



## Experiences of students and faculty members about using virtual social networks in education: A qualitative content analysis

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### Abstract

**Introduction:** Virtual social networks are increasingly being used by academics and students in health sciences. It is necessary to examine opportunities and challenges of these networks based on the views of faculty and students to describe the existing situation and planning for proper use. The purpose of this study was to explore the experiences of students and faculty members about opportunities and challenges of using virtual social networks in education.

**Methods:** In this qualitative content analysis study, twenty-two semi-structured interviews were conducted with 8 faculty members and 14 students at Jahrom Universities of Medical Sciences. Participants were selected by purposive sampling. To analyze the data, an inductive content analysis method was used. The rigor of qualitative data was checked, using Guba and Lincoln's criteria.

**Results:** Five main categories were extracted from the data as opportunities for using virtual networks in education including improving communication skills; promoting learning; strengthening and facilitating learning of clinical procedures; creating research questions; and educating patients. Four main categories were also derived as challenges of using virtual networks in education including accuracy and validity of information; security and privacy; proper contextualization and culture-building; and control and monitor on virtual networks.

**Conclusion:** According to the results, unique opportunities and challenges were explored regarding using virtual networks in education. These opportunities and challenges and finding ways to obviate challenges and converting it to the opportunities can lead to effective virtual learning, particularly in students who mainly use this method of education, and consequently increase the quality of learning.

**Keywords:** Social network, Education, Students, Faculty, Qualitative research

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### Introduction

Virtual social network is one of the new technologies that has come into the realm

of communications over the past decade, and has dramatically affected various areas including education, learning, social interactions. The

Internet influences the world, so that more than 2.8 billion users have now reached 39% (1). Iran also accounts for roughly two percent of Internet users, with the Internet influence rate of 53 percent, accounting for more than 40 million Internet users. Iranians spend a relatively long time of daily activities in the cyberspace ranking the first in the Middle East in terms of the number of users (2, 3).

One of the main groups using virtual social networks is students and faculty members. For example, more than 75% of students are active users in the Facebook (4). Iranian students have also shown a growing interest in using virtual social networks recently. However, it is not clear why and how they use the virtual social networks (5).

Today, virtual social networks like Telegram, WhatsApp, Line and Viber are used as one of the important educational environments (6). Also, virtual training has earned a special place in health sciences. For example, in a survey of 353 American Nursing Schools in 1997, it has been reported that the number of Internet-based training courses has increased five times compared to the past five years (7). In Iran, using virtual education in medical sciences universities has been growing rapidly and this has provided a platform for students and faculty members to use these networks (5).

Although several studies have been conducted on virtual education and social networking, few studies have focused on virtual networks including Telegram, WhatsApp, Line, Viber etc., which are available to many students and faculty members on the Smartphone's. These virtual social networks are the most widely used social networks in Iran. According to a survey, students believed that using virtual social networks was accompanied by opportunities and challenges, which could affect exploiting opportunities and reducing the risks of these networks (8). Since receiver and direct audience of faculty members and students in the medical sciences universities are patients and the community, virtual training is becoming increasingly important.

Virtual social networks are commonly used by faculty members and medical students. Inappropriate use of virtual networks can lead to irreparable risks for the target group, including patients. It seems that in order to better organize and use the virtual networks in line with educational objectives, the views and experiences of students and faculty members about the existing virtual social networks in the country, it is necessary to address the opportunities and challenges of the existing

virtual social networks in education and to take the most possible advantage of the effective and cost-saving applications of these networks by the valuable experiences gathered. Therefore, this study aimed to explain and identify the opportunities and challenges of using virtual social networks in education from the viewpoint of faculty members and medical students through a qualitative study.

## Methods

This study is a qualitative research with inductive content analysis approach that was conducted at Jahrom University of Medical Sciences in 2017. In the inductive content analysis approach, code categorization is extracted directly from the interviews performed (9).

