

Chapter 13

M–Learning: Accessibility and Limitations for People with Disabilities

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ABSTRACT

Learning aims at interconnecting social classes, reducing poverty, and accepting diversity of all forms. This chapter presents technology enhanced learning for people with disabilities. At first, the author scans the phases of learning progression and proposes a learning model to represent their interrelationships. Then he explains the various types of disabilities within the learning reference of context and map available technologies to their corresponding learning disabilities. A special emphasis will be exerted on mobile-learning software, hardware, and systems that meet the requirements for learners with disabilities. In this research, the author find that although m-learning has several limitations and shortcomings to deliver to users, it is a promising learning technology for people with disabilities and its technological constraint and limitations are likely to be addressed and mostly eliminated in the near future.

INTRODUCTION

Education and training are the processes by which knowledge, wisdom and skills of one generation are passed on to the next (Keegan, 2005). Learning started with chalk and talk or what is later called classroom learning, c-learning. In this method, the learner is engaged in the learning process through interaction with the instructor. Although this method of learning is still common and ad-

vantageous, it has many drawbacks. One major drawback is that it does not cope with today's busy world with a significant segment of learners have jobs and cannot make it to class on certain times. C-learning could not adapt with the rapidly changing societal needs including the needs of people with disabilities and hence the call for a new learning method became imperative. Distance learning, or d-learning, was the answer then. In d-learning students work at home, on the train, or in a coffee shop, and communicate with their instructors via mail, email, phone, voice over the

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Internet (VoIP), or any other available form of communication. D-learning has gone through three main phases. In the first phase, course material was made available in printed form, on audio tapes, videos, CDs and DVDs, etc., and mailed to students via postal services or the network. Students study, solve their homework and tests, and return their assignments and tests to their institutions for grading. One example on this method is the Open University in the UK at Milton Keynes. The second phase exploited the information technology leap and the introduction of the Internet to advance this method using email technology and software-based learning. The third phase employs major learning software such as Web Course Tools (WebCT), Blackboard, and most recently Moodle. D-learning instructors use Blackboard, for example, to add their course material and tools such as discussions and live chat to help create online course content. Recently, d-learning developed to a new type of learning that is called electronic learning, or e-learning. E-learning includes most of d-learning technologies plus that the content is made available to learners as a dynamic content via the Internet, broadcasting, and interactive media. Also, a significant portion of e-learning is made up of real time content. What distinguishes this type is that the content can be delivered to learners who are geographically separated and enables them to participate in discussions in a synchronous manner. For example, Elluminate Live! Academic Edition 7.0 is a real-time e-learning and web collaboration environment that contains live interaction to asynchronous d-learning, and promotes active learning (e-learning solutions, lluminate.com, 2010). Duke University chose Elluminate Live! software to enhance the online experience of its remote students, provide cross platform support, participants control of classroom and meetings management, offer universal accessibility, and ensure higher security among other reasons. Finally, the fourth method of learning is mobile leaning or m-learning. M-learning is the newest method of learning in which mobile

devices, wireless technology, and protocols such as Wireless Application Protocol (WAP) are used. M-learning devices come in various sizes, and they differ in their abilities of running different applications. These devices offer many services including but not limited to voice conversations, messaging (Short Message Service, SMS, and Multimedia Messaging Service, MMS), browsing the Internet, emailing and opening attachments. The main devices used in this method of learning are: handheld devices such as cell phones, smart phones, and PDAs; tablet PCs; and laptops. According to GSMA - industry association (Mobile World Congress in Barcelona), the number of connections on mobile phone networks has crossed the 4 billion mark worldwide, and forecasting further growth to nearly 6.0 billion connections by the year 2013. Such phenomenal growth makes this technology a promising one and that it is here to stay for some time.

To complement and deal with the advancements in the hardware and protocols, software industry has successfully introduced and implemented a large number of software packages aimed at m-learning. For example, Hot Lava Software, Inc. (hotlavasoftware.com) is a leading provider of mobile authoring, publishing, delivering and tracking solutions. Hot Lava Software's Learning Mobile Author (LMA) is a mobile content authoring and publishing tool that allows the speedy design, editing and publishing of trackable mobile learning content. LMA modules are delivered and the results are tracked by cell phones, any internet enabled phone, or smartphones such as BlackBerry's, Motorola Q's, Treo's and PDAs such as Palm-OS (Oliva, 2005).

M-learning major hurdle is to convert content in such a way to fit mobile devices small and low resolution screen. This challenge has been achieved to a great success via chunking content into small and meaningful units that can fit small screens.

Figure 1 shows an approximate model that represents the four learning methods and their

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