

Designing An Effective Mobile-learning Model By Integrating Student Culture

Ibrahim Mohamad

*Deanship of Preparaty Year program
Department of information technology
AL-Jouf University
AL-Jouf, Saudi Arabia*

ibrahimdalabeeh@gmail.com

Abdalla AlAmeen

*Department of Computer Science and Information
College of Arts and Science in Wadi Addawasir
Salman Bin Abdulaziz University
Riyadh, Saudi Arabia*

a.alameen@sau.edu.sa

Abstract

Mobile learning is a good technology because it allows communication, collaboration, and sharing information or resources among all of learning members. Mobile learning can be used as perfect solutions to support the learning process. Thither are many concepts and factors influencing effective learning results through creativity, collaboration, and communication. However, culture is an unaccounted factor which should be appended to the existing M-learning model. Culture may improve the learning outcomes of students. We would like to research on how to design an effective model by integrating culture to maximize the benefits of mobile learning.

Keywords: Mobile Learning, Adaptive of Mobile Learning, Mobile-learning Model.

1. INTRODUCTION

Today, the increase of using the mobile device among people of different levels, led us to edit how this device will be used to enhance the learning process between learners and teachers as new tools, even it becomes a culture between people. The mobile learning is a subset of e-learning whichever achieve the learning and teaching activities with the help the information technologies and communication, any use for mobile devices in learning is defined as mobile learning. This may include smart phones, personal digital assistants (PDAs) [9].

There are a number of reasons for using the mobile device at learning process, such as more convenience, inexpensive, many functions, small size, you can reach to hold mobile anytime and anywhere, and you can send all the types of data, such as text, image, sound or multimedia [3].

There are three types of mobile learning[25]. The first type collaborative learning here is using the mobile to exchange information among the students and the teacher or group of student via SMS .The second type is using the mobile to self-learning whenever the learner is learning via mobile by himself such as the use of learning programs on the mobile as a mentor to the student.The third type is using the mobile to distribute material, learning resources ,and tools to students such as test question , homework or by using Bluetooth technology .

A challenge for mobile learning is the design of the information capturing procedure. Learners have their own learning preferences, so learners may use a mobile device differently depending on their learning behavior or learning culture. For example, learners may prefer to do one or more of the following as part of their learning process: take pictures, record videos, write notes, or create their own blogs. Due to the variety of available media, students can learn in different ways

based on their preferred learning styles. Thus, it is essential to understand the context of use of mobile technology to facilitate students' learning as a key factor for designing a mobile learning model. Therefore, research design and methodology should be flexible and allow research practice to adapt to the need of learners.

Uses and technologies are important elements of the mobile learning system. To obtain the greatest advantage from mobile learning, it is important to understand both external factors (e.g., competition, technology shifts) and internal factors (e.g., learning preferences, pedagogical approaches). For example, [41] only uses an internal factor. By measuring the performance of participants, he finds that mobile learning is less effective than face-to-face learning. However, this study investigates only Mode of Delivery (MOD) as the factor that influences the acceptance and use of mobile learning. Williams considers only mobile learning and compares it with face-to-face learning, but it would be more useful to study a blended learning approach in which mobile technologies complete learning activities in traditional classroom settings.

In addition, there are some other factors that need to be considered for teaching and Learning.[12] asserts that teachers and students can benefit from playful, active, and experiential learning wherein the opportunity to construct, enact, and revise their learning paths is settled. However, a performance-driven culture affects teachers and students, and their organization of teaching and learning. Therefore, culture should be considered as another major factor, which may have an effect on learning performance in the mobile learning environment.

This paper will explain the impact of m-learning on learning environment in general and literature review about M-Learning theories at section one. In section two introduces our proposed model for M-learning, social constructivist theory and activity theory will be used as a basis for developing a new M-learning model. Such a model can potentially explain all important factors that affect learning outcomes of students' when they use their mobile devices in learning. The effectiveness of the model will be evaluated according to its adoption., and at section five present conclusions.

2. IMPACT OF MOBILE LEARNING IN EDUCATION ENVIRONMENT

Today, the impact of mobile device is very clear on learning process from enhance, support, make it easier to teach, it brings more enjoyment to students because new way of learning with new technologies that continuous innovation and add new features, and more service that is useful to consumer who are may teachers or learners.

