

RESEARCH ARTICLE

IMPLEMENTATION OF E-LEARNING SYSTEM CASE STUDY FACULTY OF ENGINEERING - AL-ZAIEM AL-AZHARI UNIVERSITY - SUDAN

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Abstract

The development of Cloud Computing and E learning technology, smart learning system can be build to benefit the students and faculty, by using the university and college resources and enhance learning system with proactive services. The aim of this study is to develop e-learning system for students' of Alzaiem Al-Azhari University Faculty of Engineering to continue the remaining lectures of the tenth semester for all departments (computer engineering, electrical engineering and civil engineering) after stopping the teaching system inside the halls due to the Corona virus using telegram social media as tool .So that they can complete the courses and they can graduate. The study was conducted in July in 2020. The methodology used is a descriptive survey research designed to investigate e-learning option for teaching and learning in the tertiary institution.

Key Words: E-learning, Telegram, broadcasting channels, discussion groups, a technical support group for teachers, a technical support student.

1 Introduction

The Corona virus disease 2019 (COVID-19) pandemic has shown scant respect for manmade borders and it took just three months to bring the world to a standstill. . Following the outbreak of COVID-19, Sudan closed schools and high institution nationwide to prevent the spread of the virus. This led to the testing of distance education on an unprecedented scale. Here we give a first-hand experience of Sudanese university to provide quality distance education while battling the pandemic. To gain some insight into the effectiveness of such online education, we look at the results of a statistical survey conducted among 449 students at faculty of engineering at Alzaim Alazhari University. About 59% [13] of students believed that to continue the studies online.

Today's technology is increasingly being used both inside and outside the classroom. So it is very important to accept new technology and applying its benefits in the educations system [11]. Currently, e- learning as internet based learning process uses Internet technology to design, implement, manage support and expand learning and will greatly improve the efficiency of education. E- Learning has much advantage such as flexibility, diversity, measurement and so on and it will be the main way to learn in the new century [11].

E-learning is the use of network technologies to delivering information for education and training. With the growth of computer technology development, E-learning is emerging as the paradigm of modern education. It can be defined as learning based on Information technology in which learning materials are delivered to remote learners by a computer network.

E-learning is not only a system for delivering content and e-courses or a system that uses technological tools, but an applied theoretical system and an integrated educational technological system based on a philosophical basis and new theories.

E-learning offered interaction with multiple and varied electronic learning resources in a systematic and sequential manner in electronic learning environments flexible based on computer and networking to supporting learning processes and facilitate their occurrence anywhere and anytime.

Self-paced learners are alone and completely independent, while facilitated and instructor-led e-learning courses provide different levels of support from tutors and instructors and collaboration among learners.

We have two method of E-learning Synchronous and Asynchronous in Synchronous events take place in real time. Synchronous communication between two people requires them to both be present at a given time. Examples of synchronous activities are chat conversations and audio/video conferencing; Asynchronous events are time-independent. E-learning will achieve greater success if its tools are chosen accurately and effectively as part and essential component of it. E-learning has capabilities and advantages that justify its implementation, meaning that e-learning technology can be used effectively and successfully if it has the educational capabilities and features needed by the educational process [3].

Some Sudanese universities offer e-learning, such as the Open University of Sudan, which was established in 2002 and the University aims to adopt modern teaching techniques and to provide an outstanding education for those interested in anywhere and anytime.

Sudan University of Science and Technology offers distance learning via the Internet (On-line learning) for higher studies for a master's degree in computer-integrated Education Major [12].

In 2004, the ministry of higher education established Sudanese Universities Information Network (SUIN). The aim of this network is to link higher education institutions of Sudan and increase the sharing of information between these institutions as well as to establish a virtual library for Sudanese universities and provide information technology services such as video conferencing, e-Learning, email, etc [12].

