



The Design of a Secure Framework for students Mobile Learning: Case Study in Oman

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ABSTRACT

Over the last ten years, Mobile Learning has grown to be one of the main objectives of educational institutions and has moved to international projects, but it still lacks studies and research into different aspects of Mobile Learning especially in relation to the security perspective. Researchers have examined the learning aspect with a view to development; researchers have linked learning with technology. Academics and technicians have discovered many concepts in relation to Mobile Learning. Given the research it has been observed that the current academic literature covers several aspects of these concepts. These include the student and teacher perspective and the learning environment and the consequent tools utilized. In relation to the Case Study in Oman, our practical research investigates the student acceptance and design of a secure framework for the implementation of Mobile Learning. Also the student research subject needs to evaluate the security issues in Mobile Learning and provide recommendations necessary for an enhanced framework.

Keywords: Distance Learning; E-learning, Mobile Learning; tools; threat; secure framework; security issues; communication.

1. INTRODUCTION

It is difficult to imagine, in 2018, people living urban lives without using the mobile phones. Moreover, the mobile device becomes the actual store of the individual's personal data, including normal information transfer through the network such as phone numbers, and life correspondences, which are often in the category classified as confidential by the individual or society.

2. LITERATURE REVIEW

This section provides a conceptual literature as well as the empirical literature review of the keywords of the paper which aimed to design of a secure framework for student's mobile learning using Oman as case study.

Mobile learning comprises any related type of learning which is transported on a mobile or handheld appliance. Thus, Mobile Learning is extended beyond mobile devices, and is becoming increasingly associated with other kinds of devices such as, tablet computers, eBooks, portable games machines and other devices which give opportunities for people to continue using traditional approaches to learning as they live their daily lives. [4] More specifically, Osman et al define Mobile Learning as:

"Mobile learning is the ability to obtain or provide educational content on personal pocket devices such as PDAs, smartphones and mobile phones. Educational content refers to digital learning assets which includes any form of content or media made available on a personal device." [2]

Learning is the organized process practiced by the teacher in order to transfer skills and knowledge to students and to develop their attitudes toward personal improvement in relation to the topic area of what is being learnt. Learning is the real and positive outcome of the learning process.

Electronic learning is applying electronic technology to access educational materials, externally from the learning organization. Also, "E-learning refers to the use of Internet Technology to deliver and enhance knowledge, skills and know-how." [8] In this case the individual can participate in e-learning via the Internet, but needs to use specific

devices connected to the Internet. It is a relatively new approach to learning where the Learner has control over what, when and where he/she learns. Table1 below shows the differences between e-Learning and Mobile Learning.

Table 1: Differences between e-Learning and Mobile Learning [Pamela]

e-Learning	Mobile Learning
lecture in classroom or internet labs	learning anywhere, anytime
e-mail-to-e-mail	instantaneous messaging
private location	no geographic boundaries
travel time to reach to internet site	no travel time with wireless internet connectivity

Differentiating e-learning from Mobile Learning: E-learning is completed in real-time as a connected-study, and is also defined as "synchronous" or "asynchronous" learning. Additionally, the reason for the use of our term "connected-study" is that e-learning is considered to be bonded with something and consequently presented in an official and structured way. On the other hand, in relation, , to Mobile learning, this is frequently a self-study, by which we mean that it is not bonded with something official or structured. [2]

In one important sense, Mobile Learning is considered as an extension of e-learning but not a replacement of e-learning. The reasons for this reside in the fact that mobile devices have the power to make learning even more available, accessible and consequently more possible for common use.

2.1 Mobile Learning in Higher Education

According to [7] concerned with Mobile learning in education: Omani Undergraduate students perspective [7] the researcher aim is acceptance of m-learning and how students see perceive mobile tools gathered into their study classes as M-learning tools. Also the researcher used two phases of data collection methods which are a formal discussion and a survey. During the six months of his study, he found that Mobile Learning solves many problems that were in T-learning. For example, study in specific location with available tools the classes. Although in research, did not cover part of lecturers feedback because it they are a part of m-learning.

As per the researchers mentioned Mobile Cloud Learning for Higher Education: A Case Study of Moodle in the Cloud [9] we discover that "Mobile cloud learning is an amalgamation between cloud computing and mobile learning". Also the researchers defined numbers of benefits for Moodle in Cloud", namely (1) reduction in comparative costs, (2) easily accessed as long as a mobile network is available, (3) more educational resources are available for mobile cloud learning users and (4) mobile cloud learning is also flexible and allows for adjustments.

