6 SECRETS OF ACTIVE LEARNING CLASSROOM DESIGN

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In her keynote address at the CT Forum conference in April, Michelle Weise, senior research fellow at the Clayton Christensen Institute for Disruptive Innovation, offered an insightful analysis of disruptive innovation — perhaps one of the most-used and least-understood buzzwords in higher education today. (For our write-up of her talk, see page 6.)

Weise gave an overview of what the term means and how it has played out in higher ed and other industries, but at the core of her talk were six defining characteristics of disruptive innovations — telltale signs worth posting on the wall of every IT leader’s office:

1) They target people who are nonconsumers or who are overserved by existing products.

2) The innovation is not as good as existing products, as judged by historical measures of performance.

3) They’re simpler to use, more convenient or affordable.

4) There is a technology enabler that can carry the new value proposition upmarket.

5) The technology is paired with a business model innovation that allows it to be sustainable.

6) Existing providers are motivated to ignore the new innovation and are not threatened at the outset.

It’s that last one that makes disruptive innovation so insidious — by its very nature, it’s likely to be underestimated and ignored, making it difficult to spot.

Weise pointed to for-profit institutions like the University of Phoenix as an example that meets all six criteria. Massive open online courses also come to mind. But these are fairly obvious candidates — less dangerous, perhaps, than innovations not yet on higher education’s radar. What else could be out there, unseen, quietly changing the business of teaching and learning?

There is no concrete answer, and that’s exactly why it’s so important for higher ed institutions to experiment with new technologies, innovate and think about ways to break free of traditional strategies. You never know where the next disruption might be developing.

Continue the conversation. E-mail me at rkelly@1105media.com.
NEW LEARNING SPACES. With a grant from the Association of American Universities, the University of Arizona is overhauling several classroom spaces to accommodate active learning. All of the classroom spaces will move from being the kinds of rooms in which a lecturer stands at the front of the room to ones in which students will sit at tables of, at the most, six in an effort to enhance engagement. Each room will also be supplied with banks of computer monitors, tabletop and A-frame whiteboards and other kinds of “high-touch” technology. Read the full story online.

SOCIAL FUNDRAISING. According to the results of the sixth annual CASE/Huron/mStoner Social Media Survey, more schools, colleges and universities worldwide are using social media to boost their fundraising results, and are experimenting with new strategies. Some 57 percent of respondents reported using social media to fundraise in 2015, compared to 47 percent in 2014. Meanwhile, 59 percent reported experimenting with new social media fundraising strategies. Read the full story online.

SHARING DATA. The Open Cloud Consortium, a nonprofit cloud infrastructure provider focused on scientific, medical, healthcare and environmental data and research, is beefing up its environmental data offerings through a new agreement with the National Oceanic and Atmospheric Administration. The collaboration will make more of NOAA’s environmental data available to the public, making it easier to find and access the data for research and analysis. Read the full story online.

NEW DIGITAL SIGNAGE EVENT. Debuting in Atlanta Sept. 30–Oct. 1, the newly launched EduComm Expo will focus on digital campus communication technology in higher education. “Featured will be digital display solutions ranging from kiosks to video walls, communication software, remote and on-campus collaborative learning technologies, as well as mobile, desktop and audio applications that serve colleges and universities,” according to a press release. Seminars and workshops will focus on best practices for deployment, utilization and management as well as the latest technology trends. Read the full story online.

BUSINESS FUNDAMENTALS ONLINE. Students at Amherst College (MA) can now go online to learn the fundamentals of business, through an arrangement with Harvard Business School’s HBX online education initiative. The partnership provides Amherst students with increased access to HBX’s Credential of Readiness (CORe), an 11-week online program delivered on an interactive platform designed by Harvard Business School faculty. HBX will reserve seats in upcoming CORe cohorts for Amherst undergraduates, and Amherst will verify students’ financial need information (with permission) to enable HBX to award additional financial aid to those in need. Read the full story online.

PERSONALIZED PRINT CONTENT. Knewton and HP have announced Personalized Print Learning Solutions, a system designed to make adaptive learning materials available across print and digital platforms. Publishers will be able to create personalized print chapters of text-
books, worksheets or assignments for schools that primarily rely on print textbooks. Students can learn using print and/or digital adaptive content. Read the full story online.

**FRESHMAN YEAR ONLINE.**

Arizona State University and edX have launched a new program that allows students to complete their first year of college online for credit. Global Freshman Academy will offer eight courses taught by ASU professors; students can opt to take individual courses for credit, or all eight. Those who complete the entire series will earn the equivalent of a full freshman year at ASU. The courses will cost no more than $200 per credit hour, and upon completion of each course, students who pass the final exam can pay the fee to receive college credit for the course. Read the full story online.

**PRODUCT ROUNDUP**

- Designed for large venues, the new Epson PowerLite 4770W 3LCD widescreen projector can wirelessly display content from smartphones and tablets. Read the full story online.
- D2L’s upgraded Brightspace learning platform features a new faculty user interface and Brightspace LeaP adaptive learning technology. Read the full story online.
- The Canon REALiS WUX500 pro AV LCoS projector allows HD video, audio and serial control signals to be transmitted over a single Ethernet cable. Read the full story online.

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Disrupting Higher Education

Can colleges and universities break out of traditional models and compete with the disruptive forces changing the nature of higher ed?

“DISRUPTION” IS one of the most overused buzzwords in education today, according to education industry watcher Michelle Weise, and yet most people don’t really know what it means.

“There is this tendency for pundits, policymakers and institutional leaders to take any kind of technological advancement, call it a ‘disruptive innovation,’ cram it into the classroom experience and then hope that somehow efficiencies are going to magically appear,” Weise said in a keynote presentation at the recent CT Forum conference in Long Beach, CA. “Obviously, it’s not that simple.”

Weise thinks a lot about disruption. As a senior research fellow at the Clayton Christensen Institute for Disruptive Innovation, a San Francisco Bay Area-based nonprofit think tank, she specializes in disruptive innovation in higher education.

Weise used her time on the keynote stage to clarify the term and to explore its implications for the future of colleges and universities. She compared it first to what she called “sustaining innovations,” which help drive up prices for the best customers. Disruptive innovations, on the other hand, drive prices down, transforming products and/or services that used to be complicated and expensive into something affordable and accessible to a new set of customers who don’t really need to buy it. (She called them “nonconsumers.”)

She illustrated the concept with examples from non-higher-ed industries, including the story of Digital Equipment Corp. (DEC), or rather, its decline and fall. The company, which was once a very hot minicomputer maker, fell off the cliff in 1988, not because of bad management, but because of the disruptive innovation of the personal computer. DEC invested in expensive, high-performing machines — what its best customers said they wanted — and more or less dismissed the “toy” personal computer. Meanwhile, IBM set up a separate business unit to figure out the PC and created a new business model that succeeded.

True disruptive innovations can be identified by six shared characteristics that might at first seem counterintuitive, Weise said:
1) They target people who are non-consumers or who are overserved by existing products.
2) The innovation is not as good as existing products, as judged by historical measures of performance.
3) They’re simpler to use, more convenient or affordable.
4) There is a technology enabler that can carry the new value proposition upmarket.
5) The technology is paired with a business model innovation that allows it to be sustainable.
6) Existing providers are motivated to ignore the new innovation and are not threatened at the outset.

Weise pointed to an example in higher education that checks all of these boxes: the for-profit University of Phoenix.

“People sometimes get upset when I say this,” she said. “They say, that makes no sense, because they deliver a product that I find inferior, or that doesn’t apply to students who attend my institution. If you’re thinking that this product is not good, ask yourself, is it maybe just good enough for a whole new population of students? The University of Phoenix and places like DeVry were able to deliver a higher education product and service that maybe looks different in terms of the basis of performance that we use to think about [traditional] institutions…. But consider it from the perspective of students who were working adults, who didn’t want to give up their jobs to pursue their degrees. They were even willing to pay a high premium to attend the University of Phoenix because it offered that online option, so they could continue to work and get their degree at the same time. It enabled a whole new population of people to pursue their degrees.”

A second wave of innovation arrived with online institutions like the American Public University and Grand Canyon University, which competed on price, she said. A long list of online, for-profit schools emerged and followed suit.
All this has been going on since 1989, and yet what Weise called incumbent organizations — traditional colleges and universities — have done very little to evolve. Why?

In part, it’s because of their complicated business model, which involves teaching, research and the social growth of students. “It’s almost like combining a McKinsey with a Jiffy Lube and a Facebook,” Weise observed. She also pointed to a “delicate dynamic” in higher education, in which professors are both a resource and a locus of control.

That business model — being many things to many people — leaves higher ed uniquely vulnerable to the kind of disruption that has affected the newspaper industry, she said.

“If you think about what happened to newspapers,” she said, “they were unbundled piece by piece by providers like CNN.com, Monster.com, LinkedIn and Craigslist. They were trying to do so many different jobs that these other entities were able to take them apart, bit by bit.”

So, what should higher education be doing in the face of all this disruptive innovation?

It’s not about the “what,” Weise said, but the “why” and the “how.” As American economist Theodore Levitt put it, “People don’t want to buy a quarter-inch drill; they want a quarter-inch hole.”

“People don’t buy products or services,” Weise said. “They hire them to do a job. So we have to think about why students hire higher education. They do it to grow up in life and transition into adulthood. They do it to launch a career or transition to a better career. I want to make my kids proud of me. If we think about this in terms of what’s going on today, most of our colleges are trying to be everything to everyone. So it seems like the job someone is hiring a Harvard [MA] or a Princeton [NJ] to do is the same thing someone is hiring a community college or state university to do.”

Also, traditional colleges and universities have turned away from the growing population of “nonconsumers” who need workforce skills. Only one in five freshmen actually have that residential college experience that we tend to glorify, she said. Close to 71 percent of students are what we now call nontraditional students, but which are fast becoming the norm.

These kinds of students are “overserved” by those bundled services of traditional brick-and-mortar institutions, she said. Many feel underprepared for the workforce, and they’re looking for something different.

“Higher education institutions are now competing with organizations they have never even heard of,” Weise said. “These are organizations that are really getting at the inadequacies of the system…. Things like coding boot camps, where you can pay $10,000 to $20,000, spend six to 12 weeks learning to code, and get recruited by places like Google or Facebook and start earning about six figures…. Your shot at getting a job is better than if you went to law school.”

“This is just to emphasize that it’s not who you think you’re competing with,” she said.

A growing number of nonprofit institutions are now looking at some of the practices of for-profit schools, Weise said, including the unbundled or disaggregated staffing model.

