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RESEARCH ARTICLE

THE EFFECT OF SMART E-BOOK ON THE CONTEXT OF E-LEARNING

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ABSTRACT

E-learning is witnessing a big pace in education field and has a significant role in higher education due to the rapid and huge development in technology. Smart book is one of these developments that has enriched the educational process and has its influence on students' performance. This research studies the effect of smart e-book on the pass rate of students in an IT course at the Arab Open University branches in six Middle East countries and investigates and deduces the factors that affect the obtained results.

INTRODUCTION

The traditional educational system in universities has a classroom with a professor giving speeches to students while students are listening and taking notes. Great developments in ITC (Information and Communication Technologies) have provided huge opportunities for education's providers to introduce new methods of delivering educational materials. E-learning is one of the new alternative and innovative learning environments compared to traditional learning. E-learning (Safiyeh Rajae Harandi, 2015), identifies various types of computer-aided learning; usually using modern technological means such as CD-ROM. It is expanding especially in the area of distance education and corporate training. E-book (Electronic book) (Julisar, 2017), is another enhancement in the educational process either in traditional or open universities. Students are conveyed from reading traditional text book (hard copy) into e-book (online copy). A new pace in e-learning development is the introduction of smart context in its different types; such as smart board, smart classrooms, etc. while the newest one (to date) is the smart e-book (Klimova, 2015). This paper focuses on the impact of smart e-book on educational process, mainly the pass rate in IT course in six Middle East countries and defines the factors that can affect the results and how could negative effects be mitigated or canceled. The output of this research summarizes that the smart e-book has neither positive nor negative consequence on

the pass rate due to several factors that are analyzed in section VIII. The remaining of this paper is organized as follows: part II presents various definitions of e-learning, part III shows the e-book formats, part IV presents the various types of smart context in education, part V focuses on the challenges that face both e-book and smart e-book, part VI presents the expected benefits of using smart e-book, part VII presents the methodology used in research, part VIII presents the result and analysis of study, and finally part IX is the conclusion.

Definition of E-learning

There are several definitions of e-learning summarized below (Safiyeh Rajae Harandi, 2015).

- "E-Learning identifies various types of computer-aided learning, usually using modern technological means; such as CD-ROM".
- "E-learning can be understood as an educational process, using information and communication technologies to create training, to distribute learning content, communication between students and teachers and for management of studies".
- E-learning challenges the traditional ways of training and learning, and provides new solutions for educational problems; for instance, the role of teachers is probably changing from importers of knowledge to expeditors of knowledge. It can be a very good learning practice that can exceed the education you may

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experience in a crowded classroom. E-learning contains different types of educational tools in learning. It has the same meaning with technology-enhanced learning (TEL), computer-based instruction (CBI), computer-based training (CBT), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), web-based training (WBT), online education, virtual education, and virtual learning environments.

- E-book [2] is a book publication made available in digital form, it consists of text, images, or both, readable on the display of computers (stored on primary memory) or other electronic devices such as e-reader or even available online.
- Smart e-book (interactive e-book) is another introduced concept to the educational process; it has interactive features such as audio and text features when user move the cursor over certain sentence or word; it can pronounce the required word, provide more information about specific term, and more even it can highlight the most important part of the text in order to facilitate and hasten reading of information.

E-book formats

E-book formats emerged and proliferated rapidly by the major software companies; such as Adobe with its PDF format. PDF documents are generally tied to a particular dimension and layout, rather than adjusting dynamically to the current page, window, or other size (Marinai, 2011). Scholars formed the TEI (Text Encoding Initiative), which developed consensus guidelines for encoding books and other materials of scholarly interest for a variety of analytic uses and reading, and countless literary and other works have been developed using the TEI approach (Gardiner, 2010). TEI scholars were closely involved in the early development of open e-book. Open e-book required subsets of XHTML (Extensible Hyper Text Markup Language) and CSS (Cascaded Style Sheet); a set of multimedia formats and an XML schema for a manifest. This format led to the open format EPUB. Google Books has converted many public domain works to this open format (Wu, 2013).

Smart context in Education

The concept of SMART has been introduced in several disciplines such as industry, banking, education, etc. In education; smart has many aspects that influence the learning process and performance. Smart classroom is one of those aspects that is studied in research paper (Gunn, 2017), it presents a case study of an engineering school in the Middle East that introduces a technology which enhances active learning classroom (Glukhov, 2017), presents the smart-universities and the main properties of smart-university, such as the flexibility of learning in an interactive educational environment and free access to worldwide content (Chen, 2017), examines the possibility for the active use of smart devices while learning out-in classroom in order to complement the ICT environment offered by the university (Biñas, 2012). describes the concept of electronic textbook, which provides some interactivity to the reader with the goal of improving his study experience.

