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Research paper

Distance learning for elementary school students: case study in Saudi Arabia

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Abstract

This study mainly focuses on distance learning for elementary schools in Saudi Arabia and how best to apply it. This involves designing and implementing a website similar to any Learning Management System; however, this system will focus only on elementary school students.
Distance learning is rarely applied globally in elementary schools and has not yet been introduced in Saudi Arabian elementary schools. Although it is applied in some Saudi Arabian universities, the systems or applications used in distance learning can prove slightly problematic for use by younger pupils, such as elementary students.
The data were collected through inexpensive means using a paper-based questionnaire. The population for this study was 170 participants including elementary school students and teachers of both genders. The data collected for this study supports two goals. The first goal is to get the students' opinions about whether they would like to take online classes, and the second seeks their feedback if they have already taken any previous online classes. Questionnaires were distributed in an offline environment by gathering the data from the schools.
The preliminary analysis reveals that there is a need and desire from both students and teachers for distance learning, especially online classes in elementary schools.

Keywords: *Distance Learning; Elementary Schools; Students; Teachers; Online Courses.*

1. Introduction

Distance Learning is a type of learning conducted as a communication that does not require the two parties to be physically present at the same place and time during the learning process [14, 10]. The learning process in distance learning can be conducted and delivered in many ways, such as television, radio, video, audio graphics, chat rooms, e-mail, or telephone communications, Web-based resources, or any combination [13].
The communication can be either asynchronous or synchronous. Synchronous describes a “real time” interaction when teacher and student communicate simultaneously via interactive video/TV computer conferencing. This form of distance learning environment is most similar to the traditional learning classroom. Asynchronous communication is considered to be one-way communication, that is, does not occur at exactly the same time. However, the materials are delivered via an online or Web-based course or CD ROM. Responses take place via e-mail, facsimile or telephone [13].
Distance learning can be defined as the delivery of an education process. This process requires both the teacher and student to be physically separated. There are two means of delivery, i.e. either through printed or electronic media [8]. According to Griffiths ([4] p.158) "distance education is a planned teaching–learning process that uses one or more technologies as a conduit for learning when students are separated from the instructor, requiring regular, substantive, and supportive instructor–student and student–student interactions".
The first known form of distance learning was in 1728, based on the delivery of instructional lessons while the student worked on paper. Until the 1920s, adult and post-secondary levels were the first beneficiaries of distance learning. In the 1980s to 1990s, many K-12 schools in the United States used computer-based learning [8]. Furthermore, by 1997, the number of schools using instructional computers had increased by 200% [6].
Nowadays, teaching through video-based classes is utilised more frequently. There has been an increase in technology-based distance-education classes in public schools in the United States since 2003, by more than 50% [8].
Print-based distance learning is the oldest method of distance education which is often used to advance teachers' qualification skills in many parts of the developing world, such as Africa. Print-based learning has the lowest cost compared with other types of distance learning [11].
Audio-based distance learning is mainly used by the teacher and includes radio broadcasts (Interactive Radio Instruction). The content of audio-based learning is created for teachers but designed to assist students. Students are the primary audience for Interactive Radio Instruction and teachers are the secondary audience. However, both teachers and students derive great benefit within the classroom based on audio learning [11].
Televisual-based distance learning includes visual broadcast media such as television, video, and videoconferencing. Teachers can benefit from this type of distance learning by giving them the opportunity to see real teacher-student interactions during class time, which allows them to watch the management of learning activities [11].

The process for moving to distance learning in Saudi Arabia has been slow in comparison with other countries, and according to Martzoukou and Kemp [9], more attention must be given to the distance learning processes in order to improve the overall learning experience. Saudi Arabia feels there is a need to improve the education process and thus improve the knowledge skills of the country's citizens [3].

There are several Saudia Arabian universities which have begun to use distance learning in their teaching programmes. For example, King Abdualaziz University, King Saud University, King Faisal University and many other universities are using the Blackboard system in their distance learning. In addition, the Jusur system is used in AL-Qassim University, Om AL-Qura University, Jazzan University and many others. The Web Ct system is used in King Fahd University of Petroleum and Minerals for uploading the course materials [3].

