9-1-2009

Preparing Graduate Students for Virtual World Simulations: Exploring the Potential of an Emerging Technology

Anne M. Hewitt

Susan Spencer

Danielle Mirliss

Riad Twal

Follow this and additional works at: https://nsuworks.nova.edu/innovate

Part of the Education Commons

This Article has supplementary content. View the full record on NSUWorks here:
https://nsuworks.nova.edu/innovate/vol5/iss6/3

Recommended APA Citation

Preparing Graduate Students for Virtual World Simulations: Exploring the Potential of an Emerging Technology

All exhibits, tables and figures that have remained available have been included as additional content with their respective articles to be downloaded separately. Click here to return to the article page on NSUWorks and view the supplemental files.

Unfortunately, not all the supplemental files have survived until 2015 and some will be missing from the article pages. If you are an author in Innovate and would like to have your supplemental content included, please email the NSUWorks repository administrator at nsuworks@nova.edu.

**Preparing Graduate Students for Virtual World Simulations:
Exploring the Potential of an Emerging Technology**
by Anne M. Hewitt, Susan Spencer, Danielle Mirliss, and Riad Twal

Crisis and emergency risk communication (CERC) is a key competency for healthcare management and leadership professionals. Historically, skill-building scenarios designed to teach emergency preparedness have relied on tabletop exercises. While this is a useful format in traditional, on-campus programs, the development of a corresponding activity for online students has been a challenge.

At Seton Hall University (SHU), developing skill-building scenarios that increase management competencies is a priority for both the on-campus and the online Master of Healthcare Administration (MHA) programs. Realizing a need to provide online students with similar learning opportunities to those available to on-campus students, Anne M. Hewitt and Susan Spencer, faculty members in the online MHA program, worked with Danielle Mirliss and Riad Twal, staff members from SHU's Teaching, Learning, and Technology Center (TLT Center), to investigate simulation options using virtual worlds like Second Life to replicate the tabletop exercise experience. The resulting exercise, which promises to offer online students the same realistic training experience traditionally provided by an in-person tabletop exercise, provided pilot participants with a training experience that improved their mastery of important concepts. However, we found that challenges involving student support and technology access must be addressed before virtual world simulations can be implemented successfully.

Background

SetonWorldWide (SWW), SHU's distance learning division, offers a number of online programs tailored to working professionals, including the MHA degree. Students in the MHA program include hospital administrators, supervisors, and other types of professionals involved in health care management. Although SWW is a distance learning program, students are required to attend three on-campus residencies, allowing for opportunities to participate in activities that complement their online studies and to develop a lifelong commitment to learning.

The MHA curriculum is designed to develop the key competencies expected of professionals in these fields; frequent use of skill-building scenarios helps achieve this goal. Skill-building scenarios are learning activities designed to help students increase their decision-making capabilities; in a typical skill-building scenario, students study a problem-based case, analyze the situation described, and propose an appropriate solution. Tabletop exercises are an interactive skill-building format commonly used in emergency preparedness (EP) training; these exercises require participants to collaborate in developing solutions to real-life problems (FEMA 2007). Usually, participants in a tabletop exercise describe the evolving scenario and their responses at specific planned points in time during the activity. For example, a tabletop exercise for pandemic influenza emergency preparedness would be led by a trained facilitator who would present participants with chronological segments of a scenario detailing the spread of the disease. The scenario develops as additional information is provided about the number of individuals exposed and the mortality rate. This type of learning relies on a forced decision-making framework (Dausey, Aledort, and Lurie 2005); the real-time development of the scenario is essential to allowing participants to become immersed in the urgency of the scenario and practice delivering critical decisions quickly in response to a developing situation.

SHU's online MHA programs faced two challenges in implementing existing EP tabletop exercises. First, most existing EP training examples are focused on first responder or clinical service delivery and not on the

communication and decision-making skills expected of healthcare managers and administrators. The health managers in the MHA program need training in crisis and risk communication rather than in mass casualty triage or disaster deployment protocols. (For further discussion of the distinctions between the public health and the health manager's perspectives and the alignment of best practices between them, see Hewitt et al. 2008.) Second, traditional tabletop exercises are designed to be implemented in a face-to-face setting with all participants meeting in the same physical location; this format excludes the possibility of delivering the same activity to online students.

