

## Effectiveness of M-learning in blended learning- design of prototype framework for AOU Bahrain

*Dr. Sarmad Mohammad,  
Arab Open University (AOU), ITC - Bahrain  
sarmad@aou.org.bh*

### Abstract

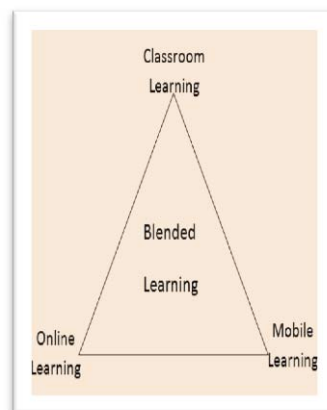
Mobile learning is a rapidly growing method of learning that utilizes smart mobile devices to deliver content. A suggested M- learning framework for smart mobile applications introduced taking into consideration the following metrics ( Quality of education support access to Information, Learning Modules, Collaboration, Assessments , Innovative Approaches, User-Generated Content & finally E-books, references as part of e-library). This research work is oriented to measure the effectiveness of mobile learning as blended learning tool in Arab Open University-Bahrain branch, in order to review, updates and reinforcement where a self-administered questionnaire was used to gather the data. The study explains the important factors that influence acceptance of mobile learning among university students. The population of the survey was limited to undergraduate students in Arab Open University (AOU). On line survey conducted with 130 learners, response rate was high at approximately 95%.

This study investigated the impact of a number of factors on learners' attitudes towards acceptance of m-learning in AOU, the learners' perspective of future of m-learning, and the overall attitudes towards m-learning. The results show that some of the independent m-learning metrics affect learners' attitudes towards m-learning, like mobile usage in educational sector and wireless technology. While some other metrics found to have significant effect on learners' attitudes, like: university commitments and positive attitudes of learners towards m-learning usage.

**Keywords:** m-learning, e-learning, blended learning, flexible learning, smart-mobile applications.

### I. Introduction

M-learning is a new stage of e-learning having the ability to learn everywhere at every time through use of mobile and portable devices [1],[5]. Figure (1) shows a diagram of blended learning system implemented in AOU Bahrain where the ongoing challenge remains as to how best improve learning and teaching methods for tomorrow's workforce [2],[9]. Mobile learning (m-learning) is rapidly becoming one of the latest trends of e-learning where more learners than ever are learning on the move rather than sitting in traditional classrooms.



**Figure-1 blended learning system implemented in AOU Bahrain**

The main objectives of this study are the following:-

- Design of smart phone applications.
- Investigation of technology affordances.
- Time spent by learners on mobile device(s).
- Learner's feedback of the future m-learning.

The aim of the research is to measure students' acceptance of m-learning by investigating a number of factors that influence student learning. This research is categorized as descriptive research. It describes data and characteristics about the population or phenomenon being studied. This research type is the most commonly used and the basic reason for carrying out is to elicit perceptions and attitudes of acceptance of the mobile as learning tool in AOU Bahrain [11][7].

### II. Methodology

Around the world, there are many universities that have been adopting m-learning technology as one of their methods in the learning [3][8]. In Bahrain, it is found that there is little effort applied in this field. AOU is the only university that has applied m-learning as one of learning resources. In the coming years, many learning organizations will be looking for creative ways to make mobile

learning work as a powerful tool to support the classroom. The suggested M- learning framework for smart mobile applications framework takes into consideration the following metrics for review, updates and reinforcement:

#### Quality of education support access to Information by smart mobile applications

- Suggested application support, latest News & announcements for learners.
- About AOU. & Contact us
- AOU Location Map.
- Tutors Information.
- Courses Details.
- Time Table Details.
- GPA Calculator.
- Alerts, Warning, Reminders & guide Procedures
- Information bases/Knowledge bases.

