ASSESSING STUDENT ACHIEVEMENT OF LEARNING OUTCOMES USING A 3D COMMUNITY HEALTH VIRTUAL SIMULATION PROGRAM

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ANCC

Continuing Nursing Education

INACSL is an accredited ANCC provider.
DISCLOSURES

Conflict of Interest

• Tona Leiker, PhD, APRN-CNS, CNE reports no conflict of interest
• Karen Whitham, EdD, MSN, MS, CNE reports no conflict of interest
• Julia Greenawalt (INACSL Conference Administrator & Nurse Planner) reports no conflict of interest
• Leann Horsley (INACSL Lead Nurse Planner) reports no conflict of interest

Successful Completion

• Attend 90% of session
• Complete online evaluation
OBJECTIVES

Upon completion of this presentation, participants will be able to:

1. Design and implementation of 3D virtual simulation for online RN to BSN students: Community Health.

2. Support the development of student learning activities by demonstrating curricular mapping to articulate high priority design elements.

3. Demonstrate student single sign-on capacity to log student time and activity in the virtual world, including movement within the virtual worlds.

4. Discuss formative and summative assessments and data analysis that provided support for continued use and ongoing development of two virtual world learning experiences.
GAP AND DESIRED STATE

Gap:
There is a knowledge gap on the outcomes of formative and summative assessments in 3D simulations in nursing education.

 Desired State:
Current state is that virtual simulations are being developed and used in academic nursing programs to support clinical learning experiences.

Therefore:
Share knowledge gained in developing formative and summative assessments for online courses using 3D virtual simulations.
OBJECTIVE 1

1. Design and implementation of 3D virtual simulation for online RN to BSN students: Community Health.
QUICK FACTS

• American Sentinel University, Aurora, CO

• Collaboration between: Multiple Nurse Educators, Academic Administrators, Instructional Designers, 3D World Professionals, and University Assessment Personnel
THE TECHNOLOGY

• 3D World Platform: Unity 3D 5 – Converted in 2016
• Interactive Communication: A flexible open source chatbot engine
• NPE (non-playing characters) - Miximo
• Learning Management System: Moodle
• Access: Single-sign-on Capabilities
# Workgroup Meetings

<table>
<thead>
<tr>
<th>Weekly CITL Technical Review</th>
<th>Monthly CITL Pedagogy Review</th>
<th>Quarterly CITL Committee Meeting</th>
<th>Nursing CITL Workgroup Meetings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurred every Thursday</td>
<td>Occurred the first Thursday of each month</td>
<td>Occurred once per quarter</td>
<td>Occurred once a month on Tuesdays</td>
</tr>
<tr>
<td>Technical Team: Bugs, building, language, design</td>
<td>Curricular focus - learning outcomes driven</td>
<td>Includes executive team and administrative leadership – oversight group</td>
<td>Nursing workgroup – Curricular alignment with QSEN; project updates; volunteers; DNP projects, demos, etc.</td>
</tr>
</tbody>
</table>
# Nursing Programs Technology Enhanced Learning Curriculum Mapping

<table>
<thead>
<tr>
<th>Course</th>
<th>AACN Essentials*</th>
<th>Activity</th>
<th>QSEN**</th>
<th>Assigned Personnel</th>
<th>Requisite Technology</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSN432PE - Community Health Nursing</td>
<td>Integrate theories and concepts from liberal education into nursing practice. (EI-1.)</td>
<td>Write a letter to head of the health department to improve the water quality in the city. (C1.M2)</td>
<td>Appreciate importance of intra- and inter-professional collaboration. (TC-A)</td>
<td>Sentinel City - City Hall</td>
<td></td>
<td>Not started. Approved to develop. In development. Testing. Complete.</td>
</tr>
</tbody>
</table>
WORKGROUP DASHBOARD

Center for Innovation in Teaching and Learning (CITL) - 2014 Project Roadmap

<table>
<thead>
<tr>
<th>Project Synopsis</th>
<th>Q1 1/1-3/31/2014</th>
<th>Q2 4/1-6/30/2014</th>
<th>Q3 7/1-9/30/2014</th>
<th>Q4 10/1-12/31/2014</th>
<th>Dashboard 1/1-12/31/2014</th>
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<tbody>
<tr>
<td><strong>Virtual Hospital--Health Assessment</strong></td>
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<tr>
<td>2014 Budget $75,000</td>
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<tr>
<td>Project Lead - Trevor</td>
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<td>Staff Involved</td>
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</tr>
<tr>
<td>John</td>
<td></td>
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<tr>
<td>Tona, Karen</td>
<td></td>
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<tr>
<td>Margaret, Bruce</td>
<td></td>
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<tr>
<td>Contractors</td>
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<tr>
<td>Shadow Health</td>
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<td>Reaction Grid</td>
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<td>Courses</td>
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<tr>
<td>BSN432</td>
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<td>BSN437</td>
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<td>N522</td>
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<td>More possible</td>
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<td>Final Completion</td>
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<td>8/1/2014</td>
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<td>Sign-off--</td>
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<tr>
<td>Judy</td>
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<tr>
<td><strong>2014 Deliverable Goals:</strong></td>
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<td>3/1</td>
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<td>3/31</td>
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<td>4/21</td>
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<td>6/30</td>
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<td>9/30</td>
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<td>12/31</td>
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Due to CITL activities in 2013, we are now in the beginning stages of developing a Virtual Hospital that will house many future activities within the nursing curriculum. The first of these activities revolves around a product developed by Shadow Health, Tina Jones Sim. This simulation takes students through two versions (undergraduate/graduate) of a head-to-toe health assessment. In 2013, the nursing team decided to implement this sim into two new courses (Health Assessment and Advanced Health Assessment).

