CHOOSING THE RIGHT DISPLAY AND COLLABORATION TECHNOLOGY FOR HIGHER EDUCATION

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Choosing the Right Display and Collaboration Technology for Higher Education

Higher Ed is bustling with all sorts of new applications for display and collaboration technology, both inside the classroom and, increasingly, all over campus. Here's some advice from experts to help you understand some basic rules of thumb for deciding how LCD panel and 4K displays, lampless projectors, video walls, and collaboration technology can be used to suit your specific application needs.

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>
> *-Jeevan Vivegananthan, Christie*

Introduction

Display needs are expanding beyond classroom projection to include a wide range of applications, such as collaborative learning, digital signage, 3D visualization, and high-visibility displays that can support thought leadership (and donations). At the same time, innovation continues to produce new technology options to consider for each of these uses, such as new lampless projectors, evolving LCD panel display options, 4K displays, video walls, and collaboration technology.

The key for AV pros working in the higher education space is to figure out the right display solution for the need. This white paper will give an overview of the various display technologies that are becoming available and a rule-of-thumb guide to the applications for which they are best suited. And, to illustrate this advice, we'll look at how a variety of display solutions are providing unique and varied capabilities in higher education institutions around the country, including the James B. Hunt, Jr. Library at North Carolina State University.

Know Your Tech Options

Across campus, technology checklists include displays for classrooms, lecture halls and auditoriums, distance learning, digital signage, large-scale presentation set-ups for public spaces, and advanced immersive multimedia learning environments, as well as collaborative and interactive features to be used in tandem with many of these applications.

"We find that many institutional buyers in higher education have a variety of video presentation needs," observes Jeevan Vivegananthan, Director of Product Development for Business Products at Christie. "Many times they're outfitting a large number of spaces with a range of purposes. In addition to classrooms, auditoriums, and lecture halls, there are a number of smaller meeting rooms and collaboration spaces with visual communication needs. Additionally, we're seeing a number of large-scale applications where video walls and interactive or immersive video environments are being built with the latest technologies."

Whether tackling a single room or a campus-wide rollout of video technology, it's useful to begin by establishing a few display requirements.

SIZE

Although it is tempting to assume that bigger is always better, display size and type are actually based on factors of audience size and usage of content. The number of viewers and/or collaborators and their needs for a given space will determine whether to go with a LCD panel display, projection set-up or video wall tile solution.

"For rooms where there will only be five to six people working together, an LCD panel display of a reasonable size may be more than adequate," Vivegananthan explains. "But at some point the room size becomes too large, and even an 84-inch display wouldn't be visible to a room serving 20 or 30 people, such as a small classroom."

In average-sized classrooms, video projection is "a much more cost-effective way to provide visual support for a larger area," he notes. "Then, moving up the scale to a lecture hall or auditorium environment, where you need to reach 100, 200, 300 people or more, you really can't get away with LCD panels, even in multiples. At that point, it's time to look at large-venue projection."

To present an even larger-scale video image and potentially add an interactive or immersive component to spaces such as atriums, student centers, visualization labs, game design facilities,

or other visual-intensive spaces, there are still other video display options available. Tiled video wall displays can be configured into an array of shapes to create a strikingly sizable image or an artfully constructed architectural component.

Video can become more powerful when tiled video walls, arrays of LCD panel displays, or large-scale immersive and/or 3D projection are paired with interactive or collaborative technology for group sharing of content and annotation.

RESOLUTION

In terms of resolution, HD remains the most commonly used format across most higher education applications, particularly in single-presenter scenarios. However, in specialty cases where detailed information must be displayed, a 4K LCD panel, projection, or video wall display solution may be in order. "With 4K, you can display four times as much information as [with] an HD option," Viveganathan notes. "It's not really necessary if you're just showing video clips, but if you're an institution and you're displaying research data, this is a more effective display format."

BRIGHTNESS

The next step in selecting a video display is to consider the ambient light in the room and ensure that the type of display in question has enough brightness to present a clear image. In most smaller meeting rooms or classrooms, Viveganathan says, an LCD panel display or a 2,000-lumen to 7,000-lumen projector will do the job. In larger spaces, such as a typical lecture hall, a 20,000-lumen to 30,000-lumen projector is recommended. It's easy to go up or down from there, heading up to 40,000 lumens for situations with extremely high ambient light levels, or back down to a 10,000-lumen projector if the budget is tight.

