



The Effectiveness of Virtual Classrooms as an Alternative to Traditional Classrooms during the Covid-19 pandemic: Problems and Solutions

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Abstract: Education, like other institutions, is affected by many external conditions. The covid-19 pandemic has greatly affected all areas of the public and private sectors, including the economy, health, education, etc. The education system needed to find appropriate solutions for the continuation of the educational process in ways that guaranteed the safety of students, teachers and other staff. This study examined the method adopted by the University of Jeddah, like other Saudi universities, in transferring education entirely to distance learning by employing virtual classrooms. 328 students (both genders) participated in this study through a questionnaire addressing students' views, perceived problems, and possible solutions concerning the effectiveness of using virtual classrooms instead of traditional classrooms. The study was reinforced by interviews to give a clearer picture. The findings of the study summarized many issues related to students and teachers, particularly technical problems, and the fear and panic that were caused by covid-19, which had a negative impact on the education process.

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1. Introduction

The Covid-19 pandemic has enforced a new educational reality in which classrooms were closed while learning was not interrupted (Zhang, Wang, Yang, & Wang, 2020). To ensure the continuity of the educational process despite the state of total closure of educational institutions, reliance on digital platforms was deemed the best choice (Asanov, Flores, McKenzie, Mensmann, & Schulte, 2021; Jin, Lu, Liu, & Cui, 2020). The Covid-19 pandemic has entirely changed the educational setting, as all teaching and learning processes are implemented through digital sources, in view of an intensive use of technology, and the vanish of face-to-face learning as a result of the total closure of educational institutions (Mok, Xiong, Ke, & Cheung, 2021). Therefore, digital learning in the context of the Covid-19 pandemic represents a new paradigm as it entails new practices and procedures that were not previously existing.

Further, the students and teachers deal with the technical elements took another direction, which calls for thinking and analysis of the opportunities and constraints resulting from Digital learning during a pandemic (Adedoyin & Soykan, 2020). The Covid-19 pandemic has also changed the works conditions in general, and created a different work climate, and therefore the nature of the digital learning prior to the pandemic differs from its nature during the pandemic, which stressed the need to explore the uses of technology within this new context (Ibrahim et al., 2021; Shahzad, Hassan, Aremu, Hussain, & Lodhi,

2020).

In the context of the Covid-19 pandemic, virtual classrooms were the principal medium employed by Saudi universities - including the University of Jeddah- for delivering content and student's interaction with faculty members since the first day of the suspension of the schooling in Saudi Arabia on the 8th of March of 2020. The sessions that were held weekly in the University of Jeddah reached about (14,000) sessions, with an attendance of approximately (23000) students per week, from the beginning of the pandemic until the end of the first semester of the academic year 2020/2021. Consequently, it is important to examine virtual classrooms in the context of the Covid-19 pandemic, as they have been utilized as a complete alternative to traditional classrooms, compared to the previous use of virtual classrooms prior to the pandemic where they blended with the traditional classrooms. Indeed, understanding the factors that affect the students' use of virtual classrooms seems to be research priorities that enhance the effectiveness of this type of classrooms (Al-Marouf & Al-Emran, 2018). This research trend is also coinciding with the studies that have stressed the necessity of conducting research studies that identify issues associated with the use of educational technologies in the context of Covid-19 (Adedoyin & Soykan, 2020; Ibrahim et al., 2021; Shahzad et al., 2020).

Despite the great advantages of virtual classrooms that have been confirmed by previous

studies, in terms of their ability to enhance creative thinking (Songkram, Songkram, Chootongchai, & Samanakupt, 2021), enhance the quality of students' learning, increase students' motivation and satisfaction with the learning process (Abuzant, Ghanem, Abd-Rabo, & Daher, 2021). Virtual classrooms can also improve students' performance skills (Albashtawi & Al Bataineh, 2020). Nevertheless, the interaction between virtual classrooms and the general context of their use during the Covid-19 pandemic as an alternative to the traditional classrooms has resulted in some challenges that must be explored. The exploration of these challenges represents a research gap that must be examined and identified and then eventually find solutions enhance the effectiveness of the virtual classrooms in the context of the Covid-19 pandemic. Therefore, the current study aims to answer the following research questions:

1. What has been the effectiveness of virtual classrooms during the suspension of physical classrooms due to the covid-19 pandemic?
2. What are problems, and possible solutions to these problems, encountered by the students while using virtual classrooms?