- Shadow Health’s Tina Jones Sim— to be implemented and tested in Q1 & Q2 of 2014.
- Other Activities in the Virtual Hospital—Informatics, ethics etc. To be tackled in Q3 & Q4 of 2014.

- Determine accessibility and Single Sign-on options (RT, Karen, Tona, Trevor, Shadow Health)
- Determine the graduate & undergraduate faculty needing training, and execute any training necessary. (Karen, Tona, Shadow Health)
- Develop orientation materials to introduce students to accessing and paying for the sim. (Trevor)
- Evaluate and integrate Shadow Health simulation into health assessment courses (BSN432, BSN437, BSN522) at both the graduate and undergraduate levels (Bruce, Karen, Tona)
- Ongoing testing during trial period for each project (Margaret)
- Build interiors of Virtual Hospital (John, Trevor, Reaction Grid)
- Add other rooms, examples, instrumentation, Informatics etc. (Margaret, John, Trevor)
OBJECTIVES 2 AND 3

Support the development of student learning activities by demonstrating curricular mapping to articulate high priority design elements.

Demonstrate student single sign-on capacity to log student time and activity in the virtual world, including movement within the virtual worlds.
RESOURCES FOR FACULTY AND STUDENTS

Sentinel City™ 2.2
Faculty Guide
v1

Sentinel City™ 2.2
Student Guide
V1

Sentinel City™ 2.2
Quick Start Guide
EXAMPLE OF A QUICK START GUIDE

Sentinel City™ 2.1 Instructions

Step 1
Download the newest version of Firefox®, and use it to run the simulation.
- This simulation will only work in Firefox® 43 or higher. Download the newest version for free here: https://www.mozilla.org/en-US/firefox/new/
- Simply follow the on-screen instructions provided by Firefox® before proceeding to the next step.

Step 2
Click here to open the Sentinel City™ 2.1 simulation and select an avatar.
- Open the link above in Firefox®.
- Select an avatar by clicking “Select” next to either the male or female characters on the first screen.
- This will be the avatar used throughout the activity.

Step 3
Listen to the voice-over instructions and expand the view to full-screen mode.
- For the best viewing experience, toggle to full-screen mode by clicking.
- Select a bus speed and then press “Start”.

Icon Legend
- City Demographics
- Neighborhood Demographics
- Quick Tips:
  ✓ Make sure your speakers are on
  ✓ Use the arrow keys on your keyboard to walk around when getting off the bus
  ✓ Click and drag your mouse to look around
  ✓ To get back on the bus, simply click “Get on Bus”.
  ✓ Close the browser window to exit
  ✓ The simulation will not work on mobile devices
  ✓ Only access on a PC or Mac, using Firefox® 43 or higher
  ✓ If you are unable to see all icons, toggle to full-screen mode in Step 3 above.
  ✓ Assure there is a strong and reliable internet connection
EASE OF USE – SINGLE SIGN ON THROUGH COURSE
EASE OF USE – TAKING THE BUS
CITY QUADRANT
DEMOGRAPHICS

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>38855</td>
</tr>
<tr>
<td>Veterans</td>
<td>607</td>
</tr>
<tr>
<td>Primary Ethnicity</td>
<td>Hispanic or Latino 46.8%</td>
</tr>
<tr>
<td>Secondary Ethnicity</td>
<td>Black or African American 13.1%</td>
</tr>
<tr>
<td>Persons Under 5 Years</td>
<td>10.9%</td>
</tr>
<tr>
<td>Persons Under 18 Years</td>
<td>20.8%</td>
</tr>
<tr>
<td>Persons 65 Years and Older</td>
<td>0.9%</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$24,672</td>
</tr>
<tr>
<td>Disabilities Under Age 65</td>
<td>12.9%</td>
</tr>
<tr>
<td>Persons without health insurance, under age 65</td>
<td>37.5%</td>
</tr>
</tbody>
</table>
CITY CHILDREN
A VIEW FROM THE BUS
A VIEW OUTSIDE THE BUS
BUSY CITY STREET CORNER
SELECTING A CHANGE PROJECT... VIRTUAL TEACHING HOSPITAL – IN 3D

