



Approach and Analysis of M-Learning in Higher Education

M.Karthi Rajan
Librarian, Thiagarajar College,
Madurai, India.
karthirajan86@gmail.com

S.Pandi Kumar
Asst.Professor, Department of Computer Science,
Subbalakshmi Lakshmipta College of Science, India.
spandikumar@gmail.com

Abstract: 21st century is an age for learning and it declared to be the age of information and communication technology due to the revolution of mobile technology. The practice of providing education with the help of modern technologies is termed as e-education or e-learning or m-learning. Today the mobile technology has become an integral part of our live and we cannot work in the society without mobile phone, internet etc. everybody is using online technology in day today working progress. Obviously the combination of wireless technology and mobile computing is resulting in escalating transformations of the educational world. The question is, how are the wireless, mobile technologies affecting the learning environment, pedagogy, and campus life? To answer this question, we must assess the current state of affairs, surveying cyber culture globally and historically.

This paper seeks to clarify the meaning of mobile learning by applying its key concepts to learning experiences in post-school education. In other words, it seeks not to discuss one fixed meaning of mobile learning but to disassemble the basic components and provide an interpretation of the model in the context of higher education. In particular, Mobile Learning, or M-learning as it is often called, is a relatively new tool in the pedagogical arsenal to assist students and teachers as they navigate the options available in the expanding of learning world.

Keywords: m-Learning; e-Learning; Smart Learning; Higher Education.

I. INTRODUCTION

M learning means acquisition of any knowledge and skill through using mobile technology anytime, anywhere that result in alteration of behavior. M-learning, is learning accomplished with the use of small, portable computing devices. These computing devices may include: smart phones, personal digital assistants (PDAs) and similar handheld devices. There is some debate on the inclusion of tablet and laptop computers. Often, wireless two-way internet connection is assumed as an integral component. 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, smart phones, palmtops, and handheld computers; tablet PCs, laptops, and personal media players can also fall within this scope [1]. M-learning is the idea that a student can learn from any place at any time using portable learning devices. M-learning or 'mobile learning' is any sort of learning that takes advantages of learning opportunities offered by mobile technologies.

II. THE CONTOURS OF M-LEARNING

Several terms are currently being used to refer to this new learning environment. Wireless is perhaps the leading label, for several reasons, including its sense of the unwiring of connectivity and the implicit untethering of hardware from local cabling. The term wireless suffers from several weaknesses, however. First, any term that defines a negative ("less") rather than asserts categorical positive risks vagueness and a historicity (as does, more famously, the term postmodern). Second, wireless underplays the mobility aspect of the new environment. Mobile learning, or m-learning, covers this point better, but this term doesn't imply wirelessness that is, I may carry a Palm without connectivity and be mobile but not wireless. Ubiquitous computing, or ubicomp, does a better job of synthesizing these two

features, describing wireless, portable, mobile, and multiple units joined in what the Dutch GIPSY Project calls a "device ecology." [2] However, the term ubicomp is often misunderstood. Mark Weiser's [14] sense of ubicomp as naturalized computing is lost when ubiquitous computing refers to "lots of machines" or "decently ready access to labs." [3] Finally, none of these terms really grasp one key feature of the new milieu: the modeling of subjects as creative, communicative participants rather than as passive, reception-only consumers. We lack a term for describing the world as a writeable and readable service, encompassing mobile phones forming communities, P2P handheld gaming, moblogging, and uploading to RFID chips. For now, and to retain to the educational focus.

III. MOBILE LEARNING IN HIGHER EDUCATION

The mobile devices strategic tools with the capacity to deliver higher education instruction in a way that was never anticipated when the first prototypes of these devices were designed and marketed. Designers can deliver successful higher education products to the present generation of learners, by means of a technology, distinctively adapted for its own personal (mostly social) purposes. This makes technology a particularly potent tool for the delivery and reinforcement of content that would otherwise be identified with the higher education "establishment". Devices "such as mobile phone and mp3 players have grown to such an extent over recent years and are gradually replacing personal computers in modern professional and social context" [10].

