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Virtual Education Challenges during the COVID-19 Pandemic in Academic Settings: A Systematic Review

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Abstract

Background: The global transition to virtual education has increased following the outbreak of the COVID-19 pandemic and the closure of schools and universities. The present study investigates the challenges of virtual education during the COVID-19 pandemic from the perspective of Iranian faculty members and university students.

Materials and Methods: In this systematic review, a systemic search of online databases (Medline, EMBASE, Scopus, Web of Science, SID, CIVILICA, Magiran, and Google Scholar search engine) was conducted for relevant studies with no time limit up to April 2022. Inclusion criteria were original research articles (qualitative, quantitative, and combined studies) with an acceptable score in the Gifford Quality Assessment.

Results: Finally, nine studies were included. Results showed that 84.5% of students agreed with continuing with virtual education, but the challenges were problems related to the Internet (e.g., disconnection and connection), problems of the electronic systems (e.g., disconnection of the system), problems related to the microphone (e.g., sound echo), problems related to interaction (e.g., one-sided communication), problems of faculty members (e.g., insufficient familiarity with the system), problems of students (e.g., higher level of the exam from the teaching of professors), and macro social problems (e.g., in educational justice).

Conclusion: The educational challenges arising from the outbreak of COVID-19 consist of three areas: infrastructural and technical challenges, challenges created in the teaching-learning process, and socio-cultural challenges. By addressing these challenges, virtual training can be a solution for education during the pandemic, and blended education can be suitable for the post-pandemic period.

Key Words: Challenges, COVID-19, Faculty members, Students, Virtual Education.

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1- INTRODUCTION

The COVID-19 disease was first diagnosed in December 2019 in Wuhan, China, with symptoms similar to pneumonia and has since spread exponentially worldwide. On March 11, 2020, the World Health Organization (WHO) declared the disease a pandemic (1-4). The COVID-19 pandemic has created fundamental challenges in all sections of society, and its consequences will remain for a long time (5, 6). This pandemic is considered by many as a turning point in modern human history, and they divide the history of the world into two periods, before and after the COVID-19. The pandemic has also affected education, with most schools and universities being forced to close due to the spread and infectivity of COVID-19 and changing their methods from face-to-face education to online and virtual education (7-11). E-learning prevented education from suspension during an outbreak. The use of offline and online electronic applications is currently increasing (12, 13).

Online education allows teachers and learners to learn and teach in any place and time (14, 15). This is also true for higher education in Iran, and face-to-face classes have changed to virtual education in response to the new conditions (16). At first, virtual training was provided irregularly. Over time, universities were required to use the NAVID learning software and platforms such as Adobe Connect, Skyroom, and Bigblue as a centralized training system, and virtual education became a regular teaching method in universities (17, 18).

This rapid transformation from face-to-face to online teaching created controversy among scientists in this regard (19). The new conditions have also created further challenges for universities and students. It is necessary to evaluate this new education method extensively and from all aspects and recognize its challenges and shortcomings. This study reviews the challenges of virtual education during the COVID-19 pandemic from the perspective of Iranian faculty members and university students.

2- MATERIALS AND METHODS

2-1. Data sources

The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) checklist was used as a template for this review (20). A systemic search of electronic databases Medline (via PubMed), Scopus, Web of Science, EMBASE, SID, Magiran, CIVILICA, and Google Scholar search engine was conducted with Mesh keywords, including "Virtual learning, Virtual education, E-learning, Web-based learning, Online learning, Online class, Teachers, Professors, Students, University students, Academic students, Iran, COVID-19, Coronavirus, Challenge, and Limitation", with no time limit up to April 2022. The search was performed independently and in duplication by two reviewers, and any disagreement was solved by the supervisor.

2-2. Eligibility criteria

Participants, interventions, comparators, and outcomes (PICO) was used to formulate the review objective and inclusion criteria.

