Asynchronous learning techniques during the COVID 19 Pandemic

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Abstract: This study aims to determine the technology-based pedagogies and their learning capabilities that can be used in managing the academic disciplines operational process during the COVID 19 pandemic. It chooses two popular learning management systems, i.e., the Blackboard and Moodle to analyze their capabilities and presents in three folds (i) the abilities of delivering and administrating a course, (ii) students' course performance evaluation, and (iii) the potentiality of evaluating quality evaluation process. The study relies on the exploratory descriptive approach to identify the types of teaching strategies and classify them according to their support for the majors. Further, it investigates for the specific characters that will support laboratory-based courses and the possibilities of quality evaluation. Furthermore, it reveals 28 pedagogy styles from four different academic disciplines, i.e., Arts and Humanities, Medical Education, Science and Engineering, and Social sciences. Finally, the study presents the mechanism of implementing tools of such LMS for achieving the efficiency during learning-teaching process.

1. Introduction

Most of the higher education institutions at present aim to provide high-quality education and this aspect is shown by the future vision of the institution, as it prepares students for academic achievement through the acquisition of knowledge and skill, which directly contributes to the growth of countries and the economy [1]. The methods and methods used by academics to communicate knowledge or skill, share it with students, implement them correctly, and customize them according to students' needs, act as a prominent catalyst for students to achieve high academic achievement [2].

It is believed that teachers should demonstrate intent to adapt and customize approaches aimed at improving student learning. The teacher can improve techniques and methods to make the teaching and learning mode more suitable for students. The teacher can also be selective in the use of techniques if he has a worthy knowledge of the available and accessible methods [3]. In every educational discipline, the methods are associated with remarkable teaching and learning outcomes. Here, in this study, some methods from four major disciplines were briefly discussed to show which methods are appropriate and appropriate and their availability in the blackboard e-learning system. The grouping of majors in this regard was flexible according to the nature and knowledge of their academic content [4].

The increase in the number of specializations in the current academic milieu, this constantly changing situation has led to additional challenges for teachers and this requires them to customize and adjust the objectives, context, contents of lessons, and communication patterns between teacher-student, student-teacher, student-student [5]. Teachers' unfamiliarity with teaching methods sometimes complicates the issue of teaching and learning. Some names of additional teaching methods are included in this paper, although they are not widely practiced by academics. At times, these lesser-known methods may be beneficial for innovative teaching techniques [6].

Each major has its requirements and conditions according to the goals that must be achieved. The curriculum makes it possible to implement and achieve these goals through the content of the course, methods of teaching, and the teaching process, and the

curriculum itself is determined according to its educational objectives concerning the participants and circumstances. In teaching, the approach used is essential for conceptualizing teacher work and student learning. Teaching methods are one of the basic aspects of teaching and learning, which must be specified in any curriculum, which in the first place constitutes a commitment to both teachers and students in implementing what is required of them in the process of delivering the curriculum [7]. The quality of the teaching process sends an implicit message about teaching techniques, student progress in learning, and knowledge acquisition. According to the contemporary development in the teaching and learning environment, the multiplicity of teaching methods and the need for a more balanced use of them is an integral part of the development of each discipline. An understanding of teaching methods greatly influences the quality of teaching, and an understanding and analysis of teaching methods can lead to a deeper understanding of the quality of student learning and teacher work [8].

The study's aims to focus on three objectives: first a characteristics' comparison of learning management systems (LMSs) through the available features. Second, to focus the role of LMSs in e-learning, and third is to propose a model consisting of six independent variables (application, integration, communication, evaluation, and content, Cost, and security) and one dependent variable which are reasons for the success of e-learning. The study's result shows that there is a statistically significant impact of LMS major characteristics on e-learning success [9].

The study provides twelve guiding advices that include a set of basic principles and practical recommendations that can apply to online learning, focusing on design features that can be quickly implemented to face the current epidemic (COVID-19). It also referred to processes for short-term transformations beneficial for long-term integration of educational technology into the infrastructure of institutions [10].

