Chapter 16
Designing for Active Learning: Putting Learning into Context with Mobile Devices

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ABSTRACT
This chapter will focus on the design, implementation, and evaluation of a recent location based, context aware system for urban education students, trainee teachers, and language learning students. We first describe the detailed design of a case iteration centered on urban education and then move on to briefly describe how the design was iteratively adapted using evolutionary prototyping for language learning. Evaluation results are presented which detail the range of learning outcomes achieved from the point of view of the students. We then discuss future work that incorporates social media and augmented reality. The chapter concludes by discussing the active learning that our design appears to encourage. A major conclusion is that there is much to commend the Zone of Proximal Development context sensitive design as a catalyst for active learning.

DOI: 10.4018/978-1-61520-080-4.ch016
INTRODUCTION

In this chapter we will focus on the design, implementation and evaluation of recent location based, context aware systems for urban education students, trainee teachers and language learning students which is part of the CONTSENS project (http://www.ericsson.com/ericsson/corpinfo/programs/using_wireless_technologies_for_context_sensitive_education_and_training/). One aim of Design Research or Design-Based research (Design-Based Research Collective, 2002) is to identify and model technology-mediated, social learning and behaviours in order to design tools that support and promote the practices under investigation. For example, Cook (2002) has proposed a Design Research approach which revolves around evolutionary prototyping. What this means in simple terms is that we need to consider repeated cycles of: empirical work, theory/model development and tool/artifact refinement. These particular aspects are typically conceived as overlapping activities and phases (rather than as sequenced ‘steps’); it is thus an evolutionary Design Research approach to analyzing the role of theory/models, empirical work and technology in learning.

The aim of this project was to provide a catalyst for active learning in context. Specifically, the goal was to provide a contextualised, social, cultural and historical account of urban education, focusing on systems and beliefs and reflecting on continuity and change in urban settings so that activities contribute to the construction of the surrounding discourses. In terms of our Design Research approach, which revolves around evolutionary prototyping, there is evidence to support our claim that there is a generality to our design and active learning. Specifically, the Urban Tour (described below) has been repurposed for language learning and tested successfully with a new set of learners.

This chapter is structured as follows. We first provide an account of the design based research focus which motivates our work alongside the theoretical and conceptual perspectives. Second, we describe the detailed design of a case Iteration centered on urban education which was also iteratively adapted using evolutionary prototyping for language learning. Evaluation results for both iterations of the case study are presented. We then discuss future work and conclude by discussing the active learning that our design appears to encourage and relate these preliminary findings back to our conceptual orientation.

BACKGROUND

Design Based Research: Evolutionary Prototyping

At the core of this research is the design of mixed reality scenarios to explore the relationship between contextual factors and knowledge formation. “The skill of writing is to provide a context in which other people can think” (Schlossberg, 1977). The dynamic creation of context using print has now radically evolved under the influence of mediums such as augmented and mixed reality. These new mediums provide information which is “inherently about who you are, where you are, what you are doing, and what is around you”. (Shute, 2009) Context is central and being able to adapt and manipulate the elements of the context has never been easier and more accessible.

An example of this is how the physical use of space can be altered to reflect the subject content under review. For instance the context of one subject (language learning) can be transferred to another (urban education) through a rapid reconfiguration in the attachment of required information within the augmented space. However whilst learning in these new forms of augmented spaces represents a paradigm shift for education it also provides a new set of design challenges for the educational technologist. All aspects of the user’s context (physical, technical and social) should take