2-2-1. Participants: Iranian faculty members and university students who have experienced online teaching/learning during the COVID-19 pandemic were chosen for review.

2-2-2. Interventions*:* The included research are non- interventional studies, so we did not have comparison group.

2-2-3. Comparators: We did not have a comparison group and intervention.

2-2-4. Outcomes: Challenges of virtual education during the COVID-19 pandemic.

2-3. Inclusion criteria

Criteria for entry of articles were original research articles (quantitative, qualitative, and mixed methods), participating Iranian professors (faculty members), and university students, and the language of the article was Persian or English.

2-4. Exclusion criteria

Exclusion criteria were the lack of access to the full version of the article, the low quality of the study based on Gifford criteria (21), and the lack of e-learning challenges during the COVID-19 in the findings section of the article. Pilot, preliminary, and case report studies were not included due to the limited sample size and higher risk of bias. Review articles and systematic reviews also were excluded.

2-5. Study selection

Database search was performed for the relevant studies, abstracts of the studies were screened to identify eligible studies, full-text articles were obtained and assessed, and a final list of selected studies was made. This process was performed independently and in duplication by two reviewers, and any disagreement was resolved by a third reviewer. References were organized and managed using EndNote software (version X8).

2-6. Data collection

A form was developed and followed for each study. The data collected by the two reviewers were combined and compared for accuracy, and any discrepancies were solved by a third reviewer.

2-7. Risk of bias

The risk of bias was assessed based on the Gifford criteria (21) by two reviewers independently and in duplication, and any discrepancies were resolved by a third reviewer. Articles were evaluated on a two-point scale (zero and one) based on the criteria provided by Gifford et al. for quantitative studies (6 criteria), qualitative (11 criteria), quasi-experimental (8 criteria), and experimental (7 criteria). These criteria included transparency in the expression of the problem and the need for research, methodology and correct sampling, how to report findings, and interpretation of results. The cut-off point for removing the article for quantitative studies was 4 and less; for experimental and quasi-experimental studies, 6 or less; for qualitative studies, 8 or less.

2-8. Synthesis of results

Due to the difference in the included studies, study designs, lack of control groups in some studies, and small sample size, a meta-analysis was not conducted.

3- RESULTS

Finally, nine studies were selected (**Figure.1**). The main characteristics of the selected studies are summarized the following:

1. A qualitative study using content analysis in 2020 assessed the educational harms and challenges of COVID-19. The results showed that the educational challenges caused by the outbreak of COVID-19 in Iran include the following:

a) Infrastructure and technical challenges, including;

- Lack of access to e-learning for some learners, especially in deprived regions, and inequality in educational opportunities;

- The high cost of the Internet for many families;

- Slow internet speed.

b) Challenges created in the teaching-learning process, including:

- Difficulty in assessing the learning and depriving the teachers of supervisory power;

- Ineffective educational content and exams;

- Poorer academic performance of some learners due to not taking virtual education seriously.

c) Socio-cultural challenges, including:

- Some learners depend on the Internet and the cyberspace;

- Using the content of others;

- Using the software as an advertising tool (22).

2. A qualitative study was conducted through interviews with university professors and school teachers via WhatsApp, Telegram, e-mail, telephone, and face-to-face conversations to examine the e-learning experience in Iran and its challenges, barriers, and opportunities. The results based on the reports and inferences and perceptions of the teachers' experience with e-learning and the electronic teaching systems pointed to four types of encounters:

1) In the beginning, there is confusion about how to use the technology, how to act in the virtual classroom, and how learners interact in an uncertain environment filled with fear of COVID-19.

2) The second encounter is to go into details, e.g., how to use the camera and new tools, how to look into the camera and the screen, how to move before the camera, what to say and not to, and how to receive feedback.

3) Next come questions on how virtual actions and behavior are, how to create excitement, how to express dissatisfaction, what the differences and similarities between the virtual environment and the conventional classroom are, and what is expected of the learners and the teacher, and what the role of network and software support is.

