

## PROFILE

**Name:** University of Washington School of Medicine

**Location:** Seattle, Washington

## CHALLENGE

Active learning classrooms offer the opportunity to remember information at a deeper level, however the technology found in these classrooms tend to be complex and cost prohibitive.

## SOLUTION

Epson's PowerLite® Pro G Series projector contributed to a lower-cost, easy to use and sophisticated active learning classroom when combined with additional supporting technology.

## The Active Learning Classroom: An Affordable Approach

**Curriculum Director at the University of Washington School of Medicine Explains the Active Learning Concept and What You Really Need to Make It Work On Your Campus**

"The educational literature is very clear. If you use the information you're trying to learn, you will remember it at a deeper level than if you just hear it in a lecture."

That's Linda Vorvick, Director of Academic Affairs at the MEDEX Northwest Physician Assistant Program, Department of Family Medicine, University of Washington School of Medicine in Seattle, explaining the basic concept behind the active learning classrooms being installed on campuses across the country. "These classrooms allow us to move to teaching methods where students are more engaged, use more neural connections and thus enhance their ability to recall what they learn."

While the technology in active learning classrooms—also called learning labs or collaborative classrooms—tends to be complex and very expensive, that does not need to be the case. Simple to use technology works best, according to Vorvick. That's true on a practical basis and neurologically as well.

Last year Vorvick worked with the Seattle office of CompView Audio Visual to design a lower-cost, yet sophisticated active learning classroom at the School of Medicine. It uses seven glass-surfaced marker boards, a matrix switching setup with



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– LINDA VORVICK, DIRECTOR OF ACADEMIC AFFAIRS AT THE MEDEX NORTHWEST PHYSICIAN ASSISTANT PROGRAM, DEPARTMENT OF FAMILY MEDICINE, UNIVERSITY OF WASHINGTON SCHOOL OF MEDICINE IN SEATTLE

inputs for seven student laptops, a sound system, podium and two Epson Pro G Series projectors.

### Active Learning at MEDEX Northwest

The new active learning classroom at Washington is part of MEDEX Northwest, the university's Physician Assistant (PA) training program. PAs are healthcare professionals who conduct physical exams, diagnose and treat illnesses, prescribe medications, and assist in surgery, and are licensed under the supervision of physicians.

PA educational programs are shorter than those for MDs, but they are intense. MEDEX Northwest in Seattle, a Master's Degree program, includes 12 months of classroom-based instruction and 15 months of clinical training. "PA education is really difficult," Vorvick says. "They have a lot of detailed medical information they have to learn, and they have to learn it fast."

Because much of the classroom time includes traditional lectures, and because the program regularly uses local specialists as guest lecturers, the new room would have to support more standard teaching methods as well as group-based active learning. "It's too much of a change to happen all at once," Vorvick explains, "especially since our instructors have already developed extensive, lecture-based materials." Still the program's six core professors, including Vorvick, are committed to incorporating active learning methods.

"It's a hard and scary process in many ways," she explains. "As an instructor, I like to think that, because I've said something in a lecture, the students have learned it. But there's a point where you come to the humbling realization that saying something is not enough, and then you start thinking about ways to ensure that they have learned the information."

"The second piece that's scary is that you are turning control over to your students. You have to trust that they're doing the right thing while they work together in groups, and even though that's not always the case, you do learn that with a good lesson plan, they are retaining more than they would with you just standing and talking."

"A third problem is that if you give your students control of the information, they will ask you questions you can't answer. You have to be comfortable showing them how medical professionals go through the process of looking up what they don't know. Of course that's a plus, too, because it's very important that they learn those skills."

### **Active Learning Activities**

Over the last year, MEDEX Northwest faculty has tried several types of activities in the new classroom, but a few stand out as especially successful.

At the most basic level, instructors put cases up during their presentations, then ask students to turn to each other and talk about them. Then they go on with their lecture and give feedback to the class. "Some take that idea farther and create small group exercises. They'll stop their lectures, break the students into

groups to talk about the cases, and then lead a discussion with the class as a whole."

Because medical cases do have correct answers—unlike case studies in business or the law—faculty have created a variation where they print the answers on scratch-off cards a lot like lottery tickets. "This way a group doesn't have to wait for the whole class to see if they have the right answer." It's more memorable as well.

Many faculty use a method called jigsawing, where they break the class into groups where there's the same number of students as there are groups, say seven groups of seven. Each group learns one variation of a skill or set of knowledge, then breaks apart to teach the others what they've learned, one student teaching one other group.

For example, students in a first-year Clinical Skills class learn to identify different types of heart murmur. Each group has an audio file for one type of murmur. They listen to that, learn its identifying features then teach what they learned to the other groups. "At the end of the session there's a PowerPoint review with time for questions and answers, so we can make sure everyone knows what they need to and that their classmates taught the information properly." In this case, they spent the next day in a clinic listening to murmurs in cardiac patients, reinforcing the learning one more time.

