

# Mobile Learning Implementation and Issues

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## INTRODUCTION

Mobile learning or “m-learning” is a relatively new learning modality in higher education and it refers to the delivery of educational content by means of mobile devices, such as PDAs, cell phones, and MP3 players, effectively enabling learners to access course materials anytime, anywhere, and any while (Walker, 2006). M-learning is also characterized as “personalized” ... “bite-sized”, and “portable”, characteristics not often associated with “conventional tethered e-Learning” (Traxler, 2007).

With the first m-learning applications emerging as early as the 1970s, it was not until the technological advances of the early 21<sup>st</sup> Century that made it entirely viable to deliver a broad range of educational content through m-learning (Sharples, 2007). The advent of powerful pocket-sized devices – such as Personal Digital Assistants (PDA) and smartphones – enabled innovative educators to utilize the emerging technological capabilities to deliver interactive educational content that was no longer constrained by a learner’s ability to access a physical classroom or Internet connection.

In addition to the new technical capabilities, many institutions of higher education faced increasing student demand for ubiquitous technology resources (Roberts, 2005). As the social characteristics of students entering the academia evolved (Dede, 2005), students became technologically savvy and accustomed to grasping abstract and complex concepts by using technology as a teaching tool (Oblinger & Oblinger, 2005; Selwyn, 2003, p. 134). By the time they entered their college-years, students have often mastered a wide range of technological tools (e.g. iPods, laptops, cell phones) and applications (instant messaging, social networks, etc.). In addition to student demand, institutions began to adopt m-learning to support recruitment (Van Eck, 2007), engagement (Ramaley & Zia, 2005), motivation (Schwabe & Goeth, 2005), and retention (Fozdar & Kumar, 2007) of students in response to rising competition from their peers (Cobcroft et al. 2006).

## BACKGROUND

In the early 2000s, the rapid development of portable technology gave rise to hardware devices that were powerful, small, and mobile. Generally, these devices were designed to fit in a jacket pocket, a trait requisite to classify it as a mobile or handheld device, so that they could be “carried on a regular, if not constant basis” (Caudill, 2007). Examples of such hardware devices include Personal Digital Assistants (PDAs), smartphones (such as iPhones), and MP3 music players (such as iPods). As reported by the International Data Corporation, these mobile devices, due to their utility and relative affordability, quickly consumed the high tech market – with more than 700M mobile devices sold every quarter in 2007 alone (“Handheld Device Vendors,” 2007).

Furthermore, the traditional classification of mobile devices by segregating them by functional utility into phones, music players, or PDA became less apparent as many smartphones, for example, featured the functionality of all three types of aforementioned devices. The harbinger of the unprecedented demand for such all-inclusive devices was the launch of Apple’s iPhone – whose sales exceeded .5M units during its opening weekend (“iPhone Sales Said,” 2007). Attracted to the prospect of carrying only one device (rather than many), users of mobile devices quickly embraced iPhone’s extensive lists of capabilities (e.g. ability to access email, text, photos, music, videos, calendar, Internet and phone services).

The increase in the capabilities of mobile devices resulted in the applications (or software) available for use on them to closely mirror those once only associated with (personal) computers (Williams & Sawyer, 2005, p. 102; Weinstein, 2006). These mobile applications included:

- **Entertainment software** or programs used to deliver educational games and simulations.
- **Education and reference software** such as encyclopedias and phonebooks.

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- **Productivity software** used for word processing, spreadsheets, databases, personal information management, web browsing, and email.
- **Specialty software** for video and audio editing, presentation graphics, drawing and painting, project management, etc.

The developments in mobile software and hardware paved a path for educators to create learning tools for use on mobile devices and introduce those tools into their physical and online classrooms, thus presenting students with ubiquitous access to course content that includes:

- **Course content** (syllabi, chapter reviews, lectures, narrated presentations, blogs, wikis, etc.)
- **Communication tools** (email, discussion areas, contact information)
- **Interactive exercises** (games, simulations, flash cards)
- **Multimedia** (video and audio clips, podcasts)
- **Utilities** (to-do lists, project management tools, etc.)

## MOBILE LEARNING IMPLEMENTATION

Beginning in the late 1990s and early 2000s, a number of institutions introduced mobile learning applications to their curricula. While their approaches, intent, and even technologies differed, their efforts could broadly be categorized as follows (Goh & Kinshuk, 2006):

- **Games and Competition in Learning:** Learning games designed for cell phones and PDAs as means of engaging students to “master team building, social, and communications skills.”
- **Classroom Learning:** Utilizing PDAs or similar devices as tools for brainstorming, voting, or quizzing in physical classrooms to promote collaboration among student and enable “students to construct new knowledge based upon previous knowledge” (Goh & Kinshuk, 2006).
- **Laboratories Learning:** When used for data gathering and control in a laboratory setting, mobile devices can help individual learning as well as collaboration learning.
- **Field Trip Learning:** Mobile devices can act as conduits for accessing (e.g. by providing en-

cyclopedic data) or gathering (e.g. by providing database interfaces) information in a field setting.

- **Distance Learning:** PDAs and cell phones can be used to support synchronous and asynchronous distance learning by providing mobile access to course management systems, supplemental instructional materials (such as audio study guides), or learning games.

Here are a few examples:

- **American University** made available podcasts of events and lectures that students could download on their mobile MP3 players. While class lecture podcasts were available to students only, the podcasts of the College’s events were readily available to the public. While the University intended “to deliver event content, interviews with VIPs, and course material to students and faculty in many formats” (“AU Washington College,” n.d.), it also enabled students to catch up on events or lectures on their own time (in case personal commitments prevented them from attending class) and pace (since they could slow down the podcast to facilitate the understanding thereof).
- **Duke University’s** much advertised iPod project sought to provide incoming students with a mobile device to help students record and retrieve course content. However, students themselves expanded the original intent of the program and “collected and created primary source materials of cultural settings, conducted interviews of experts, and produced podcasts and audioblogs that were linked and downloadable from course Web sites” (Boettcher, 2005).
- **Duquesne University** created a software program that provided a dynamic interface between the course management system (CMS) and a student’s PDA. By using the program, students were able to access almost all CMS features (discussion areas, email, course content, etc.) through their PDA. Once synchronized with a desktop computer, the PDA would download to the PDA all new course materials (from the CMS) and would upload all student’s work from the PDA to the CMS. Students could thus use the CMS and PDAs interchangeably and could have access to course materials

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