We will focus on the impact of the use of mobile technology on both teacher and student , it helps increase student commitment if it using to remind learner about date lecture or exam or even to solving homeworks, it using to waken student about their responsibilities , it uses more smooth awareness and understanding of complex topics at course because it is equipped with typical features such as multimedia that help student at revising lessons at house without teacher [26], allow students to download course material such as case studies ,exercises, listen and see lectures via video.

The mobile learning increases interaction between lecturer, student, and other students because it allows teachers to send video or image or sound or even message text to student via Bluetooth if student under distance 10 mater if more can send a multimedia message or SMS [8].

Mobile learning (M-learning) is used as communication tools to support collaboration among many students such discussing a specific topic via exchange message and work as a group. We can use it as an exam tool for teacher, so allows to send test questions or quizzes to students within the classroom, and the exam may be true or false questions or multiple choice questions[7].

The M-Learning uses to support different students in understanding the lessons and grade interactive with lesson content may be there smart student full understanding a lesson at short time and another student may need to long time to understanding a lesson, the mobile learning solves this problem by recording this lesson on mobile video to students and they can replay this video as need base[8].

There are many types of mobile based systems that enable teachers to monitor online students mobile in real time without delay and enable teachers to supervise student at learning activities and provide recommend and send orientations to students [39].

We must focus on video by mobile as a useful learning medium and as resources and reference to learn and it can be a perfect alternative compare with paper or books because enable the student visualizes how something works[23].

The mobile technology can be used to support all activities in learning environment because this device can integrate with other learning devices such as wireless local area network, electronic whiteboard, this integration enables the teacher and learner to use mobile devices at all learning processes of communication, interaction, collaboration, exchange information, and work as team to solving some problems[32].

We can use mobile technology to share technology that allows all students access and us an application, materials, information, and learning resources (Balasundaram, 2007).

The mobile learning is considered motive to encourage students to allocate more time to study because mobile can easy carry anyplace because the small size by comparison with other learning tools such as desktop computer or group of books or even laptop, and you can review the lessons at bus, cafe, and it helps spend more time at study that may lead to obtaining excellent grades on exams.

We can use mobile learning for both formal and informal learning [16], the first type formal learning is learning process between teacher and students with fixed time or even place, teachers can use mobile to give students quiz. The second type informal learning is many shapes and not has standards or limited such group of friends, exchange messages that contained information like a brief theory or mathematics law or solutions for exercises.

From impact for M-learning there is increase in education scope, it introduces learning opportunities for geographically dispersed persons or student who is not able to go to school or university as a regular[6]. The learning with mobile does not require technological training because it's easy to use[36], and mobile became culture among people with different learning background. The impact of mobile on learning, education here reduces the cost of training students with new learning tools and quickly time to insert new learning tools and reduce of effort to adapt to new technology that even may the people use it before enter schools or universities.

3. M-LEARNING THEORIES

According to (Dabbagh, 2006)[10], a range of learning literature, developed in the "Instructional Design Knowledge Base," is classified into three main schools of thought: behaviorism, cognitivism, and constructivism. Fundamentally, the major difference between these three concepts resides in how different people learn[22]. Skinner [35] describes behaviorism as a learning theory that only focuses on observable behaviors and Exclude any independent activities of the mind. On the other hand, cognitivism is a part of learning theories that are based on an information processing theory which deals with how people perceive, learn, remember, and think about information [28]. The third theoretical perspective is constructivism. Piaget [29] asserts that people construct their own understanding and generate their own rules and mental models from

their experience. Learning is simply the process of adjusting the mental models to accommodate new experiences[20].

All three theories have different assumptions about knowledge states and focus on different learning outcomes [24]. Accordingly, an examination of these perspectives in the design of a mobile learning environment is important for gaining an inclusive understanding of the learning process. Focusing on constructivism in the theories of learning, this mobile learning model is grounded in two theoretical frameworks: 1) Social constructivist theory, and 2) Activity theory.

3.1 Social Constructivist Theory

The principle of this theory is that humans generate new knowledge from interactions between their ideas and experiences. Additionally, studies on motivation and increased use of student discussion in the classroom are grounded in the theories of social constructivism [34][2]. There are a variety of advantages that result from the implementation of discussion in the classroom. Participation in group discussion allows students to generalize and transfer their knowledge of classroom learning and build a strong foundation for communicating ideas [31].