The universities at the moment need a lot of work to get ready for successful e-learning because universities students lack the skills required and knowledge necessary to use IT, in addition to that, the approaches currently in universities need to be developed to become suitable for e learning and infrastructure is limited and not at the required level and which ones are available untapped effectively and has universities strategy to provide technical support ongoing and there is no regular maintenance and no dedicated budget to fund educational technology, on the other hand, the training courses for university professors confined in Basic computer skills and lack of careful planning and effective organization as it does not include the educational use of technology [12].

In this paper, we highlight the importance of e learning and outline some existing e learning system in Sudan. The remainder of this paper is organized as follows: section 2 Material and methods Section 3 evaluation. Section 4 presents the Results and discussion and Section 5 concludes this paper.

2 Material and methods

The objective of this study is to develop e-learning system for students' of Al-Zaeem Al-Azhari University Faculty of Engineering to continue the remaining lectures of the tenth semester for all departments (computer engineering, electrical engineering and civil engineering) after stopping the teaching system inside the halls due to the Corona virus using telegram social media as tool .So that they can complete the courses and they can graduate. The study was conducted in July in 2020.

At the beginning of the semester, students and lecturers were asked to install the Telegram application in their smart phone. For students and lecturers who owned laptop, they can also install desktop version of the Telegram. After that we asked them to enter the channels and groups according to the links announced to them. Our system consists from a number of broadcasting channels, a number of discussion groups, a technical support group for teachers, a technical support group for students, a group with coordinators for each department with members of the e-learning committee and a group with members of the e-learning committee .Table (1) illustrate some statistic such as channels, students and lectures that used in our system.

Table [1]: Statistic of channels, students and lectures

Departments	Number of Broadcast channels	Number of Discussion groups	The number of students in each department	Average number of online lectures
Computer engineering	5	5	50	04
Electrical engineering	7	7	62	04
Civil engineering	5	5	90	04

In this part we will introduce these parts in detail:

1. Broadcast channels: Each subjects has a channel in each channel there are students and channel supervisors were responsible for:
 - a) Created the channel
 - b) Send the channel link to students
 - c) Upload the lectures in the channel

Figure (1) illustrate subject channel named "Data Base System" contains 49 member and contains part of the educational content of the subject



Figure 1: Subjects channels

2. Discussion groups: Each subject channels has a discussion group contain students and supervisors. The purpose of these groups is to make an interaction between students and teachers.

3. Technical Support Group for teachers: This group includes all members of the teaching staff who are studying students for the tenth semester and also includes members of the e-learning committee. The purpose of this group is to provide technical assistance for lecturers such as the necessary software for preparing their lectures.
4. Coordinator group: This group contains student's department's coordinator and members of the e-learning committee. The purpose of this group is to make interaction between student and e-learning committee.
5. The e-learning committee group: This group includes all members of the e-learning committee. The purpose of this group is: a) Coordinate the work in the system b) Develop channels and groups c) Developing laws and regulations.

We have also developed a set of laws and regulations to implement a lecture, such as

- 1- The lecture must be divided into a group of parts. The time of each part is between 10-15 minutes for a single video in order to facilitate its circulation and upload on the Internet.
- 2- It is preferable that the videos of the lecture be linked to each other to facilitate the arrangement of the parts.
- 3- The lecturers has to agree with the students on a specific time (hour, day,) to answer their questions in the discussion group.
- 4- The lecturers must raise the lectures according to the lectures schedule on Formula such as video, PDF file and PowerPoint file.

3 Evaluation

- 5- After two week of the online semester, the students and lecturers were asked to complete an online survey on their perceptions using Telegram as a tool for enhancement during their learning process. The online survey consists of (28+18) questions 28 for students 18 for lecturers and developed and published using Google form. The aim of these questions was to know the interaction between teachers and student as well access to education content for students. Students and lecturers responses were analyzed to obtain their experience, level of agreement and opinion.

4 Results and discussion

4.1 The result survey question of students

The following table shows the number of students who they responded the questionnaire.

