Chapter 65
Teacher Training in 3D Virtual Worlds: Understanding Immersive Learning for Teaching Practices

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ABSTRACT

This chapter explores the process of preparing BC teachers in the use of 3D virtual world technologies to design personalized learning and flexible learning environments. It aims to prepare teachers to effectively use 3D virtual worlds as a pedagogical and professional tool to achieve greater educational outcomes. Numerous studies have explored technology and teacher education. But few of them have examined preparing teachers for challenging technologies such as 3D virtual worlds. This chapter provides a practical framework related to technology and teacher education. Looking across the process, we discern teachers' external and internal barriers that may influence teachers' willingness of the use of 3D virtual worlds in education. We argue that both teachers' external barriers and internal barriers are critical to successful technology integration.

INTRODUCTION

The Ministry of Education (MOE) in British Columbia (BC) in Canada is in the process of transforming "its education system to one that better engages students in their own learning and fosters the skills and competencies students will need to succeed" (2015, p.1). "One focus for this transformation is a curriculum that enables and supports increasingly personalized learning, through quality teaching and learning, flexibility and choice, and high standards" (2015, p.1). These MOE changes to curriculum expect teachers to design "personalized learning opportunities that meet the diverse needs of all students" and "flexible learning environments – learning can take place anywhere, not just in classrooms" (2015, p.2). As a result, teachers are required to be tasked with ICT (information, communication and technology) abilities to support a "concept-based competency-driven approach to learning" (2015, p.3).

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This chapter explores the process of preparing BC teachers in the use of 3D virtual world technologies to design personalized learning and flexible learning environments. It aims to prepare teachers to effectively use 3D virtual worlds as a pedagogical and professional tool to achieve greater educational outcomes. Numerous studies have explored technology and teacher education (Kevin & Natalie, 2014; Zhao & Tella, 2002). But few of them have examined preparing teachers for challenging technologies such as 3D virtual worlds. Faculties of education realize that teachers need more than a general education. They need specialized knowledge, technological pedagogical content knowledge (TPACK) (Mishra & Koehler, 2009). This chapter provides a practical framework related to technology and teacher education. Looking across the process, we discern teachers' external and internal barriers that may influence teachers' willingness of the use of 3D virtual worlds in education. We argue that both teachers' external barriers and internal barriers are critical to successful technology integration.

BACKGROUND

Among ICTs, 3D virtual worlds have been widely used in supporting flexible personalized learning (Compton, Davis, & Correia, 2010; Edirisingha, Nie, Pluciennik, & Young, 2009; Good, Howland, & Thackray, 2008; Omale, Hung, Luetkehans, & J, 2009). 3D virtual worlds distinguish themselves from other types of computer applications by replicating a hypothetical real-life simulation in a graphically rich and dynamic environment (Dalgarno & Lee, 2010; McLellan, 2004; Mennecke, Hassall, & Triplett, 2008; Mikropoulos & Strouboulis, 2004).

Numerous studies explored the beneficial aspects of 3D virtual worlds (Bers, 2001; Brey, 2009; Dalgarno & Lee, 2010) and the effective use of 3D virtual worlds in teaching (Guasch, Alvarez, & Espasa, 2010; Natalie, Kevin, & Kevin, 2014; Storey & Wolf, 2010). However, teaching in these environments has not become mainstream and the numbers of educators using this environment for teaching is in fact decreasing (Gregory et al., 2015). Gregory's research group (2015) has identified a number of issues to overcome before virtual worlds become a mainstream teaching tool, including technological issues, potential student difficulties, institutional issues and personal perceptions. A number of problems in Dalgarno's study have been analyzed in relation to integrating virtual worlds into teaching and learning, such as lack of technology support, funding and time, usability and familiarity, equity and ethics, inherent limitations of virtual worlds, acceptance of virtual worlds, and management and planning (Dalgarno, Gregory, Carlson, Lee, & Tynan, 2013).

The European teacher training program, MUVEnation, is designed to encourage teachers to develop new pedagogical methods to integrate multi-user environments into the k-12 compulsory school system. It is one of the few initiatives fostering teachers' professional judgement in integrating massively multi-user virtual environments into their teaching practice. Research such as MUVEnation on pre-service / in-service teacher training in regard to using 3D virtual world technology, is limited (Kennedy-Clark, 2011; Nussli & Oh, 2014). Hence, this chapter sheds its light on teacher education and 3D virtual world technologies, aiming at understanding the kinds of knowledge needed by teachers for effective pedagogical practices in 3D virtual worlds.

To summarize: successfully teaching in 3D virtual worlds requires not only removing external barriers such as technological support, institutional issues, and funding and time, but also teachers' internal barriers including usability and familiarity, equity and ethics as well as pedagogical affordances involved. The process of preparing teachers to use 3D virtual worlds becomes more complex than expected.