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Producing and introducing mobile books, as a new model of providing learning content in medical sciences

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Abstract

Mobile technology has provided valuable opportunity for continuous processes of learning. M-books are sources of e-learning content installed on mobile phones and may work as educational assistance for learners.

This study aimed to introduce m-books as a novel e-learning content resource to university students and measure their attitudes towards it.

Using Java-based software, e-contents of four medical courses were converted into m-books and installed optionally on mobile phones of interested students. The other students in the same classes did not install m-books on their mobile devices. The attitude of both groups towards m-learning was obtained by pre-test and post-test and analyzed by t-test.

The use of m-books significantly changed the enthusiasm of students towards m-learning and increased their motivation to study course contents during dead time and in motion ($p < 0.005$). This investigation introduced m-books as a highly welcomed educational assistance in medical sciences for the first time in Iran.

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1. Introduction

Learning is not only gaining an individual experience of knowledge, but is a continuous process. Lack of continuity in learning process can withdraw learner's achievement to a higher cognitive level. The use of mobile technology, especially mobile phone which is now available to all academic learners, has created a valuable opportunity for them to continue, expand and deepen the learning process, and for educational planners and educators to share information, create equal educational opportunity and enhance interaction between teachers and students (Prensky, 2005 & Stone, 2004). It has been proved that mobile phones using multimedia techniques beyond time and space, increase students' enthusiasm to learning and provide tremendous opportunities for learning during dead time and in motion (Prensky, 2005 & Ally Mohamed, 2009). Learning through mobile devices (m-learning) along with web-based learning are two arms of e-learning which have had impressive development in recent years and has been used as a new way of teaching in major universities around the world. Moreover, mobile technology has this ability to provide learning more accessible and available in comparison with web-based environments

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(Brown, 2008; Marguerite, 2010; Soon, 2011) and therefore, mobile phones are more potent for blended learning in comparison to web-based practices (Khaddage, 2009).

During a study in India on learners' attitudes to learning through their mobile phones, 69.2% believed mobile phones as a powerful tool in their rapid learning and 72.2% believed that mobile learning was a novel opportunity for them. 73.4% of learners considered mobile learning as a learner-centered with high flexibility over time and place (Kumar, 2011). In another study, Vavoula (2011) showed that not only e-content produced for mobile phones can be as efficient as e-content loaded on Web pages, but also it can provide a high level of interaction, enthusiasm and cooperation. The mobile world has developed over time. Currently, there are over 6 billion mobile phones worldwide (Wikipedia, 2012a) and this is even more than the total sales of personal computers around the world (Wikipedia, 2012b). This development is reminiscent of Jeff Hawkins' speech in 2004 predicting a day once the majority of people in the world do not need personal computers anymore and only a smart mobile phone forms their digital life (Stone, 2004). In Iran, the number of mobile phones is more than 70 millions which is accounted for 91% of the country population. Proportion to the population this stands higher than the average in the world, as the number of mobile phones around the world is accounted for about 80% of world population (Wikipedia, 2012a). This reflects the widespread use of this technology in Iran. Therefore, this is potential for Iranian educational planners to use it as a common hardware in process of learning. Mobile books, also called as m-books are sources of learning content which are installed on mobile cell phones and may work as educational assistance for learners. This study aimed to produce m-books and introduce them as a novel e-learning content resource to university students and measure their attitudes towards m-learning. The study was conducted in Birjand University of Medical Sciences in Iran.

2. Specific goals

- Introducing mobile books as a new supplemental educational source for the first time in Iranian universities.
- Evaluating the role of m-books in changing students' attitudes towards mobile learning.
- Evaluating the role of m-books in encouraging students to extend their time of study to dead times and in motion when paper books are less applicable.

3. Methods

3.1. First stage: Designing a mobile book maker

Technical measures were conducted to generate mobile book maker software with the desired functionality. This software was programmed in Java. Given the diversity of mobile phones, was tried to design the software in such a way to can produce m-books working with vast majority of mobile phones properly.

3.2. Second stage: Converting e-learning contents into mobile books

Multimedia learning content of four medical academic courses were prepared by relevant academic members. These contents were then put in the book maker software converting them into individual m-books installable and viewable on mobile phones. The m-books produced included: 1) Medical bacteriology 2) Atlas of Medical Bacteriology 3) Medical Virology 4) Clinical History Taking & Physical Examination.

3.3. Third stage: the release of m-books

After producing m-books, they were available to students via Bluetooth or downloadable from the university e-learning portal.

3.4. Fourth stage: Assessment of m-books and its impact on students' attitude towards learning through their mobile phones.

The Population entered in the study was 158 students in four fields: laboratory technology, operating room technology, public health and medicine. Prior to introducing m-books to students, the attitude of all the population was achieved towards mobile learning in the form of a twenty-question pre-test designed based on the Likert scale using five-choice questions. Validity of questions was approved by two e-learning professionals in concordance with research objectives. Cronbach's *alpha* coefficient was calculated as 0.82 for answers of twenty students confirming the reliability of questions. Among 158 students, 106 students (group with intervention) installed at least one of the m-books on their mobile phones and studied its content repeatedly through the semester. 52 students (group without intervention) did not install any of m-books on their mobile phones and did not use them. However, the paper content of the books was provided to all 158 students. At the end of the semester, the attitude of all the population was obtained towards m-learning by post-test using similar questions as pre-test. After collecting data, it was analyzed by paired and independent t-test using software SPSS, ver19.

4. Findings

Post-test attitude scores in the intervention group (using m-books) and without intervention group (not using m-books) were compared by paired T-test. That significantly showed a positive change in the intervention group toward m-learning (P-value = 0.0001) while comparative analysis of pre-test scores between these two groups showed no significant difference (P-value > 0.05). Moreover, the mean of pre-test and post-test attitude scores in the intervention group were significantly different (P-value = 0.0001) while these measures were not significantly different in the group without intervention (P-value > 0.05).

The grade that students gave to m-learning by answering to the question "What grade do you give to mobile phone as a source of supplemental education, from grade 1 to 10?" was significantly increased in post-test (P value <0.0001) of the intervention group while no significant difference was found between pre-test and post-test of group without intervention. Enthusiasm and motivation of students to study revealed a significant increase (P value <0.0001) in group of intervention compared to students in other group. Comparing the students' attitude regarding the possibility of using mobile phones for learning in dead times and in motion showed a significant increase in positive attitude of intervention group (P value <0.0001).

5. Discussion and conclusion

This investigation introduced m-books as a highly welcomed educational assistance among students of medical sciences for the first time in Iran. Using researcher-made software and multimedia e-contents, we demonstrated an easy way for production of mobile books in Farsi.

Significant increase in the attitudes of students towards mobile learning and also their willingness to use mobile phones as a supplemental educational source indicated that these electronic learning contents can be studied and reviewed as a source of tuition at any time, especially in dead times and in motion when it is hard to use paper books. This consequently can keep students on a continuing learning trend.

Therefore, it seems that the idea of production and introducing m-books can be seriously welcomed by faculty members around the country. Since many national universities of medical sciences offer similar courses, m-books

can play a role as a tool of content sharing among faculties of the same fields. This is another advantage of m-books. All these findings are in consistency with results of studies conducted by Kumar *et.al* (2011) and Hartnell-Young (2011).

Mobile technology is now in hands of our learners. If we want to provide cheap e-learning, learners themselves should participate to pay the costs of hardware. That is what they have already done! Now it is our turn to accelerate learning process by putting learning contents on their mobile phones.

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