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Online education during COVID-19: University faculty experience for basic science education

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Abstract

The coronavirus family has significant human and animal pathogens. Such that the rapid prevalence of the COVID-19 virus has caused an increasing number of cases in various countries by making pandemics around the world. Virtual education in Iran, like many other countries, has become one of the most principal educational methods by the outbreak of this pandemic and disruption of the process of face-to-face education. This paper aims to study the teaching challenges in corona condition and report some experiences in the teaching of practical basic science courses in Farhangian University in Iran. This paper suggests some steps to improve the teaching quality based on the lecturers' experiences in the online teaching of the basic sciences courses as well as tries to provide a vision based on the students' idea about the lecturers' teaching approaches in the class.

Keywords: COVID-19; Learning; Basic science education.

Introduction:

The rate of human-to-human transmission of SARS-CoV-2 is significantly high and causes a wide range of clinical manifestations. The risk of infection significantly increases in enclosed environments compared to the out door's (1). The morbidity and mortality rates of COVID-19 is related to some health conditions. People with underlying medical conditions usually have a worse prognosis (2).

Passing already four peaks of coronavirus disease, Iran is now in the fifth peak. Cities are divided into four colors of red, orange, yellow, and blue, based on the number of positive hospitalized patients, the incremental and detrimental trend of disease, and the specialized test examinations in the "intelligent management of restrictions" plan (3), and traffic restrictions were applied. Undoubtedly, the COVID-19 virus has revolutionized the teaching approaches around the world. Many countries have adopted the policy of closing all schools and educational institutions by the spread of the coronavirus in the world. This policy influenced the learning manner of more than 1.5 billion learners and shifted them toward virtual training (4).

Unquestionably, virtual learning has many advantages which cannot be obtained by the traditional academic curriculums such as access at anytime and anywhere, non-simultaneous discussion with classmates, instant feedback of tests, and flexibility. However, virtual training is not always easy despite the advantages of learning in this space (5-7).

In Iran, universities stopped their face-to-face training with the approval of the National Corona Headquarters, and all classes were held in cyberspace from mid-February 2020 and the beginning of the second semester (4). Therefore, the teachers had to adapt all their cases to remote training instantly by the great challenge of coronavirus prevalence to protect the educational consistency with the same quality (8, 9).

It was tried in this paper to share an experience of teaching one of the practical basic science courses at Farhangian University. Moreover the ideas of some students of this university are presented about holding the virtual classes by reviewing several challenges of this space because awareness of the perspective of the main audience of e-learning provides a more accurate perspective for future research. This research refers to 7 policies to cope with the virtual teaching restrictions based on the positive experiences in the virtual training of the practical basic science courses in Farhangian University of Guilan Province.

Policies learned

The combination of offline and online classes and the use of sound in the offline training

The combination of offline and online classes and uploading audio course content, such as audio PowerPoint, etc. are emphasized. Therefore, students can use the audio files and their course contents by hearing their lecturers' voices when having more concentration and access to the Internet.

Using the teaching approaches based on animation and dynamic graphics technices

Learners face misconceptions in the offline and online spaces to perceive the abstract concepts of basic science lessons. The teachers should try to solve the lack of face-to-face communication by presenting the proper learning activities with the abstract essence of the scientific concepts to cope with the problem of understating the abstract concepts in the virtual space and improve learning in the coronavirus condition proper to the course topics. The perception of most scientific concepts needs kinesthetic schemas; therefore, seemingly it is better to pay more attention to teaching based on animation techniques and dynamic graphics including motion representations, instead of giving one-sided lectures in online or offline content classes.

The presence of training assistants from other organizations in the virtual class

The relationship between the students and society is at risk in the coronavirus conditions. Thus, the part-time presence of the experts of environmental, natural resources, or other organizations in the virtual classes can motivate the students, make the online classes attractive, and make the connection between the science and society to inform the environmental events, discussions about them, and the relationship of science with society.

