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Register now for the free Campus Technology 2009 Virtual Conference and Expo. See page 52.
The Graduates

Technology has a vital role to play in helping college students—and our country—succeed.

President Obama set a goal at the beginning of his administration: “By 2020, this nation will once again have the highest proportion of college graduates in the world.”

Well, judging by the results of the latest ACT exams, we have a long way to go: Only 23 percent of all students taking the test are ready for college-level coursework in all four major subjects. Not surprisingly, this academic unreadiness shows up in college graduation statistics. According to the White House, “Nearly half of students who enter community college intending to earn a degree or transfer to a four-year college fail to reach their goal within six years.” The completion rate for four-year institutions is equally abysmal: only 36.4 percent within four years and 58.8 percent within six years.

And though a higher percentage of the population has a college degree than ever before (in 1970 it was just 11 percent; in 2005 it was 28 percent, according to the National Center for Education Statistics), all we have to do is look at the most recent unemployment numbers to understand the impact of a college degree on one’s economic well-being. In August 2009, the national unemployment rate was 9.7 percent for high school graduates, 8.2 percent for people with some college credit or an associate’s degree, and 4.7 percent for people with a bachelor’s degree or higher. Bad news for high school dropouts: That unemployment rate was 15.6 percent. (Source: US Bureau of Labor Statistics.)

In response to this crisis, Obama has launched the American Graduation Initiative, a 10-year, $12 billion investment to help reclaim our country’s leadership position in college graduation rates.

Technology can and will play a major role in this effort. Preliminary information indicates that the focus of Obama’s initiative will be on community colleges—but the approaches can benefit four-year institutions also. For example, the administration wants to set up data systems to track students’ education progress, completion, and then career success. Statewide data systems are being created to track students through K-12, and continuing that effort into higher ed and the workplace could prove invaluable. Modernizing facilities so that students and faculty have access to each other as well as information any time anywhere also makes great sense. Investing in more and better online content, courses, and programs can help meet the various learning needs of a growing diverse population. All these efforts need technology; trained faculty to use it well; and a solid, supported IT infrastructure.

To shine more light on technology’s role in college completion, CT is offering The College Graduation Summit: Innovative Technologies and Strategies, a virtual event on Oct. 29, presented with support from CDW-G and its partners. (Register at www.campustechnology.com/gradsummit.) And don’t miss our December issue, which will focus on community colleges and key topics from the American Graduation Initiative.

Keeping students engaged, enrolled, and prepared for their futures makes fiscal sense not only for every student and every higher education institution, but also for the success of our nation as it redefines itself in the global 21st century economy. CT—Geoff Fletcher, Editorial Director

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UPCOMING EVENTS

October

OCT 15 - 19
Consortium of College and University Media Centers

CCUMC 2009 Annual Conference
Get Connected!
(www.ccumc.org/node/2358)
Greensboro, NC

OCT 19 - 21
College and University Professional Association for Human Resources

CUPA-HR National Conference and Expo 2009
Where Now Meets Next
(www.cupahr.org/conference2009/index.asp)
Las Vegas, NV

OCT 25 - 28
Association for Information Communications Technology Professionals in Higher Education

ACUTA 2009 Fall Seminar
(www.acuta.org)
Portland, OR

OCT 26 - 30
Association for the Advancement of Computing in Education

E-Learn 2009
(www.aae.org/conf/elearn)
Vancouver, BC

November

NOV 1 - 6
The Data Warehousing Institute

TDWI World Conference—Fall 2009
(www.tdwi.org/education/conferences/index.aspx)
Orlando, FL

NOV 3 - 6
Educause

Educause 2009 Annual Conference
(www.educause.edu/conferences_events/caos/2009/index.html)
Denver, CO

NOV 6 - 11
American Society for Information Science and Technology

2009 ASIS&T Annual Meeting
(www.asis.org/conferences/am09)
Vancouver, BC

NOV 7 - 10
Council of Independent Colleges

2009 Institute for Chief Academic Officers
(www.cic.edu/conferences_events/caos/2009/index.html)
Santa Fe, NM

NOV 8 - 11
National Association of College Auxiliary Services

2009 NACAS Annual Conference
(www.nacas.org)
Honolulu, HI

NOV 8 - 11
American Association of Collegiate Registrars and Admissions Officers

AACRAO 19th Annual Strategic Enrollment Management Conference
(www.aacrao.org/sem19)
Dallas, TX

NOV 17 - 18
Kuali Foundation

Kuali Days VIII
(www.kuali.org/kd)
San Antonio, TX

December

DEC 11 - 18
The SANS Institute

SANS Cyber Defense Initiative
(www.sans.org/cyber-defense-initiative-2009)
Washington, DC

January 2010

JAN 4 - 7
Council of Independent Colleges

2010 Presidents Institute
Securing a Better Future: Strategic Directions for Campus and Country
(www.cic.edu/conferences_events/presidents/2010/index.html)
Marco Island, FL

JAN 10 - 18
The SANS Institute

SANS Security East 2010
(www.sans.org/security-east-2010)
New Orleans, LA

JAN 15 - 19
American Library Association

2010 Midwinter Meeting
(www.ala.org/midwinter)
Boston, MA

JAN 19 - 21
Educause Learning Initiative

ELI 2010 Annual Meeting
(www.educause.edu/eli10)
Austin, TX

JAN 20 - 23
Association of American Colleges and Universities

2010 AAC&U Annual Meeting
(www.aacu.org/meetings/annualmeeting/index.cfm)
Washington, DC

>> For more events, go to:
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As technology proliferates and universities tighten their budgets, a number of schools are looking beyond the traditional “purchase and install” software options and tapping the trend known as on-demand, software as a service (SaaS), hosted, or cloud computing.

IT on Demand: The Pros and Cons of Cloud Computing in Higher Education

Wayne State Teaches Students How to Stay Safe in Campus Shootings

In its efforts to bolster campus safety, Wayne State University (MI) is launching an online training program to teach students, faculty, and staff how to stay safe in an active shooter situation. Among the instructions: what to do if the student hears a gunshot in the building; what to do if a shooter comes into the classroom; and more.

www.campustechnology.com/features

Why Delivering Refunds Electronically Makes Sense!

A panel of higher ed administrators discuss how electronic refund distribution is helping their schools improve service to a growing population of students—without busting campus budgets.

Discover Hassle-Free, Safe, and Secure Campus Computing

Learn how The University of Georgia maintains data security and regulatory compliance system-wide. Experts reveal ways to minimize the risk of laptop loss and theft; determine if information was accessed after a theft; keep computers up-to-date with the latest patches; and more.

Comprehensive Identity and Access Management at the University of Wisconsin

Technologists from UW address the business drivers, technical decisions, project milestones, and other processes behind their identity and access management implementation.

Fostering Classroom Interaction, Minus the Clickers

“Where on this weather map do you expect it’s going to rain today?” Dr. Perry Samson asks the 200 students in his introductory class on extreme weather. Almost instantly, dots begin to appear on the displayed map, as students indicate their answers via their wireless laptops. In moments, a clear pattern emerges on the classroom display as Samson continues the lecture.

Samson, a professor at the University of Michigan, has created an open source software tool that builds on the idea of classroom response devices, allowing students to use their laptop computers, rather than clickers, to answer a wide range and type of poll questions. Read more at www.campustechnology.com/articles/2009/08/19/fostering-classroom-interaction-minus-the-clickers.aspx.

In Box

“Chief Integration Officer,” I still see a lot of institutions struggling to strategize, align, and coordinate their IT efforts.”

—Tom Warger, location withheld

Read this and other reader comments at www.campus technology.com/articles/2009/08/26/have-we-reached-an-it-dead-end.aspx

Caribbean Schools Face Hurricane Season With Notifications in Place

Cogswell Polytechnical College (CA) Sets up Programs for Chinese Students

Bentley U (MA) to Manage Group Study Rooms With PeopleCube and Steelcase Apps

IBM: No Such Thing as a Safe Browsing Environment

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Information Overload: Ohio U Tackles Student Data With Massive SIS Project

When Brice Bible was hired as Ohio University’s new chief information officer two years ago, the institution’s student information system had recently suffered a security breach. Replacing the outdated, proprietary system quickly moved to the top of his to-do list. Read more at www.campustechnology.com/articles/2009/08/06/information-overload-ohio-u-tackles-student-data-with-massive-sis-project.aspx.

NEED TO KNOW

Fostering Classroom Interaction, Minus the Clickers

“The Right Data for ePortfolios

Are ePortfolios being used properly? If they are merely duplicating traditional grading assignments, then the answer probably is: They are not.

Have We Reached an IT Dead End?

Will we always have CIOs or VPs of IT? Or were these titles just an anomaly while technology seemed new and confusing?