2. Literature Review

The presented study aims to solve the problems of LMSs that are mostly related to pedagogical or technology. It introduces a LMS through the conceptual model, based on the combination of four theories of learning (traditional pedagogy, the behaviorism, the cognitivist, and the social constructivism). They will also depend on cooperative education for both the teacher and the learner, with the possibility of creating, managing and proposing different and varied activities. Their interaction with these activities, where and when, according to their needs and learning goals. The study planned to produce a LMS that gives the same working

potential to both teachers and learners by distributing their control over the platform [11].

The study also covers the commercial LMSs available and used in the Kingdom of Saudi Arabia through a comparative analysis. The study found that 90% of universities in the Kingdom of Saudi Arabia use the Blackboard LMS and 7% of Saudi universities use the Moodle LMS, and 4% use D2L. All the LMS have the same characteristics of communication and content management for the courses, currently there is no learning management system that provides the features of conducting laboratory experiments [12].

Notably, it discusses assessing the usability of e-learning acceptance models Technology Acceptance Model (TAM), the idea was initially from a review of more recent studies. The results of the review showed usability trends in a specific context. Among the various formulations related to usability that were reached User satisfaction, user interface design, and interaction. The significant effect of the reviewed usability factors was confirmed statistically in most of the studies covered [13].

3. Purpose of the Study

The aim of the study to make it easier for teachers to use the most practiced potential teaching methods in four educational disciplines, such as Arts and Humanities (AH), Medical Education (ME), Science and Engineering (SE), and Social Sciences (SS). It provides an analysis of the suitability and availability of each teaching style for the respective discipline in Blackboard e-LMS, as well as a hand-cited analysis of the scientific literature on the teaching methods available on the four major disciplines in higher education. Potential research questions emerge as follows:

Q1: What are the potential teaching methods practiced in higher education?

Q2: What teaching methods are exclusively practiced in the four major disciplines (arts and humanities, medical education, science and engineering, social sciences)?

Q3: How available are the teaching methods involved in the four major disciplines on the Blackboard Learning Management System?

4. Methodology

The study relied on the descriptive and analytical approach through which distance education technologies will be described in the educational process in light of the Corona pandemic, as well as analyzing the trends of these technologies, especially those related to the blackboard system and its

effectiveness in managing the educational process under the conditions of the Corona pandemic [14-15].

5. Targeted E-learning platforms:

5.1 Blackboard Learning Management System

It is a learning management system that uses a set of tools to create and manage course content, and provide learning resources to students (books, video, audio), and it is one of the systems with a complex structure that serves different aspects of the teaching processes that use different techniques, it is considered a commercial system [16].

The Blackboard Learning Management System (BLMS) is an effective LMS and allows educational institutions to provide electronic courses on the Internet as a supplement to traditional education courses and allows universities to add electronic educational resources for students, such as PowerPoint files, video, audio, movement, and other applications that can be added from the resource. To support curricula, improve teaching and increase learning efficiency.

Remarkably, BLMS allows learners at different levels of e-learning in which they study their courses, a list of the courses available for them to study, information about each course, a list of lectures, and asynchronous communication through the exchange of mail messages and participate in discussion forums between students each other. Or between students and the teacher, providing electronic information sources to support what students are studying, making available a bank of

questions related to the course for training, evaluation using performance records, and open and limited discussions [17].

The use of the BLMS requires the learner to master the skills of using the Internet, the skills of using the Internet browser, writing skills, and file management skills and does not need mastery of programming languages or HTML language [16]. And course management systems are an integrated system responsible for managing the electronic educational process through the global network of information "the Internet" that includes admission and registration, course registration, course management, assignments, student learning follow-up, supervision of synchronous and non-synchronous communication tools, examination administration, and final certification [18].

5.2 Moodle Learning Management System

It is an open-source learning management system with a multilingual interface, to create an individual, customized, safe and integrated learning environment according to the needs of the educational institution for both the students, teachers and administrators, and it also provides flexible tools to support both blended learning and online learning [19-121].

