traditional education, but it depends on the type of lesson and the type of teaching of teachers, which still has problems such as not having a way to convert the traditional method to virtual education in some topics (9).

The infrastructure that has contributed to the effectiveness of e-learning is the interactive infrastructure between different universities, and many students have had the opportunity to connect with a place other than their place of study and, in a way, increase the interaction between the scientific communities which cause Eager to learn more on some topics (10).

Finally, the biggest barrier that can be mentioned in the virtual education infrastructure is internet access, which is especially associated with many restrictions in Iran, including its high cost and the need for tools such as computers to use it, which is not available to everyone.

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And it has caused a kind of division between people (1,2).

### Educational platforms

To overcome the challenges posed by the suspension of face-to-face classes, a large number of universities began to use platforms such as Google Meet, Zoom, Adobe Connect, etc. (4).

It's up to professors and students to decide which platform to use, and it depends on the required methods to teach the topic. For example, the need for professors and students to make eye contact, video sharing, audio and file sharing, raising their hands, group discussions, etc., can change the priority of using platforms. Therefore, knowing the features and capabilities of these platforms is very important to determine the most appropriate ones (11). Besides, e-learning won't have the required quality unless the orientation adopted by professors is proportionate to the features and capabilities of a virtual environment (12).

### Audio and video

If students share audio and video, professors can teach the students through eye contact and follow their verbal and non-verbal reactions to check their participation in learning, energy level, and understanding of the lesson, and apply the necessary strategies according to the circumstances (11).

They can also control the behavior of students and prevent their misbehavior through video communication (13).

However, due to the situation, the environment, and the problems with Internet access, many students are not able to communicate via video (11).

### Group discussions

Interaction has a significant impact on creating an appropriate learning environment and better communication within the training course. Interaction between students and professors and participation in learning is the key to learning the content (12).

One of the reasons that teacher-centered classes with large numbers of students usually act poorly in education is the lack of interaction between the teachers and students and using only one single content (1).

Interaction limits in virtual education hurt students' satisfaction with education. In modern teaching methods, the full focus on teachers in the classroom is obsolete, and group discussions have been replaced as a basis for in-depth learning (11).

In this method, the role of teachers is defined as a co-

learner or a learning guide, and the main focus of the class is the students (13). Therefore, when using educational platforms, it is very important to consider these features.

### Training required to use the software

Virtual education, which has replaced traditional ones in this period, is possible by using software and systems, and the systems that are used more than others include; NAVID, Adobe Connect software, as well as other software from Including Skype and Skyroom. They also used it for their educational purposes (2).

After learning how to use this software and gaining relative mastery, they have to provide content that is relevant to the topic, which is a big challenge for virtual learning (1,5).

With the development of computer technology, virtual education can be greatly assisted, and the development of computer technologies will lead to advanced learning (6).

One of the recommended methods to improve the educational content is using books and up-to-date articles, authoritative electronic resources, and multimedia devices, and it is standard and up-to-date software that tries to consider the limitations and differences in addition to simulating the virtual learning space to a normal classroom (14).

One way to use up-to-date articles and resources is to teach the search method, that is, learn controlled terms, synonyms, and terms related to the words used and use them in various databases.

This skill must be taught extensively to overcome the challenges because, with the ability to search properly, the power can be achieved to expand the training to different types and even lead to more interaction, the result of which is to reach ideas; it is good and practical (15).

## Discussion

E-learning is a way to present more flexible learning and more opportunities for learners, facilitate the follow-up of learners' progress and their activities and also provide an opportunity to create new effective learning environments. But these factors could be improved, and their quality could be assured only when they are evaluated. In other words, without evaluation of e-learning programs and related elements, this type of education cannot be considered desirable, and no progress will be achieved (12).

Many professors acknowledge that during the

COVID-19 pandemic, students' scores on online exams have improved significantly compared to face-to-face exams. They also believe that e-learning tools are ineffective for assessing students and that the correct assessment of students using this method is difficult, and the scores awarded with this method do not accurately express the level of knowledge and skills of students (16).

Even with proper education, if the assessment is not done properly, it will also cause students dissatisfaction (14). So, professors are looking for alternative ways for online exams. Some of the methods used by professors are evaluating students' homework and projects during the semester, quizzes in cyberspace, and holding oral exams that can contain all or part of the final grade (16).

Also, during the COVID-19 pandemic, in some universities, instead of a grading system, only a general assessment is made to determine whether the students have completed the course (14).

Exam systems also often have problems such as interruption of the test site, poor support from the exam center, and typographical errors in the test questions, which is another reason for the dissatisfaction of professors and students with the online assessment methods (1).

Virtual education is a new method and approach in education that became very popular during the COVID-19 pandemic. After reviewing various studies, the results showed that the use of new technologies during the COVID-19 pandemic had increased dramatically but still has shortcomings that can be addressed to improve this method. One of the major problems of this type of method was the lack of strong infrastructure in the field of education as well as exams, the unfamiliarity of professors with teaching with this method, and the high interruption of the internet.

Virtual education, in a way, showed us a new field of education and broadened our view of educational methods; so that we can question past methods and think of new methods and not be satisfied only with existing methods because if we do not move forward, we can not complete the required progress in the field of education.

The mentioned problems are almost all solvable and can be taken to take this step forward; of course, we should not forget the traditional method and limit ourselves to new methods because the best combination is perhaps a combination of both depending on our needs.

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