

BRYAN A. BROWN, PH.D.



Culturally Relevant Virtual Reality



Virtual Reality and Culturally Relevant Pedagogy: New Possibilities for Using Technology to Initiate Students’ Application of Science Ideas to Community Issues

PROJECT SUMMARY

This project explores the design, implementation, and assessment of a science curriculum that uses virtual reality (VR) software. Using the principles of situated



cognition and culturally relevant pedagogy (CRP), the curriculum sought to provide students instruction about science by teaching them about the science happening in their community. Much of the existing virtual reality software in science attempts to take students out of their communities to show them scientific phenomenon. While this has potential, it can subtly send a

message that science is not for people in their community. In taking a culturally relevant framework into the realm of VR, students may be better able to see how science is vital to their lives. The project involved the development of a pair of CRP based VR lessons. In these lessons, students learned science and were taught to apply that content to meaningful sociocultural discourses in their communities. The research team will assess three things: (a) its impact on students’ sense of belonging to the community, (2) their appreciation of the role of science, and (3) their understanding of the content. It will also explore the teachers’ perceptions of the value of teaching science integrating CRP and virtual reality.

WHAT WE DID

To explore the impact of virtual reality in urban classrooms, we partner with 3 participating schools (see Figure1). In each school, students experienced science lessons that were designed to show them how science impacted their local

community. Each lesson was hosted on the Nearpod web-based instructional platform. For each class every student was provided a cell phone and goggles to use for the lesson. In the lesson, student used 4 VR360 lessons to learn the concept of food chains. To explore how these lessons impacted students’ learning and experiences with science we used two assessments; (1) The Changes in Attitudes about Science

Figure 2: Representation of the study design



Relevance Survey (CARS), and (2) a post-interview to assess their perceptions of their experience. These independent data sources were examined together.

WHAT WE FOUND

In analyzing the data, we found two primary findings. First, the data revealed that students experienced a positive shift in their attitudes towards science. The students revealed a more detailed understanding of how science mattered to their life. The second result was an intriguing revelation about how students thought about the science content being taught. Table 2 offers some examples of how students participating in the project made an intriguing correlation between the content of food chains and the implications of this concept on their

Code Name	Code Description	Frequency	Example
Health Justice	Instances of talk where students describe how lessons learned from VR and/or previous lived experiences shape their thoughts and feelings about justice regarding health disparities as it pertains to their community. Also may include calls to action – both individual and collective	24 instances across 13 interviews	“This lesson was connected to my community because there are a lot of people in my community that eat unhealthily. I kind of want help them so that they can eat healthier.” (Brenda, INT 2017)
Economic Justice	Instances of talk where students describe how lessons learned from VR and/or previous lived experiences shape their thoughts and feelings about justice regarding economic inequality as it pertains to their community. Also may include calls to action – both individual and collective	7 instances across 4 interviews	“Advantages for the store is the money or the government for the money.” (Ronaldo, INT 2017)
Environmental Justice	Instances of talk where students describe how lessons learned from VR and/or previous lived experiences shape their thoughts and feelings about justice	6 instances across 5 interviews	“Well, if people keep buying the plastic from junk foods, they could throw it into the sea and damage the birds.”

regarding environmental inequality as it pertains to their community. Also may include calls to action – both individual and collective

(Aaron, INT 2017)

community. Students discussed how the concept of food chains could be connected to Health Justice, Economic Justice, and Environmental Justice. For example, one student explained,

The stores have an advantage and the government also has an advantage because they're in it for the money. And the products that they – or the food that they sell. It is more like – it's more like drugs because they get addicted to it and then it's more like a habit of them eating it, and then when it's a habit they just come to it again and again and it's a bad habit, so that means – the better the habit the more money the – government gets (Ronaldo)



This type of intriguing result highlighted how students developed conceptual understanding of phenomenon that went well beyond rote learning. Ultimately, the 5th grade students participating in the study demonstrated a detailed understanding of the science phenomenon being studied while being able to draw deep cultural connections to the science being

taught. The results suggest that science taught using culturally relevant virtual reality has the potential to help students re-envision how science matters to their community while learning traditional science content.