4) Then, gradually, things become clear: problems, obstacles, and opportunities arise more vividly, and the teaching methods come to test. The emergence of different learning management systems (LMSs), and tools of university education (e.g., webinars) further the connection between education and technology (23).

3. A qualitative study in 2020 examined the faculty members' experiences with virtual education opportunities and challenges during the COVID-19 pandemic through 11 semi-structured interviews with professors of Alborz University of Medical Sciences. The qualitative content analysis extracted two main categories: individual barriers to the effectiveness of e-learning with subcategories of personality traits and family factors; and organizational management with subcategories of infrastructure, management and leadership, training and supervision, ethics and law, and evaluation (24).

4. A qualitative-analytical study on students of Jahrom University of Medical Sciences examined their perceptions and demands of virtual education. The results showed that a primary challenge mentioned by students was the lack of proper infrastructure for virtual education, including sending large content volumes at inappropriate times, lack of quality and interactive content in some courses, inconsistent content, poor quality of educational content, lack of simulation of educational content with face-to-face classes, and aggregation of educational content near the exams. The high cost of personal internet, the shortcomings of the virtual education system, the higher level of the test than teaching, the defects of the test system, and the inefficient evaluation

method were some of the concerns expressed by students (25).

5. A cross-sectional study was performed on 90 medical students of Bushehr University of Medical Sciences, aimed to investigate the opinions of medical students about the quality of virtual education during the COVID-19 pandemic. The results showed that 84.5% of students agreed with holding virtual education sections, but two-thirds of the students were dissatisfied with the technical and infrastructural problems during online sections, as well as homework and questions (26).

6. A qualitative study with a phenomenological approach used 13 semi-structured interviews with undergraduate, graduate, and doctoral students of the University of Tehran to investigate the problems of e-learning following the prevalence of coronavirus. The results showed that some of the problems were related to Internet infrastructure and some to students and professors. Some examples are:

- Problems related to the Internet (low Internet speed, high costs, disconnection and connection of the network, and problems with Internet access and domain);

- Problems of the electronic system (system connecting, disconnecting, and reconnecting, the problems with leaving the system, low voice quality, system limitations, problems with loading the files, outdated electronic learning systems);

- Microphone problems (sound echo, manual microphones, and problems with microphone connection, inconsistent sounds, and interference in sounds);

- Problems related to interaction (poor interaction in virtual classes, one-way communication, predictable content, invisible body language, and unrecognizable tone of people in the text);

- Teacher problems (little attention to e-learning, poor familiarity with the system, lack of training of professors, low creativity in virtual classes, excessive volume of assignments, inappropriate time management, attendance problems, and low understanding between student and professor);

- Student problems (inability to use the system, inability to download related files, and inability to establish communication skills);

- Social problems (educational justice, lack of practical courses, and absence of orientation classes for professors and students) (27).

7. A cross-sectional study on 60 faculty members of Bushehr University of Medical Sciences investigated the opinions of university professors about online teaching during the COVID-19 pandemic. The results showed that 40% of the professors rated the access to online and technical support as inappropriate, and 28.3% stated that the training provided by the university officials for working with online systems is insufficient. Moreover, 45% of the professors were dissatisfied with the low speed of the Internet and its frequent unavailability (28).

8. A qualitative study used semi-structured interviews with 14 professors and 66 students to analyze the opportunities and challenges of e-learning in the post-COVID-19 period. The results showed that the primary evaluation methods of students' learning during the outbreak of the coronavirus (virtual education) were face-to-face exams, virtual written exams, virtual oral exams, oral questions and answers, virtual presentations, electronic portfolios, and multiple evaluations.

- The challenges of traditional face-to-face exams include increasing the risk of COVID-19 disease, increasing the costs for people and the government, higher social dissatisfaction, distrust of university performance, criticism of university performance, and the possibility of fraud and obtaining the answers via virtual networks, sometimes even by the whole classroom.