Literature Review

Virtual classrooms are considered one of the most important interactive learning environments, and this is due to the many features available in virtual reality environments such as the writing e-board where the teacher can write explanations that help students understand the content. In addition, virtual classrooms can contain discussion rooms, independent small groups that give students the opportunity to accomplish a specific task cooperatively. There is also the facility for a 'chat' through which students can ask the teacher their questions without interrupting the flow (Martin, Parker, & Deale, 2012).

The main reason for using virtual classrooms should not just be their novelty, but the value they add to education. (Terry, Taylor, & Davies, 2019) asserted that: "The unique value of the virtual classroom session always needs to be borne in mind, centered on the roles of teacher and learner" (p. 211). This means that the teacher and the student have a major role in the success of the virtual classroom in education.

The employment of virtual classrooms in higher education is very beneficial in the continuity of learning for both teachers and students regardless of their locations. Virtual classrooms provide flexible methods of learning, and allow the practice of educational activities that may be difficult to practice in the traditional learning environment (Albashtawi & Al Bataineh, 2020). Virtual classrooms are also rich environments for digital multimedia that can be relied upon to support visual learning (Zeidan, Alhalafawy, & Tawfiq, 2017; Zeidan, Alhalafawy, Tawfiq, &

Abdelhameed, 2015). Furthermore, virtual classrooms enriched with digital incentives can increase students' motivation and engagement in learning process and they are likely to grant satisfaction and happiness (Alhalafawy & Zaki, 2019; Raes et al., 2020).

Virtual classrooms have gained prominence during Covid-19 pandemic, as they were the most applicable alternative to solving the problem of students not being in the regular classrooms (Zhang et al., 2020). In this line of thought, (Ng & Or, 2020) explored the use of virtual classrooms during the Covid-19 pandemic and the study showed that the use of virtual classrooms assisted in narrowing the gap between the theoretical aspects and their practical application which led to the improvement in skill performance. The study of (Asmara, 2020) also examines the challenges of teaching English via virtual classrooms during the Covid-19 pandemic. Moreover, the study of (de Oliveira Dias, Lopes, & Teles, 2020) is aimed at examining teachers' point of view on the learning challenges during crises via virtual classrooms. A study of (Muthuprasad, Aiswarya, Aditya, & Jha, 2021) geared toward investigating students' perceptions of the general preferences and emotional responses through virtual classrooms in the context of the Covid-19 pandemic. Given that, the current study comes as an attempt to study the issues and solutions associated with using virtual classrooms as an alternative to traditional classrooms from the viewpoint of Jeddah University students in the context of learning during the Covid-19 pandemic in the Kingdom of Saudi Arabia.

Theoretical Framework

Constructivist theory puts great emphasis on the active learning that takes place in real situations, and through which multiple perspectives can be presented by learners. Active learning is one of the constructive learning strategies that aims to activate the learner's role as a main axis in the educational process. Perhaps the most important advantage of active learning lies in promoting cooperative learning and teamwork. Active learning, from the point of view of constructivist theory, goes beyond the mere physical participation of learners to interacting and interpreting information at a high level (Al-halafawy & Tawfiq, 2014; Richey, Klein, & Tracey, 2010). (Wlodkowski, 2003) asserted: "Unless adults participate, they cannot learn, and without learning there is no possibility for transfer—that is, to apply what they have learned to their life or workplace" (p. 41). Although active learning may exist in traditional learning environments, the virtual world is a great platform for implementing active learning. This is consistent with (Khan, Egbue, Palkie, & Madden, 2017), as in traditional classes, the focus of online learning should be on active learning. This can be achieved due to the many advantages of virtual reality through which learners interact with audio and visual materials and share with their peers (Pirker,

Riffnaller-Schiefer, Tomes, & Gütl, 2018), in addition to creating a strong relationship between knowledge and real-life contexts. This is expressed in the statement that: "knowledge and the conditions of its use are inextricably linked" (Hannafin, Hannafin, Land, & Oliver, 1997).