6. E-learning classifications

Universities generally offer three levels of E-learning, explained in the table 1 [22]:

Table 1 Explains the similarities and differences between the complete, integrated and supportive e-learning levels

The face of comparison	Complete E-learning	Blended E-learning	Supportive E-learning
Course Elements: The course must contain the following elements in a learning management systems:	•The curriculum of the entire course, including description, objectives, assessment and activities. • Teacher information. •Activating the scheduled bulletin board •Activating the discussion forum •Course materials in references, slides, presentation, documents, recordings, or any other materials or	•The curriculum of the entire course, including description, objectives, assessment and activities. • Teacher information. •Activating the scheduled bulletin board •Activating the discussion forum •Course materials in references, slides, presentation, documents, recordings, or any other materials or	•The curriculum of the entire course, including description, objectives, assessment and activities. • Teacher information. •Activating the scheduled bulletin board •Activating the discussion forum •Course materials in references, slides, presentation, documents, recordings, or any other materials or

	tools that support learning. • Activate the basic virtual classroom	tools that support learning. • Activate the basic virtual classroom	tools that support learning. •Activate the virtual classroom as desired by the teacher
Preliminary actions	• A simultaneous meeting is held between the students and the teacher, during which he clarifies the course plan and how to proceed with it	• Determining electronic attendance dates by agreement between the teacher and the students of the course, provided that they do not violate the rules governing electronic attendance	•The course site in LMS will be a center for communication and activities such as use of the site, accompanying tools, announcements and duties
Previous requirements	The first two weeks of the semester start are devoted to ensuring students' basic skills needed to ensure the smooth running of the course, such as using various course tools and communicating with a faculty member.	The percentage of the part devoted to e-learning from the actual teaching hours is determined at three levels: 25%, 50% and 75%, and the agreed and approved percentage in the integrated course teaching application form must be adhered to.	Electronic materials in support of the course are made available on the site respectively, such as Power point slides, PDF files, or Word files, followed by the submission of assignments and the activation of the discussion forum, and the materials and grades are delivered and everything that can be done during the site
Course grades	Scores for electronic activities are calculated 40% of the e-course	Scores for electronic activities are calculated 25% of the total course score	15% of the total course score is devoted to electronic activities
Dates of adding activities on the site	The teacher is obligated to add two electronic activities in the course per week with determining the timing of the end of each activity separately, which calls for the student to enter to respond to the participation	The teacher is obligated to add electronic activities to the course at least once a week, which requires the student to enter to respond and participate.	The teacher is free to add activities, in agreement with students, and report activities on the course bulletin board.

7. Results and Discussion

Teaching Methods in Higher Education these paper shows are available Teaching Methods being practiced in the disciplines in higher education. Also, it identifies that there is no such study that fully acknowledges similar kinds of work in listing TMs that teachers should adopt. Table 2 and figure 1 organizes the potential TMs in higher education. [23-24]

Teaching methods across disciplines. 28 methods were drawn that can be used in different scientific disciplines. These are methods that are not used exclusively in a particular discipline. It can be adapted to a variety of conditions. E-learning, lectures, and problem-based learning are found in all four disciplines. In addition, 10 of the methods were applied in three disciplines in different groups. Table 3 lists the teaching methods that were used across the different practical disciplines [25-26].

Table 2 Clarifies teaching methods classified according to scientific specializations [24]