In 2007, the authors received a Faculty Innovation Grant (FIG) to transform the MHA program's tabletop exercise into a virtual skill-building scenario and pilot test the newly designed learning experience with online students. Even though these were online students, we planned to conduct the pilot in a face-to-face setting to facilitate the identification of unanticipated challenges associated with the virtual setting. It was also imperative that the pilot scenario be focused on teaching the CERC skills that students studying to become health care managers and administrators would need, allowing participants to practice making command, control, and risk communication management decisions (Hewitt et al. 2008).

The most promising venue for this transformation was a virtual world. Virtual worlds have shown promise for delivering immersive experiences to a wide variety of learners. The popular virtual world Second Life is currently being used to foster community in elementary and high school students through the use of its teen grid (e.g., GlobalKids.org and Zoomlab.org) and with adults through both commercial and public collaborations (e.g., Clever Zebra and IBM). The opportunity to integrate a unique interactive learning platform into the traditional learning environment has also piqued the interest of many in higher education, and symposia and online conferences dedicated to this topic are now more prevalent. John Lester, academic program manager at Linden Labs, adds that "Second Life gives both students and faculty a new medium for exploring things like distance learning, experiential learning, simulation, and scientific visualization in a fundamentally collaborative environment" (Joly 2007, ¶7). The affordances of this technology allow for a heightened sense of co-presence (Schoeder 2002), immersion in the learning experience (Barab et al. 2005; Dede 1995), and opportunities for collaboration (Gardner, Scott, and Horan 2008), all important factors for adult learners (Exhibit 1).

As a first step, we established a number of goals for the simulation; any virtual version of the tabletop exercise must:

- offer a real world activity for students,
- permit synchronous collaboration among students on campus and from various geographical locations,
- apply basic course concepts in a problem-based learning format, and
- introduce complex systems in a systematic way.

With these goals in mind, we surveyed available alternatives for virtual simulations. The search revealed that many emergency preparedness training platforms readily available for this initiative, including commercial-based solutions, emergency preparedness military models, and scripted disaster management games, required technical capabilities that exceeded SHU's available capacity and did not allow the customization necessary to address the learning needs of healthcare managers. The most promising option was Play2Train, a virtual world platform that had previously been used by a variety of other academic and health institutions, including the Centers for Disease Control (CDC), Emory University, the University of Illinois at Chicago's Center for the Advancement of Distance Education (CADE), and Idaho State University, to conduct training in Second Life. Play2Train provides an online alternative to the typical traditional tabletop scenario method, allowing students to participate in simulations synchronously, whether at a distance or gathered in one physical location, such as a computer lab.

In this venue, the EP scenario can become a collaborative learning activity delivered synchronously for both on-campus and online students. Play2Train provided the flexibility to integrate the pilot scenario as well as

future scenarios into the actual course timeframe, promising to eliminate the need for the midcourse residency. Play2Train also had available at least two other previously designed EP scenarios that could be adapted for health managers, including one [simulation](#) in which hospital staff are faced with a pandemic and must set up an outside triage location.

Virtual World Scenario Development and Implementation

Once the Play2Train virtual world platform was selected, we implemented administrative structures to support development of the exercise and facilitate necessary partnerships ([Exhibit 2](#)). In order to create a customized scenario, the instructional design staff at the TLT Center employed elements of case-based instruction, a problem-oriented approach that allows students to practice decision-making skills within the context of a real-world problem, and designed a scenario development worksheet to be completed collaboratively with the faculty members teaching the course ([Exhibit 3](#)). The worksheet was designed to capture important content-specific information in a way that facilitated the process of developing the scenario. Additional discussion focused on student preparation, technical support, and assessment techniques.

After the scenario content was determined, instructional designers worked with the Play2Train facilitator to develop the [final scenario](#) in which an explosion at a restaurant sends multiple people to the local community hospital. The goal of the scenario was to have the MHA students participating in this exercise generate initial communication messages from the hospital to the general community following a significant health crisis event. A primary task of hospital leadership during a medical emergency is to reassure the public and to provide appropriate information. As the students participated in the scenario, they collected facts and information to form the basis of the required risk communication for the public. Initial communication messages created for general media release and discussing the hospital's response to the emergency situation were required to adhere to the [CERC](#) communication model as developed by the CDC.