“In some of these models, we see that there is a subject-matter expert who consults with an instructional design team, and they build a course,” she explained. “That design team focuses only on building that online course. You have a whole set of people who are functioning as mentors and academic coaches, helping students stay on target and progress through the course. Then you have tutors who intervene at just the right moment, providing cost-effective interventions. And there’s a whole different set of people who are assessing.”

One way colleges and universities might be able to break out of their locked model and better respond to disruptions is to do what IBM did: create a separate entity for the innovation. Southern New Hampshire University, for example, created College for America, which is a separate educational enterprise. Arizona State University created ASU Online. “These are separate, autonomous units that can foster their own growth and take their own time to figure out what they’re doing,” she said.

John K. Waters is a freelance writer based in Mountain View, CA.
5 Tech Trends That Will Drive IT Decision-Making for the Next 5 Years

Data growth is forcing IT departments to adopt new forms of operation and reset their expectations of work.

**TODAY’S IT** organizations face a big data challenge: unstoppable growth. Global data center IP traffic equaled 255 exabytes per month (or 255 billion gigabytes) in 2013, according to the Cisco Global Cloud Index — and by 2018, traffic is predicted to nearly triple. Fortunately, not all of that traffic will land in the data center, but it does call for response from the information technology organization, said Gartner Research Vice President David Cappuccio in a recent webinar. “The real questions that IT centers need to ask themselves are: How much of that traffic is important; how does that data need to be acted upon; and how do we do it?”

IT has to rethink how it will address infrastructure and operations planning in three important areas, he noted: demand, technologies and the organization itself. Here’s how trends and technologies will impact IT over the next five years.

1) **Reaction to “Nonstop Demand”**

Server loads are growing 10 percent every year; network bandwidth is going up by 35 percent; and storage capacity is expanding by 50 percent, reported Cappuccio. Business is “pushing IT to go faster and faster and faster” even as IT is struggling to keep the lights on, he said.

IT is responding with two distinct ways of operating, he noted. “One is to react as fast as possible. The other is steady pace, doing things as logically and as risk-free as you can to protect the business.” All the while, IT’s domains of responsibility are being whittled away by other parts of the organization.

Gartner asked C-level executives around the world where they allocate responsibilities for digital business and emerging trends. “The CIO is not the one getting the most responsibility,” explained Cappuccio. “They’re focused on tactical, day to day, keeping things running.”

Meanwhile, the envelope for trying new things is being pushed by business unit heads, marketing and sales, CFOs and COOs. The business side “is taking control of what was considered an IT architecture in the past and now doing things its own way,” Cappuccio said. That can
be “chaotic,” he added, “but some say it also makes the business more agile.”

In fact, every business unit has become “like a little technology startup,” said Cappuccio. “If central IT does not get involved, does not begin to work with those business units — not to control what they’re doing but to understand what they’re doing — and learn how IT can enable them to do things even faster, we’re going to lose control.”

In this dynamic environment, there is no place for IT departments with the lingering reputation for saying no and putting up blockades to new requests, because the business unit “is going to go someplace else.”

The sting when that happens is this, Cappuccio added:

No matter who provides the IT services required, IT is still held responsible for the outcome. “If the environment becomes incredibly complex and we lose control, we still own that customer experience, which means we need to understand how all the pieces tie together.”

2) The Internet of Things

Gartner defines IoT as extremely small devices that are self-aware and self-discovering. These sensors may support their own mesh networks so that as devices are deployed, they find each other and “report back,” said Cappuccio. They’re also often location-aware and in some cases don’t require batteries.

IoT is sparking a new way of “looking at business and capturing information about clients and looking at creating a new level of automation to make the business more efficient,” he noted. He pointed to the use of sensors attached to hand-cleaning stations in hospitals to scan badges as nurses and doctors wash their hands: “All that data is collected. If anytime down the road there’s a lawsuit, and somebody gets infected and they’re blaming the hospital, it can go back and track the sequence of every motion and use that as defense against those lawsuits. That’s happening today.”

Most organizations are in a “look-see mode” right now, Cappuccio added. “It needs to be aware of it. If they’re not, it’s something that the business will do anyway outside of IT control, which is not long-term good.”

3) Software-Defined Infrastructure

“Software-defined” is creeping into the data center. Software-defined networks, storage and even power are making up what Gartner refers to as “software-defined infrastructure.” As Cappuccio explained, “Conceptually, what they’re all about is this: creating a new way to operate, orchestrate and automate — putting configuration control at a higher plane than it was. Rather than having individuals go out there and optimize at the device level to get the best performance or the best use of that resource, if I can do it at a control plane, I can enhance workload and traffic flow and automation and eventually enhance the overall efficiency of the operation.”

Right now, organizations are testing the potential of this technology in “small labs,” but the promise is there. “Eventually, I’d be able to manage these environments whether they were on-premise or off-premise. It truly becomes a virtual environment,” said Cappuccio. “I could begin to move workloads based on actual business needs and performance needs and time of day, and I could move them wherever they need to be.”

A related trend is “proactive infrastructures.” In this scenario, data centers are beginning to use predictive and prescriptive analytics to help IT staff gain a sense of what will happen in real time as the machines are running or what would happen if a particular system change were made.

The example offered by Cappuccio was this: If you know there’s a storm coming and you might lose power to the data center, you could move key applications somewhere
else to keep the organization running. “Suddenly I’ve got an environment that’s a lot more risk averse without having to build out a massive Tier 4 data center,” he said.

One obstacle to ready adoption of proactive infrastructures is the human one, he noted. Whereas this kind of response takes human effort now, “as you move down the food chain toward predictive and prescriptive, the amount of human effort gets reduced, the amount of automation gets increased and the amount of efficiency of the environments goes up.” But IT still shies away from the idea of software deciding when to shut down software.

4) The Evolution of Systems
Two contrary evolutions are going on right now. One is the integrated system, and the other is the disaggregated system. In the first, vendors pull together multiple devices — servers, storage, memory, etc. — to solve a problem and then sell it as a system. As these evolve, Cappuccio said, they become globally shared. “You can plug and play as you need.”

As a result, he observed, something interesting has happened. Many organizations no longer buy best-of-breed based on the technology; they choose their system based on the vendor delivering it. “Can they actually support this as they say they can? What’s their history? Do I have faith and trust in them?”

Because the price point is higher for an entire system than it is for its individual components, senior administration is becoming involved. As Cappuccio pointed out, “They’re more interested in the relationship and the trust of the vendor and the price [as] we start making decisions based on best-of-brand instead of best-of-breed.”

Also, the choice of vendor becomes a “de facto standard,” he said. “You can break out of that, but people generally tend to stay with the decision they made at least for a couple of generations of products.”

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*Source: 2013 Yearbook: Technology Innovation in Education, Center for Digital Education

80% ranked wireless broadband as their top priority for IT investment

83% are using the cloud or have plans to implement a cloud solution

55% planned to invest in professional development

77% said they are not ready for digital learning

79% are experiencing substantial administrative data growth

75% are using cloud services across 3 primary areas: Private • Public • Hybrid

61% identified lecture capture or video on-demand as a key part of their IT strategy

88% are using the cloud or have plans to implement a cloud solution

61% identified lecture capture or video on-demand as a key part of their IT strategy

55% planned to invest in professional development

We offer Professional Development training courses on every topic from mobile devices and document cameras to interactive whiteboards.
IT TRENDS

Exactly opposite of that trend is another where an organization chooses to build its own systems. “That’s the whole genesis behind the Open Compute Project,” he noted. In this movement, IT can build a computing environment from many manufacturers at a very low price point with extremely high performance. “If I wanted to upgrade processors, I could do that without having to worrying about upgrading the whole server.”

The questions that IT needs to ask itself before undertaking this approach to systems acquisition are whether it has the contacts for buying outside of its normal channels and whether it can get the support it needs. This is not unlike the open software movement of the 1990s, Cappuccio said. “We’re just beginning to see the advantages of this. It’s something we expect IT to continue to watch.”

IT service continuity is a variation on the theme of the new data center. This offshoot of disaster recovery and business continuity surfaced during Hurricane Sandy. Although plenty of organizations were ready when the storm hit and were able to keep their data centers running, a variable surfaced that they hadn’t counted on: The roads were closed, which meant fuel trucks couldn’t get to the data centers to deliver replacement fuel to keep generators running.

“The realization came that it’s not about making sure the data center didn’t go down,” said Cappuccio. “It’s about making sure those services that are client-facing continue to run regardless.” The mission for IT became how to design an infrastructure “that could sustain service continuity regardless of whether we go down or not.”

The answer is to take a hybrid approach, he said — some work on premises, some co-located and some cloud-based, and all of it backed up with the ability to shift work from one site to another as the need arises.

5) New Directions for IT

Forget about the notion of IT being either focused on maintaining services as reliably as possible or agile and constantly on the run. Organizations need both, insisted Cappuccio. “Bimodal IT,” as Gartner calls it, describes the idea that IT needs to pursue both roles: traditional and exploratory.

What characterizes each? As Cappuccio laid it out, traditional IT sets reliability as the goal and price for performance as the value. The approach is plan-driven and approval-based, the talent good at “conventional” projects and process. Cycle times are long — months or years. The other mode sets agility as the goal and revenue, brand and customer experience as the value — and requires talent that’s good with new and “uncertain” projects. Cycle times are short — days or weeks.

The trick, he added, “is to segment applications and workloads so you know which belongs where.” Also, don’t assume that because something falls into one bucket on one day that it won’t change the next: “Just because something is agile and mobile today, tomorrow it may not be.” Just as the IT organization has evolved, so has the need for IT skills. Among those most in need are the categories you could probably guess: mobile, hybrid computing, integration and process, and big data and analytics. But what’s needed above all others right now, said Cappuccio, is the skill to understand “how these pieces tie together.”

The team may have experts in storage, servers, virtualization and related subjects; but does the team have somebody who can understand the “cascading effects should one piece fall, fail or slow down?”

Essentially, Cappuccio noted, IT leaders need to cross-pollinate knowledge. That may require a change in how people are evaluated. Rather than putting the emphasis on “how smart you are in one space, it [needs to be] how many spaces can you tie together?” Appointing one or two members of the staff to undertake cross-training could be a real morale booster across the board, he added. What motivates highly skilled IT people isn’t money or accolades. “It’s learning. It’s continually challenging themselves.” When other people see that they’re excited about learning new things, “It becomes a motivational tool for them too.”

