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Measuring the degree of satisfaction among preparatory year students regarding the virtual lessons and educational platforms in the universities of the Kingdom of Saudi Arabia during the COVID-19 pandemic

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Abstract

This study aims is to examine the degree of satisfaction among students in the preparatory year at the Prince Sattam Bin Abdul Aziz University (PSAU) and Imam Abdul Rahman Bin Faisal University (IAU) regarding the virtual lessons and educational platforms during the 2019 coronavirus pandemic. It focused on the educational services provided through educational platforms and virtual lessons especially those that replaced traditional lessons during the pandemic period as an alternative option for continuing the educational process and the difficulties they faced during the pandemic. The sample represented a transitional stage between secondary and university education and the results were based on the opinions provided by males, females and students with disabilities. In addition, the study relies on a descriptive and analytical approach and contains 31 questions that were given to 276 undergraduate students. It was found that the virtual lessons through the educational platforms were a good solution for the students because they saved time and effort and supported students with disabilities. The results also showed that 78.5% expressed satisfaction with using virtual lessons and educational platforms which indicates the success of the process of transitioning to distance education during the COVID-19 pandemic. The two universities were recommended to make the necessary improvements.

Keywords: COVID-19 pandemic, Distance education, Educational platforms, Multimedia, Students with disabilities, Textual translations, Virtual lessons.

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Ethical: This study followed all ethical practices during writing.

Contents

Contribution of this paper to the literature

The originality of this study lies in keeping up with the developments and changes that have occurred in the field of education by switching to virtual lessons during the Corona pandemic as well as the target sample in this study are aware of the suitability of these lessons in achieving the necessary competencies through their distance learning experience during the pandemic period. , in addition to that, it is an important stage in their subsequent academic life as it determines their future studies In choosing whether engineering, scientific or health specializations.

1. Introduction

Education is one of the basic pillars of society. With the development of education, societies have grown and their economies have flourished. Therefore, governments and countries give great importance to education, its methods, tools and ways of developing it. According to Saudi Arabia's policy 2030 which focuses on the learner in the educational process. It outlines how to address the challenges that the educational sectors may face during the COVID-19 pandemic (Sun, Tang, & Zuo, 2020). This support continues to provide virtual lessons and electronic content through educational platforms developed during the pandemic as an alternative solution. Furthermore, this research sought ways to develop educational services that allow students to reduce the educational loss as much as possible in these exceptional circumstances.

The 21st century witnessed a qualitative leap in distance education (e-learning) which relies entirely on modern technological programs and tools to present scientific material in electronic form through multimedia tools such as videos, pictures and sound. In addition, various programs such as simulations (applications of the virtual environment) have been used to enrich the scientific content. Therefore, the importance of educational platforms is closely associated with their emergence and use as educational tools that help teachers and students interact with educational content by providing lessons that include various examples and link them to practical reality. However, the role of educational platforms in enhancing students' knowledge and helping them develop cognitive skills, such as critical thinking, reading and writing (Al-Juhani, 2019).

It is interesting to note that at the beginning of 2020, most countries throughout the world turned to e-learning during the pandemic as an alternative to regular education. In order to provide essential scientific information to all students who need to receive it electronically, regular education also relies on various electronic tools and applications. Therefore, many countries are keen to develop educational platforms by increasing storage capacity adding and activating new tools to support these platforms and providing educational content to students in various forms (Deanship of Postgraduate Studies 2020). Distance education was a saviour for the educational process in the Arab region during pandemic. Indeed, the whole world paid a great deal of attention to everything related to e-learning as it became the only ideal solution at this time.

The interest that countries and governments have shown in the e-learning process has driven them to form committees to follow up on the e-educational process through educational platforms at the school and university levels. This has resulted in the search for effective tools to provide everything possible for advances in e-learning.

This study discusses and asks questions about the importance of e-learning, its objectives and the need for it, as well as presenting previous studies that relate to this subject including their results and recommendations. The study uses a descriptive-analytical approach to reveal how teachers at Kadoori University viewed the effectiveness of e-learning during the COVID-19 pandemic. The sample for the study was chosen from 50 university faculty members who taught during COVID-19 and used the e-learning system. Most researchers advised holding training courses in the field of distance education for both teachers and students and helping to eliminate all the obstacles that prevent the use of e-learning. They also emphasized the need to combine face-to-face education and e-learning in higher educational institutions in the future (Abu-Shokeedem, 2020; Lalduhawma, Thangmawia, & Hussain, 2022).

Evaluations of the e- learning experience in information studies were represented in a course by reviewing and analysing all the documents related to the course, including lectures, discussions, assignments and methods of communication between teachers and students. In addition, this study involved a questionnaire to reveal students' opinions about their experiences with the e-course. The researcher anticipated that this study would help clarify the stages and methods of electronic transformation along with the opportunities and challenges that he faced. This study also examined how to facilitate the advancement of electronic transformation experiments in higher education, focusing mainly on information studies courses but also other courses in general (Alsalmi, 2020).