This strategy gives students opportunities to practice 21st century skills in communication, knowledge sharing, critical thinking, and use of relevant technologies in the classroom. For example, students can participate in online discussion forums. Instructors can use content management systems to work with students to share resources and give opinions. Learning collaboration can also be improved through using blogs and wikis.

M-learning offers new ways to extend education outside the classroom and into the interactions of everyday life. Students can acquire new knowledge from both formal and informal learning processes based on their learning style and learning culture.

3.2 Activity Theory

Activity theory focuses activities as the unit of analysis [38]. An activity is viewed as a goal-directed or purposeful interaction of a subject with an object, mediated by a tool/artifact, then, transforming it into an outcome [38]. Furthermore, identifies that an activity is mediated by an organization or community. The community may impose rules that affect activity. The subject works as part of the community to achieve the object. An activity normally also features a division of labor .

In the activity system according to Uden [37], a subject can be an individual or a group, who is really an important actor to perform a particular activity. For example, a student (subject) learns about a particular problem (object) using a mobile device, textbooks, and internet (tools) to complete her assignment (outcome). In this case, this student may be assigned to work in a group (rule) in which the success of his assignment can be influenced by his classmates (community) and the relationship between the teacher and students in the classroom (division of labor).

The components of activity theory have been used as analytical tools in many different areas; including education , interface design [4], and human-computer interaction [21]. Using activity theory in an educational setting provides several benefits for the community of the class. Students can use mobile technology as a tool to support their learning activities in order to achieve their goals. Therefore, activity theory plays a key role in the design of the M - learning model and in understanding a mobile learning environment[1]. Designing learning based on activity theory is more suitable for a student centered approach which allows learners to fully participate in learning activities [14]. However, it cannot be adapted to a teacher-centered approach, in which teachers have a major role in conducting classes.

Activity theory allows researchers to understand the context of use when designing a model of M-learning. Thus, it is important for researchers to determine whether a mobile learning platform will be adopted[17].

4. M-LEARNING MODEL

A number of studies explain the impact of mobile learning adoption and implementation in the information age [33]; Faux et al., 2006; [12]. The success of building M-learning systems depends on the learners' levels, subjects, and contexts of learning. Most studies of M-learning indicate that it can offer convenience and increased information access [30]. Also, Facer, Faux, and McFarlane (2005) [13] argue that, although there are a number of M-learning initiatives in the United Kingdom, an underlying principle for the use of mobile devices in education has yet to be articulated. A limited number of research reports focus on the effectiveness of M-learning in higher education [40].

This paper will propose a design of M-learning model to support teachers to create educational values and provide students with equality in M-learning environment. In another study, Kakihara and Sorensen's [19] explains that context is a central construct of M-learning. The context is created by people in interaction with other people, with their surroundings and with everyday tools. Traditional classroom learning is founded as a stable context, by setting up a fixed location with common resources, a single teacher, and an agreed upon curriculum. M-learning removes all these things and enhances the interrelated aspects of mobility. The mobility helps students to expand learning space for formal learning taken in the classroom to informal learning taken in the workplaces they prefer. The "mobile" in mobile learning can be defined as both the mobility of learners and mobility of technology [19]. Thus, M-learning can occur while people on the move utilize mobile devices to facilitate informal learning during the daily life. Also, M-learning means providing knowledge from portable tools and resources that are available in a handy device.

A central undertaking in the design of technology for M-learning is to promote enriched conversations within and across contexts. The mobile technologies directly support conversation between teachers and students, also technologies provide a communication path among classmates. Moreover, the design of technology involves understanding how to select technologies and interactions to support flexible learning across contexts, and how to integrate mobile technologies within education to empower innovative practices. Our proposed M-learning model is described in figure 1.

