(IJTBM) 2012, Vol. No. 2, Issue No. 2, Apr-Jun e-ISSN: 2231-6868, p-ISSN: 2454-468X

A CONCEPTUAL FRAMEWORK FOR HANDHELD LEARNING

***DR. PREMLATA JOSHI, #ANIL KUMAR**
**Principal, Women College of Education*
Jhojhu Kalan, Bhiwani (Haryana)
#Research Scholar, CMJ University, Shillong, Meghalaya

ABSTRACT

In today's highly connected world, people are becoming increasingly accustomed to accessing their favorite content wherever they are, on the go. The popularity of handheld web-enabled devices like iPhone, iPad and still the laptop computer means we can stay in touch wherever we are. For many, this brings an opportunity for learning convenience. This research paper is a concept paper which examine issues and challenges faced by users wanting the option of portable or mobile learning today.

INTRODUCTION

The traditional education is made in classrooms where the teacher presents the learning material to a group of students. The educational technology depends mainly of teacher and the students must physically participate in the learning process. Regardless of obvious advantages as a direct contact between a teacher and students and immediate feedback the traditional classroom education has many disadvantages. For example if the student has no ability to take part in some lesson he or she will miss the training material. These disadvantages lead to search for new and more effective educational methods.

The rapid growth of information and communication technologies and rising computer knowledge of the students make possible appearance of these new educational forms. If 15 years ago the main accent have been on Computer Based Training which used primary CD and local area networks as information medium, 5 years ago the accent is moved to use of Internet and Learning Management Systems. The e-Learning as new term is appeared. Nowadays extremely actual and perspective is mobile learning (m-Learning).

The main purpose of this study is to provide a better understanding of the characteristics of mobile learning in the context of distance education, and this is achieved by reaching three smaller goals. First, I compare mobile learning with electronic learning and ubiquitous learning. Based on this understanding of the past and current evolution of mobile learning, I describe its technological attributes and pedagogical affordances. Second, I adopt Moore's transactional

distance (TD) theory and modify it by adding another dimension: two distinctive forms of distance learning that I label individualized and socialized. This establishes a total of four types of mobile learning. Third, I classify previous studies done on this topic according to the four types of mobile learning. Finally, I conclude that instructional designers and individual learners will continue to incorporate mobile technologies into their teaching and learning effectively and will pursue their educational purposes in the pedagogical framework of mobile learning.

RELATED LITERATURE

Mobile learning refers to the use of mobile or wireless devices for the purpose of learning while on the move. Typical examples of the devices used for mobile learning include cell phones, smartphones, palmtops, and handheld computers; tablet PCs, laptops, and personal media players can also fall within this scope (Kukulska-Hulme & Traxler, 2005). The first generation of truly portable information has been integrated with many functions in small, portable electronic devices (Peters, 2007). Recent innovations in program applications and social software using Web 2.0 technologies (e.g., blogs, wikis, Twitter, YouTube) or social networking sites (such as Facebook and MySpace) have made mobile devices more dynamic and pervasive and also promise more educational potential.
However, it has been widely recognized that mobile learning is not just about the use of portable devices but also about learning across contexts (Walker, 2006). Winter (2006) conceptualized the work.

A recent review of practice in the evaluation of mobile learning (Traxler and Kukulska-Hulme 2005) suggests that not many accounts articulated an explicit position on pedagogy or epistemology (none of the evaluations concerned distance learning anyway). They seldom cited any works from the literature of evaluation or any works from the literature of the ethics of evaluation. They seldom, if ever, mentioned any ethical issues in relation to their evaluation. Most accounts cited focus groups, interviews, and questionnaires as their elicitation instruments. Some used observation and some used system logs. A few accounts mentioned several techniques and were triangulated, but most accounts used only one or, at most, two techniques. None of these elicitation techniques were particularly consistent with mobile learning technologies, and all accounts of such evaluations assumed that the evaluators were told the truth by subjects (that is, learners and teachers). Hopefully those engaged in mobile distance learning evaluation will learn from this critique. Clearly, there are problems with the epistemology and ethics of evaluating mobile learning; there are also challenges in developing suitable techniques to gather, analyse, and present evaluation. Nevertheless, the credibility of mobile (including distance) learning as a sustainable and reliable form of educational provision rests on the rigour and effectiveness of its evaluation.

