

Students at the Yale University School of Arts working in the Center for Collaborative Arts and Media (CCAM) are pushing the boundaries of their own imaginations by producing life-sized, painting-like creations in three-dimensional spaces. Their instructor introduces them to virtual reality (VR) using [Tilt Brush](#), giving them the tools to create, manipulate, and reimagine their artworks from a completely new perspective.

Yale University's Center for Collaborative Arts and Media (CCAM) is an interdisciplinary arts research center that brings together students from a variety of majors, including visual art, design, film, music and sound, performance, and computer science. CCAM is open to all Yale students and faculty who want to incorporate creative art into their studies.

In the 2017–2018 school year, Yale School of Art's lecturer and Assistant Director of Digital Media Anahita Vossoughi, introduced VR and Tilt Brush by Google into her Basic Drawing and Visual Thinking classes. Tilt Brush is a room-scale VR app that lets you paint in 3D space. "I wanted to broaden my students' sense of what is possible," she says. An accomplished painter and sculptor, Vossoughi has never been limited by traditional boundaries. "In my painting practice, paintings are not just on the wall," she says. "I take them off, paint on the floor, turn them around, and think about them as objects."

So when Google introduced Tilt Brush as a tool to paint in 3D spaces with virtual reality, Vossoughi was eager to see what it could do. "I experimented with Tilt Brush by importing my own collages, drawing on them, and exporting them," she says. She wanted to share this and other "alternate creative processes" using VR with students—and bring their imaginations to life.

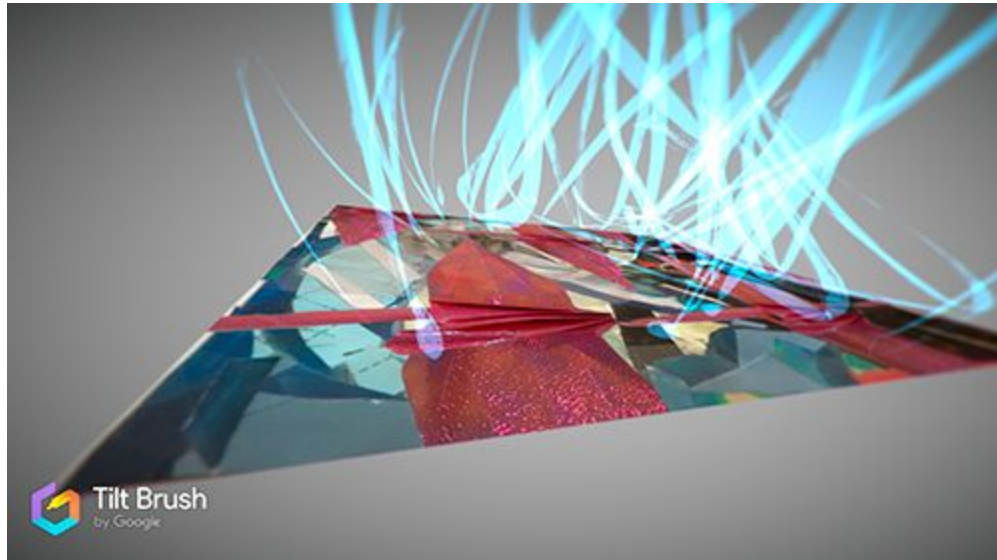
Immersing Students in a 3D World of Possibilities

Basic Drawing is a requirement for Yale School of Art art majors and may be taken as an elective by all other majors. "They're learning about line, surface, texture, proportion, one- and two-point perspective, chiaroscuro [concepts of light and dark], and other traditional drawing concepts," she says. Once her students have covered the basics of introductory drawing, she introduces them to Tilt Brush and VR.

Tilt Brush offers different brushes, effects, and tools for students to paint virtual creations in 3D. Because most of her students have never experienced virtual reality before, Vossoughi spent one class showing them how the Tilt Brush app and controller work with the HTC Vive headset. "It's not difficult for them to learn how to use. In fact, it's amazingly intuitive! Once they get the Tilt Brush basics down, they're ready to go."

"Students are learning how to draw what they see, which is challenging," Vossoughi says. "Making something flat that is originally spatial can be a difficult task. With Tilt Brush, students literally draw in space using their bodies and line in a spatial, physical way. It can be used to explore formal elements like line, shape, color, and texture in a different and new way. In a drawing class for example, it is difficult to explain the concept of line following form or a directional line. Having students literally create forms in space as though they are using wire really helps them understand that concept. This is one way in which Tilt Brush is a tool that is literally an in-between (2D and 3D) drawing space."