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WANT TO KNOW

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Top Stories

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NEWS

SELF-SERVICE SAVES TIME. With about 12,500 students, Columbia College Chicago schedules more than 1,000 student appointments a week across campus. To streamline the process, the school has deployed TimeTrade’s Enterprise Scheduling Application campuswide, enabling students to self-schedule time with advisers and staff across Admissions, Student Financial Services, the Advising Center, the Portfolio Center, the Learning Center, and more. According to administrators, the new web-based system is saving each department an average of six hours per week; students are spending 66 percent less time scheduling meetings, and no-shows have been eliminated.

GUIDING ADULTS TO ONLINE EDUCATION. The President’s Forum, a consortium of traditional and non-traditional adult-serving colleges and universities focused on online education, has launched an initiative called Transparency by Design, aimed at helping adult learners find online education institutions that support their professional and personal goals. Via the new website www.collegechoicesforadults.org, the initiative provides information on program-level learning outcomes, how outcomes are being measured, and how students have performed on those measures. Still in development are modules that will provide student satisfaction data, progress rates, and other stats on each member institution participating in the initiative. American Inter-Continental University Online is a charter member of the site.

TEXTBOOK RENTAL PARTNERSHIP. McGraw-Hill Education and online textbook rental company Chegg.com have announced the launch of a pilot shared-revenue program in which McGraw-Hill will provide new print textbooks directly to Chegg for its online rental business. Both companies will receive revenue for each rental through the life of each textbook, and students will benefit from the expanded supply of textbooks available from Chegg’s rental service. The pilot program will be used to determine the economics of renting textbooks in a live-market test.

ROOM SCHEDULING AND ACCESS. Bringing together technology from three different vendors, The University of Tennessee-Knoxville has created an integrated room reservation and building access solution for its James A. Haslam II Business Building. A network of 42 kiosks at the entrance of classrooms, conference rooms, and team room suites throughout the building allows students and faculty to view room schedules at a glance, reserve rooms, see the latest college and university news, and gain scheduled access to rooms—all with the swipe of a university ID card. NetSimplicity’s Meeting Room Manager web scheduling engine handles the building’s room scheduling, and the Cardax door access system from Gallagher Security Management Systems controls building access. Janitor Joe from Coactive Systems acts as middleware to integrate the Cardax and Meeting Room Manager databases and manage communications between the two systems.

NEW LMS FOR SJSU. San Jose State University (CA) has selected the Desire2Learn enterprise eLearning solution for campuswide implementation. The school is looking to increase adoption of its eLearning initiatives while maximizing financial resources, reports William Maguire, VP of IT and CIO. Read more at www.campus technology.com/articles/2009/08/19/san-jose-state-recommends-desire2learn-to-faculty.aspx.

OPEN SOURCE RESOURCE. Edu1world.org, an online professional networking site for higher education technology professionals and practitioners, has launched an open source community to connect successful open source users on campuses worldwide with colleagues looking for guidance on a wide variety of products and providers. The vendor-neutral community is free for employees of higher ed institutions; vendors and consultants may also join for a monthly fee. CT

PEOPLE

PRESIDENTIAL MOVES. Northwestern University (IL) President Henry Bienen has retired, and will now serve as vice chairman of the Rasmussen College (online) Board of Directors. Morton Schapiro has taken the helm as Northwestern’s president, coming from a nine-year stint as president of Williams College (MA).
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To learn more, visit www.smarttech.com/podiumwide1.
IN THE MID 1980s, a faculty member at the Duke University School of Nursing (NC) installed the school's very first computer. The school had just one audiovisual support technician—mainly to ensure that slide and overhead projectors worked properly.

Today, the top-5 private school of nursing offers sophisticated multimedia presentation and lecture recording technology in every classroom; distance-based instruction; simulation laboratories that let students practice on robotic patients; and a virtual School of Nursing in the Second Life online world.

How did the school make that technological leap forward? Key to the process was developing an IT support infrastructure to help faculty, staff, and students use technology tools effectively. The school created the Center for Information Technology and Distance Learning, or CITDL, to provide leadership, support, and development to integrate and promote the use of instructional and computer technology for the School of Nursing community. CITDL operates as the school's internal technical support group, separate from the university’s Office of Information Technology.

Here, Duke School of Nursing shares its strategies for creating a successful IT support team.

1) Recognize that it all starts at the top. Top administrators must understand that IT is essential, and that high-quality IT will pay for itself. Leadership must then make IT a priority. Duke School of Nursing Dean Catherine Gilliss does: “I believe that in order to continually expand the level of quality within our academic and research programs, we must invest substantially in technology, including, for example, computer equipment, software, infrastructure, and IT staff,” she explains. “Continual refinement of our IT processes is one of our ongoing priorities.” The school has cultivated strong relationships with the CIOs of Duke University and its health system, and is involved in campuswide IT initiatives.

2) Set strategic priorities. With the reality of limited resources, IT leaders need to ruthlessly tailor the infrastructure and support priorities to the unique needs of the school. Some 35 percent of Duke nursing courses are taught online, and most are web-enhanced. So the school realized that a recording studio and staff trained in lecture capture and production were early priorities, alongside course management software. “It takes both the content and the technology working together well to deliver a premium product to our students,” says Jeffery Dowell, the School of Nursing’s director of IT support services and infrastructure.

3) Be worth the money. “Investment” is the correct word to use when asking for IT resources, and it’s also the right word to keep in mind while using them.
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After CITDL proved a good steward of early school funding, the center has grown into a staff of eight full-time equivalents handling about five percent of the annual Duke School of Nursing operating budget. It takes significant funding to build a team, and it’s OK to build that over time.

4) Recruit ‘well-rounded squares.’ Tech know-how is only the beginning of an ideal IT staffer’s skill set, says Dowell. “An all-star team needs to hire and cultivate customer service skills and dedication to customers, a curiosity that fuels innovation, strong team cohesion, and most of all, extreme flexibility.” Over time it is important to cross-train IT staff—especially in smaller IT shops—so that the team can meet the wide variety of customer needs.

5) Get off to the right start. Once an initial investment has been won, it’s important to shine. But because a school’s needs are broad and complex, the IT team must start by meeting only the biggest needs, protecting against the greatest risks, and then outsourcing or cutting the non-essentials, Dowell advises. A top priority must be “high-impact customer personalization centered around careful communication.”

6) Lock it down, or you’ll be sorry. An IT support team’s top job is to secure networks and data. Duke uses hardware redundancy, off-site data storage services, and robust IT management tools such as McAfee VirusScan ePolicy Orchestrator and Microsoft System Center Configuration Manager. But, cautions Dowell, “There’s more to security than technology. You have to educate users continually and create a smooth and practical interface between users and proper procedures. Then make sure they are doing the right thing through audits.” One of CITDL’s most popular user-education materials is the quarterly Security Watchdog, which features an IT staff member’s dog and son (dressed up as a police officer) on the cover and reminds users of important security steps.

7) Remember: silo foolish, partnership wise. As much as possible, make use of and integrate with enterprise systems on campus. This affiliation reduces upfront cost, promotes campuswide collaboration, and builds synergies with IT colleagues. “Go ahead and cold-call someone on campus who is using technology you are interested in potentially leveraging,” advises Jackie Gottlieb, the nursing school’s director of web and technology solutions. “Meet with that person to learn about his or her system and how he or she supports it.” Also, solicit and hire the services of internal university web development and hosting operations, if those resources are available. These internal vendors often can provide a bridge of support to other campus resources. Check with colleagues on internal vendors’ effectiveness, and with new centers, and highlighted which features would be most important.

8) Translate into your customers’ language. Customers’ perceptions are their reality. Hire and train IT staff to speak about technology tools in customers’ terms. Learn the priorities and the language of customers’ work, and then show users how to apply the features of technology tools to their most significant needs.

9) Get better on purpose. Duke uses a continuous quality improvement (QI) program that relies on surveys, forums, and “grapevine chatter” to monitor user satisfaction. It’s important to focus improvement efforts on new needs and opportunities, as well as use them to detect problems. The QI results showed CITDL a need for new lecture recording capabilities.

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10) Live on the edge (just a little). While it’s advisable to rely on proven technologies and tools, you mustn’t let your tool set get rusty because you’re afraid to fail. “Taking some measured risks is necessary to offer the most useful technology,” Dowell says, noting that adopting the Lectopia lecture capture software early was such a calculated risk for Duke.

11) Look to the future. Invest in emerging areas where you can meet an identified need, such as enhancing teaching or improving a business process. There’s some trial and error here, so choose options that allow for migration and flexibility. For example: To help address current challenges in nursing such as a shortage of nurses and lack of space for clinical instruction, Duke School of Nursing is looking for tools to help train more students faster, and virtual simulation tools to enable the broadening of clinical experiences.

12) Reward your quiet warriors. The faculty and leadership of your school may get the headlines and awards for research discoveries, academic successes, and other wins, but they could never have accomplished those things without the support of your IT team or a secure server to manage their e-mails and data. Publicly acknowledge and reward the team’s contributions to your school’s success. Invest in their training. Offer your techies job satisfaction, and you won’t have to worry about losing them to some IT startup. “If I was given a job offer to make $10,000 more a year somewhere else, I wouldn’t take it,” says John Carbbuccia, network administrator of CITDL. “I just have too much fun at work.”

