Simulating clinical experience: Exploring *Second Life* as a learning tool for nurse education

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Healthcare professionals have established that experience gained through simulation is a fundamental learning activity in developing competent nurses. An emerging technology that has, up to now, had little consideration as a clinical simulation platform is three-dimensional multi-user virtual environments. The purpose of this study was to explore *Second Life* as a clinical simulation platform, based on the attitudes and experiences of a sample of undergraduate nursing students. Teams of self-selected students were placed in separate locations and participated in a clinical simulation developed in *Second Life*. The simulation involved a series of problem-based scenarios which incorporated concepts of technical skills, patient interaction, team work, and situational awareness. Results from a set of investigative interviews provided evidence to support *Second Life* as a learning format for simulating clinical experience.

Keywords: *Second Life*, virtual worlds, clinical simulation, collaborative learning environment.

Introduction

An investigation into various fields of healthcare training literature revealed that although simulation and online learning are inherent in Australian Bachelor of Nursing Programs, little is understood about the potential benefits of simulating clinical experience in an online virtual world. The purpose of this study was to investigate *Second Life* as a clinical simulation platform in terms of student usability, identifying what technical and non-technical skills could be developed in a virtual simulation, and to investigate how students perceived a simulation developed in *Second Life* could assist nursing students in practicing and developing these skills. Virtual worlds, such as *Second Life*, can be described as online computer-based simulations of a real-world environment where the user is given the impression of being in another place through replications of real life objects. *Second Life* enables learners to interact with and manipulate information and representations of an environment and synchronously communicate with other people, via a digital representation known as an avatar. *Second Life* has the ability to create an artificial social structure where problem-based scenarios can be created, allowing students to actively co-construct mental models of technical and interpersonal skills through experiencing human interaction in problematic environments (Dickey, 2005). It has also been suggested that because *Second Life* is not location specific it could provide a setting for proactively engaging students in the construction of their own knowledge through online simulated role play activities (Haycock & Kemp, 2008).

Literature review

The value of simulating experience in healthcare education

Professional and personal clinical learning experience is an essential aspect for developing competent nurses (Benson, 2004). Traditionally, undergraduate nursing students have engaged in experiential learning activities by participating in clinical field placements. However, evidence suggests clinical field placements are not ideal for providing exclusive learning experiences (Heinrichs, Youngblood, Harter, & Dev, 2008). In the current ethical and professional climate, undergraduate nursing students' experience gained by clinical practice has been diminished for patient safety and ethical reasons (Lee, Del Castillo,

Del Castillo, Bowyer et al., 2007). To overcome this problem, healthcare educators have implemented simulated activities that can reproduce experience by another means. To advance the understanding of the outcomes of simulation in enhancing the learning process, the impact of integrating technology with constructivist methods in simulation training has been studied by many researchers over the last two decades. Evidence suggests that scenario-based simulations can assist nursing students to make the transition to actual patient care and clinical environments (Alinier, Harwood, Gordon, & Hunt, 2006). By integrating technical skills with human factors, team management, and situational awareness concepts into a simulation, participants concurrently learn and develop clinical skills and concepts related to patient safety, reducing the potential for errors in the work place (Alinier, 2007).

E-learning and V-learning in healthcare education

In the past decade computer-based technology has become an important element in teaching the necessary skills and knowledge to develop competent healthcare students (Carbonaro, King, & Taylor, 2008). Studies have established that computer-based simulations can assist in developing both technical and non-technical skills which can be effectively transferred into the real world (Engum, Jeffries, & Fisher, 2003; Mili, Barr, Harris, & Pittiglio, 2008). The internet has also had a profound effect on the teaching and learning practices in higher education nursing programs, with studies suggesting that students appreciate the flexibility and enjoyment of learning in an online environment (Kenny, 2002). However, leading healthcare researchers argue that traditional computer-based online learning has a limited range of training functions due to its unrealistic settings and inadequate ability for collaboration, focused reflection, articulation, and team guided practice to occur; all of which are instructional methods that have been shown to promote diagnostic reasoning and encourage learning (Murphy, 2005; Jeffries, 2006; Alinier, 2007). This notion suggests that further research is required to understand which emerging technologies can provide meaningful experience and enhance learning.

