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A REVIEW OF MOBILE-BASED INITIATIVES ACROSS COLLEGE CAMPUSES[1]

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ABSTRACT

The information era in which we currently live is changing the culture of education. The use of information technologies has resulted in new opportunities that are rapidly evolving to include mobile learning. Keegan (2002) characterizes this evolution of distance learning as a shift from d-learning (distance) to e-learning (electronic) to m-learning (mobile) learning.

Mobile, wireless, and handheld technologies are being used to re-enact approaches and solutions to teaching and learning used in traditional and web-based formats. The goal of mobile learning is to provide opportunities for students to interact through computer-supported learning environments from mobile terminals with low speed wireless connections.

This article provides a review of mobile-based initiatives across college campuses to explore the future of mobile teaching and learning; however, much of what exists in this growing body of literature documents the results of short-term small-scale pilots and trails.

INTRODUCTION

There are definitions and conceptualizations of mobile learning that define this form of education in terms of technologies and learner experiences as reported by Traxler (2007) proponents of mobile learning define it in terms of devices and technologies; while opponents conceptualize it in terms of the learner's experience of learning with mobile devices. Traxler offers his definition of m-learning as "learning delivered or supported solely or mainly by handheld and mobile technologies such as personal digital assistants (PDAs) smartphones or wireless laptop PCs" with unique characteristics such as personal, spontaneous opportunistic, informal, pervasive, situated private, context-aware, bite-sized, and portable.

Peters (2007) argues that we are the first generation of portable information and communications technology to use portable mobile devices that provide telephone, Internet, and data storage and management in products such as i-Mate, Palm, HP, and Bluetooth combined with removable memory chips, diaries, e-mail, Web, microcomputer applications, data input, storage, and transfer central to m-learning.

Shih and Mills (2007) provide a roster of characteristics that define mobile learning as the capacity for learning anytime and anywhere through the use of multimedia (text, voice, image, or video) and communication (phone call, voice/text messaging, e-mail Web access). They further suggests that this mode of teaching and learning provides "real-time online interaction in a series of short burst learning activities, with features such as voice/ video recording for storytelling or even a mobbloging journal."

Lehner and Nosekabel (as reported in Lai, et al., 2007) views m-learning as a service that electronically delivers content to learners, irrespective of location and time, and provides learners guidance and feedback using new interfaces for diverse learning approaches.

Keegan (2002) asserts that mobile learning sets out to design a learning environment for wireless technologies and provides a virtual environment mode that includes course content, other course materials, student support services, Internet, and communications between and among faculty and students. Keegan further reports m-learning (defined by Isopia, a content provider) as a "blended learning experience extending from physical classrooms and desktops to PDAs, two-way pagers, mobile phones and hybrid devices."

LITERATURE REVIEW

A review of the academic literature revealed few research articles on m-Learning, more often than not, consisting of a number of short-term small-scale pilots and trails. Nevertheless, findings associated with the characteristics of m-learning are reported in the current review of literature.

Peters (2007) interviewed 29 manufacturers of mobile devices, businesses and education providers and found that mobile technologies were in common use in some commercial sectors, but found limited adoption for educational use.

Despite the results found by Peters, Keegan (2002) suggest that we capitalize on the availability of mobile phones and computers among college students and utilize these devices to develop didactic learning environments. To effectively creative a mobile environment, Wagner (2005) recommends the augmentation of strategies, applications, and resources to support anywhere-anytime connections for formal and situational learning, as well as personal interest explorations. Moreover, Rekkedal and Dye (2007) suggest a mobile learning environment and infrastructure should include the technology, learning content, communications, and resources (see figure 1).
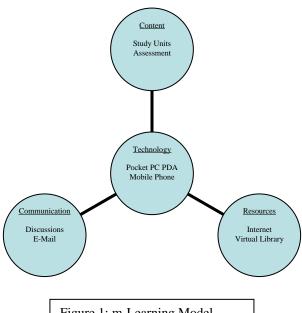
Figure 1: m-Learning Model

Klopfer, Squire, Holland and Jenkins (as reported in Peters, 2007) propose that mobile devices (handheld computers) produce unique educational affordances, such as portability, context, connectivity, individuality. Additionally, Attewell (2005) reports several advantages inherent in mobile learning: improves literacy and numeric skills of learners; provides informal learning; supports independent and collaborative learning experiences; and helps learners stay focused for longer periods of time.

The ability to provide learning anytime and anywhere, learning that is situated, and learning that is contextualized through mediation with peer and teachers are key features of mobile learning identified in the study conducted by Peters (2007).

From these literature reviews, we can conclude that characteristics such as accessibility and availability as well as informal, personal, spontaneous, opportunistic, and situated make mobile technologies an effective tool for teaching and learning.

MOBILE-BASED CAMPUS INITIATES

Mobile computing, mobile technologies, and mobile learning are popular terms to describe a growing number of university initiatives and programs which take advantage of portable digital tools and resources.

