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3-D video coming to education

Boulder Valley ISD becomes one of first K-12 districts to switch to 3-D projectors

By Meris Stansbury, Associate Editor

Primary Topic Channel: [Projectors & presentation](#)

Imagine you're back in school, and you're learning about the human body. You open your book and see the flat image of a skeleton on your page. You imagine what it must really look like and try to study as best you can. Now, imagine you're a student today. ... That's where the imagination stops. Thanks to new technology developments in projection and filming, students soon will be able to see the human body and other complex images, projected up close and in three dimensions. Welcome to the real education of the future.

3-D images floating out of screens, and kids in lightweight glasses with their jaws dropping open, might sound like science fiction--but in less than a year, school across the country will be piloting 3-D projectors to give all students, and especially those who are visual learners, a chance to fully understand the curriculum.

"It's not something you watch," says director James Cameron, who's filming his new movie *Avatar* in 3-D. "It's a reality you feel you could step into."

Cameron is one of many directors using 3-D video to enhance movies. In fact, between movies and the availability of high-end, low-cost 3-D technology, 3-D video is now on the cusp of being home- and school-ready.

Interestingly, 3-D imaging is actually an old technology. It was first created by Sir Charles Wheatstone in 1838 through "stereopsis," or the perception of depth, and his invention of the stereoscope in 1851 was viewed by Queen Victoria.

3-D video creates the perception of a differential between two slightly offset images when viewed by each of two eyes. By presenting each eye with a slightly offset or different image, a projection system or display can create the illusion of depth.

It's estimated there were a million stereoscopes in living rooms around the globe by the mid 1850s, but owing to the technology's lack of sophistication, consumers had headaches as a result of eyestrain and images were shaky at best. Not until the late 1990s, when IMAX began projecting in 3-D, did the platform really gain momentum.

In 2005, Hollywood studios' Digital Cinema Initiative, aided by the Entertainment Technology Center's Digital Cinema Lab in Los Angeles, created a specification for a standard digital cinema package. Now, approximately one in every three digital theater screens in the United States is equipped for 3-D, according to the report "3-D TV: Where Are We Now and Where Are Consumers," by David Wertheimer, CEO of the Entertainment and Technology Center at the University of Southern California, and Shawn DuBravac, adjunct professor at the George Mason University School of Business.

But it's not just movies that are using 3-D. Broadcasters, video game makers, home theater manufacturers, projector software developers, and even educational content developers have entered the 3-D market as well.

One large player in the 3-D market is Panasonic, which is working with Cameron to help direct *Avatar* by supplying him with 3-D plasma displays. Panasonic also is developing 3-D-capable TVs, DVD players, and active glasses.

According to Peter Fannon, vice president for technology policy and government affairs and 3-D expert at Panasonic, Panasonic's active glasses and TV screens are fully high definition (HD) 3-D capable, which Fannon says is available only through Panasonic.

Panasonic's active glasses are little LCD lenses that open and close the left and right eye images 120 times per second, making 3-D images appear seamless. "There's no shuttering, no blurring of any sort. The TV emits the images to the glasses via a receiver built into the glasses. You see 1,080 lines of resolution on the screen--full HD quality--seamlessly," said Fannon.

"We also have something called 'schoolroom in a box,' which [includes] whiteboards, plasma panels, small laptops, cameras, and projectors that are backwards compatible--meaning that you can buy these projectors, and when more 3-D content is available, adjust your projector to be 3-D capable for a modest premium," he explained.

Other major players in the 3-D arena include Sony, LG, Philips, Samsung, Mitsubishi, Sensio, Intel, Dolby, Ubisoft, NVIDIA, Digital Projection, BenQ, AVROver, Sharp, Vuzix, and Texas Instruments (TI).

Three companies in particular--TI's DLP division, BenQ, and AVROver--have specialized their 3-D technology for education, and these solutions debuted at Infocomm earlier this year. 3-D projectors also were a big hit at the National Educational Computing Conference (NECC) in Washington, D.C., this past summer.

AVROver, a maker of portable AV systems, has partnered with projector manufacturer BenQ to release the AVROver 3DSVS24, which the company says is the "first fully integrated 3-D Stereoscopic Educational System."

This product is a portable and rugged 3-D AV system with all components securely mounted inside. It features a powder-coated, scratch-resistant steel console, as well as sequentially numbered active glasses eyewear, storage, and sanitation.

TI's new 3-D technology uses just one projector with "DLP Link" active shutter glasses, meaning no IR emitters, polarizers, or special screens are required.

Images appear in three dimensions when the projector's 120 Hz output gets divided between the left and right eyes, with each eye receiving 60 Hz in red and blue colors. Synchronization occurs during extremely brief "dark" times between active data transmission.