Virtual worlds provide healthcare educators with unique teaching and learning strategies that can assist in meeting the educational and lifestyle needs of today's healthcare students. Literature suggests that university students can learn and understand new concepts and material, make meaningful social interactions and develop team work skills in virtual worlds such as *Second Life* (Haycock, & Kemp, 2008; Ritzema, & Haris, 2008; Baker, Wentz, & Woods, 2009). The idea of using *Second Life* to simulate an environment or event in healthcare education is not new. There are examples of *Second Life* being used to simulate the effects of unhealthy eating, the sound types of different heart murmurs and health information libraries (Boulos, Hetherington & Wheeler, 2007). However, for a simulation in *Second Life* to be effective it needs to involve more than just the student practicing protocols and skills; it also requires a human dimension where non-technical skills such as teamwork, communication and leadership can be applied. *Second Life*'s unique virtual-learning environment allows educators and simulation developers to incorporate gaming principles supported by cognitive research into the learning activity; allowing game-like environments to be created where learning involves structure, collaboration between team members and some form of motivation, regardless of the participants' location. Using learning principles applied to educational games (Gee, 2003), *Second Life* has the potential to provide a broad range of skills and characteristics allowing students to practice material and co-construct knowledge in an online environment.

Methods

The unique characteristics of virtual worlds such as *Second Life* have been well documented, however little is known about the actual learning benefits it can provide to nursing students as a simulation platform. In order to understand the potential of *Second Life* as a clinical simulation platform and play a role in its development; a simulation consisting of six different clinical scenarios was developed in *Second Life*, based on the virtual collaborative simulation model (Rogers, 2008), to investigate what this technology may offer as a clinical simulation platform. The study compiled a series of investigative interviews to research the attitudes and experiences of a sample of sixteen nursing students enrolled in a Bachelor of Nursing Program, who were exposed to six simulated clinical scenarios created in *Second Life*. Students were placed into groups based only on their year level and exposed to the simulation in separate locations to replicate the intended purpose of the simulation. The focus of the methodological framework for the investigation consisted of a series of evaluative case studies. The reason for choosing a case study approach as a framework for this inquiry was not to provide a judgment about the validity of three dimensional worlds for healthcare education, but rather to provide a rich description and explanation towards a better understanding about the benefits and constraints of using *Second Life* as a simulation tool. The study was based upon research guided by the major research question: How do nursing students perceive virtual world simulations can assist them develop characteristics and skills essential to their

future roles as healthcare professionals? Since case studies rest on the assumption that the case being studied is typical of a certain instance (Yin, 2003), only generalisations were made which were applicable to similar cases.

Results

Simulating clinical experience in *Second Life*

One of the major themes that emerged from the interviews was the positive attitudes that students had towards *Second Life* after using the simulation. No participants had used the platform before and, surprisingly, very few had even heard of *Second Life* and therefore most students expressed feelings of anxiety and hesitation towards using the simulation initially. However, in most cases the students' indicated that after participating in the trial, they found themselves immersed in the simulation and enjoyed undertaking the problems as a team, even though they were isolated in the real world. The students indicated that they were able to collaborate with each other to identify problems and develop solutions; allowing the students to practice and develop technical and non-technical skills in the simulated environment. Some of the feedback regarding the simulation included:

> "I was not so confronting, but it puts you in that situation. You still wanted to solve that problem and fix that patient so you really got drawn into the whole situation."
> "I thought it was really realistic. Definitely realistic ... It wasn't complicated, and it was really just helping with knowledge, and helping learn the cases."
> "Working in a team [in *Second Life*] is great, and it's a great experience."
> "She [a team member] could give you her ideas and you could give her yours to come up with a solution"
> "It's another way to expand your knowledge"

The students perceived that the simulation in *Second Life* would be a useful learning experience and would increase their confidence, when confronted with problems in the real world; "Even things like knowing that there is three different oxygen tanks, being able to walk in [to a surgical theatre] and know which one is which builds confidence." The students also felt comfortable experimenting with the simulation, allowing them to practice techniques and understand cause and affect in an environment that could not inflict harm to a real patient; "I felt like I didn't know [what drug to use] but it was good to experiment … Being able to see what would happen with the drugs would help in the real world."

Usability

An important element of this study was to not only to investigate if the nursing students could use the simulation, but also, how they used *Second Life* to assist them participate in the simulation. Surprisingly, most of the students found the simulation relatively easy to use. Comments such as "Did not need past experience to use *Second Life*" and "I don't think it would be much of a problem for anyone and I'm pretty much technically illiterate, and I've done alright" indicated how the students could effectively use *Second Life* as a simulation and communication platform, illustrating their ability to involve themselves in online virtual learning activities within *Second Life*. All the students could identify and interact with the patient and apparatus. Some students found it difficult to determine a course of action, "I know I had to put oxygen on but I didn't know how to do it… it was trial and error", but the majority found communicating with each other simple, "I was not used to doing it [communicating in *Second Life*] but it wasn't too bad at all actually ... a bit better than I thought." In terms of the *Second Life* platform, the technical barrier was minimal. All students could effectively operate their avatar, and feedback such as "When we had the voice there was no need to type, the voice thing was really good and clear" and "If we were typing, we wouldn't naturally say what we were thinking… I just think it wouldn't have the same 'person to person' interaction", indicated how they preferred to use voice communication, rather than text. As a whole the students perceived *Second Life* as a simulation platform they could and, more importantly, would use if given the opportunity in the future; "You could use it out of class, it's something you could access quite often, something you could access readily … it can give you that extra out of lab time to really look at real life situations and how you can handle them."