Dian Schaffhauser is a senior contributing editor for Campus Technology.
6 ResNet Pain Points and What to Do About Them

Today’s students expect high-performance residential networks with plenty of bandwidth and anytime, anywhere wireless access. Here are the top ResNet challenges at institutions across the country.

**WITH STUDENTS** bringing an ever-increasing number of Internet-connected devices to campus — all with an insatiable appetite for bandwidth — colleges and universities are under pressure to provide high-performance networks in residence halls and other non-academic areas. Many are being forced to bolster their residential networks with more bandwidth: A recent survey found that the percentage of schools that dedicate at least 1 Gbps of bandwidth to the ResNet has doubled in the last three years, from 25.5 percent of survey respondents in 2012 to 51.5 percent today. The 2015 State of ResNet survey of 550 higher education executives, published by the Association for College and University Technology Advancement (ACUTA), the National Association of College and University Business Officers (NACUBO), and the Association of College and University Housing Officers-International (ACUHO-I), is part of a five-year effort to measure the pulse of residential network practices and policies in higher education.

*Campus Technology* reached out to several technology leaders involved in overseeing campus ResNets, to find out more about their challenges and solutions.

**Improving Wireless Coverage**

Bandwidth alone is not enough — students also want anytime, anywhere wireless access. The 2015 State of ResNet report found that 65.4 percent of surveyed campuses provide robust wireless coverage (of four bars or more) throughout more than 80 percent of their campuses, a 20 percent increase from 2013. Administrators at *Providence College* (RI) confirm their top ResNet priority has been making sure the wireless network is robust. Jim Rizzo, help desk manager, said students increasingly expect to find a good wireless connection everywhere on campus. Also, newer networks are being designed to handle the assumption that each user is going to have three or four devices. “We have something like 10,000 devices on our wireless network, but when you add up our faculty, staff and students, there are fewer than 6,000 people,” he added.
Networking

“One of the biggest changes we made this year at Providence was creating a separate wireless network for consumer devices that don’t support enterprise-level network security,” explained Rizzo. The main wireless network at Providence for computers, tablets and mobile devices uses 802.1x, which the majority of students’ game consoles, Apple TV and Roku devices don’t support, he said. So Providence set up a separate wireless network called PC-Devices for those. The network is limited to Internet access only; it cannot access any internal campus resources other than those that can be accessed off campus (such as e-mail, the Sakai LMS and the college Web site).

It’s a similar story at West Chester University (PA), where Joe Sincavage, director of networking and telecommunications, reported his university is 90 percent of the way through a six-year journey to outfit the campus residential areas with wireless networking.

Because the project has been a phased progression since 2009, Sincavage said, West Chester has learned some lessons about wireless deployment along the way and applied them in newer residence halls. For instance, initially wireless access points were installed in hallways, but networking executives found that I-beams blocked wireless signals, there were dead zones in corners and student rooms received less than optimal coverage. Turn the clock forward to 2014, and the newest residence halls have been constructed with in-room wireless access points. “There had been concern that students might damage the access points and initially they had been put above the drop ceiling, but ceiling tiles also block signals,” Sincavage explained. In newer buildings, the access points are exposed. There is some damage to them, he noted, but very little.

Using Aruba Networks’ wireless equipment and products, West Chester can identify gaming devices and automatically move them into its guest networking configuration. “That safeguards our servers so that [the devices] only get out to the Internet,” Sincavage said, “but also streamlines their communication through the network.”

One issue West Chester has yet to solve is students wanting to print wirelessly to their personal printers. “We can’t support that today, because it interferes with the network,” he said. “But we are trying to work with Aruba on new technologies to support that.”

Bandwidth: To Shape or Not to Shape?

The 2015 State of ResNet survey found that 55 percent of
CAMPUS TECHNOLOGY | June 2015

Networking

responding institutions that provide their own bandwidth also limit and/or shape bandwidth. Students’ love of streaming video services is making bandwidth management a necessity at Miami University (OH), according to Chris Bernard, director of network engineering.

“Theyir desires are quickly outpacing our capacity to provide the services,” he said. Miami has been a customer of Procera Networks for bandwidth management, and three years ago, Bernard’s team began working with Procera on a solution called ResNet Turbo that allows high-bandwidth users to pay more for increased bandwidth.

In the first year, more than 100 students signed up; in the second year, more than 300 did. In the current year, the number is around 1,000 (out of a total of 7,600 residential students). The current price for 2015–2016 is $85 per semester. “Bandwidth prices keep going down, so that makes it easier,” Bernard said. “We have made a lot of changes to infrastructure to facilitate higher bandwidth speeds. We have really been moving our edge network to more of an ISP-class network rather than a higher education network or even an enterprise network.”

ResNet Turbo also benefits the students who don’t have it, Bernard explained, “because they don’t have to contend with the folks who tend to suck up a lot of bandwidth. ResNet Turbo traverses the same infrastructure, but it is a separate pool of bandwidth we have allocated for them.”

When to Consider Outsourcing

The number of schools outsourcing or considering outsourcing ResNet services has nearly doubled from 22 percent in 2013 to 38 percent in 2015, according to the State of ResNet survey. Very simply, universities are outsourcing to save money, said Ric Simmons, deputy CIO and executive director of information technology services at Louisiana State University, who also has been involved in the design and interpretation of the survey. “Funding continues to be a challenge, along with staff retention, and those two tend to be intertwined. Outsourcing can provide relief in the cost to maintain cable and network infrastructure as well as support staff,” he added, with the caveat that you do give up some control.

When Ellen Yu Borkowski was named CIO of Union College (NY) in 2010, she soon realized the campus network, particularly in residence halls, was outdated and sorely in need of upgrading. “Most of the equipment was old and we actually didn’t have full wireless coverage in the dorms,” she said. “The dorms were a pain point. If you tell students during campus tours that there is wireless in the residence halls and then they get here and find out it is not truly wireless the way they expect, that can be a challenge.”

Dealing With Guest Access

Guest network access is an issue many universities have made changes around, according to Ric Simmons, deputy CIO and executive director of information technology services at Louisiana State University. He makes a distinction between guests (those who have been invited on campus by faculty, students and staff) and visitors (who could be anyone who walks onto campus). “I am aware of campuses that provide visitors access to the campus network, and I believe that is risky with regard to security. If that person does something nefarious or illegal, the organization has a link in the responsibility chain for what happens on its network. So at LSU we do not allow visitor access to our network,” he said.

To tackle the issue at Providence College (RI), administrators reached out to other universities about how they manage guest networks, and recently made changes to make the process more secure. “We now require sponsorship before guests get on the network,” said help desk manager Jim Rizzo, “and the sponsor actually has to confirm the guest.”

One positive development in the guest network arena is Eduroam, a secure, roaming access service developed for the international research and education community. “If you work at Penn State and are an Eduroam subscriber, you can come to LSU and without even asking me for an ID, log onto our network with your Penn State credentials,” Simmons said.
Borkowski worked with a consultant to analyze options, including the cost of replacing the whole network in residence halls. “I realized that if I was going to ask for this much money, I should do my due diligence and compare the cost to outsourcing over five years.”

Borkowski also had to take into account that she has only two networking staff members, who are already stretched pretty thin, as well as some student employees. “One challenge was we were not a 24/7 support shop,” she said, and there wasn’t enough money to hire more support staff. She looked at several outsourcing options before choosing Apogee, which offers turnkey ResNet solutions.

“Apogee could provide us 24/7 support with multiple channels for support,” Borkowski said. “They ended up being cheaper than doing it ourselves and they guarantee a certain bandwidth, the cost of which would be hard to anticipate. That falls on the shoulders of Apogee with a consistent fixed cost to me over five years.”

It took a year to come up with the funding, but the college transitioned its ResNet services to Apogee in January 2013. “We have been very happy,” Borkowski said. “We do hear complaints from students, but as soon as we do, Apogee is right on top of it. We have an Apogee technician on site and he will go out and talk to students and check their connectivity. He does testing all the time. They try hard to make sure they are addressing any complaint.”

Managing Student Employees

Most colleges and universities that manage their own ResNets rely on student employees to help provide support. While the students benefit from some great work experience, several network executives said it can be a challenge to manage a student staff.

“Our IT department is pretty lean in terms of full-time IT staff, so we depend pretty heavily on the students,” said Providence’s Rizzo. Most of the time, the help desk is staffed by just Rizzo and a few students. “I am still learning how to best manage them,” he admitted. “The biggest issue is training the employees to our expectations that they handle things as professionally as possible. It is not always easy when you turn over a quarter of your staff every year and they can’t work more than 20 hours per week. It is difficult, but we revamp our training program every year.”

Engaging Students About Problems

Miami University’s Bernard pointed to another challenge of managing the ResNet: engaging students when they have problems. Some students just go on Twitter or other social media and complain, he said. “When we respond and ask if we can help, most of the time we don’t get a response — and it is very frustrating for the IT people,” he said. “I have Twitter up on daily basis looking for certain hashtags such as ‘MU wireless sucks.’ We say, ‘I can’t ask for your unique ID on Twitter, but open a support desk ticket and tweet the ticket number back to me and we can follow up on it.’ And nine times out of 10, we will not get a response.”

Bernard has talked to executives at Kent State University and a few other schools in Ohio who have hired students to be network ambassadors, serving as the go-to person in the residence hall when there is a problem. “But so far they have told us it hasn’t helped,” he said.

ResNet Strategic Planning

The State of ResNet survey has tracked whether institutions develop a strategic plan for their ResNet operations. “Such a plan may include an approach for management, as well as cost and performance information, for wireless Internet (WiFi), Internet bandwidth, cable TV, IPTV, VoIP and related services,” the report notes. Over the last three years, the number of respondents that have a strategic plan in place has risen sharply, from 34 percent to 60 percent. Still, that leaves 40 percent without strategic plans or unsure if they have one. LSU’s Simmons said he is not surprised that so many have no ResNet strategic plan: “Some organizations focus on keeping the wheels on the road, and they see a strategic plan as a burden to construct and a commitment to follow. They may see it as taking away agility. It takes time and buy-in to construct.”

David Raths is a freelance writer based in Philadelphia.
STUDENT RESPONSE devices, or clickers, have been around for a long time and are a popular and accepted technology in higher education. Many educators have found interesting and creative ways to use clickers in the classroom to engage students, break up lectures, enhance learning, foster discussion, and more (see resource sidebar). However, dramatic recent changes in the technologies available on campus—especially pervasive wireless and consumer-style mobile devices in student's hands—are making it possible to use clickers in exciting new ways. Here are some examples:

**Use students’ own mobile devices in place of physical clickers**

What if instead of dedicated clicker devices, students could use their own phones, laptops or tablets to respond to instructor questions? Some leading vendors have now introduced software platforms that enable students to download a simple app, and then use their personal mobile devices as their in-class response systems.