- The challenges of virtual written exams include the impossibility of observing the respondent (another person may answer the questions instead of the student), the possibility of network disconnection and power outage during the exam, lack of timely response due to low Internet speed, and not having access to a well-functioning Internet connection.

- The challenges of virtual oral exams include being time-consuming (especially for crowded classes), test-taker fatigue, the possibility of varying scores for the same answers, unfair distribution of questions among learners (some learners may receive simpler questions and others more complex ones), lower opportunity to answer, think, and recall, increased anxiety and stress, poor objectivity, validity, and reliability of written exams, the Halo effect (the effect of student appearance, strength, and expression on grading), poor Internet connection and the disruption of audio and video quality, Internet costs, and lack of internet access for some students, especially in disadvantaged areas.

- The challenges of oral questions and answers include being time-consuming (especially in crowded classes), poor Internet connection and audio and video quality, difficulty in grading some learners (disrupting the teacher's focus on presenting the educational content), unfair distribution of simple and complex questions among students, little opportunity to answer, think and recall the subjects, weakness of objectivity, validity, and reliability, and the Halo effect.

- The challenges of virtual presentations are being time-consuming (especially in crowded classrooms), poor Internet connection and audio and video quality, inapplicability in some courses, lack of face-to-face communication, excessive dependence on technology and the Internet, isolating some students, and forcing students to sit at computer systems. Disorganized and poor presentations do not motivate learners to do scientific research and present, wasting class time and leading students to do presentations only to receive a grade.

- Challenges against using e-portfolios include the possibility of cheating and copying, the impossibility of responsive observation (another person may do homework instead of a student), being time-consuming (especially for crowded classes), and the teacher’s need to study and give feedback to the students.

- The multiple assessment methods can be time-consuming, especially for crowded classes (29).

9. A cross-sectional study on nursing students of Tehran Islamic Azad University aimed to evaluate the quality of online teaching courses during the COVID-19 pandemic from the perspective of nursing students. The results showed that the lowest level of satisfaction was related to technical and infrastructural problems, the imbalance between the course content and the number of classes, and dissatisfaction with the contents, assignments/tests, and feedback (30).

