

PRO AV Blueprint for University AV

How three universities turned over whole buildings to instructional technology in order to boost their image, attract students, and improve education.

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New AV technology continues to march through colleges and universities despite economic upheaval. More than ever, universities see the value in bringing high-resolution presentation systems and online collaboration tools to educate the 21st century workforce faster, better, and more affordably. Widescreen, 16:9 aspect ratio display systems are among the biggest technology trends, as schools seek to make projectors and screens conform to the standard on notebook computers. Hardware vendors and integrators also say a move to real-time monitoring and support of AV assets over networks is sweeping college campuses.

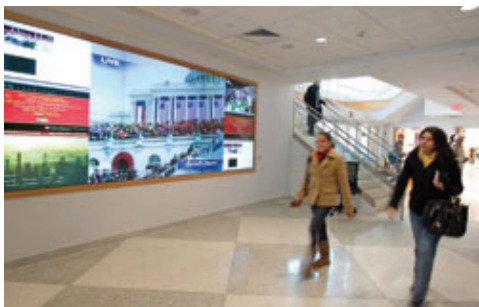
The broader wave that brings collaborative, democratized instruction to a once-stodgy world continues unabated, if the following case studies are an indication.

Temple's Alter Hall: AV from the Ground Up

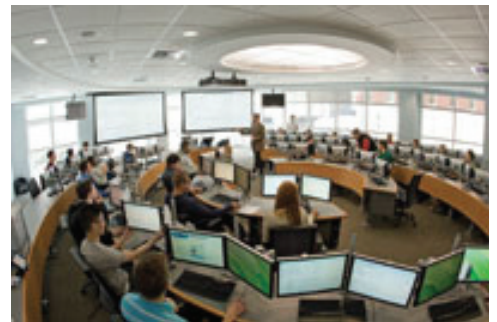
Few institutions can hope to match the tech-saturated panache of Alter Hall, the new seven-story, 217,000-foot building that opened at Philadelphia's Temple University Fox School of Business in January. "There's a 'wow' around every corner," says Paul Igoe, account manager for integrator Total Video Products.

Designed by architect Michael Graves, Alter screams high-tech the minute you walk in, so much so that CNBC devoted rare live coverage to its opening. A 15-by-15-foot videowall, fed by a Visix AxisTV server over Category-5 cables, welcomes visitors with promotional images. A 177-foot-wide, eight-color LED stock ticker traverses the beams of the student lounge, and there's a stock-trading lab and 300-seat auditorium.

"We've got digital signage throughout the building," says Larry Philbrick, supervisory consultant for Boston-based AV design firm Acentech. An atrium features a 6,400-pound globe that rests on what Philbrick calls a "water bearing"—a thin film of water at its base. "You just rotate it by pushing on it," he says.



Labolito, Manning And
Brandenberg, Temple Creative Services
Alter Hall



Labolito, Manning And Brandenberg, Temple
Creative Services

Students in Temple's Alter Hall enjoy the benefits of digital AV. Everything that happens in the classroom is recorded for later on Sonic Foundry servers.

John Deangelo, Fox School's assistant dean of instructional technology, says he is most proud of the way the wireless networking, furniture, and overall ambience encourage students to kick back and work comfortably on their laptops in Alter's numerous lounge-like spaces.

Lecture capture and Web streaming are central to the hall's vision. Most spaces are video equipped, and Sonic Foundry Mediasite RL Recorders were installed in 30 classrooms in Alter and adjoining Speakman Hall. "The ubiquity is what makes it unique," says Sean Brown, Sonic Foundry's vice president of education.

"Basically, everything the professor says and the student says is recorded, so you can go home at night and view that class again," Igoe says. Deangelo hopes to use Mediasite to enhance

communication with worldwide partners by delivering content across time zones while reducing instructor travel. The university already used Echo360 capture stations elsewhere but switched to Mediasite when Echo360 couldn't deliver an upgrade in time, he says.