In total, twenty-two participants took part in the study including eight faculty members and fourteen students. The participants were selected using purposive sampling with maximum variation in terms of demographic characteristics. The inclusion criteria for faculty members and students were: 1) at least one year of using one of the virtual social network software (Telegram, WhatsApp, Viber, Line, etc.), 2) willingness to participate in research, and 3) capability to express experiences clearly. Also, studying in medical, nursing, midwifery, operating room, anesthetics, health, or laboratory sciences for students and membership in the faculty of medical sciences (basic and clinical sciences) was another criterion for entering the study.

The data were collected with in-depth face-to-face and semi-structured interviews, which allow the participants to express their experience freely. All interviews were conducted in a quiet place with prior agreement of the participants.

The interview started with the main questions including 1) Can you tell me about social networks and virtual networks? 2) How do you describe the status of virtual social networks in the country? How about in the field of education? And 3) What are the opportunities and challenges for virtual education, such as Telegram, WhatsApp, Line and Viber? During the interview, clarifications and in-depth questions were used to add to the richness of the interview, such as "Tell me more about this ... What does this issue mean? And what do you mean?" All interviews were recorded with the permission of the participants. Data collection continued until saturation of data, which was determined through immediate analysis of data after transcription of each interview. The principle investigator conducted all the interviews.

The data were analyzed using the qualitative

content analysis method, which provides valuable information about experiences and perceptions under investigation (10). Inductive content analysis was employed in which categories and sub-categories were extracted from the transcripts without considering previous theoretical views in accordance with Graneheim and Lundman's suggestions (11). (a) Transcribing the interview immediately, (b) reading the transcripts in order to understand its general content, (c) determining the meaning units and initial codes, and (d) classifying the initial codes into more comprehensive categories.

In the present study, all interviews were recorded and then transcribed in the Microsoft Word file. At first, the sentences or paragraphs containing aspects related to each other were named as codes. Then, the codes were extracted and labeled based on the similarities as sub-categories. Finally, various sub-categories were compared based on the relationship of the underlying meanings. The same meanings were merged and constitute categories.

Four criteria of credibility, dependability, transferability and conformability were employed to enhance the rigor (12). For credibility, the researcher spent a long time immersing in the data and the transcripts, and enough time was allocated for collecting and analyzing the information. Dependability was established by using peer's check. Sampling method, the method of coding extraction and modification were recorded to obtain sufficient conformability. Transferability was obtained by rich description of data.

The present study was approved by the ethics committee of Jahrom and Shiraz Universities of Medical Sciences in Iran (Code of Ethics in Jahrom; IR.JUMS.REC.1396.151 and Shiraz; IR.SUMS.REC.1397.361). Before starting the data collection, verbal and written informed consent was obtained from all participants. All participants were assured about confidentiality of information and voluntary participation.

## Results

Based on qualitative content analysis, five main categories for opportunities and four main categories for challenges of using virtual social networks in teaching students in medical science universities were extracted (Table 1).

### 1) Opportunities to use virtual social networks in education

#### A) Improving communication skills

One of the opportunities that have been mentioned in using virtual social networks in

education was to reinforce communication skills between faculty and students. This category includes subcategory of strengthening communication as a valuable measure in medical sciences, daily interaction, and practice communication between group members. Participants have argued that using virtual social networking can strengthen communication and enable people to strengthen their communications.

Regarding strengthening communication as a valuable measure in the medical sciences, one of the participants said: "*Strengthening communication skills and establishing proper communication are necessities of medical sciences. Using virtual networks strengthens communicative skills in students and faculty members, and this leads to improved relationships between colleagues and communication with patients.*" N # 4 Students.

Regarding daily interaction, another participant stated: "*Virtual social networks have made us interact with other people every day. Repeating these interactions frequently and in different virtual groups enhanced communication skills.*" N #10 Students.

#### B) Promoting learning through social interactions

Learning through social interactions means that any knowledge, attitude, and value in an individual develop in interaction with others. Based on the social theory, learning is also shaped in the social interaction of individuals. In virtual networks, interaction with different people at different levels of information leads to learning. This category includes subcategories of dissemination of different information, group discussion between members and meaningful learning through group interactions.

