Meet the Metaverse

A New Frontier in Virtual Learning

By MICHAEL B. HORN

IT'S HARD TO DECIDE which recent "metaverse" headline has felt more unreal.

On one hand, consider Facebook's rebranding itself as Meta—a nod to the shared virtual spaces where the company believes its future lies. In this vision, large groups of individual users will meet in an immersive, simulated, digital environment, where they'll work, study, create, and form relationships that mix avatars and real-world elements to varying degrees. On the other hand, there was Meta's sub-

that "when education lags the digital leaps, the technology rather than educators defines what counts as educational opportunity." The authors recommend that researchers, educators, policymakers, and digital designers should get ahead of the trend while the metaverse is still under construction.

What is the Metaverse?

The exact definition of the metaverse is still up for debate. The term was coined by Neal Stephenson in his 1992 science-

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sequent 60-second Super Bowl commercial, which featured an animatronic dog reuniting in virtual reality with its animatronic friends, and which cost the company an estimated $13 million.

Either way, both showed that the hype behind the metaverse is real, even if the metaverse itself does not yet actually exist. Within two months of Facebook's transition to Meta, Google searches for "metaverse" increased by roughly 20 times and the term was mentioned in 12,000 English-language news articles. The year before, it had been mentioned just 400 times.

Educators excited about the future of technology haven't missed a beat, and they've jumped on the metaverse bandwagon too. The Brookings Institution released a policy brief warning

fiction novel *Snow Crash.* The most widely used definition today is from venture capitalist Matthew Ball, who has boiled it down to seven elements.

In this understanding, the metaverse:
- Is always present and has no ending
- Can be experienced synchronously by multiple people
- Does not have a population cap and can be shared by everyone, while each individual retains their agency
- Can offer a fully functioning economy
- Can span both the digital and physical worlds, as well as open and closed platforms

- Is interoperable, so digital tools and assets from one app can be used in others
- Contains content and experiences created by a range of contributors.

According to technology writer Ben Thompson, the Internet satisfies all these requirements. "What makes 'The Metaverse' unique," he writes, "is that it is the Internet best experienced in virtual reality. This, though, will take time; I expect that the first virtual-reality experiences will be individual metaverses, tied together by the Internet as we experience it today."

There are active debates about this. Some wonder just how interoperable does the metaverse need to be. How important is it, for example, for a digital tool that works in one video game to be usable in a different application? Do we need standard protocols like those that apply to blockchain, or the open-source databases that form the foundation of the current "open web"?

As a result of the complexity, it's easy to default to extended reality—virtual reality and augmented reality—when talking about the metaverse. But much as the mobile Internet has built upon the infrastructure of the Internet, Meta's Mark Zuckerberg and others argue that the metaverse will simply be the successor to the mobile internet.

More Than Web 3.0

This isn't the first time educators have gotten excited about virtual reality—nor the first time I've written about it in these pages (see "Virtual Reality Disruption: Will 3-D technology break through to the educational mainstream?" *What Next,* Fall 2016). Remember educators' short-lived obsession with Second Life, the online platform in which people create avatars to navigate a 3-D online world? That excitement faded fast, and Second Life was laid to rest alongside many other educational fads.

What's different this time around?

For starters, interest in the metaverse is rising amid a long, deeply disruptive pandemic that kicked off an unprecedented, rapid-fire deployment of virtual learning around the world. According to the Digital Learning Collaborative, in the 2018-19 school year, 375,000 students were enrolled in full-time, statewide virtual schools. By the 2020-21 school year, the number had nearly doubled to 656,000 students. That count does not include virtual schools run by local districts, which also grew dramatically during the pandemic. And many students enrolled in traditional brick-and-mortar schools now regularly learn online for parts of their day, either in school or at home.

That has smoothed over one of the main barriers to using virtual reality in class: the equipment. In the past, logging on to a laptop and wearing a virtual-reality headset were viewed as an intrusive ordeal. But the game has changed, according to Thompson. If students are doing significant amounts of work

online already, why couldn't they have a headset on for most of that time as well?

In this vision, a virtual-reality headset is just a workaday accessory, like a computer mouse. But with it, students can "walk" into different education seminars and co-working spaces for projects and experience a range of virtual-reality environments, learning applications, lectures, and more. Just as the rising popularity of now-familiar learning technology tools like laptops fueled the creation of online learning applications and environments, this dynamic, coupled with a broader interest in the metaverse, seems poised to spur the creation of more learning environments that take advantage of virtual reality and 3-D.

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Under Development

There are dozens of metaverse-type experiments underway in K-12 education.

For example, American High School touts its virtual-reality offerings on its website. The accredited, private online school has operated since 2004 and enrolled more than 8,000 students in grades K-12. Later this year, students and teachers at Optima Classical Academy, an online charter school based in Florida, will meet as avatars in a social virtual-reality platform created for the school that its founder described as a "metaverse." It is set to launch in August for students in grades 3-8, who will follow a great books curriculum. Women Rise NFT, a collection of unique pieces of digital art by artist Maliha Abidi, was formed with the ultimate goal of building a school in the metaverse to serve the 258 million children around the world who cannot access traditional schools.

