

Designing and Publication of Interactive E-Book for Students of Princess Nourah bint Abdulrahman University: An Empirical Study

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Abstract

The present study aims to keep pace with the rapid developments in the field of e-learning which includes the widespread use of e-books. Therefore, the authors conducted a pilot study on (55) faculty members from various disciplines, they assured the importance of e-books in education and the need for them. Accordingly, the authors designed and published their book "Education Technology: Foundations and Applications" as an interactive application on apps platforms by using a design model that was developed by the authors, and by adopting a list of (28) standards divided into four domains to ensure the quality of the design and development of the e-book according to educational and technological standards. Thereafter, female students' perceptions of the effectiveness of e-books and their self-efficacy in using it were identified by (44) female students of Princess Nourah bint Abdulrahman University. The results indicate that the students have the basic skills necessary to download and read e-books and take advantage of its characteristics, additionally, they believe in its usefulness and are satisfied with it as they intend to continue using e-books in the future.

Keywords: Designing. Publication, interactive, e-book, Princess Nourah bint Abdulrahman University

1. Introduction

The present time is marked by constant change and rapid technological development which led to the emergence of many new technologies, contributed to the increase of flexibility rates of learning in terms of time and space, the speed and ease access to various learning materials, such as electronic textbooks.

Recently, the spreading and utilization rates of e-books at universities and institutions of higher education around the world has increased across the educational arena for the first time in the late nineties of the twentieth century (Shelburne, 2009). E textbooks mainly are a set of texts of informative material designed for study in a digital template (including: written texts, images, graphics, audio clips, video and/ or animation, etc.), allowing the possibility of displaying on screens of e-devices (Landoni& Hanlon, 2007). E-book has become a sophisticated technological innovation expected to witness tremendous developments that enable it over time to replace traditional paper books for the prospective future (Lynch, 2012; Shen, 2011; Lai & Chang, 2011), although college students regard traditional paper books as their model of reading (Kimball et al., 2010; Letchumanan&Tarmizi, 2011); it has facilitated the task of providing informative content enhanced digitally for learners as it lend them a helping hand to discover , build, apply, circulate and exchange knowledge (Rao, 2003), as well as the positive benefits of electronic textbooks compared to its traditional paper textbooks as they offer screen text display, linking elements and plug-text digital content along with multimedia allowing the possibility of reading on mobile devices, and provide users with the required support in the form of hyperlinks to enable them reach more learning resources. Hence; they contribute to achieving a variety of needs of the processes of teaching and learning by providing all students, teachers and faculty members with an advanced interactive content featured with richness, interactivity, the ability of editing and harmonization (Shiratuddin et al., 2006), as well as to increase interactions' levels of students with learning content delivered to them, support their interaction in teams of participatory work by allowing them the possibility of writing comments and observations (Gong et al., 2013; Tsang et al., 2013), and the ability to search for the required information, and made it available to users for 24 hours a day in addition to conduct required searches for specific content more easily and efficiently compared to traditional paper books (Clark et al., 2008; Shelburne, 2009); not surprising expecting generating all new business, books to be published in a Digital template for the foreseeable future (Kelly, 2006,43).

In spite of all these globally positive benefits and successive technical developments of textbooks; yet it still represents a controversial technical tool suffers from many difficulties and negatives for practical use at the university and institutions of higher education for a variety of reasons such as: the difficulty of sailing and transition between e-books pages, lack of clarity, weakness Readability levels, and the difficulties of dealing with the User Interface while reading on the screen in addition to the difficulty of finding classes, or specific words in the text; it is the difficulties that typically affect negatively in perceptions, attitudes and utilization rates of the students (Hernon et al., 2007); therefore many of the studies recommended the need to do more to face the challenges that impede the effective use of e-books (Slater, 2010 Shen, 2011; Walters, 2013). The past few years have witnessed a massive progress in the publishing and use of e-books in a manner reflected positively to

upgrade the industry of scientific publishing at the university as well as the various institutions of higher education around the world in light of the emergence of many projects, and major companies to publish, distribute and trade e-books around the world (Wang 0.2015), and the Arab world is part of this world so this Study came to contribute to the publishing and use of e-books.

1.1 Significance

- It proposes model and standards to design e book that can be emulated in preparation and designing of e-books.
- It sheds light on the skills of self-efficacy of female university students through the use of an e-book.
- It offers a product which can benefit those who prepare e-books.
- Non-availability of a sufficient number of e-books that have the required levels of academic quality at university libraries (Letchumanan&Tarmizi, 2011; Pomerantz, 2010).
- Inability to fulfill the desire of students for speed, ease access to the texts and the contents of the e-books at any time or place (Dinkelman& Stacy-Bates, 2007); Jamali et al., 2009).
- The technical difficulties related to the conservation and maintenance of constantly updated collections of e-books (Herlihy& Yi, 2010).
- Prevalence of false concepts and perceptions that buying, getting and managing e-books due to its difficulty usually make it less efficient and effective than traditional paper books (Dinkelman& Stacy-Bates, 2007; Armstrong & Lonsdale, 2005).
- In addition, the extreme poverty suffered by the Electronic Library in terms of availability of Arabic references of books on Apple markets, "iBook store", and "Google Play".
- This is due to two things: Authors did not notice the need to develop their books to fit with the evolution of technology and the proliferation of the appropriate hardware to browse the text, and the other restrictions were being set by Apple itself, which already impeded publishing of Arabic books on the market, such as the requirement that the publisher must be registered in one of the following countries: United States, Canada and Spain as for publication house and this is not readily available to many publishing houses.