During COVID-19 teaching and learning strategies based on distance education and mixed learning theory were provided to undergraduate radiology students where they provided many recommendations for both teachers and students. For teachers, they recommended using technology to improve their teaching strategies, reviewing video conferencing platforms in advance (virtual classrooms), enhancing student participation and interaction whenever possible, involving residents in undergraduate teaching and mentoring if possible. The researchers said that students should be ready for virtual lessons, use chat to ask questions if there is no pause during the session

and provide constructive feedback so that teachers can improve future sessions and organize their time to finish any work before and after the session. The researchers emphasized that both pre-clinical and clinical curricula can be successfully transferred online through the development of high-fidelity e-learning materials and interactive virtual teaching sessions that can be incorporated into effective mixed learning (Kathryn et al., 2021).

The rapid transformation of virtual lessons across educational platforms during the COVID-19 pandemic around the world is important. Many teachers and students expressed their enthusiasm about the transformation, faculty members have already begun preparing lesson plans to provide online teaching to their students. However, dealing with the current scenario is challenging for faculty members who lack appropriate technological expertise. In addition, some students do not have access to internet services at home for remote work (Sahu, 2020).

The significant impact of the COVID-19 on education was highlighted by Sun et al. (2020) research. However, universities may take this opportunity to discover shortcomings and accelerate the reform of distance education through innovative course content, modern technology and effective management. The researchers stressed the need to transform this emergency into an occasion to further enhance international cooperation and exchange experiences, knowledge and resources to build a global online education network. Others aimed to use virtual classes to enhance the educational process that is applied in traditional lectures by identifying the effectiveness of students' use of virtual classes, the pros and cons of using virtual classes from their point of view and the obstacles that limit their use of virtual classes. Al-Abweeny, Al-Hamad, and Al-Qudah (2019) gave several recommendations to increase the efficiency of using the virtual classroom and employ it to serve the educational process.

To identify educational platforms and their advantages for self- learning and expose the impact of educational platforms on developing self-learning skills. Al-Juhani (2019) used a descriptive (analytical) approach applied to a sample consisting of 35 female students from the 28th high school in Jeddah. The results of the study stressed the role of educational platforms in increasing the students' knowledge outcome, the student's desire to use educational platforms in the curricula, the efficiency of educational platforms in developing students' critical thinking skills, students' tendency to learn freely using educational platforms and the ability of educational platforms to develop female students' reading and writing skills.

To determine the most important mathematical communication skills that second-level students should develop and identify the effects of using them Al-Zahrani (2018) selected a study sample consisting of 30 students from Saba Bint Sufyan School in the city of Al-Baha. The results of the study showed that developing sports communication skills through an electronic educational platform has a clear effect on developing mathematical communication skills in general and helps overcome the difficulties that may occur within the classroom environment.

Al-Enezi (2017) conducted a study on students of mathematics and computer majors with the goal of becoming acquainted with the educational platforms program EDMODO, the educational module application and its most important advantages in education. The study aimed shed to light on the difficulties that students in mathematics and computer science face when using EDMODO. The study sample consisted of 200 students majoring in mathematics and computers. The researcher concluded that students' personal capabilities are limited by the mathematics and computers available to them and the lack of financial means constitutes an obstacle to facilitate the use of this technology.

To discover the effects of using virtual classrooms on developing dialogue skills, academic achievement and the course's content among students of the Faculty of Sharia at Qassim University. Al-Omari (2017) used the experimental method and the observation and achievement test to attain these results following the semi-experimental method of research. While the study sample consisted of 86 students, the results showed the effectiveness of using virtual classrooms to develop dialogue skills as well as the effectiveness of virtual classrooms on students' achievement and performance in the course.

The Hinnawi (2015) study aimed to find the methods and procedures that can improve students' benefits from virtual classes at Al-Quds Open University, the reality of their use, the factors that hinder students' participation in them, or benefit from their registration and take measures to address them. Hinnawi (2015) followed the procedural research method by adopting quantitative and qualitative methods. The results showed that by addressing the obstacles students face in virtual classes, there was a great improvement in students' belief in the importance and usefulness of these classes as well as an increase in the number of participants and demand to view their recordings.

To know the effectiveness of a proposed program based on virtual classes in developing effective teaching skills for the faculty at Al-Quds Open University and their attitudes towards it, an Al-Ajrami (2013) study's sample consisted of 24 students. Also, the descriptive and analytical approach was used to determine effective teaching skills and the semi-experimental approach was used to demonstrate the effectiveness of the independent variable (virtual classes) on the dependent variable (effective teaching skills). The researcher emphasized the necessity of employing different kinds of virtual classes in teaching many subjects and holding more training courses in the field of distance education and its new applications such as Web 2.0.

To identify faculty members' opinions on virtual classrooms and their importance, the difficulties that limit the use of virtual classes, the differences between the responses of the study sample members and attributing them to various factors, the researcher prepared a questionnaire and distributed it to a study sample consisting of 169 faculty members who use a virtual classroom system in the distance educational program at King Abdul Aziz University in Jeddah.

The study's findings showed that faculty members were in favour of using virtual classes in distance education as well as suggested studies limitations. Additionally, the use of computers in on-line classes was crucial. Al-Qahtani (2010) noticed through the analysis of previous studies that the researchers had unanimously agreed on the important role those educational platforms play in enhancing and enriching the educational process through the development of self-learning skills, mathematical communication and other skills. Also, the researchers have indicated the role of virtual lessons in developing communication skills and teaching skills and raising students' achievement efficiency.

In view of the rapid and sudden shift towards distance education through virtual lessons across educational platforms in most universities as an alternative solution to regular education due to the COVID-19 pandemic.