| Arts and Humanities (AH)	Medical Education (ME)	Science and Engineering (SE)	Social Sciences (SS)
Artists' talks	CAL and tape/slide	Activity	Applied projects
Communicative	Clinical case	Blog	Behavioral simulation
Language teaching	Didactic teaching	Both activity and lecture	Business plan creation
Consultancy	Dissection by students	Dialogic	Development of new venture creation project
Data-driven learning	Experiments	Extended analogy	Discussion and debates
Desuggestopedia	Hybrid group	Face-to-face	Expert script
Discovery method	Hybrid tutorial	Group work	Group presentation
Event-based learning	Living and radiological Models	Homework	Guest speaker
Grammar-translation method	Online-only group	In-class discussion	In-class exercises
Live projects	Prosection and demo	Invited expert lecture	Individual presentation
Multiple intelligence	Self-study sessions	Jigsaw	Individual project Interview
Peer learning	Serious games	Lecture handouts	Journal article
Simulating conditions of industry	Structured lectures	Lecture with collaborative exercises	Lecture/discussion combination
Task-teach-task	Tape-slide program	Lecture with PowerPoint	Library exercise
Total physical response	Teaching with real patients	Low-tech hands-on	Life stories
	Theoretical-practical	Making/reading peer reviews	Management simulation
	Seminars	Perceptional teaching	Mind mapping
	Tuition	S-lecture	Real-life case
	Use of animal models	Simulated international conference	Role model
	Video + handout	Video and micro-lecture Virtual internship	Self-analysis
	VTS teaching method	Web-based laboratories	Teaching through the classics
			Virtual classroom Virtual simulation program
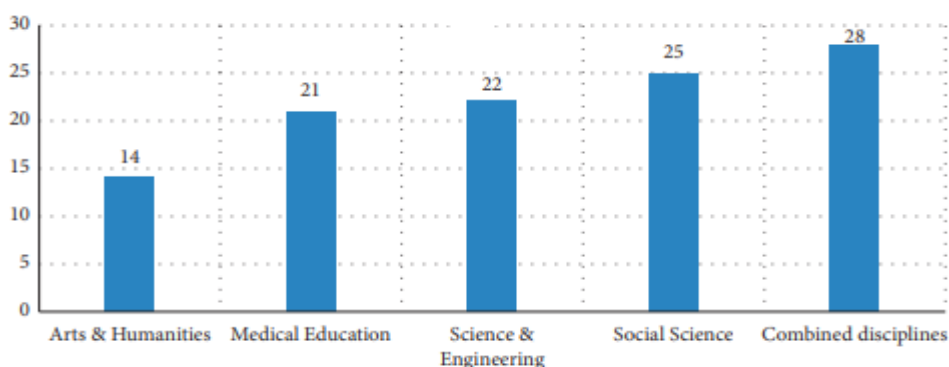
Figure 1 Number of significant TMs in each discipline

Table 3 A matrix illustrating the teaching strategy and the preferred fields for use in it

S	Teaching methods	Educational disciplines
1	Brainstorming	AH, ME, SS
2	Business/computer/game simulations	AH, ME, SS
3	Case-based teaching method	SE, SS
4	Cooperative learning group	AH, SS
5	Demonstration	AH, SE
6	Discussion sessions	AH, ME, SS
7	E-learning/web-based learning	AH, ME, SE, SS
8	Flipped classroom	AH, ME, SE
9	Game-based learning	SE, SS
10	Group discussion	AH, SS
11	Handout	ME, SS
12	Individual written report	SE, SS
13	Industrial training	SE, SS
14	Inquiry-based learning	AH, SE, SS
15	Keller method	ME, SE
16	Lab work	ME, SS
17	Lecture	AH, ME, SE, SS
18	Practical sessions	ME, SE
19	Problem-solving	AH, ME, SS
20	Problem-based learning	AH, ME, SE, SS
21	Project-based learning/group project	AH, SE, SS
22	Research-oriented teaching	SE, SS
23	Role playing	AH, SS
24	Seminar/workshop	AH, SS
25	Small group	ME, SE, SS
26	Team-based learning	AH, ME, SS
27	Video/video recorded lecture	ME, SE, SS
28	Work-based learning	AH, SE

Table 4 Mechanisms for implementing teaching methods in the four major disciplines on learning management systems (Blackboard and Moodle)

S	Teaching methods	Educational disciplines	Execution mechanism via Blackboard	Execution mechanism via Moodle
1	Brainstorming	AH, ME, SS	Forums, and virtual interactive classes	Forums, and virtual interactive classes

