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Development of a Mental Health Nursing Simulation: Challenges and Solutions

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Abstract

Nursing education programs are proliferating rapidly in the United States in an effort to meet demand for nurse professionals. Multiple challenges arise from this rapid expansion. One challenge is finding sufficient clinical sites to accommodate students. Increased competition for scarce resources requires creativity in clinical contracting. This paper examines the challenges associated with providing virtual clinical--experiences and environments rich in diversity and exposure, yet safe for experimentation and learning of mental health nursing students.

Many nursing educators face challenges finding practice settings that support and reinforce theoretical content. Our program is a baccalaureate-nursing program, in which over 500 undergraduates are enrolled. Finding appropriate placements for this volume of students can be challenging. In our BSN mental health-nursing course, for example, one group of students was assigned to a chemical dependency residential treatment program. These students gained the advantage of learning in depth about addictions and stable mental health disorders concepts, as well as participating in model interdisciplinary treatment teams and therapy groups. However, these students had no opportunity for interaction with acutely mentally ill clients. Thus, although the clinical experiences were rich in certain ways, some course outcomes related to interacting with seriously mentally ill clients could not be met. Course faculty needed to devise strategies to close this gap.

Another challenge was lack of community experience provided in the course. Community mental health care is the cornerstone of today's mental health care system, yet our nursing program remained focused on clinical experiences set in acute care institutional settings. Some students were exposed to community mental health through observation of preceptor nurses on home visits; others did not have this opportunity. In addition to lack of access to preceptors, risks of home visits include safety, time and expense of travel, and logistics of scheduling visits. Another drawback is that observation--while useful--would not provide students with hands-on experience.

The physical presence of the instructor during one-on-one interactions between student and client in a mental health clinical changes the interpersonal dynamic and makes direct evaluation of outcomes such as communication skills and ability to conduct mental health assessments challenging. Traditionally, mental health nursing courses—including ours—used process recordings (written analyses of verbatim interactions with clients), role-plays, or completion of lengthy psychosocial assessment tools to evaluate student learning in these areas. Other options have included use of standardized patients (Robinson-Smith, Bradley, & Meakim,

2009) or simulation with human patient simulators operated by instructors (Kameg, Clochesy, Mitchell, & Suresky, 2009). However, standardized patients and manikins can be very expensive in terms of financial and human resources: equipment costs, instructor time, and limited lab space (Brown, 2008).

Faced with these curricular and financial challenges, the authors recognized a need for unique solutions. One possible solution was the integration of appropriate technology to "manage time and distance" (Savery, personal communication, 2011). With the correct instructional technology, we could address several of the challenges identified earlier and potentially help course faculty to become more effective in their use of classroom technology. The primary goal was to create a more standardized learning experience for students, one that would not exist in the real world. A blended learning multi-user environment could be designed, one that would allow us to expand and extend learning from the physical world into the online world, from the real world into the virtual world.

Literature Review

In pedagogies based on constructivist approaches, situations, activities, interactions, and the environment itself are deliberately structured to enhance learner understanding (Dabbagh & Bannon-Ritland, 2005; Savery & Duffy, 1995). Through direct experience, students learn how to solve problems. Constructivist pedagogical approaches are experiential in nature, providing active information processing, "concrete experiences," and the opportunity to reflect on the experiences (Dass, Dabbagh, & Clark, 2011, p. 92). Students can demonstrate their understanding of skills through interaction with avatars. However, an avatar simulation must be more than practice of technical skills. Human elements—such as those inherent in communication or leadership--are also essential for the simulation to be meaningful and effective (Rogers, 2011). Ferguson (2011) noted that virtual worlds hold appeal because of their lack of formal educational structure; however, a virtual educational activity that lacks proper pedagogical structure becomes simply a more technically complex way of doing the same thing.

In their literature review of 15 virtual world case studies, Dass et al., (2011) found that the use of virtual worlds—while positive as a learning activity—was influenced by several factors. In a theoretical sense, the activity had to logically fit course goals. In a practical sense, students needed sufficient skill to interact in the environment and manipulate their avatars. Even more important, the computer used had to have technical capability to run the program and perform necessary functions (Dass et al., 2011).

