

# Ubiquitous Mobile Learning in Higher Education

**Gaye Lightbody**

*University of Ulster, Northern Ireland*

**Paul McCullagh**

*University of Ulster, Northern Ireland*

## INTRODUCTION

The higher education environment is changing driven by the needs of its students, evolving into a combination of different approaches (blended learning), with lectures, tutorials, and independent reading forming just one side of the overall learning encounter. A white paper from IBM (Robert, 2005) highlights some interesting viewpoints on how training programs should aim to meet the changing needs of today's learners. They are part of the Millennial (or "Net") Generation, brought up within a world of computers, mobile phones, and the Internet. More often, this generation of learner has little fear of present technology and in fact desires the latest electronic hi-tech advances. With such natural acceptance they have few barriers to impede the use of alternative methods, such as electronic learning (e-learning), to supplement their educational experience. As computing devices have become smaller and network accesses have become ubiquitous, the paradigm has been enhanced by the concept of mobile or m-learning.

Carlson (2005) has described the Millennial generation as smart but impatient, commanding immediate results and with divided attention spans. However, there are positive observations about their self-motivation and willingness to seek out and share resources to complement their course material. The speed at which information can be gleaned from the Internet using search engines has obvious benefits and students have grown to expect the same speed and accessibility in all facets of their lives, including education. This has created demands on education facilities to keep pace with modern living and upgrade teaching practices to make the most of technical advances.

The modern student is a consumer with a more varied educational background and entrance route, and with

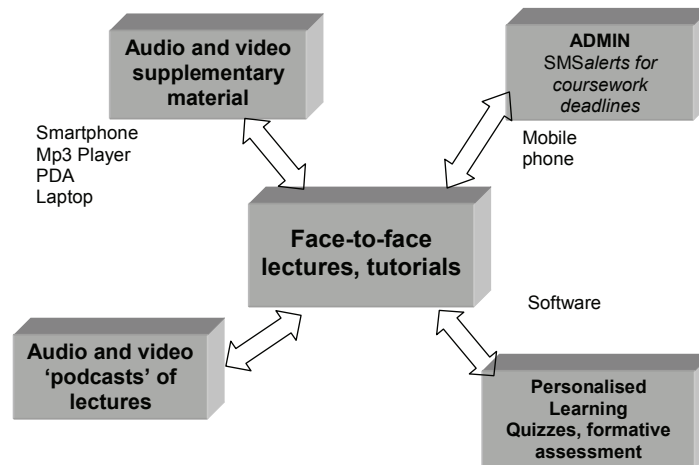
that comes more rigorous demands on the applicability of the education they are receiving in return for their money. It is likely that this will become a driver for modern teaching practices. This article will give an introduction to some of the current research into the use of modern multimedia technologies in higher education facilities, with detail given to some approaches adopted by the University of Ulster (Lightbody, McCullagh, Weeks, & Hutchison, 2006).

## APPLICATION OF MODERN TECHNOLOGY IN EDUCATION

Changes in student characteristics have encouraged a great amount of contemporary research within higher education in the involvement of mobile technology to enhance the learning experience and assist in the transfer and understanding of material. With the explosive growth in the use of mobile devices such as phones, laptops, iPods, and MP3 players this has set the platform for moving education out from the bounds of a classroom and into our everyday lives, creating the concept of "anytime-anywhere learning." A culture has evolved with these devices becoming an integral part of our daily routine, yielding the concept of "infotainment." Figure 1 depicts some examples of how modern technology can be incorporated into an educational environment.

Recent trials (Carlson, 2004) within higher education facilities using audio supplementary material have proven to be effective. A key contributor to this success is accessibility; students can perform daily tasks while listening to course material or utilize unproductive travel time watching a videocast. These devices can hold a vast volume of material, essentially providing a personalized portable digital library. Tumbling cost

*Figure 1. Modern mobile technology in education*



is another driving factor increasing affordability, and hence their growth in ownership (Tempo, 2006).

Another important aspect is the availability of material; university Web sites and shared networks enable access to a wealth of information at the touch of a button. Even this has evolved drastically through podcasting (Hammersley, 2004), a relatively new and innovative social media tool differing from downloads in that users do not need to manually search and select the material that they are interested in. If subscribed to a podcasting site they are automatically alerted and updated with new material through Really Simple Syndication (RSS) technology. In basic terms, an RSS reader on the user's PC will check the feed for changes and react by automatically retrieving the new data from the specified uniform resource identifier (URI). It has become very well established spanning from uses in popular culture to distribution of supplementary course material.

Mobile phones are increasingly becoming an active educational tool, and there is a keen interest in assessing their pedagogical impact (Mermelstein & Tal, 2005). Their role is multifunctional, from alerts for students reminding them of last minute timetable changes or coursework deadlines, to a medium for delivering course content. They could also be used to record notes for revision, group discussions, and interviews, or even to capture images and sounds from field trips. In particular, they can provide a reactive medium. E-mail and even podcasting requires some level of interest and

engagement to discover the information, with a need to log on and read e-mail, or to subscribe to a Web site. In contrast, the mobile phone provides an instant pathway to the student. Short message server (SMS) text messages (Nonyongo, Mabusela, & Monene, 2005) give a method to ensure as much as possible that the student has received the information.

This flexible and secure communication of material can assist the learner, particularly those groups of individuals that may have found the educational experience daunting. A recent European study (CTAD, 2001, 2006) evaluated the impact of using mobile phones to aid the learning of a group of young adults that had previously encountered poor experiences with formal education. The goal was to encourage an interest in self-development through the study of topics of interest to them. The outcome was positive. It was an approachable medium enabling learning at a pace best suited to them. A variety of educational tools, such as Java games and SMS quizzes, supplemented the traditional learning experience. The flexibility of the mobile device, coupled with the two-way engagement, creates a very powerful platform on which to communicate with the student and encourage learning.

The increased use of mobile devices in education has changed the dynamics of delivering material and managing cohorts. The following section gives some examples of the aforementioned technologies being employed in higher education.

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