3. RESEARCH PROBLEM

In spite of growing of mobile learning in Oman Higher educational institution but it still lacks studies and knowledge into different aspects of Mobile Learning especially in relation to the security perspective, this reflected in the performance and acceptance of using Mobile learning in Omani education filed.

4. RESEARCH OBJECTIVES

In this paper, the researcher focus upon Mobile Learning in relation to student acceptance and issues of security that entail the process of Mobile Learning as it applies to Education which could help the students to accept and use Mobile leaning effectively and efficacy. Moreover, the researchers discuss a case Study in Oman to explicate there previously mentioned areas.

5. METHODOLOGY

The survey of some Omani higher education students (Undergraduate) will be used to evaluate their knowledge and acceptance of the Mobile leaning in their activities.

6. CASE STUDY IN OMAN

In the paper, M-learning in education: Omani Undergraduate student's perspective [6], the research study conducted by Mohamed Sarrab was applied to Sultan Qaboos University, Oman, where students in the departments of computer engineering and computer science were involved. The research objective is a discussion of M-learning concepts together with providing examples of M-learning and the acceptance of M-learning from the student perspective. For evaluation, the aim entailed student knowledge and impressions of using of the mobile device as learning tool. In this respect, the research focused on a methodology of formal discussions and the implementation of a survey. In the formal discussion, Sarrab started with three points: (1) defining the concept m-learning, (2) explaining the purposes of his study then, (3) what are the steps when apply the m-learning concept. In the second phase of the methodology in connection with the survey, the research tried to get general data about students and their knowledge about e-learning and m-learning from the student perspective.

From Figure 1, M-Learning Knowledge Students response, the following summary applies:

- Indicates the use of mobile device to access internet.
- Indicates the student's ability to download mobile applications.
- Indicates the use mobile devices to send and receive emails.
- Reflects the use mobile device to translate sentences.
- Indicates the use of mobile devices to search word meaning.
- The use of mobile device to access social networks.

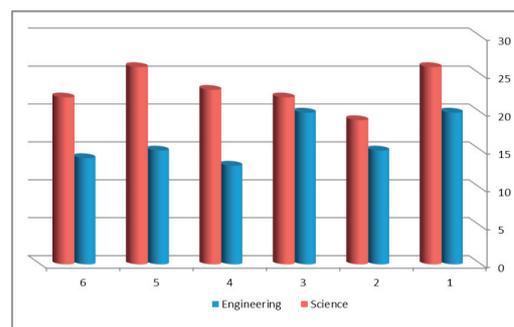


Figure 1: M-learning Knowledge Students Response.

An interesting outcome by Sarrab[6] of his research was that, in the all evaluation options of his research, M-learning knowledge science students turned out to be more knowledgeable than engineering students. It could be argued that this is not surprising, however both groups of students made similar use of the internet for their M-Learning. Some of the differences were that, 42 students from computer science indicated that they use mobile tools for communicating through emails. However, a small number of engineering students had feedback that they use their mobile tool as a translator. In addition to that, only 15 engineering students responded that they can download the needed mobile applications.

As shown in Figure 2 what are the name of the axes of the graphs as shown in Figure 1 and 2
The keys to the horizontal axis in Figure 2:

- Represents the student's ability to text friends or classmates during class.
- Indicates the student's participation in discussion forums.
- Is the use of mobile devices to read an article or submit an assignment.
- Represents the use of mobile devices to take photos or record videos of the class slides or whiteboard.
- Indicates the student ability to access university LMS using a mobile device.
- Represents the use of mobile devices to write a note and set an alarm as an assignment reminder.

Sarrab found more than 30 out of 56 students using the mobile as a learning tool in such a way to be like a photograph or to write a note as an assignment reminder etc. On other hand, less than 30 students were agreeing that they are using the mobile in class but not in terms of learning, but for discussion purposes.

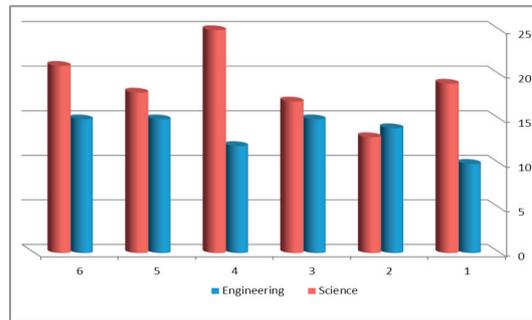


Figure 2M-learning Perception . Students Response

6.1 Authentic Learning of Mobile Security with Case Studies [3]

For the research paper Authentic Learning of Mobile Security with Case Studies[5], a survey was carried out to apply authentic learning for mobile security, the following strategies to be applied:

- The students can easily understand the concept of m-learning security when connecting the security concept to the real world.
- The students can easily gain insights and design proper defense solutions for each case from both aspects of an attack and a defense.
- Encouraging students to identify the mobile security issues by themselves and infusing them to defense practice. In each situation a mobile device is used so that they can learn when and how to use a specific solution.