David S. Bowersox, MBA, is associate dean, finance and administration, at the Duke University School of Nursing.
INFORMATION AND COMMUNICATION technologies have helped bring on an evolution (dare we say revolution?) in the instructional design process by providing tools to create open, authentic, and learner-customized experiences. This means that new challenges are facing technology leaders in how they ensure their IT infrastructure supports this emerging “organic” paradigm for eLearning courses.

The assumptions that have guided traditional course design in the past—analyze, design, develop, implement, and evaluate, known as the ADDIE process—need to be updated. Learners today are more hands-on and engaged; content for personalized learning is now much more accessible; a wealth of resources and communication tools are now literally at everyone’s fingertips (check out the Top 100 Tools for eLearning at www.c4lpt.co.uk/recommended). Linear learning experiences won’t satisfy these learners, nor will they leverage the powers of new technologies available to higher education.

An organic design process acknowledges the sea change that has occurred in learners and their tools, and allows us to create and support learning experiences that make the most of the serendipitous intersection of immersive learners, faculty open to experimentation, the challenges of learning outcomes, and the characteristics of the technologies available.

What are the hallmarks of organic courses that you should be aware of as you build the infrastructure and choose the tools to support your online programs? Some of the characteristics are: flexible course structures; open and authentic content within expansive content repositories; learner-generated content; and customized and personalized learning experiences. The chart below summarizes the most important differences between a classic and organic instructional design approach and some of the eLearning strategies and tools that enable organic learning experiences. You may find it useful to refer to this chart as you build your eLearning programs to empower your faculty and students to go organic. CT

Judith V. Boettcher is an independent consultant specializing in online and distance learning and the pedagogical applications of new media.

<table>
<thead>
<tr>
<th>CLASSIC AND ORGANIC COURSE DESIGNS WITH eLEARNING STRATEGIES AND TOOLS</th>
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<tbody>
<tr>
<td>Course Structure</td>
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<tr>
<td>Well-defined, but fairly rigid with little planned variability for learners</td>
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<tr>
<td>Core concepts with a set of defined content resources; may have some authentic and interactive content</td>
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<tr>
<td>Designed for anticipated set of learners using planned resources</td>
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<tr>
<td>Defined set of tools and technologies for specific course community</td>
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EVEN THOUGH THE HYPE around up-and-coming wireless technologies can sometimes overshadow the reality, it’s good to keep an ear to the ground because at least some of what providers promise is going to happen one way or the other. Right now, higher ed IT specialists should be paying attention to two emerging wireless trends: 1) 4G (fourth generation) cellular and 2) roaming between WiFi and cell services. (By the way, if you were hoping to hear more about 802.11n WiFi, that’s now considered established rather than an emerging trend.)

4G: LTE and WiMAX Duke It Out

The fight between next-generation cellular technologies LTE (Long Term Evolution) and WiMAX (Worldwide Interoperability for Microwave Access) continues. More carriers worldwide have announced they will use LTE, but WiMAX has been quicker to market and already has operational networks in a few cities in the US. However, in the high-stakes market of cellular technology it’s not necessarily a case of winner takes all. During the upgrades to the current generation of cellular, for example, we saw GSM take over Europe, while CDMA EVDO predominated in the US. Since Intel is the primary backer of WiMAX, laptops will start to come with that technology built in alongside WiFi. On the other hand, it’s also likely that inexpensive LTE USB plug-in modems will become readily available.

The timing of the widespread availability of the wireless signals is considerably clearer now than just a few months ago. LTE is being championed by Verizon Wireless, which has announced it will roll out LTE in 20-30 US cities/market areas in 2010 and complete its nationwide upgrade program by early 2014. WiMAX is being backed by Clearwire, which already offers the service in Atlanta, Baltimore, Las Vegas, and Portland, OR. The company plans to launch more WiMAX service later in 2009 in Charlotte, NC; Chicago; Dallas/Ft. Worth; Honolulu; Philadelphia; and Seattle. Meanwhile Boston, Houston, San Francisco, and Washington, DC, are in line for a 2010 startup.

Once rolled out, both LTE and WiMAX will provide significantly greater bandwidth than is now available. However, just how much more is one of those hyped-up topics, so we’ll steer clear of spreading the figures that are being bandied about. If you’re curious, you can check out the claims by heavyweights in the competing factions, Clearwire (spun off by Sprint; www.clearwire.com) and Verizon.
After a lifetime of first-hand experience reporting news from the field, Larry Engel, associate professor of communications at American University (DC), was convinced that reliable and lightweight technology was critical to the experience.

It’s no wonder, then, that Engel was at the forefront of a recent effort to standardize the institution’s School of Communication on a series of new tools from Sony (www.sony.com/education).

The new tools, a grand total of 12 handheld PMW-EX1 and PMW-EX3 HD cameras, are smaller than traditional cameras but a vast improvement over the old way of doing things. American officials made the purchase as part of an overarching effort to modernize the studios, where students learn the basics of television and film production in classes such as “Advanced Documentary” and “Narrative Production.”

“These new cameras are tapeless, there are much fewer moving parts and they draw less energy from the batteries,” says Engel, who doubles as the associate director of the school’s Center for Environmental Filmmaking. “I look to this as the kind of equipment that can expedite convergence and reduce replacement costs over time.”

The first batch of cameras—nine EX1s—arrived last summer, and were put into use immediately through a series of institution-funded field trips. Through a Center for Environmental Filmmaking program called “Classroom in the Wild,” Engel took 12 students to Alaska, where they put together a documentary about survivability training. In the spring, a second “Classroom in the Wild” adventure landed different students in the Galapagos Islands, where they used the cameras to put together narrative work. One group chose to produce a short film on the issue of shark-finning. Another group made a documentary on how outside pressures impact animal behavior. A third group highlighted species encroachment.

“In both cases, the cameras made capturing information easier than it would have been on larger and heavier cameras we’ve used in the past,” Engel explains. “Beside: what we got was in HD.”

Prof. Bill Gentile even took two of the cameras with him to Afghanistan on assignment for PBS titled “Afghanistan: The Forgotten War.” The cameras performed masterfully; Gentile’s piece is up for a national Emmy this year.

Nowadays, the EX1s are used mainly in the production studio, resting on tripods so they are not damaged. The cameras also recently were complemented by three EX3s, which will be used as replacements for old and dying standard-definition studio cameras that American has had since the 1980s.

Financing this technology certainly wasn’t easy. The school opted to pay out of pocket, purchasing the equipment outright instead of leasing it. Another challenge: resistance. Engel says that while students liked the new cameras instantly, a number of faculty members were skeptical to make jump into a new format (HD) and new cameras at a time when budget concerns ran rampant.

“Once they experienced the images and the technology up close, they were much more comfortable and we felt it was the right way to go,” Engel notes.

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Wireless (www.verizonwireless.com).

Whichever 4G technology comes to your region, there will be implications for your campus. As the carriers install these network upgrades, your users will see better performance when using handheld devices (including smart phones and netbooks) to access internet resources as well as proprietary services provided by the cell operators. The first effect we can anticipate is that because users “have” the technology on their devices, they will expect access to 4G wireless everywhere, regardless of whether their particular carrier has completed its upgrade in your area. And since your team is the go-to resource for all technology on campus (wry smile) this may require some research on your part to find out which carriers have and haven’t upgraded devices to have two distinct radios, one for each set of frequencies. Manufacturers have found it fairly complex to develop a handheld device that can support two radios and have enough battery power to run for as long as users would expect.

Along the way some WiFi vendors and some smart phone manufacturers have created their own (i.e., proprietary) mechanisms to better support mobility and roaming, but that’s meant that some combinations don’t work well together. However, two quite recent IEEE standards—802.11r-2008 Fast Basic Service Set Transition and 802.21 Media Independent Handover Services (both published in 2008)—should alleviate the handoff issue for both types of roaming. 802.11r takes care of voice over IP on the WiFi side and

If users could hop from 4G to WiFi and back as they move around the campus, there would be no need to have 4G signals within buildings. And that, as luck would have it, is the way things are headed.

and keep your constituents informed. (It may be futile to ask those carriers that haven’t upgraded when they plan to do so, as most times the local personnel don’t know and the national personnel won’t say.)

Another consideration is the use of 4G devices inside campus buildings. You might worry that higher ed institutions would need to install distributed antenna systems inside all or most buildings, which would be very costly. However, if users could “hop” from 4G to WiFi and back as they move around the campus, there would be no need to directly support 4G signals/frequencies within buildings. And that, as luck would have it, is the way things are headed.

Wireless Mobility and Roaming

Right now on campuses, the state of “hopping” among wireless networks involves one of two possible scenarios: The first is use when moving between adjacent WiFi access points (within a building, for example) and the other is the ability to maintain a connection when moving between a cellular and a WiFi network. Perhaps the latter would be more accurately termed “interoperability” as it refers to the seamless use of two dissimilar types of networks.

