Chapter 6
Integrating Virtual Spaces: Connecting Affordances of 3D Virtual Learning Environments to Design for Twenty-First Century Learning

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ABSTRACT

This chapter explores perspectives from general learning theories in relation to affordances of 3D virtual learning environments (3DVLEs) in order to substantiate a theoretically informed pedagogical design process. Following this review, the authors describe 3DVLE space and task design used as part of an English for Academic Purpose (EAP) course at a Canadian university. The design process is then contextualized according to a Phillips, McNaught, and Kennedy's (2010, 2012) learning framework called Learning Environment, Learning Processes, and Learning Outcomes (LEPO). The authors share sample tasks and screen shots of the 3DVLE, as well as teacher and designer recommendations for future designs. In conclusion, the authors stress the importance of drawing on multiple learning theories to illuminate the affordances of the space. Further, they call for empirical research that makes use of telemetric data in the assessment of learner interaction in relation to achieving learning outcomes and predicting learner success.

INTRODUCTION

The 21st century student is evolving to include both digital natives and lifelong and global learners. Academic content is not limited to knowledge acquisition, now extending to include skills and competency development. Meanwhile, classrooms are no longer confined to four walls as a result of new online learning environments. Consequently, teaching is not simply the synchronous transmission of information; rather, it includes the facilitation of learning opportunities in multiple learning environments, some

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unrestricted by time and place (Bransford, Brown, & Cocking, 2000; Haythornthwaite & Andrews, 2011; Illeris, 2003; Prensky, 2006). The delivery of post-secondary education has shifted to include a myriad of online spaces, such as multi-user 3-dimensional (3D) virtual learning environments (3DVLEs) in which users communicate in real-time in an Internet-hosted virtual environment. An understanding of how the affordances of 3DVLEs contribute to general learning may help educators develop more meaningful activities to be carried out in these learning spaces. Reflecting on the teaching and learning experiences in terms of how learners interact with in these online spaces has the potential to positively influence teaching practice and learning outcomes. Such knowledge could contribute to students' overall success in achieving 21st century learning outcomes, including mastery of subject content, and 21st century skills, including critical thinking, communication, and problem solving (Dede, 2010).

This chapter is motivated by the authors' experiences using 3DVLEs and will address the following two questions: (1) what are the pedagogical perspectives that inform instruction in 3DVLEs based on the affordances of the space? And, more specifically, (2) how might 3DVLEs be used to enhance 21st century skills in English for Academic Purpose (EAP) classrooms? To address these questions, the authors situate the key affordances of 3DVLEs outlined by Dalgarno and Lee (2010) in relation to general and specific learning theories. To accomplish this, they provide a broad review of traditional and contemporary learning theories in order to understand which theoretical approach (or combination of approaches) best supports learning in 3DVLEs based on the affordances of the space. To contextualize the learning process in relation to said affordances and activity design, the authors introduce a general learning framework proposed by Phillips, McNaught, and Kennedy (2010, 2012) called *Learning Environment, Learning Processes and Learning Outcomes* (LEPO). The authors then provide definitional context for a 3DVLE uniquely designed for an EAP course at a Canadian university (i.e., the *Learning Environment*). Next, they situate and describe a series of tasks (i.e., *Learning Processes*) specifically designed for and carried out in this context. The tasks could be replicated in most undergraduate university level courses, as the focus is on practicing research skills and facilitating the achievement of 21st century skills development through learning experiences (i.e., *Learning Outcomes*). The authors selected this framework as it blends characteristics from multiple learning theories. The framework also reflects the importance of environment and affordances of space reviewed in this chapter.

The chapter calls for ongoing research about 3DVLEs in order to substantiate teaching practice and space design in well-grounded theory. Specifically, it recommends empirical studies that measure levels of engagement in relation to achievement outcomes through the use of telemetrics that focus on frequency of interaction and communication in space. Overall, the chapter aims to contribute to a better understanding of how learning theories help to guide space and task design for 3DVLEs to best promote unique opportunities for learning through interaction and experience in and with the space in order to achieve 21st century learning outcomes.

BACKGROUND

A recurrent theme in academic literature on emerging pedagogies is a call for a modified or new learning theory to reflect learning in the many new online teaching spaces (Bransford et al., 2000; Dewey, 1938; Harasim, 2012; Haythornthwaite & Andrews, 2011; Illeris, 2003; Loke, 2015; Phillips et al., 2012; Savin-Baden, 2008; Savin-Baden, Gourlay, Tombs, Steils, Tombs, & Mawer, 2010). Historically well-known learning theories, while critical in accounting for how people learn generally, are problematic

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