The study came to measure the satisfaction of students in the preparatory year with virtual lessons and educational platforms in Saudi universities during the pandemic in the year 2020 and sought to develop virtual lessons and educational platforms for university education in the Kingdom of Saudi Arabia.

2. Statement of the Problem

The spread of the COVID-19 pandemic and its disruption of various educational institutions pushed them to employ technology in the educational process to ensure continuity during the rapid transition to virtual lessons and educational platforms in the education sector. The educational institutions adopted them without making sure of their readiness, efficiency and effectiveness, or ensuring that the appropriate virtual educational environment was appropriate for students. Hence, this proliferation encouraged researchers to reveal the effectiveness of virtual platforms and lessons in this study.

3. Purpose of the Present Study

The purpose of this study is to shed light on the effectiveness of virtual lessons and educational platforms in university education. This objective can be achieved by measuring the level of preparatory year students' satisfaction with the virtual lessons and educational platforms in Saudi Arabia during the COVID-19 pandemic in the 2020 academic year and determining the level of satisfaction that preparatory year students with disabilities had with the virtual lessons and educational platforms.

Additionally, another objective of this study is to expose the strengths and weaknesses of the virtual lessons and educational platforms provided to students in Saudi Arabia and the study looks for ways to develop virtual lessons and educational platforms that deal with the rapid transition to distance education during the COVID-19 pandemic.

4. Research Objectives

The researchers aimed to achieve the following objectives:

1. To measure the level of preparatory year students' satisfaction with virtual lessons and educational platforms in Saudi Arabia during the COVID-19 pandemic in the 2020 academic year.
2. To measure the level of satisfaction that preparatory year students with disabilities had with virtual lessons and educational platforms in Saudi Arabia during the COVID-19 pandemic in the 2020 academic year.
3. To highlight future ways that universities in Saudi Arabia can develop virtual lessons and educational platforms during the COVID-19 pandemic.

5. Limitations of the Research

5.1. Objective Limits

This study was delimited to measuring preparatory year students' satisfaction with virtual lessons and educational platforms in Saudi Arabia during the COVID-19 pandemic in the 2020 academic year.

5.2. Spatial Limits

This study was delimited to Prince Sattam bin Abdul-Aziz University and Imam Abdul- Rahman Bin Faisal University.

5.3. Human Limits

This study was delimited to male and female students in the preparatory year deanship at both aforementioned universities.

5.4. Temporal Limits

This study was delimited to the first semester of the 2020 academic year.

5.5. Terms and Concepts

Distance education: The researchers in this study defined "*distance education*" as "*a type of education in which electronic means and techniques are used in the educational process and the management of interactions with it*". It is also characterized by a separation between the teacher and the learner, between the learners and themselves or between the learners and learning sources. In addition, the separation is either the spatial dimension outside the premises of the educational institution and or the temporary dimension of the learning time (Deanship of Postgraduate Studies, 2020).

An educational platform was defined as: An interactive educational environment that employs Web2 technology and combines the advantages of electronic content management systems and social networks such as Facebook that enables teachers to publish lessons and goals, set assignments, implement educational activities, and communicate with teachers through multiple technologies. Also, it enables teachers to conduct electronic exams, distributes roles, divides students into work groups, helps to exchange ideas and opinions between students and teachers, shares scientific content and allows parents to communicate with teachers and see their children's results. It can help to achieve high-quality educational outcomes (Jwoaher Weebly com, 2020).

Virtual lessons were defined as "the transfer of content through the internet. The lessons can be live and directly accessed on educational platforms, remote education systems YouTube, Facebook etc or through pre-prepared educational videos (Mhtwyat Site, 2020). Virtual lessons are defined procedurally in this study as the methods used by Prince Sattam bin Abdul-Aziz University and Imam Abdul- Rahman University to manage their educational processes. At Prince Sattam bin Abdul- Aziz university and Imam Abdul-Rahman Bin Faisal university, the blackboard platform is used to manage their educational processes. It provides a safe learning environment. In virtual lessons, the faculty members insert different kinds of multimedia such as texts, images,

video, audio and others into their lectures. The student browses the content and communicates with the faculty member according to their needs through the communication channels in the system (Jwoaher Weebly com, 2020).

Students with disabilities (physically or hearing handicapped) are those who are allowed by Saudi universities rules and regulations to attend regular study sessions.

6. Methodology

A descriptive and analytical approach was used to answer the research questions and achieve the study's objectives and descriptive and analytical approach that accurately describes the phenomenon as its exists and express it qualitatively and quantitatively (McMillan & Schumacher, 2001).

Direct and recorded virtual lessons were broadcast through educational platforms to explain educational materials since the beginning of the first semester in 2020. Then, a questionnaire was presented to students to measure their satisfaction with the virtual lessons and educational platforms and search for ways to develop virtual lessons and educational platforms.

7. Study Population and Sample

7.1. Study population

They were male and female students studying at Prince Sattam bin Abdul-Aziz University and Imam Abdul-Rahman Bin Faisal University for the 2020 academic year.

7.2. Study Sample

The study sample consisted of 61 female students of the preparatory year deanship at Imam Abdulrahman Bin Faisal University and 215 male and female students of the preparatory year deanship at Prince Sattam bin Abdul-Aziz University who responded to and filled out the questionnaire distributed through electronic means of communication.

The following is a description of the study sample in terms of specialization, academic level and gender:

Table 1 presents the sample distribution based on the gender variable.