Both types of roaming involve “handoffs” that have associated hurdles to clear. In the case of WiFi point to WiFi point, it wasn’t initially designed to handle truly mobile use (that is, use while moving, as differentiated from “portable” use, which can be defined as using a wirelessly connected device in one location, stopping use, moving to a new location, then reinitiating connection). In the case of moving among cell and WiFi networks, that currently requires 802.21 deals with all types of mobile handoffs. Of course manufacturers will have to develop products that comply with these standards, and that’s still an evolving story.

What’s in it for you is that when these (hopefully) seamless handoffs come to fruition, higher ed institutions with widespread WiFi coverage can anticipate lower cellular bills when employees and students with campus-provided (or reimbursed) wireless devices can connect via your local WiFi rather than the cellular network.

Another upside could be that student-employee use of the carriers’ networks for web/net access could actually lower the demand on your internal network infrastructure.

Of course, if your institution currently doesn’t have that widespread campus WiFi, you may want to take steps now to get to that state. But first be sure to ask your preferred WiFi vendor about its support of the new standards. If you can purchase current products that will be upgradeable, then consider going forward now. However, if moving to products that support the standards will involve significant hardware changes, you may want to conduct a cost/benefit analysis to determine whether this effort is worthwhile now or whether it would be better to budget for it sometime down the road.

Whatever your current situation, it will pay to keep a weather eye on wireless mobility and roaming in your locale. Let’s keep those highly mobile users happy!

Wendy Chretien is a senior network systems consultant and project manager at Elert & Associates, an independent technology consulting firm.
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IT LEADERSHIP ROUNDTABLE

How do you lead IT through the turbulent waters of economic crisis? Take your cues from five stalwart CIOs. By Matt Villano

steady as she goes

WITH COLLEGES AND UNIVERSITIES struggling to minimize the effects of the troubled economy, it certainly isn’t an easy time to be a CIO. Recently, CT sat down with a panel of higher education IT leaders to pick their brains about best practices for steering IT through economic crisis. Panelists included Jan Biros, associate VP for instructional technology support and campus outreach at Drexel University (PA); Wayne Brown, VP for information technology at Excelsior College (NY); Kamran Khan, vice provost for IT at Rice University (TX); Rick Peterson, chief technology officer at Washington and Lee University (VA); and Adrian Sannier, VP and university technology officer at Arizona State University. Here’s an edited transcript of the conversation.

CT: How, specifically, have your IT budgets been affected by the recent economic downturn?

Jan Biros: The instructions at our university are that all budgets will be at current service levels, so we don’t expect any increases at all in anything, and that goes for IT as well.

Wayne Brown: We’ve frozen all hiring, and when anybody leaves, that position has to be evaluated by the cabinet to decide whether to replace that person or not. All other spending receives a high level of scrutiny; in some cases, we’ve even given money back.

Kamran Khan: So far this year, on non-salaried portions of the budget we gave back 1 percent. And [as of] July 1, I [had to] cut my budget by 5 percent. We also depend on our endowment here at Rice, so that has an impact, too.

Rick Peterson: At Washington and Lee, the way our budget works is that we are allocated a capital-side budget and an operating-side budget. On the capital-side budget we’ve taken a large hit in replacing desktop computers and printers, and we’re cutting our usual expenditures in classroom technology upgrades. On the operating side, it hasn’t been so bad: We had to cut 12 percent in travel and a little bit in postage. We don’t have any imprimatur from the administration, just to watch closely and don’t spend anything stupidly.
Adrian Sannier: At Arizona State we’re feeling things a little more keenly than some of the others. In addition to freezes, we have a university-wide furlough that applies to IT. On top of that we’ve cut at least $2 million off our $67 million budget and may have to give another $1 million back. And as we look toward next year, the scenario could be even bleaker.

CT: When it’s time to make cuts, how do you decide what goes first?

Brown: It’s all about prioritizing. Those things that aren’t attached to a project are the first to go. Professional development, conferences—those come off the list pretty quickly.

Peterson: We developed a five-year strategic IT plan and have an associated five-year budget. So the first thing we do is look toward items in the strategic plan that match up with funding that may be available. We’ve had some deferred maintenance, too.

CT: To what extent have these cuts made your job more difficult?

Sannier: Certainly they put a much greater strain on the management of the staff as a whole. The planning effort also becomes much more intense. On top of that, at least at ASU, a comprehensive furlough has put an additional load on us.

Peterson: We definitely have to devote more time to making sure we’re making strong and strategic decisions about where we’re investing our limited time and resources. If we look at virtual applications are layered on one another. The level of expertise that you need within staff becomes greater and more diverse. And it’s expensive. That’s where the real challenge is.

Brown: Those projects that are going to require new software, new hardware; you’ve just got to make smart decisions about what you’re going to buy.

Khan: You just have to shift all of the planning you have in place. For example, we’ve been planning for replacement plans for a while. Now, we really have to look at those and maybe rethink them to some extent.

CT: In which areas would you say it’s hardest to provide technology with some of these fewer resources?

Biros: When you look at the kinds of infrastructure that universities have gotten used to, things like storage and file servers become increasingly difficult. Security also is an issue. There’s more fragility in the system as applications are layered on one another. The level of expertise that you need within staff becomes greater and more diverse. And it’s expensive. That’s where the real challenge is.

Khan: We’re looking at user support areas across campus and reorganizing some of that. We’re also looking to make the help desk more automated. The toughest piece is going to be making sure that the service level overall for our faculty, students, and staff is not impacted too widely.

Peterson: Last year we opened a shared services desk in the library, so we were able to try to help with some of the support areas by merging what used to be three or four separate physical areas of support into one common area. And so we have tried to be innovative, because we are finding it hard to continue to meet support demands in the old structure.

CT: Describe the current hiring situation. How has the economic crisis impacted staffing?

Khan: We had a hiring freeze for about a month and a half. That’s been lifted, and now we have two or three positions open. To be honest, we’re really not getting a lot of applications. I don’t know if that’s good or bad.

Biros: We haven’t been prohibited from hiring at all, but all positions have to be approved, so they’re being scrutinized carefully. We actually have a couple of positions that were added to support videoconferencing efforts, so those will be filled.

CT: What are the best ways to stretch dollars further in this economy?

Sannier: Several years ago, we began a process of trying to move as many things to strategic partners as we could—things like the help desk and hosting tasks. In this time period, we’ve been able to renegotiate several of those relationships in ways that have been very advantageous to the university, in terms of increasing service and decreasing cost. For example, we’ve been able to get 30 percent reduction in our hosting costs going forward, without a reduction in service. The other
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thing that we’ve been able to do is call on our strategic partners to do more for the same money.

Peterson: We’re looking at trying to push as much service as we can away from our central IT group out into a vendor or cloud space. Specifically, we moved away from a course management system hosted on campus to an off-campus, hosted, open source course management system. That’s worked out great. We’re migrating all of the students away from a locally hosted e-mail platform to a vendor-hosted solution out in the cloud. And we’ve also contributed to the mission. We’ve actually had pretty good luck doing that.

Biros: We’ve tried to get involved with consortia for software licensing and purchasing. We’ve tried to outsource services. We’ve also gotten out of the business of providing dorm telephone services, as a lot of schools have. Another thing we’ve done that has brought us economies of scale: We’ve entered into relationships with five smaller colleges to provide some level of IT support on a contractual basis. In one case we provide all of their ERP and learning management systems—their whole staff is Drexel staff. This relationship is more economical for them and has given us a revenue stream. We’ve entered into relationships with five smaller colleges to provide some level of IT support on a contractual basis. In one case we provide all of their ERP and

For us, it’s a big part of the strategy to move services into the cloud.

Sannier: Us, too. Google allowed us to turn off our student e-mail server. That was a $500,000 annual savings right off the bat. We also are beginning to see a lot of uptake of the Google Docs environment—not only by students but by faculty and staff, too. The latest stuff that’s come out has given us point-to-point video inside our domain, as well.

Brown: Our instructional designers are using an outsourced version of Moodle, been looking at partnering with other schools through initiatives. Project Bamboo is one of them. It’s an initiative to provide digital technology support in service of arts and human scholarship.

Khan: We’re renegotiating. We’ve done it with our ISPs and saved dollars there. We also have some initiatives for getting people to do double-sided printing and document imaging. The energy piece is a big part of the initiative here on our campus. We’re turning off a lot of our old servers—we just turned off a 288-node cluster a couple of weeks ago. And we are moving all of the servers off our campus into our data center.

Brown: I’ve only been here [a short time], but one of the first things I did was invite the top 10 vendors in to meet with me and [we] reviewed all contracts with our foundation vice president. We sat down with these vendors, explained our mission to them, and asked them to come up with ways they can help contribute to the mission. We’ve actually had pretty good luck doing that.

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CT: Speaking of sandboxes, how do you innovate in the current climate?

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CT: Speaking of sandboxes, how do you innovate in the current climate?