With wireless-enabled classrooms becoming more common, it may make sense to take advantage of that technology if your clicker vendor offers it. When students use their own phones or iPads to respond in class, several clicker issues are addressed: Students are unlikely to turn up in class without their clicker device, or with dead batteries, since the response device is their personal phone or computer. Instructors who rely on the devices as a quick way to simple take attendance no longer need to conduct a tedious paper backup to accommodate students who have forgotten or lost their clickers. And there's no mixing up or trading personal clickers—each student simply uses his or her phone or other mobile device. Generally, a simple app is downloaded to the device, and the student creates an account for each class that will use the clicker software.
Hybrid blend—both smartphones or tablets, and clickers

While there’s certainly an upside to replacing clickers with personal mobile devices—students no longer have to purchase and keep track of a clicker device—there can be a downside, too. For mobile devices to work as clickers, the classroom must be fully wireless-enabled and ready for potentially heavy traffic at times, which can be a challenge in large lecture halls. Despite all the chatter about pervasive wireless, many institutions are still fairly early in their wireless deployments. And some instructors just don’t want students using mobile phones in class, finding them disruptive.

The right clicker vendor can address the issues above with a hybrid or blended model, in which students can use software running on their smartphones, tablets and notebooks in the classroom, or, through the same vendor, continue to use traditional physical clickers.

The hybrid approach allows for a convenient blend across an institution. Instructors who prefer to ban mobile devices from the classroom can use the tried-and-true route of physical response devices, while those professors who choose to can allow phones, tablets and notebooks as

Resources: Using Clickers in the Classroom

There are lots of great resources online where educators share their tips on using clickers in the classroom to best advantage. Here are some examples of ideas:

Flip the classroom—With clickers, it’s easy to have students watch a video or work through a set of presentation slides beforehand, then begin class with a quiz and discussion. The clicker-based quiz can hone in on a point in the lecture, allowing students to anonymously see how classmates stand before jumping into the discussion. Because they are cloaked in anonymity and can see that others share their point of view, some instructors say, a wider variety of students may be encouraged to participate and offer opinions. New clicker technology that lets a screen capture of a YouTube video or other complex image be included with the quiz question can add more fuel to the discussion.

Enhance the discussion—One clicker technique involves having students first answer a quiz question individually on clickers and then view the entire class’s answers. Next, students are paired up with someone who answered the question differently—the two attempt to persuade each other to come around to each position. After discussion, a second quiz measures who has been swayed. Finally, the instructor leads a discussion of the right versus wrong answer, and why some students might have been misled.

Instructor learning device—Professors are learning all the time too, and a carefully used clicker can not only break up long lectures with periods of student participation, but can help instructors understand their own pedagogy better. Instructors shouldn’t be afraid to use the devices to ask how well students understand a topic—or to rate their own presentation of a subject, especially a potentially sensitive or politically charged one. Letting students know that the instructor is using the device as a way to improve a lecture style can be a powerful tool in their learning process, too.

As with any classroom device, clickers aren’t foolproof; carefully calibrated questions, used judiciously, yield the best responses. Here is an excellent resource for more tips on using clickers in classrooms: teachphilosophy101.org/Default.aspx?tabid=155.
polling devices. A single classroom can even be set up to allow both choices, depending on student preference. The advantage to the institution is that there continues to be a single response system vendor in place, the standardized choice for the institution, under which students buy a single device or log into a single platform to download the necessary app for all their courses. Given the flexibility, you may want to check whether your clicker vendor allows a hybrid approach.

Send sophisticated graphics along with questions

Another high-end development in response technology made possible by using mobile devices as clickers is the ability to share screen captures from large outside applications commonly used in education, such as Google Earth, YouTube, or other popular bandwidth-heavy apps. With the right response system vendor, the instructor can send a snapshot from an app to students along with a question, thus sharing powerful pictures and video shots that wouldn’t otherwise be possible. That allows instructors to create quiz questions that include screen grabs—a convenient way to structure a question around an image, and to reinforce learning.

Use questions later as study aids

Regardless of which technology your institution embraces, ask your clicker vendor whether questions asked in class can be saved for study use later. Ideally, students can then revisit a personal bank of all questions asked during the entire course—a database that includes their own answers, right or wrong. That kind of stored personal data can be an invaluable study and review device.

Run analytics against questions and responses

With the right response software, instructors can store the questions asked, along with student responses, and analyze the results later, perhaps over the entire semester. The results can be a powerful way to enforce data-based decision making, indicating areas in which the curriculum needs changing in order to better explain certain concepts. Instructors can even combine data from colleagues teaching the same course, to analyze how different instruction methods are working.
WITH THE RAPID UPTICK in both wireless technology and mobile devices in the hands of students, the capabilities of classroom response systems, or clickers, have suddenly expanded. Given the direction of technology, and his company’s long-time leadership in the market, it made sense to begin offering a software platform allowing students to use their mobile phones or laptops as clicker devices, according to Steven Harper-Ray, Director of Products for i>clicker.

The new REEF Education platform from i>clicker is a re-imagining of i>clicker’s technology to incorporate the vast new possibilities opened up by mobile devices and wireless in the classroom. The first in what will be a suite of product offerings is REEF Polling—the name alludes to the steady evolution of a saltwater reef ecosystem—which the company released to early adopters in the summer of 2014 and is shipping to all customers in summer 2015.

REEF Polling—and the entire REEF platform of products—runs as a mobile-optimized system that will work with virtually any mobile device and platform. The REEF Polling platform builds on i>clicker’s understanding that while the market is evolving, not every classroom or institution is wireless-ready. Plenty of campuses aren’t yet fully wireless, and not all have classrooms that can handle a large number of mobile devices at once. Also, many instructors continue to want limits on mobile access and wireless devices in their classrooms, finding them distracting at times and difficult to control.
Thus, the REEF platform is “optimized and designed for mobile,” Harper-Ray emphasized, “but it works with our physical clickers as well.” The company’s hybrid strategy—allowing both mobile devices and clickers to be used at once—reflects the fact that physical classroom polling devices aren’t going away anytime soon.

In talking to many instructors and students, Harper-Ray said one thing stood out repeatedly—the continued importance of ease of use and flexibility. “While we changed the model to focus on mobile, we stayed true to our roots at i>clicker,” he said, adding that an instructor can have the REEF Polling module running in under two minutes.

To ensure ease of use, content needn’t be imported into the system. The REEF platform will work with virtually any presentation application, from Microsoft PowerPoint to cloud-based Prezi, and from Google Earth to YouTube. Regardless of the software, the polling system can turn a display into a question on the fly, which can be sent directly to students.

To fully appreciate i>clicker’s new REEF Polling software, imagine a classroom scenario:

A professor begins the day’s lecture. Having created a REEF account earlier, she opens PowerPoint, then the REEF Polling app, which launches a small toolbar. As she teaches, she decides to spontaneously capture and send a Google Earth image to students with a quiz question. Students respond using their clicker devices, smart phones, or tablets, depending on which they have elected beforehand. She then shows a simple bar chart of responses, starting a discussion. Later in the lecture, she sends out a question along with a YouTube passage from Hamlet. The answers indicate she needs to repeat some points. Finally, she shares a Word document with key points and a final question. After the session is complete, she can export detailed session data as Excel files that contain a summary tab—which includes the individual question scores for each student, as well as rolled-up total performance, total participation, and overall total scores and percentages—and can be uploaded or synchronized with the institution’s learning management system (LMS). After class or weeks later, each student can pull up all the questions and images, with their own answers, for test review.

The REEF platform is designed to be expandable as new modules and features evolve. For example, an upcoming analytics module that works in the cloud will allow instructors to parse questions asked over an entire semester or more, analyzing student answers to determine needed changes to the curriculum.
How to Create an AV Standards Document

Defining standards will help prevent audiovisual support headaches and keep your institution on the path to its strategic goals.

Audiovisual Technology is becoming increasingly complex and important in today’s classrooms. And with higher education IT departments being tasked with the design, installation and support of instructional AV systems — areas in which IT staff may or may not have expertise — it’s extremely important to develop, define and enforce AV system design/technical standards on campus.

The easiest way to do so is to create a comprehensive audiovisual design and technical standards document that can be referenced by all the parties involved with classroom AV installations. The goal of this document is to standardize AV installations across the institution, as well as streamline the design and construction process for these systems. A standards document will also help your IT department make progress toward the institution’s audiovisual strategic goals.

Why Write This Document?

Some higher education institutions have a centralized department that’s responsible for standardizing AV technology across campus, but many don’t. Many institutions leave AV design and support up to the individual departments and/or schools across campus, resulting in a hodgepodge of different AV systems being installed with varying degrees of usability and installation quality. Others might exclusively outsource all of their audiovisual design and installation duties to consultants and systems integrators. In both cases, it’s all the more important to develop an audiovisual design/technical standards document that all parties can rely on.

Every higher education AV support professional has experienced a situation where he or she is brought into a classroom construction or renovation project long after many AV-related systems-design and infrastructure decisions have been made. Rather than issue costly change orders to fix what the general contractor and electricians have already incorrectly done, the school’s AV department is expected to make compromises to systems to work around infrastructure issues. This almost always results in more work and AV support head-
aches in the future. If your campus’s construction project manager had provided the project’s architect with an AV standards document on day one, many of these problems could have been prevented. Architects are most likely provided with a similar document defining campus construction and interior design standards, and the AV standards document needs to be included.

Many readers from state schools will recognize this scenario: A different audiovisual design consultant and systems integration firm are chosen for each project, based on the lowest bid. You end up with a revolving door of AV professionals installing equipment on your campus. They have very limited knowledge of your existing classroom systems, and what direction you’re trying to go in with new installations. This is a great reason to have an AV standards document written and ready to hand to these individuals at the beginning of a project.

A common thought is that if you hire an AV design consultant, that individual will perform a comprehensive needs analysis, review your existing systems and benchmark comparable systems before starting the system design process. Unfortunately, that’s not always the case, and some unmotivated consultants will just slap their boilerplate technical specifications on your design, not taking into account any of your standards. Even an excellent consultant still needs guidance to meet your standards. Your AV standards document will be necessary to get the unmotivated consultants on the right path, and the great consultants will appreciate the information as a starting point for their design.

Remember, an AV standards document defines the design rationale that dictates the technical specifications of an audiovisual system — it’s not the same as the technical specifications document an AV consultant writes when a project is put out to bid. Rather, it’s one of the building blocks for the consultant’s technical specifications document.