ASPECTS OF HANDHELD LEARNING

Device Aspect (D)

The device aspect (D) refers to the physical, technical, and functional characteristics of a mobile device (Table 1). The physical characteristics include input and output capabilities as well as processes internal to the machine such as storage capabilities, power, processor speed, compatibility, and expandability. These characteristics result from the hardware and software design of the devices and have a signifi cant impact on the physical and psychological comfort levels of the users. It is important to assess these characteristics because mobile learning devices provide the interface between the mobile learner and the learning task(s) as described later in the device usability intersection (DL).

Table1: The Device Aspect

Criteria	Example & Concept	Comments
Physical Characteristics	Size, weight, composition, placement of buttons and keys, right/left handed requirements, one or two-hand operability.	Affects how the user can manipulate the device and move around while using the device.
Input Capabilities	Keyboard, mouse, light pen, pen/stylus, touch screen, trackball, joystick, touchpad, hand/foot control, voice recognition.	Allows selection and positioning of objects or data on the device1. Mobile devices are often criticizedfor inadequate input mechanisms.
Output capabilities	Monitors, speakers or any other visual, auditory, and tactileoutput mechanisms	Allows the human body to sense changes in the device; allows the user to interact with the device. Mobile devices are often criticized for limitations in output mechanisms such as small screen-size.
File Storage and Retrieval	Storage on the device (RAM or ROM) or detachable, portable mechanisms such as USB drives, CDs, DVDs, and SD cards.	Consistency and standardization of storage and retrieval systems greatly affect usability.
Processor Speed	Response rates; speed with which the device reacts to human input	Determined by the amount of RAM, fi le storage speed, user-interface speed, and system configuration. Unusually long or short response

		rates may affect error rates as the user may forget initial goals and/or task sequences
Error Rates	Malfunctions resulting from flaws in hardware, software, and/or interface design.	Users may not be able to perform desired tasks and may lose confidence in the device

Learner Aspect (L)

The learner aspect (L) takes into account an individual's cognitive abilities, memory, prior knowledge, emotions, and possible motivations (Table 2). This aspect describes how learners use what they already know and how they encode, store, and transfer information. This aspect also draws upon learning theories regarding knowledge transfer and learning by discovery.

Table2: The Learner's Aspect

Criteria	Example & Concept	Comments
Prior Knowledge	Cognitive structures already in memory, anchoring ideas, schema theory, Gagne's conditions for learning	Affects how easily a learner can comprehend new concepts. Potential problems include "assimilation bias" (a reluctance to adopt new procedures)3.
Memory	Techniques for successful encoding with the use of con textual cues: categorization, mnemonics, self-questioning, semantic & episodic memory, tactile, auditory, olfactory, visual imagery, kinaesthetic imagery, dual coding, and encoding specifi city.	Inclusion of multimedia by providing a variety of stimuli may help learners understand and retain concepts more easily.
Context and Transfer	Inert vs. active knowledge	Actively using information aids for learners to remember, understand, and transfer concepts to varied contexts. Discovery Learning Application of procedures and concepts to new situation; solutions for novel problems. May stimulate learner to develop skills to "fi lter, choose, and recognize" relevant information in different situations.

Discovery Learning	Application of procedures andconcepts to new situation; solutions for novel problems.	May stimulate learner to develop skills to "fi lter, choose, and recognize" relevant information in different situations.
Emotions and Motivations	Feelings of the learner towards a task; reasons or accomplishing a task.	A learner's willingness or ability to adopt new information may be affected by his/her emotional state or desire to accomplish a task. Activity Theory mayprovide additional avenues of investigation into motivation.

