

Explaining the Experience of Iranian Student Teachers on the Status of Virtual Education in the Corona Virus Pandemic: A Phenomenological Study

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Abstract:

Objectives: The purpose of this study was to explore the experiences of Iranian Student teachers on the status of virtual education in the Coronavirus pandemic.

Methods: Using phenomenological method, this qualitative study was conducted on 46 student-teachers. The data collection tool was a semi-structured interview which was conducted in absentia due to the prevalence of Quid 19. Data collection and analyses were done concurrently. Data were interpreted using theme analysis method with the support of Nvivo10 qualitative data analysis software.

Results: The thematic network indicated that the challenges of virtual education during the Coronavirus epidemic consisting of a comprehensive theme, 5 organizing themes (Inequality in access to facilities, The challenge of filtering, Internet slowness, Hardware and software challenges, Non-uniform communication channels for all students, Low capacity of communication), and 22 basic themes.

Conclusion: The results of this study can provide useful information about the current state of e-learning and education to administrators, planners, and implementers of e-learning in universities. By identifying the problems in the process of e-learning, this process can be modified, improved, or changed, and measures can be taken to develop and enhance the e-learning process in times of crisis.

Keywords: Virtual Education, Iranian Student teachers, Corona Virus, Phenomenological Study

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Introduction

Online courses are main stream throughout higher education. This pattern has been accelerated, temporarily or permanently, due to the Corona virus pandemic (Cutri & Juanjo 2020). It is almost impossible to perform academic activities, such as accessing study material or contacting lecturers and other teaching and learning processes, at an open distance learning institution without using computers and the internet (Safari, Alikhani & Safari 2014). A study established that well-developed e-learning platforms guarantee efficient and effective use by students. This is to ensure that accessibility and usability of these websites are adhered to during the development of e-learning websites (Maboe, & Eloff 2019). Nowadays, social networking is becoming a more and more powerful tool for students for communication, information sharing and discussions about various topics (Safari et al 2014, Gaftandzhieva & Doneva 2020). According to many research findings, when students change their learning from traditional to electronic, they face new problems that they may not have experienced before (Al-Yasiri, 2021). Along with learners, teachers and their teaching methods are also considered as elements of e-learning (Prasetyo, Nurtjahjanti & Ardhiani, 2021). Therefore, because in this type of training, more elements and skills are needed than face-to-face teaching, besides the skills required for face-to-face teaching, e-learning instructors must also have other skills and capabilities such as the ability to use technological facilities and generate knowledge, transfer information to students and establish communication with them electronically, as well as encourage students to seek resources and involve them in educational activities.

Alves, Miranda & Morais (2017) revealed that relatively positive indicators regarding students' access to a virtual learning environment and the relation between such access and their performance. The greater the number of accesses to the Virtual Learning Environment (VLE), the greater the number of students who pass the courses. But the number of accesses to the virtual learning environment (VLE) does not affect the average grade of the course. Since e-learning uses the capabilities of information and communication technology to facilitate and improve learning, it provides opportunities for the learner to have access to the educational course and curriculum at any time, in line with career and family commitments (Bawaneh, 2021). In this regard, researchers have stated that the establishment and development of e-learning in virtual environments of higher education enables and facilitates educational justice, regardless of time and geographical constraints, through online platforms of the teaching-learning process (Jafari, Homayooni Bakhshayesh & Alamolhoda, 2021). Therefore, with the development of virtual platforms, e-learning can solve many problems and issues in societies, including the growing need for education, lack of equal access to educational centers, lack of economic facilities, lack of experienced teachers, and high costs of educational services. In some studies on nursing students, traditional and virtual teaching methods were compared; the findings showed that there is a significant difference between traditional and virtual education groups. Also, the results indicated the positive effects of virtual education method on nursing students' knowledge about cardiac dysrhythmia. This method can be used as an alternative or complementary method to the traditional education (Safari, Safari & Abasifard 2017, Habibzadeh et al 2019). Much more recently, in a study of e-learning, it was concluded that the average level of skill, knowledge, and attitude among students and teachers was positive and higher than the mean value (Safari, Alikhani & Safari 2014). There was a significant relationship between teacher's level of education and the marital status of the participants. There was also a significant interaction between skill, knowledge, and attitude. Consequently, there is a need for successful implementation of e-learning by creating appropriate infrastructure, applying the required standards, as well as taking measures to reduce

the existing resistance in this regard, which can be achieved through training workshops. The experience of successful universities in the country and abroad can also be used to implement e-learning (Mokaripour, Shokrpour & Bazrafkan 2020).

