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Establishing Virtual Learning Environment, Private College Experience

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Abstract

Purpose: Explore the impact of the sudden shift from face-to-face learning to online learning. **Methods:** A Mixed Method approach study was conducted, where both quantitative and qualitative methods were used to collect and analyse data. The study started with the qualitative component where three focus groups were conducted to identify the SWOT analysis of the current situation and after that thorough documentation review and analysis were performed. After that, the emergency response plan was formulated with specific priorities, goals, and objectives. Following the planning and implementation of the emergency response plan, the evaluation component was conducted as the quantitative component of this study where a comprehensive sample of all undergraduate students from the Bachelor of Science in Nursing (BSN) program, Medical Laboratory Sciences (MLS) Program, Bachelor of Medicine, Bachelor of Surgery (MBBS) Program, and Doctor of Pharmacy (PharmD) Program were involved (n=371) and the faculty staff members were involved (n=48) to evaluate the Virtual Learning Environment through two online valid and reliable questionnaires were given to students and faculty members. (a) A self-administered questionnaire to measure students' perceptions of Blackboard's VLE. (b) A self-administered questionnaire to measure faculty staff members' satisfaction regarding VLE using the blackboard. **Results:** SWOT analysis was conducted and accordingly the Emergency response plan was formulated with three priorities, three goals and six objectives. Ninety-two percent of students agreed that they were engaged in the teaching sessions, and were satisfied with active learning, student-faculty contact, the assessment process, and feedback during VL sessions. While 88% of faculty staff members were satisfied with the VLE using blackboard. The key performance indicators were measured, the result of the research shows that 100% of the theory and dry laboratory sessions were conducted on time according to the planned schedule. The total number of created virtual sessions was 1043. The total number of students' attendance in virtual classes was 43686. In addition, the number of virtual group discussion sessions conducted was 702 and the total number of materials uploaded on the Blackboard was 512. Finally, the number of virtual sessions conducted for assessment purposes was 102 sessions. **Conclusion:** The Emergency Response Plan including Virtual Learning Environment framework was proposed to outline the steps to be followed in the event of an emergency suspension of classes due to the COVID-19 outbreak in Saudi Arabia. This framework delineates the various aspects considered for the successful implementation of the Virtual Learning Environment to manage the current emergency. This structured framework was the main reason for the high student and staff satisfaction percentage towards VLE.

Keywords: COVID-19, Educational Framework, E-learning, Risk Management, Virtual Learning Enviroment

1. Introduction

The Covid-19 pandemic began in Wuhan, China, in December 2019 and spread fast over the world within months. The pandemic had an impact on all aspects of life, including education. The global shutdown resulted in a lockdown of educational institutions as the situation worsened. The closure of schools, colleges, and universities created a severe situation for educational administrators, who were left with very few options. The Saudi Ministry of Education stated that online classes will replace face-to-face learning to help students continue their education in a safe and secure environment[1–3].

As a result, higher education institutions have shifted to online electronic learning methods, also known as e-learning, which employs a variety of software and hardware to replace traditional face-to-face teaching. E-learning is a broad term

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that refers to the delivery of educational programs using electronic systems that depend on technology for instructor/student interaction and distribution of course materials. It includes using advanced technology to plan, prepare, and provide learning content, as well as to enable two-way contact between instructors and students[4–6].

Blackboard is a widespread platform for online learning that is fully dependent on the internet[7]. It provides a simple means of communication between instructors and students, as well as a large storage area for learning materials[8,9]. The Fakeeh College for Medical Sciences (FCMS) has subscribed to Blackboard (an international, virtual-Learning Environment and course management system) which supports the teaching and Learning Environment, assists all students, and fosters independence. In 2017, the FCMS began utilizing Blackboard. The platform supports instructor and student interactions by providing web conferencing, enterprise instant messaging, and voice-authoring capabilities. On and off campus, the Blackboard management system gives access to educational resources related to each course[10].

The FCMS has "Risk Management Plan" since 2016, it is developed to identify, measure, and evaluate exposures and implement appropriate strategies to decrease or transfer the risk. The College has developed an "Emergency Response Plan" as a part of the Risk Management Plan to face the current situation of the pandemic. This plan provides a framework that delineates the various aspects considered for the successful implementation of the Virtual Learning program to manage the emergency (COVID-19). The "Emergency response plan" outlines the various steps of replacing face-to-face classes with virtual classes using Blackboard. This study aims to explore the impact of the sudden shift from face-to-face learning to online learning during the second semester of 2019-2020.

2. Materials and Methods

2.1 Research Design

A Mixed-method approach study was conducted to explore the impact of the sudden shift from face-to-face learning to online learning during the second semester of 2019-2020.

The qualitative part of the study was conducted through three virtual focus group meetings: the first one was with the leadership positions which are the Dean of the college and Vice Deans, and the second meeting was conducted with the faculty staff members and the third and last meeting was conducted with the administrative staff. These meetings were assigned for analysis of the current situation by the following questions:

SO Strategies - What are the College's internal strengths to take advantage of external opportunities during COVID-19?

WO Strategies - How can we improve the internal weaknesses by taking advantage of external opportunities during COVID-19?

ST Strategies - What are the strengths to avoid or reduce the impact of external threats during COVID-19?

WT Strategies - What are defensive tactics directed at reducing internal weaknesses and avoiding external threats during COVID-19?

