Featured Article

Strategies to Incorporate Virtual Simulation in Nurse Education

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Abstract: Virtual simulation, using avatars through synchronous, multiplayer virtual worlds, is an engaging and meaningful way to teach high-level skills online in nurse education. The aim of this article was to present strategies for incorporation of virtual simulation in nurse to education and to provide an approach to get started. Virtual simulation may be used by educators to enhance lecture or web-based courses, replicate high-risk clinical experiences, act as clinical makeup, foster intradisciplinary and interdisciplinary education, and address practical challenges and barriers to contemporary nursing education.

Cite this article:

Advances in technology are creating innovative and promising approaches to delivering education with a movement toward online education. In 2013, the proportion of students in the United States taking at least one online course was at an all-time high of 32.0% (Allen & Seaman, 2013). With pressures to increase enrollment, schools of nursing struggle with physical space constraints to offer classes. Obtaining clinical sites has become increasingly challenging. Moving coursework and clinical experiences to web-based formats may be a viable way to approach these problems. The scope of online education ranges from asynchronous learning environments dependent on mostly reading and writing to highly interactive experiences using sophisticated platforms with communications in real time. The traditional impressions of online learning as solitary, self-driven experiences may no longer apply given synchronous modalities and virtual clinical environments.

Although Second Life® led to a "hype" in 2007, many educators ended up frustrated with the "clunky" environment, technical difficulties, and limitless access (Young, 2010). Educators argued that computer avatars lacked important elements of humanity such as facial expression, and the low levels of fidelity were unrealistic (Walsh, 2011). Since then, software engineers have made great strides to improve education-friendly virtual worlds with ArchieMD®, ClinicalCare®, CliniSpace®, OLIVE®, Open Cobalt®, OpenSimulator®, TINA®, Virtual Heroes®, and vSim®, for example (Stokowski, 2013). Virtual simulation in the context of this article involves using web-based, synchronous, multiplayer, 3D virtual worlds for training. The use of virtual simulation in nurse education is

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likely to increase and represents a complimentary addition to more well-known forms of simulation such as manikin-based and standardized patient simulations. The future of simulation will be multimodel and include virtual worlds (Moule, 2011). Nursing faculty express an interest in virtual simulation, yet barriers prevent its widespread implementation across nursing curricula. Virtual simulation has been used successfully to teach communication skills, leadership, triage skills, and the art of instruction in nursing (Foronda, Gattamorta & Lippincott 2013a; Foronda, Gattamorta, Snowden & Bauman, 2013b; Foronda, Salani & Budhathoki, 2014). The potential uses for virtual simulation remain unlimited and for the most part, untested.

> **Key Points**
> - Faculty express interest in virtual simulation but question how to use it.
> - Virtual simulation has limitless possibilities and allows us to overcome barriers in nurse education.
> - Virtual simulation should find a standard place in nurse education.

Background

Using games as a teaching strategy is supported by multiple educational theories based on the philosophy of constructivism. Kolb's (1984) theory of experiential learning represents a starting point for both traditional and contemporary theory that supports game-based learning in clinical education. From a broad perspective, game-based learning or learning that takes place in the context of a video game leveraging specifically created environments to promote authenticity and engagement. Game based learning drives experiences in ways not always possible in traditional clinical learning spaces (Bauman, 2007; Games & Bauman, 2011; Bauman, 2012). Experiential learning models are immersive. Students are immersed in learning environments with preconceived beliefs and judgments. As a result of these experiences, they reflect on their new observations and form abstract conceptualizations. Later, they actively experiment based on these observations and form new concrete experiences that will ultimately be challenged when this cyclical learning process begins anew.

Benner's (1984) theory of novice to expert discusses how the role of experience over time comes to inform the quality of nurses' experience. Virtual simulation allows students to develop experiences to build on before working with live patients. Schön (1983) discusses the role of thinking-in-action and the role of thinking-on-action. Simulation enhances the novice's contextual ability to think-in-action by developing a repertoire of past experiences from which they can draw on during new experiences. Virtual simulation provides a series of experiences for nursing students to be exposed to certain events and consider various treatment options. Over time, clinicians develop the ability to engage in a form of self-dialog as they work their way through various new or challenging encounters. This internal dialog guides clinicians' decision making.

More contemporary theories include Squire's (2006) designed experience and Games and Bauman's (2011) ecology of culturally competent design. These theories specifically address the game environments that support learning taking place in digital or virtual environments. For Squire (2006), the designed experience sees learning and even assessment as performance. The designed experience promotes specific tasks and learning interventions within game-based environments as embodied experiences. In a designed experience, learners engage in their environment and have the sensation of personally undergoing the experience at that moment (Ahn, 2011). This provides a different sort of experience that can occur in traditional unit-based clinical rotations where the learner is always identified as a student and will be limited by this identification.

In the ecology of culturally competent design, Games and Bauman (2011) stress the rigors and challenges of accurately situating culture within virtual learning spaces using a four-element model that emphasizes the importance of activities, contexts, narratives, and characters. Virtual environments being used for educational purposes must have something meaningful for students to accomplish. The context should be relevant to the students' goals and the objectives in the courses. Learners become engaged in the immersive environment through the role that their in-world character plays in an unfolding scenario. These virtual world experiences can be profoundly social and provide transformative facets of acculturation. Students must learn how to negotiate the person they are now with the role they are playing in the virtual world, which represents the cohort or peer group they hope to join, a representation of projective identity (Gee 2003). Realizing virtual simulation has multiple interpretations, in this article, the context of virtual simulation refers to the use of web-based, synchronous, multiplayer, 3D, high-fidelity virtual worlds to engage in life-like experiences for education and training in nursing. The aim of this article is to discuss strategies for incorporation of virtual simulation in nurse education as well as an approach to get started.

Ideas for Use of Virtual Simulation

Enhance Web-Based Instruction

To attend to the needs of students, administrators are increasingly migrating courses from face-to-face to either hybrid or web-based formats (Allen & Seaman, 2013). Many programs, including master's and doctoral level programs, are being offered entirely online. Most online courses use asynchronous technology including discussion boards, wikis, and blogs to promote student engagement. Students work