In other study, all the 1st-year medical graduate students admitted in the year 2016 enrolled and most of them were actively participated in the discussion conducted on WhatsApp group with zero dropout rates. Students' feedback indicated that they enjoyed learning using WhatsApp with better participation than traditional teaching method. Students liked anytime, anywhere learning using WhatsApp and it helped them to clear doubts. The statistical difference between average pre- and post-test scores, respectively were statistically significant. In conclusion, histology teaching using WhatsApp learning group is feasible, effective, and student-friendly method. Hence, it should be used more frequently to complement traditional teaching (Maske et al 2018). Comparison of satisfaction before intervention in the two groups of e-learning and traditional groups showed that it was not statistically significant differences, while after 2 weeks after the intervention there was a significant difference between the two groups. The use of e-learning programs for nursing teachers can increase the level of satisfaction and motivation of nursing mothers. Therefore, the use of this new training method is recommended by managers and training planners as an effective training (Yazdanni et al 2020). A review article on the challenges of how to implement and deliver e-learning at Kenyan universities to review and analyze the literature on e-learning challenges, using the scaling review method, emphasized some challenges including lack of adequate policies for e-learning, inadequate information and communication technology (ICT) infrastructure, evolving technologies, lack of technical and educational qualifications and training for teachers and e-learners, lack of e-learning theory for infrastructure of e-learning practice, budget constraints and sustainability issues, negative perception of e-learning, quality issues, dominance of e-learning goals by technology and market forces and lack of cooperation between e-learning participants (Kibuku et al 2020). One of the most important factors extracted from the results of the analysis is the understanding that using social media is easier compared to a dedicated e-learning system such as Model. This factor may also discourage educators / learners from adopting an e-learning platform, regardless of useful, motivational and educational programs. Thereby providing practical information on key issues and a guide to the full use of e-learning for e-learning policy makers and developers, especially in start-ups or developing countries (Karkar et al 2020). The results also showed that professors who adopt student-centered teaching approaches do not necessarily design their combined learning courses as a student-centered learning environment. In addition, the results affirmed that student professors who have improved their level of self-direction have provided online activities and online discussion conferences. The findings suggested that more research is needed to confirm the direct relationship between this type of learning activity and self-directed learning, as well as to determine how blended learning environments can better support collaboration and interaction (Adinda & Mohib 2020).

One study found flaws in the use of social media for language learning at several higher education institutions in Malaysia. It also aimed to highlight the use of social media in overcoming barriers. The findings indicated that educators face barriers related to this technology, students' experience and expectations, as well as the language learning environment. In this regard, social media helped them overcome these (Murugaiah & Yen 2019). Besides, the results of a study analysis in Yemen showed that both professors and students use the Internet to study outside of the university. In addition, both professors and students showed that students need to participate and be called in the study of reading skills. Therefore, there is a need to implement participatory computer learning in literacy training because it is a new method for Yemeni students and may

help them improve their reading skills. The reason for this is rather simple: reading among YFL students at the University of Yemen has not improved. Most importantly the last two decades, although Yemeni students have not experienced e-learning before, they are willing to accept CACL as a new way of (Yassin, Razak, & Maasum 2019). This paper concluded that Asian students are not necessarily poor online learners, as has often been suggested, but that they are alert to the importance and real advantages of personal interaction in the learning process. For this reason it is suggested that integrated hybrid virtual and classroom courses might prove more effective and elicit more positive responses from such students than courses that are conducted entirely online (Westbrook 2006). According to this study, any efficient response should take into account the technology use trends, the technological environment, and the learners' habits and customs. In the three countries, higher education distance learning (HEDL) is characterized by a rapid increasing of registrations, the existence and spread of national network of suppliers giving birth complex platforms of DL (exceptionally in Canada and the United States), and internationalization, especially in France and United States. In these systems Coexist accredited DL and Massive Open Online Courses (MOOCs) (Wotto 2020).