After the focus group meetings, thorough documentation review and analysis were performed including revising the strategic plans, the program operational plans, and program specifications. Accordingly, Strengths, Weaknesses, Opportunities, and Threats were identified by evaluation of the listed ideas. Accordingly, goals and objectives had been identified.

According to the SWOT analysis, the Emergency Response Plan was formulated with identified priority and clear goals and objectives, and to achieve these objectives the Virtual Learning Environment Framework was developed and divided into three phases: planning, implementation, and evaluation.

2.2 The Planning Phase

This stage includes the Plan for online learning which has the following steps:

- Preparation of teaching session schedule.
- Planning for on-learning teaching sessions.
- Preparation for continuous, formative, and summative assessment.

2.3 Implementation Phase

2.3.1 For Teaching and Learning

All teaching sessions were conducted as scheduled using the specified teaching strategies.

2.3.2 Implementation of Assessment

All continuous assessment, a formative, and summative assessment was conducted.

2.4 Evaluation and Monitoring Phase

Evaluation of online teaching, learning, and assessment was conducted using Key Performance Indicators (KPIs) and satisifaction surveys. In addition to that the evaluation of the whole Emergency response plan. This phase included three components:

- Achievements of the Virtual Learning (VL) Goals and Objectives.
- The challenges that have been faced and overcome by the College.
- Emergency Response plan-KPIs.

For the qualitative component in the evaluation stage, the following methodology was followed:

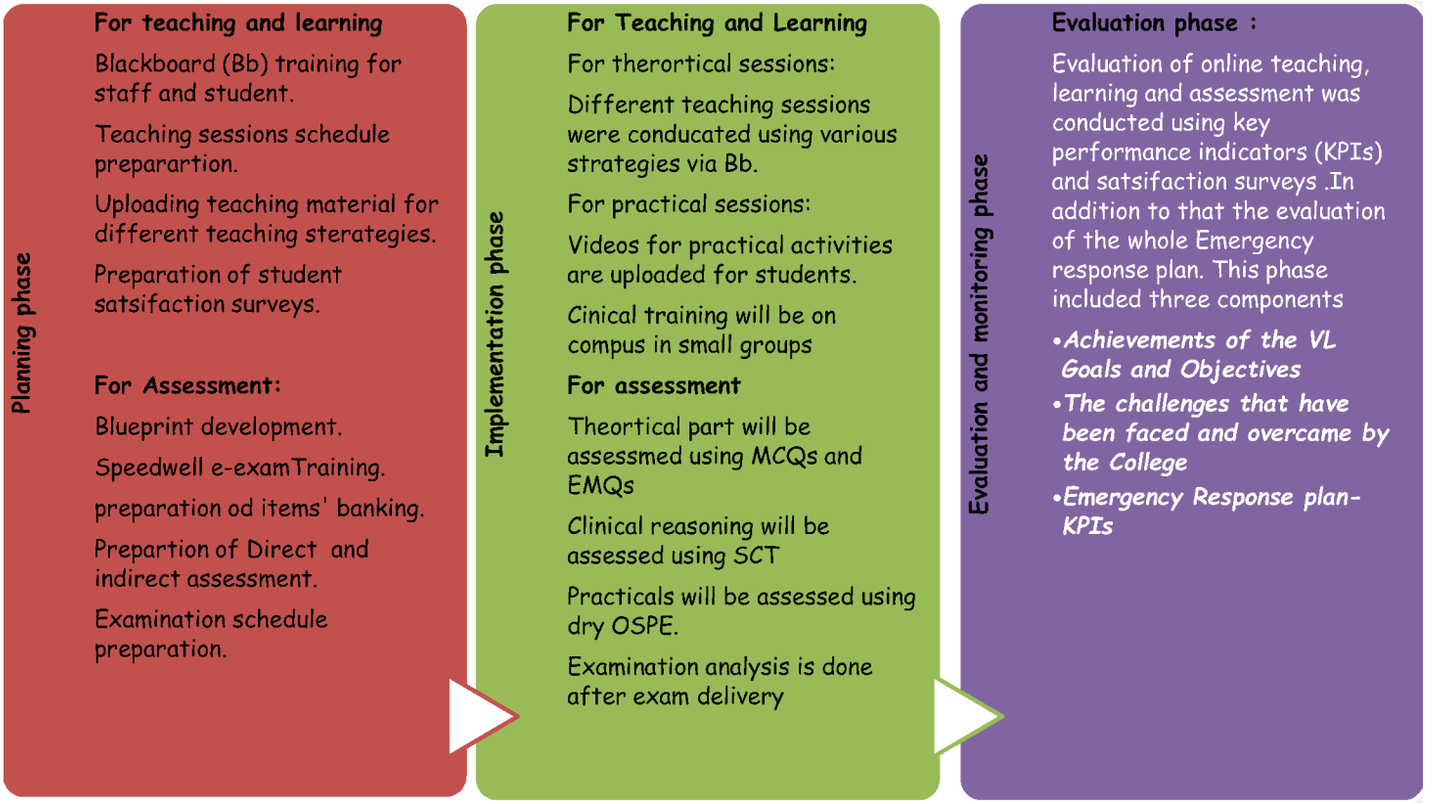

Figure 1. The three main stages for the VLE framework.