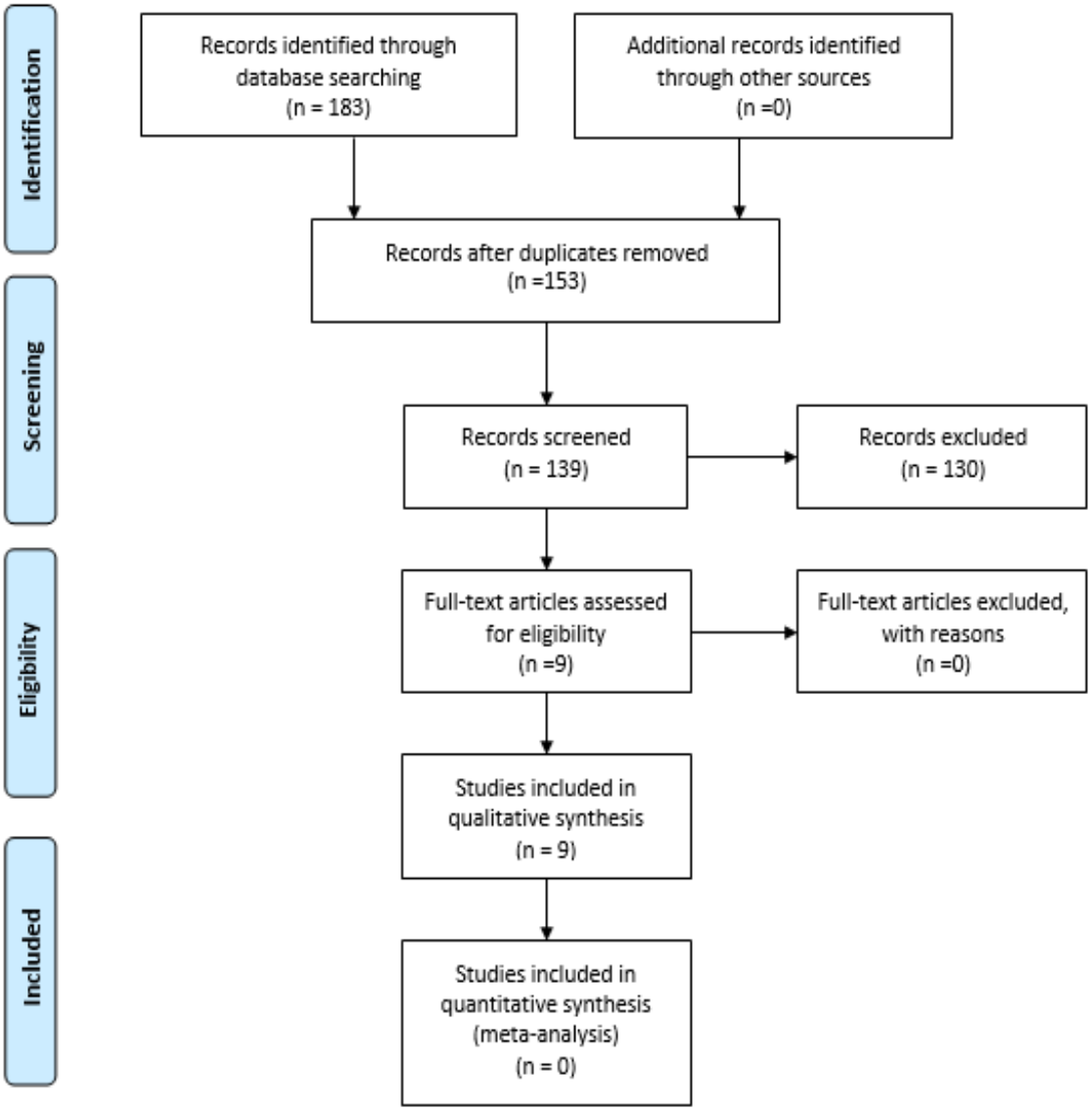

Fig.1: PRISMA Flowchart.

4- DISCUSSION

This study investigated the challenges of virtual education during the COVID-19 pandemic from the perspective of Iranian faculty members and university students. Results showed that the educational challenges following the outbreak of COVID-19 consist of three areas: infrastructural and technical challenges, challenges in the teaching-learning process, and socio-cultural challenges.

E-learning consists of educational activities via electronic tools such as audio, video, computer, network, and virtual platforms. In other words, all programs used for learning through computer networks, especially the Internet, are called e-learning (31). UNESCO defines e-learning as any educational process where all or most of the teaching is done by people who are temporarily and spatially far away from the learner, and the communication between the teacher and learner is through a printed or electronic synthetic medium (32). With the emergence of the COVID-19 pandemic, education worldwide suffered an unprecedented crisis. As there were no

preparations for such a crisis, numerous problems and challenges appeared. Although higher education was challenged by the COVID-19 pandemic, especially at the beginning, it gradually took a proper approach and created opportunities out of challenges. The primary opportunities created in education include providing access to guides for virtual education, adapting assessments to reduce fraud and achieve the desired goals, education through media, group education, more flexible learning activities and assignments, and more attention to educational content (33). A longitudinal study showed that web-based training accompanied by regular feedback from the instructor is 19% more effective than face-to-face training (34). Thiele states that this way, learners have access to more information, take responsibility for their own learning, and access instructional content whenever they wish, making the method easier and more productive (35).