Biros: Necessity sometimes is the originator of invention and innovation. And

The place I came from, Johnson County Community College [KS], had very good experience with virtualization: We were able to provide energy-savings numbers that were just fantastic. I think that makes a lot of sense for everyone. —Wayne Brown, Excelsior College
because we have to be economical, we all come up with more creative ways of offering a service. The relationship I described with our partner schools is very innovative and has a lot of potential. Just looking at leveraging the skills, talent, and technology you have spawns innovation.

Brown: Because I just got to Excelsior, there hasn’t been a lot of innovation yet. But for the next fiscal year we have planned to set up an avenue for people to apply for grants. We have to do it even with the current climate; we just can’t be stagnant.

Khan: We are starting to do more eProcurement because we hadn’t done it in the past. The bottom line for us is to get a lot of important feedback from our community, see what they’re thinking, and determine how that will impact us.

Peterson: We’ve made it a point to go out and talk with representatives from every department at Washington and Lee about their needs. We certainly don’t want to develop a slick, innovative solution if no one will use it. So we’re letting the needs of the community drive our exploration. A good example is how we moved everybody off of GroupWise from Novell and onto Outlook and Exchange. We’ll move all of the students to Live@EDU this summer. I think from everything we’ve experienced so far, students, faculty, and staff are happier with that solution.

Sannier: I believe that this economy is going to be an accelerator for one-to-one computing. For a long time universities have provided common computers in labs and various other places. And I think a lot of different times we’ve expected that students would switch over to their own devices, and for a variety of different reasons that hasn’t happened. There’s kind of a perfect storm happening right now in that students are still bringing computers to school, and the computers they’re bringing are newer than the [computer lab machines] we’re not replacing. Coupled with services we provide out of the cloud, we should have all of the elements necessary to make that transition [to one-to-one computing].

Biros: At Drexel, we took a few steps in that direction a couple of years ago when we decided not to replace the computers in the public-access area of our computing center. We went to something called a “Bring Your Own Laptop” lab. We had five machines in there for people who didn’t have machines, we provided connectivity and power, and that was it. So far, that model has worked very well.

CT: To what extent are IT budgets likely to be cut further, and what are you doing to prepare for these cuts?

Biros: I’m not sure to what extent we’ll see cuts in the budget, but I don’t think we’re going to see growth by any means. To prepare for this, we’re trying to consolidate some computing through a research co-location site. I think that’s going to be a big savings and free up space.

Brown: From an IT perspective, [we’re] trying to have a plan that is defendable, has gone through the IT governance structure, and is supported by more than just the IT guy. We also have to understand that we may have to do things next year like cut travel or cut training.

Khan: We actually are moving some of our money into a fund for next year. We also created an endowment for IT funding. If cost-cutting is one of those things that saves us money, then we want to be smart about the money we save. The bottom line is that none of us knows how long this recession will last.

Sannier: Locking in funding is just not a possibility for anybody in a state system. Clearly, we have to be prepared for whatever economic eventuality comes. That being said, I think there’s plenty of room for optimism in IT. The cost of basic services continues to decline and the capability of those basic services continues to explode. So, for us, it’s absolutely a core-versus-context trade-off. Now it’s just a question of finding out how to make it work best. CT

**Matt Villano** is senior contributing editor of this publication.
Universities are using technology to put undergraduates at the center of content creation. The result: in a word, transformative.

by Matt Villano

ORIGINAL RESEARCH AND CONTENT CREATION in the university environment have historically been the domain of faculty and their graduate students. Nowadays, however, undergraduate programs at universities across the country are putting undergrads in the center of the action.

Some of these programs—at Duke University (NC), Coastal Carolina University (SC), Arkansas State University, and Harvard University (MA)—incorporate interactive technologies to enable undergrads to research local and far-off worlds and create meaningful, original content that furthers the study of their discipline for other students and researchers alike. The content that springs from this research takes the form of high-tech simulations, interactive lesson plans, and history-rich websites for the public.

Overall, the technology behind these programs serves to help these students expand the canon, inspiring a new kind of undergraduate education.
that is immersive, experiential, and contributive at the same time. The new approaches also have transformed the way humanities traditionally are taught.

“Not too long ago, undergraduate humanities education across academia was based solely on textbooks with pretty photos and the lectures about them,” says Bill Barthelmy, senior software architect at Harvard. “With the technologies we have today, to say the times have changed certainly would be an understatement.”

Unearthing the Past
Along with Katie Vale, director of academic technology, Barthelmy runs the Harvard Yard Archaeology Project, an effort to give students a firsthand understanding of what Harvard Yard (the main campus commons of the university) was like in the 17th century, when the area was home to the first-ever Native American college.

Anthro 1130, also called “The Archaeology of Harvard Yard,” is an ongoing course that, over the past several years, has turned Harvard Yard into an archaeological site. In the class, students utilize ground-penetrating radar to determine where in the Yard to dig test pits. Once the pits have been dug, students map each of them with GPS and GIS technology, conduct research about the artifacts they’ve found, and upload all of the pertinent information to a MySQL database.

In particular, the use of the GIS technology has transformed archaeological studies, says Vale.

“Traditionally the way archaeology works is that a dig is scheduled, people uncover things, and over the next year, everyone retreats back to their labs to conduct research and information is slowly analyzed,” she explains. “With this, as soon as something is uncovered, you have a way to enter it into the field notes directly,” making the knowledge-transfer process more efficient.

This past summer, a special pilot program associated with the archaeology class introduced location-aware technology to enable students to “experience” the discovery of the artifacts even if they weren’t part of the original dig. Outfitted with an iPhone or iPod Touch loaded with a special GIS application, students walk around the Yard, and as they pass over places where objects were found in previous digs, the handheld app interfaces with Google Earth and the archaeology database to instantaneously display the artifacts, allowing students to “see” the objects where they were found, along with their associated data.

Taking this interaction one step further, students incorporate findings from both the archaeological and historical record and (with faculty supervision) build a fact-based virtual model in Second Life, which allows them to consider and question what the evidence really tells them about life in 17th century Cambridge—and in some cases, to set the record straight.

Take, for example, the subject of smoking and drinking alcohol. Students building the Second Life model had to incorporate tobacco pipes and a type of bottle that was typically used by early settlers to drink alcohol, both found on the Harvard Indian College campus grounds. An examination of the historical record, however, showed that students at the Indian College were prohibited from drinking and smoking. The incongruence of these findings led students and faculty to explore the idea that the historical record may need to be updated, to suggest that the 17th century “just say no” campaign was not an unqualified success.

Vale cites this as an example of how the technology gives students who are not a part of an original dig a chance to learn more deeply about the archaeological history of the Yard than even the students who actually found the artifacts. “Without the technologies, without the process of going through and literally analyzing all of these facts, our undergraduates never would have been able to experience these discrepancies for themselves,” she says.

It’s not just the students who benefit from this project. As Diana Loren, the associate curator for Harvard’s Peabody Museum of Archaeology and Ethnology, which houses the unearthed artifacts, states, “Certainly students in this class will benefit the most [from their work], but researchers who teach the course, as well as others, will be able to explore and interact with the data in a completely new way.”

The program is not without its challenges. Barthelmy admits that even with student help, he has had to spend a lot of
time developing the Second Life model and iPhone app. Coding is a problem as well—though a handful of students know how to write applications for iPhone and iPod Touch, there is no extracurricular development in these areas.

Still, Barthelmy plans to persevere. Based upon the initial success of the summer handheld pilot, as of press time school officials were expected to fully incorporate the technology into the fall semester’s offering of Anthro 1130.

Beyond that, Barthelmy notes, the university may even make the program open to the public. “Our hope is that people will be able to ‘dig’ a little deeper as time goes on,” he says. “No matter what kind of technology is involved, that’s the goal at the end of the day.”

Discovering Delphi
A collaborative project between Coastal Carolina University and Arkansas State University involves undergraduates in building learning models and interactive lesson plans that cross traditional academic lines and bring together faculty and learners from multiple disciplines.

This project, dubbed Ashes2Art, dates back to 2005. Its original intent was to improve materials available for teaching art and architectural history. The program has moved far beyond its initial objective to merge the pedagogical and research aspects of art history, archaeology, graphic design, web design, 3D animation, and digital photography, to recreate monuments of the ancient past online. Art, graphic design, and art history students from both institutions are enrolled, and the models and lesson plans students create are designed for use in art history, architecture, history, archaeology, and many other studies.

With faculty guidance, students from CCU and ASU conduct focused research on specific monuments, visit the locations in person, shoot high resolution digital panoramas, write essays that summarize scholarly opinions based on published archaeological reports, and document those sources through extended bibliographies. Students also build QuickTime digital panoramas and immersive 3D models of the sites, as well as create and maintain the project website. All of these products are incorporated into student-designed lesson plans that are being actively used by art history and architecture faculty at both universities.