LAMP-ILLUMINATED VS. LAMPLESS

Lamp-illuminated projectors are still the most cost-effective solution, and today's lamps have longer life, requiring replacement maybe only once or twice over the life of the projector. There are two types of lamps, mercury and xenon. Mercury is most common, as it provides great lamp life and the bulbs can be replaced easily. Xenon is more professional-level, in that the lamps are harder to handle, so they are mostly found in cinema projectors.

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Solid-state illumination, or lampless projectors, may require a slightly more sizable investment, but are commonly rated for 20,000 hours of run time, which Viveganathan points out is more than will likely ever be needed for a typical classroom application.

There are, at present, three categories of lampless projectors: LED, laser phosphor and RGB laser. LED provides up to 2,000 lumens of brightness, which is typically not enough brightness for most commercial applications. Laser phosphor is an emerging class, producing brightness up to 10,000-12,000 lumens. RGB laser is sometimes

Within the realm of LCD projection, Copley observes that WUXGA is the most commonly used resolution at this time, with some WXGA out there and XGA nearly extinct. Brightness requirements are holding steady at 5,000 lumens, and to get those lumens, he reports that many universities and colleges opt for a mixture of lamp-illuminated and lampless projectors for different applications.

In terms of DLP, single-chip solutions are great tools in the battle against ambient lighting. A single-chip, single-lamp or lampless laser phosphor projector suits many classroom applications, but those with a little extra money in the budget

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referred to as "pure laser" or "true laser," because rather than using a phosphor, the RGB is beamed directly from true laser devices, creating the best color representation and the richest, highest-contrast displays. But it's also more expensive and physically larger, although it does pack a punch, with brightness levels of 30,000, 40,000 or 50,000 lumens for large-venue applications.

Match The Application

With parameters for size, resolution, and brightness established, the next step is to address those factors with one of a number of technologies that are effective for use in higher education. Here is a guide for matching the best technology option with current classroom trends, from displays to collaboration tools.

Projectors

Projectors, whether pole-mounted from the ceiling, set up in a short-throw configuration, or rolled in on a cart, are "still big in classrooms," observes Bill Copley, Territory Sales Manager for Christie. In terms of effectiveness and reliability, not to mention image size per dollar spent, projection offerings come in numerous forms, with continued evolution in LCD and DLP® technologies.

might opt for a higher-brightness 8,500-lumen or 10,000-lumen projector. Or, for richer color and depth of image, a three-chip DLP takes a display to the next level.

North Carolina State University certainly explored the next level with its new, digital era-equipped James B. Hunt, Jr. Library. There, projection tells NCSU's story on a multitude of platforms, including immersive 3D imagery in the Teaching and Visualization Lab and large-scale video display on giant, moving panels that make up the walls of its Creativity Studio.

As the defining feature of the Creativity Studio, the flexibility and vibrancy of the projected video wall panels spark ingenuity among students. "We see projects happen in that space that we never would have imagined," comments Mike Nutt, Director of Visualization Services at the Hunt Library.

The success of the space reflects the larger academic goals of libraries in a changing technological environment, he adds. "The typical question about libraries these days is, 'Why do you need a library now that we have Google?' But students depend on us to provide the technology to enhance their education and provide valuable experience for the workplace. Libraries are an extension of that ethos."

LCD Panel Displays

Sold in classes of resolution and size, the de facto standard for classroom LCD panel display technology today is the LED-backlit LCD display, observes Christie's Vivegananthan. He notes that OLED is another illumination type that is attracting attention, but it has yet to hit the mainstream.

That covers the basics of classroom presentation, but many educators are thinking outside the rectangle when they consider potential uses for flat panel displays in schools. Many academic institutions are building labs that cater to demand for digital media training, tailoring these spaces into creative production studios that allow students to try their hand at technical skills that can be readily translated to the workplace after graduation.

