

WHAT VR IN THE CLASSROOM LOOKS LIKE

New low-code
development tools
make VR more
accessible for students

REBLENDED REALITY

The Blended Reality Laboratory is an applied research hub for those exploring ideas that operate at the intersection of real and virtual worlds. Located at the Center for Collaborative Arts and Media (CCAM), the Blended Reality Laboratory draws upon CCAM's mission to connect the arts and sciences through experimental technology and collaborative research. The laboratory and its projects are underwritten through a hybrid structure of academic, industry, and applied research support.

In partnership with

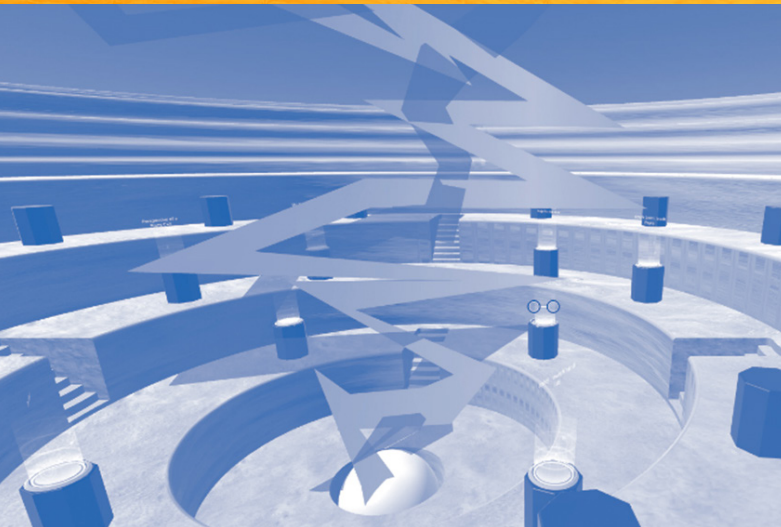


Published October 6, 2022

This work is licensed under a Creative Commons Attribution 4.0 International License.

Learn more about the Blended Reality Project at <http://blendedreality.yale.edu>

Yale



It's a question Justin Berry has heard dozens of times in meetings with professors, during roundtable discussions at conferences, and by journalists, potential investors and sponsors: What does virtual reality (VR) in the classroom look like?

As principal investigator for Yale University's Blended Reality Laboratory, Berry knows it's a question that he should be able to answer. After all, it's central to the program's mission to investigate the intersection between real and virtual worlds in the classroom.

Academia has long struggled with ways to introduce new media to the classroom in a way that makes the sometimes-complex technology accessible and approachable. Just think about how long it took filmmaking or using the Internet for research to truly become integrated in traditional teaching methods. Years, or decades after the technology became ubiquitous in business and other segments of our daily lives.

Given the potential for VR to radically change how people create experiences and consume content, accelerating the process of getting students with limited or no coding expertise immersed in the technology is of critical importance.

The Coding Barrier to Adoption

Like any digital platform, creating a powerful, meaningful experience in VR can be overwhelming for users with little or no coding experience. Students participating in Yale's Blended Reality Program typically use Unity, one of the dominant development environments for both arts and

industry to build scripts that they can deploy to just about any medium—whether it's a 3D model or animation to a PC, website, PS4 or iPhone. What Berry finds interesting about Unity is that it acts as a central development space that connects these scripts in a single place, allowing students to get in right away to create interactive VR experiences from anywhere—even remotely from HP ZBook laptops that the school provides students.

“Using these powerful platforms can be intimidating for people who haven't coded before, creating a barrier for many students—especially in the humanities,” Berry said. “This is a problem for the industry because new technologies tend to take on the personality of their typical early adopter—leaving other, less casual users behind. Like any new medium, it's important that VR becomes more inclusive, reflecting real life experiences that deal with issues that are relevant to a wide array of people.”

Berry often makes his point by asking people about their perception of VR today. Most mention first-person shooters and are unaware of VR's potential to radically change medicine, tourism, architecture, entertainment and education among other industries. If the process of creating VR experiences isn't opened up, Berry argues, the medium risks being limited to this single type of experience. While VR is a great way to play games, it is not a gaming medium in the same way that computers are great gaming devices but can hardly be adequately described solely in that limited context.

When non developers do get interested in VR, their projects tend to be inspired by the kinds of projects built by massive teams with lots of resources and time. Berry recalls an art student that used VR to bring to life her experiences



growing up in her native Iran. 3D figures with video images projected on their bodies walked around a virtual space with the audio and the video sourced from recordings that she asked fellow immigrants to record on the streets of their adopted countries. The user could walk around the room but couldn't interact with the silhouettes. They would simply walk through the user if their path was blocked—traversing the environment until they bumped into a wall where they simply turned around and walked the other way. There was almost no code in the project, just a couple scripts to power the animations, but the experience was deeply affecting and a powerful embodiment of the immigrant experience.

“The student was very curious and passionate about using VR to express herself through her art. Rather than be turned away from the opportunity out of fear because she did not know how to code, she leveraged the simple interactions available to her to create uniquely compelling content,” Berry said. “Obviously we can do more when we have expertise and confidence, but what makes non-specialists willing to gain that expertise and discover that confidence is offering them low-stakes ways to enter the medium and discover its unique affordances.”