2.4.1 Sample and Population

A comprehensive sample of all undergraduate students from the Bachelor of Science in Nursing (BSN) program, Medical Laboratory Sciences (MLS) Program, Bachelor of Medicine, Bachelor of Surgery (MBBS) Program, and Doctor of Pharmacy (PharmD) Program were involved (n=371). The faculty staff members were involved (n=48).

Sample size was calculated using Epi-info CDC software calculator based on the overall positive perception of students at a private medical college towards E-learning10, and the required students sample size is 273 participants.

2.4.2 Data Collection

Using Google forms, two online questionnaires were given to students and faculty members. (a) A self-administered questionnaire to measure students' perceptions of Blackboard's VLE. The questionnaire is divided into four constructs, each with 26 items. A 5-point Likert response scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. Exploratory factor analysis was used to examine the questionnaire's construct validity and reliability (EFA). (b) A self-administered questionnaire to measure faculty staff members' satisfaction regarding VLE using the blackboard. The questionnaire is divided into six constructs, each with 26 items. A 5-point Likert answer scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used.

2.4.3 Statistical Analysis

The descriptive statistical methods include frequency, percentages, and means. Standard deviations were used to assess the staff and students' perceptions towards online learning. SPSS software Version 26 was used to analyze the data. Means and averages were used to present the data. Missing data were replaced with the mean of the missing variables.

2.4.4 Ethical Consideration

The following ethical considerations were respected during the study:

The official approval was obtained from the Institutional Review Board (IRB) at FCMS (Approval Number: 276/IRB/2022).

Participants of the study were informed about the aim of the study.

All the participants signed informed consent before participation in the study.

No influence was used on the study participants to compel them to participate in the research.

All the personal data were confidential, and the data were collected anonymously.

3. Result and Discussion

3.1 SWOT Analysis

The faculty staff members, College Administration in collaboration with the Medical Education Department and Quality and Accreditation Unit at FCMS participated in the three focus group meetings for the development of the following SWOT analysis (Figure 1). This is to assess the strengths, weaknesses, opportunities, and threats of the shift from face-to-face to online teaching during the second semester of the academic year 2019-2020.

In the Emergency Response Plan, specific priorities to manage the sudden shift from face-to-face learning to online learning were identified as follows:

Priority 1: Faculty staff members and students' readiness

Priority 2: IT and infrastructure readiness

Priority 3: Continuation of the class schedule for all programs.

Accordingly, the Goals and Objectives of the plan were identified as follows:

Goal 1: Ensure the quality of the Virtual Learning (VL) process.

Goal 2: Improve the accessibility and engagement of students in the learning process.

Goal 3: Improve the efficiency and effectiveness of the Virtual Learning process and outcomes.

Each goal was aligned with a number of identified objectives and specific initiatives as shown in Table 1.

The plan was publicized to all faculty staff members. The plan is considered as a guide to faculty staff members that helped them to continue the educational process through virtual classes, in addition to using online assessment.

Accordingly, the FCMS carried out a SWOT analysis to set new goals and objectives and move forward during the COVID-19 crisis.

Table 1. Alignment between VL goals, objectives, and initiatives

Objectives	Initiatives
Goal 1: Ensure the quality of the Virtual Learning process.	
1.1 Identify the mechanisms for effective implementation of VL.	1.1.1 Develop policies and procedures that guide the implementation of VL courses.
	1.1.2 Train the faculty members on the appropriate use of technology for the effective delivery of courses.
	1.1.3 Train the students on appropriate utilization of the VL platform (Blackboard).
1.2. Develop a framework for monitoring the effectiveness of VL courses	1.2.1 Prepare a monitoring mechanism for VL courses.
	1.2.2 Monitor students' engagement in courses delivered using the VL platform.
	1.2.3 Observe the students' achievement of Learning Outcomes.
Goal 2: Improve the accessibility and engagement of students in the learning process.	
2.1. Develop processes that ensure students' engagement in VL courses.	2.1.1 Develop a mentorship program for students.
	2.1.2 Conduct various formative assessments and feedback sessions and support the student learning process.
	2.1.3 Provide diverse VL materials to the students.
2.2. Allocate resources to support the VL courses.	2.2.1 Assess VL readiness in the organization (faculty and student preparation, infrastructure availability)
	2.2.2 Identify the VL materials including e-books and virtual reading materials.
Goal 3: Improve the efficiency and effectiveness of the Virtual Learning process and outcomes	
3.1. Develop mechanisms to monitor the students' achievements, of course, learning outcomes.	3.1.1 Develop policies and procedures for the assessment and evaluation of students learning outcomes.
	3.1.2 Gather students' and staff's feedback and suggestions to improve the process.
	3.1.3 Continue to develop online assessment methods. (Utilization of Speedwell e-System).
3.2. Adopt strategies to enhance the VL courses.	3.2.3 Ensure effective communication process among students and faculty members.

