

Building The Ultimate Digital Classroom

Collaborative software and an all-digital backbone combine for future-proof flexibility.

By Don Kreski

If you set out to build the ultimate collaborative classroom, what would it be?

I'd expect it to be an extremely flexible space, giving students, as well as instructors, the ability to share data, share documents and present to one another from anyone's computer or any video source. It might be very much like the new Integrated Teaching and Learning Center (ITLC) at the University of Massachusetts (UMass) Medical School in Worcester MA.

"The methodology that the Medical School employs is very, very dynamic," said Alvaro Yurrita, Project Engineer at Sudbury MA-based integrator Adtech Systems (www.adtech-sys.com). To support it, Yurrita designed a system with almost 160 computer and video sources, six projectors and 17 large-screen LCD monitors, together with the flexibility to send any image from any source to any one or more of the displays.

"We used a combination of software and matrix switching to achieve



The Integrated Teaching and Learning Center at the University of Massachusetts Medical School features one 55-inch LCD display per student work group, and side-by-side projection systems (two projectors per classroom section).

All photos: AJ Abrams

the flexibility they needed within a reasonable budget," Yurrita added. "And because we needed every image at the highest resolution—1080p or higher—and had to be able to input the latest computers with the newest digital connections, Crestron DigitalMedia was an obvious choice."

According to Brian Duffy, the UMass Senior Project Manager in charge of the ITLC, the main goal of the project was to build a "dry lab" for various subject areas taught to the medical students. For example, in the ITLC, professors and students take advantage of new virtual microscopy tools, studying pre-made digital images of cellular structure and various pathogens rather than physical microscope slides. "It's a lot easier and more efficient to point to

an electronic image on a screen than to describe what students are to look for through a microscope," he said.

Another goal was to engage students more fully by asking them to work and study in small- to mid-sized groups. "People more readily engage in the learning process when they work together," he explained.

A third goal was to maximize the use of the space, no matter how the student body might be divided. Motorized separation walls fold down to break the space into three smaller classrooms, one larger and one smaller classroom or one combined room. The ITLC currently is set up for the 2010/2011 class of 125 first-year medical students, but it was built to accommodate up to 150.

According to Yurrita, UMass plan-



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One of the podiums with a keyboard and monitor for an instructor workstation, which allows the instructor to access the room controls (see inset).

ners asked that Adtech design a system that would keep signal quality at its absolute highest. “DigitalMedia will transport 1080p video and 1920x1200 images in their native formats without any compression; is ready for standard or Deep Color; yet, at the same time, will accommodate older analog sources.” And, because DigitalMedia uses card-based switchers and other components, it will be easy to upgrade should some new standard emerge in the future.

In one important model for classes in the ITLC, instructors ask medical students to investigate a problem in pathology or another discipline. Individuals examine virtual tissue samples on their laptops, and then share them in groups of four to eight students, displaying images and documents as they work on a shared wall-mounted 55-inch LCD monitor. To facilitate this kind of collaboration, the Medical School purchased two software packages from Tide-

break, Inc.: TeamSpot and ClassSpot.

The Tidebreak packages work together to connect up to 12 student laptops to a shared computer via the classroom network, then allow individuals to take over the group machine with a simple mouse movement. Team members can send pictures to this shared computer, open websites and collaborate on documents, viewing their work on the 55-inch monitor or a projector. When a group comes up with an interesting insight, the instructor can ask them to present what they’ve learned to the entire class, simply by choosing the source and appropriate displays via intuitive Crestron touchscreens. An array of three DM-MD32x32 DigitalMedia matrix switchers makes the connection.

In this way, it’s possible to share video from any of 150 student laptops and nine other sources using only 40 video inputs. The software/switcher combination has kept wiring, switching and control system programming relatively simple and affordable.

For the instructors, Adtech installed three podiums: one for each section of the ITLC, each equipped with a 20-inch annotating flat-panel display, PC, Mac, keyboard and mouse, and document camera. “These are mobile and can be

plugged into three different locations in each room,” Duffy explained. “Some instructors like to stand at the podium, while others like to lecture from one of the tables or even sit behind the students while they work.”

A Tandberg C60 codec plus a ceiling-mounted camera for each section of the ITLC provides additional flexibility. “Suppose an instructor wants to address a pathology concept from a gross anatomy point of view,” Duffy explained. “With the videoconferencing system, it’s simple to ask an expert to address the issue from an anatomy lab across campus or across the world.”

Although Adtech installed most of the AV and computer equipment in a rack room adjoining the ITLC, a wall plate is also included in each room, with HDMI, DVI, component, S-video and composite inputs to accept additional sources. Adtech also built a mobile rack containing a Blu-ray player and a DVD/VCR combination, plus additional, seldom-used inputs, including SDI.

One key to making the ITLC work smoothly was careful programming of the control system that handles all of the switching, videoconferencing operations, lighting, sound and other

(continued on page 43)

INTEGRATOR'S POV: ULTIMATE DIGITAL CLASSROOM

gear. "This is a pretty complex system, yet it needs to be easy to use," Duffy explained. "Literally, hundreds of instructors can come in, whether on an ongoing basis or for one-time presentations in their specific fields. We spent hours with Adtech working on how the GUI would present all these choices."

Duffy said that the finished screens put the most-used operations and the simplest tasks on the front pages, yet allow more experienced users to delve deeper into the ITLC's capabilities on additional pages. He asked Yurrita to build an interface similar to other Crestron panels used throughout the university. "It's part of an ongoing effort to standardize all of the AV controls on campus."

Adtech installed wall-mounted Crestron V-Panel HD touchscreen displays in each section of the ITLC. Instructors can also have the same

control layouts in a window on their computers, using XPanel software.

According to Duffy, the DigitalMedia infrastructure helps the operation of the ITLC in a number of ways. "We had the experience last year of building a lab using analog matrix switchers. It was a great design, given the technology that was available, but the large number of cables turned out to be a challenge to manage.

"With this project, one of my goals was to minimize all the wire while, at the same time, keeping the various signals in their native format. Adtech proposed using DigitalMedia, and we had one of the first installations of this new platform," he explained.

Duffy said that the project has been very well received by staff and instructors. "Everyone has embraced the new technology. The systems are absolutely doing what we thought they would do." ■
