



Interactive Projectors Have a Positive Impact on the Classroom Learning Environment

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As K–12 schools adopt new strategies for instruction and learning, networked classroom displays are paired with other devices in the larger digital ecosystem to support the changing roles of teachers and students, collaborative learning, and the development of 21st-century skills.

INTERACTIVE DISPLAYS ANCHOR A LARGER DIGITAL ECOSYSTEM

In today's classrooms, you'll find everything from personal computers, Chromebooks and iOS® or Android™ devices to document cameras, interactive whiteboards and sound- or voice-amplification equipment. All of these products are tied together in a robust wireless infrastructure that changes the traditional learning environment to one of interactive collaboration. While both educators and students welcome this shift to more engaged learning, for optimal impact, the addition of these devices to digital tool sets must be easy to manage. Given the limitations of most schools' or districts' IT staffs, the good news is that most of these new digital ecosystems can set up so they are easy to manage remotely, whether you are building the system from the ground up or carefully constructing one using legacy hardware and software.

Interactive projectors, in conjunction with wireless projection software, not only extend the range of potential learning strategies but also have real productivity and financial benefits. Projectors are a good choice for most schools and districts in regard to flexibility and affordability.

PROJECTION SOFTWARE ADDS CAPABILITY AND FLEXIBILITY TO DIGITAL LEARNING TOOLS

Many of today's interactive projector displays can extend learning beyond traditional classroom uses—particularly if they're networked to a larger digital ecosystem. Other digital devices, such as document cameras, mobile devices, and audio equipment, can be networked with interactive projector displays to facilitate types of instruction models such as lesson capture. This capability helps teachers adopt the “flipped classroom” model as a different instructional strategy to engage students, as well as to build a video library of lessons that can be used and shared.

Content is easily shared, as projectors connect quickly with student devices, and students project their screens and get immediate feedback—whether from their seat or at the board. Virtual field trips and meetups with other classes are good ways to incorporate the interactive technology into lessons as well. It's also possible to create an immersive visual experience, such as walking through the solar system, with multiple projectors.

Software is available to help extend learning possibilities using interactive projectors.¹ For example, the Epson iProjection™ app enables teachers and students to display

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— Dan Warren, director of technology operations, Des Moines Public Schools

content wirelessly from a Chromebook™, iOS, or Android mobile device. This free application allows teachers to share and control content easily and simultaneously for up to four connected devices. The powerful app also allows users to:

- Browse the Web and project webpages while enjoying high-quality images on the big screen
- Share, manage, or annotate displayed content from an easy, intuitive menu
- Take notes and then send work back to the projector—no PC required*
- Connect up to 50 devices, with built-in moderator features²

To use the Epson iProjection app, users must be connected to a network—either directly or via a wireless connection. Projectors can be networked either through the Ethernet port on the projector or through a wireless connection.

INTERACTIVE DISPLAY TECHNOLOGY EXPANDS INSTRUCTIONAL OPTIONS

Des Moines Public Schools (DMPS) faced a challenge. The Iowa-based school district wanted to use interactive display technology to support innovative and collaborative instructional spaces and upgrade the school's STEM teaching and learning capacity. Building on their 1:1 implementation, education leaders wanted to create learning spaces that would be similar to what students would encounter in college and their careers. DMPS was fortunate enough to be able to finance a complete, simultaneous installation through multiple RFPs for projectors, installation, and infrastructure.

Dan Warren, director of technology operations for the district, oversaw the installation of 3,000 interactive Epson projectors. Almost every classroom added an interactive BrightLink® projector. “We

chose Epson because of the life of the lamp,” says Warren. “Epson came with its own interactive tools but also played well with other technology.” Many district stakeholders were involved in the decision making, and they wanted smart technology that was consistent across the district. They chose Epson in part because they had a reputation for being a good partner.

DMPS wanted to create 21st-century learning environments that were flexible and collaborative, and that would support the changing roles of teachers and students. Teachers were transitioning to being learning coaches and facilitators. The goal for students was to take more ownership of their own learning, with student-led classrooms. In terms of physical space, education leaders wanted classrooms to be conducive to collaboration without a front-of-classroom in a traditional sense. For example, moveable furniture and portable technologies were facilitating new instructional strategies throughout the district. Customized software tracked students' activities at all times. Teachers were now able to track student progress continually with specialized devices--and parents were able to tune in at any time to see what their child was doing.

For DMPS, these updated learning environments have redefined the types of lessons teachers can lead. Students can now work easily in small groups, which better enables differentiated instruction. Teachers and students use the BrightLink's finger-touch interactivity to draw on or annotate documents, webpages, and pictures, and then capture those annotations. Teachers can then upload documents for student to access at a later time, or they can email them to absent students—providing a genuine lesson substitute for those who miss class.

To create a learning environment more conducive to exploring STEM concepts—particularly engineering—a MIMLAB of desktop computers was equipped with modelling and technical drawing software to design prototypes. The BrightLink's interactivity became a crucial part of the design process when students projected their designs to the entire class for feedback. For example, students used the annotation tools to suggest design improvements or help answer design problems. Then, they saved these annotations and used them to fuel product improvements. Once the design was finalized, they printed a prototype using the classroom's 3D printers.

"With the BrightLink projectors, students can get out of their chairs to interact with the content, and teachers can move freely around the room to ensure students get the support they need and remain engaged," says Warren. "Technology is now just another tool to support teaching and instruction—just a part of what we do."

BUILDING OUT A NETWORKED DIGITAL ECOSYSTEM

Northwest of Detroit, Michigan, the challenge for Livonia Public Schools sought to impact student achievement

positively with strategic technology investments. After much research, the technology committee decided on the solutions they thought were imperative for student learning: new student and teacher computing devices, a voice amplification system, document cameras, and new interactive displays.

