

# TEACHING RN-BSN STUDENTS COMMUNITY HEALTH USING AN IMMERSIVE VIRTUAL ENVIRONMENT

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## **Abstract**

The Institute of Medicine made a recommendation in 2011 that 80% of all nurses possess a minimum of a bachelor of science in nursing degree by 2020. As a result of an influx of nurses returning to school, the shortage of public/community health clinical practice sites led to competition between schools for student placements in community settings. Finding appropriate clinical practice sites has become a challenge, not only for nursing students but also for students in all practice disciplines with a required clinical or practice experience component. Immersive learning in a virtual environment effectively addresses the problem of identifying and securing appropriate community-based sites for practice experiences and provides a safe environment for students to learn how to conduct a windshield survey. The use of virtual environments is not limited to nursing or health professions. Virtual environments can be used to supplement or enhance practice experiences for a variety of professions within and outside of the health-care spectrum. The development and implementation of a virtual environment is only limited by creativity, imagination, and finances. The cost to develop and implement a virtual environment can be managed by starting small and adding additional features over time.

**KEY WORDS:** community health nursing, immersive learning, virtual environment, windshield survey

## 1. INTRODUCTION

Simulation, commonly used as a supplemental educational strategy to teach health-care professional students hands-on skills, has become a valuable tool to provide practical experiences in a safe environment before students are expected to function in real-world acute care clinical settings. Both high- and low-fidelity simulation is used across disciplines in hospital orientation programs to (i) test basic competence, (ii) practice emergency department or operating room scenarios, (iii) assess readiness for clinical environments (Neil, 2009), and (iv) teach interprofessional team communication skills (Calhoun et al., 2014; Severson et al., 2014). The purpose of this paper is to describe how an immersive virtual environment was integrated into a community health nursing course to teach nursing students community health nursing concepts. Students are being taught to conduct a windshield survey in an immersive virtual environment referred to as Sentinel City.

## 2. INFLUX OF REGISTERED NURSES ENROLLING IN BACHELOR OF SCIENCE IN NURSING PROGRAMS

Since implementation of the recommendation by the Institute of Medicine that 80% of all nurses possess a minimum of a bachelor of science in nursing degree by 2020 (Institute of Medicine, 2011) and the increase in the number of hospitals achieving magnet status (ANCC, 2014a), the requirement for bachelor prepared nurses has increased substantially. The American Nurses Credentialing Center (ANCC) Magnet Recognition Program requires hospitals to have a plan in place to reach the Institute of Medicine Future of Nursing goal to be granted magnet status, which is recognition of excellence for hospitals (ANCC, 2014b). This motivated a significant number of registered nurses to return to school. As a result, it has become increasingly difficult to find relevant clinical experience sites, also referred to as practice experience sites. To compound the problem, associate degree nurses enrolled in bachelor of science in nursing programs require a curriculum that provides additional knowledge competencies in community/public health nursing.

Typically, associate degree nursing programs do not include community health content because the focus of these programs is on the care of individual patients in acute care or long-term care settings. Community/public health nursing is a community-oriented, population-specialty area that requires a minimum of a bachelor of science in nursing to work within this specialized field. Finding appropriate clinical practice sites in community settings has become a challenge and resulted in competition between schools for student placements in the community. In addition, appropriate clinical/practice experience sites for students in rural settings may be nonexistent.

### **3. NONTRADITIONAL STUDENTS**

In addition to the challenge of securing appropriate practice experience sites in community settings, registered nurses who enter bachelor of science in nursing programs are often nontraditional students. The nontraditional student is usually older than the traditional student entering college immediately after high school, is employed full time, may have dependents other than a spouse, may be a single parent, and/or may be the caregiver for an elderly family member (U.S. DOE, National Center for Education Statistics, n.d.). Because nontraditional students have many obligations or potential geographical limitations, online education may be the only option (Killion et al., 2011). It is imperative that educators develop and implement teaching-learning strategies to meet the needs of nontraditional students and identify ways to address the problem of limited numbers of appropriate community health practice sites for registered nurses in bachelor of science in nursing programs. One way to address these challenges is by integrating an immersive virtual environment into current registered nurse to bachelor of science in nursing curricula.

