We applaud 13 visionary schools, their leadership and vendor partners, taking technology to new heights. page 29

Does Your Institution Understand Rich Media?

When Campus CEOs Drive Wireless
Today’s colleges and universities are faced with an increasing amount of information. From student information and faculty research data to multimedia files and streaming video, existing storage systems are being pushed to the brink. So a storage solution that expands as your needs expand is essential. At CDW•G, we carry the top-name storage solutions that do just that. We also have account managers who understand your unique needs and purchasing processes. So you get a better storage solution and a way to keep up with your growing needs.

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It’s All About Partnering

If we ever had doubt that IT partnering is a great thing, Dell and Napster just drove it out the door.

One of the things that sets the information technology industry apart from all others is its ability to foster vendor/vendor partnering and vendor/client partnering. In fact, until the 1980s and ’90s, the industrialized world had never witnessed the ritual teaming of peer vendors and even outright competitors that then began to become commonplace in the IT market; it was the IT industry alone that first recognized the logarithmic business growth potential of partnering. When vendor partners with vendor, the end result can be a great deal more than doubled business for each; new and increased sales can rocket by untold multipliers. And when vendor partners with client, instead of just delivering product or service to the client, the end result frequently is not just a happier customer (and valuable word-of-mouth marketing to concentric circles of potential new customers), but improved product: Through the feedback possible only through such partnering, a vendor can truly internalize customer needs and respond with new product features and capabilities in a way that simply is not possible without such symbiotic relationships in place.

I bring all of this to your attention because in my estimation, the July 6 announcement by Dell (www.dell.com) of its new partnership with Napster (www.napster.com) was a crystallization of all that is possible through vendor/vendor and vendor/client (or campus) partnering.

As to client-school benefit, one would have to be living in a cave not to be aware of the struggle campuses and students have been facing because of illegal music downloading prosecution, not to mention campus network bandwidth and network/hardware security problems. By combining Napster’s legal music downloading service with Dell PowerEdge ’955 blade server storage, campuses will be able to offer Dell-owning or MP3-owning students (even those moving off campus for the summer, or moving on to careers) legal music-and-information download subscriptions at a reduced education rate—and campus network managers will once again be able to sleep at night.

As for the benefits to the vendors, Napster gains a badly needed leg-up with the worldwide target audience of college-age kids, and in a masterstroke, Dell will undoubtedly boost server, laptop, tablet, desktop, and (importantly, against the formidable iPod) Dell DJ (MP3) sales with its under-30 audience. But notably, Dell’s campus partnership opportunities (for laptop programs and campuseswide server deals, especially) suddenly sprout wheels—assuredly to the dismay of its OEM competition.

Yet this editorial is not really about the shrewdness of the Dell marketing folks, or the ability of Napster execs to spot another subscriber market opportunity when they see one. Dell and Napster are merely the examples here; the model of what win-wins are possible for us all, when we take partnering to new heights. Partnership is simply a beautiful thing when it works.

—Katherine Grayson, Editor-In-Chief

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UPCOMING EVENTS

August 2005

AUG 3 - 5
21st Annual Conference on Distance Teaching & Learning
(www.uwm.edu/disted/conference)
Madison, WI

AUG 5 - 10
Seminars on Academic Computing 2005
(www.educave.org/conference/sac)
Snowmass Village, CO

AUG 14 - 19
The Data Warehousing Institute
TDWI World Conference Summer 2005
(tdwi.org/education/conferences/main.aspx?pagname=upcoming_conf)
San Diego, CA

AUG 22 - 25
BICSI
2005 Fall Conference
(www.bicsi.org/Events/Index.aspx)
Nashville, TN

AUG 24 - 26
Recharger Magazine World Expo 2005
(www.rechargeermag.com/conf/Expo2005)
Las Vegas, NV

September 2005

SEPT 19 - 21
The E-Gov Institute
Enterprise Architecture
(www.e-gov.org)
Washington, DC

SEPT 25 - 28
Questex Media
TechLearn 2005
(www.techlearn.com)
Las Vegas, NV

SEPT 27 - 28
InfoX Showcase 2005
(www.inflox-ny.com)
New York, NY

SEPT 28 - 29
The Emerging Technology Conference at MIT
(www.treti.com)
Cambridge, MA

SEPT 29 - OCT 1
The Council of Independent Colleges
Workshops on the Transformation of the College Library
(www.cic.edu/conferences_events/workshop-library/2005/index.asp)
Chicago, IL

October 2005

OCT 6 - 10
The Consortium of College and University Media Centers
CCUMC 2005 Annual Conference
Blazing New Trails
(www.pcc.edu/ccumc05)
Portland, OR

OCT 9 - 11
American Association of Collegiate Registrars and Admissions Officers
AACRAO 2005 Technology Conference
Implementing Technology in Student Systems and Service
(www.aacrao.org/tech05/index.htm)
Atlanta, GA