2. Pilot Study

The two authors conducted a Pilot study, in order to identify the need of female university students for e-book from the perspective of (55) faculty members, the following are their responses on the survey paragraphs, as shown in table (1):

No.	Paragraph		Totally agree	Agree	Neutral	Disagree	Totally Disagree
1	twenty-first century learners need to master reading and writing skills using modern media	N.	41	13	1	0	0
		%	74.5%	23.6%	1.8%	0%	0%
2	Mastery of reading and writing skills by using modern means is a must to get enrolled into the job market	N.	33	18	3	1	0
		%	60%	32.7%	5.5%	1.8%	0%
3	Many labor market requires multiple skills, including what cannot be learned through formal educational	N.	21	24	9	1	0
		%	38.2%	43.6%	16.4%	1.8%	0%
4	The use of e-book is compatible with modern educational models such as blended learning ,distance learning and full e-learning	N.	25	23	5	2	0
		%	45.5%	41.8%	9.1%	3.6%	0%
5	The use of technical innovations including the e-book will raise up the Quality of educational product of the University	N.	18	23	10	3	1
		%	32.7%	41.8%	18.2%	5.5%	1.8%
6	The use of e-book reduces the cost of education by reducing the cost of printing and publication of books	N.	34	10	9	1	1
		%	61.8%	18.2%	16.4%	1.8%	1.8%
7	The use of e-book contributes to increasing the quality of education for ease of updating the content and information	N.	19	28	6	2	0
		%	34.5%	50.9%	10.9%	3.6%	0%
8	The use of e-book develops educated technical skills which is a way to achieve strategic transformation to knowledge-based economy	N.	25	24	5	1	0
		%	45.5%	43.6%	9.1%	1.8%	0%
9	The use of e-book increases the learning opportunities and expands the perceptions and understanding of the learner inside or outside the book	N.	12	29	9	5	0
		%	21.8%	52.7%	16.4%	9.1%	0%
10	Using E-book learning Prepares an environment compatible with the educational requirements of the twenty-first century	N.	17	29	6	1	0
		%	32.1%	54.7%	11.3%	1.9%	0%
11	The use of e-book is one of the ways to achieve the integration between the course and the skills of twentieth century	N.	26	23	5	1	0
		%	47.3%	41.8%	9.1%	1.8%	0%

Table (1) showed the need of the majority of the faculty members for using e-books as it contributes to developing the educational process and prepares learners skills to go through labor market which its

requirements and needs change very quickly, which also Necessitates the preparation of learners' self-learning skills, which will enable them to develop their potentials through continuous learning by using modern technological media.. The use of e-book in education will contribute to achieving higher educational strategy targets including raising up the quality of educational product of universities to enable the learners to obtain modern and sophisticated skills in addition to raising up the quality of educational content which features easily updated and developed to cope with the changes more easily and quickly. Finally, rise up the quality of education and developing learners' educational and technical skills and creating educational environments compatible with the requirements of 21st century that is in favor of the overriding objective which the Kingdom of Saudi Arabia seeks to achieve which is transforming the economy into knowledge-based economy, which requires the availability of all these skills in human resources of the state.

3. Questions

1. What are the criteria of producing interactive e-books?
2. What are the stages of designing, production and publishing of interactive e-books?
3. To what extent are the students of Princess Nourah University aware of the effectiveness of the use of interactive e-books?
4. To what extent are the students of Princess Nourah bint Abdulrahman University having Self-efficacy in using the interactive e-books?

4. Objectives

The Study aims to:

- Produce interactive e-book for the course of education technology In view of the educational and technical standards.
- Publish interactive course of education technology-book on App Store and Google Play.
- Measure the perception of Princess Nourah University Students of the effectiveness of the use of interactive e-book of the course of education technology.
- Measure self-efficacy of using interactive e-book of the Princess Nourah University Students.
- Contribute to training the female students on how to find, purchase and use of e-books.

5. Limitations

The present study is limited to designing eBook for the course of educational technology, it is conducted for the first semester of the academic year 2016/2017; it was carried out via global information network (Internet).

6. Study Terms

E-book: electronic textbooks were known as "a set of textbooks designed primarily in a digital template, or digitized and converted from the traditional paper format to digital, or, which is converted into any of the various electronic files in viewable formats, or readable on the screens of all kinds of devices, whether fixed or mobile, or tablets as well as various devices for reading e-books"(Wang, 2015, 9).

E-book publishing: procedurally; the two authors defined it as a set of procedures including analysis, design, programming and experimentation, publication and evaluation.

The publishing of e-book: Electronic Publishing: It is transferring the information by computers from the publisher to the ultimate beneficiary directly through the communications network (Wang, 2015). Procedurally; the authors define it as the availability of textbook on the App Store and Google Play.

Self-efficacy: Pandora defines self-efficacy as an individual's belief in their abilities to employ cognitive processes and motivation by which they control the important events of their lives and to help them achieve self-motivation (Bandura, 1994). Procedurally; authors define self-efficacy as the belief and perception of the students of the university in their abilities of using e-book.

7. Theoretical Framework

E-book; its importance and effectiveness in education:

Most contemporary educational authors prefer to define electronic books as electronic textbooks templates usually presented to students featuring similar characteristics to traditional textbooks paper that (Moody, 2010) indicate to the possibility of "flipping" its pages as well as it contain digital features to help readers to read effectively such as pronouncing words, Put notable lines under certain parts of the readable text, options for converting printed text into audio, as well as the use of multiple and hypermedia (such as audios, graphics, animation, and video) (Dalton &Palincsar, 2013 Chen et al., 2013; (Gong et al, 2013), And it include two main components which are the digital content provided to users and the electronic devices that help the users to read the contents, texts and e-books(Anuradha & Usha, 2007). Electronic textbooks used in education are consisted of three integrated core elements contribute together to upgrading the operations of digital learning for students

in the twenty first century (Cavanaugh, 2005; Rao, 2003). The hardware of electronic textbooks includes advanced technological applications for a particular group of fixed and animated electronic devices, which allow the users of students to display the contents of electronic textbooks, and the software of electronic textbooks is a group of computer software applications which they can download and run the electronic textbook content. In addition to the actual content of the electronic textbooks which it is an electronic informative content that could be reached by readers. There are six major formats and templates to design files of electronic textbooks used in education, (Lebert, 2009; Cavanaugh, 2005): which are:(TXT, plain text, the written text files format), (.html / .xml,) formula Web files, (.pdf) portable Document Format, Microsoft Reader format program files (.lit), program format E-Reader files (.pdb), and finally the formula of electronic publishing program files (.epub).