Table 1. Distribution sample based on gender variable.

Gender	Number of students
Female	188
Male	88
Total	276

Figure 1 presents the percentages of the sample distribution according to the gender variable.

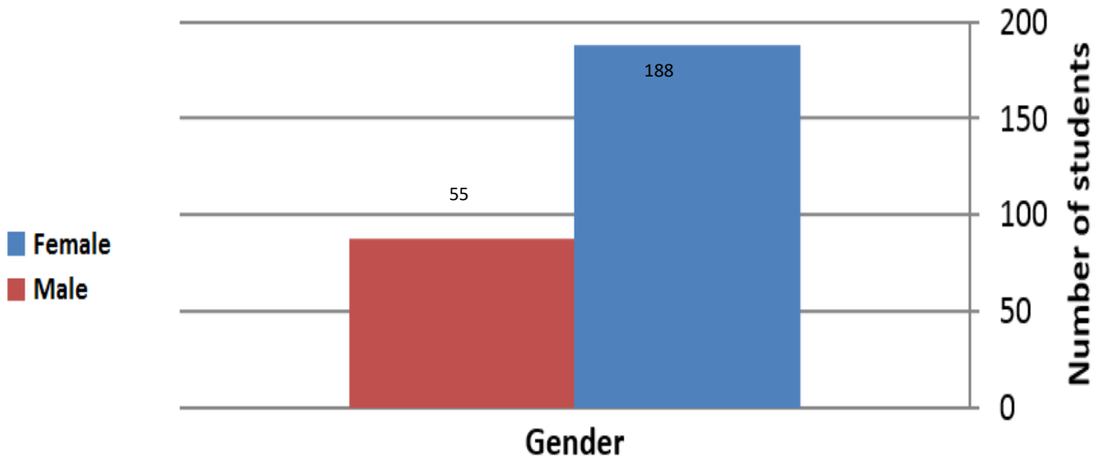

Figure 1. Percentages of the sample distribution according to the gender variable.

Table 2 presents the distribution of the sample according to the variable of specialization.

Table 2. Distribution of the sample according to the variable of specialization.

Specialization	Number of students
Humanity track	103
Scientific track	173
Total	276

Figure 2 presents the percentages of the sample distribution according to the specialization variable.

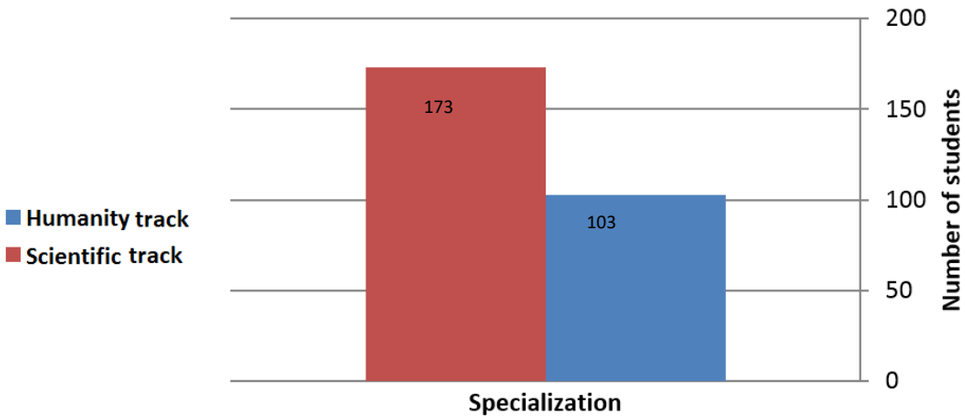

Figure 2. Percentages of the sample distribution according to the specialization variable.

Table 3 presents the distribution of the sample according to the status variable (students with disabilities).

Table 3. Distribution of the sample according to the status variable (students with disabilities).

Status	Number of students
Students with disabilities	10
Students	266
Total	276

Figure 3 presents the distribution of the sample according to the status variable (students with disabilities).

Figure 3. Distribution of the sample according to the status variable (students with disabilities).

7.3. Study Tool

A questionnaire was used that consisted of 31 questions, 28 closed questions and 3 open questions and it was built and designed using the theoretical framework and previous studies in which the researchers asked students about their opinions on virtual lessons, educational platforms and potential development. The questionnaire was divided into four sections: initial data for the sample participants, statements that measure students' satisfaction with virtual lessons and educational platforms, expressions that measure the students with disabilities' satisfaction with virtual lessons and educational platforms, and phrases that define ways to develop virtual lessons from the students' point of view. After it was built, the questionnaire was presented to two experts from the educational departments of Imam Abdulrahman Bin Faisal University and these experts expressed their views on the linguistic formulation of phrases and the linkage of each phrase to its axis to make sure of its effectiveness and the questionnaire tool was reformulated according to their suggestions and applied to an exploratory sample consisting of 276 male and female students.

8. Results and Discussion

The following is an extrapolation of the results for the three axes of valid responses:

The first axis: measures the preparatory year students' satisfaction with virtual lessons and educational platforms in Saudi Arabia during the COVID-19 pandemic for the 2020 academic year. The axis dealt with a set of points that measure these students' satisfaction with virtual lessons and educational platforms as shown in Table 4.

Table 4. Frequency of answers to the questions of the first axis (F: Frequency, P: present).

