

E-learning in Saudi Arabia

Challenges and opportunities

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Abstract

The effects of teaching mathematics by e-learning on students' performance in Saudi primary schools are inspiring signs for Saudi educational reforms. Due to the gender segregation in Saudi education, this paper was conducted in schools for girls. A total of 48 female students voluntarily participated from two primary schools- one public and one private. Students were assigned to experimental groups. They were taught mathematics by e-learning over a 13 week period. Interviews were conducted with students. The qualitative results indicated that students supported the new method of teaching mathematics. Several obstacles, advantages and disadvantages were reported as well. This finding supports the value of e-learning pedagogy as a significant tool for improving mathematics education in Saudi Arabia.

Keywords

E-Learning; Mathematics Education; Saudi Primary School

Introduction

The integration of ICT in classroom settings in the last two decades is a popular issue in education field. A growing number of researchers are beginning to leverage these new approaches and develop meaningful ways to integrate them into the classroom (Kebritchi & Hirumi, 2008; Robertson, Fluck & Webb, 2007; Wagner, 2006). This is reflected in the use and adoption of various teaching and learning approaches in order to empower learners. One of the learning approaches to emerge as a consequence of integrating technologies in education is e-learning technology.

E-learning, as defined by the European e-Learning Action Plan, is 'the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration' (Commission of the European Communities, 2001: 2). In the context of mathematics as a subject, mathematics has remained mysteriously unpopular and difficult for many students, despite its critical role in almost all fields and careers (Yushau, 2006). Greater

efforts have been undertaken to improve mathematics education, and the recent developments in technology mean that the world is now even more mathematically based. Despite this, Saudi Arabia is one of the lowest performing countries in science and mathematics (Reddy, Kanjee, Diedericks & Winnaar, 2006).

The increase in information transfer has made it difficult to deliver education to individuals. Dramatic changes in the field of education are strongly needed.

Saudi Arabia And E-Learning

To support the implementation of e-learning in Saudi Arabia, a National Centre for E-learning and Distance Learning was established in 2005, with the aim of creating a complementary educational system that uses e-learning technologies (National Centre for E-learning and Distance Learning, 2010). Many outstanding projects have been adopted by this centre to assist in the transition to a digital society and support the implementation of e-learning in Saudi Arabia, such as the Saudi Digital Library Project.

Despite the growing availability of educational technology (mainly e-learning) and the awareness of its potential contributions to enhance learning outcomes, teachers still face complexities in using existing e-learning material (Arab News, 2006; Hassana, 2008), and the implementation of successful e-learning and online instruction in Saudi Arabia's educational system is still very limited (Alaugab, 2004). Al-Harbi (2011) stated that e-learning in Saudi Arabia is still a new process and is in its infancy. Even in cases where e-learning has been applied in Saudi Arabia, there is no measurable evidence of its effectiveness for students' learning outcomes, and no clear framework or policy to implement e-learning in Saudi schools (Hassana, 2008).

Saudi Arabia needs to generate a clear plan for implementing new technology in the educational setting. Strong evidence emphasises that previous

efforts were unsuccessful not because of the lack of effective efforts, but because the implementation was not planned thoroughly (Al-Wakeel, 2001). The implementation of an effective e-learning system in the Saudi educational system is a vital step towards accomplishing government policy in the information technology area.

Methods

This study aimed to investigate the effects of teaching mathematics in Saudi primary schools using e-learning. The study employed qualitative approach in multiple forms: observations, field-note and follow up interviews. The study involved 48 female students from grade six in two schools, public and private. The experimental groups received instruction from e-learning. The participants were volunteers who agreed to be part of the project.

The Tool

One of the critical parts of this research was the development of the e-learning website that served as the venue for students to learn mathematics. The website designed in this study—Mathematics Online in Saudi Arabia (MOISA)—allowed the students to learn mathematics at their own pace in their own time, with a flexible, interactive and engaging online experience (see Figure 1) .



FIGURE 1 THE WEBSITE FRAME IN ARABIC

The MOISA website provides online mathematics learning for teachers, students and parents. The website not only provides a good learning environment, but also enables school teachers to make the teaching process more active and appropriate. The website design allows students to play educational games as well for educational activity. The students

can use computer or mobile devices to read the mathematics-related material.

To access the website, experimental groups needed to use specific usernames and passwords assigned to them by the researcher (see Figure 2). Once the students logged on to the website, an automatic e-mail was sent to the researcher so that it was possible to track how many times the students accessed the online materials. This was also done to control the bias that would have arisen if the control groups had accessed the website.