Using e-books has positive characteristics effect on using e-books by university students as being declared by Walton (Walton, 2012):as Speed and ease in synchronous access to many required e-books, visual &aesthetic appearance of electronic books, the awareness degree of the importance of e-books, The availability of functions of saving in bookmark bar, putting highlights lines, write notes and comments, ease of sailing / roam between the contents of the e-books, ease of portability, transportation, readability on the screen, the ability for practical use, the ability to search for the required information, and benefit from utilizing cutting-edge technologies. A set of positive characteristics must be met in an effective e-books to raise up the levels of student learning (Gibb, 2008a; Chong et al., 2009) ; Rupp-Serrano, 2010) like the updating of sailing / touring tools, ease of readability of the written lines, the speed and ease of synchronous access to many of the required electronic book titles as well as easy access to new e-books, and viability for practical use as well as for easy portability and transport; (Crestani et al., 2006; Abdullah & Gibb, 2008b; Chong et al., 2009);A study established precisely the factors affecting negatively on the students' decision in using e-books as: difficulty of sailing / Touring, the weakness of clarity levels of the used screens , lack of appropriate e-book reading devices design issues as well as the increase of its weight as a burden on the users of the students. Another study (Berg et al., 2010)highlighted the face of participating university students for many of the difficulties in the viability of e-books for practical use when performing a number of tasks related to remembering and retrieving information, perhaps the most prominent of all is the difficulty of sailing / roaming between the contents of the e-books, and the use of certain characteristics such as: (find the all required information) effectively despite their proficiency and good skills of using computers.

There are several important considerations must be taken into account when using e-books in education as indicated by (Giacornini et al., 2013; Wang, 2015). These include: the possibility of modifying the design ,sizes and forms of font templates used in different texts, the availability of active hyperlinks for search in external sources of additional information of the relevant documents available on the Internet, the simplicity and lack of complexity of the procedural steps followed to buy and get e-textbooks, and the availability of electronic lexicons and dictionaries help the reader to know the meanings of words and the difficult vocabularies, enabling the reader to highlight lines and putting selected parts of readable text in a bookmark as well as writing the required notes and comments, and ease of portability and load from one place to another as well as the ability for practical use, appropriate prices and financial cost for all users of the students, teachers and faculty members, as well as the appropriateness of the used electronic textbooks to play the role of supporting tool for the processes of teaching and learning. In addition, there are many benefits accruing when they use electronic textbooks (Sprague, 2008 &HunterAbram, 2010; Paxhia, 2011; Daniel, 2013; & Woody).

- Benefit from the employment of multimedia tools (such as audios, images and graphics, video clips, animation, and digital educational toys); which can thus attract the attention of students, and their sense of enjoying the thrill during learning and combining the use of several senses while reading to overcome traditional limitations facing readers as a result of their reliance on only visual reading.
- Enable teachers to restructure the teaching and learning process, produce more suitable modules of study and digital content to fit with styles, religions, languages, cultures and levels of skills of the learners at the same time commitment by the regulated educational criteria of the educational process.
- Getting rid of the phenomenon of heavy school bags through the use of small-sized e-books, the easy-load and transport from one place to another.
- Easiness of maintenance and replacement operations, and other operations for technical support for users of electronic textbooks.
- The speed of updating and the student's attaining the latest versions of e-textbooks around the world.
- Easiness of translation into many different languages around the world.
- Provide an opportunity for students to write and take required notes.
- Easiness of documenting references and preparing bibliographies lists for the purposes of scientific Study so as to help the students to adhere to required ethical standards when reading and documenting used references.
- The possibility of student's taking advantages from the spread of social networking websites in

spreading their quotations, opinions, views, personal reviews towards the contents of e books and making it available to their other peers.

- Providing students with electronic linguistic dictionaries and lexicons to increase their ability to read the required texts smoothly & enable them understand the meaning better, and to overcome the problems related to the weakness of the outcome of vocabulary.
- EBook is an eco-friendly which contributes to saving thousands of dedicated paper industry trees.
- Despite the many positive benefits enjoyed by the electronic textbooks, we find a number of negatives, and challenges that stand as a stumbling block in the way of practical use in education, especially in universities and institutions of Higher Education, Perhaps the most prominent include (lai, 2011 & Chang Girard, 2014;): prices rising, the financial cost and the difficulty of the formulas benchmark rationing, the various templates of e-books available for trading in the market, the difficulty of raising the levels of efficiency and effectiveness of e-books services for users, the challenges of commitments of the required level of quality and accuracy of electronic books content, challenges to prolong the duration of ownership of e-books in the future, the challenges of reducing health risks and the problems of fatigue and eyes overwork, and the challenges of improving the readability levels of used e-books in addition to the challenges of copyright protection quotation, and intellectual property of original authors.

Standards of Designing, production and publishing of e-book:

Educational studies indicate that it should rely on specific educational and technical design standards when designing e-book, this due its effect on the look and the experience of the user when interacting with e-books (Pattueli, 2010); therefore there is a need to put dedicated and codified principles depended on usability and prepare effective and Sophisticated instructional designs for interfaces of e-books in the light of the experiences and perceptions of users from students;(Kang et al., 2009) recommended on the need to evaluate the ability of e-books for practical use at the same time (Nielsen & Budiu, 2012) emphasized on the urgency of the need to design, produce and evaluate the effectiveness of the facades of the interaction of e-books displayed on the screens of mobile phones from the perspective of codified educational principles to the field of education design . Among the most important considerations that must be taken into account when designing e-books is the ability for practical use. (Rogers et al., 2011); indicate to the term usability as the warranty of enjoying the interactive products of education design with the ease of learning and interaction in applied use as well as being a fun and interesting from the perspective of the users. Historically, it is noted by (Smith & Ragan, 2004) that the pedagogues considered over long periods the capability for practical use as one of the key issues to be taken into consideration when designing different interfaces.