In some study in Iran, the results showed that educational challenges including the extensive amount of the context in the courses as well as a large number of modules, disregarding the educational prerequisites of the field, failure of professors to accompany students at the early stages of the projects, etc.; organizational challenges including non-diversification of e-learning courses, high availability of online academic staff due to lack of e-learning experience, ethical challenges such as lack of appropriate culture for applying this discipline, negative perception towards e-learning, technical challenges including low speed of internet, shortage of physical spaces in e-learning, supportive challenges such as lack of facilities, lack of permission to use the university canteen, evaluation challenges such as mandatory in-person exams in e-learning courses, not allocating a reasonable proportion of the final mark to in-person exams, managerial challenges such as inefficiency of the educational content, rejection of students by the head of virtual faculty due to lack of time and lastly, communicational challenges such as lack of interaction with academic staff and classmates as well as lack of face-to-face communication (Safari, Khatony & Tohidnia 2020, Shafiei Sarvestani et al 2019).

The other study revealed that technology use and scaffolding had positive effects on learning. Learners with high prior knowledge benefited more from reflection phases; learners with low prior knowledge learned better when supported by examples (Chernikova et al 2020). The results indicated that, confirmation of the usage of online learning environments could be explained by information quality, system quality and service quality variables. 63% of the variance of the satisfaction variable was explained by information quality, system quality, service quality, confirmation, utilitarian value, outcome expectations and perceived value.

Finally, other research results confirmed the propounded constructs of Information Systems Success Model and Information Systems Expectation Confirmation Model (Daghan & Akkoyunlu 2016). Five main categories of usage reasons were identified by an inductive qualitative content analysis: "Search for Information and Inspiration", "Search for Social Interaction", "Beat of Boredom and Pastimes", "Escape from Negative Emotions", and "Search for Positive Emotions". Flow experiences positively predicted the categories "Escape from Negative Emotions" and "Search for Positive Emotions" (Brailovskaia, SchillackJürgen & Margraf 2020). Following this view, students' experiences in distance learning reflect the state of education in each situation. Since virtual education and e-learning is relatively new in Iran and considering the problems and shortcomings in infrastructure, support, and even implementation, e-learning has been faced with

several challenges and obstacles. Eliminating these shortcomings requires scientific and professional planning as well as conducting numerous studies to identify and remove barriers to achieving effectiveness in the e-learning process (Fiddin & Bustami, 2021). It should be noted that one of the effective factors in satisfying learners in the e-learning process is to study of the quality of e-learning services from the students' perspective (Alam, Ahmad, Naveed, Patel, Abohashrh & Khaleel, 2021). Students' views of the teaching-learning process affect their decision to strive for success and benefit from the educational process, as well as their commitment and educational and organizational affiliation to the university and the quality of the university's image in its interactive environment. So, the aim of this study was to explore the experience of Iranian students on the status of virtual education in the Coronavirus epidemic.

Methods

Using phenomenological method, this qualitative study was conducted on 67 students in a university of teacher training in Iran. Initially, 120 students received interview questions. 92 interviews that were complete were reviewed, and the reviews were saturated with 46 interviews, after which the answers were repetitive. The selection criterion was informed consent to participate in the research voluntarily. The data collection tool was a semi-structured interview which was conducted in absentia due to the prevalence of COVID-19 in Iran. For this purpose, WhatsApp and Telegram social networks were used to distribute interview questions, interaction with participants and emails were used to collect students' answers. Students were asked to express their views in a narrative manner and to use symbols to indicate their mental state where necessary. This technic is provided when the interviewer can interview people that are not easy to access. The lack of some elements, as intonation, can be filled up with the use of emoticons. Before the users were able to create simple emoticons with a normal keyboard, for example a "smiley" could be made as ":)". Nowadays the keyboard gives the opportunity to create more advanced emoticons "😊" (Adhabi & Anozie 2017). To ensure the accuracy of the researchers' perceptions of each participant's statements, if necessary, the students were contacted and the accuracy of the perceptions were reviewed with him/her and the necessary changes were made. Finally, after 67 interviews, the information was saturated. Saturation refers to the repetition of information obtained and confirmation of the previously collected data (Ratnapalan 2019). Purposeful sampling is a technique widely used in qualitative researches for the identification and selection of information-rich cases to make the most effective use of limited resources. This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced in a phenomenon of interest (Palinkas et al 2025). Data collection and analyses were done concurrently.