Modes of communication that were spontaneously developed by the younger generation have been subverted to serve the purposes of transmitting higher education. Such structural changes in the delivery of higher educational instruction add a powerful tool to the arsenal of available means that educators can use to make delivery more efficient, personal and culturally acceptable to those who

pioneered these new modes of text delivery [12]. These fundamental changes pose new problems to the designers. What new design paradigms and meanings can be attributed to the use of mobile technology? How can we appreciate their full significance within the context of traditional instructional design theory? Before the development of new forms of information and computer technology such as the current mobile “smart” cellular telephones, the design paradigms by means of which the delivery of higher education was understood remained essentially static. The extraordinary potential inherent in mobile devices, anticipate radical changes in the very structure of educational dynamics especially in the way in which people interact with one another in society. The kind of informal learning through the use of mobile devices makes it an even more potent tool of educational communication than the customary forms and modes of traditional education. These revolutionary changes developed out of the unforeseen significance of human social life generally more “mobile”, creative and opportunistic, than the formal modes of traditional education.

IV. TRIPARTITE OF M-LEARNING

The foregoing observations can help designers to understand the position and significance of mobile learning in the context of higher education. It is possible to argue that the portability and mobility of these technological devices have had strong implications for the meaning of terms that had been extensively defined in existing literature. Using the mobile device as a signifier, the concepts of mobility can be divided into three significant areas: mobility of technology, mobility of learner and mobility of learning especially in higher education landscape.

This tripartite division of mobility is evident in the current literature on the subject and designers who have used mobile technology for educational purposes have confirmed this. Figure 1 is a graphic depiction of the three divisions of mobile devices that can deliver a higher level of educational instruction. In practice, the technology, the learner and the actual learning process operate in an uninterrupted continuum within the social context of education. The subversion of the signifier here (that operates to the advantage of the educator and the educated) is that mobile devices were constructed and marketed as forms of technology, designed solely to enrich and enhance the social and personal lives of users. The successful delivery of higher educational instruction depends on the tripartite significance of the word mobility as it is used in the context of higher education. These three elements are interdependent and are equally important in making mobile devices viable as instruments for the delivery of higher education instructional contents.

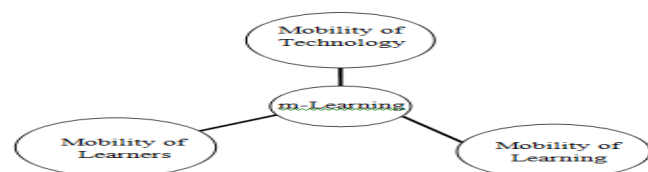


Figure 1. Tripartite of M-learning

Accordingly, the paper describes mobile learning as learning environmental based on mobility of technology,

mobility of learners and mobility of learning [4] that augments the higher educational landscape.

V. MOBILITY OF TECHNOLOGY

The mobile technology referred to in this article is mainly more advanced cellular telephones. But there are other forms of technology such as “smart” phones, digital cameras, flash-discs, iPods and personal digital assistance devices (PDAs). Mobile devices used to deliver higher education content and instruction can also function as audio-players, media-players and digital cameras. Advanced mobile devices are furnished with Wireless Application Protocol (WAP) and Wireless Fidelity (Wi-Fi) capacities so that a user can connect to the Internet by means of his or her PDA [13].

The mobile cellular devices mentioned above have the capacity to link to the Internet and deliver content and instruction that can enable learners to learn at anytime and anywhere in a format that is culturally prestigious among people in the same age group. Most of the more advanced models can support a portable, digital and wireless lifestyle and mode of teaching and learning. It is precisely the mobility of these devices that makes them highly prestigious and therefore desirable as instruments of learning among learners in the same age group. In fact they are highly valued by young people in their early twenties because they are visible indicators of wealth, privilege, luxury and modernity. Mobile devices with advanced features like those mentioned above are therefore regarded as more trendy, fashionable and prestigious among these consumers than the standard desktop personal computers that connect to the Internet by means of landlines.

The first designers of this mode of delivery were extremely ingenious in the way in which they exploited the prestige and iconic value of mobile devices among young people in their twenties. Educationists have in effect adroitly utilized one of the most potent symbols of wealth, prestige and fashion among the young. Education by means of mobile devices is therefore nothing if not revolutionary in its design methods, implications and results.