Tsakonas & Papatheodorou (2008) proposed a theoretical framework for evaluating the quality of user interaction with e-books that various different digital libraries contain, as he considered practicality as one of the basic Indispensable requirements to improve the quality of all levels of design, production, publishing, and evaluation operations of e-books by based on mutual correlation relations between three key elements: the user and the used system and content in the light of the three pivotal dimensions of evaluating the quality of interaction with e-books which are: the ability for practical use, useful process, and practical performance, and after about a decade (Norman, 2002) suggested a model of the principles of design the capability for practical use from the perspective of education design consists of four main principles characterized by great ability to overcome the difficulties and complexities that are usually face educational designers when regarding the requirements of usability and making their products more likely to deal with it easily from an applied practical perspective, namely: clarity, good conceptual paradigms, logical linking and feedback. Also (Yeh, 2010) provided another new model consists of three main principles for evaluating the effectiveness, quality and interactive educational designs in the digital age from the perspective of the ability for practical use, namely: efficiency, convenience, and interestingness, at the same direction (Lim et al., 2012) designed a proposed model consists of four main dimensions ramifies nine of effective instructional design principles For portability of interactional interfaces of users of e-books for practical use and they were as follows: learnability, efficiency, effectiveness and user satisfaction, then (Wang, 2015 & Huang) gave a proposed model consists of four main principles of viability for practical use in the design of the interactive facades of e-books displayed on mobile phone screens, it includes three main factors affecting the user interacting with the e-book form: It is the aesthetic elements of the book, a sense of achievement and ease when using the book and the appropriate procedural process for the users that mimic their previous experiences. The findings of (Jardina, 2012 & Chaparro) clearly indicated to enjoying Inkling device applications of reading electronic textbooks with the highest efficiency levels at all from the perspective of practicality in light of the results of the university students who participate in the study when performing the following six major tasks to practicality that assigned to them as they read content and texts of required e-textbooks. The standards contain the possibility of highlighting, putting specific texts in the bookmark of the e-book, search for a specific word, talking notes and locate written comments, change the size of texts displayed on the screen, navigating and roaming between the contents of the e-book. Both (Lee et al., 2006), and (Tullis & Albert, 2008) confirmed that in spite of the diversity and variation

of the models and the theoretical frameworks for the dimensions of practical use structure, they clearly seem to agree on four main dimensions, namely the learnability, effectiveness, efficiency and user satisfaction.

Self-efficiency in using e-books:

The concept of self-efficacy beliefs was introduced by Albert Bandura two decades ago and still receives the same attention from the scientists and authors who have concluded the necessity and importance of the role they play in the educational process. The term of self-efficacy has been used to refer to an individual's belief in his ability to do a specific behavior at certain levels of performance (Schunk, 2002 & Pajares). Efficiency means self-beliefs and views on the one's ability to organize and perform activities and events to discharge their mandate to achieve specific levels of achievements. Dealing with technology requires specific abilities and skills, especially those which come to deal with technology and which require individual skills and self-competencies in learning. The learner self-efficacy is considered one of the characteristics help him to choose suitable tasks to him as some studies indicated that there is a close correlation between the confidence felt by the students in their ability to do certain tasks and their selection to perform these tasks as well as their success in the completion (Randhawa et al, 1993).

Self-efficiency is one of the critical factors in the self-regulation process and choosing the type of experiences needed by the learner, and self-motivation achievement, self-efficiency is perceived as self-perceptions of the individual and his belief in belonging to the knowledge and skills he own, the ability to perform a particular thing, take a decision and choose between a range of alternatives, and through it the learner's ability increase to cope with failure and adversity, and reduce the tension that may occur in some situations, and supports his confidence in himself, (Bandura, 1994), as the learner's self-belief affects in determine or anticipating his results, the confident student in his social skills expect success in his relations with others, similarly the one who has the confidence and belief in his academic skills expect high scores in exams.

The motivation and self-discipline are consider of the most important required competencies for the use of educational technologies (Abbitt, 2011), and as the self-efficacy of the individual affected by the experiences of mastery and previous experiences where he has a self-belief in the ability of achievement and success in the relevant experience. In addition, the ease of use of technology and its usefulness will directly effect on the self-efficacy of the user, the study of (Ertmer, 2010)& (Ottenbreit-Leftwich) indicate that self-efficacy of students in dealing with e-books is represented in their ability to monitor their progress in learning and performing auto monitoring as well as the ability to search through the Web, send and receive electronic messages and the ability to use the time optimummly. The importance of self-efficacy of the learner is as follows (Bandura, 1994):

- Self-efficacy helps to stimulate the cognitive processes, if the cognitive experience was complex; therefore it requires a high level of self-guidance that relies largely on self-efficacy, which increases the ability of the individual to decide and regulate the level of learning and thus rise up the level of knowledge.
- It helps the learner to choose the appropriate tasks to him, as there is a close relationship between the confidence felt by the learner in his ability to perform a certain task and his choose to exercise this function, it also contribute to self-efficacy of the learner to strengthen self-interest of the subject and increase his desire to accomplish it.
- Self-efficacy plays a vital role in encouraging the learner to strive to achieve success, reach his objectives and regularly try his hardest.
- The motivation of the learners increases the confidence in himself and in his abilities and make him feel enthusiastic in doing business, unlike the learner who doubt in his abilities affects negatively on his performance, reduce his determination and his best performance.
- Individual's belief of self-competence is an expected scenario. As if the self-efficacy is high, they think of a scenario of success which is giving them good support to be strengthened for better performance.
- Individual's belief of self-competence is enhancing the effectiveness of achievement and the incentive composition which effects on his involvement towards the tasks assigned to him, the individuals tend to perform tasks and activities in which they feel competent and confident and avoid those tasks that are skeptical in performing.
- Self- beliefs effect on one's thinking patterns and on his reaction responses, high self-competence helps him create the feelings of a private psychological comfort at difficult tasks and complex activities, unlike the owners of low self-esteem who feel complex towards things more than it really is.