#### Suggested Learning Modules to be included AOU m-learning

- Just-in-Time Learning: The just-in-time approach allows learners to update their skills continually with higher knowledge gained compared to traditional classroom.[4]
- Micro learning: The way more learners are actually doing informal learning and gaining knowledge in micro content and micro media/multitasking environments.[10]
- Reach-back/Review: Reach Every Student in Every Class Every Day.[12]

#### Collaboration capabilities

- Coaching Asynchronous & Synchronous Conferencing using LMS forum chatting.
- Feedback & mentoring
- Using of Social Networking

#### Assessment MTA-TMA Mock Exam

- Quizzes, evaluations & MOOCs tests
- Surveys & reporting

#### Innovative Approaches to be included

- Games and Simulations
- Location-Specific Content
- Augmented Reality
- Contextualized Learning
- Spaced Learning

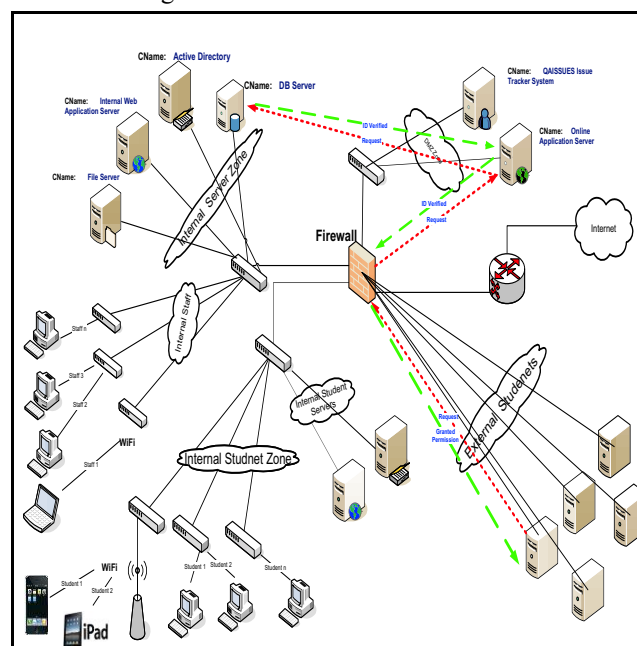
#### User-Generated Content

- SMS & feedback Note Taking through LMS.
- Transcription through SIS
- Videos recorded lectures
- Blogs & Learning journals

#### Access to Information, Education and References, E-books, & journals

- E-library Text Books
- Papers
- Manuals or Reference Guides
- Index for references of Study Plan.
- Useful Links to recorded video lectures & Field Guides Presentations

This study was designed to focus on the learners' perceptions and preferences in connection with the acceptance of mobile learning as a learning tool in AOU Bahrain. Figure (2) shows that the information technology infrastructure in AOU supports the mobile learning.



**Figure 2: AOU – IT Infrastructure of blended learning system support m-learning**

An on line survey-based, using a measurement instrument developed for collecting the data. Survey was the best method to be employed in this study as it enables us to gather data about learner's attitudes, which is the main aim of the current study. In this

research an online questionnaire distributed to the undergraduate students in order to answer the research questions. Publishing the questionnaire online through AOU's learning management system (LMS) was the best method to reach all students at the same time. The study suggests some significant metrics to investigate student's attitudes towards m-learning, so the following metrics were used in the survey to measure the acceptance of mobile learning as blended learning tool: Recently have many universities provide their services through smart phones that have seen in recent years the IT boom. In fact Arab Open University is one of the technologically advanced universities.

The designed m-learning application contains several sections help students get the information they want easily as illustrated in Figure-3 where **LMS AOU360° supporter** contains administrator interface, which accessed through a secure user name and password. Also contains several sections helps administrator to add, delete and modify data in the database. Arab Open University Mobile Service Center (AOU MSC), where it will be the official party for data broadcast to all devices, study covers features of the application and issues related to suggested framework given as follows:

- **Tutors information:** provides information about AOU tutors in order to communicate with them easily by telephone or by e-mail.
- **Courses information:** Provides information regarding courses, such as prices and/or credit hours. Too many features provided in the application related to learner (Time Table, GPA calculator & assessments feedback)
- Types of mobile device(s) you own or plan to purchase such as Cell phone, PDA, Smartphone, iPhone or MP3 player/recorder.
- Average amount of time spent on your mobile device(s) on a daily basis such as less than 1 hour, 1-3 hours, 3-6 hours or more.
- Student's perspective of the future of mobile learning.
- Level of Student's attitude to acceptance of m-learning metrics like: extrinsic influence, behavioral intentions and university commitments.

