Chapter 16
Using Technology to Support Quality Learning for School Activities Involving Field Studies

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ABSTRACT
The term mobile learning provides an image of active learning, of moving out into the world beyond the confines of the desk, beyond the classroom, beyond the school. The affordances of mobile, networked digital computers can provide learners with seamless access to and between information systems including data capture facilities and global positioning systems in real world settings. Mobile learning has come to represent a fruitful partnership between innovation in pedagogy and innovation in information and communication technologies. This chapter explores this nexus as it appears in emerging practices of a range of classroom teachers who are working to combine their aspirations for high quality student learning with the affordances of mobile technologies.

INTRODUCTION
The increasing use of mobile technologies to support global communities has impacted on all sectors of education and has resulted in changes in the conceptualisation of mobile learning in schools and the discipline of science in particular. Earlier definitions of mobile learning focussed upon the devices themselves and on strong links to e-learning (Traxler, 2007). However recent considerations of the scope of work identified as mobile learning have suggested that a single definition of mobile learning is not adequate (Sharples, 2007; Kukulska-Hulme

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& Traxler, 2007; Naismith, Lonsdale, Vavoula, & Sharples, 2004). Indeed the wide range of applications of mobile technologies evident in the literature indicates that mobile learning may be more appropriately conceptualised by a cluster of dimensions or common factors including the learning environment, curriculum, tools and community links (Winters, 2007; Laouris & Eteokleous, 2005). Rather than defining mobile learning these dimensions or factors represent areas to be considered when developing learning activities that require the use of mobile technologies.

Mobile learning implies the concept of the mobility of the learner so that there is no constraint to the data or the real world contexts in which it is collected. Reflections by educators and researchers working in this area emphasise the “broader concept of learning taking place in the mobile age, rather than the use of the narrower term ‘mobile learning’” (Taylor, 2007, p. 26). “What needs to move with the learner is not the device, but his/her whole learning environment.” (Laouris & Eteokleous, 2005, p. 7). Hence the pedagogical options that are supported by mobile technology become a critical focus for consideration (Beetham & Sharpe, 2007; Luckin, Brewster, Pearce, du Boulay, & Siddons-Corby, 2005). These options can be combined into a framework that comprises firstly a theoretical stance on the nature of knowledge and on how people learn then secondly a pedagogical approach informed by this stance.

This chapter contains an account of a project that focused on supporting school teachers in their use of mobile technologies to enhance learning in the field. This two-year project was funded by an Australian government initiative concerned with innovation in science, technology and mathematics education in schools. The project team included specialists in curriculum design, ICT education, outdoor education, software design and system analysis. Five publically funded schools from Sydney’s southern and south-western suburbs responded to an invitation from the University of Sydney to join the project. These schools comprised two high schools and three primary schools with student populations reflecting the culturally diverse, urban population of Sydney. The project team focused on providing a group of 12-15 teachers from these project schools with the resources and support they required to design, conduct and evaluate a high quality learning experience for their classes of students incorporating the use of tablet PCs and digital cameras.

The first of four sections in this chapter discusses the pedagogical framework constructed by the participants in the project and provides an insight into the theoretical background of the project’s educational approach. The second section considers requirements of mobile technologies viewed from the perspectives of school students, their teachers and researchers. The third section provides closer detail of the work of two of the project schools – a high school and a primary school. The final section discusses issues arising from the implementation of the project and considers future directions in this work.

Creating a Pedagogical Framework for Mobile Learning

Over several years, there has been an increasing focus upon the nature of high quality learning and the theoretical ideas emerging from this activity formed the basis of a common approach to pedagogy constructed and adopted by the participants of this project focusing on the design of school field work activities. These activities were to be supported and enhanced by the use of mobile personal computers (in particular tablet PCs) and associated technologies that support learning in contexts that are no longer bounded by wires and walls.

The theoretical orientation of the project is grounded in social constructivist perspectives (von Glasersfeld, 1995; Vygotsky, 1978) which support group processes of collaboration and consultation.