After faculty members refined the scenario, the instructional designers prepared training materials to be distributed to students prior to the virtual exercise. Faculty members teaching the exercise sent an e-mail directly to the students, welcoming them to the class and informing them of the activity ([Exhibit 4](#)). At that time, four files were made available to the students via the class Blackboard site:

1. [Pre-Assignment](#)
2. [How to Begin](#)
3. [Second Life Skills Checklist](#)
4. [In-World Orientation](#)

Additionally, *Second Life for Dummies* (Robbins and Bell 2008) was mailed directly to the students. Two optional but strongly recommended orientation sessions that were held within Second Life itself helped students to familiarize themselves with the virtual environment. The goal of these preliminary steps was to establish the purpose of the virtual learning activity and to increase the students' level of comfort with the technology.

Rather than immediately implementing the exercise with geographically dispersed participants with the additional complications that could be introduced by distance, we held the pilot implementation during the on-campus midcourse residency. This allowed us to ensure that participants had access to the required technology and immediate technical support and allowed us to observe the needs of this student population as they worked through the scenario. We planned to use the information gathered in this way to increase the effectiveness of the pre-scenario training materials. On the day of the pilot exercise, students met in person for an informal lunch and attended a one-hour content lecture. An additional hour was spent in a computer lab refreshing navigational skills in Second Life. Following this skills refresher, the actual activity began with students watching the scenario in which a restaurant explodes, sending multiple people to the local

community hospital. The students then met in the Play2Train hospital command center (Figure 1) where they assumed their assigned virtual roles while faculty members and support staff played the roles of community partners (Table 1). Although the roles for this exercise were taken from the hospital incident command system plan (HEICS III), the primary emphasis of the exercise was not the delivery of health care services but rather on management skills and CERC.

Several opportunities to provide students with scaffolding and guided reflection were made available. At two points during the scenario, the faculty member running the scenario stopped the activity to allow feedback from the executive in residence, a practicing healthcare administrator who acts as a mentor to both students and faculty members in the program, and to direct the flow of the scenario toward the unit objectives. Once they completed the scenario, students completed the required group assignment using the CERC anticipated questions worksheet. Completion of the group communication assignment signaled the end of the class scenario activity.

Assessing the Experience

All stakeholder partners in the virtual world scenario were interested in assessing the success of the intervention. Two survey instruments designed for this purpose were submitted and approved by Seton Hall University's institutional review board. Immediately after the virtual world scenario was completed, all students participated in a debriefing session that included both verbal and written components.

First, the instructor requested feedback on the emergency preparedness content material and the related CERC objectives covered during the activity. Emphasis was placed on the use of decision-making skills and the importance of teamwork regardless of assigned roles. Second, students were encouraged to share their feelings and experiences around the use of a virtual world as a learning tool. This open comment time allowed students to identify missing resources in their preparation for virtual learning and for the scenario. As a group, the students felt that the Second Life resources provided were sufficient and that they had received the initial information early enough to allow for adequate preparation.

To obtain further insight into the students' perspectives regarding Second Life and Play2Train, we asked students to complete a short survey. On the survey, students used a five-point Likert scale to indicate their satisfaction with the scenario and the virtual learning experience. Overall, students indicated that they enjoyed the virtual learning experience and felt that they had gained appropriate knowledge and had increased their communication skills (Exhibit 5).

Lessons Learned and Developing Best Practices

Faculty and support staff, including instructional designers, participated in a series of reviews and project debriefing sessions that identified areas of success and challenges to be considered in future enhancements. Two distinct challenges emerged from these conversations:

- Virtual world exposure and experience is still limited among adult graduate students. Only a small number of students reported awareness or knowledge of virtual worlds. This placed added demands on the faculty and design team as they were introducing new information on emergency preparedness skills while preparing students for new learning technology.
- Technology constraints faced by distance education students may impede the integration of virtual-world-supported scenario exercises in online courses. Many of the students interviewed use older computers that do not have the graphics cards required to support Second Life. In addition, the typical student's inexperience with virtual worlds requires just-in-time technical support that is not usually available from help desk staff, placing great demands on faculty and technology support professionals.

The team's analysis of the experience and of student responses to it also produced a set of best practices for preparing adult students for virtual learning experiences:

- Team participation and integration: The scenario development process as well as the student preparation and implementation activities required multiple skills and action steps that were best accomplished by specific experts working in a team project model.
- Timeline flexibility and length: All participants agreed that a substantial lead time was needed to prepare students for an initial virtual world learning experience. As virtual world experiences become more commonplace, this timeline can be expected to decrease.
- Support materials and guided practice: Adequate and appropriate support materials are needed to foster integration of the content material with the virtual world activity. The two guided practice sessions in Second Life were fundamental to the success of the learning activity.

