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Teaching with Second Life[®]: Hemorrhage Management as an Example of a Process for Developing Simulations for Multiuser Virtual Environments

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KEYWORDS

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simulation;
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Abstract: This article describes the process used for developing a simulation in Second Life[®], a multiuser virtual environment. The aim of the project was to increase our awareness and skills in using Second Life as a teaching medium and to teach postpartum hemorrhage management to undergraduate nursing students. The experience gained in this project is the result of a collaborative teaching effort between two university nursing programs. This article presents a summary of the key lessons learned from our project. These lessons include the importance of planning and adequate preparation to ensure a focus on learning, the need for orientation to Second Life, and the benefits of working collaboratively.

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Introduction

Second Life[®] is an example of a virtual world where many people can interact within what is called a multiuser virtual environment (MUVE). A MUVE is described as an online, or virtual, environment that enables multiple simultaneous users to access virtual contexts where they can interact

with digital artifacts, represent themselves through *avatars*, communicate with other participants, and take part in shared experiences that can be similar to those in real world contexts (Dieterle & Clarke, 2009).

Virtual worlds, such as Second Life, add a new dimension to Web-based education. A virtual world is a computer-based environment where individuals interact through an avatar (Skiba, 2007). Second Life, developed by Linden Labs[®], is a free, online, three-dimensional virtual world where users

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navigate and interact within the environment by using their avatar (secondlife.com). Avatars can interact with objects and with each other through action, voice, and text chat.

This article draws on the experience gained from a collaborative teaching effort between two nursing programs, one at the University of Auckland, New Zealand, and the other at Boise State University, Idaho, United States. The project team of five people consisted of nurse lecturers and others with technical expertise who together developed and ran a series of small pilots of a simulation for teaching the management of postpartum hemorrhage within Second Life.

Key Points

- Second Life®, as an example of a multiuser virtual environment, can provide an authentic learning environment for clinically based simulations.
- A planned approach helps ensure a learning focus.
- A team is highly recommended in order to provide educational and technical support.

Theoretical Framework

Second Life provides an Internet-based collaborative learning environment within which to provide a simulation. Constructivist learning theory can be supported in Second Life through planning and attention to the learning needs of students (Skiba, 2007). Simulations are considered complex, interactive, and social experiences (Dieckmann, Gaba, & Rall, 2007) and as such are based on notions of collaborative learning. The use of technology to mediate collaborative learning allows students and teachers in different locations to interact with each other. Vygotsky (1962), an educational psychologist, thought that higher level cognitive functions appeared first on the social plane and only later on the individual plane. This premise stresses the importance of social interaction in learning and recognizes the relationship between speech and action. Vygotsky (1978) also introduced the concept of a *zone of proximal development*, defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). The zone of proximal development is considered an attribute of collaborative learning. Jolliffe, Ritter, and Stevens (2001) contend that collaborative learning can lead to deep processing of information, development of shared understanding, and improved learning. These effects are enhanced when collaborative learning occurs with authentic tasks (Jonassen, 1994). Second Life allows a realistic environment to be designed and developed so that avatars can interact in lifelike ways.

Simulated scenarios are experiential learning opportunities in which students are encouraged to take active roles while instructors take on facilitator roles (Jeffries, 2007). Scenario design characteristics include learning objectives, a level of fidelity, a problem set, and a reflective thinking or debriefing opportunity (Jeffries, 2007). The debriefing session after participation in a scenario helps students to develop their critical reasoning and judgment skills and is a critical simulation element (Dreifuerst, 2009).

The way simulations support learning can be further explained in terms of Bloom’s seminal work describing three educational domains, namely, the cognitive, psychomotor, and affective domains (Bloom, 1956). Simulations serve learning needs in the cognitive domain related to knowledge acquisition and thinking processes, but in virtual worlds, simulations struggle to meet learning needs in the psychomotor domain, such as hands-on clinical skills. The use of MUVE simulations to support learning in the affective domain is perhaps the least understood of all, yet it provides an intriguing area for research. Authenticity is a prerequisite for genuine affective learning in a simulated environment (Lombardi, 2007). In a real-world simulation, authenticity is enhanced by realism (Dieckmann et al., 2007). High-fidelity manikins, trained role players, and genuine equipment aid in the immersion of students in the scenario. In a MUVE-based simulation, the user interface operated by students is not only a barrier to immersion in the scenario but can interrupt the higher level learning that is the goal of simulation.

Context

Our experience is drawn from a small international project using Second Life for teaching undergraduate nursing students from two schools of nursing. This project provided us with an opportunity to collaborate and test innovative technology. The project team consisted of five people: three nurse lecturers, who were most active in the teaching aspects, and two very technically able colleagues who developed the Second Life environment.

The students were undergraduate nurses who were taking the maternal–child health course. The selection of the topic for the simulation was based on identifying a health issue that was sufficiently similar, in terms of the language used, assessment expected, and normal management, between two quite different health care systems. Ethical approval for the project was obtained from both organizations’ ethical boards. Students were invited to participate in the Second Life simulation, and only small numbers were recruited. Therefore it is possible that students who volunteered were those more computer literate or more comfortable using Second Life.

As part of developing the scenario and then running the simulation within Second Life, several small pilot studies

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