Then there are plans to support educators through the metaverse. The company k20 launched the Eduverse, a "metaverse hub for educators," to connect teachers and administrators in a shared virtual world, where they can learn, network, and advance in their careers.

Finally, there are an array of enablers and supplemental providers that provide virtual-reality experiences for students and educators. Companies like Labster offer virtual-reality laboratories and FluentWorlds allows students to learn English in a variety of virtual worlds. Kai XR offers "360 degree" virtual field trips and EDUmetaverse has over 35 virtual worlds that educators can use.

And consider Dreamscape Immersive, a virtual-reality company founded by computer scientists and former Disney leaders. While its main funders are from the entertainment world—major Hollywood studios, Steven Spielberg, Nickelodeon, and AMC Theaters, which is planning to co-locate Dreamscape virtual-reality experiences in some of its theaters—the company also has partnered with Arizona State University to create Dreamscape Learn. Its first offering, a series of virtual-reality labs called "Immersive Biology at the Alien Zoo," was created by Spielberg and company CEO Walter Parkes as an alternative for conventional lab work in college-level Introductory Biology.

A high-school course is planned for later this year.

And even Meta has a team dedicated to developing education applications in the metaverse.

Looking Ahead

As metaverse mania continues, three things appear true.

First, innovation theory suggests that the early successful instances that apply elements of the metaverse will be proprietary in nature. They will be optimized initially to maximize the performance and reliability of an immature technology at the expense of scale and interoperability. That immediately suggests a problem. Many of the instances that are called a metaverse won't meet a key criterion of Ball's definition: interoperability. Indeed, much of what passes for metaverse hype right now is still virtual reality clothed in new marketing language.

This may not be a bad thing, however, given concerns about whether the metaverse will be a safe and healthy place for children. Experiences in walled-off gardens—think Prodigy and America Online, not the whole of the World Wide Web—could be safer, at least initially, even though that might temporarily undermine the vision of innovating instruction or skill development through the blockchain or decentralized autonomous organizations.

Second, the metaverse seems more of a sustaining than a disruptive innovation for full-time virtual schools. Unlike disruptions, sustaining innovations improve the performance of an existing product or service to better serve users who already exist. Full-time virtual schools that have sometimes struggled to engage students would likely benefit from a more immersive, social experience. Combining their programs with the metaverse, as well as with in-person learning pods, could create a more robust and accessible schooling experience. Alongside the flexible models of learning that took root during the pandemic, such as pods and hybrid online and in-person programs, a socially rich, immersive metaverse could, eventually, disrupt traditional, brick-and-mortar schools.

Finally, metaverse applications can create educational experiences that are otherwise impossible in a traditional environment. Virtual reality can bring content alive with dynamic images and hands-on digital exploration. It can bring real people and knowledge from other parts of the world into classrooms everywhere. Consider the potential for science labs, language learning, internships, cultural exchanges, and field trips (see "The Educational Value of Field Trips," *research,* Winter 2014).

When the metaverse comes to class, these are the areas where you'll want to point your virtual-reality goggles.

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but its school board and its political establishment did not. By the late '60s, there was an increasing level of frustration over the exclusion of African Americans, especially from decision-making power. Their kids were making up a larger and larger percentage of the student body in the schools, yet they had very little representation on the school board. There was a lot of activism to change that. I think that eventually the white leaders of the city and the school board realized that the time had come. The system was in crisis, and they realized they needed to hire somebody who could bridge that divide and who had some credibility, that it was time to hire an African American leader.

Do you think that big-city school systems can ever become effective, or do we need to move to a different model? Today, I see charter schools, decentralization, and giving parents choice as a new form of citizen participation. Isn't that the message your book leads to, that big-city systems can't move forward?

I didn't intend that. I would say that a big theme is the tension between what schools and school systems can and can't accomplish. One of the big patterns in the history of education is America's tendency to put everything on the schools, to expect schools to solve all our problems. It goes back to the 19th century, with Horace Mann calling schools the great equalizer. There's a narrative about public education being the ticket to people's success and the engine of social mobility. And Foster, as I said before, worked hard to raise expectations and bring that narrative closer to reality for all students.

But another lesson in my book, and in much scholarship in the history of education, is that we expect too much of schools, because they're embedded in the larger society. If urban school systems are having problems, it's partly because cities have problems, and schools aren't separate from that. People have economic problems, and that leads to educational disadvantages, and the schools can't just level the playing field by waving a wand, whether it's a particular school and principal or a system and a superintendent. They're operating within constraints on what they can achieve. In that sense, I think the problem's even deeper than people realize, but I would agree that at their best, charter schools and other kinds of innovations can empower leadership like Foster's.

This is an edited excerpt of an Education Exchange podcast, available at educationnext.org.