Making the students familiar with their learning styles

Since the students get far from the formal learning space instantly and lose face-to-face communication with the lecturer and their classmates, their learning is disrupted. One way to meet this challenge is to familiarize students with their learning styles. The lecturer can help them to cope with the training restrictions using the learning style detection tests, and thus. the student's awareness about their preferred learning style.

Interaction with students in different ways

The learners need to be sure that their education will continue uninterruptedly in the days away from the university. Moreover, the relationship between the lecturer and students only through the LMS system may not be sufficient. Since the students are young and energetic and can learn by virtual space, lecturers need to contact their students through any way they can such as email, phone, and letter.

Process-based evaluation

Faculty members should change the types of evaluation according to the situation of cyberspace. It is difficult to observe the online space and guarantee the students' non-cheating. Furthermore, students without Internet service will face problems while processes affecting their mean score negatively (10). Thus, it is essential to evaluate them permanently. Continuous presentation of assignments and constant communication between the teacher and the student is a good solution. At Farhangian University, since the beginning of the coronavirus disaster, the practical course evaluation was based on the mean scores of continuous homework and students' cooperation and participation in performing activities effectively during the semester, which was welcomed by most students.

Inspiring motivation by proposing the attractive and project-based homework

Some homework was defined in the form of Context-Based Learning Method (CBLM), inspire motivation and make the homework attractive. In the CBLM design, ecotourism projects in the home environment were on the agenda, and learners presented their reports as a film and pictures to the class (Figure 1). Moreover, the understanding of scientific concepts in the field in the classroom was improved by focusing on natural phenomena and in the form of news reading. Of course, if the student couldn't go outdoors, the films and pictures of the environments are given by the lecturer to the student to make a scientific argument about them.

Figure 1. In a separate file

Responses from the learners

The seventh policy was executed to reduce the teaching restrictions in the virtual space of the classroom to teach basic sciences at Farhangian University in Gilan province. The following, students[1] were polled at the end of the course. They pointed out some limitations:

Fateme says to the lecturer about the importance of interaction:
The positive points of this term are the direct relationship of students by the phone call to their lecturer.

According to Masoume's idea:
The positive point of the virtual class was that the students relied more on their own for better learning. Furthermore, all the students could participate similarly. The audio files and videos of the lecturer can be saved and listened to whenever needed. Access to the lecturer by phone and asking various questions was another positive point of the virtual training.

Zahra says:
If I limit my idea to the practicality of science, I must say that this course was one of the courses, for which all students, including me, had high expectations for its scientific use, and when I understood that this course is taught virtually, I told myself I would learn nothing. However, after activities and attending the class I concluded that the course that I learned would not bother mostly from virtual training I thought.

Maryam says:
I was somehow satisfied because it made me study more articles and get familiar with varied ideas. However, it was difficult because our course was practical and needed the presence of the lecturer. Besides, it was essential to be present in some places such as museums, laboratories and so on. Nonetheless, generally in confrontation with this unpredictable problem, the course was trained successfully in my idea.

Sara explains a significant idea:
Another problem of virtual training was spending a great time with a cell phone which has always a concern about eye health.

[1] Names are nicknames.

Conclusion

Meanwhile, practical courses are always exposed to challenges due to their special requirements. The principal solution should be thought to remove the training challenges due to the continuous coronavirus prevalence and the acceleration of disease in the new waves. The lecturers should not stay idle and easily translate the previous decade's tasks within a virtual form, rather they should make evolution in the training. Noticeably, the lecturers cannot return to the past natural method though they need to design and implement new training methods based on the learning results. The new learning objectives alongside the existed challenges should be explained using both the experiences and the research-based framework to make the new horizon in knowledge, skill, and attitude. In this paper, seven steps were described to improve the virtual training of the scientific concepts in the practical basic science courses at Farhangian University.

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Conflicts of interest

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