Although one of the basic principles of creating a successful virtual classroom is that it focuses on interaction between learners, this principle is sometimes a great challenge for teachers, especially those who lack experience in how to design online learning environments (Rima Aditya, Permadi, Nurhas, & Pawlowski, 2019). For example, sometimes not giving enough time to complete a task can be an obstacle to well-informed virtual learning. In a study carried out by (Campbell & Stasser, 2006) compared two groups given a decision-making task looking into a criminal case with suspects. The first group consisted three people face-to-face who cooperated among themselves, while the second group consisted of three people who used simultaneous chatting. The study concluded that the chat group reached more correct solutions but only when enough time was allotted (Clark & Mayer, 2016). This leads us to what is known as the 'theory of learning mastery'. This theory suggests that learning is the ratio between the time required to complete learning and the actual time spent by the learner on learning. In addition, the actual time for learning depends on the learner's perseverance and this is influenced by motivational elements (Richey et al., 2010). This is where the role of the teacher comes in and how the teacher can motivate learners to complete the required time for learning.

Moreover, virtual classrooms are characterized by the presence of many tools such as video conferencing, online whiteboard, messaging tools, and discussions within individual groups. These features create rich learning environments in which the teacher and learners can carry out socially discussed tasks. (Richey et al., 2010) mentioned that "many rich learning environments are networked" (p.133). This can be included in the virtual classroom by allowing learners to access knowledge webs, and in turn can reinforce the principle of constructivist learning theory, which focuses on learning by exploring multiple perspectives.

2. Methodology

This study used sequential mixed-methods to attempt to answer the research questions. A questionnaire was employed as a quantitative method to give an overall picture of the effectiveness of using

virtual classrooms as an alternative to traditional classrooms, and to elicit the problems that students faced in these virtual classrooms. Then, an interview protocol was employed as a qualitative method to yield a deeper understanding of the research issue.

1- Population and Sample

The study was applied to male and female students of the University of Jeddah. One of the newest universities in the Kingdom of Saudi Arabia, it was founded in 2014 and includes a number of colleges and theoretical and applied departments. A total of 328 eligible students (146 male and 182 female) participated in the online questionnaire. Eight students (three male and five female) were selected for individual interviews after the online questionnaire. The students' selection in the current study was based on statistics extracted from the Blackboard system in the University of Jeddah showing the most active students and more using of the virtual classroom systems included in the Blackboard system.

2. Instrument

The online questionnaire consisted of three sections. The first section was factual, with questions about the student's gender, experience of learning through virtual classrooms, and the device used to enter the virtual classroom; it included an invitation to participate in the interview. The second section consisted of 12 items (Table 3) around the effectiveness of virtual classrooms in the educational process from the student's point of view. The third section consisted of 13 items (Table 4) that focused on the issues and problems students faced during the use of virtual classrooms. In both the second and third sections, a five-point Likert scale was used with "5" corresponding to "strongly agree" and "1" corresponding to "strongly disagree". The questionnaire was developed based on the characteristics of learning in virtual classrooms in the context of the Covid-19 pandemic, in addition to the elements of the questionnaires that were developed in previous research studies.

The follow up interviews had five open-ended questions. Table 1 categorizes the interview questions according to the specific research focus in this study. The interview questions were mainly grounded on how to depend on virtual classrooms as an alternative to traditional classrooms. The interview questions also focused on the issues that students encounter while using virtual classrooms and the important solutions from their point of view.

Table 1: Interview questions by specific research focus

Research focus	Interview Questions
1. Effectiveness of virtual classrooms as an alternative to traditional classrooms	1. How do you see the use of virtual classroom as an alternative to the traditional classroom? Why? 2. In your opinion, how can the effectiveness of using virtual classrooms in education be increased in the future? Give an example. 3. In your opinion, have the virtual classrooms succeeded in overcoming the suspension of physical classes due to the covid-19 pandemic?
2. Problems and solutions encountered by the students while using virtual classrooms	4. What are the most prominent educational and technical problems that you faced while learning through virtual classrooms? 5. What solutions do you suggest to solve the problems arising from the use of virtual classrooms?

