Like most conscientious instructors, Anita Bart tries to span the distance between herself and her students. In Bart’s case, however, that phrase takes on new meaning.

Many students attending her administration of justice classes at West Hills Community College District (located in central California) are sitting in a classroom 50 miles away from her lectern. Bart has been using WHCCD’s video conferencing technology for almost four years, and she now teaches nearly all of her classes over the system, alternating in-person appearances between two WHCCD campuses.

“One of the problems we had in the past was that if a class didn’t have enough students in one location, we’d have to cancel it,” says Bart, who teaches at WHCCD’s campuses in Coalinga and Firebaugh.

“When we started video conferencing, it didn’t matter if we just had a few people at one site or the other because we could bring them together with the technology and teach them at the same time. Now, there are full classrooms at both ends.”

**Video Conferencing in the Classroom**

Colleges and universities have long used teleconferencing for administrative meetings, but educators like Bart are now putting the equipment to work specifically for the purposes of teaching and learning. With multiple classrooms equipped for fully interactive video conferencing, WHCCD has embraced the technology as a standard way to present a wide range of classes.

But even institutions with more modest implementations are finding that teleconferencing can extend the reach of courses and events, as well as forge a collaborative link among far-flung researchers and scholars.

“Even though video conferencing is not an emerging technology, people in higher education are still working the bugs out and seeing how they can use it, but it’s coming along,” says Veronica Diaz, associate director of the Educause Learning Initiative (Educause is a nonprofit organization that promotes the use of IT to advance higher education).

“Some institutions invest in college-wide or district-wide systems that they use for teaching and learning, as well as business. We’re also seeing it used a lot as a way for students to connect in a more personal way in hybrid learning with online courses.”

**Filling a Niche**

At WHCCD, gathering the critical mass of students needed to make individual classes viable was one of the initial drivers for adopting video conferencing, says Joe Savopolos, the district’s distance learning operations manager.

The technology also offered cost savings by enabling the district to offer the same class at separate campuses simultaneously, and by reducing the need to shuttle students from site to site. WHCCD serves about 10,000 students from California’s Pleasant Valley region on campuses in Lemoore, Coalinga and Firebaugh, and also offers classes at the Lemoore Naval Air Station.

“The initial and most important driver for us is the desire to share teaching and learning assets among the campuses,” Savopolos says.

In 2002, WHCCD contracted with Fresno State University for help with design and deployment of a state-of-the-art video conferencing system. The key criterion for the system was that it had to provide full technology integration for instructors as they taught their classes to multiple sites, Savopolos says.

“They had to be able to hook up laptops for PowerPoint, show movies on DVD or VCR, and anything else,” he says. “We wanted to make sure that whatever way the teachers wanted to present information, that option was available.”
WHCCD launched its system by outfitting two classrooms for video conferencing with a Polycom codec, high-definition cameras and HDX ceiling microphones, along with projectors, display screens, DVD/VCR equipment and power protection. The district now has 10 classrooms and five meeting rooms equipped for video conferencing, with two to three more rooms planned for a building about to be constructed on the Lemoore campus.

**Sharing Between Campuses**

In addition to video conferencing among its own campuses, WHCCD uses the technology to share resources with other institutions. Fresno State University video conferences classes that students can take for bachelor's degree credit to WHCCD sites. A radiation technology program and nursing classes that WHCCD offers jointly with Fresno City College are delivered via video conferencing, says Savopolos.

"Medical programs of all sorts seem to have an affinity with technology right away, like the psychology technology program and the pharmaceutical program we video conference between Lamoore and Coalinga,” Savopolos says. “But I can’t think of any kind of classes we don’t video conference anymore. You start out small and learn how to do things, and the teachers and students also adjust to the technology."

The wide array of equipment in high-end video conferencing installations raises integration and maintenance challenges, which means some adjustment for the IT staff as well, says Scott Young, WHCCD’s media technician.

"No technology is perfect, but we learn from our problems," Young says. “You learn what you can do, and as the systems have gotten older, you learn work-arounds. But the issues have never been that bad and video conferencing certainly works for us. “

Besides any new installations, much of the existing video conferencing hardware and software at WHCCD is reaching an age at which it will need to be replaced, Savopolos says. The current cost for WHCCD to completely equip a video conferencing classroom is about $40,000. The district relies, however, on a significant return on its investments in video conferencing in the form of educational benefits and money saved by consolidating classes, he says.

The district uses video conferencing in other, more traditional ways as well — for internal meetings that bring together people from WHCCD campuses, and for virtual gatherings of educators, administrators and IT folks from other educational institutions. The school has even interviewed prospective teachers, one from as far away as Guam, over a video conference link, Young says.

**NU's Video Conferencing Collaboration**

Bringing geographically separated individuals and small groups together is the most common use of video conferencing at Northwestern University, where the technology connects staff and faculty from the main Evanston, Ill., campus to satellite campuses in downtown Chicago and the Middle East, says Brandon Grill, system administrator for NU’s School of Communications.

"Much of what we do fits the traditional way video conferencing is used in business,” Grill says. “But even in that model there’s real academic value because we have labs that collaborate with other labs all over the world. Video conferencing is really the best way to do that. We have professors that work with other scholars thousands of miles away, and they do it using video conferencing.”

For several years, Northwestern’s executive masters degree program has had a significant distance learning component (briefly suspended for a curriculum revision), with students video conferencing into classes from their homes or offices, Grill says. That model works reasonably well, but variables related to the equipment, bandwidth and carriers available to individual students have occasionally created challenges for the students and Northwestern’s IT staff, Grill says.