The website was comprised of a variety of e-learning materials, such as an online mathematics tutorial, materials that assisted the students to learn advanced topics, useful links that allowed them to discover new international ways of learning mathematics, and past exams.

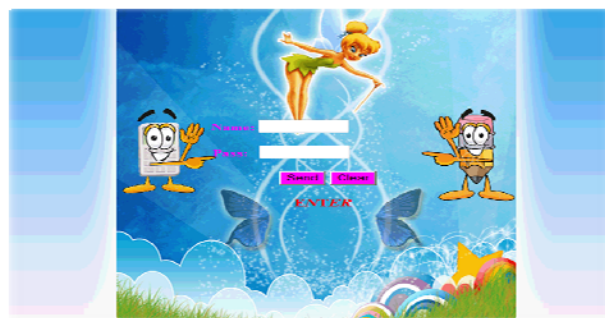


FIGURE 2 USER'S REGISTRATION PAGE

Data Collection And Analysis

Before the experiment took place, a pilot study was conducted in order to determine how the new tool—an e-learning website—would fare. This pilot study was used to develop and improve the e-learning website. In addition, the pilot study had the purpose of improving the environment's technical robustness and the learning material's quality (Gay & Airasian, 2000). Then, experimental classes were taught mathematics by e-learning over 13 weeks. In order to attain a better understanding on their experience, a semi-structured interview approach was conducted for feedback purposes, and probing questions were used in order to pursue interesting points (Cohen, Manion & Morrison, 2007). The main topics covered in the interview were:

- The advantages and disadvantages of learning mathematics by e-learning;
- The effects of learning mathematics by e-learning on students' mathematics knowledge;
- The effects of learning mathematics by e-

learning on students' computer skills;

- The effects of learning mathematics by e-learning on students' personality and confidence levels; and
- The problems and barriers to learning mathematics in this manner

Analysing the interview results was undertaken based on the guidelines of Charmaz's grounded theory (Creswell, 2009). Grounded theory is a qualitative methodology that has systemic steps that involve 'generating categories from information (open coding), selecting one of the categories and positioning it within a theoretical model (axial coding), and then explicating a story from the interconnection of these categories (selective coding)' (Creswell, 2009: 184).

Results

The purpose of the first and second questions was to determine the advantages and disadvantages of using e-learning in mathematics classes. The students' responses indicated that the main advantages from the project were: (a) saving time; (b) breaking the routine; (c) receiving feedback; and (d) engagement. The disadvantages were (a) lack of physical interaction; (b) getting easily distracted; (c) misusing the internet; and (d) the project was difficult to master at the beginning.

The third question investigated the participants' opinions about the effects of learning mathematics by e-learning on mathematics achievement. The majority of the interviewed samples believed that their mathematics knowledge had improved after learning mathematics by e-learning. Only one student from the public school seemed disinterested in learning mathematics by e-learning, and believed that the conventional method of learning mathematics was better.

The fourth question was about the effects of the digital classes on the students' computer skills. Several students' responses indicated that their computer skills had improved because they could search the internet and use e-mail more quickly. However, one response from the private school indicated that there was only a slight improvement, and one respondent from the public school believed her computer skills had remained the same because she did not notice any significant improvement.

The fifth question investigated the problems that the samples faced during the project. The main problems reported by the interviewed samples were: (a)

technical problems; (b) lack of sufficient training before conducting the project; and (c) fear of using the technology.

Discussion And Conclusion

Young people are using technologies in all their daily activities, including their learning. They find it difficult to engage with the traditional teaching method (Green & Hannon, 2007). Thus, students who have grown up in the era of digital technology are poised to obtain the benefits of e-learning (Federation of American Scientists, 2006; Shaffer, 2007).

The current study demonstrates that employing e-learning has the ability to improve mathematics education. The main goals of mathematics education are to give students a strong ability to use mathematics concepts in other fields, and to train them in abstract and logical thinking (Bringsild, 2008). These targets can be obtained by teaching students to understand broader concepts, instead of focusing only on upcoming exams. The use of an e-learning environment in mathematics classes can enhance students' understanding (Bringsild, 2008). The findings of this research support this, so do the results of numerous previous studies (e.g. Blyth, Clarke & Labovic, 2006; Etukudo, 2011; Hsu, Chang & Lo, 2011; Nathan, 2010).

Several students reported during the interview that they liked the idea of learning mathematics by e-learning because of the flexibility that the new approach offered. This finding is consistent with the studies of Dhariwal (2010) and Etukudo (2011), who reported that e-learning provides an opportunity for individualised mathematics learning because every student can learn according to his or her pace. This cannot be offered by traditional learning. More studies on this topic are needed in order to use e-learning effectively in mathematics classes in Saudi primary schools.

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