Why Second Life®?

There are between 300 and 900 virtual worlds in existence, and over 1 billion registered avatars worldwide (KZero, 2010). Second Life® (SL) is a popular virtual world, a world existing solely online, where any of over 20 million registered avatars can interact at the same time (Gilbert, Murphy, & Avalos, 2011). Aggregated data from seven SL activities indicated that SL tends to immerse users in a state of flow, where they may be engaged for a sustained period of time, concentrate without effort, and enjoy their experiences (Mayrath, Traphagan, Jarmon, Trivedi, & Resta, 2010). Adult learning in SL is enabled by an immersive environment, collaboration across geographical boundaries, and health and emotional benefits such as psychological well-being (Mancuso, Chlup, & McWhorter, 2010). Significant barriers include technical challenges and the learning curve required for novices (Mancuso et al., 2010).

Advantages of SL as a virtual world for medical settings include its power to create objects and experiences that are authentic and realistic (Salmon, 2009), yet not real. For example, a client could become critically ill and die with no actual threat to the client. In a psychiatric setting, a client could become violent or suicidal with no actual threat to the client or student.

Second Life® has been used in BSN, accelerated BSN, and masters nursing programs (Skiba, 2009), and offers access to experiences that students may not be able to experience in clinical rotations. Most nursing students have enjoyed the experience and requested more time in SL (Skiba, 2009). Additional uses of SL technology have included virtual home visits for public health nursing students (Stewart, Pope, & Duncan, 2009), and virtual office hours in SL that eliminate travel time for commuter students and faculty (Richardson, Hazzard, Challman, Morgenstein, & Brueckner, 2011).

Benefits of SL in nursing are that it "enables role playing, collaboration, real-time interactions between students and faculty, and experimentation" (Skiba, 2009, p. 129), with students rating SL above webinars and a learning management system in terms of perceived quality of instruction (Johnson, Vorderstrasse, & Shaw, 2009). Scenarios in virtual worlds can be standardized; thus, learner performance can be monitored, recorded, and evaluated (Kilmon, Brown, Ghosh, & Mikitiuk, 2010). SL also has potential to cross geographic barriers as a tool for distance learning (Inman, Wright, & Hartman, 2010).

Difficulties reported with SL have been technical (i.e. slow computers that freeze or crash), cultural (inappropriate social interaction from avatars), and time required to build the environment and objects (Inman et al., 2010). Additional limitations include increased workload related to learning how to use SL, perceived time pressures, and logistical issues of accessing and maneuvering within the program (Chang, et al., 2009). Older students have concerns about the learning curve and understanding virtual worlds. Access to computers capable of running the program may be an issue. Some students do not appreciate ways in which the program is applicable to nursing, while others students feel uncomfortable interacting with other avatars (Skiba, 2009). In general, obstacles of SL tended to be overlooked when it came to the student's positive educational experience (Skiba, 2009).

Challenge 1: Assembling the Right Team

Key to our success was full support of administrators—including the Director of our Learning Resource Center--within the College of Nursing Central Administration initially approached us in the spring of 2009 with the idea of developing a virtual reality application in our junior level course. They directed us to essential collaborators in the university community—members of the instructional technology/design technology department. Our new collaborators suggested that Second Life® was the ideal venue from which to launch our virtual experiment. They also quickly recognized that some of the ideas envisioned by course faculty exceeded their design capabilities, making it necessary for them to reach out to professional contacts with whom they had collaborated in the past—Loyalist University. Funding was provided in part by the College of Nursing, and in part by the university.

Other essential team members were students. Four graduate students enrolled in a Masters in Instructional Technology program—all K-12 teachers--were assigned to help us implement our plan and assist with training as part of a class project. Another valuable team member was an Honors nursing student, whose senior project was to work with lead nursing faculty in developing a survey questionnaire to collect evaluative data about the simulation.

