

Innovations in Teaching Using Technology Grant 2017

Application Form

Application Deadline: September 30, 2017

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Year hired: 2016 and 2013

Project Title: Joint Emergency Preparedness Education through Virtual Reality Collaboration

Courses that will benefit from this innovation

Nursing Concepts, Global Health and Diversity, Earth Science Lab, Geoscience of Natural Disasters

Context for the teaching methodology and its implementation

Emergency preparedness education is a critical component of the Nursing and Allied Health program and like all curriculum must be kept up to date. The Geography, Planning and Sustainability program also offers courses in Natural Disasters and planning and has already employed augmented reality technology. We are proposing to formalize and expand this training to keep abreast of the latest teaching and technology tools.

How they meet the criteria of innovation, scalability, and adaptability

We are proposing a joint effort to modifying what and how we teach to facilitate learning in today's changing environment by implementing this new technology together. This adaptation of new technology will enhance learning and offer a new and stimulating learning environment and culture. The application of virtual reality (VR) is a unique method of communicating information to students in various settings including allied health professions and working in cross program setting will be a valuable experience for students in both programs. For all of these reasons using VR is innovative, scalable, adaptable, and applicable to teaching students in acquiring the knowledge, skills, and attitudes essential to be safe, competent future leaders in nursing and geography.

Objectives of the proposal

Our objectives are to bring new technology and associated skills to our programs through the purchase of virtual reality equipment is readily adaptable and can be shared in an interdisciplinary manner including the faculty in the department of environmental science, Rowan at RCGC and Rowan University School of Nursing. They will be initially tested when teaching emergency preparedness skills. All of these curricula address emergency preparedness skills.

Although Rowan University has CAVE technology, the use of this technology is cost prohibitive. This application outlines how VR can be used in allied health science curricula in a low cost, value added manner. The virtual reality headsets will initially be used to teach emergency preparedness. The environmental science faculty mentor Dr. McGlynn has experience that will guide and assist the nursing and allied science faculty in this effort. Today's VR headsets are practical and offer a variety of possibilities in the classroom. They offer the ability change and enhance learning irrespective of class size, curriculum, discipline, and learning environment.

The use of computerized technology is rapidly growing in the classroom and in healthcare. Many computer-based programs use avatars to develop allied health science skills. Although this has usefulness, the VR method employs a three-dimensional educational tool that simulates real-life scenarios, thus providing a high-fidelity simulation. There is a dearth of literature about how to bridge the gap between knowledge & application with the use of VR in allied health sciences and none on collaborative efforts between departments/schools. This will be exciting for students and faculty and has additional advantages of applying this teaching strategy is that it enables students to repeated practice sessions, exposes students to varied conditions, reflect, and it is portable (CNI, 2012).

The National Council of State Boards of Nursing (NCSBN) released the results of a landmark, multi-site, RCT exploring use of simulations in pre-licensure clinical nursing education. Evidence suggests simulation can be substituted for up to 50 % of traditional clinical experiences under conditions comparable to those described in the study (NLN, 2014, NCSBN,2014).

Description of the specific innovation.

This proposed project is designed to introduce VR in a cross curriculum, affordable, and small trial manner to validate a teaching approach that takes traditional simulation one step further into an emersion experience into a virtual world. It will evaluate learning outcomes in both disciplines and student perceptions regarding the inclusion of virtual reality simulation as a teaching strategy. It will be tested across disciplines and in the content area of emergency preparedness. In addition, a project to explore readiness of student's use of virtual reality simulation as a learning tool.

Why this technique is innovative

The project is innovative because it blends unique pedagogical practices while employing a host of interactive learning methods that engages multisensory instruction. It constructs a realistic virtual world whereby students can practice core skills in emergency preparedness. This will promote learning on many levels. It challenges students to rethink traditional modes of coursework and brings synthesis of information to the forefront in an interactive, enjoyable, realistic and value-added way.

Students can visualize, navigate and interact with a 3-D virtual environment. It is anticipated a system that use simulations which are viewed through a head mounted goggles. The goggles display a 360 view of scenarios that can be linked to a program downloaded onto iPhones or Android phones. This adds to the realism and immersion of an emergency situation. Through the use of the VR headsets, we will be able to provide students with a unique opportunity to view firsthand how to function as emergency response team members.

Students will be asked to read about public health emergencies, review lecture material and then practice new skills in a virtual world. This innovation is rarely used in nursing curricula and hopefully will be seen as a positive learning experience. The grant will assist the ability of more students to use cutting edge technology in the learning process. If funded our redesigned will enable many students over many years to enter a new realm of learning. This innovation challenges & engages students to shift learning from textbook only into a futuristic learning method. This teaching method is designed to challenge students to apply skills beyond the basics.

Evidence of Project Impact

High fidelity simulation provides the most realistic experience for teaching new skills (Australia DOH). Surface learning is rote, involves memorizing and short-term memorization; often a teaching paradigm focus (Hunsker, 2012, Barr & Tag, 1995). Strategies that enhance long term learning include: create meaningful experiences, active learning, and reflection (Kolb, 2015, Anderson, L.W., Krathwohl, D.R., Airasian, P.W., Cruikshank, K.A. et al. 2001, Bloom 1996).