Trinder [13] explains the functionalities of the most popular and expensive mobile phone technologies. These include an organizer, video camera, telephone, GPS and film player. They also include games, e-book, e-mail facility Internet access and musical MP3s. But the most popular functions in all mobile phone remain the short messaging service (SMS) and the multimedia messaging service (MMS) – frequently used functions in the delivery of higher education instructions. This innovation has been discussed in terms of Trinder’s [13] classification of PDA functionality.

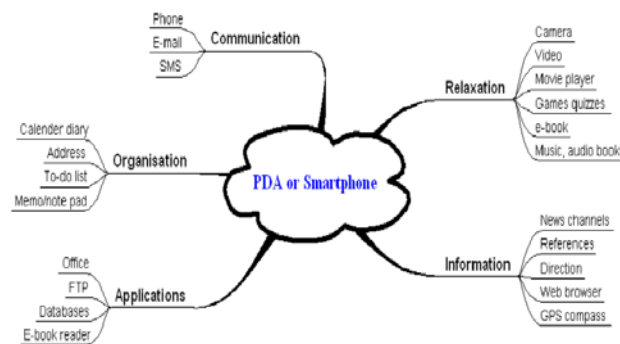


Figure 2. PDA for M-learning

Figure.2 highlights the functions of Personal Digital Assistant (PDA). This device connects easily with the Internet, and enabling it to perform many different functions [1]. Also “when combined with wireless connectivity, learning activities can be monitored and coordinated between locations. However, the task of designing such activities and appropriate learner support is complex and challenging. The impacts of new mobile technologies need to be appraised and evaluated” [1]. This is because of the challenges that still have to be overcome before this mode of educational delivery becomes as widely accepted as e-learning. However, Motiwalla states that although it is inevitable that m-learning will soon become an essential extension of e-learning, this transition will not happen overnight [5]. Instant access to learning at any time and in many places will obviously be very useful to learners, but only to a privileged few until wireless technology becomes more efficient and widely available. It also depends on designers’ ability to apply the appropriate forms of instruction that will make this mode of learning an essential tool in the delivery of higher education.

Table 1. M-learning devices with technologies

<i>Devices</i>	<i>Technologies</i>	<i>Description</i>
PDA, iPad, smartphone, flash drive	Cable	Direct, wired connection. Least complicated, least flexible
Laptop computer, PDA’s, mobile Phones cell phones	GSM, Wi-Fi, IR, Bluetooth	Commonly used short range wireless technologies.
Palms, 3G cell phone, PDA, smart phone and iPODS	WiMax, GPRS, GSM	Commonly used long coverage wireless technologies

From a technological point of view, mobile devices are becoming more and more capable of performing all the functions necessary in learning design. Since affordability and sophistication of mobile device technology have increased its popularity within the educational context and, educationalists should determine whether current theories of psychological, educational learning and instructional design are adequate to describe the processes and meet the challenges posed by this new mode of delivery. Traxler [1] writes: “[designers have] not explored the actual technologies or pedagogies in any detail and [have] sought to define questions for discussion rather than provide answers for what might in fact be premature or inappropriate questions”.

VI. MOBILITY OF LEARNERS

E-learning mediated by personal computers is mostly bound by location and time (availability) because of the configuration of a personal computer. The computer has no wireless learning tool linked to the Internet, which means that one must always work in one place at a particular time determined by availability and connectivity. But with mobile learning, learning can occur at any place and at any time. The ordinary (non-mobile) personal computer with landline connections to the Internet is constrained by the places in which they are located and their availability. Non-portable personal computers are too heavy to move easily and so learners are compelled to work in the same place and during the time slots allocated to them by university authorities. By contrast, learning with mobile is a learner

centric activity because it is both mobile and nomadic, and not pedagogically teacher-centric as in the case of traditional lectures and hardware installed in one particular location under the aegis of the university’s authorities.

Ting [6] makes the following remarks about the advantages of mobile learning: “The overall advantages provided by the mobile learning are more flexible, accessible and personalized learning activities. Such advantages keep the learners engaged in the ongoing learning activities and enhance their productivity and effectiveness”. Furthermore, Guralnich [7] suggests that the designer would be better served if he/she considered the entire context in which learners will use particular m-learning programme. However, today’s designers often tend to borrow design ideas from their e-learning experience.

