







# DISPLAY TRENDS

## FOR HIGHER EDUCATION

BY WAYNE BORG

The front of the classroom display continues to be a main focus in today's classrooms, with teachers relying on the displays to enhance their lessons and to keep students engaged. As display technology evolves, IT and facility managers have more options to choose from, depending on the size of the classroom or lecture hall.

### **Bigger**

Projectors have traditionally been the display of choice for the larger university classrooms and lecture halls, because bigger screens are better. The larger the classroom, the further away the students are from the display, and the larger the display screen needs to be so that students at the back of the room can easily see and read text. Projectors can easily project images large enough to fill these larger screens, as most projectors can display an image up to 300", measured diagonally.

### **Brighter**

Projectors are rated by the brightness (in lumens) of their light source. The more lumens the projector's light source can produce, the brighter the image will be that the projector displays on the screen. The needed brightness of a projector all depends on how much ambient light there is in the classroom. The larger the classroom, the more ambient light. Other factors—like large windows letting in sunlight or overhead lighting—need to be considered, as well. High brightness projectors, from 5,000 to 22,000 lumens of brightness, are becoming more popular, with some IT and facility managers opting for higher brightness levels than needed in the larger classrooms because they are bright enough to be seen even if the teachers leave the shades open and the lights on.

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### Laser

Laser projectors have no lamps to replace, ever. Many of today's laser projector models have laser light sources that will last up to 30,000 hours, which is twice the average life of a projector lamp. The most common complaints that educators have about projectors concern the lamps. Based on an average of seven hours of use a day and 220 school days a year, a typical higher education classroom projector will be in use about 1,540 hours per school year. Projector lamps start to degrade immediately and can lose up to 50% brightness between 2,000 and 3,000 hours of use. As a result, a 6000 lumen lamp projector will project a brightness of only about 3000 lumens after just a couple of years of use, while laser projectors keep images bright and clear for well over ten years because their light sources degrade much slower. Replacing lamps is the single largest maintenance cost of traditional lamp projectors; the cost of the lamps and labor easily reaches hundreds of dollars over the life of the projector. With laser projectors, however, there is no need to ever purchase, stock, or replace a projector lamp ever again. For an added bonus, most laser projectors don't have filters, either.

### Laser Is Better

The new laser projectors on the market today have improved light sources that are engineered to produce consistent vibrant colors and clear text. They have also closed the price gap compared to lamp-based projectors, with initial purchase prices that are now much more affordable than ever before. They produce less heat than lamp projectors and consume less electricity. Reduced power consumption is one of the more overlooked benefits of laser technology. A lower electricity bill could be the biggest area of savings for larger schools that use projectors in every classroom. For campuses that are focused on reducing greenhouse emissions: not only do laser projectors run cooler, but they are also much more efficient to operate, thereby reducing a school's overall carbon dioxide footprint. Additionally, these products have no mercury to worry about. All lamp projectors use mercury vapor lamps, so switching to a laser light source removes this toxic element from the campus—one that is hazardous to human health and to the environment. One of the best laser projector features is that they turn off and on immediately, with no waiting for the projector to warm up.

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### Lens Shift

Lens shift actually moves the lens in different directions, vertically and horizontally. This flexibility does not change or decrease the native resolution of the lens, but it does help with installation to adjust the projector when it doesn't align perfectly with the screen. Keystone digitally alters the projected image to fit the screen before it gets to the lens, but this alteration will decrease the resolution. Both will help to line up the image properly on the screen, but maintaining the highest resolution is always better. Motorized lens shift and motorized zoom and focus are great step-up features, as they not only help with the initial install, but also make re-aligning the projector easier when needed.

### 4K UHD Resolution

Projectors and displays with 4K Ultra High Definition (3840 x 2160) resolution capability have become the standard in higher education. 4K UHD delivers 8.3 million active pixels to the screen, which is four times more than full HD 1080p. Campus administrators should choose projectors that have a high enough native resolution to accept 4K video signals, supports HDR (High Dynamic Range), and are able to produce sharp, life-like images and vibrant

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colors. For classrooms, the greatest benefit of 4K resolution is the improved clarity for text; clearer text can be projected on larger screens. Small numbers, small letters, and images can all be displayed in finer detail. When viewing projectors using this resolution, students are able to see clear text, whether they are sitting in the front row or at the back of the classroom.

**Interactive**

For smaller classrooms, interactive flat panel displays (IFPDs) have become a great option, with many schools replacing their interactive whiteboards with IFPDs. These displays feature 4K UHD resolution and, more touch points (some with up to twenty points of touch, and up to forty using Windows), so users can write clearly with much better accuracy than interactive whiteboards. These displays also offer more connectivity options and anti-glare glass for use in rooms with high ambient light. Most IFPDs designed for the education market are available in screen sizes ranging from 55

to 86 inches. The latest IFPDs are easier to use, with enhanced whiteboard software designed to help teachers with their lessons and keep students interested. Some feature quick-draw pens that automatically launch the whiteboard, along with floating toolbars that can instantly select tools such as an eraser, ruler, and highlighter. Users can also change colors on the pen. These boards integrate with popular learning software like Google Classroom, Google’s free learning management system, and they include single sign-on support so users can sign into their accounts to access Google Classroom resources like lesson plans. All of these features are designed to make teaching with IFPDs easier.

**Displays**

Overall, displays are better today than they ever were. Both projectors with screens and IFPDs now offer better resolution, higher brightness, and enhanced feature packages. The images that can now be displayed are

clearer and brighter than ever and can only help both teachers and students with the learning process. Projectors and screens are still the most affordable technology to use to get the large screens needed in larger classrooms and lecture halls for students to be able to read small text and numbers. Old, costly lamp projectors should be replaced with new, 5000+ lumen laser projectors to provide the high-quality, large images that the larger classrooms need while reducing maintenance costs at the same time; for smaller classrooms, the latest interactive flat panel displays are a great option.



**ABOUT THE AUTHOR:** Wayne Borg is the Marketing Manager at Optoma Technology Inc. He has over thirty years of sales, marketing, and product development experience in the audio/video, electronics, and appliance industries.

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