Challenge 2: Working Out the Details

Two faculty members in the mental health-nursing program took the lead in specifying the learning activities. They wrote specific learning objectives and detailed client histories based on course outcomes of client assessment, communication, and safety. These informed the design of the virtual environments. In consultation with instructional technologies team members, they developed a basic simulation, which consisted of a nursing student making a follow-up mental health visit to a recently hospitalized client. Within Second Life®, a virtual street was constructed. On opposite sides of the street were two houses – one for each client. Client one demonstrated symptoms typical in someone with schizophrenia such as hearing voices. Client two demonstrated symptoms associated with a major depression such as suicidal thoughts.

Students were expected to create their own avatars, clothe them in professional attire, and follow the usual protocols in scheduling a date and time for the site visit. Students were provided with learning outcomes for the experience that focused on developing a safety assessment (of the client and the home environment), demonstrating communication skills, and conducting a mental status assessment. Nursing students would enter SL in their avatar form and proceed to the university's island within SL. From there they would "teleport" to the house of the client with whom they had scheduled the visit. The clinical instructor assumed the role of the "patient" within the simulation and responded as appropriate to the interview questions presented by the student. Interviews lasted between 45-60 minutes and included debrief time away from the client's home at a Welcome Center created specifically for nursing. After the interview, students submitted a written report documenting their assessment of the client and his or her environment, as well as their nursing actions and evaluations.

Students were given "release time" of approximately 6-8 hours. Faculty replaced a process recording and another assignment that the students completed on their own totaling an estimated 6-8 hours with the simulation assignment. Discussions about whether an excessive amount of time to master basic functions within Second Life® has been allotted are ongoing. The simulation did not take the place of any actual clinical contact hours, however.

Figure 1. Patient with schizophrenia in his home.

Mini roadblocks emerged at times during the development phase. For example, it was possible that up to six instructors could schedule interviews at the same time; thus, a separate "street" had to be constructed for each instructor. All participants gained access to the streets through a central launching area in the Welcome Center. If more than one group appeared in the Welcome Center debrief area at the same time, their chat logs would become intermingled. The quick fix was to withdraw to another meeting area—such as an inviting tree house nearby. Second Life® allows for either audio communication or text-based chat. Although sound would add fidelity to the simulation, it would require additional equipment that some students might not

have on their computer. More importantly, it would prohibit meaningful recording of the interaction. An instructional decision was made to require text chat, which would readily facilitate saving the record for later review by student and instructor.

Recognizing that some students would have older computers with insufficient bandwidth to download Second Life® software, an advance plan was made to offer the option of running the simulation on computers in the Learning Resource Center (LRC). The Second Life® application was installed on all LRC computers. When implementation began, some students took advantage of this option after trying unsuccessfully to run Second Life® from home; others were requested to meet their instructor in the LRC and debrief live following the simulation.

Challenge 3: Getting Everyone On-board

The rollout for the project began in Spring 2010. An in-service conducted by the graduate students in the Instructional Design course was provided for all course faculty. The students created a Getting Started guide for faculty (and ultimately students) that included information on obtaining clothing, manipulating an avatar, teleporting, and saving chat logs. Lead course faculty were excited about and invested in the Second Life® exercise, but engagement of part-time clinical faculty was also required.

Part- time faculty unfamiliar with virtual environments were in the unfreezing stage of Lewin's (1947) change theory and required motivation to accept this change. They initially responded with less enthusiasm, less comfort, and less confidence about their ability to grasp the technical application. Part-time faculty had not participated to any degree in development of the simulation; they also had difficulty investing the time required to master the program. To boost their comfort level, all clinical faculty were encouraged to experiment with Second Life® over summer break; in addition, a course group meeting was scheduled in one of the houses in Second Life® to give clinical faculty more opportunity to practice getting to the locations and manipulating their avatars. The course was taught twice in fall semester and twice in spring semester. Initial plans were for lead faculty to pilot the simulation the first half of fall and to add clinical faculty the second half. However, clinical faculty did not feel prepared to start Fall II, so their entry was delayed until spring semester.