Who Should Write It?

As important as it is to write a standards document, it’s more important to write it properly. Incorrect, nonexistent or vague information provided in the document can cause just as many problems as not having the document in the first place. It’s imperative that you look to an individual who really understands audiovisual system design to write this. Better yet, pull together a group consisting of campus AV and IT professionals, your academic technology support staff, your school’s construction project managers, the campus’s interior designer, facilities staff, etc., to help cover all angles of AV system design and installation. Ultimately, you want an InfoComm CTS-D certified individual to write most of this document, with someone who has a CTS-I certification contributing to the technical specifications. If those qualifications don’t exist within your staff, hire an AV consultant to assist with the writing. Relying on someone with these certifications will make sure you’re starting with a baseline of industry standards, then building on them to customize for your campus’s needs. This will be a constantly evolving document that adapts to past AV installation lessons and mistakes, as well as changes in technology and teaching trends, so pull your group of contributors together every year to revisit these documented standards.

What Content Should Go Into It?

Your AV standards document will be all-encompassing, defining every technical, infrastructure, aesthetic and environmental variable that will affect your AV installation. Specifics are needed to clearly define your standards. For example, “Projection screen shall be properly sized for the room” leaves way too much room for interpretation. Replace that statement with “The projected image height should be no less than one-sixth the distance from the screen to the farthest viewer,” and you’re starting to get into the kind of measurable specifics that will ensure you get the AV system you need. Include pictures of properly installed equipment and infrastructure-related items to reinforce what you’ve written.

These standards documents can run long, but properly organizing them will go a long way. Making the document easy to read will result in more parties using it and referring
back to it as they work on the AV system designs that you’ll ultimately have to support. A quick online search of other schools’ standards documents shows a mix of institutions with well organized documents as well as others that simply throw their ideas on paper in a haphazard fashion.

Your standards document should also include codes and regulations that affect AV installation. Even though you assume that architects, engineers, general contractors and electricians have a good understanding of building to code, you still need to clearly define these standards. Include standards that make sure your AV installations are adhering to Americans with Disabilities Act Standards, National Electrical Code, etc.

Who Should Receive It?
Now that you’ve spent the time to write your comprehensive AV standards document, it’s time to get it out to the public. This is one of those situations where the more publicly accessible this document is, the more apt people are to reference it. Send it to your campus’s construction project managers, each department/school’s technical support representatives, interior designers, electricians, facilities managers, AV integrators, architects and engineering firms. Post your standards document publicly on your department’s Web site for download. Ask your facilities department if your AV standards document can be included with their construction and interior design standards that they have most likely already created for the campus.

It may seem like a daunting task assembling a standards document like this, but a little bit of work on the front end will result in a noticeable improvement in your campus’s future audiovisual installations. CT

Mike Tomei is an AV design and management consultant based out of Central New York, and the owner of Tomei AV Consulting.
3 Key Trends in Campus AV Technology

With active learning environments on the rise, new AV systems support classroom collaboration.

**IN COLLEGES AND** universities from coast to coast, classroom learning environments are becoming more active and collaborative. Students are contributing to discussions and presentations, and the days of instructor-centric lectures are waning. This development is having a profound effect on the deployment of audiovisual technology in education.

“Classroom AV technology plays a big part in facilitating active learning environments,” said Mike Tomei, an independent audiovisual consultant who designs and installs AV systems for classrooms.

Makers of AV equipment have responded in kind, developing new products that support more active and collaborative learning. Here are three key trends that illustrate this concept.

1) **Projectors and displays are becoming increasingly interactive, with more touch points to support multiple users at once.** Interactive projectors have shown steady growth since they first hit the market in 2009, said Linda Norton, vice president of PMA Research, a high-tech market research firm that specializes in the projector market.

According to Norton’s firm, U.S. sales of interactive projectors jumped 36 percent last year, from 63,042 units sold in 2013 to 85,813 units sold in 2014. Although Norton’s firm does not track sales by vertical market, it’s safe to assume that many of those sales were to colleges and universities — and she said there is no reason to believe this growth won’t continue in 2015.

New options for interactive projectors continue to emerge, with more devices supporting touch interactivity with a finger instead of a pen. In April, for instance, Mimio upgraded its projector line by adding a touch-enabled device. The MimioProjector 280 series now includes a conventional, non-interactive model (the 280); a pen-based interactive model (the 280i); and a touch-enabled model (the 280T).

Sharp’s Aquos Board helps students and instructors to collaborate and share content.
The 280I allows for the simultaneous use of up to 10 interactive pens, which is a significant increase in functionality over the dual-pen operations of other models, Mimio said. The touch-based 280T supports up to 10 simultaneous touch points.

How might this be useful in the classroom? On MimioConnect, the company’s online community of educators, one educator suggested projecting four incomplete equations on the board. Have four teams of two to three students each come to the front of the class, and assign each team an equation to solve. Then, compare and contrast the different strategies that students used to solve each problem, and ask the class to discuss the pros and cons of each method.

“This makes learning fun and game-like,” the educator wrote. “It encourages the students to work together to solve the problem, just how problem-solving is [done] in the real world. And it also brings the entire class into the learning process, so it isn’t [just] one student up at the board.”

Many schools look to interactive projectors as an alternative to interactive whiteboards in classrooms, said Tom Piche, a marketing executive at Epson America, which makes the BrightLink series of interactive projectors for education. With an interactive touch area ranging from 60 inches to 100 inches diagonally, these projectors give educators some flexibility in terms of classroom installation, he said.

Touch capability is increasingly important, and many customers now expect this instead of pen-based interactivity, Piche noted. “With iPads, iPhones and tablets, people have gotten so used to swiping with their finger,” he explained. “That has become the expectation at the board as well.”

Interactive flat-panel displays also are catching on in education. During the Texas Computer Education Association conference earlier this year, BenQ demonstrated its new 70-inch RP702 high-definition interactive display, which features 10-point multitouch technology and a built-in whiteboard app called QuickNote for annotating on the screen. And the Australian company Electroboard Solutions made its U.S. debut by demonstrating Prowise interactive flat panels for education, ranging in size from 55 inches to 84 inches diagonally.

“With iPads, iPhones and tablets, people have gotten so used to swiping with their finger. That has become an expectation at the board as well.”

— Tom Piche, Epson America

From a cost perspective, interactive projectors or whiteboards will be cheaper than large flat-panel displays, Tomei pointed out. However, there are some benefits that might make interactive flat panels worth the money.

For instance, even when using an ultra-short-throw projector, there will still be shadows on the projected image when users are writing on the board or interacting with projected content, Tomei said. Also, projectors can be bumped out of alignment, requiring a technician to realign and calibrate the image — and they require lamp changes when the lamp burns out.

“You don’t run into either of those issues with flat-panel displays,” he noted.

2) New apps and devices allow multiple users to collaborate and share content wirelessly at the same time.

A number of new AV systems allow for wireless collaboration between instructors and students, enabling an ever-
A growing number of AV manufacturers are integrating Miracast technology into their devices, enabling users of Windows or Android tablets to mirror their screen on a display. For instance, many Panasonic projectors and interactive flat panels include Miracast, allowing users to show content from their own device wirelessly — provided they are using a device that supports the Miracast screencasting standard, such as a laptop or tablet running Windows 8.1 or Android 4.2 or later.

Epson recently introduced free software called Moderator, which enables instructors to control multiple presentations at once. Up to 50 students can connect to an Epson projector simultaneously from a laptop, iOS or Android device, using Epson’s free iProjection app — and with Moderator, which runs on Windows or OS X, the instructor can display up to four student screens at the same time.

Instructors can see who is connected from a list on the left side of their
own computer screen. To show a student's screen, the instructor simply drags that student's user ID to the center of his or her screen. In controlling what the entire class sees, instructors can choose from among single, split-screen or four-screen views.

Systems such as ShareLink, Moderator and Touch Display Link are designed to take advantage of the “bring your own device” phenomenon in education. But Tomei recommended that campus AV buyers involve their network services team when planning for and evaluating systems that enable wireless collaboration, to ensure their networks can handle the anticipated demand without any signal interference.

3) Web conferencing offers a more versatile option for making video connections.

Nearly everyone is familiar with Skype or Google Hangouts, but there are other Web-based conferencing systems that enable educators to connect with remote speakers without the need for expensive videoconferencing equipment.

These services, which allow users to participate in a video chat or conferencing session using any device with a Web browser, are more scalable and reliable than ad-hoc calls using a free system such as Google Hangouts — but colleges and universities don’t need high-end equipment to use them.

Lamp-Free Projectors: A Bright Idea?

Solid-state illumination can save on the total cost of projector ownership.

Projector lamps can be expensive, and it can be a hassle to replace them when they burn out. Properly disposing of mercury lamps isn’t easy either. For these reasons, a small but growing number of organizations are opting for lamp-free models when buying projectors.

Lamp-free projectors, which use solid-state illumination (SSI) instead of traditional mercury lamps for their light source, include LED projectors, laser projectors and hybrid projectors that use a combination LED/laser light engine. Since Casio launched the first hybrid projectors in 2010, a number of other manufacturers have introduced SSI models as well.

When lamp-free projectors first came out, they were more expensive than similar models with traditional light sources, and the colors were slightly off, said Mike Tomei, an independent AV consultant for education. “Now, we’re either at or really close to the point where these are comparable,” he said. “I think, in the next few years, most schools will be buying these.”

Sales of projectors with solid-state light sources instead of lamps are on the rise. PMA Research predicts an 8 percent growth in sales of projectors with laser/LED hybrid light engines in the United States this year, said Vice President Linda Norton. She attributed this growth, in part, to falling prices. “In 2014, the average selling price of laser/LED hybrid projectors was $1,322, and we expect the average price to be $1,280 by the end of this year,” Norton said.

Earlier this year, Casio introduced a new hybrid projector that sells for about $700. The EcoLite XJ-V1 is powered by Casio’s fifth-generation LED/laser light source, with an estimated lifespan of 20,000 hours. It produces 2,700 lumens of brightness and boasts XGA resolution (1,024 pixels by 768 pixels).

While PMA doesn’t have figures that are specific to education, its 2013 end-user survey showed that 54 percent of projector buyers in the corporate market found solid-state illumination to be “very important,” and 38 percent said SSI was an “absolute must” for their next projector purchase.

