Summer 9-1-2020

Using Virtual Reality in Teaching Education Students

Edward G. Iglesias
Stephen F Austin State University, iglesiase@sfasu.edu

Lauren Burrow
Stephen F Austin State University

Dr. Lauren E. Burrow and Edward Iglesias

Title: Using Virtual Reality in Teaching Education Students

Project Background

The Emerging Technology Laboratory opened in the summer of 2017 as a Virtual Reality-based Makerspace. The early focus was on recruiting faculty who could use either VR or 3D printing as part of their pedagogy. An early recruit was Dr. Lauren Burrow who during the course of two years brought her pre-service teachers enrolled in various pedagogy courses to the Virtual Reality-based Makerspace at the Steen Library. The purpose of this exercise was to expose new teachers to the possibilities of VR in Education in providing Virtual Field Trips. For many, Makerspaces allow individuals to make what was previously "impossible" or what was previously relegated only to imaginations into a reality. However, in rural settings, VR spaces allow teachers to take what is "real" and make it available to their students. One of the strengths of VR is the ability to take the user to locations that are simply inaccessible either because of cost, museums in Europe, risk, or outer space. Additionally, VR is useful as an "empathy engine" that can safely expose the user to situations to better understand at an emotional level the "realness" of a virtual experience; for example, witnessing the inequities of homelessness or the following the perilous journey of a refugee. Essentially, VR creates an opportunity for students and teachers to become both consumers and creators of spaces that are otherwise inaccessible to rural communities.

This chapter will go into detail about the equipment used, the overall environment of the makerspace (including sound proof rooms), planning that went into programming as well as efforts made to recruit faculty. Information will also be provided on how instructors can frame

structured guidance to elicit transformative experiences with students, as evidenced by anecdotal feedback from Dr. Burrow's student-users, comparative data regarding pre-service teachers' confidence and commitment levels involving VR-integration in classroom spaces, and notes on how this experience could be improved.

Supplies

- 4 Oculus Rift VR Workstations
- 2 HTC Vive VR Workstations

Instructions

1. Prior to coming to the VR Makerspace, students read a recent article about the destruction of about one quarter of the Great Barrier Reef due to coral bleaching and the need to turn attention towards protecting the remaining reefs for wildlife, weather, and tourist revenue purposes. The pre-service teachers completed a knowledge- and attitude-based reflection based on article content.
2. During the virtual field trip, students viewed theBlu experience (https://store.steampowered.com/app/451520/theBlu/) in the stand-up VR spaces. After their assigned field trip experience, students were able to explore VR scenes of their choosing at the sit-down stations.
3. After completing the VR field trip, students wrote up how the VR experience had impacted their knowledge about and attitudes toward this potentially endangered natural resource.
4. The class concluded with open discussion about ideas for and the importance of finding ways to use VR-based tools to increase field trip accessibility for their future students.

Suggestions/Tips/Cautions

While allowing students "free choice" can be fun, consider encouraging students to engage in "free play" during follow-up visits to make the most of limited class time. When working with large groups, we suggest having students schedule their own VR visits by a certain date, and then hosting class discussions after visits are completed; otherwise, enforce "viewer time limits" so that all students receive an equal experience. With large groups, pay attention to ocular hygiene; wipes seem to be a good solution but must be administered with care as they can damage the coating on the lenses of the unit.

Make sure to preview the scene yourself so that you can answer student questions about the field trip, and make sure the staff running the VR-experience are also familiar with the pre-chosen activity so they can guide students to scenes of interest or be ready to troubleshoot if students "get lost" during their viewing. Beware that some students may experience situations which are uncomfortable when using VR. If a phobia is known of ahead of time then alternate arrangements can be made; however, we had at least two instances of students who did not know they were afraid of being underwater until they were in that simulation. Finally, both HTC and Oculus now make wireless units, and these are preferable since the trailing cord tends to "shock" users out of the experience if they brush against it.

Reflections

From the instructor perspective, this VR-experience provided an engaging, learning-based field trip to a "place" that most of the pre-service teachers had never experienced. The purposeful selection of the VR-scene helped to both build students' awareness about ecological damage that is currently occurring to coral reefs while also inspiring them to imagine the positive impacts of and innovative possibilities for VR-field trips in K-12 classrooms.

For the student participants, seeing the coral reefs in a virtual setting helped build empathy towards scientists' calls to protect these natural wonders. One student reflected: "It's hard to care about something you don't know much about, but the VR-trip brought the ocean 'to life for me' and made me curious to learn more about other parts of the world that might be endangered." Many students confirmed that the experience helped them reconsider and get more excited about the potential uses of VR-field trips in their future classrooms, "Before this I couldn't really think of many places to take my students, but now I am so excited to take them all around the world." Another student, who had never been diving, shared: "It blew my mind. I couldn't believe how real it was or how immersed I felt. It was the most incredible feeling." But beyond the "wow!" factor, all the students agreed that there are so many possibilities for VR-use in educational settings, with many sharing ideas beyond just field trips. One student stated, "This would be so cool to use for science labs…I would much rather have my students dissect a virtual frog than a live one." And several students continued to return to the VR-Lab after the course ended so that they could "get away from the stress" of their studies or to "just explore" another new place.

Overall, the activity was a success: it helped build a productive partnership in which the professor was able to leverage existing University Library services to enhance her course instruction and it got pre-service teachers excited about innovative learning opportunities for their future students.