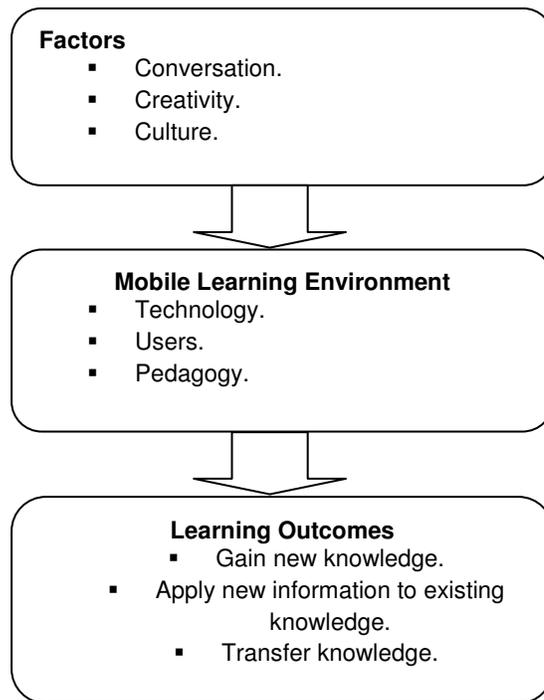


FIGURE 1: A Proposed Mobile Learning Model.

Naismith and Corlett [27] suggest that an effective design of M-learning applications needs to:

Create quick and simple interactions that can help the learner in responding to information in a timely manner. Prepare flexible materials that can be accessed across contexts and serve an individual's learning needs. Consider special capabilities of mobile devices that might add to the learner's experience, such as the use of audio.

Use mobile technology to facilitate learning, especially making use of the features in current mobile devices for voice communication, note-taking, photography, and time management. Furthermore, [27] define five critical success factors for mobile learning projects. These important factors are:

1. Access to technology: making mobile technology available where and when it is needed.
2. Connectivity: using mobile devices to connect to wireless networks, e.g., 3G, 4G, WI-Fi and Bluetooth, to provide access to learning resources.
3. Integration: integrating mobile learning projects into the curriculum, the student experience, and daily life.
4. Ownership: owning the technology, or having ability to use or upgrade it anytime.
5. Institutional support: designing relevant resources in a mobile format, training staff and providing technical support and maintenance.

The ticklish success factors mentioned above are significant for mobile learning environments. With regard to students' learning needs, it is necessary to provide open access to information in the mobile age. Thus, students can use appropriate mobile devices for learning purposes in a mixed learning environment, by using mobile learning as an addition with traditional classrooms.

5. CONCLUSION

Utilizing mobile technology at learning environment is an important issue because it has an impact on both students and instructors on learning environment, the students' awareness and understanding will increase with utilizing mobile. And integrate mobile with other learning tools, this integration will reduce time, efforts from teacher to achieve learning tasks, and became teaching process enjoyment to teachers and student because mobile will enable collaboration and communication between student and teacher at learning environment.

A new mobile learning success model would be built based on two research theories: Social constructivist theory and activity theory. There may be other theories that might be integrated in this research, such as socio-technical theory and the technology acceptance model (TAM). According to the socio-technical theory [5], researchers propose that the achieved design system should aim to the joint optimization of the technical subsystem and social subsystem. Both the devices and tools of technical subsystem and the employee's skills and attitudes of social subsystem are critical factors of the organization. As a result, the design of a mobile learning system needs to consider that all the subsystems are working in harmony. As well as the TAM, Davis [11] suggests that perceived usefulness and perceived ease of use can determine an individual's intention to use a system. When users discover that the mobile learning system is useful and easy to use, they will feel more comfortable to use it. Ultimately, the intention to use the mobile learning system would lead to better students' learning outcomes.

The new model supported by this theoretical framework includes the impact factor "culture" and other aspects of using mobile learning in education. Cultural difference is also an important factor as well as motivation, collaboration, and communication. As the mobile learning market becomes gradually global, understanding cultural difference and educational values could provide a

significant competitive edge for universities. Johari, Bentley, Tinney, and Chia [18] recommend a new intercultural standard for creating the instructional of a course in which designers and learners can clearly convey the educational values to each other. These educational values are mainly influenced by (1) cultural norms, (2) the philosophy of learning, and (3) personal preferences for learning[15]. When instructors know they will have intercultural students in their classes, they should create materials that are culturally neutral.

This requires use of an easier sentence structure and avoiding slang. Also, students who take intercultural courses should have an open mind to try new things and embrace new learning habits and adapt to them.