OCT 12 - 15
10th North American Higher Education Conference
Beyond Boundaries: Building Bridges of Collaboration in Higher Education
(www.conahec.org/conahec/Conferences/-SanJuan2005/index.html)
San Juan, Puerto Rico

OCT 18 - 19
Educause 2005 Annual Conference
Transforming the Academy: Dreams and Reality
(www.educave.org/conference/annual/2005)
Orlando, FL

OCT 23 - 26
League for Innovation in the Community College
2005 Conference on Information Technology
(www.league.org/2005ct)
Dallas, TX

OCT 26
Society for College and University Planning
The 3rd Annual Campus Sustainability Day
(www.scap.org/oid/3/index.html)
Virtual Webcast Event

OCT 30 - NOV 2
The Association for Communications Technology Professionals in Higher Education
2005 ACUTA Fall Seminar
(www.acuta.org/conference/wcet/2005/index.html)
Denver, CO

November 2005

NOV 2 - 5
WCET 17th Annual Conference
E-Learning E-Llusions and Triumphs: Reimagining the Academic Ecosystem
(www.conference.wcet.info/2005)
New Orleans, LA

NOV 13 - 16
AACRAO’s 15th Annual Strategic Enrollment Management (SEM) Conference
(www.aacrao.org/ses15)
Chicago, IL
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The Supreme Court has spoken. In a 9-0 decision on June 27 concerning the case of MGM vs. Grokster, the US Supreme Court implicitly affirmed that copyright is a very good thing and explicitly stated that "one who distributes a device with the object of promoting its use to infringe copyright…is liable for the resulting acts of infringement by third parties." In other words, if the primary or most common use of your firm’s product is to help individuals with copyright infringement, and if your firm promotes the product as a way to violate copyrights, then your firm can be held liable for the resulting acts of copyright violations by individuals who use your product.

No question, this is a really big win for the music and movie industries. The Court’s decision overturns two lower court rulings that Grokster (www.grokster.com), StreamCast Networks (www.morpheus.com), and other companies that produce and distribute peer-to-peer (P2P) software were not liable if individuals used these products to violate copyright. Indeed, the Supreme Court felt that there was ample evidence that Grokster and StreamCast clearly intended to aid and abet copyright infringement, stating “the unlawful objective was unmistakable.” Writing for the Court, Justice David Souter’s opinion stated that there was “evidence of [copyright] infringement on a gigantic sale” and that the “probable scope of copyright infringement is staggering.”

Not surprisingly, there was a bit of a victory dance in the post-Grokster press releases from the entertainment industry. The Recording Industry Association of America (www.riaa.org), the trade group that has been aggressive in filing John Doe lawsuits for P2P copyright infringement, applauded the Supreme Court’s unanimous decision, stating that the Court “has addressed a significant threat to the US economy,” while “helping to empower the digital future for legitimate businesses—including legal file sharing networks—by holding accountable those who promote and profit by theft….” This decision lays the groundwork for the dawn of a new day that will bring the entertainment and technology communities even closer together, with music fans reaping the rewards. Concurrently, Dan Glickman, president of the Motion Picture Association of America (www.mpaa.org) announced that the Court’s "unanimous
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- **True 600 x 600 dpi; HP ImageREt 2400 color print quality**
- **Optional 500-sheet tray increases input capacity to 850 sheets**
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## HP Color LaserJet 4650 Series

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- **Increased paper flexibility of up to 1,600 sheets, including the ability to handle heavy media**
- **Dramatically improves print quality with HP ImageREt 3600**
- **High-speed networking capabilities**

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1. Direct digital photo printing from compatible memory card.
2. Instant-on Technology is environment and application dependent.
3. HP Color LaserJet 3500n price includes instant savings of $100 (was $899). Offer ends October 31, 2005.

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ruling is an historic victory for intellectual property in the digital age, and is good news for consumers, artists, innovation and lawful Internet businesses.”

Not to be outdone by the music and movie associations, StreamCast Networks vowed in a post-Grokster press release “to continue its fight for freedom to innovate.” The release proclaimed that “once all the evidence is put forward, we are confident that it will be proven that Morpheus did not, does not, and will not promote or encourage copyright infringement.” Additionally, the StreamCast statement proclaims that the “Supreme Court decision is Orwellian in that Hollywood—and the copyright and entertainment industries—now become the thought police.”

The ‘Morning After’ Challenge

Not surprisingly, Grokster and Morpheus software were both still readily available on the Web in the days after the Court’s decision. Even as the decision was a clear victory for the plaintiffs, the music and movie industries confront a huge “morning after” problem: changing individual attitudes and behaviors about copyright infringement and P2P downloading. A clear challenge for the media industries is that in this case, the genie—free P2P software—has been out of the bottle for a very long time (at least as measured by Internet years) and has a growing user base.

