

# Chapter 18

## E-Learning, Mobility, and Time: A Psychological Framework

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### ABSTRACT

*Psychological theory and research has contributed to the characterisation and resolution of numerous applied problems in educational and technological contexts. In this chapter, the authors consider psychological theory and research concerning time and discuss how it can inform the understanding of the temporal dimension of mobile learning. Mobile learning presents a number of specific psychological challenges to learners (Terras & Ramsay, 2012), and in this chapter, the authors explore those psychological influences that are time-based. Specifically, they highlight the importance of considering the psychological dimension of time (i.e. how it is perceived and experienced) and illustrate how the subjective experience of time influences the mobile learning experience. The authors identify eight important psychological factors that educational developers and technologists alike should seek to manage in the quest for successful mobile learning. In doing so, they characterise the psychological infrastructure that is required to support the temporal aspects of mobile learning. In particular, the authors highlight the importance of time perception and time management skills as learners need to monitor and allocate their time appropriately across the learning task. Mobile learners also require good meta-cognitive awareness, and they require a high degree of meta-cognitive skills in order to effectively monitor and control their environment and thereby their learning. The discussion highlights the psychological challenges that learners, education providers, and software developers need to overcome in order to address the temporal demands of elearning and maximise the potential of mobile learning.*

### INTRODUCTION

The potential of technology to transform learning has long been recognised. However, the increasing availability, sophistication and connectivity of handheld mobile devices may translate this

potential in reality: mobile technology empowers individuals by allowing them to take control of their own learning thereby transforming the nature and format of education by transcending the traditional boundaries of space and time.

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Considerable insights can be gained by viewing the educational applications of technology in higher education through a psychological lens (Terras, Ramsay & Boyle, 2011). Of particular importance are the psychological challenges associated with mobile learning environments (Terras & Ramsay, 2012). The five cognitive challenges identified by Terras & Ramsay (2012) reflect specific characteristics of cognitive functioning that are particularly vulnerable to disruption caused by the changing spatial-temporal demands of learning while mobile. Their framework reflects important features of a learner's cognitive architecture: memory is context dependent; cognitive resources are finite; cognition is distributed and learning is situated; meta-cognitive ability is important i.e. how learners monitor, control and process information is essential and individual differences in skills and preferences matter. In short, learners must possess the appropriate psychological infrastructure if they are to become effective e-learners.

Mobile learning does not only offer the possibility of anywhere access, it also offers the possibility of *anytime* access. The 24/7, anywhere, nature of mobile access epitomises the educational potential of mobile learning. However, if this potential is to be realised, a full understanding of how users perceive and behave in a learning environment that is not bound by traditional temporal and locational constraints is required (Terras & Ramsay, 2012). In this chapter we explore how the previously identified cognitive challenges regarding contexts of access (i.e. location) also apply in the temporal domain. Time is already implicit in our characterisation of the cognitive challenges associated with mobile learning as *many changes in context occur over time*. Research exploring the temporal aspects of e-learning is currently emerging, and psychological theory and research can offer important insights. For example, it is essential to differentiate between physical time

(objective) and psychological (subjective) time. It is also important to recognise that both retrospective and prospective aspects of time need careful management in e-learning. The distributed nature of learning and cognition should also be appreciated i.e. learning exists across people, artefacts and time, and this has design implications for the presentation and use of information (Terras & Ramsay, in press). Therefore, in this chapter we present a detailed consideration of the temporal aspects of mobile learning within our existing psychological framework. Firstly, we define mobile learning and the temporal challenges it presents.

### **THE NATURE AND CHALLENGES OF MOBILE LEARNING**

In its widest sense, mobile learning can be conceptualised as the use of connected (wireless/cellular networked) handheld devices to augment learning and teaching (MoLeNET 2011). There are numerous more specific definitions of mobile learning, many of which focus on the devices themselves such as technological *platform* (Quinn, 2000) and those that view mobile learning as specific form of “e-learning that uses mobile *devices*” (Pinkwart, Hoppe, Milrad & Perez, (2003) in Idrus and Ismail (2010, p. 2767) (Traxler, 2007). However, it is interesting to note that the way mobile learning is conceptualised is evolving away from an emphasis on the mobility of the technology itself, towards greater recognition of the mobility of the learner (Wang et al., 2012). When viewed through a psychological lens, it is clear that attention must be focused on the individual mobile learning experience. Therefore our conceptualisation of mobile learning draws on the definition of Sharples et al (2009) which highlights the importance of learner mobility and their associated skills: “...how the mobility of learners augmented by personal and public technology can contribute to the process of

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