In this new mobile learning model, learning outcomes would be measured by assessing the quality of the new model, and analyzing learners' satisfaction. The satisfaction of learners can be measured by surveying learner attitudes towards the mobile technology and observing the enjoyment of mobile learning experiences. Consequently, this new mobile learning model will describe how students use mobile devices for their learning purposes in a blended learning environment. Additionally, results from research may assist teachers in designing their courses to use mobile learning to help students meet their learning objectives. Furthermore, research findings may enable university administrators to make effective decisions regarding the role of mobile learning, and also provide end-user training to motivate students to use mobile learning for their efficient learning outcomes.

For future work ,the researcher can study challenges that may arise when applied mobile learning technology across different cultures .Then introduce solutions and framework to overcome these challenges.Another idea about Study the relationship between type of course and its impact on the success implement mobile learning .

6. REFERENCES

- [1] Anthony, A." Activity Theory as a Framework for Investigating District-Classroom System Interactions and Their Influences on Technology Integration".*Journal of Research on Technology in Education*. Vol. 44, No. 4, pp. 335–356 .2012.
- [2] Alavi, M. "Computer-mediated collaborative learning: An empirical evaluation". *MIS Quarterly* 18 (2).1994.
- [3] Balasundaram,S.,Ramadoss,B. "SMS for Question-Answering in the m-Learning Scenario". *Journal of Computer Science*,3(2), 119-121. 2007.
- [4] Bodker, S. "Through the interface: A human activity approach to user interface design". Hillsdale, NJ: Lawrence Erlbaum Associates.1990.
- [5] Bostrom, P., Heinen, S."MIS problems and failures: A socio-technical perspective part I: The cause". *MIS Quarterly*, 1(3), 17-32. 1977.
- [6] Cavus,N.,Uzunboylu,H. "Improving critical thinking skills in mobile learning".*World Conference on Educational Sciences 2009*,434–438. 2009.
- [7] Cheung,W.,Hew,K." A review of research methodologies used in studies on mobile handheld devices in K-12 and higher education settings". *Australasian Journal of Educational Technology*,25(2),153-183. 2009.
- [8] Corbeil,J.,Valdes,M. "Are you Ready For Mobile Learning?".*EDUCAUSE QUARATERALY Journal*,2,51-58. 2007.

- [9] Corlett,D.,Sharples,M.,Bull,S.,Chan,T." Evaluation of a mobile learning organiser for university students". *Journal of Computer Assisted learning*, 21(3),162–170.2005.
- [10]Dabbagh, N."Select instructional models/Theories to develop instructional prototypes". 2006.
- [11]Davis,D." Perceived usefulness, perceived ease of use, and user acceptance of information technology". *MIS Quarterly*, 319-340. 1989.
- [12]Fisher, T." Teachers learning with digital technologies: A review of research and projects". Vol. 14. Bristol: Future lab. 2006.
- [13]Facer, K., Faux,F., McFarlane,A."Challenges and opportunities: Making mobile learning a reality in schools". Paper presented at Proceedings of m-Learn 2005, July 1, 2011.
- [14]Gifford R.,Enyedy,N. "Activity centered design: Towards a theoretical framework for CSCL". Paper presented at Proceedings of the 1999 Conference on Computer Support for Collaborative Learning, Palo Alto, CA: 22-36.1999.
- [15]Hofstede, G. "Cultural differences in teaching and learning". *International Journal of Intercultural Relations*, 10(3), 301-320. 1986.
- [16]Hulme , A., Sharples, M., Milrad, M.,Sánchez,I."Innovation in Mobile Learning: a European Perspective". *International Journal of Mobile and Blended Learning* ,1(1),13–35. 2009.
- [17]Huang,C. Lai Lin,F."Using activity theory to model the tiawal atayal".
- [18]Students' classroom mathematical activity" .*International Journal of Science and Mathematics Education* .Vol . 11. 213-236.2013.
- [19]Johari, A.,Bentley, H.,Tinney, V.,Chia, H."Intercultural internet-based learning: Know your audience and what it values". *Educational Technology Research and Development*, 53(2), 117-127.2005.
- [20]Kakihara, M., Sorensen,C." Mobility: An extended perspective". Paper presented at Proceedings of the 35th Annual Hawaii International Conference on System Sciences. HICSS: 1756-66.2002.
- [21]Kang,H,Gyorke,A." Rethinking distance learning activities: a comparison of transactional distance theory and activity theory". *Open Learning* .Vol. 23, No. 3, 203–214,2008.
- [22]Kuutti, K..Activity theory as a potential framework for human-computer interaction research. In *Context and consciousness: Activity theory and human-computer interaction*. ed. B. A. Nardi, 17-44. Cambridge, MA: MIT Press. 1996.
- [23]Leidner, E.,Jarvenpaa,S."The use of information technology to enhance management school education: A theoretical view". *MIS Quarterly* 19 (3): 265-91. 1995.
- [24]Maniar,N.,Bennett,E.,Hand,S. ,Allan,G." The effect of mobile phone screen size on video based learning".*JOURNAL OF SOFTWARE*,3(4),51-61.2008.
- [25]Mowrer,R., Klein,S. *Handbook of contemporary learning theories*. Mahwah, NJ.: Lawrence Erlbaum Associates. 2001.
- [26]Nakabayashi,K., Hoshide,T.,Hosokawa,M.,Kawakami,T., Sato,K." Design and Implementation of a Mobile Learning Environment as an Extension of SCORM 2004