The majority of participants have highlighted promotion of learning through social interactions as important opportunities for using virtual social networks in education. They believed that information and interactions that are distributed on the virtual network between individuals would enhance learning.

As to group discussion between members and meaningful learning through group interactions, one of the participants said: "*I am a member of a scientific group in the Telegram, and I learn a lot on a daily basis, which is effective for my job and career prospects, because when a question arises and the members discuss over possible answers, it will lead to meaningful learning.*" N # 2 Students.

Regarding dissemination of different information, another participant stated: "*I am a member of a qualitative research virtual group.*

**Table 1:** Categories and sub-categories of the study

Categories	Sub-categories	Significant statement
Improving communication skills	<ul style="list-style-type: none"> <li>Strengthening communication as a valuable measure in the medical science</li> <li>Daily interaction</li> <li>Practice communication between group members</li> </ul>	Our communication skills are strengthened when we interact with other people in virtual social networks about of variety topics.
Promoting learning through social interactions	<ul style="list-style-type: none"> <li>Dissemination of different information</li> <li>Group discussion between members</li> <li>Meaningful learning through group interactions</li> </ul>	One of the positive features of virtual social networking is that we learn through scientific discussion and query and response in various virtual groups.
Strengthening and facilitating learning of clinical procedures	<ul style="list-style-type: none"> <li>The possibility of continuous observation of various clinical training procedures</li> <li>Availability of a variety of clinical educational procedures</li> <li>The possibility of using a variety of educational procedures at the patient's bedside</li> </ul>	One of the ways which I use for nursing students at a patient's bedside is that first I show them procedures using educational videos, and then we do it at the patient's bedside.
Helping to create research and innovation questions	<ul style="list-style-type: none"> <li>Helping create ideas in designing research questions</li> <li>Helping boost creative thinking and innovation</li> <li>Helping inventions especially in the field of medical equipment</li> </ul>	Membership in virtual networks and interaction with different people is helpful in creating research questions and new ideas.
Patient education	<ul style="list-style-type: none"> <li>Formation of specialized virtual groups associated with specific diseases</li> <li>Providing education by experienced personnel in the relevant field</li> <li>Tracking people's disease process</li> </ul>	For example, I'm a member in a group of multiple sclerosis patients. In this group, there are good trainings for patient self-care.
The accuracy and validity of information	<ul style="list-style-type: none"> <li>Releasing information without specific source</li> <li>Lack of confidence in the accuracy of information</li> <li>Causing undesirable outcomes after using incorrect information</li> </ul>	In my opinion, the credibility of information published on virtual social networks should be questioned unless provided with robust scientific documentation.
Security and Privacy	<ul style="list-style-type: none"> <li>Concerns about security and privacy</li> <li>Concerns about the dissemination of personal information</li> <li>Failure to identify individuals</li> </ul>	It is important for us health students to consider the privacy of patients when using virtual networks because they trust us.
Proper contextualization and culture-building	<ul style="list-style-type: none"> <li>Lack of infrastructure required for using virtual social networks</li> <li>Lack of culturalization regarding the proper use of virtual social networks</li> </ul>	We health students must to be aware of the benefits and risks of these networks before membership and use the virtual networks so that we can effectively use it.
Control and monitor on content of the virtual network	<ul style="list-style-type: none"> <li>Lack of control over setting up various types of virtual social networks</li> <li>Lack of monitoring of information and content of virtual social networks</li> </ul>	An accurate monitoring system is needed to control the setting up and content of social networks especially in the field of health science, because we deal with patients.