### III. Data Analysis

A total of 123 questionnaires were collected out of the 130 questionnaires distributed. The students were asked to provide their attitude regarding m-learning as a tool in blended learning system in Arab Open University. From figure (4) regarding investigation of technology affordances, the device ownership statistics reveal some interesting numbers that approximately 61.7% of students own a Smartphone, while PDA ownership is very low at about 4.1% and Cell phone ownership is at a healthy 29.2.

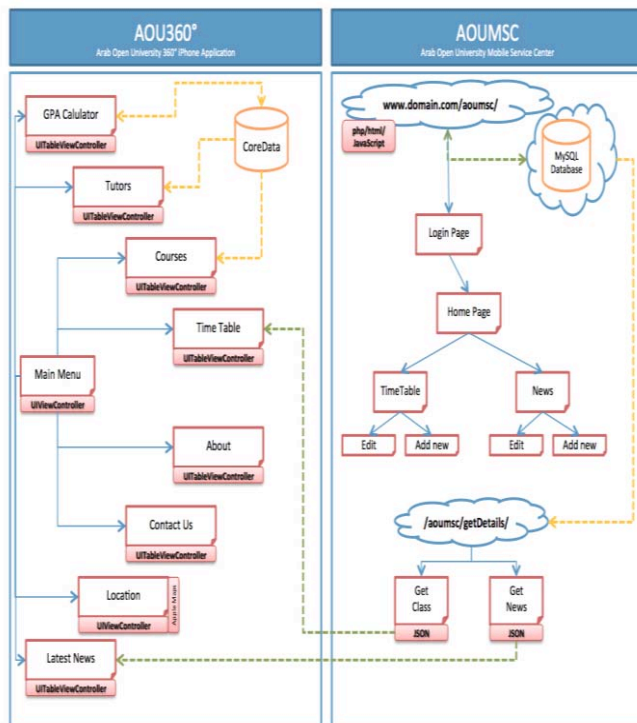


Figure -3 Designed smart phone applications

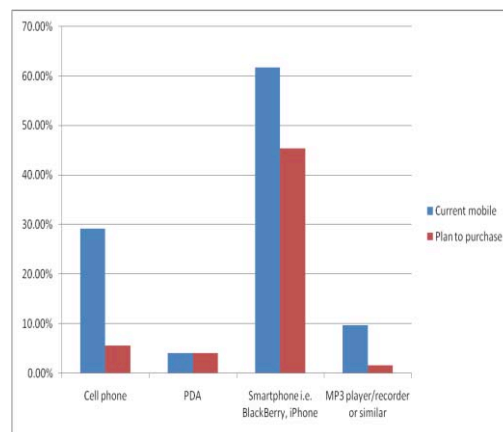
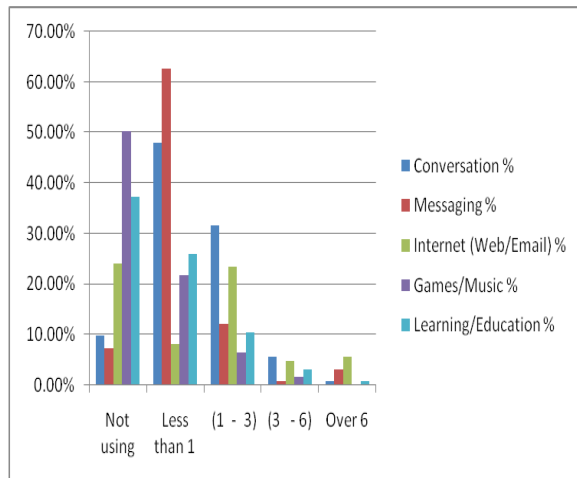


