

New Learning Modes: **Break Through Classroom** Walls





What You Will Learn

Innovative educators are adopting new approaches to engage a generation of learners who expect more video, more interactivity, and the freedom to learn from anywhere, not just inside the classroom. New approaches include:

- “Flipped classrooms,” where students view video lectures before class so that valuable class time can be spent on group projects, discussion, and labs
- Distance learning using telepresence or the Cisco WebEx® cloud-based service, enabling students and faculty to join audio and high-quality video conferences and share their desktops from anywhere, with any device
- Virtual field trips, exposing K-12 students to destinations and experts anywhere in the world
- High-performance campus Wi-Fi networks that capitalize on the Bring Your Own Device (BYOD) trend to enable digitized textbooks, interactive quizzes during class time, review of video lectures between classes, and more
- Virtual desktops stored in the cloud, giving students the freedom to use any personal device to work with specialized applications that previously were available only in labs

This white paper, intended for educators and IT professionals in schools, colleges, and universities, shares the successes of schools adopting these approaches and briefly describes the technologies behind them.

Engaging a New Generation of Learners

Viewing slides on an overhead projector in the classroom is like going back in time for today’s students, who grew up viewing and capturing high-definition video on smartphones and tablets, anytime and anywhere. Now educators are capitalizing on video and mobile devices to transform the learning experience.

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Our Lady of Lakes University Delivers Video Lectures to Satellite Campuses

Our Lady of Lakes University, whose main campus is in San Antonio, Texas, uses Cisco Show and Share to offer advanced classes to students enrolled at the Houston and Harlingen, Texas, campuses. By viewing live and prerecorded video, students will have the opportunity to learn from the same experienced faculty as their peers on the San Antonio campus.

Flipped Learning

Also called the backwards classroom and reverse instruction, flipped learning refers to assigning prerecorded video lectures as pre-class homework, and devoting class time to discussions, group work, and labs. With this learning model, the role of the instructor evolves from lecturer to guide.

New lecture capture solutions make flipped learning accessible to instructors without technology backgrounds. The Cisco® Lecture Vision solution, for example, provides everything needed to:

- Capture the lecture using any device, including a built-in camera on the instructor's laptop or tablet, as well as Cisco TelePresence® Systems or other professional equipment.
- Transform the video for viewing and searching. New tools offload the hard work from the teacher, automatically transforming the video for optimized viewing on different devices, from smartphones and laptops to large, high-definition displays in common areas. The Cisco Lecture Vision solution even automatically creates transcripts that appear alongside the video, and allows students to search by speaker or keyword and go right to that portion of the video.
- Share the video with class members on Cisco Show and Share®, a webcasting and video sharing application. Students can log in to search for and view videos from any device, and a free Show and Share app is available for iPhones and iPads. Rather than passively viewing the lecture, students can respond and interact with their peers by posting comments that appear to subsequent viewers when that portion of the video is played. An instructor who notices a flurry of questions several minutes into the video receives valuable feedback that the concept needs further explanation.

Whether or not you bring flipped learning into your classroom, lecture capture also makes class content available to students who missed class or need more repetitions to absorb the material. In K-12 districts, providing video lectures on Show and Share can help integrate home-schooled students with state curricula. And in higher education, giving students the option to view some or all lectures online saves fuel costs and helps students who are juggling school, jobs, and family.

Virtual Field Trips

Field trips are undergoing a transformation, thanks to high-definition video conferencing systems in the classroom. Suppose a K-12 class wants to take a video field trip to a university museum or medical center. At the appointed time, either party places the video call, which is as simple as making a phone call. The presenter meets the class "face to face" and begins the program or conversation. This might involve walking through the museum and pointing out the sights, using a mobile videoconferencing unit. The presenter can engage the students by asking questions, just as if the students were physically present instead of hundreds or thousands of miles away.

Video field trips even offer advantages that in-person field trips do not. First, students can experience destinations and hear from university experts anywhere in the world, not just within a one- or two-hour bus ride. In the past, students in South Texas wouldn't have the opportunity to visit a university museum in New York, much less the Great Barrier Reef. Second, schools avoid transportation costs, freeing discretionary funds for other vital school programs. Finally, video uniquely engages the current generation of "digital natives," who may be more excited by interactive video than if a researcher came to the classroom.

Distance Learning

Schools are also harnessing video to expand access to AP, remedial, language, and other specialized classes, benefiting students in schools without sufficient enrollment to justify hiring their own specialized teachers. In California's Campbell-Union High School District, students in multiple schools can enroll in a desktop publishing class taught by one teacher at Prospect High. When class begins, students in all classrooms put on headsets and join a Cisco WebEx conference to interact with the teacher and each other through document sharing, chat, voice, and polling.

And at the Duke University Fuqua School of Business, a 140-seat virtual lecture hall provides the Cisco TelePresence classroom experience, extending the classroom to presenters and students in other global locations. Presenters appear larger than life on 103-inch plasma displays at the front of the room. Remote presenters and students initially see a panorama of the classroom; the display is large and clear enough to make it possible to recognize individual people. When a student in the virtual lecture hall presses the microphone button on the desk to speak, a camera zooms in on that section of the classroom so that remote participants can see the speaker close up. Cameras also follow professors as they move, sensing their location on a touch-sensitive mat. The university refers to the experience as presence learning, not distance learning, because remote students feel as though they are present during the learning process.

Virtual Desktops

Traditionally, using applications owned by the institution, such as lab software, meant traipsing to the lab to use a PC with that software installed. Now schools and universities are building virtual desktop infrastructures (VDIs) so that students and researchers can access their desktops from anywhere, including home, using any PC, laptop, or tablet. In Richland, Washington, the Richland School District built a VDI so it could replace aging desktops in classrooms and labs with less-expensive thin clients.