- Specifications". IEEE international Conference on Advanced learning technology, 369 – 373, Niigata, IEEE Xplore.2007.
- [27] Newhouse, P., Williams, J., Pearson, J. "Supporting mobile education for pre-service teachers". *Australasian Journal of Educational Technology*, 22(3), 289-311.2006.
- [28] Naismith, L., Corlett, D. "Reflections on success: A retrospective of the m-Learn ".conference series 2002-2005 Paper presented at m-Learn 2006 - Across generations and cultures, Banff, Canada 2006.
- [29] Norman, A. "Twelve issues for cognitive science". *Cognitive Science*. 4 (1): 1-32.1980.
- [30] Piaget, J. "The child and reality: Problems of genetic psychology". New York: Grossman. Quinn, C. learning: Mobile, wireless, in your pocket learning.1973.
- [31] Ragus, M. "M-learning: A future of learning". *Knowledge Tree e-Journal* 9, September 9, 2011.
- [32] Reznitskaya, A., Kuo, L., Clark, A., Miller, B., Jadallah, M., Anderson, R., Nguyen-Jahiel, K. "Collaborative reasoning: A dialogic approach to group discussions". *Cambridge Journal of Education* 39 (1): 29-48. 2009.
- [33] Shen, R., Wang, M., Pan, X. "Increasing interactivity in blended classrooms through a cutting-edge mobile learning system". *British Journal of Educational Technology*, 39(6), 1073-1086. 2008.
- [34] Sharples, M., Taylor, J., Vavoula, G. "A theory of learning for the mobile age". *Medienbildung in Neuen Kulturräumen*: 87-99.2010.
- [35] Sivan, E. "Motivation in social constructivist theory". *Educational Psychologist* 21 (3): 209-33.1986.
- [36] Skinner, F. "Are theories of learning necessary?". *Psychological Review*. 57(4), 193-216. 1950.
- [37] Uzunboylu, H., Cavus, N., Ercag, E. "Using mobile learning to increase environmental awareness". *Computers & Education Journal*, 52(2), 381-389.2009.
- [38] Uden, L. "Activity theory for designing mobile learning". *International Journal of Mobile Learning and Organization* .1 (1): 81-102. 2007.
- [39] Vygotsky, S. *Mind in society*. Cambridge, MA: Harvard University Press.1978.
- [40] Wang, M., Shen, R., Novak, D., Pan, X. "The impact of mobile learning on students' learning behaviours and performance: Report from a large blended classroom". *British Journal of Educational Technology*, 40(9), 673–695. 2009.
- [41] Whittlestone, K., Bullock, J., Pirkelbauer, B., May, S., and Sánchez, I. "The significant factors affecting engagement of veterinary students with mobile learning". Paper presented at IADIS International Conference on Mobile Learning Conference Proceedings, Algarve, Portugal, Lisbon: 135-9.2008.
- [42] Williams, W. "Assessing mobile learning effectiveness and acceptance. Doctor of Philosophy"., George Washington University 2009.