Discussion

Overall, the clinical simulations within *Second Life* are an ideal setting for engaging teams of undergraduate nursing students in developing a broad range of technical and non-technical skills through experiencing realistic problems in a in a safe, nonthreatening environment,. The results from this study

support *Second Life* as a learning format for simulating clinical experience, with the majority of the students indicating they had a positive and realistic experiences using *Second Life* as a simulation and communication platform. The students agreed that the simulation in *Second Life* assisted them develop technical and non-technical skills and in most cases the students were not deterred by the technology, expressing that they could operate and would use *Second Life* for simulating clinical scenarios in their own time. The Critical Life simulation enabled the students to collaborate and solve problem-based scenarios in a team, allowing students to actively co-construct technical and interpersonal skills through experiencing human interaction in a virtual, problematic environment. Further research is currently being undertaken to investigate the attitudes of undergraduate nursing students towards technology supported learning, communication and entertainment to identify and further explain any links between the students' personal online habits and experience with *Second Life*.

References

Alinier, G. (2007). A typology of educationally focused medical simulation tools. *Medical Teacher*, 29(8), 243-250.

Alinier, G., Harwood, C., Gordon, R., & Hunt, B. (2006). Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. *Journal of Advanced Nursing*, 54(3), 359- 369.

Benson, P. (2004). Online learning: A means to enhance professional development. *Critical Care Nurse*, 24(1), 60-63.

Boulos, M.N., Hetherington, L., & Wheeler, S. (2007). *Second Life*: An overview of the potential of 3-D virtual worlds in medical and health education. *Health Information and Libraries Journal*, 24(4), 233-245.

Carbonaro, M., King, S., Taylor, E., Satzinger, F., Snart, F., & Drummond, J. (2008). Integration of e-learning technologies in an interprofessional health science course. *Medical Teacher*, 30(1), 25.

Dickey, M. D. (2005). Three dimensional virtual worlds and distance learning: Two case studies of active worlds as a medium for distance education. *British Journal of Educational Technology*, 36(3), 439-541.

Engum, S., Jeffries, P., & Fisher, L. (2003). Intravenous catheter training system: Computer-based education versus traditional learning methods. *The American Journal of Surgery*, 186(1), 67-74.

Fanning, R., & Gaba, D. (2008). Simulation-based learning as an educational tool. In *Anaesthesia Informatics* (pp. 459-579). New York: Springer.

Gee, J. P., 2003. *What video games have to teach us about learning and literacy*. New York: Palgrave/Macmillan.

Haycock, K., Kemp, J. W. (2008). Immersive learning environments in parallel universes: Learning through *Second Life*. School libraries world wide. Retrieved March 10, 2009 from: http://asselindoiron.pbwiki.com/SLW+14:2+Kemp +and+Haycock

Heinrichs, W. L., Youngblood, P., Harter, M., & Dev, P. (2008). Simulation for team training and assessment: Case studies of online training with virtual worlds. *World Journal of Surgery*, 32(2).

Jeffries, P. (2006). Designing simulations for nursing education. *Annual Review of Nursing Education*, 4(1), 161-177.

Kenny, A. (2002). Online learning: Enhancing nurse education? *Journal of Advanced Nursing*, 38(2), 127.

Lee, C. H., Liu, A., Del Castillo, S., Bowyer, M., Alverson, D., Muniz, G., & Caudell, T. P. (2007). Towards an immersive virtual environment for medical team training. *Studies in Health Technology and Informatics*, 125,274-9. Retrieved May 7, 2009 from http://simcen.org/pdf/lee_mmvr07% 20ver%202.pdf

Mili, F., Barr, J., Harris, M., Pittiglio, L. (2008). Nursing training: 3D game with learning objectives. In *First International Conference on Advances in Computer-Human Interaction* (pp. 236-242). Sainte Luce: IEEE Computer Society.

Murphy, J.I. (2005). How to learn, not what to learn: Three strategies that foster life long learning in clinical settings. *Annual Review of Nursing Education*, 3(1), 37-55.

Rogers, L. (2008). Virtual worlds: a new window to healthcare education. In *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*. http://www.ascilite.org.au/conferences/melbourne08/procs/rogers-poster.pdf

Yin, R. K. (2003). Case study research, design and methods (3rd ed). Newbury Park: Sage Publications.

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