"For the first time," said Dave Duncan, worldwide education business development manager for TI, "we will be launching affordable 3-D projectors in line with XGA and SXGA pricing made specifically for the classroom environment." This means that pricing for the systems will be comparable to projectors with similar specifications that do not have 3-D capabilities.

One key feature of TI's new technology is that its 3-D projectors also function normally as 2-D projectors without image distortion.

So far, roughly 15 projector manufacturers have adopted TI's 3-D technology. There are 35 projector manufacturers that use DLP technology in all, and TI's DLP division shares its technology, which includes 3-D capabilities, with all of these companies.

Boulder rolls the dice with 3-D

With all the relatively low-cost and seamless 3-D technologies now available to educators, some schools are starting to take advantage.

The Boulder Valley, Colo., Independent School District has decided to "future-proof" its classrooms by rolling out TI DLP's 3-D technology.

The district, which spans 500 square miles and has 28,000 students in 51 schools, has always been an early adopter of technology, according to Len Scrogan, director of instructional technology.

"We always have extensive planning--we take our time, consider what really matters, and then we make investments in what matters when it comes to technology and our district," explained Scrogan.

Boulder is a high-bandwidth district that believes in taking advantage of the resources available in education today...and in the future. "We live stream [video], we have many internet projects, and we plan on distributing 3-D as part of our technology backbone," Scrogan said.

In a process that took about 18 months from start to finish, Boulder has reached its goal of having 3-D-capable projectors mounted in every classroom.

Boulder chose Vivitek projectors, which use TI DLP's 3-D technology.

According to Rick Nguyen, executive vice president at Vivitek Corp., during Boulder's competitive-bidding process, 46 3-D-capable projection units from different companies were invited for a tech shootout.

In total, Boulder purchased 400 of Vivitek's 930TX units and 625 of the D825EX units.

"We really focused on total cost of ownership issues," Scrogan said. "We standardized on DLP and we had specific expectations. DLP has a better contrast ratio and greater readability than LCD, and a good quality of image. But what's also great is that there's no filter cleaning, and it's sustainable that way--it won't deteriorate."

"Educators have a lot to think about when considering how to implement 3-D," said Bob Wudeck, business development manager for TI's pro AV group, "including the brand of projectors, the content you want to use, research on 3-D and the technology, how best to invest, what type of glasses to use, and how you're going to clean those glasses."

Wudeck mentioned that AVRover's eyewear cleaning box is a great solution, and that "little things like this" can really help a district when switching to 3-D.

Scrogan said his district will introduce 3-D video into the classroom with math and science curriculum first, then progress to many other subjects.

"We want to try things that are innovative and can make a difference in all areas of education," said Scrogan.

Content still catching up

Even with more than 1,000 3-D-ready projectors mounted in Boulder's classrooms, students might have to wait a little while before they begin realizing the benefits of 3-D video--because while the technology has arrived, the content is a little slower in coming.

Wudeck said TI is talking to major content developers about how to make their content work with DLP's 3-D technology. These developers include SAFARI Montage (which is currently partnering with AVRover and BenQ to deliver a library of 3-D-ready content), EON Reality, Discovery Education, RM Education, and Promethean.

Since TI DLP's 3-D technology is both 2-D and 3-D compatible, "once 3-D content is uploaded, the chip will recognize it as 3-D and switch from 2-D to 3-D [automatically]; it's that simple," said Wudeck.

"Once the content is there, we'll start using our 3-D-ready projectors for 3-D [video]," said Scrogan.

Having content readily available might encourage more educators to make the switch to 3-D-compatible projectors, although--according to Wudeck--educators already are lining up to future-proof their classrooms with or without content.

"Because of the affordability, ease of use, and quality of 3-D, educators will start implementing pilot programs around the country in about 90 to 120 days," predicted Wudeck. "Just since NECC, TI has had an incredible amount of requests for demos. And when content comes in, I'd say, five to six months, then you're really going to see a huge boom."

"Once the pilot programs get running, we'll start to get data about how kids remember ... and understand content better when they see information in 3-D," said Duncan. Like Wudeck, Duncan believes that white papers and case studies from 3-D pilot programs will be available during next year's major tradeshow.

"We're still in the early phase of the adoption curve," said Wudeck, "but it's moving fast. Expect to see some big rollouts in 3-D next year."

Links:

[T.I. DLP](#)

[AVRover](#)

[Panasonic](#)

[Boulder Valley ISD](#)

Note to readers:

Don't forget to visit the **Building a Cost-Effective Digital Classroom** resource center. If today's students are to compete in an increasingly global economy, schools will need much more than textbooks and traditional pencil-and-paper approaches to succeed. Students need the benefit of technology-rich classrooms to give them marketable skills that they will use throughout their professional lives. Go to: [Building a Cost-Effective Digital Classroom](#)

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