### **4. IMMERSIVE LEARNING IN NURSING EDUCATION**

The use of simulation in nursing education provides opportunities for students to learn and apply critical thinking skills and theoretical principles

of nursing care in a safe environment. Immersive virtual environments can be used to teach community/public health concepts such as community assessment by conducting a windshield survey. According to Green et al. (2014, p. 135), “virtual worlds have the potential to offer nursing students social networking and learning opportunities through the use of collaborative and immersive learning.” Incorporating immersive learning in a virtual environment has several positive benefits for students, such as the convenience of carrying out a windshield survey during a time that is most convenient for working students without having to leave their home. In addition, immersive learning in a virtual environment effectively addresses the problem of identifying and securing appropriate community-based sites for practice experiences.

## **5. IMMERSIVE VIRTUAL ENVIRONMENT: SENTINEL CITY**

Sentinel City is a virtual environment developed by the American Sentinel University to represent what students would find in an urban city in the United States. This virtual environment provides students with unique opportunities to explore health and environmental issues facing American cities today. Students are able to take a tour around the virtual community while observing the environment and people of Sentinel City. Through observations, students gather information that helps them assess potential health issues and risks within this virtual environment.





FIG. 1: Sentinel City - Casper Park District



FIG. 2: Sentinel City - Bus Start Menu

## 6. COMMUNITY ASSESSMENT WINDSHIELD SURVEY IN A VIRTUAL ENVIRONMENT

### 6.1 WINDSHIELD SURVEY

A community assessment starts by conducting a windshield survey where students explore the eight subsystems of a community in the immersive virtual environment. A windshield survey is a composite of subjective data collected through personal observations. During a windshield survey, the observer uses sound, sight, and smell while riding, driving, and/or walking around a community. Windshield survey data of a virtual environment includes the observations and perceptions of what is observed, heard, or smelled—similar to what is observed in an actual community.

Another important part of a community assessment is the collection of objective data obtained from county, state, national, or federal sources such as demographic data from a state health department or census bureau. This information helps to define the assets of a community and changes that are needed to improve the health of the population in that community. Data from an actual community similar in size to Sentinel City is provided to students as a source of objective data.

In addition to the “people” (the core) of the community, there are eight subsystems that come together to form the assessment data for a windshield survey. Subsystems are individual yet integrated systems that contribute to the characteristics of every geographical community. The eight subsystems within every community include (i) physical environment, (ii) safety and transportation, (iii) health and social services, (iv) education, (v) recreation, (vi) politics and government, (vii) communication, and (viii) economics (Lundy and Janes, 2014).

### 6.2 ENTERING THE VIRTUAL ENVIRONMENT

Students start their windshield survey by reviewing an introductory video, then logging into the virtual environment and selecting an avatar. Students are able to personalize their avatar by selecting the gender. Once students have selected the gender of their individual avatar, the student is automatically placed on the city bus. Students select the speed of the bus, can stop the bus ride to take notes on what they observe, and can get off the bus

and walk around the city. Students are encouraged to start their tour of the city on the slowest speed but can ride the bus as many times as needed to complete the windshield survey. There are buildings in the city that students can enter, such as a supermarket. Many different sounds, such as children playing, can be heard throughout the city. Although students may mute the sound, they are encouraged to listen to the different sounds as they tour the city. This would be expected when conducting a windshield survey in an actual community.



**FIG. 3:** Sentinel City - Avatar Selection



**FIG. 4:** Sentinel City - Bus Stop

### **6.3 COMMUNITY HEALTH NURSING COURSE: WINDSHIELD SURVEY ASSIGNMENTS**

Students complete windshield survey assignments every other week of the eight-week community health course. The windshield survey assignments are divided into the following four assignments:

- Assignment 1: community core
- Assignment 2: physical environment, health and social services, safety and transportation
- Assignment 3: education, recreation, and politics and government
- Assignment 4: communication and economics

The course culminates with a final project, which is the development of a health education project that addresses the needs of a target population living in Sentinel City. The health topic for the project is based on the results of the students' completed windshield survey. Similar to assets or resources found in an actual community, students are instructed to assess and document the strengths (assets) as well as the limitation of resources in Sentinel City. As part of the final project, students include specific recommendations regarding



the subsystems that should be strengthened to improve the health status of a people in Sentinel City. This information is shared with nursing administration so additional features can be added to the virtual environment.