Arne Flaten, associate professor of visual arts at CCU, says that Ashes2Art was inspired by similar graduate and faculty projects at UCLA and other universities, and, “We felt we could get similar results from undergrads if they were given the right tools and proper supervision. We were right.”

The first stage of the project focused on Renaissance Florence. While that initial course did not “reconstruct” lost monuments, it provided a context in which to evaluate various technologies and gauge the potential and efficacy of such a program. More recent research involved the archaeological site at Delphi, Greece, which dates back to the fourth century BCE, where a total of 40 students from both schools traveled during the summer of 2009.

“The course originally was designed to blur the lines between what traditionally have been art studio and graphic design and art history, but we’ve exceeded the expectations of even that,” explains Flaten. “Students are not just learning from what their instructors are telling them; they are learning from engaging with site plans and excavation reports and cognitively taking this information and translating it into three-dimensional imagery.”

The project’s use of various and complex technologies has created its own cross-disciplinary effect at the two universities. Originally students learned the necessary tech skills as part of the course. These technologies include Easypano’s Panoweaver and Tourweaver; Autodesk 3ds Max (formerly 3D Studio Max), Stitcher Unlimited (formerly RealViz Stitcher), and Mudbox; Adobe Photoshop, Dreamweaver, and Flash; Google Earth; interactive mapping tools; and others—a non-trivial list to master.

Since then, program officials have been working with other department heads to set up prerequisite classes in various
TECH-ENABLED LEARNING

other departments so that undergraduates already know how to use programs like Autodesk 3ds Max when they get involved with Ashes2Art. According to Flaten, this commitment to incorporating a variety of subject areas only adds to the expanding canon by breaking down traditional walls between disciplines.

“We’ve got people from computer science and marine science and graphic design and art history—we’re expanding the curriculum by putting people together who might not have necessarily had conversations traditionally,” he says.

He adds that “When you can take your classroom from lecture to lab experience, it changes the traditional methodology of teaching and turns it into more of a heuristic approach.”

While Ashes2Art is still under development, the program hopes to eventually incorporate sites elsewhere in Europe, or colonial plantations and the Gullah people of Sandy Island, SC. Until then, Flaten notes, the biggest challenge of the program is funding. Ashes2Art had been funded by the National Endowment for the Humanities, but that funding has just about run out. What’s more, CCU and ASU were paying to send students abroad, but in the current economy, those expenditures have come under increased scrutiny as well. To resolve these problems, program officials have applied for additional grants.

“We’ll keep this going no matter what,” Flaten says. “Money is important, but to me the bigger issues are content, research, and technology.”

Recreating the Antebellum South

Late 19th century Durham, NC, has long been recognized by historians as a symbol of the New South, dubbed, for example, by Booker T. Washington as a “City of Negro Enterprises.” Undergraduates at Durham-based Duke University are using a mix of primary research and technology to gain—and disseminate—a better understanding of emancipation, industrialization, immigration, and urbanization that lie at the heart of Durham’s special place in history.

The Digital Durham website offers students, teachers, and researchers a range of primary sources with which they can investigate the history of a post-bellum Southern community.
sources with which they can investigate the economic, social, cultural, and political history of a post-bellum Southern community. Most of the sources have been uncovered by undergraduates; all sources have been digitized and entered into a database by the same group.

Taken together, the materials on Digital Durham cover more than 600 topics, including: African-American business enterprise, the emergence of textiles, tobacco production and marketing, child labor, prohibition, evangelical revivalism, 19th century medical practices, women’s experience of childbirth, and public and private education.

“This is arguably the single most comprehensive set of resources about late 19th century Durham that exists today,” says Trudi Abel, the project’s director. “Aside from some faculty advisers, students are behind all of it.”

In particular, Abel says undergraduates have helped her aggregate data from the 1880 census. These data have been available to the public since the 1950s, but have been trapped on microfilm so very few people have bothered to access them. At Duke, students review the microfilm, transcribe the data, put the data into a spreadsheet, and migrate them into an SQL database, which is where they live online. Also online are audio postcards—podcasts of oral histories and other recordings—created by Duke students in an undergraduate research seminar on the history of Durham and the New South.

As part of the project, undergraduates are encouraged to search for primary source material themselves. Common places students look include on-campus libraries, the county courthouse, and public libraries. In some cases, students have uncovered material that nobody discovered previously.

Last year, for example, one student dug up a copy of a 19th century journal called the Journal of Industry, edited by Charles Hunter—a publication that Abel later determined to be one of the few surviving copies of the newspaper.

Today, a digital copy of the journal exists under “Printed Works” on the Digital Durham website and contains the text of a speech by Frederick Douglass given in Raleigh at the time. Abel says the process of finding the paper and digitizing it made the student feel like she was contributing to the body of historical evidence.

“When students are doing their own research, they design it so it’s of intrinsic interest,” notes Abel, a scholar in residence in Duke’s history department. “They’re using the same kinds of raw materials that a historian or scholar would use and they get to experience the joy and the frustration of doing that kind of fresh and original historical work.”

Down the road, Abel hopes to expand the Digital Durham project to incorporate an interactive map that would reveal to visitors the names and occupations of people living in Durham in the 1880s. On the surface, she says, this map will provide visitors with cursory data on the 4,000 people who called the city home way back when. More profoundly, however, if she can get the map to sync up with a map of Durham today, the endeavor could provide a cornucopia of information about Durham as it survived industrialization.

“If you look to see where the [minor league baseball team] Durham Bulls play today, you’d learn that the first grade school for African-American students sat out in left field,” she says. “That’s incredibly important in the history of public education in our town, tying into questions about access to education, segregation, and the progressive movement.”

She concludes: “Being able to see the two [maps] at once would give students the ability to see history in layers. That’s what this entire project is about.”

Matt Villano is senior contributing editor of this publication.
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Three SaaS providers talk about why cloud computing is more secure than you think.

Safety & Service in the SKIES

by Mary Grush

AS COLLEGES AND UNIVERSITIES rely more heavily on software as a service (SaaS), they’re putting more critical data in the cloud. What are the security issues, and how are cloud providers responding? CT went to three higher ed SaaS vendors—Google, IBM, and TopSchool—and asked them to share their thoughts about the state of security in cloud computing. Our panelists for this virtual roundtable discussion were:

Anthony Hill, CTO for SaaS-based student lifecycle management provider TopSchool. Previously he was CIO of Golden Gate University (CA), where he led a major initiative to move the university’s IT services to the cloud.

Jeff Keltner, business development manager at Google, responsible for Google Apps in the education sector worldwide.

Dennis Quan, director of autonomic computing in the IBM Software Group. He launched the IBM/Google Cloud Computing partnership in 2007.
In our experience, security is a secure choice for institutions? Jeff, make that moving services to the cloud compelling argument SaaS vendors can deal with. Dennis Quan: In our experience working with higher education, the more they come to see that cloud [services] are often much more secure than the environment the schools have been providing, or could afford to provide in house. That’s because of the scale and level of investment that a provider like Google has, and the fact that IT security is at the core of what we do. Security is critical for the operation of Google as an enterprise—whereas for most universities it’s something they need to do but it’s certainly not a core aspect of what it means to be a college or university. A cloud provider’s investment clearly outstrips what a school can afford to invest, and by partnering with a provider like Google, schools can actually get a higher level of security for their information than they were able to provide previously.

CT: What kinds of security issues have emerged in cloud computing projects you’ve seen in higher education? Dennis, you’ve been working with the IBM/Google Cloud Initiative—maybe you could use that as an example.

Dennis Quan: In any industry, education included, there’s going to be a spectrum of applications and workloads that you’ll see moving onto the cloud. In our experience working with higher education, a lot of work has been focused on the research or instructional spaces. And in those areas, security concerns tend to take on a very specific flavor—not so much security as in confidentiality, but more in terms of safeguards or in some cases having to do with law enforcement.

I’ll take the IBM/Google research cloud as an example. About two years ago, we put three clouds together—one at the University of Washington, one at an IBM research facility, and one at a Google facility—to support classroom instruction and research uses of cloud computing facilities. The security concerns in such a research or academic setting are certainly not as onerous as they would be, say, for a bank. If you have a cloud that is being used for classroom instruction, you use security not so much as a way to prevent others from seeing your work, but as a way to make sure that there isn’t accidental deletion of data that are being created by other students or researchers. Sometimes it is used to ensure that there is fair distribution of resources across multiple teams. You put policies in place to divide the time up in a logical fashion so that no individual can end up monopolizing the environment.

CT: But surely you all must have seen additional areas of concern that are more on a par with other industries.

Anthony Hill: I don’t think there’s really much difference between the needs of the commercial and education sectors relative to cloud security.