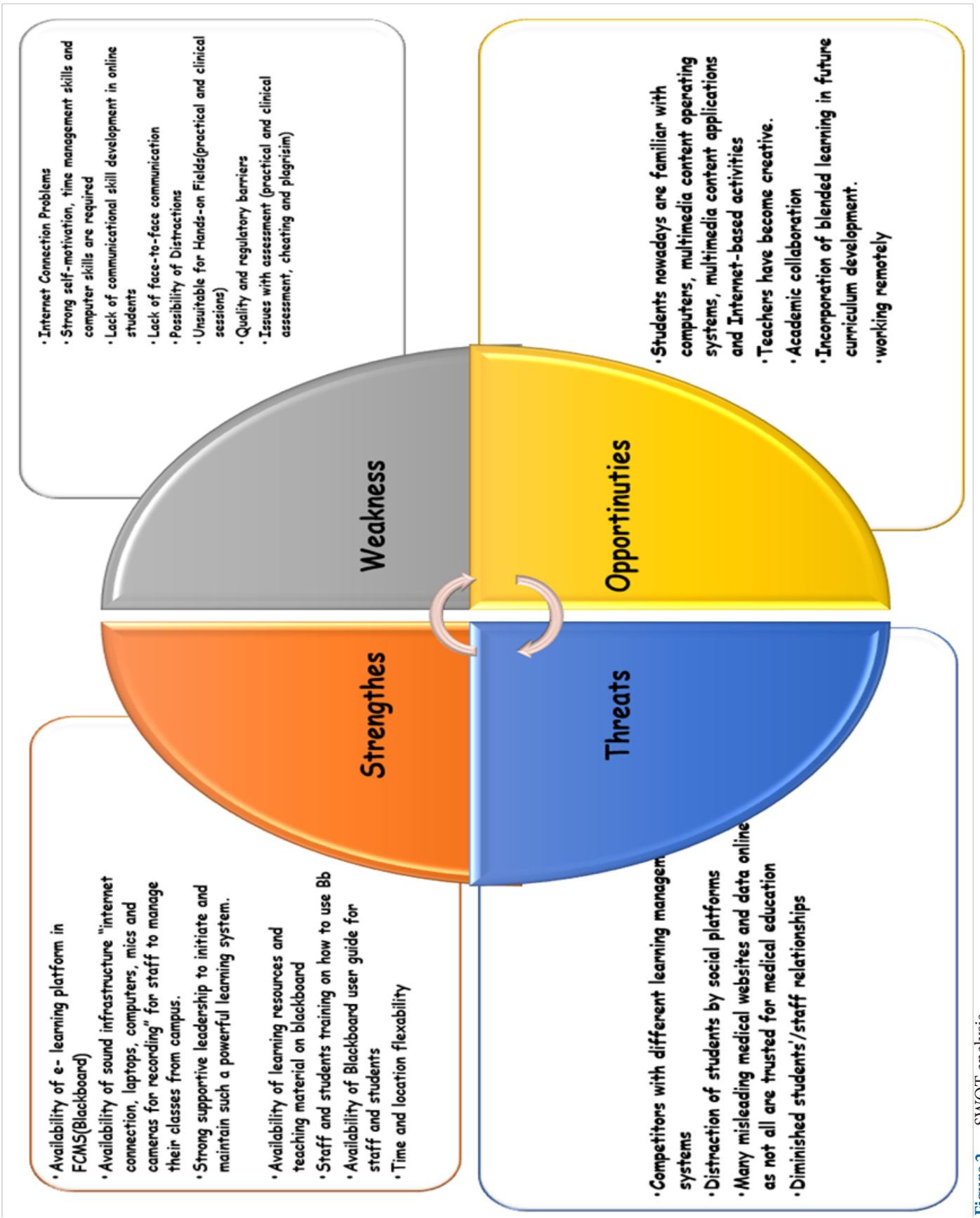

Figure 2. SWOT analysis.

3.3 The Evaluation Phase

Achievement of VL goals and objectives based on the identified initiatives is presented in Table 2. In addition, a summary of the challenges that have been faced and overcome by the College is addressed in Table 3.

3.2 The Implementation Phase

All the scheduled teaching and learning sessions as well as the assessment activities were implemented as planned.

3.3.1 Achievements of the VL Goals and Objectives

Table 2. Shows the achievement of VL goals and objectives based on the identified initiatives

Objectives	Initiatives	Achievements
Goal 1: Ensure the quality of the Virtual Learning process.		
a. Identify the mechanisms for effective implementation of VL.	1.1.1 Develop policies and procedures that guide the implementation of VL courses.	Policies and procedures for guiding the teaching and assessment process were developed. The Online teaching and learning Policy [LAT-40]. Online assessment process and management policy [LAT-41].
	1.1.2 Train the faculty members on the appropriate use of technology for effective delivery of courses.	Faculty staff members were given training on how to manage the virtual classroom by the Blackboard administrator.
	1.1.3 Train the students on the appropriate utilization of VL platform (Blackboard).	Students were given a user guide on how to access and interact during the virtual class sessions and technical support by the IT staff. User guide for accessing and management of online examinations through 'Blackboard' was publicized to the students.
1.2: Develop a framework for monitoring the effectiveness of VL courses	1.2.1 Prepare a monitoring mechanism for VL courses.	FCMS Dean conducted a daily virtual meeting with the program directors and discussed the daily progress report from all programs to ensure the continuation of the processes without any compromise. The program directors accessed and monitored the class sessions to ensure that the various teaching strategies were implemented to achieve optimum student learning through maximum student interaction during the classes. The overall quality of the teaching and learning process was monitored through specially identified Key Performance Indicators.
	1.2.2 Monitor students' engagement in courses delivered using the VL platform.	The program directors accessed and monitored the class sessions to ensure that the various teaching strategies were implemented to student engagement during the classes. An electronic questionnaire was distributed to assess students' satisfaction with the VLE. 92% of students agreed that they were engaged in the teaching sessions.
	1.2.3 Observe the students' achievement of Learning Outcomes.	Students' achievements of Learning Outcomes were monitored by direct and indirect assessment methods.
Goal 2: Improve the accessibility and engagement of students in the learning process.		
2.1 Develop processes that ensure students' engagement in VL courses.	2.1.1 Develop a mentorship program for students.	Mentorship and academic advising sessions were conducted virtually with students using PeopleSoft, Blackboard, and WhatsApp.
	2.1.2 Conduct various formative assessments and feedback sessions and support student learning process.	The total number of formative and summative assessments in the second semester of 2019-2020 using Blackboard was 102
	2.1.3 Provide diverse VL materials to the students.	An electronic questionnaire was distributed to assess students' satisfaction with the VLE Students' satisfaction with the effectiveness of active learning during VL sessions was 4.6/5.0 Students' satisfaction with the effectiveness of student-faculty contact during VL sessions was 4.6/5.0.