*In this group, subjects and approaches are presented in a variety of qualitative research and faculty members in the group offer comments and suggestions. Hence, with good interactions between the members, it leads to learning for us and other colleagues". N #3 faculty members.*

### C) Strengthening and facilitating learning of clinical procedures

Other opportunities that participants mentioned were to enhance and facilitate learning clinical procedures through virtual networks. One of the features of virtual social networking is that there are fewer long and boring texts. The

majority of the content in these networks consists of images, videos and short videos. Availability and continuous viewing of films about clinical procedures in virtual networks lead to training, enhancement and facilitating learning of these procedures. This category includes subcategory of the possibility of continuous observation of various clinical training procedures, availability of a variety of clinical educational procedures, and possibility of using a variety of educational procedures at the patient's bedside.

About possibility of continuous observation of various clinical training procedures and availability of a variety of clinical educational

procedures, one of the participants said: *“Medical clips that are released on virtual networks are easily available. Availability and convenient download of these medical clips makes them regularly viewed at leisure and when needed, which will lead to strengthening and facilitating performing clinical trials at the patient’s bedside.”* N # 12 student.

Regarding the possibility of using a variety of educational procedures at the patient’s bedside, another participant stated: *“When I was a trainee with nursing students, I wanted to teach them how to change dressing. Firstly, I showed an educational film to the students that trained the dressing change in a sterile way. Students have seen the film several times and then changed the patient’s dressing. Feedback from the students was very positive and acceptable”.* N # 5 faculty members.

#### D) Helping to create research and innovative questions

Helping to create research questions and boost innovation in people is another opportunity that can be exploited by using virtual networks. Creativity and technology in today’s world is a wonderful combination of learning and human development that has been in daily interactions of each community and information technologies, and social networks have a significant role in its development. Virtual social networks lead to scientific exchanges between people in various topics and can be the starting point for research ideas and creativity, especially for students. Students think through scientific challenges that arise between individuals in different virtual groups, and consequently their creativity and innovation grow. This category includes subcategory of helping to create ideas in designing research questions, helping boost creative thinking and innovation, and helping inventions, especially in the field of medical equipment.

About helping to create ideas in designing research questions, one of the participants said: *“I have come up with a number of occasions in which I got the idea of the issues shared in scientific groups and I could use these ideas to write a research project.”* N # 7 Faculty members.

Regarding helping inventions especially in the field of medical equipment, another participant stated: *“In my opinion, using virtual social networks can have a positive impact on our students’ creativity and initiative, in addition to training. For example, in an invention record in nursing recently, using virtual network contents effectively assisted me in facilitating the work*

*process”.* N # 14 students.

#### E) Patient education

From the viewpoint of faculty members and students, one of the most important opportunities of using virtual social networks in education was patient education. Virtual social networks play an important role in facilitating distance care which enables patients at any time and place to receive care through these virtual networks and communicate with health care team. This will increase the quality of care, reduce the costs, and increase the productivity.

The majority of participants considered opportunity to educate the patient through virtual networks efficient and cost-effective and emphasized planning an efficient teaching method through these networks. This category includes subcategory of formation of specialized virtual groups associated with specific diseases, providing education by experienced personnel in the relevant field, and tracking people’s disease process.

About providing education by experienced personnel in the relevant field, some participants said: *“In a medical center, we can determine separate groups in a virtual network under the supervision of an experienced staff who can provide both necessary training to this group of patients and follow the course of their illness.”* N # 8, 11, 14, students and N # 3 and 4 faculty members.

Regarding following up the disease process, another participant stated: *“One of the most important problems about treatment in our country is that patients are forgotten after hospital discharge, and the disease condition and treatment complications are not followed. By using an integrated social networking system that is accessible to all individuals, patients’ treatment status, patient education and drug complications can be effectively followed up after the discharge”.* N # 4 and 13 students.

#### 2) Challenges of using virtual social networks in education

##### A) Accuracy and validity of information

The most important point about virtual social networks is whether or not the content and information published on the virtual networks are sufficiently valued, which was one of the concerns of students in health science. Students in the field of health science are dealing with physical and mental issues in patients; therefore, they need to be ensured about the existence of information in the virtual networks. Presentation of information without strong scientific evidence in the virtual networks can be a huge threat for

health science students and their patients. One of the most important challenges of using virtual networks in education is accuracy and reliability of the released information. This category includes subcategory of releasing information without specific source, lack of confidence in the accuracy of information and undesirable outcomes after using incorrect information.