Quan: Of course academic environments hit upon traditional IT challenges, just like any other industry—running payroll, running HR systems, with confidential student records, and so on. Another area is adherence to government policies. As an example, when we were setting up the cloud computing partnership with Google, the issue came up around export compliance. The reason this comes up is that of course the classrooms that are leveraging these cloud facilities have a mixture of students of different nationalities. [Ed note: Sharing certain kinds of data with foreign students or faculty from some countries can be considered a form of export according to Export Administration Regulations and International Traffic in Arms Regulations.] To enable us to trace or keep records to ensure that export compliance laws are being upheld, we need to be able to create accounts for different students, to be able to have ways of monitoring the information that’s kept on the clusters. And in some aspects, it’s been part of that security policy to make the information as public as possible in order to prevent it from being treated as sensitive, confidential data.

CT: How can cloud providers show hard evidence of their security practices—are there standards or groups that can help do this?

Keltner: At Google we’ve tried to find standard ways to be more open about what we do. The one big one we’ve gone through is what’s called the SAS 70 Type II [Statement on Auditing Standards No. 70; www.sas70.com] certification, where we have third parties auditing, with a control document—a confidential document we can show to customers that specifies how we are operating the data centers and what our privacy and security mechanisms are. We are also working toward a FISMA [Federal Information Security Management Act; csrc.nist.gov/sec-cert] certifi-
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cation, which is commonly used by federal government agencies. So we’ve tried to choose the right ways to be open and transparent, but this is still a very new and emerging space. I’m sure we’ll continue to see this space evolve as more and more people get involved and some more standards emerge.

Hill: In IT there are a lot of ways to do things, and I think it’s incumbent upon the end-user organization to be able to interview the cloud vendor, learn what its controls and protections are, and what the infrastructure is, and then make a decision. The end-user organizations also can benefit from compliance regulations. SAS 70 can validate that the cloud provider has met all of the controls. It’s a very good place—perhaps the best place—for the end-user organization to begin. And we can also check references for cloud providers, both with other universities and in the commercial sector. The vendor will provide references, and it’s always a good idea just to ask around. And organizations that have been in the market longer will sometimes have user groups.

CT: Do you have any examples of good security measures that may be more easily achieved in the cloud, or that may even be unique to cloud computing?

Keltner: One is the ability to enforce the encryption of data in transit at all times, so the internet is not an exposure risk. So any time a user is accessing our services, the communication between that user’s computer and the Google cloud is encrypted. Still another common example we hear is about e-mailed documents. In the cloud world, when you don’t send the data, but rather provide access to a spreadsheet or a Google document, you can also later revoke access to those data. So in the cloud, you start to see holes plugged in the way security is done. The model provides some security capabilities that really aren’t there when you’re talking about data on local machines and clients.

CT: What are some security concerns that are out of the direct control of the cloud vendor? Who’s responsible then?

Hill: Because an application is in the cloud, it is by default available to any browser. So you have to give additional thought to access control as an end-user organization. Previously for on-premise applications we could rely on authentication to the network. Or we could rely on someone having to be physically on campus to use the application, because the application was installed on the client side on the user’s local workstation—he could not access the application from home or from a café. But with cloud computing, the applications are available anywhere, any time. And while that’s a huge advantage, it also means that the end-user organization—as well as the cloud provider but mainly this falls on the end-user organization—has to be especially diligent in account management, because the other levels of network or physical security that were previously relied upon have gone away.

Take for example, a terminated employee. There are many stories in the industry where a terminated employee’s access to an application was never turned off. Yet the employee in many cases couldn’t get to the application anyway because he couldn’t log on to the network anymore, or he couldn’t come to sit at his workstation on campus anymore. Now, with cloud computing, that has changed, and account management needs to become a lot more rigorous.

Despite the fact that an end-user enterprise goes to a cloud provider to use an application service, there are still joint responsibilities. Security is one of those joint responsibilities. The cloud provider has a set of responsibilities, but the end-user organization also has a set of responsibilities. And for the security model to work, both organizations have to do their part.

I think it’s a mistake for any end-user
Colleges and universities tasked with finding new ways to slash budgets – while still keeping their technology current – are turning to innovative new solutions wherever they can find them.

One area that demands regular investment by higher education is information technology, where rapid advances, coupled with the high expectations of incoming students, force an almost continuous upgrade cycle. To remain viable, educational institutions must provide ubiquitous access to the Internet, fast – wired and wireless connectivity across the campus – and support a wide variety of devices including game consoles, smart phones and netbook computers.

Fortunately, IT offers a wide range of possibilities for saving money. One example is energy savings. Campuses can save on equipment such as servers and switches right out of the gate when they “go green.” Installing more efficient technology equipment can return the original capital investment through significant savings on utility costs. Innovative modular equipment can reduce energy consumption in the data center dramatically. As an example, an educational institution with five campuses, using a converged voice and data network and some 600 Alcatel-Lucent OmniSwitch LAN switches, saved nearly $500,000 over five years on total energy consumption – cutting their energy costs in half.

Another way to ease the impact of technology on the budget is through policy based provisioning of security and authentication. Alcatel-Lucent’s Access Guardian framework allows administrators to implement dynamic access controls through the network infrastructure, both wired and wireless. User network profiles (UNP) enforced at the edge switch provides a means of correlating a user to a specific set of access control policies – including QoS, ACL, VLAN, and Time of Day access.

Regardless of what is connected to a switch port (hubs, IP phones, etc.), every device is identified and the appropriate preconfigured authentication structure is applied. For example, when managed devices capable of 802.1X authentication attempt to connect to the network they will be challenged to provide their credentials. Other legacy devices such as printers will not be challenged, but instead will be granted access through MAC authentication. Likewise, guests or devices unknown to the network will be redirected to a download page to help schools better manage and maximize the rich possibilities technology offers its faculty and students.

Finally, automating intrusion detection and the corresponding reaction is another feature of the OmniSwitch. Traffic Anomaly Detection (TAD) detects the anomalies in network traffic by monitoring the difference in the rate of ingress and egress packets on a port, and if the packets match certain patterns, will either send an SNMP trap to the Automated Quarantine Manager (AQM) network management application or automatically disable the anomalous port. Since automatically disabling a port requires manual intervention to enable it, the most efficient practice is to send this to the AQM for processing.

The Automated Quarantine Manager (AQM) receives input from Syslog or SNMP traps, determines the source MAC address of the offending device and then pushes MAC based ACL and quarantine VLAN rules to all OmniSwitches – automatically isolating the misbehaving device wherever it may be on the network.

Clearly, the intense demands of technology in education can be met with smart solutions that don’t break the bank. Rather, those solutions can actually help save money, such as smart energy solutions that can save on power consumption, as well as solutions that enable it, the most efficient practice is to send this to the AQM for processing.

Go online at www.campustechnology.com/campussafety to read more.
organization to think that by moving to a cloud, they are absolving themselves of some responsibilities. What they’re actually doing is leveraging the much larger and more sophisticated infrastructure and management capabilities of the SaaS vendor.

CT: Should IT organizations be asking cloud providers what kind of procedures they have in place to respond to security incidents?

Hill: I think they should ask what mechanisms the SaaS provider has to respond to security incidents, and I think they should ask themselves that very same question. Things that universities typically have not been rigorous about, they need to become more rigorous about in a cloud environment.

It’s a mistake for schools to think that by moving to a cloud, they are absolving themselves of some responsibilities.

—Anthony Hill, TopSchool

CT: So is it a good idea for institutions to ask the same questions to cloud providers that they ask themselves about their own security processes and procedures?

Keltner: Well wait—there’s often an assumption that the operations of the cloud provider’s data center and the underlying technical architecture are similar to what an institution would do in-house. That’s a misconception. For example, the way Google stores data, or what would be stored on an individual hard disk, would be very different from how an IT shop for even a large university would store data. If someone took a server from a university data center, they’d likely be able to look at the data and read e-mails, etc. But with the way Google stores data, even if someone were able to break into a Google data center and run out with some servers, the data would be totally incomprehensible to them for a variety of reasons. So there’s still a lack of understanding of how it is that a cloud provider can offer the kind of scale of service that they do. And I think when you dig into the reality of what’s being provided and how it’s being provided, then you start to understand that some of the concerns that you used to have around security and redundancy are really the wrong questions to ask. [For a list of the right questions to ask, see “Top 10 Questions…” at left.]

CT: Given concerns for security, how do you think adoption of cloud computing may play out over the next few years?

Keltner: People are looking at cloud computing in different areas. There’s lots of computing that goes on in a university, from high-performance computing, to running course management systems and student information systems, to e-mail. Schools are beginning to evaluate where to start. It’s not going to be everything at once; maybe they start with the e-mail, or the calendaring. We anticipate that institutions will slowly move bits and pieces of what they do into the cloud.

CT: You mean, as they have more experience with the cloud they’ll feel more secure?

Keltner: It’s somewhat like the difference between flying and driving. Some people feel a lot safer behind the wheel of their own car than flying on a commercial airline, but statistically speaking, you are a lot safer flying than you are driving your car. But those of us who fly all the time have become very comfortable with it. And I think people will also develop a level of comfort with cloud computing.