2.2 Allocate resources to support the VL courses.	2.2.1 Assess VL readiness in the organization (faculty and student preparation, infrastructure availability)	Faculty staff members were given training on how to manage the virtual classroom by the Blackboard administrator. Students were given a user guide on how to access and interact during the virtual class sessions and technical support by the IT staff. The following KPIs are used for monitoring the VL: The total number of the created virtual session was 1043. The total number of virtual group discussion sessions conducted was 702 The total number of staff who accessed Blackboard was (67/67) 100% The total number of synchronous sessions was 580. The total number of the training sessions regarding using Blackboard for faculty staff members was 2. The total number of the faculty staff members who attended the training sessions conducted by the Blackboard administrator was 62. Total number of training sessions regarding using Blackboard for students was 2. Students' satisfaction with Blackboard service quality was 4.5/5.0.
	2.2.2 Identify the VL materials including e-books and virtual reading materials.	Total number of references uploaded and discussed on Blackboard was 512.
Goal 3: Improve the efficiency and effectiveness of the Virtual Learning process and activities		
3.1 Develop mechanisms to monitor the students' achievements of course learning outcomes.	3.1.1 Develop policies and procedures for assessment and evaluation of students learning outcomes.	Policy and procedures for guiding the assessment process were developed. The online assessment process and management policy [LAT-41]
	3.1.2 Gather students' and staff's feedback and suggestions to improve the process.	Students' satisfaction with the effectiveness of the assessment process and feedback during VLE was 4.6/5.0 Overall students' satisfaction with the VLE using blackboard was 4.5 Overall faculty satisfaction with the VLE using blackboard was 4.4
	3.1.3 Continue to develop online assessment methods. (Utilization of Speedwell e-System)	FCMS established Speedwell e-System in January 2020. The system includes most types of questions (MCQs, EMQs, essays, OSCE). The process is regulated through policies and procedures. All the faculty were trained on how to use speedwell. The training workshops were divided into three phases. The first phase was conducted in March 2020 by a representative from the speedwell company. The second phase was conducted on-site to train key users (TOT). during this phase, a speedwell user guide was developed for the faculty and the students. Then, serial workshops were arranged by the key users for all the faculty covering the following areas: Construction of questions and completing banks. Grouping of questions according to the relevant topic and CLO. Making tests based on the blueprint. Producing reports
3.2 Adopt strategies to enhance the VL courses.	3.2.3 Ensure effective communication process among students and faculty members.	Students' satisfaction with the effectiveness of student-faculty contact during VL sessions was 4.6 The proportion of faculty staff members who attended faculty development sessions to enhance their teaching skills using the e-Learning platform was 75%.

3.3.2 The Challenges that have been Faced and Overcame by the College

Table 3. Shows a summary of the challenges that have been faced and overcome by the College

	Challenges	Strategies adopted to overcome these challenges
1.	**Management of the current emergeny.**	Prepared an "Emergency Response Plan". Formulated an "Emergency Response Team" with the following functions and responsibilities. Ensure continuation of the regular class schedule for all offered programs. Facilitate timely communication with staff members and students on any updates. Make decisions on conducting laboratory sessions, clinical sessions, and internship training. Monitor the implementation of the plan through daily progress reports. Ensure the availability of resources and technical support for the smooth running of the sessions. Make contingency plans by foreseeing further developments. Monitor faculty staff members' and students' feedback and satisfaction. The team was chaired by the FCMS Dean and the membership include vice deans and program directors.
2.	**Continuation of teaching and learning process in the event of an emergeny (COVID-19).**	"Emergency Response Team" developed policies and procedures that guide and ensure the optimal standards of virtual teaching, learning, and assessment processes. Class schedules were prepared and announced for faculty members and students according to the program study plan for all offered programs at FCMS. Faculty staff members were given training on how to manage the virtual classroom by the Blackboard administrator. Continuous IT support was provided by the College IT team. Students were given a user guide on how to access and interact during the virtual class sessions and technical support by the IT staff. 'BlackBoard' Virtual Learning platform was utilized for the virtual teaching and assessment process. Here it is worth mentioning that FCMS has been using this platform for managing the teaching-learning and assessment (formative assessment) process for the previous academic years. So, the faculty staff members, and students were quite familiar with the system and its applications.
		The theory, practical and clinical sessions were conducted according to the following: <u>Theory Classes:</u> According to the class schedule the course instructors logged into the system and deliver the classes by facilitating virtual interaction between the instructor and students and thus ensuring an interactive classroom experience. The recorded videos were accessible to students after the session. The students' attendance and participation in these sessions were monitored and reported through the system. <u>Laboratory sessions:</u> The course instructors' video tapped the procedures beforehand and the videos of procedures were uploaded according to the laboratory session schedule. Hands-on training on all these procedures was conducted after resuming the regular sessions to ensure students' competency. <u>Clinical sessions:</u> For courses with a clinical component, videos were uploaded to the students for demonstration of specific skills and the instructor explained the procedure virtually but students' hands-on training was postponed after resuming the regular sessions.
3.	**Assessment process**	The theory component of the course: Theory examinations were conducted online by using Multiple Choice Questions according to the blueprint. The examination schedules were prepared for all programs and communicated to the students. Laboratory component of the course: Online laboratory session assessment was conducted through the Blackboard" (spots/Dry OSPE). The clinical component of the course: Clinical sessions and assessments were postponed until resuming regular classes.