Lead faculty continued to mentor clinical faculty. For example, they set up mock simulations for clinical faculty as clients while administrators also observed. Lead faculty led 35 students through SL simulations in the first semester, with positive initial feedback and survey data.

Figure 2. Debriefing following a simulation.

Progress Made

Currently, the SL simulation has been used over three semesters. Data on perceived educational effectiveness and technical difficulty from the survey instrument developed by the

senior honors student and course faculty have been analyzed through two semesters (n = 126). Quantitative data analysis was performed using SPSS version 19.0. Correlations were performed to determine significance of the relationship between perceived educational effectiveness and perceived technical difficulty, and between perceived technical difficulty and age.

Educational effectiveness and technical difficulty means were calculated for the total sample and for each semester and rotation (see Table 1). Educational effectiveness scores had a possible range of 8-32, with higher scores indicating greater effectiveness. The mean in the total sample was 22.22. Technical difficulty scores had a possible range of 14-56, with higher scores indicating greater difficulty. The mean in the total sample was 26.33. Responses to open-ended questions were reviewed by the researchers and shared with course faculty.

Table 1.
Group Means

Group	Educational Effectiveness	Technical Difficulty
Fall I	29.35 (median 30)	22.24 (median 21)
Fall II	25.94 (median 27)	24.5 (median 24.5)
Spring I	20.55 (median 22)	28.57 (median 28)
Spring II	19.65 (median 21)	26 (median 26)
Combined	22.22 (median 22.5)	26.33 (median 25)

Results indicated that SL simulation is moderately effective as a teaching strategy and slightly difficult as a technical program. Correlations using Pearson's r were performed to assess degree of relationship between educational effectiveness and technical difficulty. There was a significant negative relationship (r = -.472; $p < .01$); thus, if the student perceived greater technical difficulty, she or he also perceived less educational benefit. Correlations were also conducted to determine whether age was a factor in perceived technical difficulty. Some research has suggested older students may be more challenged by technology (Cobb, Heaney, Corcoran, & Henderson-Begg, 2009). No significant relationship was found; therefore, age was not a factor in students' perception of technical difficulty; however, mean student age in our sample was older than in Cobb et al. (2009). The relationship between age of computer and educational effectiveness was also significant (r =.188; $p < .05$). Those using older computers perceived less educational effectiveness.

Open-ended questions were included in the survey to elicit positive and negative aspects of the activity perceived by the students. Some of the aspects most liked were the ability to conduct a home health assessment without the potential safety risks (16), and the realism of being in the moment with a client and having to think on one's feet (11). Some students liked that the simulation was unique when compared to other assignments (11). Others appreciated the focus on communication (6), working from home (4), and being able to save and review the interaction (4).

Students also identified several negative aspects of the simulation, including difficulties in creating and dressing an avatar (17) and maneuvering around the SL environment (12). Some thought the program was time consuming and hard to set up (8). Students disliked waiting for the instructor to type her response during the interaction with the patient (7). Some didn't like the virtual setting, stating the program was "not real" (5).

Clinical faculty movement towards acceptance of the SL simulation is still in the change stage. It is also true that the SL simulation is more labor intensive. Factoring in individual interviews, as well as time required to review documentation of the home visit that students submit post-interview, and complete the grading rubric, faculty do spend slightly more time and have more student contact than before the simulation began. There have been no significant complaints about time as faculty have come to appreciate the value of the activity. Indeed, there is some evidence that faculty are moving towards refreezing, where changes are accepted and become permanent (Lewin, 1947). For example, one part-time clinical faculty member felt a student needed additional practice and evaluation of communication skills; she suggested that the student meet her on Second Life® for a second simulation. Faculty have used Second Life® to provide experiences with acute clients not encountered in the clinical setting or to compare real client symptoms with virtual symptoms demonstrated by Second Life® clients.