2	Business/computer/game simulations	AH, ME, SS	Forums, and virtual interactive classes	Forums, and virtual interactive classes
3	Case-based teaching method	SE, SS	Forums, virtual interactive classes, WIKI	Forums, virtual interactive classes
4	Cooperative learning group	AH, SS	Forums, and virtual interactive classes	Forums, and virtual interactive classes
5	Demonstration	AH, SE	virtual interactive classes	virtual interactive classes
6	Discussion sessions	AH, ME, SS	virtual interactive classes	virtual interactive classes
7	E-learning/web-based learning	AH, ME, SE, SS	Interactive classes, forums, virtual interactive classes, WIKI sites	Interactive classes, forums, virtual interactive classes
8	Flipped classroom	AH, ME, SE	virtual interactive classes	virtual interactive classes
9	Game-based learning	SE, SS	virtual interactive classes	virtual interactive classes
10	Group discussion	AH, SS	Groups, forums, and virtual interactive classes	forums, and virtual interactive classes
11	Handout	ME, SS	Diaries, file uploads, forums, and virtual interactive classes	file uploads, forums, and virtual interactive classes
12	Individual written report	SE, SS	Diaries, file uploads, forums, and virtual interactive classes	file uploads, forums, and virtual interactive classes
13	Industrial training	SE, SS	virtual interactive classes	virtual interactive classes
14	Inquiry-based learning	AH, SE, SS	Forums, and virtual interactive classes	Forums, and virtual interactive classes
15	Keller method	ME, SE	--	--
16	Lab work	ME, SS	virtual interactive classes	virtual interactive classes
17	Lecture	AH, ME, SE, SS	virtual interactive classes	virtual interactive classes
18	Practical sessions	ME, SE	virtual interactive classes	virtual interactive classes
19	Problem-solving	AH, ME, SS	Forums, discussion boards	Forums, discussion boards
20	Problem-based learning	AH, ME, SE, SS	Forums, discussion boards	Forums, discussion boards

21	Project-based learning/group project	AH, SE, SS	Forums, discussion boards	Forums, discussion boards
22	Research-oriented teaching	SE, SS	Discussion boards, blogs, WIKI sites	Discussion boards
23	Role playing	AH, SS	virtual interactive classes	virtual interactive classes
24	Seminar/workshop	AH, SS	virtual interactive classes	virtual interactive classes
25	Small group	ME, SE, SS	Groups, forums	forums
26	Team-based learning	AH, ME, SS	Groups, forums	forums
27	Video/video recorded lecture	ME, SE, SS	Registered classes	Registered classes
28	Work-based learning	AH, SE	Discussion boards, blogs, WIKI sites	Discussion boards

Table 5 The difference between Blackboard and Moodle

Blackboard	Moodle
Closed source system - commercial (a sum of money is paid plus the cost of use according to the number of courses offered and the number of learners enrolled in it)	It is an open source, not-for-profit system
Ease of use for teachers and learners	Ease of use for teachers and learners
There is more than one way to communicate with the registered learners	There is more than one way to communicate with the registered learners
Available in more than one language	Available in 75 programming languages
Display educational content in more than one way	Display electronic courses in more than one format
The degree of safety and technical support is high	The degree of safety and technical support is high.
The cost of using the system depends on the number of learners registered in the system	Scalable by other developers

Through the previous discussions, a comparison was made between e-learning management systems (Blackboard and Moodle) depending on the teaching methods available for each system that can be used in the educational process. The comparison was explained through Table 4 and 5.

8. Conclusion

The study reviewed distance education techniques in light of the Corona pandemic (Covid 19), and showed that there are 28 teaching methods that can be used in the four scientific disciplines: arts and humanities, medical sciences, science and engineering, and social sciences, and the study showed that there are three levels of e-learning: education Full e-learning, integrated e-learning and supportive e-learning and showed the similarities and differences between the three levels of e-learning, and explained that there is a great similarity between full e-learning and integrated e-

learning, but they differ from supportive e-learning, as the study showed that complete e-learning is more used and comprehensive in Teaching procedures.

The study also indicated that the teaching methods used in the social sciences, science and engineering amounted to 22 teaching styles out of a total of 28 teaching styles, with a rate of 78.5%, while in medical education 19, 19 teaching methods were used, representing 67.8% of the total of 28 teaching styles, while the methods The teaching methods used in the arts and human sciences amounted to 14 teaching styles, accounting for 50% of the total teaching methods. The teaching methods varied between brainstorming, simulations, case studies, seminars, cooperative education, and others, with the aim of developing students' scientific, creative and innovative skills. The implementation mechanism through the Blackboard was distributed among forums, interactive virtual classes, discussion boards, groups, recorded classes, blogs and wikis, but it was found that the interactive virtual

classrooms are the most used and interactive in the processes of teaching methods via the Blackboard or Moodle.

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Conflict of interest

The authors have no conflicts of interest to declare that they are relevant to the content of this article.

Does the Article Screened for Similarity?

Yes.

Author's contribution

Both the authors equally contributed to this work.