Several studies have shown that online education allows teachers and learners to learn in any place and time (36-38). A review study on education users' opinions about e-learning during the COVID-19 pandemic showed that due to numerous problems, the satisfaction of education users with this method is low, and they still prefer face-to-face training. Despite these findings, this study showed that most of the studies conducted in this field have emphasized the use of e-learning methods as much as possible and considered it a suitable method for education in the current situation. Also, the lack of adequate infrastructure and educational facilities has been a great challenge for providers and recipients of education (39).

The results of the present study indicated the challenges of e-learning from the perspective of students and professors. Challenges are inevitable in e-learning, similar to every other system. Identifying the challenges of e-learning is necessary to raise the attention, make the necessary forecasts, prepare and invest appropriately, and develop a strategic plan for the learning system. According to Freund, the main reasons for failure in e-learning initiatives are a lack of personalization, cooperation, and interaction and the absence of learner-centered e-learning (40). The level of development of countries affects their use of information technology. Devices such as computers and networks are expensive and not always available to the general public in less developed countries. Several studies show that interaction has a significant impact on a suitable learning environment and a better relationship with the training course.

Interaction has always had a special place not only in distance learning but also in traditional education and in independent learning (39, 41).

E-learning can make up a significant part of education in the current situation of the world. Many learners, teachers, and organizations welcome e-learning due to its safety and the possibility of using it in any place and time. More participation and interaction in electronic methods can significantly improve learning and satisfaction. The basic infrastructure for the implementation of e-learning and its widespread accessibility are the necessary conditions for the success of e-learning. The learner in the online learning environment requires some background knowledge, previous experience, and mental preparation. Entering the online learning environment without knowledge and skills will waste time, lower the mood, leave the learning unfinished, and lead to failure. Therefore, it is necessary to clarify and train the use of e-learning and optimize it to meet the educational needs of the profession, life, and social activities. It is achieved by raising the level of knowledge of the learner and explaining the benefits and features of e-learning.

5- CONCLUSION

This review study showed that due to the current COVID-19 pandemic, electronic/virtual education is needed more than ever. Several studies have emphasized the need to use e-learning in the current situation to prevent the spread of COVID-19 disease. On the other hand, this method of education is associated with challenges, including problems related to the Internet (weak Internet, high cost of Internet consumption, disconnection and connection of the Internet); problems with electronic systems (problem of connecting to the system, problem of disconnecting and connecting the system, problem of leaving the system, problem of system limitation, problem in loading the file); microphone and audio problems (sound echo, microphone connection problem, interference in sounds); problems with interaction (low virtual classroom interaction, one-sidedness, pre-planned content, lack of body language); teachers' problems (little familiarity of teachers with the system, lack of proper justification, little creativity in virtual classes, large volume of assignments, incorrect time management, the problem of attendance); students' problems (inability to use the system, inability to download related files, inability to establish communication skills); problems of the society (the issue of educational justice, the problem of holding practical courses, not holding orientation classes for professors and students).

The culture and rules required for this method should be developed, and hardware and software infrastructure should be provided to optimize the benefits of e-learning facilities. Capable teachers and producing valuable content are other infrastructural factors of this training type. The COVID-19 crisis, despite all its challenges, can be an opportunity to identify weaknesses, shortcomings, and infrastructural deficiencies in e-learning and be a starting point for continuing this learning method in the future.

6- AUTHORS' CONTRIBUTIONS

Study conception or design: MS, and MA; Data analyzing and draft manuscript preparation: KS, ND, and AA; Critical revision of the paper: MS, and KS; Supervision of the research: MA and ND; Final approval of the version to be published: MS, KS, ND, AA, and MA.

7- CONFLICT OF INTEREST: None.

8- REFERENCES

1. Chan JF-W, Yuan S, Kok K-H, To KKW, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. The Lancet. 2020; 395(10223):514-23.

2. Singhal T. A review of coronavirus disease-2019 (COVID-19). The Indian journal of pediatrics. 2020;87(4):281- 86.

3. Lai C-C, Shih T-P, Ko W-C, Tang H-J, Hsueh P-R. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID19): the epidemic and the challenges. International journal of antimicrobial agents. 2020;55(3):105924.