Although there are several Saudi Arabian universities which have begun to use distance learning in their teaching programmes, none of Saudi Arabia's elementary schools have yet applied it.

The impact and acceptance of distance learning have been positive by both teachers and students. The performance of students is fundamentally the same for both types of learning in terms of standard learning measures. The effectiveness of distance learning is more noticeable in the attitudes of students and teachers and requires no investment. Students utilising distance learning methods can interact easily and be more comfortable with other students or teachers since the online environment is less intimidating with no face-to-face setting. Increasing convenience, while eliminating barriers as well as increasing flexibility, feedback and the ability to customise learning is greater in distance learning as it overcomes the potential barrier of traditional face-to-face experience [2]. Distance learning is rarely applied in elementary schools globally. Although, it is utilised in some Saudi Arabian universities, the systems or applications used in distance learning can sometimes be difficult for younger pupils, such as elementary students.

The overall aim of this study is to develop a friendly website as a learning management system for elementary students in a way that is flexible, convenient and offers the ability to work from any place where an Internet connection is available.

2. Literature review

There has been much research on distance learning for elementary school students. This section explores the previous studies that researched distance learning, which are summarised here:

- Distance Learning for Gifted Students: Outcomes for Elementary, Middle, and High School Aged Students

This study discussed Distance learning (E-Learning) programme on K-12 gifted students. It represents research on the effectiveness of distance learning on the student in addition to reporting that E-Learning culture is rare in the younger students (elementary schools) [12].

- K–12 Online Learning: A Survey of U.S. School District Administrators

Picciano & Seaman [1] conducted a survey indicating that limited studies have been undertaken regarding students in elementary and secondary schools who enroll in fully online and blended courses. This study is one of the first to collect the afore-mentioned data with the collected data being sufficient for future studies. These data were about the number of students enrolled in fully online courses or blended courses and considered the issues arising from distance learning.

- The Effectiveness of Interactive Distance Education Technologies in K-12 Learning: A Meta-Analysis

This study sums up a synthesis of studies about the effectiveness of distance learning using videoconferencing and telecommunications in elementary, secondary and high schools. In this study, the data were collected from 929 students and analysed over sample characteristics that include study methods, learning environment, learner attribute and technological characteristics [5-6].

- Students' Attitudes and Perceptions towards the Effectiveness of Mobile Learning in King Saud University, Saudi Arabia

This study, undertaken in King Saud University, represents the result of surveying undergraduate female students about their perspective and knowledge of Mobile phone education [7].

3. Methodology

The overall methodology for the study consisted of:-

Stage1: Review literature and previous works covering design of Distance Learning for Elementary School students

Stage 2: Questionnaire

The paper-based questionnaire is an inexpensive means of gathering data. Participants for this study include students and teachers from both genders. The questionnaires are distributed among elementary schools. The data collected for this study supports two goals.

The first goal is to ascertain the students' opinion on whether they would like to take online classes, and the second goal is to determine if they have taken part in any online classes before. Therefore, the desired goal of the questionnaire is to establish a website based as a learning management system (LMS) in accordance with users' needs.

The participants for this study are elementary school students and teachers from both genders. The sample is a total of 170 respondents comprising 100 students (50 female and 50 male) and 70 teachers (35 female and 35 male).

The questionnaire used in this research is structured in a simple manner and consists of a single page. It is estimated that the average time needed to complete the questionnaires is 5 minutes. Questionnaires will be distributed in the offline environment with data gathered from the schools.

Stage 3: Implementation

This stage provides an insight into the actual system of distance learning in elementary schools and how to convert physical teaching into virtual classes, such as online and recorded videos of classes. DLESS system connects teachers and students together more easily, offers flexibility in class schedules, and can be an easy and friendly interface for elementary school children. This is achieved by showing the interface of the DLESS website through presenting screen shots of some website pages.

4. Results and data analysis

The results of the questionnaire are presented in tables 1 & 2. The respondents to this questionnaire were 100 students (50 female and 50 male) and 70 teachers (35 female and 35 male).

