

# Built For Collaborative Learning

## Information Sharing At The Health Sciences Learning Center

Knocking down intellectual walls between disciplines often requires building new physical structures, and technological infrastructures that bring together spaces and people in new working arrangements. The \$55 million Health Sciences Learning Center at the University of Wisconsin, Madison, part of the state's \$210 million HealthStar initiative, provides classroom instructional space and clinical skills training for the Medical School and the School of Nursing.

The Center is physically connected by land-bridge to Rennebohm Hall, the home of the UW-Madison School of Pharmacy, which shares the center's student computer lab and the new Ebling Health Sciences Library that occupies part of the

second floor and all of the third floor of the center. Dedicated in May of 2004, the 250,000-square-foot center is home base for approximately 600 medical students, 400 baccalaureate and 200 advanced practice graduate nursing students, 60 physician assistant students, with 470 residents/medical fellows using the facilities as well. Students work in interdisciplinary teams to solve problems. A Teaching and Assessment Center where students' clinical skills are assessed in a hands-on setting and a Basic Skills Clinic simulating a high-technology patient care environment are key components of the facility.

In their design for the Health Sciences Learning Center (HSLC), KahlerSlater Architects dissolved

### Four Basic Venue Types

The HSLC facility breaks out into four basic venue types, served by similar technologies: lecture halls, including a 350-seat auditorium, two large, one medium, and one small hall; standard breakout rooms (16), enhanced breakout rooms (5), and cluster classrooms (7), conference rooms (2), a computer-training room, and the library function room; distance learning and education rooms (6); and the Clinical Assessment Center (with 24 examination rooms).

The auditorium and lecture halls all have Sanyo and Sony LCD projectors, Extron AV matrix routers, 3-chip Sony cameras and Wolfvision document cameras. Audio for these venues includes Bose ceiling speakers (129 in all) and EAW installation loudspeakers, Shure wireless and lectern mics, and assistive listening systems from Listen Technologies. QSC CX and PL Series amplifiers provide power running on the Biamp AudioFLEX digital audio platform. Crestron PRO2 dual-bus control system processors reside in each venue and with a Crestron Isys TPS-6000 desktop touchpanel and four TPS-6000 lectern-mounted touchpanels manage AV signal selection.

The 16 standard breakout rooms are modestly equipped, while the five enhanced breakout rooms have Sony LCD projectors and Crestron Media-Manager controllers with TPS-3000 touchpanels. Likewise, the two conference rooms and the computer-training



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room all have Crestron TPS-3000 touchpanels interfacing with their own MP2E MediaManager control system.

The four distance learning classrooms (two 24-seat and two 12-seat spaces) and the two smaller distance education origination rooms, present special cases. Two NEC plasma screens and two NEC projectors are in the front of each distance learning room, and one plasma each in the meeting-sized origination rooms. Six Crestron PRO2 dual-bus control system interfaces, and six TPS-5000 touchpanels serve these spaces. Two Crestron CNX-DVP4 digital video processors in the distance ed rooms are used to display two high-res images simultaneously on a single 16:9 aspect ratio plasma.

traditional boundaries dividing the library, the computer laboratories, classrooms and distance learning facilities. These various learning environments are organized around a central atrium that encourages collaborative learning among the health science disciplines.

Acting as a consultant to the architect, Professional Audio Designs of Milwaukee created an AV environment that supports the facility goals of collecting information for the various schools and programs all in one central location, and connecting learning spaces, teachers and students throughout the facility, and beyond. Basic elements of the AV infrastructure design are a fiber-optic network and a central codec array and video systems distribution room. Crestron control is in every room, and Crestron e-Control connects every room.

"Everything runs through two huge Autopatch routers under Crestron control," said Professional Audio Designs lead systems designer and one of the company's principals, Scott Leonard. "Signals can be routed

to the codecs in the codec array room, to fiber converters that link rooms together, or to go to recording and streaming of lectures. The codec room was designed to take advantage of all these technologies that could be implemented whenever the client was ready." A Crestron Isys TPS-6000, 15-inch desktop touchpanel in the codec room is connected to all the other Crestron panels in the facility via ethernet. From this single panel, an operator can monitor any of the panels in the facility, control the routing system, as well as actually take over operations in any of the rooms.

The decision to locate all codecs centrally rather than place codecs in every room of the facility, was based upon two basic ideas, said Leonard: "First of all, we wanted to cut down on the number of codecs needed. A codec can be easily routed to the auditorium, the larger lecture halls, and the six distance learning rooms, the venues most likely to use streaming audio and video. Secondly, technology has a way of changing...with racks of codecs in one room, the

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## Video Capture, Encoding, Streaming And (Now) Podcasting

by Daniel Marleau

Each of the 24 exam rooms in the Clinical Assessment Center has a tablet PC with a video capture card. We wrote our own application to manage video capturing. When a Medical School student walks into a room, he or she swipes an ID card through a reader that activates the vid cap card in the PC. The PC talks to the controller, which then looks for an available encoder. For every four rooms there's an encoder using Windows Media Encoder software. When the exam's done, the student swipes the card again, which stops the encoding. The completed media file is uploaded from the encoder to our streaming media server where faculty and students can log on with their ID via a web interface and access the media file for their session.