Similarly, Seattle University in Washington built a VDI to make classroom software, including Microsoft Office and Mathematica, available to students on any campus computer. Students log in and begin using a virtual machine delivered over the network. An article in the campus newspaper quoted a freshman saying, "I like that I don't have to purchase expensive software for all my classes when I can just get them anytime I want."

Bowdoin College and University of South Florida Embrace BYOD

At Bowdoin College in Maine, the day after winter break in 2012 was a test for the newly upgraded campus wireless network. Reflecting the BYOD phenomenon in education, the college's 1750 students were expected to return from the holidays with double the number of personal mobile devices. What's more, those devices would be consuming approximately double the bandwidth because of growing use of two-way video, video content for classes, digital textbooks, and even class projects like robotics control.

Fortunately, Bowdoin's IT team had prepared for the influx of personal mobile devices by upgrading to new Cisco® wireless access points that provide high performance at greater ranges, even when many students connect at once from the same area. A headline in the student newspaper read: "College listens to students; upgrades wireless system."

The University of South Florida also kept up with rising wireless traffic by upgrading to the new Cisco wireless access points, which provide coverage over 80 percent of the campus. Approximately 40,000 people connect to the Wi-Fi network on a typical day, including students using personal mobile devices for multiple-choice quizzes during class, to access online learning applications such as MATLAB and Blackboard, and more.

Bring Your Own Device (BYOD)

Whether or not they're invited, students increasingly bring personal mobile devices such as smartphones and tablets to campus. In the [Cisco Connected World Technology Report](#), 66 percent of students surveyed said the most important technology in their lives was a mobile device, such as a smartphone or tablet. Rather than regarding personal devices as a distraction, some educators are viewing the BYOD trend as an opportunity to integrate these devices into the learning experience.

On campuses with high-performance Wi-Fi networks, students can review video lectures between classes. Faculty can give multiple-choice quizzes during class time to gain real-time feedback on students' mastery of the concept. Students can connect to the class portal on a learning management system or a Cisco Quad™ online community, to ask questions. And students can study from digitized textbooks, easing their budgets as well as their backs.

Although students provide the devices, campus IT teams need to make sure the Wi-Fi network is up to the task of carrying more sessions with more data. This is especially important in high-density environments like lecture halls, dorms, and stadiums.

The Technology behind the New Learning Modes

Delivering an excellent video and Wi-Fi experience underpinning these new learning modes requires a strategic approach to campus network architecture. When all applications, devices, and the underlying network work together, IT teams can spend less time on management and troubleshooting, freeing time for innovation. Cisco solutions that support new learning modes include:

- **Mobile video:** The Cisco Jabber Video™ for TelePresence client transforms any Windows or Mac device into a high-quality video device. And students and faculty can also join video and web collaboration sessions from any device, with any operating system, using the Cisco WebEx cloud service.
- **High-density Wi-Fi:** Cisco Aironet® 3600 Series Access Points deliver 30-percent higher performance at greater range than other wireless access points. They also work with the wide variety of devices used on campus, including 802.11n and 802.11a/g devices. Built-in Cisco CleanAir™ technology automatically detects and works around sources of interference, such as microwave ovens.
- **Virtual desktop infrastructure (VDI) and Cisco Virtualization Experience Infrastructure (VXI):** The Cisco Unified Data Center solution provides everything you need, including the server, switching, virtualization software, and storage access. In contrast to a VDI system, a Cisco VXI deployment delivers voice and video as well as virtual desktops.
- **Medianet:** The campus network is the foundation for a good user experience and a manageable load for IT teams. Schools, colleges, and universities are adapting their existing IP network to become a medianet, which is a network optimized to deliver an excellent video experience without affecting the performance of other applications. A medianet also has the intelligence to simplify provisioning and performance monitoring, reducing total cost of ownership. Automatic provisioning without involvement by IT is especially important in BYOD world. And performance monitoring lets IT groups troubleshoot while a call is in session—for example, during guest lectures.

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Katy Independent School District Credits BYOD with Boosts to Engagement and Test Scores

Many districts in the United States are striving to afford one laptop for each student, the so-called 1:1 approach. Concerned about sustainable budgets, Katy Independent School District in East Texas decided to invest instead in infrastructure that could take advantage of the personal investments parents made in their children's devices. To try out the program, the district provided mobile devices in 10 new schools and to 1500 fifth graders in other schools. Every teacher reported improvement in students' engagement and test scores.

At the start of the 2011–2012 school year, the district bolstered its wired and wireless network and implemented a BYOD policy. An AP government and history teacher reported that she no longer had to compete for time in the computer lab. Now, students assigned an Internet search are online in seconds, using personal devices or a school-owned laptop. The teacher also engages students by asking multiple-choice questions during class, using response system based on smartphones, Twitter, and the web. Even students who previously were disruptive are paying more attention.

Conclusion

The same video and mobile technology that students embrace in their personal lives is transforming the learning experience. New Cisco video and collaboration solutions make the learning experience more engaging and collaborative for students. Unlike consumer-oriented solutions, Cisco solutions deliver a consistent, high-quality user experience required for uptake. They free faculty from time-consuming, technical tasks such as transforming video for viewing. And they simplify management for campus IT teams, so that they can focus instead on strategic learning initiatives.

For More Information

Cisco Connected Learning, visit: www.cisco.com/go/connectedlearning.

Cisco Lecture Vision, visit: www.cisco.com/web/strategy/education/enhanced_edu_capture.html

Cisco Mobile Collaboration in Education, visit: www.cisco.com/go/unifiedworkedu



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