A Gateway to Creating Powerful VR Experiences

Berry made it his mission to find a way to make VR more accessible to students with limited or no coding experience. Operating on the mantra of Simple, Compelling, Imperfect, the professor spent several months in 2020 with recent

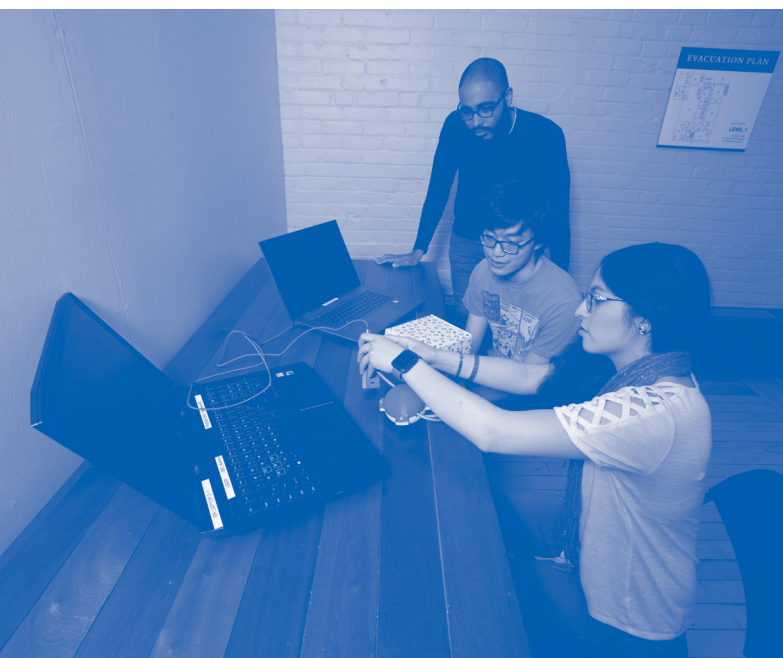


graduate Bobby Berry building a toolset that let students access the power of code while focusing on the power of meaningful interactions rather than the technical hurdles of scripting. Called Verb Collective, the platform contains more than 50 simple scripts such as “to touch” or “to grow” that users can deploy within Unity to quickly generate custom experiences. Stitched together, the actions can be used by students with little or no coding experience to create dynamic interactions in a virtual world.

“VR is such a powerful medium in terms of presence and immersive qualities, and you can't really understand these experiences without being right there in it,” Berry said. “Verb Collective makes creating these immersive experiences so simple. Students can move actions and sounds around, create basic interactions and give creators what they need to produce a powerful experience for other people. At the end of the day, what they need is not something optimized or extremely robust. What they need is a way to play with the possibilities in the context of the medium itself.”

Most importantly, low code VR allows students to quickly get up to speed and start experimenting in the medium right away. A language student or political science professor with no technical background can jump right in with no barriers or opportunity to get discouraged by a lack of functionality. Anyone—whether they have the coding knowledge or even a passion to learn—can make rich, interactive experiences in a single day.

And that, according to Berry, is the most exciting element of virtual reality: opening it up and allowing anyone with an imagination to get in, get their hands dirty and create



powerful experiences that they can share with other people. New media is new, and that means that people going in with fixed expectations and predictable outcomes are already missing out on the opportunities that lack precedent.

Yale community members participating in the Blended Reality Program include students creating a virtual zoo for kids undergoing chemotherapy to visit because their compromised immune systems are too weak to go out into crowded spaces, professional dancers using artificial intelligence (AI), machine learning (ML) and VR to discover new ways for their bodies to move, nurses creating augmented reality (AR) applications that overlay a digital representation of a patient's circulatory system so they can non-intrusively identify an appropriate vein to inject medicine, a team of mechanical engineers collaborating together to invent a VR controller specifically designed for people with disabilities and a language professor building an immersive experience with video and audio collected from her village in Indonesia and then encouraging her students to build similar environments from the places they are studying.

All these projects were imagined and developed by non-developers—people who are users or close to users in the field.

So, What Does VR Look Like in the Classroom?

Berry uses Verb Collective while teaching his class “3D Modeling for Creative Practice” in Yale’s School of Art. Students are asked to do things like create social VR worlds meant to visualize a patient’s brain, then taking that patient on a tour of their brain in the company of doctors trained

to understand the types of tumors they possess. None of the students created a perfect system, but because they approached the challenge through experimentation and play, they developed concepts that were unique and that have inspired multiple grant applications. Expertise is powerful at working with what we know, but play is how we learn and how we innovate.

“VR in the classroom is not about the model of headset or the layout of the lab,” Berry said. “It is about cultivating approaches that bring in more voices and more diverse perspectives. It is about finding ways to play with VR, not as though it were a game, but as though it were a piece of clay that we can touch and squeeze and mold into meaningful shapes.”

Berry uses accessible VR to teach people that they don’t need to be experts in a technology to create meaningful experiences in it. People, and especially students, face enormous pressure in the modern world. Expectations are through the roof, and people are increasingly compelled to master a skill, show proficiency or achieve some objective metric that builds a reputation or a perception around them as a person. What if students were encouraged to spend time learning something new or creating an experience with no expectations of being judged or evaluated?

Imagine a world that is open to experiment, to taking chances with no risk involved? Berry wants to make that possible for students navigating the pressures of university life and coming of age. The key, he insists, is making the technology accessible to anyone willing to give themselves a chance. The greatest advancements in technology happen in garages, the same way that HP was created, when inspired individuals acquire the courage to do the unthinkable and attempt the unprecedented.