It provides students with the ability to expand their skills in new, unique and innovative ways promoting quality emergency preparedness skills. The focus of this approach will be to incorporate skill development in a safe controlled environment. Core skills can easily be taught with a simulation approach (Masten, 2001). VR programs provide students with a unique learning opportunity to practice skills in a safe environment available to them anytime, anywhere.

Plans for evaluating and sustaining the innovation.

When these students make their way into a job market they can display a portfolio that contains a unique learning experience and confidence in their skills. In the past, Rowan University's GPS Program has used this technology in its Geoscience of Natural Disasters and Earth Science Lab classes taught by Dr. McGlynn. The technology has been well received and adapted to by students. Dr. McGlynn has already shared his experience at the Rowan University Academic Technology Week 2017 conference and at the 2017 Rowan Global Online Symposium.

We are grateful for your consideration and if awarded a grant we would meet regularly to discuss the implementation, compare notes and uncover best practices. We would also be honored to share our collaborative efforts at 2018 the Rowan Online Symposium, Academic Technology Week 2018 and other professional development opportunities.

Supplemental Documents

The following supplemental documents are attached:

- 1) NCSBM Recommended standards
- 2) VR Head Set Materials
- 3) Student Comments
- 4) Useful Web Locations
- 5) References

Supplement 1. NCSB Recommended Standards for Simulations

The National Council of State Boards of Nursing (NCSBN) conducted a large, comprehensive study concerning the use of simulation as a substitute for traditional clinical experience. Their research indicated that high-quality simulation experiences could be substituted for up to 50% of traditional clinical hours across the prelicensure nursing curricula (Alexander. M., Durham,C.,Hooper,J,,et al., 2015).

The NCSB standards include:

Standard I – Consistent Terminology

Standard II – Assure Professional Integrity of Participants

Standard III – Provide Clear and Measurable Objectives

Standard IV – Facilitation with Multiple Methods

Standard V – Provisions of a Proficient Facilitator

Standard VI – Debriefing Process That Improve Practice Through Reflection

Standard VII - Participant Assessment and Evaluation

Supplemental 2. VR Headsets Information

QPAU headsets \$4.49/ea

Requesting 100 head sets

Total Material Cost= \$449.00

Supplemental 3. Useful Web Links

<https://www.youtube.com/watch?v=skKKBQpvsII>

<https://www.youtube.com/watch?v=yFBOXSmTTi4&t=124s>

<https://www.youtube.com/watch?v=o3a1fkLsNS4&t=74s>

https://www.amazon.com/Cyberlink-DVD-EH00-RPU0-00-PowerDVD-17-Ultra/dp/B071Y3KNMR/ref=sr_1_1?ie=UTF8&qid=1499909371&sr=8-1&keywords=power%2Bdvd%2B17&th=1

http://www.ebay.com/itm/Google-Cardboard-3D-Virtual-Reality-Glasses-DIY-Kit-for-Android-Apple-45mm-Lens/252797253083?_trksid=p2047675.c100005.m1851&_trkparms=aid%3D555018%26algo%3DPL.SIM%26ao%3D2%26asc%3D44757%26meid%3De419b4423fee42dd8288b562536dab82%26pid%3D100005%26rk%3D2%26rkt%3D6%26sd%3D253031727923

<https://www.youtube.com/watch?v=xAGD6AjIZqk>

Supplemental 3. Exemplars of Student Comments (Environmental health)

"This class could literally save your life. Not many classes can say that."

"I learned an incredible amount of useful information in this class, even though it wasn't in my major. Professor McGlynn is very enthusiastic and very knowledgeable but still fun to talk to. He is always ready to answer a question and he will go to great extents to make sure we really understood the material. I had a great time in this class and I would recommend it to anybody needing a lab."

"I like how this course was actually really getting the students out in the field and doing some of their own research such as water testing lakes and rivers and even doing research on major rivers! It was fun and very educational."

"This course has very important content that should be a requirement for all majors. The instructor is amazing and his love for geography shows through his enthusiasm to teach every week."

"Professor McGlynn is an inspiring, enthusiastic, and knowledgeable collegiate educator. As a current graduate student in the field of Geoscience, I owe much credit to Professor McGlynn for supporting my passion for natural sciences and providing me with opportunities to grow in the field of Geography/Geology. Professor McGlynn challenged me in the classroom and included me in many professional projects throughout my undergraduate career, helping me to develop a greater resume for my pursuits in graduate studies..."

..."Professor McGlynn's connections to NOAA also provided for fantastic hands on classroom lab activities. Every student that completes the Department of Geography & the Environment program knows that when they completed Professor McGlynn's courses they not only sincerely enjoyed and benefited from the class, but left feeling like they were part of a small community. A memorable and positive influence, Professor McGlynn truly understands how to make learning at Rowan a special experience."

Supplemental 4. References

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DOI: [http://dx.doi.org/10.1016/S2155-8256\(15\)30783-3](http://dx.doi.org/10.1016/S2155-8256(15)30783-3)

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