Table 1: The Students' Answers to the Questionnaire

Questions	Answer		
	YES	NO	Sort of
1) Do you know how to use a computer?	56.5 %	5.4 %	38%
2) Do you know how to use the Internet?	76.2 %	5.4%	18.4%
	0 -1 Hour	2-3 hours	4 hours or more
3) How often do you use a computer daily?	25.9%	61.9%	12.2%
4) How long do you use a computer for studying?	65.3%	30.6%	4.1%
	YES	NO	Sort of
5) Do you prefer to take online classes?	57.8%	26.5%	15.5%
6) Have you taken online classes before?	42.2%	40.1%	17.7%

7)	What online classes would you prefer to take?	Optional classes 33.3%	Extra classes to improve your study 57.1%	Required classes 9.5%

Table 2: The Teacher's Answers of the Questionnaire

Questions		Answer		
		YES	NO	Sort Of
8)	Do You Know How To Use A Computer?	76.2%	-	23.8%
9)	Do You Know How To Use The Internet?	76.2%	-	23.8%
		0 -1 Hour	2-3 Hours	4 Hours Or More
10)	How Often Do You Use A Computer Daily?	23.8%	52.4%	28.8%
11)	How Long Do You Use A Computer For Teaching /Working?	19%	52.4%	28.6%
		YES	NO	Sort Of
12)	Do You Prefer To Teach Online Classes?	38.1%	33.3%	28.6%
13)	Have You Taught Online Classes Before?	23.6%	47.6%	28.6%
14)	What Online Classes Would You Prefer To Take?	Optional Classes 33.3%	Extra Classes To Improve Your Study 57.1%	Required Classes 9.5%

5. Implementation

This section will illustrate the DLESS system structure (See figure 1), and the System Website design.

5.1. System structure

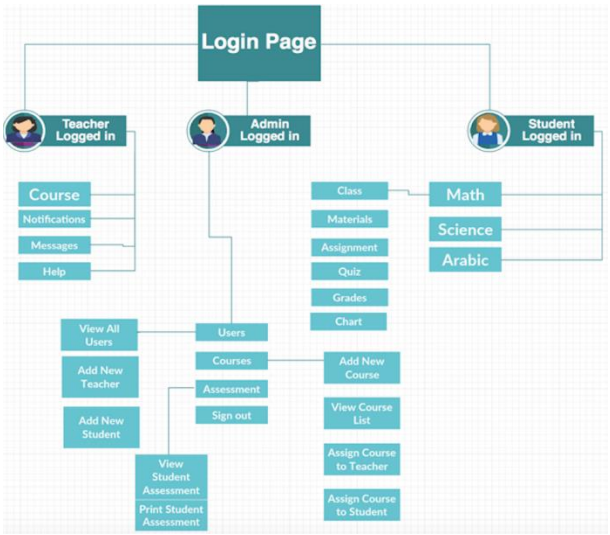

Fig. 1: System Structure.

5.2. System website design

The DLESS system is divided into three types of user - student, lecturer, and administrator. There are general pages for all users and a separate page for any user without a login. (See figures 2, 3, 4 & 5)

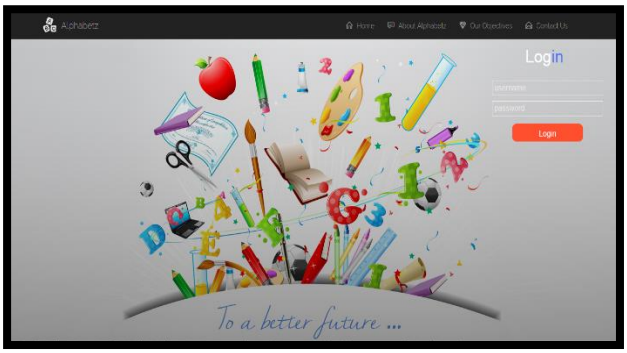

Fig. 2: Home Page.

- Student Page (After Logging in as a student) Courses that students take in the semester page (See figure 3).