8. Methodology & Procedures

Methodology:

The approach adopted in this study is the developmental approach of education technology as stated in (Rita and Ritchie, 1994), where it passes through the study of three Methods: the analytical descriptive approach which

specifies and defines the problem, the approach of developing educational systems which construct the proposed training program, and the experimental approach that designed quasi-experimentally to investigate the effectiveness of the e-book.

Study Population and Sampling:

The study population consisted of all female students of the Princess Nourah University, the study sample was selected from students of Princess Nourah Abdul Rahman, whose being taught by the authors, section 2U4 and III, the number of respondents has reached (44) students.

Tools of the study:

To achieve the objectives of the study, the authors relied on the three following tools:

Standards list of e-book design: List of e-book design standards: the authors prepare a list of necessary standards that should be available when designing e-book to be used successfully and leaves a positive impact on education, so they followed the following steps: start by referring to related previous studies to prepare the preliminary book design list standards, where it included 27 standards distributed on four domains, and then distribute the preliminary list of standards on a range of specialists and those who are interested in the field of education and computer technology and instructional design for arbitration and give their comments on the edit or delete or add, and then make the necessary adjustments in the light of the aforementioned notes and reformulating paragraphs that need to be reformulated and delete inappropriate paragraphs and integrate others in a single phrase, finally; the list of criteria formed of 28 distributed to four domains.

A questionnaire to measure the effectiveness of e-book: The authors used a standardized survey questionnaire to measure the effectiveness of students' use of e-books, (E-Book Effective Use by Students (EBEUBS) for (Jeong, 2012), the proposed scale consists of 14 single questions designed according to five-point Likert questionnaire: (1) Absolutely, (2) Rarely, (3) Sometimes, (4) Often, (5) Always. The paragraphs of the questionnaire of (Jeong, 2012) fall under the three main domains to measure the effectiveness of students' use of e-books, namely: satisfaction with the use of e-books, the practical benefit of using e-books, and behavioral intentions to use e-books.

A questionnaire to measure Self-efficacy for students' use of e-book: self-efficacy preparation scale passed throughout many steps as follows: First, selecting the objective of the scale: The scale aims to measure self-efficacy in using e-books among students of Princess Nourah Abdul Rahman University, and then determine the scale domains: scale domains was determined in the light of the nature and purpose of the scale, which is an essential step before formulating phrases where they come under specific domains related to each other on the one hand and with the subject of metrology on the other hand, the authors set two main domains of the scale which are: (the efficiency of dealing with electronic applications stores and the efficient use of e-books properties to serve education), until phrases selection: The formulation of a set of phrases under the aforementioned domains had been taken into account when formulating it to be linked with domain and the scale number reached 13 phrases in the initial image of the scale which consisted of responses on each phrase (I cannot at all, I cannot, uncertain, I can with assistance, I efficiently can).

Validity

Virtual validity: to check the validity of the content of the Study tools, they were being displayed after designing on a group of arbitrators, experts in the fields of psychology, teaching methods and education technology. They were being asked to express their opinions in terms of the appropriateness of its clauses to achieve the objectives of the study and the adequacy of the tools in terms of the number of paragraphs and comprehensiveness and the diversity of content and evaluating the language in addition to any other comments they see fit to optimize and improve the level of study tools.

Validity of internal consistency: Pearson correlation coefficient of measuring the relationship between the paragraphs of the effectiveness of students' use of e-books, and the total degree as shown in table (2):

Table (2): Pearson's correlation coefficient of measuring the relationship between the paragraphs of the effectiveness of students' use of e-books and the total degree

Extent of satisfaction with using e-books		E-Book Practical benefit		E-Book Behavioral Intentions	
No.	Correlation coefficient	No.	Correlation coefficient	No.	Correlation coefficient
1	.08798**	5	.06110**	10	.08783**
2	.07723**	6	.07444**	11	.07501**
3	.05642**	7	.07650**	12	.06213**
4	.07661**	8	.08001**	13	.07797**
		9	.06308**	14	.07699**

Pearson's correlation coefficient of measuring the relationship between the questionnaire paragraphs of effectiveness of students' use of e-books, and the total degree of questionnaire as shown in table (3):

Table (3): Correlation coefficients measuring questionnaire paragraphs of effectiveness of students' use of e-

books and the total degree of questionnaire

No	Correlation coefficient	No	Correlation coefficient	No	Correlation coefficient
1	.07055**	6	.04746**	11	.06805**
2	.04870**	7	.04656**	12	.05680**
3	.06099**	8	.05523**	13	.06522**
4	.06244**	9	.05318**	14	.07124**
5	.02072	10	.07387**		

**** Significant at level of 0.01**

Correlation coefficients measuring dimension's questionnaire paragraphs of effectiveness of students' use of e-books and the total degree of questionnaire as shown in table (3)

Table (3): Correlation coefficients dimension's questionnaire paragraphs of effectiveness of students' use of e-books and the total degree of questionnaire

Dimension	Correlation coefficient
Extent of satisfaction with using e-books	.08082**
Practical benefit of using e-books	.06473**
E-Book Behavioral Intentions	.08812**

**** Significant at level of 0.01**

Correlation coefficients measuring questionnaire paragraphs for effectiveness of students' use of e-books applications and the total degree of domain

Table (4): Correlation coefficients paragraphs measuring use of e-books applications and the total degree of domain

No.	Correlation coefficient	No.	Correlation coefficient
1	.04518**	6	.02677**
2	.04640**	7	.05242**
3	.04121**	8	.06461**
4	.04810**	9	.05875**
5	.04530**	10	.02540

Verifying the reliability of tools:

The reliability of tools by using alpha Cronbach's coefficient has been verified:

Table (5): Alpha Cronbach's coefficients of reliability for the questionnaire dimensions of the effectiveness of using e-books

Dimension	No. of paragraphs	Reliability Coefficient of Alpha Cronbach
Extent of satisfaction with using e-books	4	.074
Practical benefit of using e-books	5	.075
E-Book Behavioral Intentions	5	.081
Total reliability	14	.084