#### **6.4 VIRTUAL ENVIRONMENT AND OTHER COMMUNITY HEALTH COURSE ASSIGNMENTS**

The use of a virtual environment in the course is not limited to the windshield survey assignments. An example of another assignment in the community health nursing course is a learning activity where students address one of the phases of disaster management, i.e., prevention, preparedness, response, or recovery. Students take a bus ride around Sentinel City to identify areas in the community that could potentially be the site of a man-made or natural disaster. Another assignment in the course is to select an infectious disease from the Centers for Disease Control (CDC) National Notifiable Infectious Condition website, an infectious disease that could potentially impact an aggregate living in Sentinel City. Students are required to develop, in layperson terms, a short public service announcement (PSA) that can be used to alert the residents about the outbreak of the selected infectious disease, which includes the signs and symptoms of the disease, and prevention measures, then determine the best form of media to share the PSA in Sentinel City. Students are instructed to take into consideration the lack of Internet access in the virtual environment, which further supports the authenticity of this virtual community because according to the Federal Communications Commission's 2015 Broadband Progress Report, approximately 55 million (17% or one out of six) Americans lack Internet access (FCC, 2015).

#### **6.5 EVALUATION OF THE VIRTUAL ENVIRONMENT**

Assessment of a virtual environment as a valuable teaching and learning strategy is ongoing. Students were initially required to take a pretest prior to being able to access the community health course. However, mechanisms were not put in place that required students to complete the posttest at the end of the course. Response rates on the posttests were low and faculty was

not able to get an accurate assessment of the learning that took place as a result of using the virtual environment. Recently, questions to evaluate the value of using the virtual environment as a teaching tool were revised and two assessment questions are now embedded within several of the windshield survey assignments. Student responses to the first two assessment questions are provided below. At the end of each term, review and analysis of responses to all assessment questions is completed and results are shared at the assessment committee and nursing faculty meetings.

## 7. INITIAL STUDENT FEEDBACK

Student feedback about the virtual environment has been positive. Students state: "I like that I don't have to get out of my pajamas to do the windshield survey." "With my work schedule, I would not have been able to do the windshield survey. The virtual city made it easy for me to complete the assignments."

In response to the question, "What did you find in the virtual city that will be most valuable in helping you understand how to do a windshield survey?" students responded: "The virtual bus tour was an excellent way to introduce a windshield survey and walk me through step by step of what to look for. I thought it was interesting just listening to the sounds of the city as the bus went through." "I found that being able to move slowly through the city, being able to get around, and being able to pay attention to detail helped me get through Sentinel City." "I compared [the city] to a smaller version of NYC. The signs and advertisements helped. A windshield survey is data that is collected through observation and I really felt that the detail put into creating Sentinel City was amazing." "Overall, participating in a Windshield Survey is interesting. It is like sitting in the park or at the mall and people watching." "In the virtual city I was able to look around and see not just the people who live there but in the conditions their street and buildings are."

On the final course project, students are asked to respond to the following question: In your prior nursing courses, you learned new concepts, theories, or patient care strategies using traditional methods such as course readings,

lectures, PowerPoint presentations, or videos—how would you compare traditional methods to your experience in the virtual city? The following are examples of student responses to this assessment question: “Approach to learning about this subject has been excellent! I prefer this approach as opposed to power points, readings, etc.” “This type of virtual experience feels more hands on. I’d recommend it to anyone!” “Program was very interactive and educational. It built and challenged my assessment skills ... thoroughly enjoyed this new learning approach ... great method to encourage and support learning.” “Real life setting makes concepts easy to apply, content is driven by the student, not the teacher.”

## 8. CONCLUSION

Virtual environments can be used in a variety of programs outside of nursing and can be a valuable immersive learning experience for students in many different practice disciplines with a required clinical or practice experience component. The development and implementation of virtual environments is only limited by creativity, imagination, and finances. The cost to develop and implement a virtual environment can be managed by starting small and adding additional features over time. Examples of additional features that could be added to the virtual environment include interactive avatars, emergency alarm systems, community bulletin boards, and a chamber of commerce with historical information about the community. Integrating virtual environments in courses is an innovative teaching strategy that addresses the challenge of securing appropriate clinical practice sites in community settings that enhances learning not only for nursing students but also for students in a variety of practice disciplines.

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