Remaining Challenges

Our survey findings have coincided with previous literature in that technical issues such as learning to use the SL program and downloading the program on personal computers were major causes of dissatisfaction for students (Gallagher-Lepak, Reilly, & Killion, 2009; Inman, Wright, & Hartman, 2010; Kokol, Blazun, Turk, & Abbott, 2006, Mayrath et al., 2010). One student suggested, "if avatars were made beforehand for the students, the educational value of this program would increase." Another notable finding was the correlation between educational effectiveness and computer age, suggesting older computers led to more technical problems and less satisfaction with the simulation. Students also experienced frustration with learning how to navigate and maneuver around the virtual world, and finding that technically inexperienced instructors could not necessarily assist them with computer glitches. Others wanted more time to tour the house, look at its contents, and have a longer conversation with the patient: "I was too rushed and could not multitask quick (sic) enough," one student stated.

Some students found the experience inferior to real life interaction, naming frustrations such as not being able to read avatar facial expressions adequately or not taking the exercise seriously (Inman et al, 2010). In addition, students were not particularly enthusiastic about learning a new technology for the course when they perceived it was unrelated to their end-goal of nursing knowledge (Mayrath et al., 2010).

To address these challenges, some changes have been made. A generic avatar was created by a course instructor; students have the option to use this avatar for their interaction rather than create their own. Few students have used this option, however, preferring to personalize their own avatar. Although personal preference cannot be dictated for those who do not like virtual interaction, a panel of facial expressions was provided to the instructors to increase realism of affect; however, additional technical upgrades to enhance the realism of the client avatar would be useful. Second Life® is a shared resource and unfortunately issues of lag time when typing and occasional computer freezing persist. The university is exploring other virtual worlds suitable for this type of immersive instructional experience.

Conclusions and Future Implications

Initiating an innovative learning strategy in a course is a major undertaking, particularly when technologies unfamiliar to faculty are involved. Our experience in developing and implementing our Second Life® simulation has taught us some valuable lessons. First, having a

tech team that is capable of troubleshooting and finding solutions for technical difficulties that arise is key. Additional technical issues related to the virtual world itself may be more difficult to resolve.

Most integral to success, however, is faculty development. For said development to occur, administrators must support release time for practice and experimentation with new ideas and new tools. Time for faculty development must be ongoing, and it must be twofold. One essential piece is technical skill development. Even more critical to success, however, is helping faculty understand the value of the educational innovation—how it meets course outcomes and where its pedagogical rationales are rooted. Finally, engaging all course faculty in early stages of planning is recommended to facilitate the change process.

Second Life® or other virtual reality simulation is a good fit in a practice profession such as nursing. It provides virtual clinical experiences and environments rich in diversity and exposure, yet safe for experimentation and learning for mental health nursing students. From a constructivist perspective, students can become immersed in experiential learning, taking an active role in creatively shaping that learning.

References

Brown, J. F. (2008). Applications of simulation technology in psychiatric mental health nursing education. *Journal of Psychiatric and Mental Health Nursing, 15*, 638-644.

Chang, V., Gutl, C., Kopeinik, S., & Williams, R. (2009). Evaluation of collaborative learning settings in 3D virtual worlds. *iJET*, *4*(3*),* 6-17. doi.10.3991.ijet.v453.1112.

Cobb, S., Heaney, R., Corcoran, O., & Henderson-Begg, S. (2009). The learning gains and student perceptions of a Second Life virtual lab. *Bioscience Education, 13*. Retrieved from http://www.bioscience.heacademy.ac.uk/journal/vol13/beej-13-5.pdf

Dabbagh, N. & Bannan-Ritland, B. (2005). *Online learning: Concepts, strategies, and application.* Upper Saddle River, NJ: Prentice Hall.

Dass, S., Dabbagh, N., & Clark, K. (2011). Using virtual worlds: What the research says. *Quarterly Review of Distance Education, 12*(2), 95-111.