4	**Ensuring the confidentiality of the online assessment process:**	Students and faculty members were given clear guidelines and orientation on the process by the 'Assessment Center'. User guide for accessing and management of online examinations through 'Blackboard' was publicized to the students. To access the online examination, students agreed to follow the code of conduct and confidentiality policies of FCMS. Faculty staff members and other support staff involved in the process also signed a confidentiality undertaking.
5.	**Monitoring the quality of teaching and learning process.**	A policy and procedure for Monitoring the quality of the online teaching and learning process were developed. FCMS Dean (Chairman of the 'Emergency Response Team') conducted a daily virtual meeting with the program directors and discussed the daily progress report from all programs to ensure the continuation of the processes without any compromise. The program directors accessed and monitored the class sessions to ensure that the various teaching strategies were implemented to achieve optimum student learning through maximum student interaction during the classes. A daily progress report was submitted to the College Dean. Students were given a variety of communication platforms to reach the faculty members and academic advisors through Blackboard, PeopleSoft, and mobile applications. Surveys were prepared to monitor students' satisfaction with the virtual teaching and learning process as well as to measure the achievement of Course Learning Outcomes. Virtual peer review sessions: FCMS is keen to continue its monitoring role for teaching and learning, so the peer review of teaching is continued to monitor the quality of teaching practices in the four undergraduate programs. The total number of virtual peer review sessions conducted in the second semester of 2019-2020 was 12. The overall quality of the teaching and learning process was monitored through specially identified Key Performance Indicators
6	**Faculty Professional Development**	Opportunities were available for faculty staff members to improve and develop their professional skills and capabilities during COVID-19. A series of virtual activities were conducted in the second semester of 2019-2020. The total number of staff development activities conducted virtually was 19. The total number of academic development activities conducted virtually was 5. The total number of professional development activities conducted virtually for the MBBS program was 5 The total number of professional development activities conducted virtually for the MLS program was 5 The total number of professional development activities conducted virtually for the BSN program was 4.
7	**Academic Advising sessions are planned and conducted to address and assess students' needs**	Academic advising sessions were conducted virtually using PeopleSoft and WhatsApp groups. Students' satisfaction with the academic advising process was 4.6/5.0.

3.3.3 Emergency Response Plan-KPIs

3.3.3.1 Student Satisfaction on VLE

Table 4. Student Satisfaction regarding VLE at the program and institutional levels (n=371)

KPIs: Student Satisfaction with VLE	MLS Program	BSN Program	Pharm D Program	MBBS Program	Overall
Students' satisfaction with the effectiveness of student-faculty contacts during Virtual Learning sessions.	4.7	4.4	4.8	4.5	4.6
Students' satisfaction with the effectiveness of teamwork during VLE.	4.7	4.4	4.8	4.5	4.6
Students' satisfaction with the effectiveness of active learning during the Virtual Learning sessions.	4.7	4.4	4.8	4.5	4.6
Students' satisfaction with the effectiveness of the assessment process and feedback during Virtual Learning Environment.	4.6	4.4	4.8	4.5	4.6
Students' satisfaction with Blackboard service quality.	4.6	4.4	4.8	4.3	4.5
Students' satisfaction with the overall effectiveness Virtual Learning experience.	4.3	4.2	4.7	4.1	4.3
Average per Program	**4.6**	**4.4**	**4.8**	**4.4**	**4.5**
Note: The rating scale is out of 5.0					

Table 4 shows that the students were satisfied with VLE with average 4.5/5.0. The PharmD Program students were highly satisfied with the VLE (4.8/5).

3.3.4 Faculty Staff Members' Satisfaction with VLE (n=48)

Table 5. Faculty staff members' satisfaction regarding VLE at the program and institutional levels (n=48)

KPIs: Faculty Satisfaction with VLE	MLS Program	BSN Program	PharmD Program	MBBS Program	Overall
Faculty staff members' satisfaction with Blackboard system quality.	4.6	4.7	4.8	4.5	4.65
Faculty staff members' satisfaction with the virtual teaching benefits.	4.3	4.6	5.0	4.4	4.57
Note: The rating scale is out of 5.0					

Table 5 shows that the faculty staff members were satisfied with VLE. They were highly satisfied with Blackboard system quality with an average of 4.65/5.0.