North Carolina State University, College of Agriculture and Life Sciences (CALS) piloted a PDA initiative during fall semester 2002 using freshmen transition courses and field experiences. The purpose for selecting the aforementioned participants was to provide incoming freshman an opportunity to engage in hands-on research for their first university course credit. The specific PDA used was the handheld Palm m130 together with Mobile Mentor software which afforded students the opportunity to share laboratory data from field research projects; create and edit Microsoft Word and Excel documents; and view PowerPoint slides using Documents to Go by DataViz. The hardware in conjunction with the software allowed students to:

a) access electronic copies of course files and assignment sheets pre-loaded on their devices;
b) download personal events and dates from campus-wide calendar system;
c) download copies of their resume and send to potential employers.
d) access a built-in digital camera for taking photos around campus to documented assigned projects.

Two years after the PDA mobile computing implementation at NC State, a survey was administered to 65 participants to access students' attitudes and performances with mobile technologies. CALS reported preliminary results from the PDA initiative as successful with only 3% of participants surveyed opposing the use of mobile technologies for educational purposes (CALS, 2004).

Wake Forest University piloted a program called MobileU in the fall of 2005 (Walker, 2005). Pocket PC phones were distributed to 100 students to explore educational usage for mobile technologies. Jay Dominick, chief information officer at Wake Forest suggests that student communication patterns are diverging and as a result they are less likely to engage in traditional messaging such as e-mail and more apt to embrace new technologies such as instant messaging and text messaging. The Pocket PC, a combination of a cell phone and a mobile computer with wireless access, was used for mobile messaging (i.e. instant and text messaging); mobile access to academic information; and voice-enabled software application which has the capabilities that allow students to use voice commands to solve life occurrences or situations. Imminent feedback from pilot participants will be used to determine whether to provide similar mobile technologies to all students in the near future.

Ann Frechette (2006) reports on Montclair State University's GPS-based mobile phone that allows students to alert campus police with their location anytime they are feeling unsafe. This pilot, the first initiated in the United States, utilizes cell phones as a personal alarm device connecting students to campus police. A package of customized applications, Rave Guardian, developed by Rave Wireless in collaboration with Montclair State University was introduced to students in 2005. To participate in the program, students were required to subscribe to Rave Guardian through Campus Connect. The service was hosted by Sprint/Nextel through a national network and provided students with the resources to manage their academic and social lives. The service allowed students to: (a) identify the GPS location of campus shuttle buses; (b) check class assignment changes; (c) get specials at local merchants; and (d) share their GPS location with friends. Montclair State University received national recognition for this mobile-based initiative supporting campus safety.

The Office of Information Technology (OIT) at the University of Tennessee in Knoxville conducted a pilot study that included the Clicker, a personal response device. The pilot was introduced in the summer of 2005 and included approximately 1,940 participants who were enrolled in 16 classes ranging in size from 35-660. The OIT describes clickers as .....

> "portable, hand-held devices that allow students to send their responses to multiple choice, true-false, and quantitative questions wirelessly, via infra-red or radio frequency technology, to a receiver connected to the instructor's laptop computer. Software installed on the computer analyzes the data and displays the results graphically (bar graphs, pie charts, etc.), giving both students and faculty a quick idea of what concepts might need further review, additional explanation, or increased preparation." (p. 2)

A survey was administered to evaluate clicker technology and found an overall satisfaction with 47% (537) of students responding. Approximately 70% of the study participants agreed that the use of clickers: (a) contributed to their learning; (b) helped them to understand key lecture points; and (c) helped them to identify areas they needed to spend more time on. Based on study results, UT has continued its use of clicker technology to increase student engagement and support active participation in classes.

Lastly, Fayetteville State University is embarking on a mobile-based pilot called Bronco Mobile which began at the start of fall 2007. This initiative will include the integration of mobile technology with phone-based academic and computing tools. The technology will enable students to receive text alert from school organizations, class change notices and cancellations and emergency alerts such as weather advisories and school closings. The authors, an assistant dean and assistant professor at Fayetteville State University, plan to access and evaluate the Bronco Mobile pilot program and will report the findings in separate forum.

As a final point, Traxler (2007) argues that before we can effectively implement wireless and mobile education within higher education, social, cultural, and organizational factors must be addressed.

CONCLUSION

The competitive environment in which we live suggests that the practice of distance learning will continue to be defined and thereby contested as evident by correspondence, video, and electronic teaching and learning environments.

Portability, personal, and contextual are just a few attributes that describe mobile learning; as such, we cannot ignore its possibilities with respect to education. The technologies associated with mobile learning denote informality, spontaneous, situated and ubiquitous. Mobile technologies have enabled a new way of teaching and learning. The informality of such, as argued by Peters (2007), is by now embedded in our daily lies; millions of Web-enabled phones are being used by learners (who may not be enrolled in formal courses) to seek information or to communicate and connect to geographically-dispersed friendship groups in far away communities.

Despite its characteristics as well as support, more research is needed in order to determine whether mobile technologies can be deployed for educational purposes.

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