Challenges: This section provides the challenges that face the e-book and smart e-book.

Challenges of E-Book

The demand for e-book services in libraries has grown in the last two decades; nevertheless, difficulties keep libraries from providing some e-books to clients. In most cases, publishers allow limited license to their e-books in certain disciplines to libraries, it means that the library does not own the electronic text but they can circulate it either for a certain period of time or for a certain number of downloads, or both based on the license agreement (Julisar, 2017).

Challenges of Smart E-Book

The existence and growth of smart e-book face the same challenges mentioned above in addition to some difficulties related to smart context; the huge size of digital media affects the interactive response time between client and interface. Certain specific obstacles are associated with the need of extra software (plugins) to run audio and video components and high speed internet connection. Another challenge is the need of training the clients on using the components of smart environment. Enhancing the experience of using interactive education materials such as smart e-book is a main requirement, but it should not affect negatively the accessibility of disabled people specially people with low vision or hearing capabilities.

Benefits of Using Smart E-book

The most approaches used by students to memorize information are the visual, audible, and writing. The suitable method cannot be predicted only through the learning process. During the learning process, some students prefer the visual and audible representation of information, which enhance their memorizing abilities. In visual representation, for example, the information provider, such as smart e-book, provides the text in different colors and fonts, uses mind maps, diagrams, animations, geometric shapes, and video clips. Other students, who prefer listening to audio files, find the smart e-book, really, supportive when they perceive information (Dunlosky, 2013). Smart e-book is expected to improve the learning experience by providing summaries to paragraphs, highlighting important information, providing pop-ups that contain definitions of jargons in paraphrased way, running audio recording when hovering the cursor over a sentence or terminology, and many other interactive ways (Doiron, 2011).

MATERIALS AND METHODS

This research aims to evaluate the performance of students when using the smart e-book is certain IT course. The data used to measure the pass rate was obtained by the previous and the current chairs of the course; the data obtained was the total number of students enrolled in the course in six branches of the Arab Open University and the number of pass students in each academic semester.

The academic semesters are the Fall 2017/2018 and the previous two (Spring and Fall 2016/2017); the Fall 2017/2018 semester is the one which the smart e-book is used, while the e-book was used in the previous two semesters. This data was used to calculate the pass rate in each semester in order to compare between them in each university branch to conclude the effect of smart e-book on the performance of students as illustrated in the next section.

RESULTS AND ANALYSIS

To study the effect of introducing smart e-book in the environment such as university, a case study is presented that compares the pass rate of students in three academic semesters. The first two semesters used the e-book while the third one moved to smart e-book. This case study is applied in the Arab Open University in six branches (Kuwait, KSA, Oman, Jordan, Bahrain, and Egypt), specifically in an IT course (level one). Figure 1 below shows the pass rate of students in the six branches in Fall 2016/2017 where the e-book was the main tool of education.

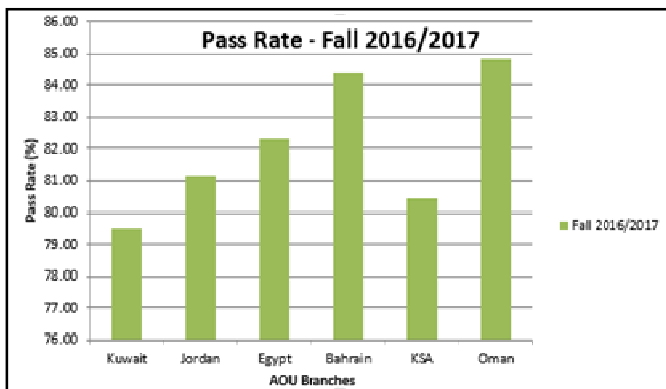


Figure 1. Pass rate in fall 2016/2017 – e-book

Figure 2 shows the pass rate of students in the six branches in Spring 2016/2017 where the e-book was the main tool of education.

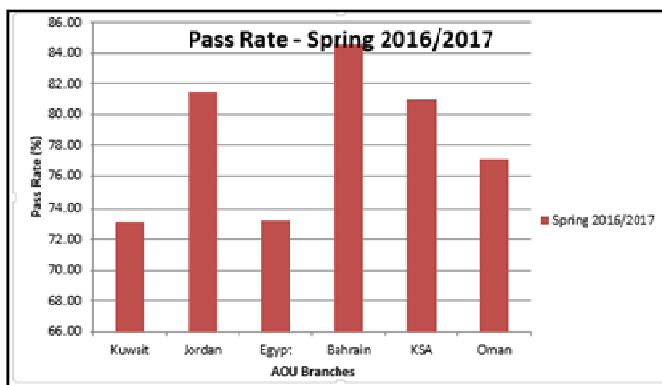


Figure 2. Pass rate in Spring 2016/2017 – e-book

After applying the smart e-book as the main tool of education, we find the results summarized in Figure 3.

