

Chapter 2.9

MobiGlam:

A Framework of Interoperability and Adaptivity for Mobile Learning

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ABSTRACT

This chapter discusses the principles underpinning the design and the development of a framework, MobiGlam, which supports ubiquitous and scalable access to learning activities. The framework allows full end to end interconnectivity among open source virtual learning environments (VLEs) and Java-enabled mobile devices. Through this framework, interoperability and adaptivity techniques are combined to address the technical, pedagogical, and institutional challenges of mobile learning. The discussed framework achieved a level of flexibility and simplicity that resulted in a wide acceptance of the framework institutionally, allowing its use in various real world settings.

INTRODUCTION

Mobile learning brings together various evolving research areas with on-going challenges; ranging from the limitations and poor usability issues facing mobile technologies to the social and the pedagogical aspects of introducing a new technology for learning. Such challenges

are viewed as major concerns for mainstreaming mobile learning (Doering, 2007; Keegan, 2005; Stead, 2005); yet, collectively, they are not well investigated by current research (Seong, 2006). Consequently and despite the significant amount of literature in mobile learning, it is not yet being used as a truly ubiquitous technology. Meanwhile, the success of mobile learning is closely related to the degree of its ubiquity. A similar statement

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was made in the conclusion of a comprehensive literature review in mobile learning:

In the future, the success of learning and teaching with mobile technologies will be measured by how seamlessly it weaves itself into our daily lives, with the greatest success paradoxically occurring at the point where we don't recognise it as learning at all. (Naismith et al., 2004)

Based on this, there is a need for a solution that will support flexible and large scale use of mobile learning. Mobile learning has shown several empirical successes in different settings and modes: work based, distance based, independent, classroom based learning, or field work (Chen et al., 2005; Goh & Hooper, 2007; Kramer, 2005; Naismith et al., 2005; Rogers et al., 2004; Wentzel et al., 2005). However, as yet, incorporating mobile access in an institutional infrastructure is not a practical or a seamless process. As such, the importance of providing a flexible architectural solution for accessing learning material through mobile technologies is identified. The term flexibility in this context implies (a) applicability in different learning settings without influencing the pedagogical soundness or being influenced by institutional issues (e.g. security policies, extra staff time and extra costs) and (b) readiness to accommodate different adaptivity techniques for enhancing the overall user experience. Interoperability will create opportunities for making use of existing expertise in e-learning and the opportunity to merge with established infrastructures. Furthermore, adaptivity techniques can support the implementation of automated intelligent behaviours according to the changing elements of a user's context. In this chapter, the MobiGlam framework through which these two concepts are pulled together is described.

In order to highlight the significance of the discussed solution in the area of mobile learning, the chapter starts by a discussion in which the challenge for mobile learning is formalised

as the problem of enhancing mobile usability in light of the requirements for pedagogical usability and institutional deployment. Then, several guidelines for designing a mobile learning solution are discussed.

USABILITY REQUIREMENTS FOR MOBILE LEARNING

The success of a mobile learning application significantly relies on the human and the organisational factors in adopting the continuously evolving wireless technologies (Kukulska-Hulme, 2007; Wagner, 2005). Such statement suggests the need to focus on best practices in usability. It is a challenging task to define the usability requirements for mobile learning due to its multidisciplinary nature. Besides the issues associated with using wireless technologies, the early attempts in the field uncovered pedagogical, institutional, social and economical challenges (Economides, 2007). The following discussion starts with the elements of a positive mobile user experience, and then involves the elements from the user's educational context.

In the Mobile Context

A recent review of literature in mobile usability proposes that the essence of a positive mobile user experience lies in the simplicity by which a user can complete a particular goal (Coursaris & Kim, 2006). Mobile usability is obviously heavily context dependent. Whether the context relates to the handset, the connection, the application or the user, different related elements could interfere with the simplicity by which a user can accomplish a certain goal. It is strongly believed that whether it is for leisure or work, mobile users usually have immediate goals when using mobile devices (Weiss, 2002). Therefore, it is important to give mobile users exactly what they need and allow them to finish their goals

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