

# Chapter 8

## Mobile Learning in Medicine

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### ABSTRACT

*Mobile learning (m-learning) is particularly important in medical education, and the major users of mobile devices are in the field of medicine. The contexts and environment in which learning occurs necessitates m-learning. Medical students are placed in hospital/clinical settings very early in training and require access to course information and to record and reflect on their experiences while on the move. The work of postgraduates and physicians involves a high degree of mobility between distributed sites and instant communications within work environments. Distributed sites where physicians work and in which students are placed are often in remote and rural areas. The technological advances can be capitalized to promote and facilitate situated learning.*

*This chapter describes the medical context and characteristics of medical students, residents, and medical professionals and implications for m-learning. Some technologies used and examples of usage, benefits, outcomes, and barriers at the undergraduate, postgraduate and continuing medical education are explored.*

### INTRODUCTION

The medical education system in any country plays a pivotal role in training physicians with the skills required to address the priority health concerns of the community, region, and/or nation they have a mandate to serve. Although the priority health concerns are to be identified jointly by governments, health care organizations, health professionals and the public (Boelen 2000), each country has its own national voice.

In Canada, the Association of Faculties of Medicine of Canada (AFMC) is responsible for providing guidance on undergraduate, postgraduate and continuing medical education and for managing a rigorous system of accreditation. In USA, the Association of American Medical Colleges (AAMC) and in UK, the General Medical Council (GMC) are equivalents. The duration of basic medical training is typically 4 years where a student completes an acceptable program of medical education (undergraduate medical education: UGME) followed by 2-6 years of accredited residency training in a specialty (postgraduate medi-

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cal education: PGME) such as family medicine, surgery, psychiatry, etc. Licensing examinations have to be passed to legally practice medicine. Even after beginning to practice, medical professionals are expected to be involved in continuing medical education (CME) to maintain their license.

The learning needs of UGME, PGME and CME, while overlapping in many ways are also quite distinct. In UGME, the learner focuses primarily on obtaining foundational knowledge, skills and attitudes and learning is generally driven by external factors such as curriculum and examination (Davis et al, 2007). In the early years, the student usually learns within a university setting or closely supervised hospital/clinic setting.

In PGME, the learner builds on this knowledge, with increasing opportunities to practice skills and to work under minimal supervision or independently in a hospital or clinic. Here, learning is influenced by self-motivation and relevance to clinical practice. In CME, the focus is more on reviewing knowledge and skills, maintaining competence and learning about new developments in the field. Thus, as in almost all professions, in order to make informed decisions in practice, medical personnel have to be provided with opportunities to participate in Life Long Learning.

In medical education, though the learning needs are different at the UG, PG and CME levels, because of the varying settings in which learning occurs, opportunities have to be provided in the context of the “anything, anywhere, anytime” imperative (von Jan, Ammann & Matthies, 2008), and mobile learning may be one of the solutions.

## **BACKGROUND**

### **What is Mobile Learning?**

Mobile learning or m-learning has been defined in very many ways (Attewell & Savill-Smith, 2004; Collis & Moonen, 2001; Keegan, 2002; Kukulska-Hulme & Traxler, 2005; Laouris & Eteokleous,

2005; Metcalf, 2006; Mitchell, 2003; O’Malley et al. 2003; Van Barneveld & Shaw, 2006). While eLearning is defined as learning supported by digital electronic tools and media, m-learning is defined as eLearning using mobile devices and wireless transmission (Milrad in Attewell & Savill-Smith, 2004). Others (Keegan) define m-learning as “the provision of education and training on PDAs/palmtops/handhelds, smart phones and mobile phones” (p. 6) number). O’Malley et al, with a focus on mobility, define m-learning as “any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies.” While some (Milrad, Keegan) focus on the mobile use of technology, others (O’Malley) focus on the mobility of persons. M-learning is defined by yet others who emphasize learning as “the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime, that results in an alteration of behavior” (Geddes, 2004, p. 1). In this chapter, the emphasis will be on learning.

The goal of m-learning should be to develop content for mobile applications in order to accommodate the needs often described as just-in-time (JIT), location based learning (LBL), just-in-location learning (JILL), learning-on-demand (LOD), and what-I-need-when-I-need-it (WINWINI) (Van Barneveld & Shaw, 2006).

### **Attributes of M-Learning**

The attributes of m-learning are described as spontaneous, personal, informal, contextual (situated), portable, ubiquitous (available everywhere), ambient (surrounding us completely), unobtrusive or pervasive (integrated with daily activities that it is hardly noticed) (Kukulska-Hulme & Traxler, 2005; O’Malley et al. 2003). This means that the device used should be small, so that it can be easily carried in the pocket or hand, blending with the environment, and easily accessible to the person at

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