In her Visual Thinking course, Vossoughi has students scan and import a two-dimensional collage into Tilt Brush. “Using color theory concepts, students can modify or expand upon existing color schemes,” she says. Some students animate their collages by adding starbursts, sparkles, shooting rays of light, and other Tilt Brush effects. “Also, they are able to scale up their small collages and work ‘huge,’” she adds. “They can draw on the front or the back, turn them around and upside down, eventually export them for print, then paint or draw on them again.”



Tilt Brush painting in progress by Yale student Lauren Gatta



Lauren Gatta's Tilt Brush painting, printed with collage

The goal of using these tools, says Vossoughi, “is not finding an endpoint, but opening things up—giving students an expanded sense of what’s possible in drawing and visual thinking. It’s exciting for them to use Tilt Brush and VR to create their own process—something that never existed before. The exploration that can happen is limitless.”

Imagining the Future for VR in Arts Education

Vossoughi says while using VR and Tilt Brush in her classroom “feels like a beginning,” she expects more arts educators will adopt these technologies once they discover their potential as powerful teaching, learning, and creation tools.

Her students learn “how to cultivate a different, quieter, contemplative space in VR,” and notes that Tilt Brush and VR gets them excited about learning art skills and exploring art concepts.

“Arts education is always pulling in new technologies and expanding the toolbox that students have to make things with,” Vossoughi says. “Just because it’s technology doesn’t mean it’s not improvisational. So I think much in the way that the Adobe Creative Suite made its way into all art schools, I am sure that VR will too.”

Organization Profile

The [Yale University Center for Collaborative Arts and Media](#) is an interdisciplinary arts research center that bridges diverse arts disciplines and fosters critical inquiry at the intersections of visual art, design, film, music/sound, performance, and computer science. Programs promote interdisciplinary inquiry, discourse, production, and research across expanding fields of arts practice. The Center supports collaborations in arts research across disciplines with an open door policy to all Yale students— graduate, professional, and undergraduate students alike.

Products Used

[Tilt Brush](#)



<p>Project Title</p>	<p>Layering with Tilt Brush, Wide Format Printing, Scanning and Markers</p>
<p>Project Description</p>	<p>To get students to consider alternate processes with painting and drawing, we use Tilt Brush as part of the process to to expand their toolset. Students import color collages into Tilt Brush to rework as planes. We then export as .gif files to capture our work in VR.</p>

Logistics & Operations

<p>What problem was your project designed to solve?</p>	<p>How to get students to consider alternate processes in painting and drawing</p>
<p>What hardware & software did you use?</p>	<p>Tilt Brush, PC, HTC Vive headset and controllers</p>
<p>What processes did you implement to manage the project?</p>	<p>In class VR was not used as an end game. We weren't trying to make VR environments but using it as a tool where students were guided to explore formal concepts in VR. Starting with traditional explorations of color through collage, they quickly learned to scan and import physical media into Tilt Brush. Students then used basic color theory concepts to modify color schemes, and scale up their small collages to much larger sizes.</p> <p>Although VR as a medium is traditionally associated with 3D space, students used it to investigate an in-between space. They aren't working flat. They worked on their "collages" like they would planes. They can draw on the front or the back, turn them around and upside down and eventually export them for print then paint or draw on them again. They can make .gifs as well.</p>

What process did you go through to design your project?	I experimented with Tilt Brush, importing collages, drawing on them and exporting them to come up with a workflow I could share with the students.
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Measuring Success

How did you define success and when?	When students are exposed to alternate processes and expand their toolset -- I consider it a win.
Other thoughts?	Tilt Brush is a tool that is literally an in-between drawing space. It is spatial but reduced and abstract. It is not flat but can be used to explore formal elements like line, shape, color and texture that we are trying to get a handle on in a foundational class in a different and new way.

Learnings

What made this project such a success?	Students learned that drawing and painting can incorporate a range of tools they may have not thought possible. With Tilt Brush, students literally draw in space, learning how to draw what they see. The concept of a line moving through space and following a form is difficult to teach, but has been made directly accessible through Tilt Brush.
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