Norton cited the convenience and lower total cost of ownership of lamp-free projectors, as well as their “green factor,” as reasons for this support.
For instance, Pexip offers a scalable, cloud-based platform for videoconferences and meetings, called Pexip Infinity. The service allows schools to create “virtual meeting rooms” in which students and instructors can join using any smartphone, tablet or other device with a camera and a Web browser.

Pexip Infinity takes advantage of the new WebRTC (Web Real-Time Communication) two-way videoconferencing capabilities built into the Google Chrome and Firefox browsers. It also uses a distributed architecture to optimize bandwidth: Only the person who is talking uses the full amount of bandwidth, while the others who are connected use just a small fraction. What's more, there is no limit to the number of users who can join a call or meeting, according to the company.

Users can choose from several different formats. These include a “virtual auditorium” mode, in which the current speaker is shown along with smaller images of up to 21 other participants, and a “lecture mode” showing just the speaker.

Pexip Infinity is licensed based on the number of ports used per month, and a yearly enterprise option includes an unlimited number of ports.

Another Web conferencing service, Vidyo, offers its own cross-platform systems for hosting videoconferences, lectures or meetings on any device.

The VidyoDesktop app brings videoconferencing to Windows, Mac and Linux computers, letting users connect from wherever they are. The VidyoWeb browser extension lets participants join conferences from within a Web browser on desktop or laptop computers. The VidyoMobile app brings videoconferencing to Apple and Android tablets and smartphones through a wireless broadband or WiFi connection.

Tomei said traditional videoconferencing codecs work well, but you have to know what technology is used on the other end of the call.

“If you know that and you need a reliable connection, this would be my recommendation,” he said. But if you connect to many different sources and don’t know what technology they will be using, “then Web conferencing would be the better choice.”

Dennis Pierce is a freelance writer who has been covering education and technology for more than 17 years.

4 Tips for Campus AV Buyers

Independent audiovisual consultant Mike Tomei designed AV systems for Harvard University (MA) and Ithaca College (NY) before striking out on his own. He now works with schools and colleges nationwide to help them develop standards and a strategic plan for their AV installations.

Here are Tomei’s four key recommendations for planning successful AV projects.

- **Think ahead.** Make sure the systems you design will support your future needs. For instance, while 4K video displays might be too cost-prohibitive for some schools to install today, “I do specify video switching that can handle 4K,” Tomei said, “so when you’re ready to upgrade, you can.”

- **Focus on design.** Spend most of your time on doing a needs analysis, and talk with instructors about how they want to teach. “AV shouldn’t hinder teaching and learning; it should facilitate these,” he advised.

- **Include enterprise management.** Your tech staff should be able to remotely monitor and troubleshoot AV equipment. “AV staffing doesn’t increase proportionally with the amount of classroom technology,” Tomei noted, “so remote access and support is critical.”

- **Don’t overlook staff support.** Schools need to offer academic tech support as well. “You have to teach instructors how to use these systems because they will require new pedagogies,” he said.
When it comes to managing digital devices, too many IT leaders dread January, when students return to campus with hordes of new devices acquired over the holidays, expecting to “auto-magically” connect to the university network. That’s an all-too-common scenario, according to Josue Fontanez, who is the product line marketing manager for desktop-as-a-service (DaaS) at VMware, the well-known cloud and virtualization software and services company.

That dread is understandable, given the extensive challenges facing IT in managing its networks. With the growing popularity of BYOD, or bring-your-own-device policies, users—whether faculty, staff or students—are turning up on campus with more and more new devices, and expecting access to a full range of resources immediately. For students raised in a digital world, there is an ingrained expectation that every device will work immediately and seamlessly on the campus network. “That’s really tough,” Fontanez points out. “How can an IT administrator possibly know every device that might turn up on campus?”

Ensuing problems include incompatible applications, challenges when apps are frequently updated, and the ability to secure access to sensitive data. Add to that the difficulty of supporting the wildly varying styles and times that students need access to the network—especially to computer labs, which have set hours of operation. Finally, mobile devices and older computers have limited processing power, leading to inconsistent student experiences accessing course material.

How to address all of these challenges while still providing every student with a first-class educational experience?

“Of all the vertical [industries] we work with, higher education is one of the most challenged,” Fontanez said in a recent Campus Technology webcast. “There is little to no control of the devices that students bring to campus and want to work from, but they still need and expect a first-class educational experience on all devices.”

What if you could support access to apps and data from any device users bring to your institution? What if you could offer 24-hour access to your computer labs? What if the same user experience was delivered across every device and to every user, regardless of whether the student, faculty or staff member is using a five-year-old desktop computer, the latest tablet, or a mobile computing device like a new smartphone? What if you could add or update applications at any time during the school year, without waiting for summer or the semester break?

Especially in higher education, virtual desktops offer an excellent way to fill the diverse needs of a wide range of users, Fontanez explained in the webcast. With virtual desktops, computing is shifted from the device itself, to a back-end data center, either on-premises or in the cloud. Computing devices no longer have to be powerful enough to run the latest applications—they instead become thin clients, with the desktop itself residing elsewhere.
From an IT perspective, virtual desktop infrastructure—or VDI—offers a secure platform in an easily manageable environment. IT staff can update the platform centrally, applying campus policy across the infrastructure and refreshing systems as needed.

When institutions consider the options available for running virtual desktops, Fontanez said, many are already familiar with the concept of an on-premises VDI deployment, in which virtual desktops are supported in the campus computing center. “Those benefits have already been realized, and schools are familiar with them,” he pointed out.

For additional benefits, moving VDI to the cloud using DaaS technology capitalizes on virtual desktops but offers additional benefits. In the webcast, Fontanez listed the following as some of the benefits of DaaS:

- First, a college or university can get up and running quickly, piloting a deployment across one class or department to test it out. Because a cloud deployment is so easy to scale, it’s easy to start small and grow, adding desktops as needed.
- Second, there’s no capital expense—with the cloud, there’s no big initial infrastructure investment. Costs are operating expenses and pricing is utility-based and monthly, making budgeting easier.
- Third, DaaS dramatically reduces the operational skills needed. With VMware Horizon Air, Fontanez said, the design, deployment and management of the system is handled by the vendor, so there’s no need to hire expensive experts to manage a VDI implementation. As usage grows, VMware can scale up. And, Fontanez said, since VMware provides multiple datacenters, desktops are hosted in the nearest datacenter, to ensure the best user experience.
- Finally, there’s another option: Colleges and universities that are already familiar with VMware and VDI through on-premises deployments can test out a cloud deployment through DaaS using VMware’s hybrid model, in which some departments or campuses can run on-premises virtual desktops, while others try cloud-based DaaS.

In fact, Fontanez said, that hybrid combination is probably the most popular model he sees among VMware’s higher-education clients.

Beyond the choice between on-premises or cloud support, it’s still all about the options available, Fontanez said. Colleges and universities typically need to fulfill a variety of diverse needs, he pointed out, ranging from the needs of full-time students and faculty and their devices, to those who need temporary access, perhaps during a conference or summer session, or to satellite educational centers. VMware offers a variety of desktop service models for all use cases, including full VDI desktops that can be assigned to a particular student or faculty. With the cloud, “those cloud-hosted desktops can easily be assigned to a particular student or faculty member,” Fontanez said.

Shared desktops, also referred to as a non-persistent desktop, are particularly useful in situations such as campus computer labs, either actual labs or virtual labs. In either case, with VMware, once a student logs off, the desktop is refreshed to its original state, and is then available to another student. “Those types of desktops are particularly useful for situations where students aren’t locked to a particular desktop,” Fontanez explained. “Instead, they are saving documents to a shared server or to a cloud location. A single desktop can be shared across a number of users. From a cost-per-user perspective, we’ve seen it work really well.”

Another typical higher education use case is a situation in which institutions don’t need to provide a full Windows desktop experience to students, but instead need to supply access to just a particular application. “What we provide in that case,” Fontanez said, “is Microsoft RDP host infrastructure, which can provide access to a specific application.”

The bottom line, Fontanez concluded, is this: Through a single vendor supplying a single cloud service—VMware Horizon Air—almost any type of school can efficiently and cost-effectively handle all of their diverse user device needs, supplying individual or shared VDI desktops, on-premises or in the cloud.
LIKE A JAZZ DANCE  performance, active learning combines doing, movement and impromptu variety in a way that gets students and faculty up and out of their usual positions in the classroom. The room and its technology trappings become the stage and props for encouraging the unexpected to unfold.
The goal of active learning is to create a space that can become the catalyst for change, noted Lennie Scott-Webber, director of education environments for Steelcase and former head of the Department of Interior Design & Fashion at Radford University (VA). “When you open the door to a space, does it give you permission to act differently other than to be behaviorally conditioned to ‘sit and git’ or ‘stand and deliver?’ If the space doesn’t give permission to change, then it’s too easy to revert back to what we know.”

Designing and outfitting a classroom for active learning doesn’t have to be particularly complicated or excessively pricey. Still, the process you follow should be a unique choreography suited specifically to your campus’s needs. CT asked experts from institutions across the country to share their top tips, tricks and pitfalls.

1) Abandon the Cookie Cutter

The University of Oklahoma’s first active learning space was “no holds barred, very high-budget, very ‘bells and whistles,’ very executive-looking,” said Chris Kobza, OU’s manager of IT learning spaces. But that kind of budget is out of the reach of the average college or department, so for subsequent spaces, Kobza and Director of Strategic Initiatives Erin Wolfe changed their design approach “a little bit to make it more economical.”

As Kobza explained, “You can do nice tables that don’t move; you can do flexible tables that do. You can do really high-end technology, or maybe you just want some nice whiteboards and [basic] technology. We have spaces that are very flexible and mobile and almost scattered in a way. Then we’ve got other spaces that are just structured looking and still high tech and flexible, but not in a way that you’re 21st Century Classroom

4 QUESTIONS TO GUIDE CLASSROOM DESIGN

By next year, the University of Oklahoma will have nearly a dozen active learning spaces, up from one in 2012. Every single classroom looks different from the others, and that’s by design. Chris Kobza, manager of IT learning spaces, and Erin Wolfe, director of strategic initiatives, have honed their process down to four simple questions:

1) What’s the vision?
2) What’s the focus?
3) How flexible?
4) What’s the budget?

The process starts when they sit down with the person or people who want to redo a room to find out what they envision — is it maximum technology or maximum flexibility? “It’s a real casual conversation but you can learn enough about what their expectations for the space are, what the expectations for their faculty are, what they hope the students get out of the space,” said Kobza.

Next, they ask what the focus is — teamwork, digital content work or something else.

Then they ask how flexible the room should be. Do the room sponsors want movable everything (including technology), or do they want movable furniture and basic technology options?