Deangelo says it was a challenge to ensure the hardware that feeds content to Mediasite was working properly. If the battery in a wireless mic failed, the recording might miss the instructor's entire audio feed, or a tracking camera might lag behind some scenes.

Signal distribution, much of it over Magenta Research transmitters and Cat-5, makes content sharing among rooms nearly seamless. "You can take any signal from any room and redirect it to any other space," says Deangelo, adding that a vendor who attended the opening was able to broadcast its signal to the videowall and other displays.

Most rooms have dual plasma screens that are angled to optimize views for people in the corners. Philbrick says Acentech worked with the architect to build a "hinged," or splayed wall design.

Sometimes AV input came too late in the design process. The MBA commons called for projectors to be built into walls, which didn't allow cooling. So thermostatic controls, fans, and ducts were added to divert air to the plenum space above the ceiling. Total Video technicians say early involvement in the planning and a good relationship with contractors made work go smoothly. "They would tell us they were going to close up walls in three days," says Jason Kane, Total Video's project manager. "We were able to avoid the need to cut up walls." Closets for equipment racks were designed into every room, with some rooms built expressly for AV, and walls pre-cut for projectors.

AMX equipment—the Temple University standard—controls each room's AV system. Podiums are motorized to move 18 inches vertically and 17-inch ONE Monitor touch screens provide annotation capabilities.

Students can schedule the 26 breakout rooms from a Web browser using AMX Meeting Manager software. Authentication in the software separates undergrad from MBA access to certain rooms, and Deangelo hopes soon to integrate secure card access.

Crown amplifiers, ClearOne DSPs, JBL speakers, and Clockaudio, Shure, and Revolabs microphones anchor the audio, along with Sennheiser assisted listening. Voice lifting in every room emanates from ceiling speakers. Vaddio ControlVIEW infrared tracking tell the Vaddio PTZCAM 70 pan-tilt-zoom cameras when someone enters the field of view. All 17 case-study rooms have power connections in tables and wireless networks for students.

Top to bottom, Alter Hall is a showcase not just for the glitz of AV, but also its potential to transform higher education.

Florida Atlantic: Office Depot Supplies Executive Class

AV was essential to the image Florida Atlantic University wanted for its Office Depot Center for Executive Education, a two-story, 15,500-square-foot addition to the Barry Kaye College of Business that opened early this year on the main campus in Boca Raton.

"They were looking for as high-quality and technically advanced a system as they could get within a certain budget," says Martin Lois, sales engineer at design/build integrator AVI-SPL, which worked on six spaces in the center.



Courtesy AVI-SPL

Architecture and AV create an executive-class feel in the building, which is used for graduate and MBA courses, as well as corporate events, some held by Office Depot, headquartered nearby, whose \$2.8 million donation was matched by the state. A case-study room has elegant woodwork and lecterns. Automated shades come down when the 5,000-lumen Panasonic PTD5500U projector is turned on, all controlled by Crestron hardware.

Some rooms have Smart Board PX350 overlays on one of their 50-inch NEC PX50XM4A plasmas. Audio is handled by JBL speakers, Biamp and Crown amplifiers, ClearOne mixers, and Shure microphones. Two videoconferencing rooms have Tandberg MXP 3000 codecs that will offer streaming over the Web once Echo360 servers are added, says Peter Goumas, the college's director of IT.

All that technology aside, the architecture presented challenges during installation. While mounting a projector to the ceiling in a case-study room, technicians risked ruining custom woodwork if they didn't cut it right on the first try, Lois says. A large, divisible multipurpose room had a bulkhead with holes barely wide enough for the two NEC plasmas and their Display Devices PL3050 lifts, let alone the hands to install them. "We only had inches to work with," says Lois. So the general contractor widened the openings and patched them later.

Goumas says of the displays, "They come out of the ceiling automatically when you turn on the system." An AVI-SPL programmer worked diligently to get the Crestron equipment to switch the front and mid-room display sources to accommodate dual or single-room operation, he says.