Interview Focus Questions Includes: Please share your experiences of training during a Coronavirus epidemic by answering the following questions: "What methods did the teachers use?" "What were the means of communication (communication channels) in teaching between you and your teacher?" "What challenges and problems did you face in this type of teaching?" "What were the advantages and facilitators of this type of teaching?" "How was your satisfaction with this type of training compared to face-to-face teaching?"

After receiving each interview, the researchers carefully read the texts line by line several times and transcribed or inferred by the researchers using the keywords or phrases in the text. Three steps of open, axial and selective coding were performed on the data. During the study, various methods were used to ensure the accuracy and reliability of the data. Three people encoded the

data to ensure the accuracy and objectivity of the data and codes. After coding, copies were returned to some participants to verify the codes and interpretations extracted.

Data were interpreted using theme analysis method. The identified topics were re-examined in a focus group discussion session using a virtual social network to finally agree on the extracted categories. The validity of the data was determined using verification techniques through researchers' self-review and reliability by accurately guiding the data collection process and researchers' alignment. In addition to the researchers, the transcript of the interview was provided to another expert to prevent this. After re-extracting the sub-categories from the answers provided and comparing them with the categories extracted by the researchers, the attitudes of the researchers and the subject matter specialist were aligned. Colizzi's seven-step model was used to interpret the data. This method consists of seven steps: 1. Carefully read all the descriptions and important findings of the participants; 2. Extraction of important phrases and sentences related to the phenomenon; 3. A concept of excerpts from important sentences extracted; 4. Sorting participants' descriptions and common concepts into specific categories; 5. Convert all inferred comments into comprehensive and complete descriptions; 6. Convert complete descriptions of the phenomenon into a real, concise description; 7. Validation (Colizzi 1978).

Validation of qualitative research data

In this part of the research, in order to calculate the validity of the findings, the criteria of validity and reliability were used. For this purpose, the researcher's method of alignment and self-review during the process of collecting and analyzing qualitative data was used. In this way, by examining the theoretical and research evidence obtained from the sources and using them, the themes were justified using the same method of alignment. Given that the topics are convergent with multiple research sources and backgrounds, it can be said that the themes identified on the challenges of virtual learning during the Coronavirus epidemic have the necessary validity. In this study, after enumerating the basic organized and comprehensive themes related to the development of distance learning challenges in the Coronavirus epidemic, an attempt was made to determine the relevant components using the Nvivo10 software.

Results

The results showed that after 46 interviews with the participants, the data reached theoretical saturation. All students were undergraduates. Their average age was 23 ± 4 . Communication tools and educational channels including Telegram, WhatsApp, Email, LMS, Adobe Connect. Some of these channels, such as Telegram and Adobe Connect, have limited usage and filters in Iran. Based on the results of written distance interviews with students, the state of virtual education in the Coronavirus epidemic, which is depicted as a network of themes, is formed after several steps, which are described below:

1. The phase of building basic themes

In this phase, after writing the data, re-studying and recording the initial ideas, tried to summarize some meaningful codes under a basic theme. Examples of basic themes recorded in the Nvivo10 software are summarized in Table 1.