Social Aspect (S)

The social aspect takes into account the processes of social interaction and cooperation (Table 3). Individuals must follow the rules of cooperation to communicate – thereby enabling them to exchange information, acquire knowledge, and sustain cultural practices. Rules of cooperation are determined by a learner's culture or the culture in which an interaction take place. In mobile learning, this culture may be physical or virtual.

Table3: The Social Aspect

Criteria	Example & Concept	Comments
Conversation and Cooperation	Social constraints; 4 maxims (rules): quantity, quality, relation, and manner.	Affects quality and quantity of communication; miscommunications may occur when any of the 4 maxims are not met.
Social Interaction	Conversation as a cooperative activity, sharing of signs and symbols.	Agreement on the meaning of signs and symbols may affect reinforcement of social and cultural beliefs and behaviours.

CONCLUSION

While learners may not actually share the same physical environment, they can use mobile devices to share aspects of their personal and cultural lives. To solve problems unique to their situations, learners can readily choose from a seemingly unlimited quantity of data. The Internet has ushered in an era in which information has become easy to access and easy to publish. Now, learners must acquire the skills and tools to navigate through this growing body of information. Mobile learning enables learners to interact using additional tools such as text messaging, mobile

Internet access, and voice communications – all through wireless networks. Although this medium may be hindered by low bandwidth and limited input and output capabilities, there are some distinct advantages:

- Wireless, networked mobile devices can enable learners to access relevant information when and where it is needed. Mobile learners can travel to unique locations, physically with or virtually through their mobile devices.
- The ability to access a variety of materials from anywhere at anytime can provide multiple cues for comprehension and retention. • Learning within specific contexts can provide authentic cultural and environmental cues for understanding the uses of information which may enhance encoding and recall.
- Well-implemented mobile education can assist in the reduction of cognitive load for learners. While it is difficult to determine how to chunk information, differing patterns of presentation and amounts of information can potentially help learners to retain, retrieve, and transfer information when needed. The FRAME model can help practitioners and researchers to leverage these benefits and to better comprehend the complex nature of mobile learning.

For example, in attempting to repair a carburetor on a car, can the learner retrieve appropriate instructions at the exact time it is needed? If she can, indeed, access information when it is needed, is she able to choose the best resources? Is the information easy to hear or view on the device? Is the underlying networking infrastructure adequate? Is the learner fully utilizing the affordances of the device? If this learning task is taking place in a formal educational system, are the learning tasks designed in a way that encourages meaningful interaction with peers or experts? The checklist in Appendix A can help answer such questions and guide the development and assessment of mobile learning environments. While reading through the remaining chapters in this book, one can refer to the FRAME model and this checklist to assess the extent to which learners are engaged in balanced and effective mobile learning experiences.

REFERENCES

1. Cherry, S. The Wireless Last Mile. IEEE Spectrum, September, 2003.
2. Jamalipour, A. The Wireless Mobile Internet: Architectures, Protocols, and Services, John Wiley & Sons, 2003.
3. Sharma, S., F.Kitchens. Web Services Architecture for M-Learning, EJEL,Vol.2, Issue 1, 2004.
4. Singh, H. Leveraging Mobile and Wireless Internet, Learning Circuits, September, 2003.

5. CeBIT 2004 - Catch a glimpse of the future, http://www.siemens-mobile.com.
6. European GSM Market has 25% Growth During 1Q'04 According IDC, Computerworld-Bulgaria, Issue 16, 2004.
7. The Mobiles' Applications Market Has Huge Potential, Computerworld-Bulgaria, Issue 42, 2003.
8. Toshiba 0.85-inch HDD 2.0GB/4.0GB, http://sdd.toshiba.com.
9. Toshiba Announces World's Smallest Direct Methanol Fuel Cell, http://www.dcviews.com/press/Toshiba-Methanol-Fuel-Cell.htm.
10. 239% Growth in the Smart Phones and PDA Sale During Q2'2003 in EMEA, Computerworld-Bulgaria, Issue 30, 2003.http://www.ericsson.com/technology/technologies_az.shtml