

Chapter 2

Producing Generic Principles and Pedagogies for Mobile Learning: A Rigorous Five Part model

Davina Calbraith
Anglia Ruskin University, UK

Reg Dennick
University of Nottingham, UK

ABSTRACT

This chapter outlines how innovative research methods were developed (Calbraith, 2010), and how the model described in this chapter was based on (and adapted from) comprehensive research concerning learning objects (Calbraith & Dennick, 2009). It describes how the model was designed and developed to create a robust foundation on which to build rigorous research-based content for mobile learning. Taking a step-by-step approach it describes how reliable pedagogies were formed, how subsequent research testing distilled factors noted from this method into both unique and generic pedagogical principles, and how the principles formed can be used in any context or discipline to produce effective and enjoyable learning. The authors include analysis of a worked example using this approach (in this instance from Nursing) in order to illustrate how each stage of the model may be performed, and to make clear how the process may be replicated and incorporated into many different settings.

INTRODUCTION

This new mobile learning model was developed using an original systematic review method,

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grounded theory to develop emergent theory, and comprehensive research/usability testing on seven specially designed Learning Objects.

Using a step-by-step guide, the aim of this chapter is to practically highlight how this model was formed, the methods used, and most importantly

how it can be replicated. It may be used either in part (to produce effective Learning Objects for mobile devices), or in full (to produce rigorous teaching and learning pedagogies within mobile learning environments). To this end, a practical example has been taken from an Intensive Care Nursing (ICU) setting from one of the author's pool of research studies. This ICU example is an exemplar in that it illustrates how the process may be applied. Although this is taken from ICU, generic parallels and implications for this model's use within other disciplines/settings are possible, and are therefore outlined and discussed. (N.B. All research studies used in the development of this model and the ICU example have full ethics approval from two universities and two Healthcare Trusts in the UK. Further details available on request).

Peters (2007) defines mobile learning (or 'MLearning') as learning performed on handheld and desktop devices that are portable, interactive, connected and individual. This therefore includes Personal Digital Assistants (PDAs), laptops, mobile phones, smartphones, iPhones, and iPad. Kukulsha-Hulme and Traxler (2007) describe mobile learning as 'learning that is not time or space dependent' and note that it can be "informal, unobtrusive, ubiquitous and disruptive" (p1492). Kukulsha-Hulme and Petit (2008) therefore underline the need for the definition to take into account social and philosophical dimensions. For the purposes of this model, the working definition of mobile learning will therefore be 'any type of learning performed on a mobile device unconstrained by time or place'.

The term PDA (personal digital assistant), first used in 1992, is defined as a mobile device which functions as a personal information manager with the ability to connect with the internet. Many employ touch screen technology.

Nusca (2009) defines 'Smartphones' as "mobile phones that offer more advanced computing ability and connectivity than a basic feature phone" (i.e. they run complete operating system software

and provide a platform for application developers - PC Magazine, 2010). The first smartphone (with touch screen and predictive text) was released publicly in 1993. The first phone to call itself a smartphone was the Ericsson R380 in 2000. Most smartphones (especially HTC ones) now have touch screen and/or stylus, 3G, windows media player, and mobile phones capabilities (Microsoft, 2010).

The term 'iPhone' (first used in 2007) is 'an internet and multimedia enabled smartphone'. Designed and marketed by Apple Inc, they use a multi-touch screen, allow third party applications with diverse functionalities. They have been described as 'PDA/cell phone hybrids' (CNET, 2010). The 'Blackberry', introduced in 2002, was the first smartphone optimised for wireless e-mail (CRN, 2010). iPad is the latest addition (released 2010) which is a 'smartphone/laptop hybrid' (Paczkowski, 2010, Arrington, 2010). It has Wi-Fi, 3G and 'multi-touch' capabilities i.e. finger-tip sensitive LCD (Martin 2010, Eaton 2010, Topolsky 2010).

For the purposes of this chapter the focus will be on Learning Objects *only* (within mobile learning) using PDAs, Smartphones and iPhones as described above. The working definition of a learning object will be a digital learning package "that addresses one clearly identifiable topic or learning outcome and has the potential to be reused in different contexts" (Weller et al 2003).

In short, this chapter describes how educators can build a process that ensures effective learning takes place anytime and anywhere using one clearly identifiable topic or learning outcome.

BACKGROUND

Mobile learning has enjoyed rapid expansion over the last few years and advancement of new technologies has undoubtedly influenced this. The United Nations predicted that the world's population would reach 6.3 billion by the end of

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