### **A More Reasonable Approach to Technology**

Over the last few years, Vorvick has looked carefully at what a program really needs to make all these activities possible.

The students obviously need somewhere to sit, but Vorvick settled on an unusual seating plan. Because there would be a mix of traditional lectures and activity-based learning, she decided on individual, tetrahedron-shaped tables with separate chairs. "Students can line them up in rows or quickly move them together so groups of two to eight students can face each other."

The students need to be able to take notes and share text and sketches as they work through activities. The team provided two methods to do so. They can sit and use their laptops, or they can stand and write on 48" x 96" marker boards wall-mounted around the room. "For most activities, they prefer the marker boards, and that's great," Vorvick explains. "There's research that shows people are more likely to remember something if they write it by hand than if they type it on a computer. It's a question of the neural connections they use—our brains don't process writing and typing in the same way."

When they have finished a group session, students need to present their findings to each other. To do so, they simply photograph them with their smart phones and route them to the projector using iProjection, Epson's free app for Apple and Android devices. It's a quick, inexpensive but very useful solution. Vorvick says it works quite well.

***“Among the Pro G advantages are full high-definition support, a native widescreen format matching today's laptops and mobile devices, their ability to accept virtually any kind of wired or wireless signal, and the fact that their ‘color brightness’ — the intensity of the red, blue and green light that creates colored images—is significantly higher than with other projection technologies, providing visibly better, more vibrant images.”***

– DEBORAH KLEIN, GENERAL MANAGER FOR COMPVIEW AUDIO VISUAL'S SEATTLE OFFICE

Another concern was the fact that the MEDEX Northwest program extends over four campuses in Washington State and Alaska, and certain classes are shared using video conferencing equipment. So the classroom had to support that technology with cameras, microphones and a LifeSize video codec.

The choice of the display was crucial. Many active learning rooms have multiple flat panel displays—one or two for every student group—but Vorvick says that's overly expensive and unnecessary.

Deborah Klein, General Manager for CompView Audio Visual's Seattle office, says her engineers recommended two Epson Pro G projectors because of their ability to provide very bright, sharp images large enough that everyone can see them clearly. Among the Pro G advantages are full high-definition support, a native widescreen format matching today's laptops and mobile devices, their ability to accept virtually any kind of wired or wireless signal, and the fact that their “color brightness”—the intensity of the red, blue and green light that creates colored images—is significantly higher than with other projection technologies, providing visibly better, more vibrant images. “That's especially important in a medical school, where you need great color,” she says.

In designing an active learning classroom, Klein stresses the need for technology that is very easy to use. “We installed a touch-sensitive AMX control screen and programmed it to show a floor plan of the classroom,” she explains. “You simply touch an image

of the laptop or device you want to project, then touch an image of the projector, and your video appears on that screen.”

Six wall plates, each with an HDMI input, allow students to connect their laptops and other digital devices to the projectors, and an AMX Enova network works in the background to transport and switch the signals. “Using the control screen at the podium, the instructor can send any student device, plus her own laptop, a document camera and video from a Blu-ray player to either or both projectors,” Klein explains.

To simplify operations further, the CompView team designed a sound system with eight ceiling-mounted microphones covering the entire classroom. Four Audix microphones are mounted above the front of the room and always on to pick up the instructor's voice. Four more multi-directional ClearOne pods pick up students' voices during group presentations and class-wide discussions. The CompView team tied everything together with a Polycom audio processor, which provides microphone mixing, equalization and the processing needed for video conferencing calls. Twelve Tannoy ceiling speakers provide audio within the room.

“The great thing is, you don't have to think about where the microphones are or where you need to stand or sit,” Klein says. “They just work.”

### **Systems Theory and Active Learning**

Active learning is becoming more and more important on many campuses, but the transition can be challenging. Its success at MEDEX Northwest is due largely to the fact that the core medical faculty are acutely aware of how the brain works and how people learn.

Then, too, “In systems theory, the environment you put people into is largely responsible for the results you get,” Vorvick explains. “If you put your instructors in a lecture hall with one computer input and one screen, you're going to get a lecture. And we have found that if you put people in a classroom with group tables, marker boards and a series of laptop inputs, you're going to eventually get something better. The system is there, easy and ready to use, so with no other encouragement, your faculty will tend to use it.”

One change Vorvick expects to make is to replace the individual tables. “The fact is, it's still too easy to lecture in this room. It's true that a hybrid approach was the right choice a year ago, but I suspect that in another year or two we will want to change to

permanent group seating.” Of course, that’s relatively easy and inexpensive to do.

She does not, however regret the technology choices, and that does not surprise Klein. “At CompView, we partner with vendors we can trust implicitly. For example, with Epson we get a great projector at a very competitive price. Their support is outstanding, and they even have a next business day replacement program if we run into any kind of problem. For color, brightness, access, support and the quality of the product, you can’t beat them. They help us make sure our most innovative clients—including the University of Washington Medical School—succeed when they try something new.”

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