Ferguson, R. (2011). Meaningful learning and creativity in virtual worlds. *Thinking skills and creativity, 6,* 169-178. doi:10.1016/j.tsc.2011.07.001

Gallagher-Lepak, S., Reilly, J., & Killion, C. (2009). Nursing student perceptions of community in online learning. *Contemporary Nurse 32(*1-2*),* 133-146. Retrieved from www.cinahl.com/cgi-bin/refsvc?jid=597&accno=2010401523

Gilbert, R.L., Murphy, N.A., & Avalos, M.C. (2011). Realism, idealization, and potential negative impact of 3D virtual relationships. *Computers in Human Behavior, 27*, 2039-2046. doi: 10.1016/j.chb.2011.05.011

Inman, C., Wright, V.H, & Hartman, J.A. (2010). Use of Second Life in K-12 and higher education: A review of research. *Journal of Interactive Online Learning, 9(*1*),* 44-63.

Johnson, C.M., Vorderstrasse, A., & Shaw, R. (2009). Virtual worlds in health care education. *Journal of Virtual Worlds Research, 2(*2*),* 3-12.

Kameg, K., Clochesy, J., Mitchell, A., & Suresky, J. (2009). The impact of high fidelity human simulation on self-efficacy of communication skills. *Issues in Mental Health Nursing, 31*, 315-323. doi: 10.3109/01612840903420331

Kilmon, C., Brown, L., Ghosh, S., & Mikitiuk, A. (2010). Immersive virtual reality simulations in nursing education. *Nursing Education Perspecitves 31(5)*, 314-317. Retrieved from http://www.cinahl.com/cgi-bin/refsvc?jid=2239&accno=2010862052

Kokol, P., Blazun, H., Turk, D., & Abbott, P. (2006). E-learning in nursing education-Challenges and opportunities. *Consumer-Centered Computer-Supported Care for Healthy People,* 387-401. Retrieved from http://www.mendeley.com/research/elearning-nursing-educationchallenges-opportunities/

KZero. (2010, October 10). Virtual world registered accounts breakthrough 1 bn [Web log message]. Retrieved from http://www.kzero.co.uk/blog/?p=4448

Lewin, K. (1947). Frontiers in group dynamics. *Human Relations 1*, 5-41.

Mancuso, D., Chlup, D.T., & McWhorter, R.R. (2010). A study of adult learning in a virtual world. *Advances in Developing Human Resources, 12*(6), 681-699. doi: 10:1177/1523422310395368

Mayrath, M.C., Traphagan, T., Jarmon, L., Trivedi, A., & Resta, P. (2010). Teaching with virtual worlds: Factors to consider for instructional use of Second Life®. *Journal of Educational Computing Research, 43*(4), 403-444. doi: 10.2190/EC.43.4.a

Richardson, A., Hazzard, M., Challman, S., Morgenstein, A., & Brueckner, J. (2011). A "Second Life®" for gross anatomy: Applications for multiuser virtual environments in teaching the anatomical sciences. *Anatomical Sciences Education 4*, 39-43. doi: 10.1002/ase.195

Robinson-Smith, G., Bradley, P.K., & Meakim, C. (2009). Evaluating the use of standardized patients in undergraduate psychiatric nursing experiences. *Clinical Simulation in Nursing, 5(*6), e203-e211. doi: 10.1016/j.ecns.2009.07.001.

Rogers, L. (2011). Developing simulations in multi-user environments to enhance healthcare education. *British Journal of Educational Technology, 42*(4), 608-615. doi:10.1111/j.1467-8535.2010.01057.x

Salmon, G. (2009). The future for (second) life and learning. *British Journal of Educational Technology, 40*(3), 526-538. doi:101.1111/j.1467-8535.2009.00967.x

Savery, J.R., & Duffy, T.M. (1995). Problem-based learning: An instructional model and its constructivist framework. *Educational Technology, 35,* 5.

Skiba, D. (2009). Nursing education 2.0: A second look at Second Life®. *Emerging Technologies Center, 30*(2), 129-131, Retrieved from http://nlnjournals.org/doi/pdf/10.1043/10942831%282007%2928%5B156:NESL%5D2.0.CO%3B2

Stewart, S., Pope, D., & Duncan, D. (2009). Using Second Life® to enhance ACCEL an online accelerated nursing BSN program. *Studies in Health Technology & Informatics, 146,* 636-40. doi: 10.3233/978-1-50750-024-7-636