Finally, and only at the end of the discussion, they ask the money question: What’s the budget? Even though that’s what people typically open the conversation with, budget isn’t as important as people make it out to be, Kobza and Wolfe noted. Regardless of cost, said Kobza, “You’re going to have spaces that look different and might operate a little bit differently, but they really do 90 percent of the same stuff, and they accomplish the exact same mission.”
Kobza and Wolfe tailored the design for each room based on the specific requirements of the people “who owned the spaces” and the faculty who use them. (See “4 Questions to Guide Classroom Design,” page 33.) “What ultimately came out of that was a cohort of spaces that are all different in some ways,” said Kobza, but “deep down they’re all really similar.”

Not including physical renovation of the spaces, budgets for furniture and technology run from $40,000 or $50,000 on the low end to nearly 10 times that on the high end. “really,” said Kobza, “the high-dollar stuff comes down to specific technical requirements or a space that you want to showcase — something you want to use to attract students or faculty or show to donors or something like that. it’s not going to have as big an impact on the actual learning experience.”

2) Don’t Discount Ugly Rooms

A shift in curriculum to a team-based active learning approach at Bryant University (RI) cried out for a new kind of classroom, so the institution set up the Ideation Lab, a 24- to 32-student space where every surface is writable, the furniture is modular and, as Robert Shea, associate vice president for teaching and learning, noted, “it’s a great place to teach.” Usage is in “excess of 90 percent.”

For its second active learning space, instigated when the university received the donation of a new telepresence system, the decision was made to turn around a room where nobody wanted to go. Bello 102, a classroom with a legacy teleconferencing system housed in the library, “had big huiking cables in there and when you were in the back of the room, you could barely see the screen. There was no permanent whiteboard space; you had to wheel one in,” Shea recalled. It was the “lowest utilized classroom space on campus.” In fact, he added, if adjunct faculty weren’t scheduled in there, usage “probably would have been zero.”

One advantage: Not much had to be done with the wiring, Shea pointed out — just buying new furniture, doing technology for the wireless projector and installing the telepresence system. Now he takes formal proposals from faculty on how they might use Bello 102. “I’m in the process of reviewing them now and trying to get as many folks into that space as I can,” he said.

More recently, a group of faculty came together and asked for a third active learning space — this time in the main academic building. As Shea recounted, technology wasn’t even on the wish list. “If it just gives us the ability to have students working in teams, it would be great practice for us,” the faculty told him. Shea and his team have identified the space where the classroom could be implemented, and facilities has been brought in to identify surplus furniture that might work.

Shea has pared down the list of must-haves for active learning: “It’s not that we have to have everything pretty, but we do have to have enough.”

21st Century Classroom

Quick Tips

Ask yourself, “Are classrooms on the college tour?” advised Lennie Scott-Webber, director of education environments for Steelcase. If the answer is no, your campus may be ready for a classroom reboot. “The classroom is not only where the students will be for however long their career path portion takes, but that’s where the faculty go to work every day in their educational arena. If it is not on the tour, then you have to ask yourself, what are you ashamed of?”

Look for examples of active learning on campus. Check out your design studio courses, suggested Scott-Webber. “You usually have a four- to six-hour block,” she noted. And in that situation, “Boy, you’ve got to learn how to manage active learning awfully quickly. It’s all problem-based or project-based learning. You present the same problem to 24 students, and they’re all going to have the right answer — it’s just not the same right answer.”

Lower the bar to entry. While some schools make a practice of putting faculty through extensive training sessions before they gain access to the rooms, the University of Oklahoma went the other way — and sped up adoption. “We wanted professors who were already doing this well to have a place to do it,” explained Chris Kobza, manager of IT learning spaces. “But additionally we wanted to give... (continued on next page)
learning to just a few elements: first, furniture that can be moved around and the space to do it in; and second, the ability for students to capture the work they’re doing together — “whether low tech or high tech.”

With funding in place, demolition started in May 2014; the Brian J. Flynn Discovery and Collaboration Space, dubbed DisCo, opened for business last August.

Choosing the library turned out to be a savvy move for professors who were thinking they might want to start incorporating this sort of learning into their courses a place to try it out. We didn’t want to create a high bar of entry to this.” To sustain faculty efforts, the university provides support, training and learning communities.

Ignore the naysayers. When seeking people to use new active learning classrooms, start with the most interested faculty, recommended Robert Shea, associate vice president for teaching and learning at Bryant University (RI). Then pursue the curious bystanders, who — with a little “incentivizing” — will move forward. But don’t seek 100 percent success, he advised: “You can waste an awful lot of time and resources trying to move the most recalcitrant faculty.”

Provide just-in-time support. For the first week a faculty member is new to the classroom, suggested Derrell Jackson, director of education at Herman Miller, have an IT specialist hover in the area, so he or she can pop in and say, “Okay, here’s how you use this iPad to connect wirelessly with this technology” or “Here’s how you use the interactive whiteboard.”

Do “purposeful marketing.” Stonehill College (MA) makes a point of taking photographs and capturing quotes from faculty as they cycle classes through the institution’s library-based active learning space. Then those pieces are (continued on next page)
When Stonehill opened its new active learning classroom, there was an underlying sense that it would “immediately transform everything that happens in that space,” recalled Chase. The reality is that while it “transformed a good deal of what we’re doing, there are still some classes where we’re doing a little bit more of a traditional instructional session.”

For a while that tepid outcome disappointed the librarians. But eventually they realized that the larger picture showed something else: “Yes, we might have one or two or three sessions that are a little more traditional, but we also have all of these other uses of the space that are happening now and that we’ve enabled by doing this renovation.”

5) Prepare for the Politics
Selecting a space to transform into an active learning classroom can be rife with politics. Not only does it suggest favoritism — particularly when it’s being funded by the provost rather than a given department or program — but it can also entail a battle with the registrar’s office because that room is being removed from the inventory of available classrooms, which makes course scheduling that much more difficult.

Derrell Jackson, Herman Miller’s director of education, advised rounding up your advocates at the front end and planning to collect data at the back end. “If you get a body of people behind you, you can go to leadership and say, ‘We want to do these things. We believe this space can help us.’”

Once the space is granted, it’s time to do some pre- and post-occupancy surveys. The goal, explained Jackson, is to get impressions of students and faculty about the traditional classroom before its transformation and again after they’ve been in the space for a semester.

The data you collect will serve two purposes. First, if the newly redesigned classroom worked, that data can help you build the case for expanding to other spaces on campus. Second, the data will give you insights about what didn’t work. As an example, Jackson cited one school that leveraged soft seating in the new environment. The data confirmed that “students loved it in the beginning.” However, by the end, “they were clamoring for more work surface. So we learned that you have to have a balance between the comfort seating and standard student tables to really accommodate great learning in a space.”

6) Plan Ahead
One major challenge that OU has faced in its expansion of active learning classrooms is the tight turnaround most project sponsors expect. “A lot of times people come to us and they want these very quickly because maybe they have funds running out at the end of the fiscal year or they want [the spaces] online by the next academic year,” said turned into stories for the library’s biweekly newsletter. According to Liz Chase, head of collections, assessment and user engagement at MacPháidín Library, that kind of marketing helps woo instructors who now will realize they can’t simply do “the same thing” or who don’t know that you’ve built the new space in the first place.

Get stakeholder feedback. Stonehill posted architectural renderings in public spots and, over the course of a couple of weeks, invited stakeholders — faculty members, students and library staff — to write feedback on sticky notes. People became “very specific,” said Chase. For example, images of different kinds of seating included a picture of an ottoman with five little chairs that “looked like a flower.” One observer wrote, “This looks great but doesn’t look comfortable for studying long-term.” The college went with other seating choices.

Encourage students to voice their support. Bryant U’s Shea asked students to create videos that he could share with the anonymous donor who supported the reboot of Bello 102. As one student from last year’s class responded, “Thank you for making this space available. It’s added so much to my educational experience. I’m confident that students at other campuses are not having this level of technology made available to them.” Concluded Shea, “I think that’s representative of what a lot of students feel about the room.”
Wolfe. When there’s only a few months to produce the new space, racing through the process of what the room should become, choosing “furniture, finishes and technology” and then getting it “installed and up and running” and training faculty “really creates some difficulties,” she added.

Her wish is to get a year for the makeover. “If we could have that, it would make our lives a lot easier.”

The demand for the spaces “has been constant,” said Kobza. “But if it was up to me and a lot of other people, we would have 60 of these things on campus. We really want to see this occupy a much larger percentage of our campus learning spaces. We’ve still got a long way to go before we get there.”

Dian Schaffhauser is a senior contributing editor for Campus Technology.
his students, but what he really wanted was a tool that could assess his math students’ problem-solving process and give them feedback.

Evaluating an Online Instructional Tool

Around 2009, Lafreniere began looking for a tool to accomplish that goal. One of them was WebAssign, an online instructional system that combines digital learning content with instant assessment. “I eyed WebAssign because it had the ability to take advantage of some of the powerful packages on the mathematics and engineering scene, which were Maple and Mathematica,” he said in a phone interview. “Those were real draws because I knew the power behind those products that they were tapping into.”

As part of the product evaluation process, Lafreniere was able to compare WebAssign and other tools side-by-side in his classroom on a trial basis. “Those were real draws because I knew the power behind those products that they were tapping into.”

Lafreniere evaluated the tools based on their academic value as well as cost, including textbook costs for students. The students had a real affinity for WebAssign, Lafreniere said, and as a professor, he liked its features, such as question authoring, pooling and randomization; customization and support for third-party tools for video, simulations and online calculators; as well as freedom to choose between publishers. (The university had already adopted a textbook and wanted a tool that could support it.) He also saw the potential of WebAssign and Enhanced WebAssign to let students convey their mathematical thoughts beyond click-and-point by using digital ink. “It really has a lot of tools that are highly graphical in nature,” he said.

Responsive Teaching, Collaborative Learning and Online Assessment

Lafreniere lets the students work through the material at their own pace in WebAssign, but the majority of them choose to move through the coursework together. Because the tool lets Lafreniere monitor how well each student is mastering the material, he can pace his course accordingly, going back to reteach concepts students are struggling with. “You can see an evolution in students becoming more and more open, knowing that they can come to a classroom where they’re actually going to get a chance to ask questions about the difficulties they’re facing, versus a typical lecture where I’m moving on whether you understand it or not,” said Lafreniere. Over time, he has collected data about the number of times a typical student needs to work through a type of problem before he or she masters the concept, and he provides students with those benchmarks. If they’re still struggling with a concept after that number of attempts, it’s a flag that they need assistance.