Mobile learning devices also have the capacity to enhance a learner’s sense of individuality and community as well as his or her motivation to learn through participation in collaborative learning. These devices stimulate a learner’s sense of ownership of the content as he/she participates actively in a variety of social, collaborative and cooperative activities - all of which are centred on the mobile learning device.

Educators and designers should address the needs of learners in this age of wireless communication and connectedness. Slogans such as “walk and use”, “walk and talk”, “just for me” and “just in time” usher in the new phrases in education like “You ring, we bring” ushered in previous developments in society. Instructional theory in this mobile age should be learner-centric rather than technology- or teacher-centric. This is because, as Uden [8] observes: “Mobile technologies offer new opportunities for students’ educational activities in that they can be used across different locations and times”. Students using mobile technologies are not only remote from their instructors; they also fully control the access of information on their mobile devices. In this light,, one of the main advantages of mobile learning is that it allows this generation of learners to enjoy a certain amount of freedom and independence.

VII. MOBILITY OF LEARNING

Researchers and practitioners of mobile learning are engaged in pioneering experiments for transmitting the full content of higher learning to students by means of mobile cellular devices. Walker [9] points out that the advantages of mobile learning are not dependent solely upon the ability to use a portable and wireless communication device successfully. He argues that the kind of learning experienced by mobile owners is unique because it is received and processed within the context in which the learner is situated. The context is utterly individual – completely different from the rigid outlay of the traditional classroom or lecture room, and the computer laboratory.

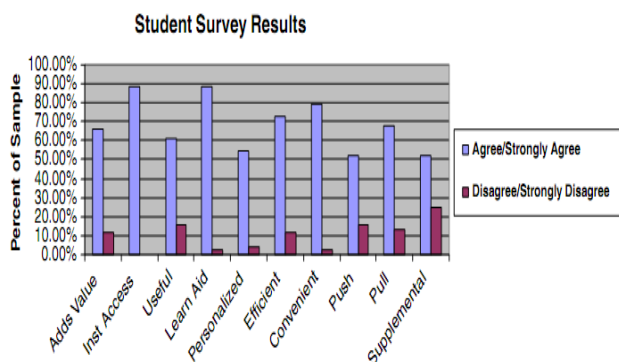
The international conference on mobile learning entitled MLearn 2004 adopted as its guiding statement the desire to provide “learning anytime and everywhere”, Attewell & Savill-Smith’s [10] paper and those of other contributions were designed to indicate how such a vision could be fulfilled. Most of the papers presented at this conference focused on the description and development of theories that would support the practice of mobile learning and the design production of mobile learning materials and systems.

Mobile learning devices have also enriched the theory and practice of e-learning. Contemporary consumers of higher education in developing countries almost always use mobile learning devices as adjuncts to e-learning in higher education. Sophisticated mobile devices are currently capable of delivering a comprehensive range of e-learning materials by means of web connections, infrared and Bluetooth transmissions. For Ally [11] “mobile learning intersection of mobile computing and e-learning; [it provides] accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning and performance-based assessment”.

VIII. CASE STUDY

The pilot project is “m-Educator” aims at design and development of mobile video streaming application including development of identified courses. This pilot project is a client-server based m-learning product that includes two sub modules namely, admin module and client side m-learning application. Admin module can be used for student, instructor, course, content and quiz management including video adaption and rendering based on learners mobile phone audio/video capabilities. Client side m-learning application developed for android & J2ME platforms can be used for accessing short duration video lectures, reference and quiz material. The users are finishing school students, colleges and training institutes and universities. The user’s survey indicates the needs of m-learning system.

Table 2. Student Survey



IX. CONCLUSION

In conclusion, the authors define mobile learning as “any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners and mobility of learning”. Since mobile learning is spreading rapidly and likely to become one of the most efficient ways of delivering higher education instruction in the future, it has become necessary to examine its implication for the design of teaching and learning. The uses and applications of mobile learning have multiplied in different contexts even though the eventual consequences of the proliferation of this medium are not yet entirely clear, either to designers and practitioners themselves or to researchers.

It is necessary for research on the effects and modes of mobile learning to investigate and explore the practice of

this particular medium in terms of the instructional design theories of the past, and to adapt such theories so that they can account for the extraordinary number of changes that have taken place not only in education, but in society at large.

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