3.3.5 Professional and Academic Development Activities

Table 6. Number of professional and academic development activities

KPI	Professional Development Activities				Academic Development Activities	
	MLS Program	BSN Program	Pharm D Program	MBBS Program		Total
Number of staff development activities conducted virtually using Blackboard	5	4	5		5	19

Table 6 shows that the total number of professional and academic development activities that were conducted in the second-semester academic year 20129-2020 was 19 activities. 14 professional development activities at the program level and 5 academic development activities at the institutional level.

3.3.6 Peer Review Visits

Table 7. The Number of peer review visits conducted per program

KPI	MLS Program	BSN Program	PharmD Program	MBBS Program	Overall
1. Number of peer reviews conducted per program to ensure the quality of virtual teaching sessions.	3	3	2	4	12

Table 7 shows that 12 peer review visits were conducted by one peer from the same specialty in collaboration with the MED and program directors to ensure the quality of virtual teaching sessions. The table shows that 4 peer review visits were conducted in the MBBS program, and 3 visits were conducted in both BSN and MLS programs. While 2 visits were conducted in the PharmD program.

3.3.7 Conduction of the Educational and Assessment Sessions

Table 8. KPIs for monitoring the conduction of the online education and assessment sessions

KPIs	Results
The proportion of theory classes conducted as per the class schedule.	100%
The proportion of laboratory sessions conducted as per the class schedule *. *Wet practical and clinical classes were postponed.	100%
Total number of created virtual sessions.	1043
Total number of synchronous sessions	580
The total number of students' attendance in virtual classes.	43686
The Number of virtual group discussion sessions conducted.	702
The total number of materials uploaded on the Blackboard	512
The Number of virtual sessions conducted for assessment purposes.	102

Table 8 shows that 100% of the theory and dry laboratory sessions were conducted on time according to the planned schedule. The total number of created virtual sessions was 1043. The total number of students' attendance in virtual classes was 43686. In addition, the number of virtual group discussion sessions conducted was 702 and the total number of materials uploaded on the Blackboard was 512. Finally, the number of virtual sessions conducted for assessment purposes was 102 sessions.

4. Discussion

With the pandemic forcing all educational institutions to seriously consider e-learning tools and resources[11], FCMS carries out a SWOT analysis as part of the emergency response plan. This analysis helped the college to set new goals and objectives and move forward. Accordingly, the VLE framework was formulated with three stages to achieve the goal and objectives of the emergency response plan. Achieving the mentioned goals and objectives and measuring the identified KPIs of the structured framework for VLE was mandatory to assess the effectiveness of this framework. Each goal is aligned with several identified objectives and specific initiatives that were monitored through identified KPIs. Most of the KPIs were highly achieved in the FCMS plan and this reflects a good commitment from the staff members and students as well.

This study provides a framework that delineates the various aspects considered for the successful implementation of the Virtual Learning Environment to manage the emergency during the COVID-19 pandemic. The institution was fully equipped and confident to deliver an interactive classroom experience to our students by using our latest updated technology provisions.

The study showed that the shifting from face-to-face education to e-learning went smoothly, the smooth transition was due to the structured framework, all the challenges in different educational areas were identified and the strategies to overcome these challenges were adopted. For example, one of these challenges was a continuation of the teaching and learning process in the event of an emergency (COVID-19) and the adopted strategies to overcome these challenges was to adopt e-learning and use Blackboard as the teaching and learning and assessment platform. To do that in effectively and properly, orientation was given to students and staff about Blackboard utilization and using its interactive tools effectively. One of the KPI related to this area is assessing Students' satisfaction with the effectiveness of active learning during Virtual Learning sessions that showed great satisfaction from students, and

this was inconsistent with a study conducted at Al-Fasial university that reported challenges related to using technology during COVID-19[6]. The reported challenges to online medical education during the COVID19 pandemic included issues related to communication and the use of technology tools. In our study, most of the students were satisfied because of their experience of using online tools before this pandemic situation. The prior experience provided an extra advantage to them while using Blackboard. In addition to the formulation of structured guide about how to use Blackboard, in addition to that the structured orientation program offered to students before starting online/virtual teaching and learning.

Regarding Student Satisfaction with VLE at the programs and institutional level, the result shows that the students were satisfied with VLE with an average of 4.5/5.0 at the institutional level. In addition to that, the PharmD Program students were highly satisfied with the VLE. This result was consistent with the result in a study conducted at Maastricht University for undergraduate medical students where students' perception was investigated regarding the effects of a Virtual Learning Environment (VLE) and the students were satisfied with the VLE.

In addition, an analysis of the faculties' perception of online learning during COVID-19 showed that the faculties were highly satisfied with online teaching and blackboard utilization. The study showed that faculties were satisfied with the online experience, and this was like the study conducted in Jordan where the staff were satisfied with their experience in online teaching and learning[12]. The high satisfaction rate in our study is owing to the proper orientation given to staff about the utilization of Blackboard.