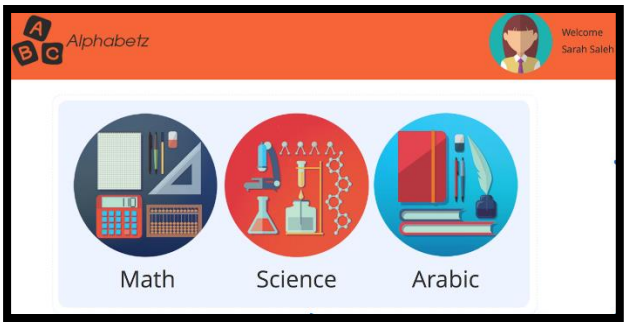

Fig. 3: Courses Page.

- Teachers' Page (After Logging in as a teacher)

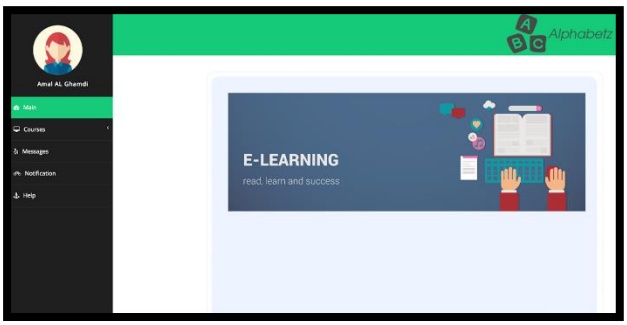

Fig. 4: Teacher Main Page.

- Administrator Page (Admin dashboard)

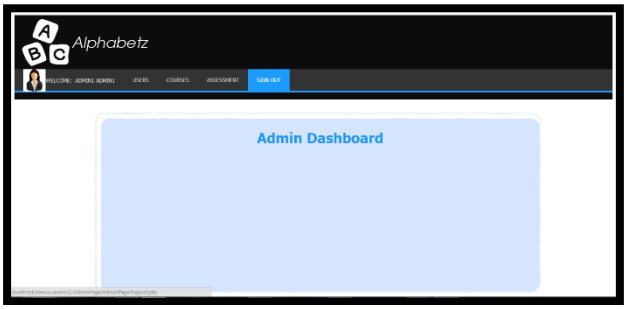

Fig. 5: Admin Main Page.

6. Discussion

- Students

The students' questionnaire results conclude that 75% of respondents prefer to take online classes, while only 15% prefer face-to-face classes. 42% of respondents have taken online classes previously and 40% have not taken any online classes before.

About 52% of respondents prefer to take optional classes, 40% of respondents prefer to take extra classes to improve their study, and 6% of respondents prefer to take required classes.

About 50% of respondents prefer to take online classes live (both student and teacher simultaneously), while 40% of respondents prefer to access a recorded video of the classes.

- Teachers

The teachers' questionnaire results conclude that 78% of respondents prefer to teach online classes, while only 18% felt the opposite was true. 47% of respondents have previously taught online classes.

About 33% of respondents prefer to teach optional classes, 57% of respondents prefer to teach extra classes to improve their students' class learning, while 9% of respondents prefer to teach required classes.

About 73% of respondents would like to teach online live (both student and teacher at the same time), while 37% of respondents prefer to make a recorded video of the classes.

The response to the open question elicited different answers. However, all teacher respondents were in total agreement on the importance of distance learning for elementary school students.

The preliminary analysis has revealed that there is a need and desire from both students and teachers for distance learning, especially for online classes in elementary schools.

7. Conclusion and recommendations

Although, distance learning (especially virtual classes) has been conducted in some elementary schools in many countries across the world, the system has not yet been applied in the elementary schools within Saudi Arabia. However, there are some particularities regarding the distance-learning programme when taking online classes:

- The flexibility of time and/or place: online classes in some distance learning programmes give students flexibility related to time and place of taking exams and viewing lectures.
- All class materials are available online.
- The number of students in a traditional learning class is limited by the classroom capacity; this problem is solved in distance learning since the teacher can accept greater numbers of students within an online class.
- Availability of providing online classes at a convenient time suitable for the student and teacher outside school hours.

Based on the study results, there is a need to design and implement a distance-learning website for elementary schools. Since the target scope is elementary students and teachers, the website will be easy to use and user friendly. The elementary school students and teachers will test the website features during the process of building the site.

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