That was the goal for a new lab created in the Criss Library at the University of Nebraska, Omaha. There, a number of buzz-worthy creative tools, such as 3D printers, green screens, and video production equipment, were installed. But there was still one more element needed to complete the picture, recalls Joyce Neujahr, director of patron services at Criss Library: "We knew that what we still needed was some kind of display technology that our students could use to experiment, play, and create."

The school found its solution in LCD panel displays, which it configured in a video wall, set up on a rolling cart for portability. Augmented with multi-touch interactivity, the video wall has become a central point for student collaboration and communication.

Video Wall Tiles

Video walls provide an opportunity to create a rich media experience that demonstrates a school's tech-savvy and forward-thinking academics. For most higher education applications, video walls are composed of LCD panel displays or video tiles. With the latter, the sky is the limit in terms of size and shape, as tiles can be assembled into any number of flat or curved configurations.

Furthermore, the addition of touch interactivity to a tiled display encourages students and visitors to play, learn, and experiment. Returning to NCSU's Hunt Library as an example, video walls can take many forms. Nearly 500 video tiles were deployed in five research labs and display walls throughout the building.

The four public-facing tiled video walls have become a focal point for student contributions in generative art and dynamic, interactive content from multiple disciplines, including engineering,

design, and computer science. Having created content for the displays will be a real bonus after graduation. "The video walls provide a real competitive advantage for students," NCSU's Mike Nutt points out. "Every graduate who walks in to a job interview has a cellphone, but not everybody has experience designing for a 20-foot video wall."

Collaboration Tools

Another component has become a necessity for today's classroom video systems: collaboration technology. It's a BYOD world, and the classroom is no exception, especially in light of the increasingly common "flipped classroom" approach, which shifts pedagogy away from a single presenter and places greater emphasis on small-group discussion and sharing of visual data via mobile devices and laptops. New collaboration tools have ended the days of presenting via only one projector or display input at a time—now it's possible to present and annotate multiple sources of content from various student and educator participants seamlessly and wirelessly on a centralized LCD panel display, projection system, or video wall set-up.

In classrooms, innovation labs, and nearly any academic space where groups are working together toward a common goal, collaboration technology makes possible what participants have come to expect from a video system: "We needed team members to come in with whatever device they're comfortable using, and connect and collaborate with that device without having to wade through a maze of cables," explains Dr. Dave Dawson, a research scientist at the University of West Florida's Innovation Institute.

Following the Innovation Institute's implementation of a wireless collaboration solution that also enables remote switching between sources and content management from any mobile device, Dawson says his team was able to "improve the efficiency and efficacy of what we do—we're able to compare information easily and make better decisions."

Christie Has It

The cost of a technology upgrade or a complete communications fit-out for a new building or campus can be daunting. Fortunately, it's possible to condense some line items into packages, identifying a single source for many elements.

"The advantage of working with a company that has a wide range of expertise and a broad product offering is that we can provide a wide range of solutions that can fit any budget," says Jeevan Viveganan than, Director of Product Development for Business Products at Christie. "We can provide the whole package, from small- and mid-sized projectors to very high-end video wall and processing technologies. Christie understands how all those pieces go together. Collaboration and learning today is not about just one display, or just one type of interaction. We can help join those pieces together and tailor [the solution] to meet different budget needs. No matter how people want to share or what their budget limits are, we have a range of prices, sizes, and technologies to serve them."

He adds that frequently on large-scale projects or institution-wide rollouts, Christie will work with clients to identify the most cost-effective solution for streamlined duplication across similar room types. Scaling up from a basic foundational system is also easy to manage, and with the manufacturer's immersion in video innovation, customers can rest assured that they will be ready for what's next.

"Visual information sharing technology is our DNA," Viveganan than emphasizes. "Our mission statement talks about shared vision, and that's not just about fulfilling physical AV needs, but also clients' needs and their expectations. You're not just getting product, you're getting our perspective on how we can engage people further in these shared experiences."

Conclusion

The wide array of display and collaboration technologies in use across campuses is indicative of continued growth in dynamic learning approaches. Chosen thoughtfully, with technical and use case parameters in mind, displays and the collaborative tools that enliven them can take educational experiences to the next level.