Q	Measure the satisfaction that preparatory year students had with virtual lessons and educational platforms	The scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	I am fully conversant with the technical skills necessary to handle virtual lessons and educational platforms.	F	74	107	62	18	15
		P	26.8	38.8	22.5	6.5	5.4
2	Accomplish assignments across educational platforms with ease.	F	93	104	49	21	9
		P	33.7	37.7	17.8	7.6	3.3
3	I follow virtual lessons across educational platforms with ease.	F	76	106	52	31	11
		P	27.5	38.4	18.8	11.2	4.0
4	I participate fairly in the virtual lessons across educational platforms.	F	75	109	52	28	12
		P	27.2	39.5	18.8	10.1	4.3
5	Virtual lessons across educational platforms save me time and effort.	F	109	99	36	11	21
		P	39.5	35.9	13.0	4.0	7.6
6	Virtual lessons via educational platforms are a good solution for learning and for the learner, especially in exceptional circumstances.	F	134	87	30	13	12
		P	48.6	31.5	10.9	4.7	4.3
7	I feel that the faculty member can manage and organize the educational process through virtual lessons and across educational platforms.	F	74	119	49	17	17
		P	26.8	43.1	17.8	6.2	6.2
8	I believe a faculty member can manage time during virtual lessons across educational platforms.	F	81	121	39	19	16
		P	29.3	43.8	14.1	6.9	5.8
9	A faculty member can manage student groups during virtual lessons and across educational platforms.	F	79	120	52	12	13
		P	28.6	43.5	18.8	4.3	4.7
10	A faculty member provides feedback more easily during virtual lessons and across educational platforms.	F	54	115	51	34	22
		P	19.6	41.7	18.5	12.3	8.0
11	Educational platforms provide different formats for presenting scientific content to the learner (text files, audio files, electronic braille files, translated files).	F	84	119	45	15	13
		P	30.4	43.1	16.3	5.4	4.7
12	I feel that activating modern learning methods during virtual lessons and across educational platforms (active learning, self-learning, peer learning) has become easier.	F	82	95	57	26	16
		P	29.7	34.4	20.7	9.4	5.8
13	The virtual lessons across educational platforms cover all course objectives according to the course timetable.	F	72	113	44	31	16
		P	26.1	40.9	15.9	11.2	5.8
14	I am facing a problem with frequent disconnection from the virtual lessons due to technical problems (internet, browser, hardware).	F	103	78	60	17	18
		P	37.3	28.3	21.7	6.2	6.5
	Results	F	1190	1492	678	293	211
		P	30.8	38.6	17.5	7.6	5.5

Table 5 presents the mean and standard deviation of the responses of the second axis.

Table 5. Mean and standard deviation of the responses of the second axis.

Q	Measure the satisfaction that preparatory year students had with virtual lessons and educational platforms	Mean	Standard deviation	Percentages
1	I am fully conversant with the technical skills necessary to handle virtual lessons and educational platforms.	3.75	1.09	75%
2	Accomplish assignments across educational platforms with ease.	3.91	1.05	78%
3	I follow virtual lessons across educational platforms with ease.	3.74	1.10	75%
4	I participate fairly in the virtual lessons across educational platforms.	3.75	1.10	75%
5	Virtual lessons across educational platforms save me time and effort.	3.96	1.17	79%
6	Virtual lessons via educational platforms are a good solution for learning and for the learner, especially in exceptional circumstances.	4.15	1.07	83%
7	I feel that the faculty member can manage and organize the educational process through virtual lessons and across educational platforms.	3.78	1.10	76%
8	I believe a faculty member can manage time during virtual lessons across educational platforms.	3.84	1.10	77%
9	A faculty member can manage student groups during virtual lessons and across educational platforms.	3.87	1.03	77%
10	A faculty member provides feedback more easily during virtual lessons and across educational platforms.	3.53	1.17	71%
11	Educational platforms provide different formats for presenting scientific content to the learner (text files, audio files, electronic braille files, translated files).	3.89	1.05	78%
12	I feel that activating modern learning methods during virtual lessons and across educational platforms (active learning, self-learning, peer learning) has become easier.	3.73	1.15	75%
13	The virtual lessons across educational platforms cover all course objectives according to the course timetable.	3.70	1.14	74%
14	I am facing a problem with frequent disconnection from the virtual lessons due to technical problems (internet, browser, hardware).	3.84	1.18	77%
Results		76%	1.11	3.82

Figure 4 presents the percentages of the arithmetic mean of the answers to the questions in the second axis.