About lack of confidence in the accuracy of information in the virtual networks, one of the participants said: *"We cannot trust the information released on the virtual networks because it is unclear whether this information is correct or not since there is no reference. Therefore, incorrect information could have irreparable consequences."* N # 3, 5 students and N # 2 faculty members.

As to following the disease process, another participant stated: *"Because we are dealing with patients, we cannot trust any information. Trusting any information without a specific source can create irreparable complications for our patients. In the healthcare system, our first priority is to take care of patients"*. N # 6 faculty members.

#### B) Security and privacy

Another challenge of using virtual networks in education is the concern about identity, privacy and security of individuals. Usually, virtual social networks provide opportunities to put the pictures and videos on their personal page. Students can also put their personal information on these networks. Health sciences students are concerned in case their information and privacy and their patients are at risk. Therefore, they try to use fewer actual images and clinical cases (patients) to train themselves and their counterparts. This category includes subcategory of concerns about security and privacy, concerns about dissemination of personal information, and failure to identify the individuals.

About failure to identify the individuals in the virtual networks, some participants said: *"Sometimes, some information is released on the virtual networks that is unclear who the senders are. So, when the sender has no information, there is doubt about the information released."* N # 1, 2 students and N # 5 faculty members.

Regarding the concerns about security and privacy and about the dissemination of personal information, another participant stated: *"Sometimes, you want to use information, pictures and videos to train students or patients or send them something in this way and there is concern that your personal information may be published in different virtual groups, but you*

*face the challenge of disusing it"*. N # 3 faculty members.

#### C) Proper contextualization and culture-building

Another challenge of using virtual networks in the education is the lack of establishment and culture building in this regard. Today, virtual social networks are part of education. Using these networks without awareness and knowledge can have an adverse effect on students' personal and professional lives. Hence, it is important to recognize the pattern of student's behavior and the culture of using these networks because health sciences students are faced with patients and human issues. This category includes subcategory of the lack of infrastructure required for using virtual social networks and lack of acculturation regarding the proper use of virtual social networks.

About the lack of acculturation regarding proper use of virtual social networks, some participants said: *"Virtual social networking suddenly entered the country, meaning that users are getting into the process of using and installing these software without getting information about how to use it and the culture of using it."* N # 6 students and N # 4 and 7 faculty members.

Regarding the lack of infrastructure required for using virtual social networks, another participant stated: *"In our country, there is no training infrastructure at minimum level for using virtual social networks. Sometimes, a high volume of educational videos, the limited volume of the Internet, etc., result in some drawbacks in the training process in the virtual space which reduces the motivation of faculty members and students"*. N # 2 and 8 faculty members.

#### D) Controlling and monitoring the content of the virtual network

Another major challenge in using virtual networks in education is the lack of control and close monitoring of information and content on the virtual social networks. Monitoring information is one of the important features of virtual social networks. Existence of an accurate monitoring system and organization of information in the virtual networks can provide appropriate opportunities for using these networks in education at universities. Whether the students, especially in the field of health sciences, are confident that the information disseminated in the virtual networks passes through the monitoring filter, with a better attitude toward the optimal use of these networks. This category includes subcategory of lack of control over setting up various types of virtual social networks and lack

of monitoring of information and content on the virtual social networks.

About the lack of monitoring of information and content on the virtual social networks, one of the participants said: *“There is no monitoring of information released on the virtual networks in the field of education; there is no evidence about accuracy of the information that can be trusted. I think there is a need for specialized associations that control educational information, and then its release to the virtual networks.”* N # 8 Faculty members.

Regarding the lack of control over setting up various types of virtual social networks, another participant stated: *Each day, groups or channels are created on the virtual networks. As you sleep at night and wake up in the morning, you're joined to several groups on the virtual networks. The multiplicity of groups on the virtual social networks reduces monitoring, quality and mistrust of these networks.* N # 11 students.