4. Alsoufi A, Alsuyihili A, MsherghiA, Elhadi A, Atiyah H, Ashini A, et al. Impact of the COVID -19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. PLoS ONE. 2020;15 (11): 1 -20.

5. Aristovnik A, er i D, Rav elj D, Toma evi N, Umek L. Impacts of the COVID -19 pandemic on life of higher education students: A global perspective. Sustainability. 2020; 12 (20):8438.

6. Taghizadeh S, Haji J, Mohammadimehr M. A Comparative Study of the Challenges and Opportunities of Higher Education in the Corona Pandemic in Iran and around the World. NPWJM. 2020; 8 (27):47-57.

7. Murphy MP. COVID-19 and emergency eLearning: Consequences of the securitization of higher education for post-pandemic

pedagogy. Contemporary Security Policy. 2020;41(3):1-14.

8. Mhlanga D, Moloi T. COVID-19 and the Digital Transformation of Education: What We Are Learning in South Africa. Education Sciences. 2020;10(7):180.

9. Johnson N, Veletsianos G, Seaman J. US Faculty and Administrators' Experiences and Approaches in the Early Weeks of the COVID-19 Pandemic. Online Learning. 2020;24(2):6-21.

10. Adeoye I, Adanikin A, Adanikin A. COVID-19 and E-learning: Nigeria tertiary education system experience. International J of Research and Innovation in Applied Science. 2020;5(5):28-31.

11. Rezaei A. Student learning evaluation during the Corona: Challenges and Strategies. Ed- ucational Psychology. 2020 Apr 20;16 55:179 -214.

12. Utomo MNY, Sudaryanto M, Saddhono K. Tools and Strategy for Distance Learning to Respond COVID-19 Pandemic in Indonesia. Journal homepage: http://iieta.org/journals/isi. 2020;25(3):383-90.

13. Liu X, Zhou J, Chen L, Yang Y, Tan J. Impact of COVID-19 epidemic on live online dental continuing education. European Journal of Dental Education. 2020;24(4):786-89.

14. Allo MDG. Is the online learning good in the midst of Covid-19 Pandemic? The case of EFL learners. J Sinestesia. 2020;10(1):1-10.

15. Scull J, Phillips M, Sharma U, Garnier K. Innovations in teacher education at the time of COVID19: an Australian perspective. Journal of Education for Teaching. 2020;46(4):497.

16. Al-Balas M, Al-Balas HI, Jaber HM, Obeidat , Al-Balas H, Aborajooh EA, Al-Taher R, Al -Balas B. Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. BMC medical education. 2020 Dec; 20(1): 1 - 7.

17. Al-Taweel D, Al-Haqan A, Bajis D, Al-Bader J, Al-Taweel AM, Al-Awadhi A, et al. Multidisciplinary academic perspectives during the COVID-19 pandemic. The International Journal of Health Planning and Management. 2020;35(6):1295-1301.

18. Ghafouri -Fard M. The boom in e -learning in Iran: The potential that flourished with the Corona virus. Iranian Journal of Medical Education. 2020; 20(4): 33-4.

19. Radha R, Mahalakshmi K, Kumar VS, Saravanakumar A. E-Learning during lockdown of Covid-19 pandemic: A global perspective. International journal of control and automation. 2020;13(4):1088-99.

20. Moher D, Shamseer L, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Syst Rev 2015; 4: 1.

21. Gifford W, Davies B, Edwards N, Griffin P, Lybanon V. Managerial leadership for nurses' use of research evidence: an integrative review of the literature. Worldviews on evidence-based nursing. 2007;4(3):126-45.

22. Gharari M, Mohammadi R, Ghorbani M. Assessing Educational Harms and Challenges of Covid-19. IRJE. 2021; 16 (5): 29-37.

23. Ebrahimabadi H. Cyberspace developments, learning theories and patterns of electronics training. Quarterly Journal of Basic Sciences, 2018; 9(2):85-101.

