Chapter 4

Teacher–Created Augmented Reality Experiences: An International Perspective

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ABSTRACT

This paper describes the process and results of a project to incorporate Augmented Reality (AR) technologies and pedagogical approaches into a Virginian elementary school and a corresponding process to train a group of Australian teachers to develop AR experiences for their own educational settings. The process involved training a group of 5th grade teachers in Newport News Virginia and a corresponding group of k-12 teachers in Queensland, Australia on the design and production of narrative-based AR games in order to give them the skills to build their own AR games. This chapter focuses on describing the training process, the pedagogical approach, and an exploration of the practical issues that arose from these projects (e.g. policy and fiscal issues that dictated the choice of technology). The discussion of the results from this effort demonstrates the promise of the approach, and shows the potential for educational practices.

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INTRODUCTION

Augmented Reality (AR) can most concisely be described as the use of a technological medium (e.g. a smartphone) to overlay digital information onto the real world. Milgrim (1994) represents the distinction between AR and other “mixed realities” as a continuum with the “Real” environment on one end and fully “Virtual” environments at the other end. According to Milgrim’s work, AR can be described as somewhere in the middle of the continuum between the real and virtual worlds.

Augmented Reality in educational settings has been defined as “games played in the real world with the support of digital devices (PDAs, cellphones) that create a fictional layer on top of the real world context” (Squire & Jan, 2007, p. 6). Both the 2010 (K12 edition) and 2011 Horizon’s Reports identified Augmented Reality as a medium-term technology for learning (New Media Consortium, 2010 and 2011). For the most part, Augmented Reality Games (ARGs) have traditionally been conducted outdoors with the aid of GPS-enabled handheld computers (O’Shea, Mitchell, Johnson, & Dede, 2009). Efforts underway at the University of Wisconsin, Massachusetts Institute of Technology and Radford University have all focused on using smartphone technology to deliver educational ARGs in outdoor settings, while other settings have focused on developing ARGs that can be played inside through the use of non-cellphone technologies.

This chapter will describe two case studies that were conducted to explore the issues associated with training teachers to build ARGs for indoor use. The first of these case studies involved teachers in the Newport News Public School system and the second case involved teachers from the greater Brisbane, Australia area. These two cases provide context for not only whether teachers can be trained to build ARGs successfully, but also to explore any potential cultural differences that would impact the participants ability to do so.

BACKGROUND

Before going further, however, it is important to define what is meant by the term “game.” There are numerous definitions of the term. The Merriam-Webster dictionary defines games as activities “engaged in for diversion or amusement” (Merriam-Webster, Inc., 2011), however, the focus in this definition on “diversion or amusement” creates difficulties for educational institutions that see this sort of game as a distraction from educational efforts rather than a necessary component of them. Koster (2005), in his book A Theory of Fun for Game Design, dismissively quotes definitions by Roger Caillois (“activity which is…voluntary…uncertain, unproductive, governed by rules, make believe”), Johan Huizinga (“free activity…outside
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