Basic themes	Evidence for the interview code 6
<ul style="list-style-type: none"> - Variety of communication tools in education - Insufficiency of telegram for education 	<p>The conditions in our country and our city were normal, so that everyone could move around easily and without any worries. On a fateful day when they announced that Corona had arrived in Iran, all the students stayed at home and after a while they said that the education had become virtual and that the students should join the Telegram and WhatsApp groups. No one should have complained that the filter breaker in Telegram software is incompatible with us and is constantly disconnected and connected.</p>
<ul style="list-style-type: none"> - Course content stored in WhatsApp will soon become inaccessible - We do not have a secure location to record contents for presentation 	<p>In WhatsApp, if we do not save the textbook, two weeks later, the file is not in the phone memory. Let me define an example. I had math once and had to give it that morning. My niece, who is very naughty, was constantly making noise. I also recorded the sound for five minutes with confidence. But in the middle of it were my niece screaming and the sound of Loudspeakers for dry bread buyers (buy bread scraps in Iran) and the sound of guests talking. Every room I went to was noisy. After all, I went to the roof to record my presentation. I had a hard time presenting with the audio recording.</p>
<p>Telegram is not suitable for online educational communication</p>	<p>Once in the online class, I turned on my telegram to attend the English language class, the filter breaker did not turn on. I did not enter the telegram anymore. A little later I was at the end of downloading the telegram when the class ended and I was absent because of it.</p>
Basic themes	Evidence for the interview code 7
<ul style="list-style-type: none"> - Confusion over the diverse use of communication tools and networks in education 	<p>Due to the fact that it is not possible for students and professors to be present in educational centers and universities during the prevalence of this disease, we will inevitably turn to distance education. Virtual education was applied in different ways by the professors of different courses. For example, some professors held their classes according to programs provided by the university. Some others formed educational groups and channels on social networks. The other group left the study of the lessons to the student and informed the students that in case of any problem, they should contact the relevant professor at the same time and fix the problem. Anyway, the first experience of virtual education took place seriously these days, and it has certainly not been and will not be without problems.</p>
<ul style="list-style-type: none"> - The Internet is constantly disconnected and connected - Not all students have access to the Internet - Low internet speed <p>Telegram is filtered and difficult to access</p>	<p>The main methods of holding classes and programs are WhatsApp, Skype, Telegram, and Adobe Connect. The main problem of this type of training is the speed of the Internet and social networks. It is interesting and unfortunate that the Telegram program, which is undoubtedly the most important bridge between professors and students, has been filtered by the Ministry of Communications, and access to this application has</p>

	certain problems for reasons that are not related to the field of education. This is if programs such as Instagram, which is much more harmful and dangerous than Telegram for the public and the way of thinking and culture of our society, have not been filtered. This matter needs to be considered.
Basic themes	Evidence for the interview code 16
Variety of communication tools	Since it was a virtual connection, the professors used Telegram and WhatsApp messengers more and held midterm exams in the same programs. In this way, the professor sent a questionnaire and specified a certain period of time that the students had to answer.
<ul style="list-style-type: none"> - The Internet accessibility problems - Inadequacy of virtual education facilities for all students - Lack of equal virtual education conditions for all students - Difficulty in accessing teaching files by some students 	Virtual classes posed many challenges, including a lack of facilities. There were people who had problems in Internet access. For example, those in the village every day during the scheduled hours of the class had to go to a place where the Internet was connected. One day, I myself went to the village and exactly that day I had the presentation of one of the lessons which was really hard. Of course, it can be said that the city internet was not so great that we can be sure that it will not be interrupted at any time. For instance, the professor would send a file, she/he would have to wait for all the students to open it, and then she/he would start her/his lesson. Maybe due to the low model of some children phones, the files did not open or needed a special program through which the program was opened and that program did not open on the model of those phones and caused problems.
Inappropriate students' phones for receiving audio / video teaching files	

2. The phase of building organizing themes

In this phase, after refining and reviewing the basic themes, arranging meaningful code under a basic theme and repeatedly recording ideas in the work progress process, as observes in table 2, all the same basic themes (in terms of content or function) regarding the challenges and barriers of virtual education were placed under five organizing themes: – 1. Inequality in access to facilities 2. The challenge of filtering, slowness and interruption of the Internet 3. Hardware and software challenge 4. Non-uniform communication channels for all students and professors 5. Low capacity of communication channels to communicate and exchange messages simultaneously.

