Not just games: The broader potential for VR in schools

Lisa Castaneda, Manrita Sidhu and Michael Scanlon

Virtual reality is starting to make its way into classrooms across the country. Although the VR content itself is engaging and interesting in its own right, VR has much more potential for learning. Our work with students in seven different schools last year showed us that it is not just content consumption and gaming that kids are thinking about when they consider VR. Though students definitely told us how much they liked being on a shipwrecked boat deep under the sea, or trying to communicate with one another as they solved a challenging puzzle while immersed in a different world, we were intrigued by the number of students who really engaged with VR in a much broader sense. Whether it was as artistic visionaries creating 3D art pieces, working in VR game engines to design content, creating 360 videos for other students to watch, or even exploring the functionality of VR itself, there was a great deal of learning going on. In fact, virtual reality seemed to tap into student interest in computer science in new ways. As this technology becomes more accessible to schools, we'd like educators to consider the breadth of learning that can occur within VR.

"How does this thing work?"

Though we anticipated that students would be intrigued by the idea of learning with the more advanced VR headsets, we were somewhat surprised by how many students referenced an interest in how virtual reality actually works. One group of high school students in an advanced computer science class immediately wanted to take apart their advanced headset so they could understand how it worked (Their teacher was able to pull an article from a computer magazine that took a headset apart for them, as he was not yet willing to sacrifice their own classroom headset for this purpose.)! This curiosity about how VR could work and how some of the more advanced headsets could track movement was impressive and even elementary aged students expressed delight and fascination about the technology itself. They asked how it was possible and genuinely wanted to know more. Teachers can use the hardware itself as a discussion point for technology learning.

"I think I can create something like that."

In addition to the interest in the physical hardware, students in many of the classes we worked with became intrigued by creating content. Some felt compelled to do so because they thought they could do certain tasks better than the developers. Others had visions for things that had not yet been created in VR and wanted to capture those ideas. Still others had experience in creating regular 2D or 3D video games and wanted to try their hand at the challenges of developing in VR. User friendly VR game engines like Unreal and Unity are increasing their presence in education, and have some pre-made assets, online tutorials and basic instruction which make it possible for students to begin creating relatively quickly, even in VR. Many students commented that they primarily saw VR as a "creation tool." One student with an interest in computer programming noted, *"I think requiring us to make VR worlds and test them out would be a major boost in programming knowledge."*

It is worth noting that even students with limited programming experience were eager to create artistically in software like *Tilt Brush.* Tech class teachers often used existing content as a jumping off point for discussions involving programming and design with their students. Experiencing content in order to critique, expand and build on ideas was a key aspect of the implementation of VR in the more advanced courses. A high school student stated, *"The applications for this [are] endless."* We see many potential opportunities to augment learning through the creation of content and students did as well, referencing science, medicine, even driving and automotive technology as subject areas where VR would be useful and relevant.

One school we worked with focused exclusively on the creation of 360 videos for virtual reality. Students in a media course at the middle school level grappled with issues surrounding narratives, what constituted "valuable" video content, and the technological challenges of recording an interesting piece in 360 video. The editing process was challenging but doable, even at the middle school level, and students faced really interesting creative direction problems as they realized that content looks very different in 360 film. An early assumption of many kids working in 360 video is that *any* content would be interesting just because it is in 360. Students quickly learned that was not the case and did some hard thinking to determine how to convey a story that really captured the essence of 360 video technology, something they had not spent time doing before. As students observed other filmmakers' work in VR they were inspired to develop their own visions and run with them as content creators.

"That wasn't something I considered before."

Virtual reality definitely presented itself as an interesting learning option for kids inclined towards technology-based careers. Many of those students already knew about VR, had watched their favorite YouTubers play around with it, or had heard/read about it themselves before trying it at school. Another element that surprised us was how VR attracted students to computers in a way that other technologies had not done thus far. Students articulated that VR provided a fundamentally different experience. For instance, in one high school, a teacher observed that students outside of his regular computer science class, who had heard he had an advanced VR headset, came in, tried it, asked questions about VR, and then enrolled in the course because they were interested in exploring computer science, and now saw virtual reality as an avenue to do so. Though we did not specifically ask students about VR driving an increased interest in computer science overall we saw in student responses, and heard anecdotally from teachers, that students in their courses pursued further work in design and computer science because of interests developed as they were using VR. Some of the more narrative experiences in VR really resonated with students as storytellers as they saw great potential for experiencing books they had read or in capturing powerful moments in 360 film.

From a variety of standpoints, virtual reality in schools is an interesting case study in student interest. What we find is that when students consider VR, they see well-beyond simple content consumption. In fact, our research showed that the ability to directly interact with their content (versus passively watching it) was a huge draw for students of all ages. Our study indicated that

overwhelmingly, kids feel inspired by virtual reality, want to ask questions about it, and desire to bring it to their schools. Engaging with new technology can help them tap into their creativity and think critically about how they learn. They feel excited to actually experience technology when it is on the cutting edge and see potential for learning from virtual reality that they don't see in other technologies. We will close with a thought from a student that discusses how virtual reality engages student interest. Though our research focused on the learning aspects of virtual reality, we as educators must not forget that enjoyment and fun in learning is a key element of student interest:

> *"I have always had the same opinion that VR would be fun. If someone can figure out a way to make learning fun I think we would have less kids that skip school and fail because it will catch their attention and make them want to learn. I think this would be a huge benefit to our society."*