Faculty members, who access the



Daniel Marleau (pictured) is the director, information technology, Health Sciences Learning Center.

same site, have some half-dozen students to review. They watch the session video and complete an online evaluation form. Students are alerted when their review is complete so they can log on to view the results. (Faculty can also use the tablet PCs in each exam room to evaluate student performance with

"standardized patients," on the spot. These sessions are recorded and archived, but are not available to students for viewing. The School of Nursing also uses these rooms for student-run practice sessions, conducted without standardized patients.)

Brian Duffy recently added this audio-video capture capability for all our lecture halls. As with the Assessment Center, everything is routed through the codec array room where we added Windows Media encoders to encode lectures into MP3 and Windows Media video formats. We capture whatever is being routed through the main projector: podium computer, document camera, room camera, slide projector, VHS/DVD.

Starting in the second week of August, students have been able to log on to the server and download lectures to an iPod.

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client can change out any of them without tearing up a classroom."

Large-scale projects of this nature play out over years. Leonard pointed out that most often the AV portion of a major project is bid out well in advance of construction, leaving much of the audio and video integration to take place in the construction phase itself. And such projects may take two years to build. "Three or four years is many generations in the world of technology," he said. The challenge is to develop an AV sys-

tems design that anticipates change and incorporates the inevitability of change. "We write the spec so that we can work with the AV contractor to re-evaluate and upgrade the technology during construction. Working in close collaboration with a responsive AV systems contractor like AVI-Midwest is critical." AVI-Midwest's Brian Duffy, project head, was systems contractor for the project.

A specific instance of the systems design and installation process meeting the challenge of changing technology is the use of Crestron's MediaManager, a product family that provides total control of a small to medium-sized room's

multimedia resources, including CD players, DVD players, projectors, screens and lighting.

"The MP2E was not available at the time the spec was written," Duffy explained, "but the spec was Crestron. Scott and Professional Audio Designs worked in close collaboration with us to find an affordable control solution for the smaller rooms in the installation."

»AVI-Midwest...

[www.avi-midwest.com](http://www.avi-midwest.com)

»Crestron...[www.crestron.com](http://www.crestron.com)

»KahlerSlater Architects...

[www.kahlerslater.com](http://www.kahlerslater.com)

»Professional Audio Designs...

[www.proaudiodesigns.com](http://www.proaudiodesigns.com)

## Clinical Assessment Center

Clinical skills training and assessment clinics are a proven, cost-effective way to educate health care professional students and residents in a non-threatening environment. Though the concept is not new, the technology employed in these assessment clinics has only recently come into its own.

The HSLC Clinical Assessment Center at UW Madison consists of 24 exam rooms, an exam area, a control area, an orientation room, and a conference room. Each of the exam rooms is outfitted with two in-ceiling, remote-controlled and programmable pan/tilt/zoom/focus domed cameras placed on either side of the room. One camera views the exam table, and the other views the interview table. Each exam room is also outfitted with two in-ceiling microphones, one placed over the exam table and one over the interview table.

"Audio setup is a very important component of these exam rooms," Leonard said. "If the audio is good, you can use higher-compression video." To ensure good audio, Professional Audio Designs spec'd room acoustics that offer fair sound absorption and sound insulation. "An excessively 'live' room will sound hollow and confusing and degrade intelligibility on a recording," Leonard pointed out. Sound leakage between the rooms and air-handling noise were minimized. Leonard and his staff selected unobtrusive microphones with the correct pickup pattern to optimize the signal-to-noise ratio. "We created a computer simulation of the acoustics of the space to aid us in the selection, and applied some fairly sophisticated signal processing via the Biamp AudiaFLEX [with CobraNet control modules] such as multi-band compression, to optimize microphone performance."

Even lighting-level, lighting angle, and overall color temperature—for best camera performance—was selected by Professional Audio Designs, who also recommended colors for backgrounds and wall coverings that would not strain the capture capabilities of the video camera.

Audio, video and control signals from the exam rooms are sent to six full-height electronic equipment racks in the control area housing all the audio, video and control equipment for each exam room: a streaming encoder, a microphone mixer, and three LCD monitors. The control area racks also house an Autopatch 48-input to 48-output audio/video matrix router, an audio and video monitoring system, and a Crestron PRO2 dual-bus control system processor.

All functions of all processors can be controlled and setup via a 12-inch Crestron touchpanel, or from either of two Crestron wall-mounted interfaces in the orientation and conference rooms.

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