Chapter 16

A Mixed Reality Approach to Hybrid Learning in Mixed Culture Environments

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ABSTRACT

This chapter describes a conceptual framework that aims to augment existing eLearning systems with a 3D virtual classroom environment to provide geographically dispersed online learners with a sense of being together and part of a natural class. The virtual classroom model the authors present is based on a combination a ‘massively multi-user’ games technology system from Sun Microsystems Research Labs, a distance learning platform based at Shanghai Jiaotong University and a mixed reality environment developed at Essex University. Learning is, to some extent, a social activity as it involves relationships between people (between students, between students and teachers). Networked technology has a global reach bringing not just new opportunities but also complex multi-cultural and pedagogical issues. Thus, in this chapter the authors discuss both the technology and the socio-educational aspects of designing online Mixed Reality Hybrid Learning systems.

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INTRODUCTION

The Internet has opened the possibility for “anyone, anytime, anywhere” communication, accelerating the pace of globalisation, as network services become affordable international commodities consumed by an increasingly multicultural market. For example, banking services are available via the Internet 24/7 to account holders as they roam the globe.

Education has the potential to be such a global service. Ron Perkinson, the Principal Education Specialist for the International Finance Corporation (part of the World Bank Group) estimated that the value of the global education market in 2005 was worth a little over US$2.5 trillion with the private higher education market being valued at over $400 billion worldwide (about 17% of the overall education market). In 2005 the international student population worldwide was 115 million, growing at a rate of approximately 15% per annum, with about half of this increase being due to China (Perkinson, 2006). Education is becoming increasingly important in modern knowledge-based economies (Clarke, Callaghan, 2007) where learning is rapidly becoming a life long process, as borne out by figures such as, 40% of undergraduates in US and 65% of students enrolled in Singapore’s private higher education establishments are over 25. Such facts speak for themselves and form a driver to find effective new ways of meeting the growing demand for learning services.

In a parallel trend, online games are growing massively in popularity. According to a survey by comScore, a market analyst company, there are 217 million online gamers worldwide (double the number of students), growing at a rate of 17% per annum. The market analysis firm DFC Intelligence, has estimated that the worldwide online game market is worth around $4 billion now and will grow to $13 billion by 2012 with about 50% of the market being the Far East, 25% in the USA and 18% in Europe. Major markets such as South Korea, China, Japan and the US all gross over $100 million per annum. For example the Chinese online gaming market value in 2007 was some $1.2 billion (9.36 billion Yuan) with the number of online gamers in China estimated at around 59 million in 20082. Males continue to dominate the online gaming market although the gender gap is narrowing in countries such as Malaysia, Singapore and Korea where the female gaming population stands at 48 percent, 47 percent and 36.5 percent, respectively. The networked nature of the technology gives it a global, location-independent reach, creating massive commercial opportunities. For example a single game, World of Warcraft, from Blizzard Entertainment, grossed over $100 million in several different countries in its first year. We share the view that network education and Massively Multi-User Games (MMUG) technology share a common computational framework and that the massive investment in games technology could be synergistically exploited to provide cost effective forms of educational services to a diverse multicultural audience (Winston, Moore, Pearson, Hall, Shadbolt, Weston, 2008).

This chapter seeks to show how traditional eLearning systems can be augmented with games technology to provide an increased sense of realism for multi-cultural online learners (our aim is to provide as natural a feel to online lectures, as possible). We approach this by first describing our existing eLearning system based at Shanghai Jiao Tong University and secondly by describing our mixed-reality environment (Mirtle) based at Essex University. We then present our work on Socio-Educational aspects of learning, such as multi-cultural issues from San-Diego State University, before concluding with a discussion on how these approaches might be integrated into a single framework.