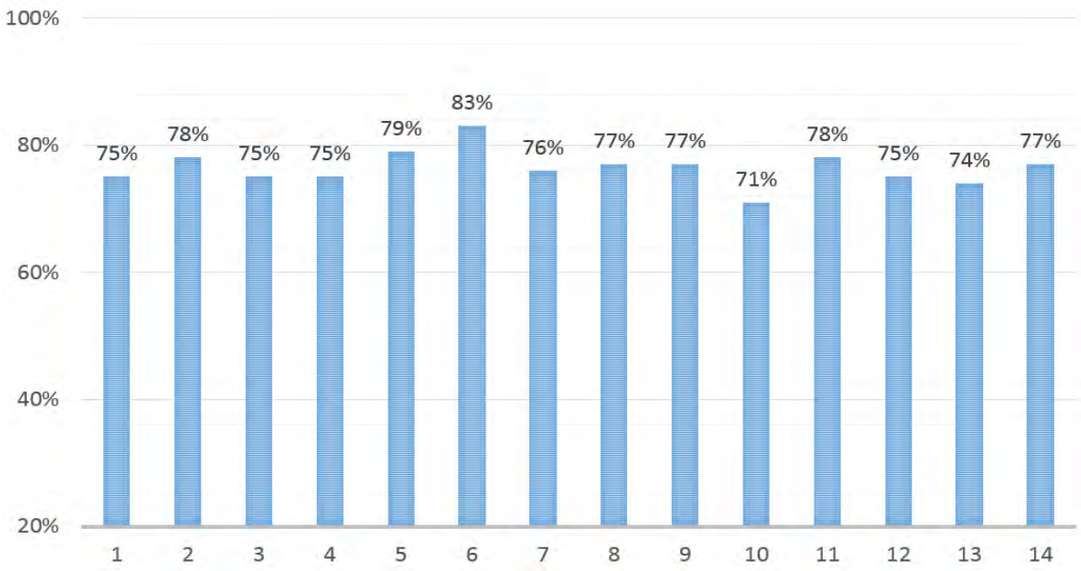

Figure 4. Percentages of the arithmetic mean of the answers to the questions in the second axis.

The first axis: It is revealed from the students' responses that there is agreement on the items of the axis in general, as the percentages were close and ranged between 71% -83% which are considered high to medium rates. Virtual lessons through educational platforms are a good solution for the learning environment and for the learner, especially in exceptional circumstances as the approval rate reached 83%. While the lowest approval rate reached 71%, the faculty member provided feedback more easily during virtual lessons and across educational platforms.

The answers of the study sample varied regarding the open question related to take the student's opinion on whether there were other obstacles or difficulties they faced while using virtual lessons and educational platforms other than those mentioned. Most of their opinions were in the presence of problems related to the slow pace of the site that provides the virtual lessons or the educational platform, the lack of clarity of some lessons and the lack of modern and interactive teaching methods. Moreover, some students considered the spatial conditions unequipped to take direct virtual lessons as well as the difficult of concentrations, inability to interact with students

and teachers, boredom, the difficulty in organizing time, the large number of assessments, tests and also the high cost of devices and inability of all students to provide devices to follow virtual lessons.

The second axis: Measure the satisfaction that preparatory year students with disabilities had with virtual lessons and educational platforms in Saudi Arabia during the COVID-19 pandemic for the 2020 academic year. The axis deals with a set of points that measure the satisfaction that preparatory year students with disabilities had with virtual lessons and educational platforms as shown in Table 6.

Table 6. Frequency of answers to the questions of the second axis (F: Frequency, P: present).

Q	Measure the satisfaction that preparatory year students with disabilities had with virtual lessons and educational platforms	The scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	I feel that the educational process through virtual lessons and educational platforms has become easier and more suitable for students with disabilities.	F	138	93	31	7	7
		P	50.0	33.7	11.2	2.5	2.5
2	Educational platforms and virtual lessons contribute to the demand for learning for students with disabilities.	F	116	103	38	12	7
		P	42.0	37.3	13.8	4.3	2.5
3	Tools are available for students with disabilities to interact with virtual lessons on the educational platforms	F	118	86	52	13	7
		P	42.8	31.2	18.8	4.7	2.5
4	Virtual lessons delivered across educational platforms helped in meeting the educational needs of students with disabilities	F	109	106	48	5	8
		P	39.5	38.4	17.4	1.8	2.9
5	There are informative guides for students with disabilities to interact with online platforms and meet their needs	F	85	95	64	18	14
		P	30.8	34.4	23.2	6.5	5.1
Results		F	566	483	233	55	43
		P	41.0	35.0	16.9	4.0	3.1

Table 7 presents the mean and standard deviation of the responses of the second axis.

Table 7. Mean and standard deviation of the responses of the second axis.

Q	Measure the satisfaction that preparatory year students with disabilities had with virtual lessons and educational platforms	Mean	Standard deviation	Percentages
1	I feel that the educational process through virtual lessons and educational platforms has become easier and more suitable for students with disabilities.	4.26	0.94	85%
2	Educational platforms and virtual lessons contribute to the demand for learning for students with disabilities.	4.12	0.97	82%
3	Tools are available for students with disabilities to interact with virtual lessons on the educational platforms	4.07	1.02	81%
4	Virtual lessons delivered across educational platforms helped in meeting the educational needs of students with disabilities	4.10	0.95	82%
5	There are informative guides for students with disabilities to interact with online platforms and meet their needs	3.79	0.94	76%
Results		4.07	0.96	81%

Figure 5 presents the percentages of the arithmetic mean of the answers to the questions in the second axis.