CT
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The College Graduation Virtual Summit Proposed Schedule
October 29, 2009

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
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<tbody>
<tr>
<td>10:30 AM - 11:00 AM</td>
<td>Dedicated Exhibit Hall Time</td>
</tr>
<tr>
<td>11:00 AM - 12:00 PM</td>
<td>Modernizing Community College Facilities</td>
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<td></td>
<td>In spite of rising enrollment, deferred maintenance and difficult budgets, some community colleges have managed to create modern, technology-rich learning environments with robust networks. How did they do it?</td>
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<td>12:00 PM - 12:30 PM</td>
<td>Dedicated Exhibit Hall Time</td>
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<tr>
<td>12:30 PM - 1:30 PM</td>
<td>Innovative Strategies to Improve College Graduation</td>
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<td>Between 50 and 60 percent of students entering any level of higher education fail to graduate within six years. Technology-based approaches, especially online courses and learning communities, have been shown to improve graduation rates.</td>
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<tr>
<td>1:30 PM - 2:00 PM</td>
<td>Dedicated Exhibit Hall Time</td>
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<tr>
<td>2:00 PM - 3:00 PM</td>
<td>Engaging in Successful Business Partnerships</td>
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<td></td>
<td>Partnering with business and industry in defining the needs of the workforce and creating and implementing programs can result in higher graduation rates and greater placements rates for employment in the future. Technology companies know this and have led the way in ensuring a workforce for themselves.</td>
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<tr>
<td>3:00 PM - 3:30 PM</td>
<td>Networking Lounge Live Chat with Industry Professionals</td>
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<tr>
<td>3:30 PM - 4:30 PM</td>
<td>Dedicated Exhibit Hall Time</td>
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<tr>
<td>4:15 PM</td>
<td>Summit Prize Giveaway</td>
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Annual Conference Highlights

Campus Technology 2009

This year’s annual summer conference, held in July in Boston, reflected IT trends at higher education institutions and was a chance for attendees to explore Web 2.0 technologies, social software, smart classrooms, new instructional media, and more. Here, we share some images of this inspiring and productive event.

A Meeting of Minds: The Executive Summit

An invitational summit brought together higher education technology leaders for a daylong discussion of technology and leadership. Joan Falkenberg Getman of Cornell University (NY) led three plenary panels on emerging technologies, societal trends, and leadership. Discussion panelists pictured (above, left to right): Julie Smith, CDW-G; Aaron E. Walsh, the Media Grid; Phil Long, The University of Queensland (Australia); with moderator Getman.

Afternoon discussion workgroups were led by Chris Dede of Harvard (MA). In small groups, summit participants personalized the day’s experiences by talking with peers about technology customization at their own institutions.

A “technology sandbox” gave summit participants hands-on time with current products supplied by sponsor CDW-G and a just-launched immersive mixed reality product courtesy of the Media Grid.
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Thought-Provoking Keynotes and Sessions

Chris Dede gave the opening keynote on emerging interactive media and their implications for teaching and research. Aaron E. Walsh, one of the 11 Campus Technology Innovator awardees for 2009, spoke in his keynote session about immersive technologies and their potential impact on education. Phil Long’s closing keynote was an intriguing glimpse into one education technology leader’s own global IT journey.

Breakout and workshop session topics ran the gamut from briefings on the latest social software tools to in-depth examinations of technology infrastructure. Mark Frydenberg of Bentley University (MA) presented a breakout session on how to engage millennial students, and attendees used Web 2.0 tools interactively during the session (above left). Stanford University’s (CA) Academic Technology Specialist Menko Johnson and research scientist Helen Chen joined a panel moderated by Director of Technology Services Bob Smith on “Supporting Technically-Facilitated Intercultural Classes” (above, left to right). In two seminars delivered by virtualization expert Greg Shields (far left), attendees could get a half-day crash course on virtualization and opt to continue for the rest of the day to take a “deep dive” into the topic. And Josh Baron (left) of Marist College (NY) gave a breakout session to update attendees on Sakai, and later led a panel discussion and open forum on open education.

Attendees enjoyed in-depth conversations with CT Innovator award winners during a Birds of a Feather luncheon, exploring technologies and tech topics informally.

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A busy exhibit hall demonstrated that Campus Technology 2009 remained prosperous even in a challenging economy—the place to be to learn and share knowledge about IT in higher education. CT

Editor’s note: Don’t miss CT’s first-ever virtual conference and expo, Dec. 3, 2009, 10 am to 6 pm EST. The live online event will feature expert speakers, a virtual networking lounge, technology product demos in a virtual exhibit hall, and free content downloads and presentations to go—and best of all, it’s free! See page 52 for details.

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A special introductory price of $99 is available through the end of the year. www.techsmith.com.

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The new Diggitdo Smart Document Camera from Califone International features image recognition capabilities: Once an image has been saved, placing the same item under the camera will automatically prompt the device to reopen the saved image. The device also features the ability to link audio and video recordings to a presentation file, enabling instructors to create single-click, multimedia tutorials that can be automatically replayed. Other specs include a 2-megapixel resolution with auto focus, 3x optical zoom, annotation capabilities, and an internal microphone. MSRP: $599. www.califone.com.

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Soundshpere’s Q-CS Power1 is a compact powered loudspeaker offering a built-in 15-watt amplifier for direct connection to projectors and computers, with no additional equipment required. Designed for low-finished-ceiling installations, the speaker offers 180-degree-by-360-degree dispersion, allowing a single unit to provide high-quality sound over a large area. Two inputs accept L and R stereo signals which are electronically summed internally, eliminating the need for external stereo-to-mono summing devices when a single speaker is used. MSRP: $329. www.soundsphere.com. CT
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Here is just a sampling of the outstanding sessions scheduled for December 3

Five Elements of Exceptional Technology Enhanced Learning
Stephen Laster, Chief Information Officer, Harvard Business School
In this must-attend session, Stephen Laster will share how to “get back to basics” and concentrate on creating instructionally sound experiences that leverage the power and reach of today’s collaborative technologies. Through thoughtful design, we can collectively deliver on the true potential of the apex of teaching, learning and technology.

Lessons and Outcomes from University of Minnesota’s Future Classrooms
Jeremy Todd, Interim Director of the Office of Classroom Management and Linda Jorn, Director of the Digital Media Center, University of Minnesota
The University of Minnesota explored the future of classroom design by constructing two pilot classrooms developed as student-centered, integrated, flexible learning spaces. Goals of the pilot included stimulating interest in innovative classrooms, demonstrating new flexible classroom construction techniques and formal faculty and student assessment of new classroom designs and pedagogy. Come hear the lessons learned, outcomes and pedagogical impact of these forward-looking classrooms.

Immersive Technology Platform Standards: Sharing Your World
Aaron E. Walsh, Director, Grid Institute and Boston College Faculty, Julian Lombardi, Assistant Vice President for Academic Services and Research Support, Office of Information Technology at Duke University, John Lester, Strategist and Evangelist, Second Life, Linden Labs, and Jordan Slott, Staff Engineer, Sun Microsystems
This session examines emerging standards for immersive environments, and considers the issues technology and academic leaders on campus should take into account as they explore the amazing opportunities of immersive education.

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While it may not be an official job requirement at many institutions, the majority of higher ed CIOs have advanced degrees, according to a new Center for Higher Education Chief Information Officer Studies (CHECS) survey of 352 higher ed CIOs. CHECS also surveyed campus technology leaders (the level below CIO) on the same topic. Here's how the data break out:

Over three quarters (77 percent) of CIO survey respondents reported having either a master’s (59 percent) or doctoral (18 percent) degree. At the same time, the CHECS survey of 222 technology leaders (TL) found that less than two-thirds of these respondents (61 percent) reported having an advanced degree.

Wayne Brown, founder of CHECS, surmises that fewer technology leaders may have an advanced degree because “TLs are typically focused on the day-to-day operations and are a lot closer to the technology than the CIO. They are working on their certifications.”

The study further notes that the type of institution where the CIO works may be a strong determiner of what kind of degree he or she has: For example, only 9 percent of CIOs at research universities reported bachelor’s degrees as their highest-attained degree, compared to 13 percent of CIOs at master’s-granting institutions, 23 percent at baccalaureate-only institutions, and 23 percent at two-year or associate’s-degree colleges.

“Clearly, an advanced degree is important for an aspiring higher education CIO,” posits Brown, who himself is a CIO at Excelsior College in Albany, NY, and holds both a PhD and an MBA. While an advanced degree may not show up on a job posting as a formal requirement—a recent unscientific look at CIO-type jobs on higheredjobs.com revealed that only one out of the 11 jobs posted asked for an advanced degree—“There is clearly a significant majority of higher education CIOs who have one,” Brown says. “And if you are competing with those same people for a job—especially at a master’s- or research-level institution—your degree will be one of the considerations.”

Some campus tech leaders are already on the road to an advanced diploma. Brown reports that when TLs were asked what they were doing to get ready for the CIO role, 24 percent of them said they were working on their next degree.

The full version of the CIO and technology leader reports can be found at the CHECS website: www.checs.org.
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