Conclusion

Creating a virtual learning experience using Play2Train's Second Life environment satisfied our need for an interactive simulation that allowed for discovery, critical thinking, and analytical skills, all goals of a graduate MHA course. Preparing the adult graduate students required a team of committed professionals, significant lead time, specially developed support materials and guided practice activities, and a scenario development process that integrated project goals and outcomes. Using a phase-in methodology, we plan next to pilot the scenario with our online students. Future activities for SHU's MHA program include the integration of virtual world student preparation into the graduate student orientation, the refinement of the scenario to present additional emergency preparedness challenges, and the use of voice chat within Second Life to augment the Play2Train experience. As students develop virtual world skills and increase their familiarity with this new technology, additional scenarios will be added to other courses within the MHA curriculum.

Our experience could be replicated in many disciplines that use scenario-based learning. The decision to develop and use a simulation delivered in a virtual world should be based on several factors. First, the instructors must ensure that the course content is aligned with the choice of scenario. Instructional design of the scenario should directly facilitate attainment of the desired learning outcomes through appropriate activities. In addition to the learning objectives, both faculty members and students must be allowed adequate time to develop the necessary technical skills to participate successfully in the scenario. Finally, it is important that instructors encourage the students' sense of discovery and engagement throughout the learning activity. If these factors are accounted for, a virtual world can provide an engaging, learning-intensive alternative to face-to-face scenario exercises.

References

Barab, S. A., M. Thomas, T. Dodge, R. Carteaux, and H. Tuzun. 2005. Making learning fun: Quest Atlantis, a game without guns. *Educational Technology Research and Development* 53 (1): 86-108. http://inkido.indiana.edu/research/onlinemanu/papers/QA_ETRD.pdf (accessed January 28, 2009). Archived at http://www.webcitation.org/5eB3oxU94.

Dausey, D. J., J. Aledort, and M. Lurie. 2005. Tabletop exercises for pandemic influenza preparedness in local public health agencies. U.S. Department of Health and Human Services Office of the Assistant Secretary for Public Health Emergency Preparedness. http://www.pandemicflu.gov/plan/states/tr319.html (accessed April 15, 2009). Archived at http://www.webcitation.org/5gWdAMr02.

Dede, C. 1995. The evolution of constructivist learning environments: Immersion in distributed virtual worlds. *Educational Technology* 35:46-52. http://www.virtual.gmu.edu/ss_pdf/constr.pdf (accessed January 28, 2009). Archived at http://www.webcitation.org/5eB4COjsU.

Federal Emergency Management Agency (FEMA). 2007. NIMS Compliance Metrics Terms of Reference. http://www.fema.gov/pdf/emergency/nims/comp_met_terms.pdf (accessed January 29, 2009). Archived at http://www.webcitation.org/5eC2UfIie.

Hewitt, A., S. Spencer, R. Ramloll, and H. Trotta. 2008. Expanding CERC beyond public health: Sharing best practices with healthcare managers via virtual learning. *Health Promotion Practice* 9 (4): 83S-87S.

Gardner, M., J. Scott, and B. Horan. 2008. MiRTLE. *EDUCAUSE Review* 43 (5). http://connect.educause.edu/Library/EDUCAUSE+Review/MiRTLE/47238?time=1223401704 (accessed January 28, 2009). Archived at http://www.webcitation.org/5g0XHo60I.

Joly, K. 2007. A Second Life for higher education? Virtual worlds may wind up breathing new life into teaching, learning, and creative expression. *University Business* (June). http://www.universitybusiness.com/viewarticlepf.aspx?articleid=797 (accessed January 28, 2009). Archived at http://www.webcitation.org/5eB3Fx5aW.

Robbins, S., and M. Bell. 2008. *Second Life for dummies.* Hoboken, NJ: Wiley Publishing.

Schoeder, R. 2002. Social interaction in virtual environments: Key issues, common themes, and a framework for research. In *The Social Life of Avatars: Presence and Interaction in Shared Virtual Environments*, ed. R. Schoeder, 1-18. London: Springer-Verlag.

COPYRIGHT AND CITATION INFORMATION FOR THIS ARTICLE