The questionnaire was built by reviewing relevant previous studies (Albashtawi & Al Bataineh, 2020; Ng & Or, 2020; Zhang et al., 2020) and designing questions that reflect the points to be emphasized in this study. The draft questionnaire was then presented to a number of experts in the field of educational technology in order to measure content validity and face validity. They gave a number of suggestions that were addressed to improve the questionnaire. Then, the reliability of the questionnaire was assessed through a pilot study conducted with 12 students for which Cronbach's alpha was computed. Similarly, the interview protocol was revised by experts in the field in order to refine the questions and thereby yield a deeper understanding of the research issue. The measure stability is ensured before application, where Cronbach's α (= 0.87).

3. Results

In order to undergo descriptive analysis, Version 23.0 of the Statistical Package for the Social Sciences (SPSS) was used in this study. A total of 328 eligible students affiliated with the University of Jeddah (146 male, 182 female) participated in this study. 171 students (52.1 %) reported that they had sufficient experience in learning through virtual classrooms. Also, there were a number of different devices that were used by students to enter the virtual classrooms (Table 2).

Table 2: Devices used by participants to enter virtual classrooms

Device	Percentage
Personal computer	14.0 %
Laptop	75.9 %
Tablet (e.g. iPad)	5.3 %
Smartphone	4.8 %

1-Effectiveness of virtual classes in the educational process from the students' point of view

The findings indicated that virtual classrooms were seen as effective as an alternative to traditional classrooms, and that they played a significant role in the University of Jeddah during the suspension of the study due to covid-19. 41.9 % (n=156) of participants

agreed or strongly agreed that virtual classrooms had an important role in strengthening their participation during lectures, and 56.7 % (n=186) agreed or strongly agreed that the virtual classrooms increased their interaction compared to traditional classrooms. Also, 61.9% (n=203) of participants agreed or strongly agreed that learning through virtual classrooms allowed them to learn by trial and error. This may be due to some of the features found in the virtual classrooms, such as recording of lectures, which allow the student to refer to the lecture more than once in order to master the learning. This is consistent with 87.8% (n=288) of participants agreeing or strongly agreeing that the use of virtual classrooms allowed them to learn according to their individual abilities. This is probably because virtual asynchronous classrooms eliminate the time constraints which normally prevent students returning to lectures at any time, and this was confirmed by 78.9% (n=259) of participants. Moreover, 59.5 % (n=159) of participants agreed or strongly agreed that learning through virtual classrooms provided a variety of sources of knowledge that made education more interesting and attractive.

Participants were fairly evenly balanced on the question of whether learning through virtual classrooms reinforced collaborative work, with 37.8% (n=124) agreeing or strongly agreeing and 33.8% (n=111) disagreeing or strongly disagreeing. However, a small percentage of participants expressed more negative views, with 14.0% (n=46) agreeing or strongly agreeing that using virtual classrooms in learning was a waste of time, and 24.0% (n=79) that learning through virtual classrooms did not achieve the educational objectives. Nevertheless, the results of questionnaire generally show that virtual classrooms had a positive role as an alternative to traditional classrooms during the suspension of study in the physical classrooms at the University of Jeddah due to the spread of covid-19 (Table 3).

The interviewees had varying views about the effectiveness of using virtual classrooms in the educational process. Interviewee #1 confirmed that she benefited a lot from learning through the virtual classrooms. She mentioned that there was not much difference between learning in traditional and virtual

classrooms except for her greater isolation, as the traditional classroom provided more interaction with other students. This is consistent with (Koslow & Piña, 2015) view that there are reduced opportunities for interaction among students in online learning. The interviewee also mentioned that, at the beginning of learning through virtual classrooms, many of her colleagues were afraid of getting poor examination results because the lecturer might not be able to deliver all the required content.