Table 2: interviews codes, basic and organizing themes related to students' experiences of virtual education

Organizing themes	Basic themes	Interviews codes
Inequality in access to facilities	Inaccessibility of students to appropriate educational tools (laptop, computer or smartphone)	3, 4, 25, 30, 32, 33, 36, 41
	The cost of buying internet packages	8, 10, 27, 33, 35, 42, 44

	The difficulty of student access to high speed internet, especially in rural areas	4, 7, 8, 12, 16, 18, 29, 30, 35, 36, 41
	Putting financial pressure on low-income families to provide the necessary infrastructure	26, 18, 12
	High volume of internet usage	32, 33, 36, 42, 44
The challenge of internet filtering, slowness and interruption	Continuous internet disconnection and reconnection	1, 7, 10, 13, 14, 15, 20, 24, 29, 33, 35, 44, 45
	Telegram filtering and the need to use a filter breaker	7, 44, 45
	Continuous disconnection and reconnection with the professor in the Adobe Connect	23, 24, 34, 38, 44
	Absence due to continuous internet disconnection	3,6,9,18,20,43,45
	Inadequacy of the internet speed for exam	12, 13, 17, 19, 30, 33, 35
Hardware and software challenges	Inadequacy of Telegram for virtual education	6,10,44
	Deleting information and submitted files from WhatsApp over time	6, 12, 16, 30, 40
	Use Telegram capabilities to announce attending without class attendance	10, 30, 36, 44, 45
	Inadequacy of the student cell phone for studying course resources and keeping files	12, 16, 19, 28
	Difficulty and time -consuming of entry to Telegram	2, 6, 27, 40, 44, 45
	Getting boring the atmosphere of WhatsApp, Telegram and mobile	18, 34, 36, 43
	Inefficiency of internal messengers for virtual education	2, 4
Non-uniform communication channels for all students and professors	Non-uniformity of media used by professors for education (WhatsApp, Telegram and Adobe Connect)	1, 2, 3, 5, 6, 7, 8, 12, 15, 16, 19, 17, 34, 35, 38, 39, 43, 44
	Variety of communication ways with professors	1, 2, 3, 5, 6, 7, 8, 12, 15, 16, 19, 17, 34, 35, 38, 39, 43, 44

Low capacity of communication channels to communicate and exchange messages simultaneously	Crowded class groups because of the high number of sent message	27, 34, 37, 37, 42, 45
	High volume of professors submitted files	16, 22, 27, 34, 36, 42, 44, 45
	Poor bandwidth	2, 5, 7, 9, 10, 12, 18, 27, 31, 37, 38, 40

As mentioned at the beginning of this phase, in order to integrate the basic themes into several organizing themes, after repeated study of the basic themes, an attempt was made to place the basic themes under the five organizing themes in order to provide a base for faster and easier understanding of the barriers and challenges of virtual education during the Corona epidemic.

Of note is that as regards in qualitative research, researchers' attitudes in the process of integrating codes and themes affect the final result of the research, in this study to facilitate summarizing and integration of basic themes as well as reaching a consensus among the members of the committee in choosing the basic themes under each of the organizing themes, tried to provide a definition of each organizing theme according to its function in the University, a criteria and a guidance should be provided to committee members to make it easier to decide on the integration of basic themes under each of the organizing themes.

3. The phase of discovering thematic network

In this phase of the research, based on the results obtained from the previous phase, thematic network related to the challenges of virtual education during the Coronavirus epidemic, which was obtained using Nvivo10 software, is shown in Figure 1. According to Figure 1, the data from the formation of the thematic network indicate that the challenges of virtual education during the Coronavirus epidemic consisting of a comprehensive theme, 5 organizing themes, and 22 basic themes. Its validation is also examined below.