To facilitate the interpretation of the results, the authors used the following method to determine the level of the answer of the tool paragraphs, where (always = 5, often = 4, sometimes = 3, rarely = 2, never = 1), then those answers categorized into equal five range levels through following equation: the length of category = (maximum value - minimum value) ÷ number of alternatives = (5-1) ÷ 5 = 0.80, as shown in table (6):

Table (6): Distribution of categories

Description	Extent of Means
Always	4.21 – 5.00
Often	3.41 – 4.20
Sometimes	2.61 – 3.40
Rarely	1.81 – 2.60
Never	1.00 – 1.80

Table (7): Alpha Cronbach's reliability coefficient for dimensions of questionnaire of self – efficacy

Variable	No. of paragraphs	Alpha Cronbach's reliability coefficient
The total reliability of the scale of self-efficacy in the use of e-books applications	10	0.66

To facilitate the interpretation of the results, the authors adopted the following method: (I efficiently can = 5, I can with assistance = 4, Uncertain = 3, I cannot = 2, I cannot at all = 1), then those answers categorized into equal five range levels through following equation: the length of category = (maximum value - minimum value) ÷ number of alternatives = (5-1) ÷ 5 = 0.80, as shown in table (8):

Table (8) Categories Distribution

Description	Extent of Means
I efficiently can	4.21 – 5.00
I can with assistance	3.41 – 4.20
Uncertain	2.61 – 3.40
I cannot	1.81 – 2.60
I cannot at all	1.00 – 1.80

9. Results and discussion

1. Answering the first question, “What are the criteria of producing interactive e-books?”

Reviewing pieces of literature review such as Wang & Huang (2015), Lim et al. (2012) and Yeh (2010), the authors identified the list of e-book design criteria: 28 criteria divided into four domains as follows:

The first domain: user interface: the design of the screen is simple, easy access to the book and log out, the possibility to change the font type, font maximizing and minimizing, marking hyperlinks in a different color, highlighting of significant sections, taking notes on the pages of the book, pointer to the user's location within the book, clear and understandable icons to the user, searching for a specific word through inserting it into the search box, navigating to specific pages through inserting its number in the search engine.

The second domain: Content: the screen contains adequate amounts of texts, combining texts and images on the same screen, view photos and graphics with high resolution, the possibility of enlarge images and graphics, use of the bullets and splitting texts into portions for easier reading.

The third domain: output and total view: providing an electronic reading experience close to the one of reading the paper, providing front and back cover to the book, the book works on different platforms using a variety of devices, the possibility of flipping pages like paper book, the length and size of the page similar to paper book, a unified output of lines in terms of size, color and presentation.

The fourth domain: Interactivity: multimedia hyperlinks, sharing highlighted sections across the social networks, the book index supported with hyperlinks allowing the transition to the required chapter directly, the inclusions of a video clip, the book offers an electronic interactive content, such as asking questions to the reader and providing immediate feedback.

2. Answering the second question, “What are the stages of designing, production and publishing of interactive e-books?”

Making use of instructional design models through the following networks: Total model of instructional design ADDIE and ASSURE (Heinich, 1999) (Rayan et al., 2000), (Alebatta 0.2007), the authors designed electronic textbooks (Shaye and Alaaad 0.2017), It was presented to the reviewers in educational and information technology, instructional design and programmers to make the required modifications, the final model consisted of six main stages which are: analysis, design, programming, experimentation, publishing and evaluating, the following is a description of each of these stages:



E book designing model (AlShaya and Aloyaid, 2017)

The first stage: Analysis: It includes the following sub-stages:

1. An analysis of the characteristics of the target audience: They are female students of the Princess Nourah bint Abdulrahman University who study education technology course.
2. Identifying the total objectives of the e-book: It is expected After studying this book that female student is familiar with: (the concept of education technology and its development, educational communication and its models, modern teaching strategies and educational technology, skills, models and importance of instructional design, educational multimedia presentations, modern trends in the field of e-learning , distance learning, mobile learning and digital information sources, technical innovations in the classroom, social networks and applications in education , cloud computing and its applications in education , the safe use of the internet, electronic evaluation, application of educational technology standards).
3. An analysis of learners' needs: the authors did an exploratory study in order to identify the need of female university students to e-book from the perspective of (55) faculty members.

The second stage: Designing: It includes the following sub-stages:

1. Choosing of paper book: a book of education technology, foundations and applications of the authors and it is being taught as a reference to the education technology course (TC 131).
2. Choosing the appropriate educational multimedia: Identification of multimedia (images, audio clips, and videos ...) that need to be designed or used, indexed and organized in accordance with a timetable to support the content of the book.
3. Dealing with paper book text: It was through the following steps: rearrangement, editing and revising the scientific material, reviewing the text linguistically and with spelling, file formatting and unifying the font sizes, taking into account the reducing numbers of used lines as much as possible, the choice of the standard lines that run on most systems, reduction of colors, fonts and formats to facilitate the transfer of texts to Web, determine head and sub lines, re-edit photos attached and its appropriateness for the terms of electronic publishing preferably choosing high efficient Photos, delete footnotes below the text due to the difficulty of dealing with it in the file, link the texts with hyperlinks as (photos, pages and video) on Web, converting tables and charts into images to maintain the coordination of it , indexing the contents in accordance with head and sub-titles for easy movement between the parts of the book, linking videos by running Web sites, convert text files to e-books Epub format, convert texts to Web pages to deal with it inside the e book.
4. Preparing technical design of display screens: a design which shall be similar in both systems operators of electronic devices IOS and Android in order to preserve the unity of the linkage between the two programs where the book is the same.
5. Design appropriate presentation software: It is a program through which the desired text would be displayed as well as the video and images and using the book in accordance with the terms of electronic publishing.

Thirdly: Programming: It includes the following sub-stages:

1. Start of programming codes for both systems after the adoption of a copy of the used book.
2. Installation design on Codes.