Interviewees #2, 4 and 7 agreed with interviewee #1, but they stressed that it was difficult to compare learning through virtual classrooms with traditional classrooms, especially for students who had never been taught through virtual classrooms. Interviewees #3 and 5 emphasized that the application of distance learning through virtual classrooms may have succeeded in completing the

semester, but it did not succeed in delivering the content properly. They mentioned that they had never learned through virtual classrooms before the pandemic and that this may have had an impact on their lack of interest in utilizing this technology. In addition, they mentioned that perhaps fear of the corona virus itself and the experience the whole world went through may have reduced their focus on learning at the beginning of the crisis, especially since many of them had families and children.

Interviewees #6 & 8 did not differ from the other students, but they emphasized that the experience was enjoyable and opened up many ways for them to self-learn by participating in courses offered remotely. They wanted the university to continue to offer courses through virtual classrooms, even after the crisis was over.

Table 3: Students' views on use of virtual classrooms as an alternative to traditional classrooms (N=328)

Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The use of virtual classrooms in the educational process strengthened my participation during lectures.	46	156	109	15	2
2. Learning through virtual classrooms allowed more interaction compared to traditional classrooms.	62	124	44	78	20
3. Learning through virtual classrooms reinforced collaborative work with my peers and teachers.	31	93	93	67	44
4. Learning through virtual classrooms allowed me to learn by trial and error.	64	139	16	78	31
5. I would be excited to take other courses in virtual classrooms.	107	89	66	29	37
6. Using virtual classrooms boosted my technological skills and abilities.	92	76	52	90	18
7. The use of virtual classrooms in education allowed me to learn according to my individual abilities.	187	101	8	21	11
8. Using virtual asynchronous classrooms freed me from time constraints, which enabled me to return to lectures at any time.	218	41	31	18	20
9. I feel I have a positive role in the educational process through virtual classrooms.	61	96	59	47	65
10. Learning through virtual classrooms provided a variety of sources of knowledge that made education more interesting and attractive.	55	140	72	18	43
11. Using virtual classrooms in my learning wasted my time.	31	15	66	103	113
12. Learning through virtual classrooms did not achieve the educational objectives stated in the syllabus.	46	33	51	138	60

2- Issues and problems students faced during the use of virtual classrooms

The findings in the following table indicate that 70.1% (n=230) disagreed or strongly disagreed that lack of technical experience was a handicap to their learning during virtual classrooms, and 64.0% (n=210) disagreed or strongly disagreed that time constituted an obstacle to the participation of students with their peers and instructors in the virtual classrooms. Moreover, the following percentages of students did not find obstacles to be: files, presentations and other media that were presented

simultaneously (55.2%, n=174); chat messages during the virtual classrooms concurrently (42.7%, n=140); unorganized student participation (47.0%, n=154); and lack of oversight by instructor, especially during the work of students in small groups in the virtual classrooms (65.2%, n=214). Furthermore, 67.7% (n=222) of participants did not think learning through virtual classrooms was difficult.

On the other hand, a large percentage of the participants (86.0%, n=282) asserted that internet problems during the lectures in constituted a major impediment to learning in virtual classrooms. Other

problems were reported to be that there were no clear instructions on how students should participate in virtual classrooms (58.2%, n=191), and that virtual classrooms did not fit all courses (55.18%, n=181) (Table 4).

All interviewees, without exception, affirmed that the problems related to the internet were the most important obstacles they encountered during the transfer of education to distance education due to the covid-19 pandemic. Interviewee# 3 mentioned that many students lived in areas far from the city of Jeddah, where the internet did not work well, so they had to use mobile devices which were not effective for accessing many of the educational applications. Interviewee# 5 mentioned that she did not find this use of technology in distance education a major obstacle but her problem was the shortage of devices that she could use in her household; her brothers and sisters were also off school and needing these devices in order to accomplish the educational tasks required

of them. The use of synchronous education at the University of Jeddah through virtual classrooms may have made it more complicated, especially for scheduled lectures in the morning period. She stated that the university later tried to address this issue by adopting asynchronous distance education through discussions. Interviewee# 6 agreed with the other interviewees. He emphasized that learning through virtual classrooms had an important role in completing the courses, but he had a great fear of the connectivity issue because once the internet was lost, the lecture was lost. He stated that many lectures in virtual classrooms were recorded and available for the student to return to later. However, another problem was that the attendance of students was directly connected to automated monitoring systems, even online, so a student may reach high enough rate of absenteeism to be deprived of the course, although the main reason was the student's inability to connect to the virtual classroom.

