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Basic elements and characteristics of mobile learning

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Abstract

Mobile learning (m-learning) as a kind of learning model allowing learners to obtain learning materials anywhere and anytime using mobile technologies and the Internet. It is necessary that the elements of mobile learning are organized correctly and the interactions between the various elements are combined in an efficient and optimum way so that the mobile learning is successful and the implementation is efficient. In addition, the characteristics of mobile learning should be organized, and the way they are applied to mobile learning activities and the application methods and the duration of the application time should be planned well in advance. Consequently, a deeper insight into theory-based research is required to better understand the underlying motivations that lead academics to adopting mobile learning elements and characteristics. These reasons have motivated authors to carry out this study. Learner, teacher, environment, content and assesstment are basic elements of the complete mobile learning. The core characteristics of mobile learning are ubiquitous, portable size of mobile tools, blended, private, interactive, collaborative, and instant information. They enable learners to be in the right place at the right time, that is, to be where they are able to experience the authentic joy of learning. The aim of this study is to describe the basic elements and characteristic of mobile learning according to new trends in developing technology. The paper might be useful for anyone interested in designing, preparing and implementing a mobile learning.

1. Introduction

Mobile phones are very important in youths' life's (Moura & Carvalho, 2008). With the decreasing of prices of mobile phones, demand increased. International Communication Union (2010) indicated that 86% of world population using mobile phones in 2010. According to KKTCELL (a mobile operator in Northern Cyprus) 93% of adults using mobile phones in Cyprus. Also KKTCELL indicated that mobile phones most used by 18-34 ages. As a result of the demand to use mobile phones, important developments rise in recent years in the field of mobile technologies. These developments are laptops, notebooks, mobile phones, smart phones, wireless technologies, general packet radio service (GPRS) connections, Bluetooth etc. Also information record, information transform and converting format of information features are very important. In recent years, the use of mobile technologies has increased in a number of fields such as banking, economy, tourism, entertainment, library research, and etc. (Lakhal et al. 2007; Hew, 2009). Change is difficult but it is probable that the rapid development and implementation of new technologies and social changes make change in the educational provision inevitable (Cavus, 2011). These developments also led to the use of mobile technologies for educational purposes. When the examining the literature

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on teaching and learning activities in classroom are inadequate (Entwislte & Ramsden, 1983; Zull, 1998; Koren, 1999). Also researchers suggest that learning activities must support with extra activities out of classroom (Saran, 2009; Uzunboylu & Ozdamli, 2011). With the mobile technologies learners and instructors should make different activities which are more motivational and more interesting from traditional activities.

Lan and Sie (2010) described mobile learning (m-learning) as a kind of learning model allowing learners to obtain learning materials anywhere and anytime using mobile technologies and the Internet. According to Low and O'Connel (2006) mobile learning increase flexible and gives freedom feelings to students. Yi et al. (2009) described that m-learning is generally considered to increase the performance of learners by making learning accessible. Mobile learning technologies eliminates geographic boundaries and provides collaborating learning environment between foreign groups. Furthermore, advances in handheld devices have facilitated the use of multimedia in mobile applications, which allows mobile learners to have access to a wide variety of richly diversified learning resources (Huang et al., 2010). Laurillard & Pachler (2007) defined m-learning is being the digital support of adaptive, investigative, communicative, collaborative, and productive learning activities in remote locations, proposes a wide variety of environments in which the teacher can operate. Yi et al. (2009) described that m-learning was an array of ways that people learn or stay connected with their learning environments including their classmates, instructors, and instructional resources while going mobile.

The wireless handheld devices such as personal digital assistant (PDA), mobile phone, wireless laptop, tablet, and personal computer (PC); which are always on and always with the learner, allows learner to get information about courses. Learners can attend exams, download notes, share information, and also these process are track to the system then instructor can take reports toward learner process. They also facilitate 'justin- time' learning; learners could often take advantage of unexpected free time as they frequently have their devices with them (Evans, 2008; Vavoula & Sharples, 2008).

A deeper insight into theory-based research is required to better understand the underlying motivations that lead academics to adopting mobile learning elements and characteristics. It is necessary that the elements of mobile learning are organized correctly and the interactions between the various elements are combined in an efficient and optimum way so that the mobile learning is successful and the implementation is efficient. In addition, the characteristics of mobile learning should be organized, and the way they are applied to mobile learning activities and the application methods and the duration of the application time should be planned well in advance. These reasons have motivated authors to carry out this study. The aim of this study is to describe the basic elements and characteristic of mobile learning according to new trends in developing technology.