Table [2]: Number of students responded to the questionnaire

Departments	The number of students for each department
Computer engineering	45
Electrical engineering	32
Civil engineering	62

Table (3) shows the statistics of students to know the availability of Internet service quality.

Table [3]: Availability of Internet service quality

Internet service quality	Students ratios
Strong and very fast	12.6%
Strong and fast	9.8%
Medium	51.7%
Weak and very slow	25.9%
Weak and slow	11.9%

Table (4) shows the percentage of students who have been able to download lectures.

Table [4]: Statistics of lectures download by students

Number of students	Lectures download ratio
Less than 50	32.4%
50-64	19.01%
65-74	7.5%
75-84	11%
85-100	30.1

Figure (2) illustrate the students' decision to continue studying using Telegram or not. 53.1% of students prefer to continue studying via Telegram and 46.9% of students not prefer to continue due to some reasons, such as poor internet and blackouts most of the time.

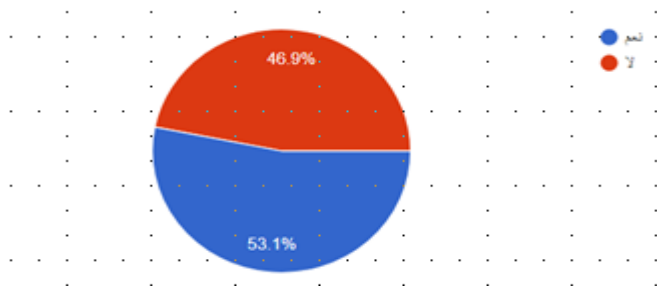


Figure 2: The students' decision to continue studying online

4.2 The result survey question of lecturers

A set of questions were asked to the lecturers to find out the extent of the interaction between the lecturers and the students. The percentage of interaction between students and lecturer in discussion groups was 80%, while the percentage of students who interacted via email was shown in the Table (5).

Table [5]: The percentage of students who interacted via email

The rate of students interacted via email	The percentage of lecturers
Less than 50%	50%
50%-74%	33.3%
75%-100%	16.7%

75% of lecturers prefer to continue studying using the telegram as shown in figure (3) for the following reason 1) Provide social distancing for the pandemic 2) encourage students to use online learning which has been used in the universities in developed and as the virtual life will grow 3) using Internet will assist student research, it is a good change which has to be done. 25% lecturers not prefer to continue studying using the telegram because 1) poor internet connectivity especially in rural areas 2)poor electricity 3) lack of broadband connectivity 4) lack of online interaction with students 5) low speed of internet in many towns and rural areas.

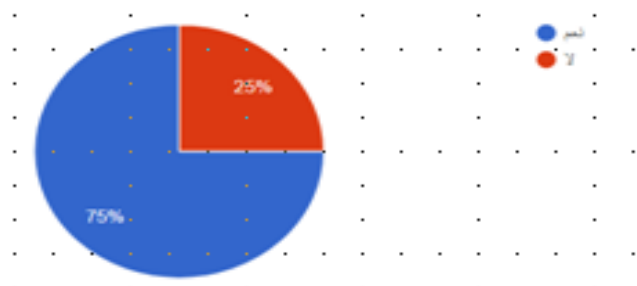


Figure 3: The lecturer's decision to continue studying online

5 Conclusion

The e-learning process depends mainly on the student.

Universities at the moment need a lot of work to get ready for successful e-learning.

Infrastructure is limited and not at the required level and to establish IT offices in every faculty.

Some lecturers do not convinced entirely of the e-learning as an option of the learning process.

In the engineering studies some subjects need to be taught in the classroom

In e-Learning courses, learners may have more diverse backgrounds than those in traditional courses. Thus, selecting a learning path that is suitable for an individual learner is recognized as an interesting research area in e-learning systems. It is admitted that online learners may be more sophisticated than traditional classroom learners.

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