## Discussion

In this qualitative study, the opportunities and challenges of using virtual social networks in education of medical sciences students were extracted. The results explored five main categories as opportunities and four main categories as the main challenges of using virtual networks in education. Extraction of these categories showed that proper use of virtual social networks in education could provide good opportunities for medical students, so that they are affordable in terms of time, cost, and process, which can improve communication skills; strengthen the clinical procedures; promote learning, creativity and innovation; and facilitate the process of patient education by students. The results of a qualitative study carried out by Denison et al. showed that valuable information resources, motivation, access and efficiency, and increased awareness are among the opportunities of using Smartphone's in support of changing health behaviors (13).

From the perspective of participants, extensive and active interactions between individuals on the virtual social networks enhance the communication skills and learning. Using virtual social networks increases interpersonal intelligence through critical thinking and creates multiple social interactions that foster cognitive and social competencies (14). Some studies have also shown that virtual social networks increase the interactions between students and faculty members and critical thinking skills, promote learning through colleagues, strengthen clinical skills, provide quick feedback, and create a

collaborative atmosphere (15-17).

One of the important opportunities of using virtual social networks is to educate patients through these networks. As there is a shortage of human resources in the healthcare centers to provide education to patients and lack of providing necessary training to patients is one of the important challenges of the health system in the country, using virtual social networks provides a new horizon in patients' education, accompanied with saving time, cost and human resources (18). Since accuracy and content validity of the information is very important in the field of patient education, it is necessary to develop specific protocols in order to manage the information properly by academic members in each group on the virtual social networks.

Other results of the present study are identification of challenges of using virtual networks in medical sciences education, which should be addressed through planning at the macro- and micro-levels to address these challenges. The accuracy and validity of information, security and privacy, proper contextualization and culture-building, and control and monitoring of virtual networks are important challenges in this field. The results of a study on the status of social networks from the viewpoint of students showed that 36% of respondents had little confidence in the information released on the social networks (19). To solve this challenge, which is one of the most important challenges of virtual networks in education, especially in medical sciences, we suggest that groups on the virtual networks should be developed in a specialized way, and then a person should be appointed to determine the educational credibility of the content released in the educational groups comprised on the virtual networks. This person should be trained in the field and content, and the content should be pre-released in the group by the responsible person in terms of content validity and then presented to the group in public.

Lack of adequate contextualization and acculturation on how to use virtual social networks is another challenge of using virtual networks in education. From the perspective of participants, there are infrastructural and cultural issues for using virtual networks in education including high-speed and non-filtered internet, security requirements, developing educational protocols in accordance with standards, development of culture for proper use among students and faculty members, raising awareness of the importance of using networks in education. The results of a study revealed that development of culture and provision of necessary contextualization for using

virtual networks in education is a requirement, and faculty members and students should receive necessary training and skills in this field (20, 21). Some studies showed that lack of knowledge and skills in students and faculty members in terms of proper use of virtual social networks is one of the issues that should be considered in using these networks (22).

The lack of control and monitoring on the content of virtual social networks is another major challenge that participants have referred to. One of the important reasons for faculty and students' fears of using these networks is lack of accurate monitoring in this regard (23). It seems that creation of an accurate monitoring system and involvement of specialized associations with the virtual networks can address this concern.

The results of this study are limited to the viewpoints of students and faculty members. Therefore, researchers need to know that in order to obtain more accurate and comprehensive results, they are to take advantage of the point of view of planners and economists involved in educational policy in this regard, too.

## Conclusion

The present study results identified opportunities and challenges of virtual social networks in education of medical sciences students. These opportunities include improving communication skills, promoting learning, strengthening and facilitating learning of clinical procedures, creating research questions, and educating the patients. The challenges include the accuracy and validity of information, security and privacy, proper contextualization and culture-building, and control and monitoring the virtual networks. Identifying these opportunities and challenges and finding ways to obviate challenges and convert it to opportunities can lead to effective virtual learning, especially in students that mainly use this method of education, and consequently increase the quality of learning.

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