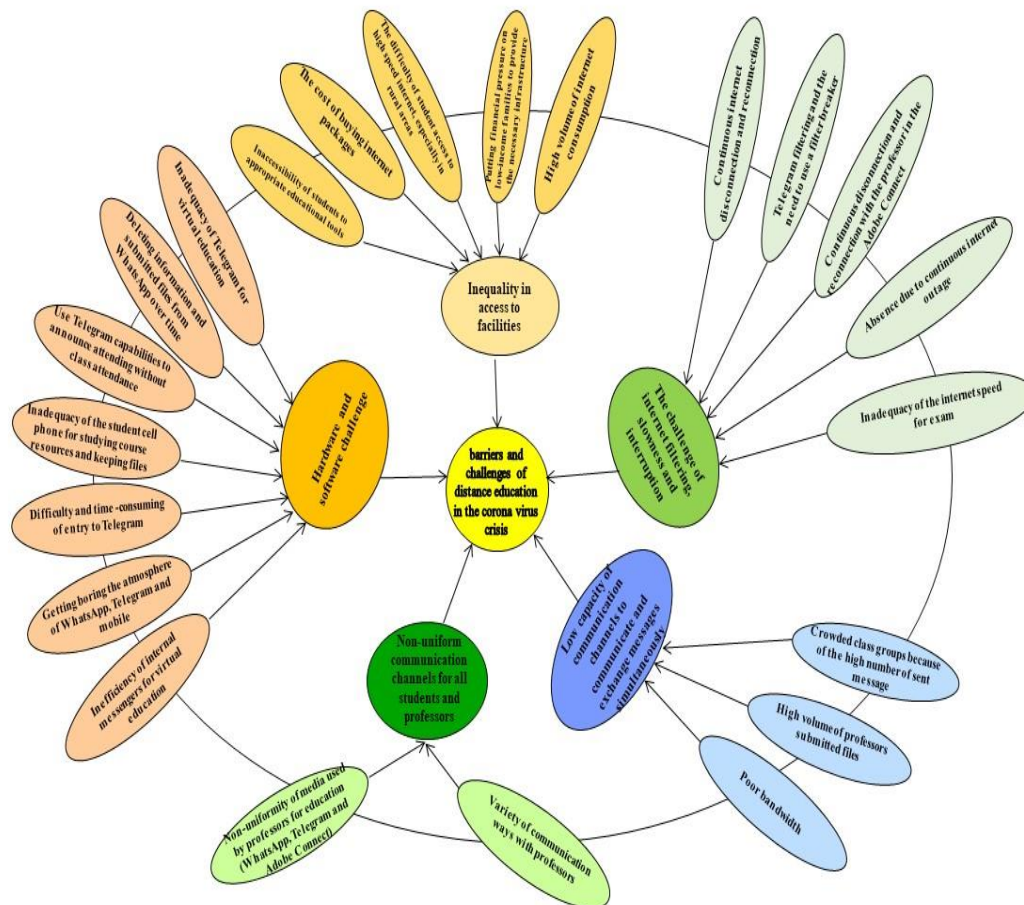


Figure 1: The thematic network of barriers and challenges of virtual education in the corona virus epidemic in Iran

Discussion and Conclusion

There is little doubt that the sudden outbreak of Covid-19 virus has affected all education systems in the world. Specifically, this created more challenges for Iranian educational institutions that were not properly prepared. The result of this study showed that all the same basic themes (in terms of content or function) regarding the challenges and barriers of virtual education in Iran were placed under five organizing themes include "Inequality in access to facilities", "The challenge of filtering, slowness and interruption of the Internet", "Hardware and software challenges", "Non-uniform communication channels for all students and professors", and "Low capacity of communication channels to communicate and exchange messages simultaneously". In confirmation of the findings of the study, many researchers argued the existence of problems such as temporary interruption of the Internet and the lack of timely attendance in virtual classes by students who are at home and off campus or the lack of access to some of them who live in deprived and rural areas and lack the necessary facilities for e-learning, are among the threats that affect the quality of e-learning and learning (Safari, Mostfaie 2016B, Chen & Chang (2020, Feng et al 2020, - Kumar et al 2017). Accordingly, the quality and effectiveness of e-learning is achieved when the creation and development of infrastructure and requirements for students for e-learning are considered by the authorities (Maboe & Eloff 2019, Alves, and Miranda & Morais 2017).

In other words, university administrators and educational planners should take appropriate measures and provide an example of the necessary facilities and infrastructure for virtual

education, in accordance with the requirements of the students' place of residence, to turn such obstacles and threats into appropriate educational opportunities.