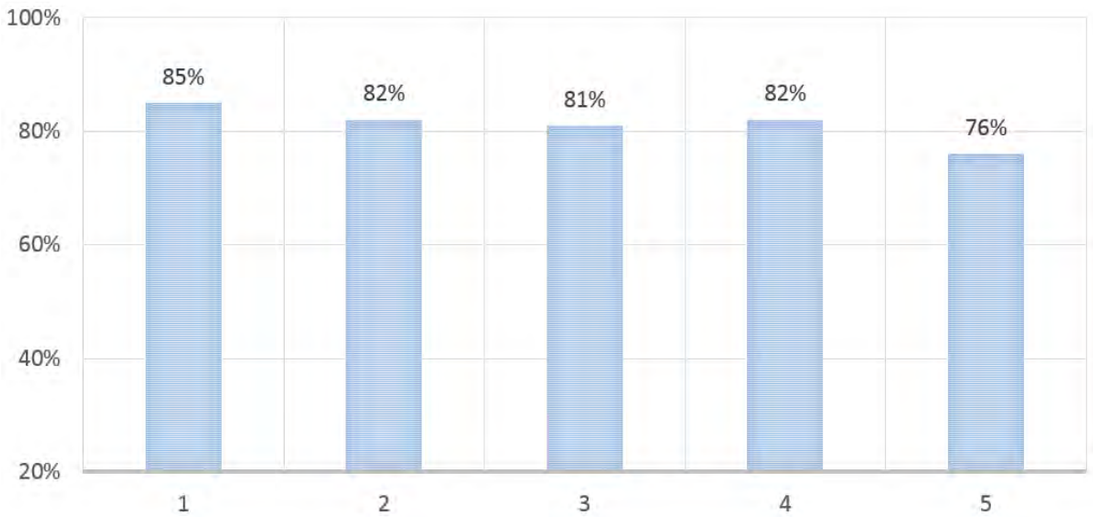

Figure 5. Percentages of the arithmetic mean of the answers to the questions in the second axis.

The second axis: it is noticed that among most of the items, the approval rates were close as they ranged between 76%-85% which are high rates. Students reported that the educational process through virtual lessons and educational platforms became easier and more suitable for students with disabilities as the approval rate reached 85%. Since the lowest approval rate was 76% identification and guidance guides for students with disabilities to deal with the electronic platforms and meet their needs have been made available. This leads us to review the

competent authorities and those at the university responsible for providing identification and guidance for students with disabilities and conducting awareness campaigns based on this evidence.

In the open question, the students were asked about their opinions of the obstacles and difficulties that they faced with their disabilities in dealing with virtual lessons and educational platforms. Their opinions were as follows: there are problems with providing test systems that consider physical disability, the inability to use hands to answer questions, the lack of aids for the blind (such as voice-overs), the lack of aids for the hearing-impaired (such as textual translations of sounds), and the possibility of health problems due to the prolonged use of electronic devices.

The third axis: ways to develop virtual lessons and educational platforms in universities in Saudi Arabia during the COVID-19 pandemic for the 2020 academic year. This axis dealt with a group of points that represented ways of developing virtual lessons and educational platforms as shown in Table 8.

Table 8. Frequency of answers to the questions of the third axis.

Q	Ways to develop virtual lessons and educational platforms	The scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	Establishing introductory courses on virtual lessons and educational platforms and how to deal with them.	F	103	110	40	16	7
		P	37.3	39.9	14.5	5.8	2.5
2	Providing the necessary and supportive technical equipment to use virtual lessons and educational platforms to improve educational outcomes.	F	114	118	25	12	7
		P	41.3	42.8	9.1	4.3	2.5
3	Providing introductory videos and guides for dealing with virtual lessons and educational platforms.	F	115	113	34	10	4
		P	41.7	40.9	12.3	3.6	1.4
4	Providing a hotline to answer students' inquiries and solve their electronic problems.	F	153	62	36	15	10
		P	55.4	22.5	13.0	5.4	3.6
5	Establishing behavioural educational goals that are compatible with virtual lessons and educational platforms.	F	109	119	34	11	3
		P	39.5	43.1	12.3	4.0	1.1
6	Providing educational content through virtual lessons and across educational platforms in multiple audio, visual and textual formats.	F	116	101	42	12	5
		P	42.0	36.6	15.2	4.3	1.8
7	Enriching virtual lessons by linking them to educational websites.	F	96	108	47	20	5
		P	34.8	39.1	17.0	7.2	1.8
8	Taking students' suggestions and ideas on how to develop virtual lessons and educational platforms.	F	132	91	35	14	4
		P	47.8	33.0	12.7	5.1	1.4
9	Keeping up with everything new in the field of virtual lessons and educational platforms.	F	108	104	47	12	5
		P	39.1	37.7	17.0	4.3	1.8
Results		F	1046	926	340	122	50
		P	42.1	37.3	13.7	4.9	2.0

Table 9 presents the mean and standard deviation of the responses of the third axis.

Table 9. Mean and standard deviation of the responses of the third axis.

Q	Ways to develop virtual lessons and educational platforms	Mean	Standard deviation	Percentages
1	Establishing introductory courses on virtual lessons and educational platforms and how to deal with them.	4.04	0.99	81%
2	Providing the necessary and supportive technical equipment to use virtual lessons and educational platforms to improve educational outcomes.	4.16	0.94	83%
3	Providing introductory videos and guides for dealing with virtual lessons and educational platforms.	4.18	0.89	84%
4	Providing a hotline to answer students' inquiries and solve their electronic problems.	4.21	1.09	84%
5	Establishing behavioural educational goals that are compatible with virtual lessons and educational platforms.	4.16	0.87	83%
6	Providing educational content through virtual lessons and across educational platforms in multiple audio, visual and textual formats.	4.13	0.95	83%
7	Enriching virtual lessons by linking them to educational websites.	3.98	0.99	80%
8	Taking students' suggestions and ideas on how to develop virtual lessons and educational platforms.	4.21	0.95	84%
9	Keeping up with everything new in the field of virtual lessons and educational platforms.	4.08	0.95	82%
Results		4.13	0.96	83%

Figure 6 presents the percentages of the arithmetic mean of the answers to the questions in the third axis.