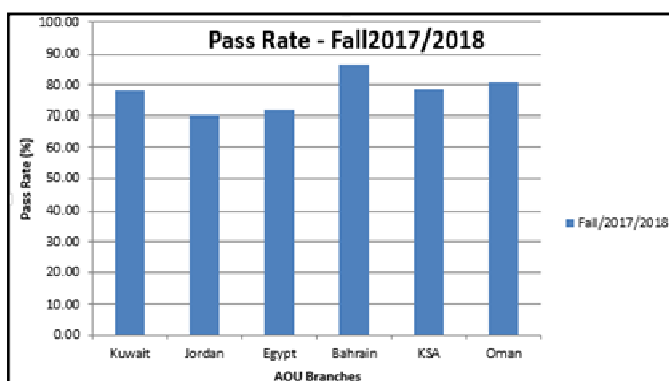


Figure 3. Pass rate in Fall 2017/2018 – smart e-book

Figure 4 shows the comparison between the pass rates in the three semesters. The results illustrate that the smart e-book has a positive effect by increasing, a little bit, the pass rate in Bahrain, while the performance is decreased slightly in the rest five countries.

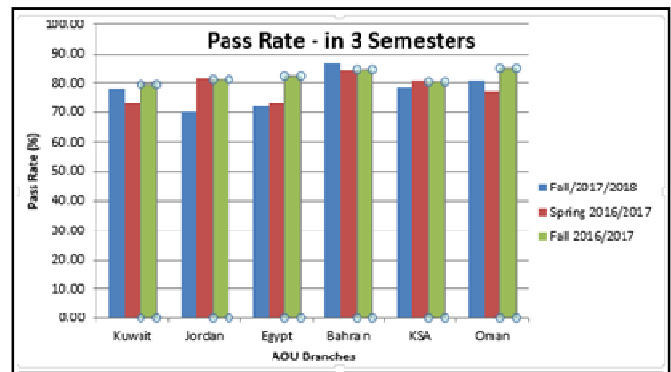


Figure 4. Pass rate in 3 semesters

It is noticed that applying the smart e-book in this case study has neutral effect, in general, for the following reasons:

- Although there are several methods to deliver information in traditional education in schools, students most often depend on teacher as the main source of feeding information, which is a one way method. Moving to a new environment (undergraduate level) that uses smart tools and different teaching methods (sharing and searching for information), makes it hard for students to deal with and accept the new atmosphere.
- Generally, students at the first level courses have lack of computer and internet skills, which affect negatively on taking the advantage of smart e-book.
- The gap when moving from e-book context to smart e-book context could be filled by an intermediate step that considers the concept of learning for understanding. The concept means that students are not familiar and understanding of interactivity. To make benefit of using smart e-book, understanding the concept of interactivity is essential.
- Ontological insecurity; individuals seek some level of psychological security. Insecurity generates anxiety, which can produce resistance to accept new experience or practicing unprecedented technology.
- Trust; it is a socially constructed phenomenon. Trust for change is required during the implementation of technology concepts. When disagreements occur between students' opinions about the benefits and using of smart e-book, the trust of the new technology is decreased. And so, in some cases, it can affect negatively the performance of students in the course.
- Inertia; it is the inability to make an internal change despite significant external changes. This is because of routine; students used to use e-book for considerable period of time, and so they have inability to react to changes imposed by the new environment. By and large, human tends to accept routine.

Conclusion

This research studies the effect of smart e-book on the passrate of students in six branches of the Arab Open University. When

applying the smart e-book to first level IT course, the result shows that the pass rate is fluctuating by slight increment and decrement for different branches of the university. Several reasons are observed that justify the results, which summarized by the trust of the new context, accepting the routine, a gap between the movement from using e-book to smart e-book, lack of skills of internet and computer, and the huge leap when moving from the traditional learning in schools to the smart environment in open university. In future, the smart e-book will be more activated by studying the intermediate step when moving from using e-book to smart one and focusing on the interactivity as the methodology of teaching prior conducting the undergraduate courses. More analysis and study on the reasons will be applied by means of surveys and questionnaires.

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