6.2 University of Nizwa Case Study

The records show that the University of Nizwa's Colleges started to use the Moodle system during the Spring 2015/16 semester. The Moodle process started with faculty members in Colleges, who were encouraged to deliver their teaching materials through the Moodle system or Eduwave (comprehensive user-friendly e-Learning & educational Management Platform) <https://www.itqlick.com/eduwave>.

Spaces were created in the Moodle system for all Nursing courses and access was given to all the faculty members. From Spring 2015/16, a total of 16 Nursing courses were placed online. It is expected that by Spring 2017/18 most Nursing teachers will be using the system as a teaching resource.

The use of university of Nizwa students indicates that they use the mobile learning but with little functionality.

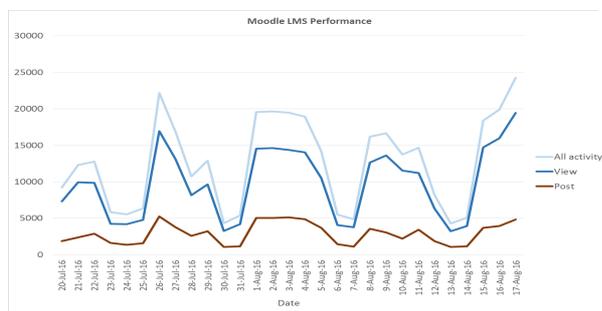


Figure 3 Conceptual Framework work

Figure 1 Student Moodle Access from 20 July - 17 August 2016

7. SUGGESTED CONCEPTUAL FRAMEWORK (BASED UPON THE UNIVERSITY OF NIZWA CASE STUDY)

In order to measure students' perceptions of using of mobile devices as mobile learning, the following conceptual framework is indicated in Figure 3. The novelty of this approach is based on Unified Theory of Acceptance and Use of Technology (UTAUT). The purpose of the study is to increasing the student's awareness mobile learning with e-learning and then evaluating the student behavior, first step is defining the participant's element, which Information



System students, Computer Sciences students and Computer Engineering students. Thesecond step (as illustrated in the above programs on the University of Nizwa survey description and analysis) is data collection of m-learning from student perspective.To complete the conceptual framework of mobile learning, there needs to analyses gender, age and the M-learning experience plays a moderate role in the relationship between dependent and UTAUT model items (independent variable).

8. RESEARCH FINDING

The mobile phone, as most of people knows, and it became an indispensable necessity. Some studies have shown that the mobile is the most technologically used device in our hands (Piipuu, 2017), and the three most common items we are carrying are: keys, wallet and mobile device. Here the researchers summarize the study finding in following points:

- The mobile devices specifications encourage students to use it in their study, training, self-learning. Also the mobile device is the virtual student memory which is using to save all electronic books and mails.
- The M-learning system can achieve the largest number of students from different places, especially most of students has smart mobile. Also it provides excellent opportunities for students to learn through M-learning who are lack of university and college.
- Overcoming the problem of lack of computers in educational institutions, todays mobile have become equivalent to small computers capable of performing searches on the Internet.
- The result show there is no different between student genders in accept the M-learning in University of Nizwa.
- The use of mobile phones in education is a technology obsession, or it is an innovative new way to promote technology in education, but technology cannot provide a magic solution to all current educational problems.
- The ease of using the Internet through the mobile, whether at home or outside in any time, can be a dangerous to teenagers through accessing to some websites that are not inappropriate to their age, in a way that will affects their academic achievement.
- The small size of the mobile screen compared to the computer screen through which the use in learning and this leads to the limited volume of information that is exchanged between students and their instructor.

9. CONCLUSION

This study takes 4 months to concluded, that mobile learning can enhance the e-learning to be M-learning, through solves e-learning issues on the student's side. Certainly everyone agreed that they were able to learn through mobile learning but it needs hardly working to remove all learning limitations of traditional learning and distance learning. There must be there are policy and laws governing this type of learning. Also the M-learning requires doing feasibility study of determining the economic effect for each of student, instructors and educational institutions.

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