The project was delayed a month so the construction company could install soffits and drop ceilings 8 inches to clear sprinkler pipes. "You never really know where all the A/C ducting and piping is going to go," Goumas says. "It's never fully defined in the construction drawings."

In another room, vibrations plagued a projector mounted on a pole connected to a sprinkler pipe. "Every time someone of substantial weight would walk by, it would shake the projector," Goumas says, crediting an AVI-SPL technician with installing a rubber mount that alleviated the problem.

Signal distribution via Extron switchers became critical when the university wanted to future-proof the building with the ability to transmit audio, video, and VGA signals to the planned streaming servers. Lois says his team worked with the architect and electrical contractor to add cable trays to accommodate the cabling alongside the network wiring, and upgraded the Extron switchers. Goumas says long cable runs caused VGA attenuation that required AVI-SPL to also add Extron extenders to boost gain.

The college decided it wanted displays with wide aspect ratios, which Goumas says required changing the originally specified displays and adding scalars. "Doing 16:9 images on some kind of budget is very difficult," says Lois. "We chose products that, although they might not be true HD, do a very good job of the 16:9 imaging."

The aspect-ratio and resolution issues were an eye-opener for Lois, who faced anomalies and screen-size problems that required extensive modifications to the scaling. He recommends paying close attention to planned resolutions and says AVI-SPL does more in-house mock-ups on display devices before taking them on-site.

Though planned and funded before the economic crisis, the center could help FAU continue to attract students and donors. Goumas says the college used to hold fund raisers in its electronic trading room. "Now when we're bringing in people to impress, we take them to Office Depot Center."

Penn State: The Art and Science of Law

Videoconferencing is a medium that will allow Pennsylvania State University's Dickinson School of Law take distance learning to a new plateau once its Carlisle campus gets the AV makeover that University Park received last year. All told, 113,000 square feet will be upgraded, including 75-seat tiered classrooms, a 250-seat auditorium, and two 50-seat courtrooms. The eventual goal, say school officials, is to make the two campuses mirror each other so students can get their legal training at the most convenient location.

But this isn't just any old videoconferencing. Unlike lecture-based majors such as physics and accounting, instruction in law is built around intense and frequent dialog among teachers and students. "In the legal profession, facial expression, hand gestures, and inflection of voice are all important," says Jim Ferlino, vice president and principal of project integrator Vistacom. This requires videoconferencing systems that preserve body language and the aural dance of verbal give-and-take.



Destiny Heimbecker, Vistacom
Penn State

“Law schools, historically, didn’t believe in distance learning,” says Jim Sanphy, senior associate at AV designer Shen Milsom & Wilke. But the school did such a good job with its new systems that it claims to be the only law school approved by the American Bar Association for distance learning in the last two years of the three-year program.

It accomplished this not with pricey telepresence systems, but with standard-definition videoconferencing units choreographed by a custom AMX application that maintains pre-set configurations for student presentations, distance-learning, and teaching modes. Ferlino credits the human-centric system to the clear expectations Shen Milsom & Wilke established while gathering customer feedback and showing flexibility in accommodating change. One example was the decision to use projectors instead of 65-inch plasma screens, for which infrastructure was already in place in the rear of the lecture halls. Teachers said the approximately 40-foot distance didn’t provide enough realism when viewing students at the remote site, so projection was brought in to enlarge the image to about 120 inches diagonal. “It’s probably unusually large for a teacher’s monitor,” Sanphy says.

It also helped to have a technically savvy client with experience using push-to-talk mics and preset cameras.

“We’ve been doing what we’re going to be doing for the last three years,” says John Davie, director of instructional and information technology. Davie had discovered a formula that preserves the feel of a normal dialog when a student releases the mic button and the camera reverts to the instructor shot. In the local room, the camera stays on the student for two seconds, but in the remote room, it stays for eight seconds. This allows instructors to continue viewing remote students’ body language and pick up cues that suggest, for example, whether they understood the last point. “The sound goes away, but the camera remains,” Davie says. “It’s all about body language.”