“A lot of universities do synchronous distance learning, but they have regional centers that students come to. In that situation, they can control the equipment and the bandwidth and everything you need for proper video conferencing,” Grill says. “We decided to do it so students could be at home or work, so we had to deal with various carriers and upstream speeds, and people at work behind corporate firewalls, but we eventually worked the glitches out.”
Potential enrollees for any given course at Northwestern are likely to come from a single campus, so the university has few plans to video conference classes to multiple locations. The School of Communication does, however, maintain three fully integrated video conferencing centers, and the university as a whole has many more, says Grill.

"Demand for video conferencing is definitely increasing and we try to meet everyone’s needs," he says. "The debate team is using video conferencing to prep with other schools, and people are video conferencing in for doctoral dissertation defenses. Those are more the kinds of requests we get rather than for whole classes."

**Factoring in Cost and Bandwidth**

Cost and lack of bandwidth have been the most significant barriers to more widespread adoption of video conferencing in higher education, says Educause’s Diaz.

"The most advanced of these systems are not cheap, and they’re dependent on high and consistent levels of bandwidth. If you have an intermittent or glitchy Internet connection, it’s just not going to work for you,” Diaz says.

“But depending on the type of institution and its budget, there are a lot of different levels available for teleconferencing. There are a lot more options for connecting synchronously and personally than there used to be. At a basic level, people can use something like Skype, and at the other end, some institutions are installing telepresence suites.” (See the section, Being There: The Promise of Telepresence, for more information on telepresence.)

The use of video conferencing to beam whole classes and courses is growing, but not as quickly as its implementation as a collaboration tool among scholars, and a way to customize and personalize learning that takes place online.

“A faculty member can set up a session using a tool like Adobe Connect where they have students log in and listen to a session, or go through a lesson, and then log into an interactive session with the instructor,” she says. “It’s really humanizing that online experience for students.”

Like most technologies, video conferencing takes some getting used to on the part of both students and instructors, says Diaz.

"The stereotypes aren’t always true, but there is a technology gap between students and teachers,” she says. “Students bring to the classroom a comfort level with technology that has to do with their experiences they’ve had in Facebook and Twitter or e-mail. That doesn’t mean that they know how to use those skills for teaching and learning or have the discipline to use them in that way. The educators have to learn to transfer and leverage that comfort."

And technology is definitely a draw for 21st century students, says Young at WHCCD. “In all of our video conferencing classrooms we do almost everything digitally. We’ve taken overhead projectors and blackboards out of the loop, and the way we present information is state-of-the-art,” he says. “We’ve found that new equipment is more engaging. It keeps the students’ attention locked on what’s being said and what’s being done.”

**Being There: The Promise of Telepresence**

Media technician Scott Young remembers early efforts at WHCCD, before the district set up dedicated video conferencing classrooms and meeting rooms. “We initially used an old system where you transferred over a television signal using mixer boxes and old phone lines. It was all really humorous.”

From its beginnings in cobbled-together systems, herky-jerky video and barely synchronized audio, video conferencing is evolving toward what vendors and analysts call “telepresence,” technologies that aim to create the realistic impression that people in remote locations are actually present in a meeting room.

Telepresence installations present near-life-size high-definition video images, some in 3D. Audio is delivered so that it seems to emanate from video screens, or more specifically, from the mouths of the images on the screens. Cameras mounted at eye-level provide a sense of eye contact. Telepresence suites are often outfitted with custom furniture that disguises the hardware, in order to add to the sense of a face-to-face meeting.
Networking technology manufacturer Cisco has been a leader in the development of telepresence technology, and video conferencing manufacturers such as Polycom, Tandberg (acquired by Cisco in late September) and LifeSize currently offer telepresence solutions.

With price tags for installations often running into six figures, telepresence technology users are usually large corporations. Some universities have, however, already invested in telepresence suites, says Educause's Veronica Diaz.

Continuing advances in telepresence, along with lower costs, could transform remote meetings and distance education, says Northwestern's Brandon Grill.

“I’ve seen the demos, and it’s really fantastic technology,” Grill says. “There are great systems coming out, but they are cost prohibitive for wide adoption. If those prices drop, you’ll start seeing a lot more classes done over video conference or telepresence. Right now, standard video conferencing is always a little off, not quite the same as being there. Telepresence makes that a lot better.”

Making It Work

 Colleges and universities that are beginning to use video conferencing for remote learning should make time to prepare instructors along with the hardware and software, says WHCCD's distance learning manager Joe Savopolos.

“There’s a learning curve that everyone has to climb, and it’s steeper for some teachers than for others,” he says.

Savopolos and media technician Scott Young offer some tips to make the adjustment to video conferencing go more smoothly:

- Get the equipment up and running and let instructors play with it. This helps them decide how they are going to use the equipment.

- Identify enthusiastic instructors who adjust to video conferencing easily. Then direct their peers to them for advice and encouragement.

- Integrate video conferencing with course management tools over the Internet. Students then have access to assignments and additional resources, and can submit homework, take tests and get their grades remotely.

WHCCD administration of justice instructor Anita Bart has some advice from the user side of the technology:

- Alternate the sites from which the class is taught. This way, all the students see the instructor in-person at some point.

- Early in the course, plan lots of group activities. This forces students to engage with each other over the teleconferencing link.

- Be prepared for glitches in the equipment. Have a Plan B ready.

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