Please Select your Change Project Topic
- Medical-Surgical Communication
- Emergency Department Throughput
- Operating Room Safe Surgery
- Suicide Risk Reduction
- Improving Electronic Documentation

You have selected Medical-Surgical Communication
- Read/Print the Scenario Details
- Read/Print the Floor Plan
- Visit the Situation Room

Medical-Surgical Communication Floor Plan

Medical-Surgical Communication Scenario Details

Assessing the Impact of California’s Nurse Staffing Ratios on Hospitals and Patient Care

Introduction
The California Nurses Association (CNA) has made an important finding that the ability of nurses to provide safe patient care is affected by nurse staffing levels. This study was conducted to assess the impact of staffing ratios on patient outcomes. The results suggest that staffing levels have a significant impact on patient safety and outcomes.
EXPLORE THE SITUATION ROOM
2D VERSION OF VIRTUAL TEACHING HOSPITAL
2D VERSION OF VIRTUAL TEACHING HOSPITAL CONTINUED
OBJECTIVE 4

Discuss formative and summative assessments and data analysis that provided support for continued use and ongoing development of two virtual world learning experiences.
QUALITATIVE AND QUANTITATIVE ASSESSMENTS

Formative Assessments

BSN432PE

Summative Assessments

Virtual Simulation Course Surveys

BSN432PE Community Health

BSN421PE Leadership and Management

Academic Assignment Assessments

End of Course Surveys

Student

Faculty
EXAMPLE OF STUDENT REPORT

SENTINEL CITY™

REPORT

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EXAMPLE OF STUDENT USE OF CAMERA WITHIN THE WORLD
ASSIGNMENTS

BSN421PE Leadership and Management
  Four Assignments
  Final Project
  Eight Weekly Discussion Forums

BSN432PE Community Health Nursing
  Four Assignments
  Final Project
  Eight Weekly Discussion Forums

**All curricular mapping benchmarks met for multiple terms in both courses.**
FEEDBACK FROM STUDENTS

“Enjoyed the Sentinel City experience. I felt the program was very easy to use and fun. More detailed than I had expected. More realistic than I had anticipated. I strongly recommend this program to other students.”

“Sentinel City was fun and exciting to use. Positive learning experience that brought with it a new way to visualize and interpret the surrounding community.”

“Allowed me to use a windshield approach . . . from the comfort of my home, at my convenience and on my own time. It is technology at its best.”
FEEDBACK FROM FACULTY

“This was an optimal way to teach about a windshield survey…Students could go back in and view it as many times as they needed to, and the common experience supported discussion between peers.”

“In traditional educational settings, there are many experiences that pass for a windshield survey, but using Sentinel City provided more directed observations after which several students related that they were now paying attention to these concepts in their home community. This transference is valuable to students’ learning.”

“This is a tremendous tool for our students and a wonderful vehicle for us to teach about community nursing… [the program lets] the students explore as many times as they would like, and each foray into Sentinel City allowed them to observe something new. The online format also is very convenient, allowing them to interact when they are able, a documented benefit of virtual simulation… immersion in Sentinel City can only enhance students’ learning. They will have more control to examine and explore.”

“As an instructor, the simulation allowed me to know exactly what the students were viewing so that I could draw connections between their reading and what they were seeing.”
PRE AND POST SIMULATION SURVEYS

Overall have a greater than 80% student response rate to pre and post surveys in virtual simulation courses across the university.

BSN432PE Simulation Surveys:
In BSN432PE 6.67% of respondents strongly agreed with knowing what a windshield survey is whereas, 100% strongly agreed at end of course. And, 66.66% felt confident in doing a windshield survey at the beginning of the course as opposed to 100% at end of course.

BSN421PE Post Simulation Surveys:
In BSN421PE 83% (3D) and 86.66% (2D) of respondents agreed/strongly agreed with: There were enough opportunities in the simulation to find out if I clearly understand the material and 77% (3D) and 93.33% (2D) of respondents agreed/strongly agreed that the simulation resembled real life.
END OF COURSE SURVEYS

Students
In both courses, 100% of students responded yes to:
Did you achieve, or will you achieve upon completing your studies, the goals you had when you started the course or program?
Would you recommend these studies to a friend?
All things considered, were you satisfied with your studies with us?

And, self-reported:
In BSN432PE, 95.83% and in BSN421PE 100% of the respondents reported that the learning materials, including the text, contributed to my learning.

Faculty
In both courses, 100% of faculty responded to faculty survey that these courses do not need revision.
REFERENCES


Questions?

CONTACTS

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www.americansentinel.edu