In addition, the findings showed that participating in virtual classes cost students money to buy the Internet, hardware, etc., which in itself has put a lot of financial pressure, especially on low-income or poor families, and in practice it has deprived students of receiving virtual education or has prevented them from receiving such education with appropriate quality. These factors have been mentioned in the studies of some researchers (Wang et al 2020, Gelli et al 2014, Read et al 2020, Mozafari et al 2016). Distance learning classes in Iran are held both offline and online using the university's LMS system, social networks such as WhatsApp, Telegram and email. However, some studies show that students enjoy using social networks such as WhatsApp with better participation than the traditional teaching method (Maske et al 2018). In a study on the role of WhatsApp in education in Turkey, teachers said the program had its drawbacks. They said it would be difficult for a group of students to use the app without a smartphone or internet connection, and would not be fair in terms of communication (Zan 2019). Social networks such as WhatsApp are used for instant messaging and have been seen in places that negatively affect students' levels of understanding, learning skills, productivity, and academic achievement (Yilmazsoy, Kahraman & Kose 2020).

The problem of internet access in terms of hardware and software and the diversity of teaching communication channels for students was one of the findings of this study. According to some researchers, effective and efficient implementation of e-learning largely depends on the provision of technical, financial, and equipment infrastructure for teachers and learners (Nie, Panfilova, Samusenkov, & Mikhaylov, 2020). However, according to the experience of students in our study, continuous disconnection and weak Internet, the inadequacy of bandwidth with a large number of users, lack of high-speed Internet in all parts of the country, especially in deprived rural areas, the cost of purchasing Internet packages and the lack of necessary facilities and equipment for this type of education for all students, were among the problem related to infrastructure and technology that affected the quality of the teaching-learning process in virtual education. In this regard, Nasrat, Khamosh & Lavangnananda (2020) stated one of the serious obstacles in the process of e-learning is the lack of user access to resources and infrastructure. However, to solve the existing problems in this field, while making the necessary arrangements to develop the bandwidth required for virtual education, hardware and software facilities are needed to better hold these training during COVID-19 for all users and students in all parts of the country and create a suitable platform for students to virtually learn necessary knowledge and skills (Read et al 2020, Safari, Azizi & Ziapour 2018, Kibuku et al 2020, Yassin, Razak & Maasum 2019, Shafiei Sarvestani et al 2019, Safari, 2015, Wotto 2020).

Among the findings of this study was the low capacity of communication channels to communicate and exchange messages simultaneously. Findings of some studies indicate that some electronic communication channels are more effective in establishing online relationships than other channels. However, presenters have to use the available channels to effectively establish online relationships (Pauleen, D. & Yoong 2001). In this regard, one study (Khogali, 2020) showed that decreased face-to-face interaction, lack of student participation in the teaching-learning process, reduced individual commitment, and inability to summarize educational materials were among the weaknesses of e-learning. Moreover, according to some researchers, designing educational content in an attractive way and using different multimedia for providing educational content are among the factors affecting the quality of e-learning processes that should be considered by e-learning teachers (Rabiman, Nurtanto & Kholifah, 2020). However, in the process

of virtual education, professors should pay attention to the learning process of the students as well as the development and production of knowledge by students with the help of technology, while striving to establish relationships with students and provide a platform for their participation in the educational process.

In general, according to what has been said and according to our findings, although the use of e-learning systems during COVID-19 has attracted the attention of all universities, since it reduces unnecessary commuting and observes social and physical distancing guidelines, and also prevents the spread of the virus, this type of education was not without flaws for students. Most of these problems can be attributed to the sudden and unforeseen change in the process of education from traditional to virtual. Moreover, according to our study, slow Internet, and also unfamiliarity of professors and some students on how to use electronic educational systems and applications, etc., were all effective factors in determining the quality of online education for better learning. So, it is necessary for university administrators to find a solution to remove the barriers to virtual education in advance.

Research limitations:

1. The limitation of the statistical community leads to the avoidance of generalizing the results to all universities.
2. Geographical dispersion and the impossibility of face-to-face meetings in the Corona period have made it impossible to identify environmental factors affecting the quality of e-learning.

Research suggestions:

1. Similar research should be conducted in other provinces to gain a comprehensive understanding of the problems and barriers to e-learning.
- 2- The pathology of virtual education from the perspective of professors should also be addressed.
3. Identify the environmental factors affecting the formation of organizational trust in public libraries.
4. Identify the motivating factors for more students' participation in virtual and distance education.
5. In order to remove the obstacles related to technical and information infrastructure and equip the minimum technical facilities for students, basic planning and action should be taken.

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