2- Basic Elements of M-Learning

Basic elements of mobile learning are learner, teacher, environment, content and assesstment. Figure 1 shows basic elements of an effective mobile learning approach.
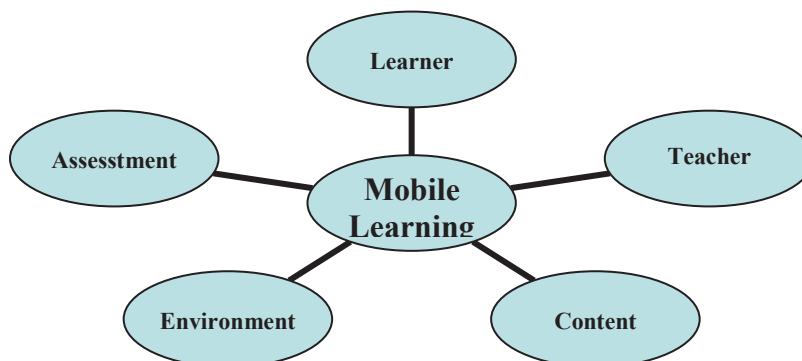

Figure 1. Basic elements of m-learning

Basic elements are described below:

(i)Learner: Learners at the center in all teaching and learning activities according to new education approaches. All the other elements serves to the learner. Mobile learning builds on the learner's interests, experiences and needs. Makoe (2010) claim that as the mobile learning concept implies, the pedagogical approach places the student at the center of the learning process. The learner plays an active role from determination of the goals until the evaluation stage. Learner's roles are giving below:

- Access information when they need
- Responsible for own learning
- Learning with their learning speed
- Discover and use their learning styles
- Create and share new information or product
- Study with their peers collaboratively
- Evaluation themselves and other groups

(ii)Teacher: Books and other media elements store information and teachers convey it to students in traditional learning environments. On the other hand, recently using technology for store information, support more accessible information for students. According to Halis (2002) this situation created a new dimension opposed to traditional teacher role about information search and use. Figure 2 provides much reduced overview of the changing roles of teachers:
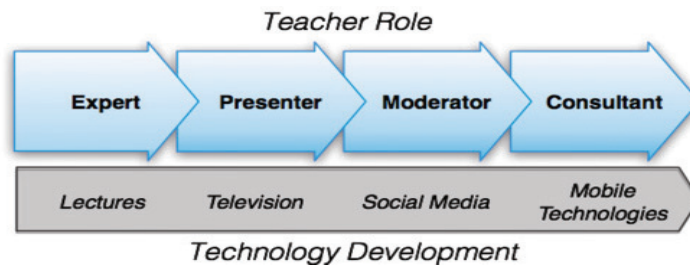

Figure 2. Teachers role in developing technology era (Ghaln, 2011)

According to Ghaln (2011) before television the main roles of the teachers were the role of the domain *expert* that presents information to the students. The transition of the media formats changed the role of the average teacher from being an expert towards being a *presenter* of the expertise of others. With the Web 2.0 and social networks many things have changed again. In these settings the role of the teachers needs to change from the presenter of expert knowledge to a *moderator* of opposing positions. With the mobile technologies changed role and responsibility of the learners the role of the teacher changes slowly towards that of a *consultant*. In this role teachers need to be able to identify the students' interests, relate these interests to topic related learning goals, and offer opportunities to reach these goals that are related to the specific conditions a learner is in. Teachers' roles in mobile learning:

- Qualified to use required mobile tools and technologies
- Determine the strengths and weaknesses of used methods and study to resolves the weaknesses with different methods
- Facilitator guide
- Advisory
- High levels of self-confident about courses
- Learn with their students
- Eliminates the barriers
- Increase motivation of learners
- Arrange activities to support interactive interactions between collaborative groups
- Arrange activities for evaluation of process

(iii) Content: Issues that expected to learn by students. Content should be decided in consultation with all stakeholders such as learners, teachers, parents etc. Otherwise teachers can not get the desired results. Learning content must enable a user to quickly zone into needed information. In addition, the content can be presented with interactive games or quizzes. Content should support with graphics video and other multimedia elements. Siragusa et al. (2007) described that the detail and extent of the content provided to students may vary depending upon the students' pedagogical needs.

(iv) Environment: Environment must design properly to obtain positive learning experiences. Environment is that place when students reach information. Students studying entirely online must have access to all of the unit content including the learning outcomes, assignment requirements and relevant resources. Students attending face-to-face classes may receive the content in class and additional content on online with mobile technologies (Siragusa et al., 2007). Students can access course content, while traveling on the train or in a coffe shop. Environment must increased interaction between students-students and students-teachers. Wikis, social networks, or blogs can use for increase social interaction. This enviornments must design available for mobile phones, laptops and other mobile tools. Uzunboylu and Ozdamli (2011) indicated that m-learning with handheld devices eradicated geographical borders, enabling co-operative learning environments which have individual and group interaction in the education.

