VIRTUAL REALITY

for education
Redefining Education

Education is on the cusp of a technology revolution that will transform teaching and learning to an experience-based approach. At Facebook we are creating virtual reality hardware and immersive experiences to pioneer this movement.

Successful education engages students in learning, collaborating and creating. It fosters rich discussion, helps students visualize abstract concepts, encourages them to identify challenges and supports them in creating solutions. In today's digital world, however, finding new ways to engage students is becoming increasingly difficult since smart phones are more interesting and engaging than most of the technology we provide in schools.

Immersive technology is the next step in the natural evolution of computer based instruction and can deliver experiences that are not otherwise possible with traditional books or videos. Virtual reality is changing how students are learning, collaborating, and creating by providing experiences that teach through exploration. In educator Edgar Dale's "Cone of Learning" he states that we remember 10% of what we read, 20% of what we hear and 90% of what we experience by doing or through simulations. Immersive technology such as VR can make abstract concepts visual, take students to new locations to explore or connect them with others around the world. This kind of experience gives students the ability to guide their own learning and results in higher engagement and retention.

"[VR is] going to be an important part of how you engage with media in the future...it's going to be a very normal thing and a big part of your life." - CA Teacher describing VR to her classroom
Why VR for Education

Education teams across Facebook and Oculus are redefining the way we teach and learn by developing industry-leading content, virtual collaboration and creation tools.

At Facebook, we believe that virtual reality has the power to transform education and turn classrooms into 21st-century technologically advanced places of learning. The technology and content will not only increase engagement and knowledge retention, it will also allow students to get equitable access to education regardless of distance and turn students into innovative creators.

"I'm excited to make a virtual story because I want people to hear our story. This project will give us an opportunity to show people a [hometown] story they wouldn't otherwise see." - CA Student
The Benefits of Virtual Reality
Let Your Mind Explore

Virtual Reality immerses you into environments with a sense of presence. This allows students to learn about topics by living in them and interacting with them, which makes the learning more memorable. In VR, dynamic experiences lead students to discover for themselves, which encourages them to learn through curiosity and exploration.

Virtual reality also presents an opportunity for collaboration between peers. Teachers that have used virtual collaboration with their students report that avatars help level the playing field and that students are more likely to interact with each other. VR also allows experts and mentors to connect with students from anywhere around the world as well as student collaboration across schools and districts.

Special education teachers are using VR to calm and refocus students experiencing sensory overload. The technology is also being used to create personalized learning environments for students with special needs.

With 3D modeling and VR creation, students have a powerful new tool to express their understanding, create solutions, tell stories or create artwork.

"I love the excitement from the kids and how they are engaging with [VR]"
- CA Teacher
Powering What is Possible in Education

How cutting-edge technology transforms lessons into immersive experiences, defies distance and pushes boundaries.

Explore

Consume

Virtual field trips
time travel, change your scale from microscopic to macroscopic or visit places that are too dangerous, expensive or physically impossible to visit

Make the abstract visual
see invisible physics and chemistry

Storytelling and empathy
walk in someone else's shoes and learn about the world from their perspective

Technical training
improve safety and success in medical, vocational and corporate training

Join

Collaborate

Distance learning
join students with experts from all over the world

Group learning
join students from different schools in virtual spaces to learn from each other and collaborate on projects

Build

Create

Student creation
students create content for their classrooms or to demonstrate their understanding

Computer Science/CTE
students learn computer science/technical skills through creating VR experiences

Educator creation
educators create content for their lessons and labs

Storytelling in 360°
student created 360° films for history reenactment or to tell the story of their community

Digital art
3D painting and sculpting
6.3/7 - the average score when a focus group of 9 teachers was asked how interested they would be in classroom VR experiences which enabled students to conduct Q&A’s, career panels, college tours and other social activities.

“I wanted to take my kids on a field trip...my kids don’t have that money, so this seemed like an opportunity to be able to do that” - California Teacher

“I think [VR] is a good idea for school because you have a better understanding [after], almost a perfect picture in your head” - California Student
Integrating VR into Classrooms
VR will play an increasingly important role in education as the industry continues to evolve.

The transition from our current classrooms to digital ones is going to change what teaching and learning looks like. The role of the teacher will be to teach through exploration and innovation rather than simply delivering knowledge. The future of VR for education, however, lies in the teachers decision to adopt the technology as an aid to enhance their teaching. Having this technology in classrooms will make schools a place where students can have access to tools that they don’t necessarily have at home, which will add excitement to the learning.

With the proper implementation, Virtual Reality can be an incredible learning, collaboration and creation tool, that will help guide students through abstract topics, build empathy, unlock creativity and help them connect to the world in new ways.

“I like that we were free to add almost anything we could [imagine]”
- Arkansas student
VR Challenges in Classrooms

Our work to deploy and document VR programs in classrooms has shed insight on unique challenges and opportunities for future work.

**Insight #1**

Every classroom VR experience is a social VR experience.

Unlike traditional VR use cases, using VR in a classroom is unique because students are surrounded by peers and prone to engage with one another while in VR. We’ve seen positive engagement (collaborating to navigate an experience, debug a device, etc), negative engagement (playing pranks on one another, taking pictures to joke about a peer, etc), and social image concerns when classrooms use VR headsets. All of these suggest a need for dedicated safety and usage guidelines for VR in classrooms.

“No way, I spent two hours on this [hair].” - a student declining to use a VR headset due to concerns on convenience and social image.

**Insight #2**

We may not need one VR device per student in a classroom.

Past educational technology programs suggest that one device per student does not pave an immediate path to impact. Regarding VR, some teachers can envision headsets actually being shared in a student group or used asymmetrically. Multiple teachers mentioned a strategy of using VR headsets similar to equipment in a lab.

“I can see this working like a science lab: 5 groups, 3 students in each group, [and 1 headset per group]” - a teacher in WA talking through how to use VR in the classroom

**Insight #3**

Teachers need more robust tools for supervision and training, and may need to leverage specific teaching styles to use VR in classrooms.

In one pilot, we worked with teachers to prepare for a VR lesson with Oculus Go (the same approach was more challenging with Oculus Rift). Training was completed within one hour and we observed the teacher deliver the lesson in their classroom. Successful teachers used more of a facilitative than directive teaching style. Many teachers reported a need to see what students see and better align content to course curriculum.

“Where are you? What do you see?” - multiple teachers as they worked with students in VR experiences.
Upcoming Research

Key challenges and questions we look forward to exploring in 2019 and beyond include the following.

1) Most research on VR in classrooms focuses on limited visits and reactions, not longitudinal outcomes. How does the excitement around and efficacy of VR technology in schools vary when observed over time?

2) What would we build if we designed a VR experience from the ground up with a focus on the classroom experience?

3) How might we deploy a rotating set of VR devices to a network of schools to effectively distribute resources and utilization (example: headsets are not sitting around unused)?

4) As VR the space evolves, what resources, support, and training will teachers need to organically utilize devices and surface their own use cases?

5) How effective can VR storytelling activities be in changing perceptions about tech and computer science for middle- and high-school learners?