Timothy Klan, district administrator of information and instructional technology, chose the components for their new technology implementation. His criteria included interoperability, reliability, manageability, and simplicity. To meet the criteria, he chose a BrightLink interactive display as the centerpiece of every classroom. Klan decided to mount the interactive display above the whiteboard in each classroom. Using interactive pens, students and teachers could now annotate and interact with projected images, websites, documents, and more. Teachers could also connect wirelessly to the BrightLink from their Chromebooks or personal devices, equipped with Google Cast™ or the Epson iProjection app. While moderating sessions, teachers could remain in control while giving students the ability to participate. Up to four devices were able to project on the interactive screen simultaneously—allowing students to collaborate in real time.



"We looked for supporting systems that were easy to manage," says Klan. "We needed devices that would: a) be reliable, and b) we could control remotely if something went wrong." The Chromebooks, desktop computers, and Epson BrightLink displays are all managed by IT over the district's network.

HOW INTERACTIVE TECHNOLOGY HELPS TACKLE REAL-WORLD PROBLEMS

At Texas's White Oak Middle School in White Oak ISD, librarian Michelle Cooper is using Epson interactive displays and the Epson iProjection app to host Skype® sessions with authors and middle-school classrooms in other states. The school purchased new projectors and software in August of 2017. Scott Floyd, chief technology officer for the district, came to one of the school's Lunch and Learn sessions and trained all the teachers. Now everyone in the school is using the projectors and Epson iProjection software—about 25 classrooms and 365 students.

After successfully hosting a series of author chats via Skype, Cooper met a New Jersey librarian online and they organized a "mystery" chat between two of their classes. The kids had fun sharing information about their favorite books, and by the end of the chat, both classes had correctly guessed the location of the other school.

The technology club that Cooper advises also used the interactive displays for a recent TCEA 3D design challenge that reinforced students' engineering skills. Each year, TCEA hosts a 3D design contest that challenges students to design a solution for a real-world problem. Cooper notes that students are encouraged to use the engineering design process and 3D modeling software, approaching the problem like engineers and relying on critical-thinking

skills to create inventions that can have a meaningful impact on the world. Cooper's technology club signed up for the challenge and decided to design and submit a flood protector—a drainage system inspired by Houston's Hurricane Harvey. The four students were able to project their device screens simultaneously and they developed the design collaboratively. "They submitted their design, notes, and one-minute commercial video for their project," says Cooper. "They won second place in the contest." TCEA Executive Director Lori Gracey congratulated all of the winners and participants, saying: "I was blown away by the entries in this year's contest. These students demonstrated real ingenuity and engineering thinking in researching, developing, and prototyping their ideas. They are truly considering ways to solve the world's problems and transform our future."

It's clear from these stories that interactive display technology is more than just stand-alone hardware for today's schools. When used as a component in a networked digital ecosystem, it can change profoundly what happens in K–12 classrooms, help prepare students to tackle real-world problems, and support 21st-century teaching and learning.

INTERACTIVE DISPLAYS

Epson's high-performance, network-ready BrightLink interactive projectors are transforming today's classrooms. Available with virtually maintenance-free solid-state laser light sources, or in long-life, low-cost lamp-based models, Epson BrightLink displays feature 3LCD technology. BrightLink works with existing whiteboards, eliminating the need for dedicated electronic boards or space-consuming flat panels.

EPSON® CLASSROOM DISPLAY SOLUTIONS

Epson has 40 years of experience developing groundbreaking education tools to help engage students, promote collaboration, and support faculty and administrators. Schools can enhance every student's learning experience with dynamic, user-friendly imaging technology that invites participation and engages students. Epson visual solutions are an ideal fit for any learning space, with large, easy-to-see images and the latest in connectivity and support for Chromebooks, tablets, and smartphones. With touch- and pen-based interactivity, the projectors make it easy to draw or collaborate using any wall and familiar, intuitive gestures. Epson's new laser projectors offer projection within the 4,000 to 6,000 lumen range and up to 20,000 hours of maintenance-free operation.³

For more information, visit <https://epson.com/projectors-education>

In addition to Epson's BrightLink interactive displays, it also offers BrightLink Pro, which integrates the utility of a PC-free, digital whiteboard, projector, and interactive display into one solution that connects easily to the network, allowing sharing of digital whiteboard content with network connected devices for a true remote collaboration. These projectors turn any surface into an interactive area on which users can annotate. Remote participants can use their mobile devices and write to the digital whiteboard in real time. Users can share notes easily and save, email, or print directly—without the need for a PC or software.

LASER PROJECTORS FOR SCHOOLS AND DISTRICTS

Epson's newest, most technologically advanced projectors utilize 3LCD technology with a laser light source to provide up to 20,000 hours of virtually maintenance-free projection.³ Actual hours may vary depending on mode and usage environment. 3LCD, 3-chip technology features exceptional color accuracy and vivid color brightness. The projectors turn on and off instantly, delivering vivid images and requiring no warm-up or cool-down periods. In addition, most Epson laser projectors conveniently use a 120V power source. ■

ABOUT THE AUTHOR

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1. Check your owner's manual to determine if a wireless LAN module must be purchased separately to enable wireless connection on your Epson projector. Epson projectors can be networked either through the Ethernet port on the projector (check model specifications for availability) or via a wireless connection. Not all Epson projectors are able to be networked. Availability varies depending on model.
2. Moderator control, connecting via QR code, and Projector Remote are not available on iProjection for Chromebooks.
3. 20,000 hours is the estimated projector life when used in Normal Mode. Actual hours may vary depending on mode and usage environment.