Each campus will have a functioning courtroom packed with AV, including an evidence station that lets people submit evidence in various formats selected from a control panel. The judge can view the evidence before deciding who in the courtroom can see it. The witness’s display has an overlay that lets them annotate the evidence.

HD-SDI AV over fiber was rejected in favor of Magenta Research unshielded twisted pair devices to distribute video over Cat-5 among instruction rooms and a master control room. Each room needs multiple signal paths for cameras and PCs, which would have been prohibitively expensive over fiber. Extron DVS 304 scalars sit in equipment racks in lecterns. Integrating AV into the lecterns was a challenge because of the space taken up by the motor assemblies that move the work surfaces up and down. The solution, says Ferlino, was to remove casings from equipment and cut back the rack.

Other hurdles included distributing audio and maintaining quality through numerous breakpoints, as well as programming Biamp AudiaFlex DSPs to configure equalization, compression, and amplification of dozens of student mics. The Biamps had to be pre-set for the two- and eight-second videoconferencing delays. And when interference from the building’s Wi-Fi network caused clicks and pops on the 20 Sabine wireless microphones, Sabine’s president flew in to recommend amplified antennas that fixed the problem.

In the end, Penn State had an AV infrastructure finely tuned to its needs. Now it will replicate it. “I don’t think I’ve ever seen a client that’s done so much analysis of what works for them,” Sanphy says.

David Essex is a technology writer based in Peterborough, N.H.

Equipment List

Here is a partial list of the equipment installed by the AV integrators at three universities.

Temple University’s Alter Hall

- * AMX NI-2100, NI-4100 NetLinx controllers
- * ClearOne Converge Pro 840T mixers
- * Da-Lite Electrol screens (various sizes)
- * Extron CrossPoint 450 Plus 88 HV 8x8 RGBHV switchers

- * JBL Control 26T speakers
- * Magenta MultiView UTx 232 Universal transmitters, AK500/1000 receivers
- * Polycom HDX 9001 SD codecs
- * QSC CX204v power amps
- * Revolabs Solo Desktop System, lapel mics
- * Samsung 46- and 57-inch LCDs
- * Sennheiser SI30/1500 IR system
- * Vaddio TrackView 100 systems
- * Vaddio WallView 70 PTZ cameras
- * Vaddio AutoView IR sensors
- * Visix AxisTV professional content server
- * Visix AxisTV channel player

Florida Atlantic's Office Depot Center

- * Audio-Technica AT845R tabletop mics
- * Biamp MXA75 amplifiers
- * Chief wall and tabletop mounts
- * ClearOne XAP 800 audio mixers
- * Clockaudio C01-ERF mics
- * Crestron AV2 control processors
- * Crestron TPS-3000 touch panels
- * Crown CTs600 power amplifiers
- * Display Devices PL3050 plasma lifts
- * Extron MAV 44 AV switchers
- * Extron MVX 44 VGA A switchers
- * JBL Control 26CT, Control 28-WH speakers
- * NEC PX50XM5A 50-inch plasma displays
- * Panasonic PTD5500U multimedia projectors
- * Smart PX350 plasma overlays
- * Shure ULXS14/84 M1 wireless mics
- * Tandberg 3000 MXP codecs

Penn State's Dickinson School of Law

- * AMX AutoPatch Optima switcher
- * AMX NI-4100 NetLinx controller
- * Biamp AudiaFlex CM DSPs
- * Contemporary Research 232-STS tuners
- * Crestron QuickMedia power amp
- * Elmo P100 Visual Presenters
- * Extron IN1508 presentation switchers
- * Extron DVS 304 scalers
- * Extron IN3252HR distribution amps
- * Magenta UTx universal transmitters
- * Sabine SWM-7231-L5 wireless mics
- * Tannoy CMS601 DC BM speakers