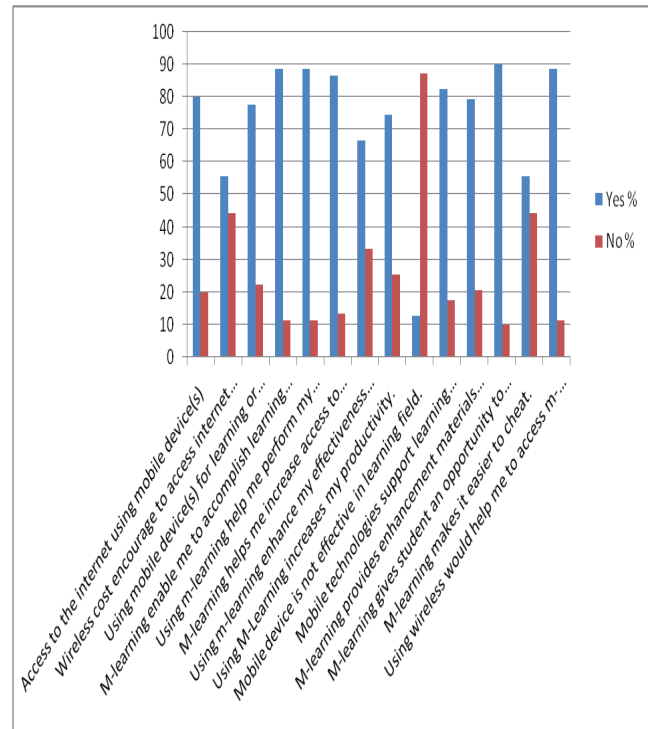
Figure 4: Investigation of technology affordances

A more revealing statistic is the planned purchase of these devices. The percentage of students who intend to purchase a Smartphone in the future is 45.5%, compared to 4.1% for a PDA and 5.6% for cell phones. Most students who are planning to purchase new mobile device would be shifted to Smartphone due to interesting facilities that these phones offer. Regarding amount of time that student spent on his/her mobile device as notice in Figure (5) thirty seven percent of students do not applicable to use their device for learning or educational purposes, 26% of students spent less than one hour, 10.5% spent 1-3 hours daily on learning activities, and 3.2% spent 3 hours or more, with approximately 62.6% of students spending less than one hour per day sending or receiving text messages and 3 or more hours per day in conversing which have 31.9%, this mean that there is an amount of time spent by students text messaging and conversing are higher than that for other activities.



**Figure 5: Daily Time spent on mobile device(s)**

Most students have mobile devices that can support many latest services such as SMS, GPRS, MMS, email, packet switching, WAP, Bluetooth and many more. Also, they spend amount of time in using their mobile in educational purpose. We can summarize that the students have the main ingredient to accept mobile in learning. In order to define major ideas that the student has about his/her perspective of the future of mobile learning, some important descriptive statistics were calculated, especially the mean for students' responses on questionnaire items. From the figure (6) it is clear that the highest percentage of respondents have positive attitude towards the future of mobile learning.



**Figure 6: Learners feedback of the future m-learning**

#### IV. Discussion & conclusions

The research's primary goal was to measure the acceptance of mobile as learning tool in Arab Open University, Bahrain. Accordingly, the research is investigating a number of factors that influence student acceptance, as not understanding these dimensions and factors can lead to failure post-implementation because users' unwillingness to accept the new technology can lead to nonuse and thus the technology does not bring the intended benefits for the organization [4][10]. An analysis of the data obtained by the researcher through distributing 130 questionnaires to students online and receiving 123 valid and filled questionnaires.

The goal of this study was to fill this research gap by analyzing the attitudes towards acceptance mobile as learning tool in AOU. Basic information about the respondents' descriptive statistics have been defined such type of mobile devices and the amount of time that spend in using mobile. Then, the impact of some variables such as mobile usage in AOU educational sector and wireless technology has also been

examined. In addition, the research showed the learner's perspective of the future of mobile learning in general Figure-6, which was positive feedback represent as an index for effectiveness.

Arab Open University applied mobile as one of its learning resources, the level of attitude towards m-learning the university offers has been measured based on some factor that impact student's acceptance such as university commitment, behavioral intention and extrinsic influence. 130 online questionnaires have distributed to students and 123 valid and useable filled questionnaires have collected. The results of this research showed, mobile usage in education sector affects attitude towards acceptance m-learning that offer by AOU. In contrast, that there is no relationship between wireless technology and acceptance of AOU m-learning and this due to some strategy that university was adopted. While, university commitment, behavioral intention and extrinsic influence have significant effects on attitude towards the current m-learning that university offers. The student's perspective of the future of mobile learning was positively, using wireless would help them to access m-learning and they agree on the following ten conclusions:

<b>Ten conclusions related to Student's perspective of m-learning metrics</b>	
1.	Free Wi-Fi encourage learners to access LMS and SIS applications through smart mobile.
2.	Using m-learning enable learners to accomplish learning tasks more quickly and effectively.
3.	Using m-learning help learner to perform studies anyplace and anytime
4.	M-learning helps learners to increase access to learning materials and educational resources.
5.	Using m-learning enhance learners acceptance and effectiveness in learning skills development (Learn things better and smarter).
6.	Using M-Learning increases learners productivity.
7.	Mobile technologies support learning experience that is collaborative, accessible and integrated with the world beyond the boundaries of a regular classroom.
8.	M-learning provides enhancement extra materials to supplement the textbook.
9.	M-learning gives learners an opportunity to get or provide information in case of urgent need.
10.	Using m-learning helps learners to perform MOOCs tests & examinations.

## References

- [1] Attewell, J., & Savill-Smith, C. (eds) (2004). Learning with mobile devices: Research and development – A book of papers. London: *Learning and Skills Development Agency*. Retrieved from <http://www.mlearning.org/archive/docs/Learning%20with%20Mobile%20Devices%20%20A%20Book%20of%20Papers%20from%20MLEARN%202003.pdf>
- [2] Barone, C. (2005). The New Academy. In Oblinger, D. & Oblinger J. (eds) *Educating the net generation. Ch 14. EDUCAUSE ebook*. Retrieved from <http://www.educause.edu/ir/library/pdf/pub7101.pdf>
- [3] Carlson, S. (2005). The net generation goes to college. Tech-savvy “millennials” have lots of gadgets, like to multitask, and expect to control what, when, and how they learn. Should colleges cater to them? *The Chronicle of Higher Education*. 52(7), A34.
- [4] Georgiev, T., Georgieva, E. & Smrikarov, A. (2004). M-learning – A new stage of elearning. *Proceedings International Conference on Computer Systems and Technologies – CompSysTech' 2004*, 1-5. Retrieved from <http://ecet.ecs.ru.acad.bg/cst04/Docs/sIV/428.pdf>
- [5] Hilton, J. (2006). The future for higher education sunrise or perfect storm?, *EDUCAUSE Review*. 41(2). Retrieved from <http://www.educause.edu/ir/library/pdf/erm0623.pdf>
- [6] Long, P. D., & Ehrmann S. C. (2005). Future of the learning space breaking out of the box. *EDUCAUSE Review*. 40(4), 42-58. Retrieved from <http://www.educause.edu/ir/library/pdf/erm0542.pdf>
- [7] Matheos, K., Daniel B. K., & McCalla G. L. (2005). Dimensions for blended learning technology: Learners' perspectives. *Journal of Learning Design*, 1(1), 56-76.

- [8] Mortera-Gutierrez, F. (2006). Faculty best practices using blended learning in e-learning and face-to-face instruction. *International Journal on ELearning*, 5(3), 313-337.
- [9] Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. *Computers & Education*, 49(3), 581–596.
- Muir, D.J. (2001). Adapting online education to different learning styles. National Educational Computing Conference, “Building on the Future”, July 25-27, 2001. Chicago, IL.
- [10] Naismith, L., Lonsdale, P., Vavoula, G. & Sharples, M. (2004). Literature review immobile technologies and learning. Futurelab Series. University of Birmingham. Retrieved from [http://www.futurelab.org.uk/resources/documents/lit\\_reviews/Mobile\\_](http://www.futurelab.org.uk/resources/documents/lit_reviews/Mobile_)
- [11] Oblinger, D. & Oblinger, J. (Eds) (2005). Educating the net generation. EDUCAUSE ebook. Retrieved from <http://www.educause.edu/ir/library/pdf/pub7101.pdf>
- Prensky, M. (2001a). Digital natives, digital immigrants. *On the Horizon*, 9(5). Retrieved from <http://citeseer.nj.nec.com/pretschner99personalization.html>
- [12] Prensky, M. (2004). What can you learn from a cell? – Almost anything. *Innovate*, 1(5). Retrieved from <http://www.innovateonline.info/index.php?view=article&id=83>