

Chapter 57

Case Analysis: Advancing Virtual Learning Environments Through Evaluative Processes

Annette Greer

East Carolina University, USA

Susan Martin Meggs

East Carolina University, USA

Sharon Kibbe

East Carolina University, USA

ABSTRACT

This chapter describes an ongoing evaluation of Second Life (SL) virtual reality as a pedagogical tool in theory anchored undergraduate education. SL has been found to advance learning, collaboration, engagement, and critical thinking among students. This chapter presents a process for evaluating, documenting and analyzing the development and implementation of virtual learning environments at institutions of higher education using case examples to establish output measures. Important to successful incorporation of SL in undergraduate instruction is ensuring that the training students receive in SL align with the assignments they are expected to complete. Alignment of SL activities and the course curriculum into a workable sequence is an essential aspect of a “plan, implement, evaluate, refine” rotation for creating learning strategies within the virtual environment that meets learner styles. Since incorporating SL, the authors have found evidence that virtual reality enhances student engagement and learning outcomes are comparable to improved to those from a traditional classroom.

ORGANIZATIONAL BACKGROUND

This chapter describes the application of virtual reality (VR) through Second Life (SL) as it was used for two case examples including: 1) a freshman foundations course in interior design, one of the first core courses in an Interior Design program and 2) Early College courses offered to high school students. Process evaluation can be used to determine outputs and impacts of SL as an educational environment, learning strategy, and means of formative and summative learning (Meggs, Kibbe, & Greer, 2014).

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Case Analysis

For the interior design case (Meggs et al., 2014), a qualitative, multi-method approach was adopted using constructivist theory as a guiding framework. Meggs et al. (2014) from Interior Design evaluated the process of creating a hybrid course integrating both SL and traditional teaching strategies, to instruct students ($n = 135$) over a period of five semesters (3 years). While traditional (bricks and mortar) classroom experience was the basis of the original educational model, incorporating a virtual learning environment allowed for interactive evaluation and thus development of critical thinking and marketing skills. It was hypothesized across all the case examples for virtual learning that applications in SL advance student learning; that skill sets are clearly demonstrated through use of the virtual environment; and that SL virtual reality is an effective adjunct in preparing students for their selected professions (Meggs et al., 2014).

Setting the Stage: Constructivist Theory and Learning in Virtual Reality

Constructivist theory allows for personalized learning to characteristic needs and learner styles (Kuriolovas, Kubilinskiene, & Dagiene, 2014). Further, use of constructivist theory in the design of virtual environments for learning provides opportunities for active experiential learning, allowing the learner to interconnect prior knowledge to innovate new knowledge, and provides venues for complex reasoning and problem solving (Huang, Rauch, & Liaw, 2010). VR offers features that enhance student abilities to personalize objects of learning, engagement with the content and context of learning creating a constructivist scaffold for continuation of learning into adulthood. In addition, VR enhances social constructivism, increasing independence but also interaction among learners, and in the cases presented in this chapter, supported collaborative learning (Huang, Rauch, & Liaw, 2010). Neely, Bowers, and Ragas (2009) surveyed instructors in fifteen nations who realized that SL held “constructivist potential” for active learning within educational environments (p.117). The use of VR helps to generate learning environments where learner-centered freedom of choice and creativity in design also permits the student to assume greater responsibility for learning interaction as well as co-construction of knowledge. Brill & Park (2008) suggest that college-age students’ thinking and behavioral patterns are altered by digital technologies so that visual images are read in “parallel and linear means” just as handwritten or printed books might have been read in previous generations (p.71). Digital learning is consistent with the use of VR as a learning environment, where visualization is important to construction of new knowledge, and is an essential skill for students preparing for the current work environments.

Second Life as a Learning Space

For those unfamiliar with Second Life (SL), it is a virtual Internet environment, developed by Linden Lab. Users create avatars or persona representations that digitally provide 3-dimensional form to individuals within virtual environments. There are specific computer requirements (2015) for both Windows (version 7 or 8.1) and MAC version (10.9) operation systems in order to access SL for functional interaction. SL requirements change on an ongoing basis as technology advances, however; it must include: broadband Internet connection, the latest Windows or MAC operation systems, a GHz processor rigorous to handle the vast image demand, minimum of 3 GB of computer memory, 1024 x 768 pixel or higher screen resolution, and a high level graphics card. The VR participant is offered creative opportunities to become an interactive part of a community with the ability to visit other VR lands built by residents of the environment. SL is sustained by “Linden dollars,” a lucrative economy by means of a commercial

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