3. Use SDK to convert the book files into electronic application running on IOS & Android,
4. Using e-books editor to modify the text, 5- compress Epub files to reduce its size by using a dedicated files adapter.

The Fourth stage: Experimentation: It includes the following sub-stages:

1. Present the book to a sample of reviewers in education and information technologies for adopting the content and comment on the initial version after preparing the book in the electronic form.
2. Upload a beta version of the e-book on a platform for a specific time through the period of its applying on scoping sample,
3. Perform the required amendments to the initial version of the e-book in the light of the views of the scoping sample and the arbitrators
4. Upload the amended version of the e-book on software platforms for approval and for submission to the core sample Study.

The Fifth stage: Publishing e-book: It includes the following sub-stages:

1. Create an account on Apple Store and Google Play platforms, the program owner creates an account on one of the platforms of programs which require the payment of an annual subscription worth \$ 100 for first and \$ 25 for the second one as well as linking a credit card account to pay the annual subscription and bank accounts numbers to deposit sale of application software platforms profits.
2. Open developers account with specific mandates to follow-up program development by technical specialists and they cannot have access to banking information of the account holder.
3. Upload Initial versions of the software on both platforms programs for their accreditation and waiting for the results of tests on the platform codes program.
4. Accreditation of the program: the accreditation takes 7- 10 days on App Store, while it is two to four days on Google Play.
5. Applying e-book on the core study sample in studying education technology course.

The Sixth stage: Evaluation:

1. Applying the e-book on the core sample of the study: by allowing the book to the basic sample students to study the educational technology course.
2. Evaluating the book online and take all notes during the application period, and evaluate the students learning through the book using by self-efficacy questionnaire and through identifying the students interacting with the e-book.
3. Editing the book in light of the observations made during the application and the views of the study sample period; one of the most important specifications of electronic publication is the possibility of amendment in the text of the book, the amendment is not preferred in the programming of the book.
4. Re upload e-book in the final version: After making the amendments in the light of the basic experiment of the study, the program is re uploaded again on the two platforms programs, it takes ten days by App store to review whatever simple the amendment is.



The e-book of educational technologies course which being produced and published on App store and Google play is characterized with the following: flipping pages, maximizing and minimizing the fonts size, the index of the book is supported by hyperlinks allowing the user to go directly to the required chapter, highlighting the important portions to read, taking notes by writing it on the margins of the pages, going to specific pages by entering its number in a search engine, sharing the highlighted parts through social networks, post and insert video clips and links to external sites.

Challenges faced by the authors and solutions during the stages of producing and publishing the e-book:

1. Inability to publish the book at the book store as a regular book because of the requirements of App Store so the solution was to turn the book into an application in the form of a book which required

- considerable effort and high cost.
- Incompatibility of E books text editors programs with Arabic texts. This required re converting the content of the electronic books to uncoordinated texts and use electronic publishing software to edit and format the text. This claimed a big effort because these programs are not prepared for artistic output of texts.
 - Slow browsing in the case of Arabic content, deficiencies of programming tool in displaying the Arabic text, for example, «vertical browsing position».
 - High cost of programming tools rated thousands of dollars.
 - The difficulty of obtaining technical support to the problems of the Arabic content by developers.
 - Unavailability of Arabic society for publishers or authors and developers especially for Arabic content unlike other languages.
 - Rarity of similar versions in order to benefit from the ideas of it or convey their experience.
 - Rarity of Arabic publishing idea as when spreading it publishing companies might be interested in the idea of competition to provide the tools to develop the Arabic content such as: spell Checker, Grammar Checker, the possibility of publishing footnotes, various types of indexes, proper ways to display Arabic content, browsing from right to left.



- Answering the third question, "To what extent are the students of Princess Nourah University aware of the effectiveness of the use of interactive e-books?"

Table (9): Frequencies, percentages and means arranged in descending order for the responses of the students about satisfaction with using interactive e books.

No.	Paragraphs		Always	often	sometimes	rarely	never	Mean	standard deviation	Order
3	I feel good about using e-books as a tool for reading	No.	21	19	3			4.42	0.63	1
		%	48.8	44.2	7.0					
4	I feel good about the colors used in e-books.	No.	19	20	4			4.35	0.65	2
		%	44.2	46.5	9.3					
2	I feel good about using eBooks as a support tool for learning.	No.	15	21	7			4.19	0.70	3
		%	34.9	48.8	16.3					
1	I feel good about the functions and tools of e-books.	No.	13	22	8			4.12	0.70	4
		%	30.2	51.2	18.6					
Total mean for dimension								4.27		
Standard deviation								0.50		

* Mean is out of 5.00

Table (9) indicates that the general arithmetic mean of the first dimension is: the level of satisfaction of using e-books, and it was (4.27); confirming that students of princess Nourah University have high level of long

lasting satisfaction with the use of e books. Means study sample responses of students ranged between (4.12-4.42), and this result is consistent with the two studies of Clark et al., (2008) and Shelburne (2009), which emphasize that the electronic textbooks usually privileged with positive specifications, the most prominent one is the ability to search for the requested information and made it available to users 24 hours a day in addition to conducting searches for certain content easily and efficiently, compared to traditional paper books.

The second dimension: the practical benefit of using e-books:

Table (10) Frequencies, percentages and averages arranged in descending order for the responses of the students' practical benefit of using interactive e books

No.	Paragraphs	Always	often	sometimes	rarely	never	Mean	standard deviation	Order
5	It is easy for me to read the lines written in bold type in the e-books.	No.	29	12	2		4.63	0.58	1
		%	67.4	27.9	4.7				
6	Method of displaying the contents of e-books is featured by clarity, sequencing / logical sequence.	No.	23	18	2		4.49	0.59	2
		%	53.5	41.9	4.7				
8	It is easy for me to flip pages of e books	No.	21	11	9	2	4.19	0.93	3
		%	48.8	25.6	20.9	4.7			
9	It is easy for me to search and find important information on e- book	No.	17	13	13		4.09	0.84	4
		%	39.5	30.2	30.2				
7		No.	14	18	11		4.07	0.77	5
		%	32.6	41.9	25.6				
Total mean for dimension							4.29		
Standard deviation							0.53		

*** Mean is out of 5.00**

Third Dimension: E-Book Behavioral Intentions:

Table (11): Frequencies, percentages and averages arranged in descending order for the responses of the students' E-Book Behavioral Intentions towards using interactive e books.