(v) Assessment: Assessment is a critical component of the complete m-learning. Mobile technologies can assess record and report learner performance to the instructors. So, student evaluation should make via database logs, software packages, online exams, chat room, discussion board, online quizzes, or project evaluation. Also students should evaluate themselves and others. It provides the pieces needed to accurately evaluate a learner's knowledge, skills, creativeness and etc. Sharples et al. (2005) described that assessment is matched to the ability of the learners, offering diagnosis and formative guidance that builds on success. According to Behera (2011) the assessment should help the learner clear all his doubts based on the course and at the same time, learn a little bit more about the same. A good designed course should provide immediate feedback so that the learner is able to judge how well he has understood the content of the course. The feedback shouldn't be such that it discourages the learner and makes him/her feel like he/she doesn't know anything. A feel good factor is very important for the learner after he takes the course along with the assessment.

3- Basic Characteristics of M-Learning

Mobile learning has different characteristics. The core characteristic of mobile learning are ubiquitous, portable size of mobile tools, blended, private, interactive, collaborative, and instant information. Seppälä and Alamäki (2003) claimed that the core characteristic of mobile learning enables learners to be in the right place at the right time, that is, to be where they are able to experience the authentic joy of learning. Figure 3 illustrated basic characteristics of an effective mobile learning approach.

Figure 3 Basic characteristics of mobile learning

(i)Ubiquitous/Spontaneous: Mobile learning is more spontaneous than other learning types. It is this spontaneity that is probably the most defining characteristic of mobile learning. Mobile learning is context aware, meaning that students can learn everywhere. Wireless technologies such as laptop computers, palmtop computers, and mobile phones are revolutionising education and transforming the traditional classroom based learning and teaching into *anytime* and *anywhere* education (Cavus & Ibrahim, 2009).

(ii)Portable size of mobile tools: Mobile learning tools are small and portable (Quinn, 2000; Ahonen et al., 2004; Cavus & Ibrahim, 2009). Students can use it everywhere during their learning activities.

(iii)Blended: Teachers can use this approach with blended learning model (Uzunboylu, Cavus & Ercag, 2009). Students can use mobile tools for homework, projects or etc. in the education. Blended learning, which combines classroom instruction with m-learning, can maximize the benefits of both face-to-face and online methods (Bonk & Graham, 2006; Ocak, 2010).

(iv)Private: M-learning is private. It means that only one learner at a time usually has access to the mobile tool and that when students want to access information connects and downloads independently from other learners (Chidi, 2002; BenMoussa, 2003; Zhang, 2003; Virvou & Alepis, 2005).

(v)Interactive: M-learning environments which utilizes the latest technologies to bring an interactive learning environment into learning and teaching activities (Cavus & Uzunboylu, 2009). Students are not passive, the functions of mobile tools and environments allow varying levels of interactivity. Sharples et al. (2005) indicated that the technological layer represents learning as an engagement with technology, in which tools such as computers and mobile phones function as interactive agents in the process of coming to know.

(vi)Collaborative: Mobile technologies are support communication between students and teachers. So mobile technologies may use for collaborative learning activities in the education (Uzunboylu, Cavus & Ercag, 2009; Virvou & Alepis, 2005).

(vii)Instant information: Using a mobile tool is all about immediacy (Eteokleous & Ktoridou, 2009; Cavus & Ibrahim, 2009). According to Cohen (2010) the need is for quick answers to specific questions. Learning content must reflect this requirement by providing material that enables a learner to quickly zone into information. Examples of instant information are definitions, formula, and equations, etc.

4. Conclusion and Future Work

In order to get efficient results and the maximum performance from students using mobile learning in education, each of the elements of mobile learning should be prepared carefully, and the mobile learning characteristics should be planned and prepared with a knowledge of the teaching medium, learning environment and the learning activities. Otherwise, positive results can not be expected from the mobile application. These reasons have motivated authors to carry out this study. Learner, teacher, environment, content and assesstment are basic elements of the complete mobile learning. The core characteristic of mobile learning are ubiquitous, portable size of mobile tools, blended, private, interactive, collaborative, and instant information. This study raised important issues about the mobile learning charactersitics and elements. They were observed and possibilities of mobile technology integration in education have discussed. M-learning with handheld devices eradicated geographical borders, enabling co-operative learning environments which have individual and group interaction. The paper illustrated that in order to implement mobile learning effectively it is necessary to prepare the elements required for the teaching medium, and also, investigation should be carried out to gather the knowledge required for the mobile learning characteristics. It can be concluded that the paper might be useful for anyone interested in designing, preparing and implementing a mobile learning. Further studies can investigate the advantages and disadvantages of mobile learning tools and its educational uses.

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