EDUCATION WEEK

Projectors Face New Classroom Competition

Some schools are considering televisions as alternatives, but screen size and interoperability remain an issue

By Tam Harbert

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Projectors still have a firm hold as a front-of-the-classroom display in K-12 education, even as students' attention is shifting toward the growing number of digital learning devices they use in classes.

In fact, classroom projectors are the fastest-growing type of technology hardware in 8th grade math classrooms in the United States, according to a new Education Week Research Center analysis of survey data from the National Assessment of Educational Progress.

But today's modern projectors are a far cry from the clunky ones of days gone by. They've become more adaptable, interactive, and reliable, and some vendors are starting to use lasers for lighting to eliminate the cost and frustration of having to replace lamps in the devices.

Even so, classroom projectors are now under pressure from other display technologies, especially flat-screen TVs.

The battle for the display-technology market appears to be fueled by educators' growing demands for interactive features. "What we've heard loud and clear is that schools need to be able to integrate the projector into the classroom ecosystem," said Jason Meyer, the senior product manager of **K-12 projectors at Epson America Inc.**

That's an ecosystem that is networked and within which **both teachers and students often have their own wireless devices**. Epson supplies software with its interactive projectors that enables students to wirelessly send what's on their screens to the projector display. Or the teacher can use the software to serve as moderator and choose which student's work to display. (Other companies that produce classroom projectors include Hitachi, BenQ, InFocus, and Boxlight Mimio, according to a recent market report from Technavio.)

But networked large flat-screen TVs can also be interactive.

When voters in Colorado's Boulder Valley school district passed a bond to build several new schools, the district's chief information officer, Andrew Moore, re-evaluated display technologies. The new schools will have many large windows and thus a lot of natural light, which can make projector displays hard to see. Flat-screen TVs, on

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the other hand, don't have that problem. And as Moore researched TVs, he realized that they could be interactive, too.

The district's standard 1-to-1 computing device is a **Chromebook**, and Boulder Valley aims to equip all students with web-based laptops eventually. The district chose Sony 75-inch TVs that use the Android operating system, the same operating system used for Chromebooks. That means student and teacher devices can connect to the display through GoogleCast, sending what's displayed on their screens onto the TV display.

"When teachers see this technology, it basically changes their view on how kids can share and collaborate in the classroom," said Moore. "The teaching dynamic starts to change."

Although the TVs can have a higher upfront price than projectors, Moore figures that the long-term maintenance will be less. "If you buy a quality TV, they have a long life," he said. "And you don't have to replace bulbs."

While 70-inch TVs can be $1,000 or less, prices rise quickly after that. Currently, 90-inch models can be $5,000 or more. For comparison, Epson's projectors, for example, can range in price from $300 or so for a portable one to $2,400 for an interactive version, Meyer said.

However, Moore's approach is not so easy if the flat-panel TV uses a different operating system, is on the school's wired—versus wireless—network, or the school hasn't standardized on a specific brand of laptop such as a Chromebook.

Donna Williamson, the technology director for the Mountain Brook schools in Birmingham, Ala., has looked into flat-screen TVs but needs a display that is "software-driven and hardware-agnostic." GoogleCast won't work for her schools because the district has a mix of devices, including iPads, Windows laptops, and Chromebooks.

"You have to be able to accommodate whatever walks into your room," she said. In addition, she's not convinced that a 70-inch display is large enough for students in the upper grades to see from the back of the room. "With projectors, you can get a 102-inch diagonal display, so everyone has a good view," she said.

Those are points that Epson's Meyer likes to emphasize.

"There's nothing that competes with the kind of image sizes we can do," he said. "We can produce up to a 300-inch image from a $400 projector in a very small package. That can be important in a classroom where students sit 25 feet away."

Connectivity can also be an issue, whether it's a projector or a TV, Williamson said. Sometimes, the display needs a connection to the wired network, but the mobile devices are on a different, wireless network. "Being able to connect the classroom devices to the screen in a way that is easy,

Classroom Virtual Reality, For Teachers on a Budget

Jessie Creech teaches advanced Spanish at Mountain Brook High School in Alabama. Her students speak the language and read nonfiction texts in Spanish well. But reading Spanish literature is challenging because of its complex, descriptive narratives. The students struggled to understand an excerpt from Gabriel Garcia Marquez's One Hundred Years of Solitude, for example.

That prompted her to think about how she might create a more conducive atmosphere, like the tropical jungle in which the narrative is set. "I wanted my students to feel like we were in a different place," Creech said.

She started researching possibilities. When she came across a university lab that was using classroom projectors to create an immersive learning experience, she decided to give it a try. With the help of Donna Williamson, the technology director for the Mountain Brook district, and funding from the district's Institute for Innovation, she experimented with different types of projectors and software that could tie the images together.

After experimentation with the technology, Williamson realized that none of those modern projectors worked very well.

So they took a simpler path. Creech now uses four basic projectors, each positioned to project on a different wall. Using the computer, she can stretch an image from one projector to cover multiple walls, producing a panoramic effect. Or she can project a different image onto each wall. She might put a picture of a jungle on one

controlled, wireless, and hardware-agnostic is a feature that is second only to size," she said.

In many ways, educators said, classroom projectors have become more like interactive whiteboards.

Julie D. Judd, the chief technology officer for the Ventura Unified district in California, has installed Hitachi interactive short-throw projectors that can be mounted above a traditional whiteboard, turning the whiteboard into an interactive system. The projector connects via infrared technology to a pen so a teacher can write on the whiteboard. Using software, the projector captures whatever she writes on the board.

"It's like an endless whiteboard," Judd said.

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wall, for example, a map on another, and a quiz about the book on another. She's installed tile board, an inexpensive substitute for whiteboards, on her walls so she can write on the images as well.

Williamson said the next step is to make the system interactive.

Meanwhile, Creech is looking for better ways to change the images in each projector. She's experimenting with a Myo device from Thalmic Labs, a bracelet that allows a person to control devices remotely through gestures.

One day, virtual reality may be ready for the classroom. But right now, it's just too expensive, said Williamson.

In the meantime, she said Creech's solution is simple, inexpensive, and effective—and it shows how schools can apply current technology in creative ways to meet the needs of students.

"We want the curriculum driving the technology," Williamson said, "not the technology driving the curriculum."

—Tam Harbert