No.	Paragraphs	Always	Often	Sometimes	Rarely	Never	M	St. D	Order
12	I intend to read more of the e-books in order to search for the required information that I need for a variety of purposes.	No.	22	14	6	1	4.033	0.081	1
		%	51.2	32.6	14.00	2.3			
11	I intend to use e-books to help me learn.	No.	19	16	5	3	4.19	0.19	2
		%	44.2	37.2	11.6	7.0			
14	I would choose reading electronic versions if I had options to choose between electronic copies, and printed paper for certain books.	No.	18	8	13	4	3.93	1.06	3
		%	41.9	18.6	30.02	9.3			
10	I intend to increase my usage rates of electronic books in the future.	No.	12	15	15	1	3.88	0.85	4
		%	27.9	34.9	34.9	2.3			
13	It is expected to rely almost entirely on various readings on e-books over the next five years.	No.	12	15	9	5	3.70	1.15	5
		%	27.9	34.9	20.9	11.6			
Total mean for dimension							4.00		
Standard deviation							0.73		

*** Mean is out of 5.00**

Table (11) shows that total arithmetic of the third dimension was (4.00), a value emphasizes that students of princess Nourah University want to use e-books in the future; e-books should be utilized in the educational process and to face the challenges that impede its utilization as recommended by Slater (2010), Shen (2011) and Walters (2013).

Table (12): Arithmetic mean arranged in descending order for the dimensions of the questionnaire

Dimensions	*Mean	St. D	Order
Extent of satisfaction of using e-books	4.27	0.50	2
Practical benefit of using e-books	4.29	0.53	1
E-Book Behavioral Intentions	4.00	0.73	3
Total degree for the questionnaire of measuring the effectiveness of students' use of e-books	4.18	0.47	

* Mean is out of 5.00

Table (12) showed that total mean for the questionnaire was (4.18), assuring that students of princess Nourah University have high interactive standards with e books, and this is from the perspective of the female students themselves.

4. Answering the fourth question, "To what extent are the students of Princess Nourah bint Abdulrahman University having Self-efficacy in using the interactive e-books?"

Table (13): Frequencies, percentages and means arranged in descending order for the responses of the participants about the availability of the students' self-efficacy in using e-books.

No.	Skill	The scale					Mean	St. D	Order
		I efficiently can	I can with assistance	Uncertain	I cannot	I cannot at all			
4	I can navigate through the application of the book and get to know its properties and services	No.	39	2			4.95	0.22	1
		%	95.1	4.9					
3	I can download books on the tablet or smartphone	No.	37	4			4.90	0.30	2
		%	90.2	9.8					
5	I can benefit from e-books to serve my education	No.	37	4			4.90	0.30	2
		%	90.2	9.8					
10	I can benefit from video clips in e-book	No.	30	2	9		4.51	0.84	4
		%	73.2	4.9	22.0				
8	I can use the important sections highlighting property in eBook	No.	27	6	6	2	4.41	0.92	5
		%	65.9	14.6	14.6	4.9			
7	I can use the search feature in the e-book	No.	28	4	7	2	4.41	0.95	5
		%	68.3	9.8	17.1	4.9			
6	I can use control property of font type and size in e-book	No.	27	2	10	2	4.32	1.01	7
		%	65.9	4.9	24.4	4.9			
2	I can do the process of using the card of iTunes & Google Play to buy the book	No.	13	18	8	2	3.98	0.99	8
		%	31.7	43.9	19.5	4.9			
9	I can use the service of taking notes in the e-book	No.	14	10	13	4	3.83	1.02	9
		%	34.1	24.4	31.7	9.8			
1	I can do the process of buying the book using a credit card payment	No.	9	16	8	4	3.54	1.23	10
		%	22.0	39.0	19.5	9.8			
Total mean						4.38			
Standard deviation						0.42			

* Mean is out of 5.00

According to table (13), the highest self-efficacy levels in the use of e-books among students of Princess Nourah University appeared in paragraph 4, "I can navigate through the application of the book and get to know its properties and services," with a mean of (4.95), followed by paragraphs 3 and 5, "I can download the book on a tablet or smart phone" and "I can benefit from e-books to serve my education" with an arithmetic mean of (4.90), and this demonstrates high-level percentage of perceived self-efficacy among the students of such skills.

While paragraph 2 "I can buy a book using iTunes & Google Play Card" ranked the eighth with mean of (3.98), followed by paragraph 9, with a mean of (3.83), while paragraph 1, "I can buy the book using payment credit card" at the tenth rank with a mean of (3.54) and can be attributed to the low level of the perceived self-efficacy of the students in the process of buying e-books through various payment methods owing to their young age and their dependence on the free e-books at their previous experiences, and this is in line with (Mun & Hwang, 2003) that the self-efficacy of the individual affected by his prior relevant experiences, therefore, the

high level of self-efficacy to use e-books largely linked to the former experiences of students. The ease and spreading of technology significantly contribute to raising the self-efficacy. Table (13) illustrated that the majority of paragraphs have an arithmetic mean exceeds 4.32, which is a high rate and this is consistent with the study of (Kissinger, 2011), which emphasized that the participants have high level of self-competence in dealing with e-books and their perception of what they are learning in addition to the availability of opportunities for social learning through communicating with others.

Recommendations

In light of the results of the study, some recommendations have been made:

- Establishing research projects among technical college students to provide tools to facilitate converting Arabic paper books into eBooks.
- Open up new markets for the distribution of books such as cooperation with the Amazon and some electronic online libraries.
- Creating a special e-book community on social networks to facilitate communication between the author and the readers.
- Holding training courses for authors to identify the properties of e-books and the benefits for the author when using e books.

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