Table 4: Problems facing students in virtual classrooms (N=328)

Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. I don't have enough technical experience to learn in virtual classrooms	17	32	49	93	137
2. There were some problems related to the internet during the lectures in synchronous virtual classrooms.	158	124	20	17	9
3. I lost my motivation to learn due to lack of direct contact with the lecturer.	79	42	31	109	67
4. The content in the virtual classrooms is presented in a difficult and incomprehensible way.	77	62	38	81	70
5. The lack of experience of the lecturer in how to deal with the virtual classrooms was an obstacle to my understanding of the content.	53	68	68	77	63
6. I did not have time to discuss with my colleagues or instructor due to the large number of students in the virtual classrooms.	29	34	55	122	88
7. Chat messages during the virtual classrooms concurrently caused my focus to be distracted from the main lecture.	58	37	93	79	61
8. In virtual classrooms, many files, presentations and other media were presented simultaneously, and that produced a large amount of information that was difficult to absorb.	33	75	46	104	70
9. Unorganized student participation in virtual classrooms caused noise that hindered concentration during the lecture.	42	83	49	109	45
10. There were no clear restrictions that govern sharing among students in virtual classrooms.	79	112	40	53	44
11. There was a lack of oversight by the instructor, especially during small group work in the virtual classrooms.	29	21	64	142	72
12. I found it difficult to understand the lecture given through the virtual classrooms.	31	23	53	81	141
13. Learning through virtual classrooms does not fit all courses, and there were some courses in which it was difficult to understand the vocabulary and contents.	93	88	90	40	17

The questionnaires (Table 4) had shown that the three items on lack of direct contact with the lecturer, displaying of content in virtual classrooms, and experience of the lecturer had obtained fairly close results between agreement and disagreement. These were confirmed by the interviewees, who found that the communication with the lecturers was good and continuous through multiple means of communication, and this in turn helped them to overcome many of the problems that they faced during the period of suspension of physical classes. They also mentioned that some lecturers were not familiar with the use of virtual classrooms, most noticeable in the first weeks.

Regarding the solutions that interviewees proposed to solve these problems, interviewees mentioned that the main problem lay in the internet, and this problem must be solved. Students may be responsible for part of this issue by subscribing to the internet service supported by optical fibers, but the university should have the capabilities to support its programs used in the educational process. For example, the Ministry of Education in cooperation with communications companies have supported programs for its students in the elementary, middle and high school levels, so that these programs are available free of charge to students. Also, they mentioned that the covid-19 pandemic may have opened the way for students and universities to apply distance education through virtual classrooms. Hence, universities should continue to provide this type of education, especially at the present time, so that all students may gain sufficient experience in how to learn through it.

4. Discussion and Implications

It was noted in the results of this study that students at the University of Jeddah held positive views of the effectiveness of using virtual classrooms during the suspension of the study due to the covid-19 pandemic. Although the teacher has a major role in the success of virtual education, especially in complex learning situations that need more experience (Bolstad & Lin, 2009; Rima Aditya et al., 2019), the student's role is not much different from the teacher's. In this study, 75.9 % of participants used a laptop to enter the virtual classrooms. This may have played an important role in the success of learning from virtual reality because other devices, such as iPads and Smartphones, may not guarantee effective use in education, as some applications do not work well on devices like these. In addition, the teacher has a prominent role in designing and displaying content through virtual reality, and this role cannot be overlooked, but what must be focused on, and perhaps it appeared clearly in the results of this study, is that the role of the teacher goes beyond mere preparation and design for virtual lectures. During the suspension of physical classes due to the pandemic, students lived in a state of fear and panic,

partly because of their fear of the pandemic itself and partly because of their fear about their educational future (as mentioned in the interviews). Education was suddenly transferred to distance education. Through motivation theory, the ARCS Model of motivational design by (Keller, 2010), the teacher should have the ability to build confidence among learners by letting them know what is required of them. Objectives and new assessment methods used in the period of distance education should be made clear to students. The attendance and absence strategy that was linked electronically should be clarified. In the case of technical problems beyond the control of the student, the teacher needs to be able to handle this without affecting the students, and the teacher needs to satisfy students by having fair evaluation methods.