One of the main challenges faced by FCMS was the assessment process and ensuring confidentiality of the online assessment process. FCMS dealt with these challenges effectively as follows: the theoretical examinations were conducted online by using Multiple Choice Questions according to the blueprint. These MCQs were assessing critical thinking and clinical reasoning and the time was limited to avoid cheating, in addition to that, the examination schedules were prepared for all programs and communicated to the students with clear guidelines and regulations for the exam. Moreover, the practical Examination also was conducted as an online/dry OSPE with clear guidelines announced for students. This structure outline leads to a high percentage of student and staff satisfaction. The result of the current study was consistent with a study conducted in Jordon where all medical schools were included[13]. This study aims to identify possible challenges, limitations, satisfaction as well as perspectives for this approach to learning and it shows that, despite the established regulation and planning regarding the examination process by universities, there are still some obstacles encountered by students. One of the issues is, there is no unified mechanism in terms of the duration and way of the exams which results in confusing the student. Therefore, the main reason that our students and faculty are more satisfied with the online exam process and Virtual Learning Environment is the proper guidelines for students and staff. The current student and an additional reason of high student and staff satisfaction is the sufficient training and orientation sessions conducted for the students and staff. As FCMS provided sufficient training for students for using the Blackboard system to join the virtual classroom, submit the assignment, and other useful features.

In addition to that, one of the main reasons that contributed to the high satisfaction of VLE is conducting faculty development sessions for staff about teaching, learning and assessment methods.

Regarding the monitoring of the teaching, learning, and assessment process during the pandemic, Several KPIs were calculated to assess this, one of the important KPIs was the numbers of peer-review sessions conducted to ensure compliance the teaching strategies stated in each course Student Study Guide.

This study shows that the outline and structured framework were very helpful tools to support online teaching, learning, and assessment and get a high satisfaction rate from students and staff. In addition to that the variety of options and features offered by a Learning Management System (LMS) provides FCMS with a powerful mechanism for educational content representation.

5. Conclusion

The Emergency Response Plan including Virtual Learning Environment framework was proposed to outline the steps to be followed in the event of an emergency suspension of classes due to the COVID-19 outbreak in Saudi Arabia. This framework delineates the various aspects considered for the successful implementation of the Virtual Learning Environment to manage the current emergeny. This structured framework was the main reason for the high student and staff satisfaction percentage towards VLE.

6. Ethics Statement

The official approval was obtained from the Institutional Review Board (IRB) at FCMS (Approval Number: 276/IRB/2022).

7. References

1. Khalil R, Mansour AE, Fadda WA, et al. The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students' perspectives. 2020; 20(1):1-10. https://doi.org/10.1186/s12909-020-02208-z PMid:32859188 PMCid:PMC7453686
2. Al-Kadri HM, Al Moamary M, Al Knawy BJAoTM. Framework for curriculum delivery during COVID-19 pandemic in a health sciences university. 2020; 15(4):185. https://doi.org/10.4103/atm.ATM_493_20 PMid:33381232 PMCid:PMC7720741
3. Tanveer M, Bhaumik A, Hassan S, Haq IUJJoEE. Covid-19 pandemic, outbreak educational sector and students online learning in Saudi Arabia. 2020; 23(3):1-14.
4. Al Zahrani EM, Al Naam YA, AlRabeeah SM, et al. E-Learning experience of the medical profession's college students during COVID-19 pandemic in Saudi Arabia. 2021; 21(1):1-11. https://doi.org/10.1186/s12909-021-02860-z PMid:34416889 PMCid:PMC8378523
5. Shah AUM, Safri SNA, Thevadas R, et al. COVID-19 outbreak in Malaysia: Actions taken by the Malaysian government. 2020; 97:108-116. https://doi.org/10.1016/j.ijid.2020.05.093 PMid:32497808 PMCid:PMC7264933
6. Mishra L, Gupta T, Shree AJIJoERO. Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. 2020; 1:100012. https://doi.org/10.1016/j.ijedro.2020.100012 PMid:35059663 PMCid:PMC7832355
7. Crawford J, Butler-Henderson K, Rudolph J, et al. COVID-19: 20 countries' higher education intra-period digital pedagogy responses. 2020; 3(1):1-20. https://doi.org/10.37074/jalt.2020.3.1.7
8. El Zawaidy HJIIJoE. Using Blackboard in online learning at Saudi universities: Faculty member's perceptions and existing obstacles. 2014; 3(7):141-150. https://doi.org/10.12816/0006902
9. Daniel SJJP. Education and the COVID-19 pandemic. 2020; 49(1):91-96. https://doi.org/10.1007/s11125-020-09464-3 PMid:32313309 PMCid:PMC7167396
10. Ghazawi E, Gouda E, Al-Sagheer AS. Moving from Face-to-face to Virtual Learning Using Blackboard: Faculty and Students' Perceptions.
11. Alshaikh K, Maasher S, Bayazed A, Saleem F, Badri S, Fakieh BJS. Impact of COVID-19 on the Educational Process in Saudi Arabia: A Technology-Organization-Environment Framework. 2021;13(13):7103. https://doi.org/10.3390/su13137103
12. Almahasees Z, Mohsen K, Amin MO. Faculty's and students' perceptions of online learning during COVID-19. In Frontiers in Education Frontiers Media SA; 2021 May. https://doi.org/10.3389/feduc.2021.638470
13. Al-Balas M, Al-Balas HI, Jaber HM, et al. Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: Current situation, challenges, and perspectives. 2020;20(1):1-7. https://doi.org/10.1186/s12909-020-02257-4 PMid:33008392 PMCid:PMC7530879