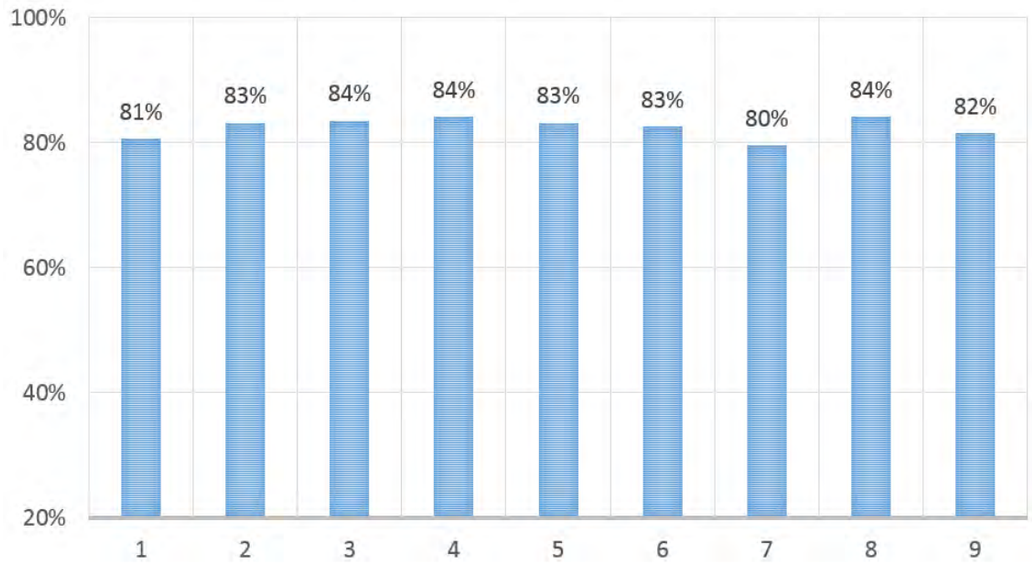

Figure 6. Percentages of the arithmetic mean of the answers to the questions in the third axis.

In the third axis, there is an 83% approval rate on all the proposals to develop virtual lessons and educational platforms. The percentages were close and high, ranging between 80%-84% and the highest approval ratings reached 84% for three proposals. First, students approve of the idea of creating introductory videos and guidance should be provided to deal with virtual lessons and educational platforms. Second, students approve of the idea of providing a hotline to answer students' inquiries and solve their electronic problems. Third, students think that their suggestions and ideas on how to develop virtual lessons and educational platforms should be considered. The seventh proposed question, to hold enriching virtual lessons by linking them to educational websites, received the lowest approval rating of 80%. Therefore, it can be concluded that teachers should be directed to enrich the virtual lessons by linking them to educational sites.

The study sample answered the open questions to learn students' opinions on whether there are ways to develop virtual lessons and educational platforms in universities in Saudi Arabia during the COVID-19 pandemic other than those mentioned in the third axis. Students mentioned that the need for teaching members to participate and take their suggestions through their experience of virtual lessons and educational platforms in an attempt to develop them. Students suggested that making virtual lessons interactive and enjoyable by introducing interactive teaching methods, such as providing educational games and using programs based on making motivational competitions about the educational material would reduce the boredom and pressure that may result from the large number of lessons that students take.

9. Recommendations

Considering the previous results, this study presents the following recommendations:

- Developing plans and programs for virtual lessons and educational platforms based on students' positive feedback.
- Considering the students' perspectives on the obstacles and difficulties that they faced during virtual lessons and the proposed educational platforms, such as interruptions or repeated exits from the virtual lessons and trying to develop solutions to these problems in coordination with the concerned authorities.
- Providing informative and guiding evidence for students with disabilities and conducting awareness campaigns so that more people know this evidence.
- Working on developing virtual lessons by introducing interactive teaching methods to motivate students and encourage them to participate.
- Measuring the effectiveness of virtual lessons and educational platforms from the perspective of the teaching staff and listening to their suggestions to develop virtual lessons and educational platforms.
- Providing various educational activities to enhance the growth of students' skills and experiences while reducing boredom.
- Considering the health problems related to the long period of use of electronic devices that affect both students in general and students with disabilities and studying these problems in cooperation with specialists.
- Developing educational platforms to support students with disabilities by providing them the means and tools to make virtual lessons and educational platforms more effective and attractive, with a focus on developing and diversifying test systems.
- Providing courses to help students organize their time and follow virtual lessons across educational platforms in a useful way.
- Proposing special initiatives to facilitate the provision of computers to students who are unable to purchase them due to the high cost.

10. Conclusion

It is concluded from the results and discussion of the study that the percentage of students' satisfaction with the use of virtual lessons and educational platforms during the COVID-19 pandemic reached 78.5%, which is a very good rate. Also, following the recommendations proposed by researchers to improve and increase the efficiency of virtual lessons and educational platforms, the percentage of students' satisfaction will likely increase which

indicates that the transition to distance education during the COVID-19 pandemic was a success. In addition, distance education can be considered as an alternative solution to traditional education and not only to support it in the coming years.

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