The problems related to the internet and the lack of devices were perhaps the biggest problems that students faced in this period, and this lay behind some of the negative attitudes among students about the use of distance learning; without good internet connection these devices and distance education have no value. Universities should use the experience of this pandemic to promote the idea of distance education, especially in Saudi universities. Technical problems that may have been a worry for students regarding the use of distance education should be addressed by convincing them that the technical problems that exist in distance education may also be found in the physical educational environment.

Moreover, many challenges may face the successful implementation of distance education in Saudi universities. For example, when a number of students attend a lecture given online, and it is not possible to activate the video to show the attending students because of privacy, how can the lecturer be sure that students attend for the whole of the lecture and how can the lecturer confirm that the student who is attending now is the student registered for the course? Several restrictions must be put in place to control the educational process through distance education. The student must feel the importance of distance education and not see it as just a temporary tool that was able to address a specific situation.

Universities should also focus not only on synchronous distance education, but also on asynchronous distance education because it would help to overcome many of the problems that arise in distance education, as was evident in the frustration of some students due to the loss of many synchronous lectures. This was confirmed by a study carried out by (Lin & Gao, 2020), which confirmed that through asynchronous online courses students felt more effective and had an increased focus on learning, and this led to deeper learning. This study also asserted positive feeling among students at Chinese colleges about interacting and discussing in asynchronous online courses.

55.2% of participants asserted that virtual classrooms did not suit all courses. This may be

because virtual classrooms had previously been used as online lectures that require students and teacher to attend simultaneously. Virtual classrooms should go further by developing 3D virtual classrooms through which the student can interact with 3D virtual objects. Virtual classrooms should include applications that demonstrate the anatomy of the human body, and applications through which engineering shapes and chemical experiments can be built.

Conclusion

The spread of technology over recent years has played an important role in making it easier to apply distance education strategies. Perhaps one fundamental reason for initiating distance education lay in providing educational opportunities for learners who were unable to attend school. It was seen as important to prepare people to participate in the nation's economic and social development, in addition to spreading the principles of cooperative work, dialogue and accepting others' opinions. However, this idea soon changed to becoming a means of solving urgent educational problems, such as the cessation of regular schooling due to the covid-19 pandemic. Much harm could have been caused to students and lecturers if international universities had not taken the decision to switch to distance education. Decision-makers must have worried about the extent to which they could achieve their educational goals through distance education, especially since some students and lecturers lacked sufficient experience to benefit from using the necessary technology.

The University of Jeddah has focused entirely on distance education during this period, especially on synchronous distance education through virtual classrooms. This study has discussed the effectiveness of this experiment from the students' point of view and the obstacles that may have hindered the achievement of positive results. The results have shown that the virtual classrooms had a positive role as an alternative to traditional classrooms, especially in enhancing student participation and in giving them the opportunity to record and re-run the lectures, allowing them to learn at their own pace and convenience.

Yet, despite these positive results, there were many problems hindering the students from achieving their required goals. Most of these problems were technical, arising from poor internet connectivity, which may be solved in future by a better internet supply such as 5G. Other problems arose from the lack of clear instructions on the rights and duties of the students in the virtual classroom.

In addition, the results indicated that the virtual classrooms followed the traditional pattern, perfectly simulating a university lecture hall attended by students and teachers. This is why a large percentage of students stated that virtual classrooms would not be a suitable option for all courses, especially in science which requires experimental work. Therefore,

universities should address these issues through holding workshops to discuss integrating distance education into regular courses in more positive and interactive ways, even after the crisis was over.

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