Sometimes it’s Lafreniere providing that assistance, and sometimes it’s a fellow student. The system generates a unique set of problems for each student, while ensuring that they are based on the same mathematical concept. That randomization means students can work collaboratively, helping each other understand the mathematical procedure without copying each others’ work. “It allows the students literally to sit next to each other, as well as online, and talk about a problem that they’re trying to solve from a conceptual and procedural fluency standpoint, versus peering over [someone’s] shoulder and just taking an answer and submitting it,” said Lafreniere.

Since implementing WebAssign, Lafreniere has also revamped his approach...
to assessment and switched to proctored exams through a testing center. Each exam is available during a two-week window, so students can select a time that is convenient for them and when they feel best prepared to tackle the challenge. Because the exams take advantage of WebAssign’s randomization feature, there is no risk of students cheating by sharing answers. It also means students can take each exam up to three times, with different problems each time. Lafreniere gives about eight exams throughout the course, so using the proctored approach means eight hours more classroom time for teaching and learning during the semester.

**Effects on Developmental Math Outcomes**

Since implementing this new approach to developmental math classes, Lafreniere has seen an increase in the rate of students passing the course and progressing to college algebra. “It was really impressive how students — when given the right direction to work on concepts, to build their procedural fluency — can learn the material and not have to revisit it time and time again,” said Lafreniere. The college algebra instructors noticed a change in the students coming from the developmental math classes, too. “Other faculty were finding them contributing and well prepared for their classes,” said Lafreniere. “That was a telling sign that things were going right.”

Based on the success of Lafreniere’s developmental math classes, the university has rolled out the new approach to all of its developmental math classes, so there are now about seven or eight faculty members using the new approach.

Leila Meyer is a technology writer based in British Columbia.

**U West Florida Uses BYOD Content-Sharing System for Collaborative Problem-Solving**

By Leila Meyer

**THE INNOVATION INSTITUTE** at the [University of West Florida](https://www.uwf.edu) is using a digital collaboration system that lets people share content on a single screen from their own laptops, tablets and smartphones, so they can more easily discuss ideas and solve problems together.

Opened in January 2014, the institute aims to bring together people from industry, government and education to talk about problems and figure out how solutions from one particular domain might be extended to another. “Our charge is to address some of the large problems in education — in particular to try and discover an innovative way to approach what we’re doing,” said Dave Dawson, research scientist at the Innovation Institute.

**Connection Challenges**

The people who come to the institute for these problem-solving sessions bring with them a wide variety of technologies, some of which are locked down in a way that makes it almost impossible for the user to make any configuration changes to his or her device. The collaborative nature of the problem-solving process at
Project Spotlight

the Innovation Institute requires the ability to analyze and compare the differences and similarities between what different organizations are doing, and the institute wanted a content-sharing system that could simplify that process.

“We wanted to make it so that people could walk into the building with whatever it is that they use most often, whether it’s a PC-based laptop, a Mac, an iPad, an Android tablet or a phone of any type, and connect to our display system and collaborate with other people with a minimum of distraction — without going through a trunk full of hardware connectors or adapters or going through contortions for systems configuration, which they often don’t have the administrative rights to do,” said Dawson.

In the end, the institute selected the Christie Brio wireless presentation and collaboration system from Christie Digital. Christie Brio supports multimedia, multi-device and multi-platform content sharing without additional hardware or drivers. It can share content wirelessly and in real time for up to five content feeds per unit.

The system was in place in time for the opening of the Innovation Institute's new facility in January 2014. According to Dawson, the implementation process was “absolutely painless.” As part of the process, the institute created a separate guest network to enable visitors to connect their mobile devices to the Christie Brio system. Apple iOS devices, such as iPads and iPhones, connect to the system over Apple AirPlay, and Android devices connect to it through Miracast. So far, the only unexpected surprise occurred when Apple released a new version of iOS, which broke the AirPlay connection to the Christie Brio system, but Dawson noted that the people at Christie Digital fixed the problem in just a few minutes over a remote connection.

Results

The Christie Brio system lets people from any organization bring their own mobile technology to the Innovation Institute, log on to the guest network and start sharing. They share interactive digital video, presentations, spreadsheets and other digital content, and collaborate to solve problems and develop new ideas. According to Dawson, the people who visit the institute love the technology. “The first thing they always ask is, ‘Can we get one of these for our shop?’” he said.

Since the Innovation Institute opened just over one year ago, it has grown from 12 people to more than 150 people and has roughly doubled its square footage, taking over another part of the building where it’s located. The institute plans to implement a second Christie Brio system with a larger 4K ultra-high-definition display for use in the expanded space.

Dawson calls technologies like Christie Brio “enabling technologies” because they simplify the collaboration process rather than complicating it. “We’re looking for things that enable us to do the things that we want to do without the distraction of tinkering with the technology to make it work for a particular case,” he said. “We want people to be able to focus on the issue at hand rather than on the technology to enable them to articulate their vision.”

Leila Meyer is a technology writer based in British Columbia.
The push for “student success” is all around us. Today, new campus IT implementations, software development efforts and academic program redesigns all seem conceived in the popular context of student success, or they are in some significant way connected to it. But what about the notion of “faculty success”?

Michael Cottam is Webster University’s (MO) associate vice president for academic affairs and director of its Online Learning Center. He has developed innovative support programs for online faculty there and in his previous posts with very large online programs at higher education institutions including Rio Salado College (AZ) and Mount St. Mary’s University Online. CT talked recently with Cottam, who asserted that supporting his institution’s online faculty is the most important element of creating student success.

CT: What does it mean to support online faculty as they work for student success?

Michael Cottam: It really is about helping the faculty member to be the first, the most effective and the most important contact for the student. In spite of all the supports we might provide (advisers, success coaches, counselors, tutors and so forth), I do not believe that student success will happen without really effective faculty.

CT: Effective in what particular way?

Cottam: In the way that they create courses, in the way they interact with the student and in the way they use the technologies available to them.

CT: So would you support faculty in how they use the technologies for online course delivery?

Cottam: Sure, but support for online faculty isn’t just during the course. It starts long before the first class, in the course design process — in how you set up the learning management system for them and how you train them in tools and give them ongoing support. We support faculty fully in designing courses, rather than just handing them a course shell in the learning management system for them to develop from scratch.

We need to start with individual attention to the faculty member, so we assign them an instructional designer — someone who knows the technology and the best practices for online instruction. For faculty, designing an online course is often dramatically different from designing an in-person class; you’re including more multimedia, more video, more games and more simulations. You’re blending technologies from a publisher, maybe some open education resources and maybe your own lecture notes or learning activities that you’ll need to adapt to an online environment.

CT: Within the institution, is there some coordination, if not standardization, among these course designs?

Cottam: At Webster, we use a master course model, where we have a faculty
member work with a designer to create a master course according to school- or program-established design guidelines. Then we copy that master course over to many sections — so other faculty can work with this master, and customize and personalize their own section to match their needs. Finally, we monitor and improve the master course regularly, based on faculty and student feedback.

CT: What else is key to building these master courses with faculty — and student — success in mind?

Cottam: Thinking ahead! Scheduling courses well in advance so that faculty have a good idea of when they will be teaching online and can prepare for that. We allow time for faculty to customize their course to best serve their students by using their own personality and style — things they know work for them.

And we provide faculty a sandbox during training, a safe place for them to play with the technology and become familiar and comfortable with running discussion boards, embedding media, setting up announcements and alerts, as well as learning how to use the analytics. New faculty may also “shadow” a current online course, with the guidance of a mentor. All this preparation, given appropriate lead time, helps faculty to succeed online. And students recognize that the faculty member is ready to help them, starting right on day one, to succeed in the class.

CT: What about ongoing support, once the faculty member is established in teaching online?

Cottam: We can’t simply stop at the beginning of the course and say, “Okay, you’re trained … just go ahead.” It’s a matter of providing, on an ongoing basis, access to experienced faculty and staff who can answer any questions and help solve problems online faculty might have. And this goes far beyond questions about the technology, to include policy and procedures as well as instructional issues.

Beyond these reactive services, we have a faculty knowledgebase and a series of proactive communications — short, actionable tips and reminders to help online faculty stay on track and solve the challenges that come with teaching online.

CT: Do you evaluate these ongoing services?

Cottam: We do provide opportunities for feedback and for collaborative efforts to improve. We don’t rely on one-way communication and assume we know what’s needed. We listen to what the faculty see as barriers to success, and we provide opportunities for students to give us observations at any time during the course.

“We don’t rely on one-way communication and assume we know what's needed. We listen to what the faculty see as barriers to success, and we provide opportunities for students to give us observations at any time during the course.”

Still, an important reason we need to consider the concept of community is the normally distributed nature of online faculty. In our case, for example, we have about 70 locations in the U.S., including our main campus in St. Louis, some satellite campuses in St. Louis and other campuses across the country. Those who teach online may be working in multiple faculty communities, both in-person and online, with individual faculty residing in many different locations.

I think our responsibility at the Online Learning Center is to help these faculty connect at the levels most appropriate for them — at the course, program and/or school levels. Ways to do that could include anything from supporting a webinar to establishing a virtual faculty commons.

Faculty do support each other in the effective use of technology for teaching and learning. So faculty-to-faculty connections are very powerful in moving
teaching and learning forward in the online environment.

CT: Is there a role for analytics in terms of faculty success?

Cottam: Yes, actually analytics and dashboards are emerging to support faculty as well as student success. Most learning management systems embed some type of analytics. You can see student login, student activity, student engagement…. Toolsets are different everywhere, but just as an example, we are investigating a plugin for our LMS that uses statistical models to indicate student performance based on data the LMS already collects. And with that, there’s an opportunity for us to look at faculty performance in terms of student engagement and in terms of student success. What faculty actions contribute to student success? I think that’s an important area of investigation, given the availability of data now. The analysis of that data can help the faculty member better respond to student needs and, of course, identify how the institution might better support faculty.

I think this technology is something that can improve teaching and learning online in a way that you cannot do face-to-face. There’s a great opportunity to leverage big data to make faculty more effective at teaching online.

CT: Is support for online faculty a campuswide effort?

Cottam: Supporting faculty and helping them be successful is something that requires collaboration on campus. When we talk about faculty success, we need to consider the entire university system and how its diverse constituents can work together toward supporting the improvement of perhaps the most important contact that a student has: the faculty member.

Insofar as we can use the technology and purposefully take action throughout the institution to help faculty succeed, I think our students are going to succeed. CT