24. Sadati L, Nouri Z, Hajfiroozabadi M, Abjar R. Faculty Members' Experiences about Virtual Education Opportunities and Challenges during the Covid-19: A Qualitative Study. J Med Educ Dev. 2021; 14 (42):1-10.

25. Mosalanezhad L, Atashpoor S, Kalani N. What do medical students want to learn in the Corona Crisis Curriculum? Expressing Students' Expectations and Strategies. J Educ Ethics Nurs. 2021; 10 (1 and 2):4-11.

26. Yazdanparast, A., Lashgari kalat, H., Marvi, N. A Survey of Medical Students' Opinions on the Quality of Virtual Education Courses Held in Bushehr University of Medical Sciences during the COVID-19 Pandemic. Med Edu Bull, 2020; 1(2): 77-86.

27. Zarei, A., Javadipour, M. Problems of E-learning in the University of Tehran due to the Spread of Coronavirus. Journal of Management and Planning In Educational System, 2021; 14(2): 313-42.

28. Azadi H, Ghazanfarpour M, Yazdanparast A. Investigation of the Opinions of Professors

of Bushehr University of Medical Sciences Regarding Online Teaching during the COVID-19 Pandemic. Med Edu Bull 2020; 1(2): 96-103.

29. Rezaei, A. Student learning evaluation during the Corona: Challenges and Strategies. Educational Psychology, 2020; 16(55): 179-214.

30. Abdolreza Gharehbagh, Z., Seifi, B., Moeini, F. Assessing the Quality of E-learning Courses during the COVID-19 Pandemic from the Perspective of Nursing Students of Islamic Azad University, Tehran Branch, Iran. Med Edu Bull, 2021; 2(2): 199-207.

31. Redmond, J. A., Parkinson, A., Mullally, A., and Dolan, D., Synchronous e-Learning: Three Perspectives, Innovations in E-learning, Instruction Technology, Assessment, and Engineering Education (2007); pp 175-180.

32. UNESCO. Open and Distance Learning. Trends, Policy and Strategy Considerations. Paris: UNESCO, 2002.

33. Taghizadeh S, Haji J, Mohammadimehr M. A Comparative Study of the Challenges and Opportunities of Higher Education in the Corona Pandemic in Iran and around the World. NPWJM. 2020; 8 (27) :47-57.

34. Leasure AR, Davis L, Thievon SL. Comparison of student outcomes and preferences in a traditional vs. World Wide Web-based Baccalaureate Nursing Research Course. J Nurs Educ, 2000; 39(4):149-54.

35. Wilkinson A, Roberts J, While A. Nursing students' use of technology enhanced learning: A longitudinal study. Journal of Nursing Education and Practice, 2013; 3(5).

36. Allo MDG. Is the online learning good in the midst of Covid-19 Pandemic? The case of EFL learners. J Sinestesia. 2020;10(1): 1-10.

37. Scull J, Phillips M, Sharma U, Garnier K. Innovations in teacher education at the time of COVID19: an Australian perspective. Journal of Education for Teaching. 2020;46(4):497.

38. Hosseini M.A., Ghahremani A.R., Mohammadi Shahbolaghi F., Mohamadzadeh S., Tamizi Z. The advantages of Electronic Learning in Nursing Education: A Review study. Journal of Nursing Education (JNE) 2016;4(4,14); 9-16.

39. Ranjbar Kouchaksaraei S, Rohaninasab M, Nikjo P, Jannati Y. The education users' opinion about the E-learning in Covid-19 pandemic in the world: a review study. Clin Exc. 2021; 10 (4):41-51.

40. Babaei M. Introduction to e-learning. Tehran, Iran Institute of Information Science and Technology: Chapar; 2012.

41. Attaran M. Globalization of information technology and education. Tehran: the Institute of Educational Technology Development of Smart Schools; 2015.