BigChampagne (www.bigchampagne.com), a market research firm focused on media consumption, reports that the number of people in the US using P2P networks more than doubled between June 2003 and June 2005, from 2.9 million in 2003 to 6.2 million in 2005; moreover, the average download also more than doubled in size, from 3.97MB to 8.99MB. The entertainment industry’s inevitable follow-on lawsuits may eventually bankrupt Grokster and StreamCast, but the litigation will not necessarily change individual behaviors.

The morning (and months) after the Grokster decision may not have big consequences for colleges and universities, since they have been dealing with the problem for some time. True, many in the campus community will understandably lament the potential impact of the Grokster decision on legitimate P2P networking and future technological innovation. But as previously noted in “Lost Under the Streetlight,” (Digital Tweed, November 2004), data from the Campus Computing Survey (www.campus-computing.net) shows that the vast majority of four-year colleges and universities already have campus policies to address inappropriate P2P activity, as do more than half of community colleges. Additionally, growing numbers of institutions include copyright education as part of a mandatory (often online) “digital rights and responsibilities” program for new students and faculty.

Moreover, P2P infringement remains a consumer issue, not just a campus problem. Despite the RIAA’s continuing efforts to portray college students as the primary population of digital pirates, as of March 31, 2005, only 4 percent of the 8,400-plus John Does targeted as part of the RIAA’s P2P lawsuits were college students.
Intentionality and Liability

That said, the months after the Grokster decision may get very interesting for consumer ISPs. Consider, for example, a billboard promoting SBC/Yahoo’s DSL service that I’ve seen in a number of locations in Los Angeles over the past few months (see image, page 10). SBC/Yahoo! is selling broadband access, but the marketing message specifically links the service to content: “faster downloads” of music and movies.

Viewed through the filter of the Grokster decision, the SBC/Yahoo! billboard could be read as encouragement to infringe on copyright. Paraphrasing Justice Souter in Grokster, “the [probable] unlawful objective is unmistakable.” The SBC/Yahoo! billboard, like the marketing efforts promoting Grokster and Morpheus, can be read as encouraging “recipients [customers] to…download copyrighted works,” while the advertising reflects “active steps to encourage infringement.”

Perhaps the Grokster decision will prompt the RIAA and others in the media industries to turn their attention to P2P as a consumer issue, one that goes well beyond campus networks. Some months ago, an RIAA official told me that the association’s press releases have targeted colleges and college students over consumers and consumer ISP services (for example, Adelphia, Comcast, Earthlink, SBC, Time Warner, Verizon, and others) because colleges respond to the threat of litigation, whereas consumer ISPs and telcos view litigation as a cost of doing business. But now that Justice Souter and his colleagues on the Supreme Court have told us that intentionality could lead to liability (“the unlawful objective is unmistakable”), perhaps the consumer ISPs will begin to acknowledge that they too have an obligation to promote copyright education, as opposed to promoting, aiding, and abetting copyright infringement.

“Now that Justice Souter has told us intentionality could lead to liability, perhaps consumer ISPs will acknowledge their obligation to promote copyright education.”

Kenneth C. Green is founding director of the Campus Computing Project (www.campuscomputing.net).
NEWS ▶ A VIRTUAL LOCKER? Higher ed IT pioneer and University of Wisconsin-Madison CIO Annie Stunden is seeing her visions become realities at UW-M: Everyone should have a Web space for file storage, sharing, and collaboration. This fall, as a new crop of freshmen enter the university, along with their My UW-Madison Web portal they’ll have better-than-ever access and storage for digital files. My WebSpace, a system for Web-accessible file storage, retrieval, and sharing, debuted last year and proved so popular that, this fall, the university plans to ratchet up service to accommodate 10,000 new users. (Add that to last year’s level of 19,000, with close to a million files and folders.) With more than 40,000 students attending the university, and over 13,000 faculty, the content management and file-sharing system is poised for even more expansion. But Madison’s “DoIT” staff is confident that the Xythos-based system (www.xythos.com) will be scalable enough to handle the expected growth. ▶ FCC SEEKS ADVICE FROM HIGHER ED. Tamara Closs, president of the Association for Communications Technology Professionals in Higher Education (www.acuta.org), and associate director of Enterprise Product and Service Development at Georgetown University (DC), has been named to serve on a 55-member Consumer Advisory Committee that advises the The Federal Communications Commission on the impact of new and emerging technologies, consumer protection and education, and access for people with disabilities. ▶ GOOD ENOUGH? IT leaders from more than 350 colleges and universities contributed their thoughts to a recent Educause Center for Applied Research (ECAR) study of business-process performance and technology investment. Educause says the study “corroborates the subjective impressions that trustees, regulators, and others have that colleges and universities lag behind the leading sectors of the economy in the performance of business processes.” But could it be that level of performance is adequate when IT investment must be considered across a range of institutional priorities? Check out the study, titled “Good Enough!” (www.educause.edu/ers0504). ▶ PEOPLE ▶ NEW PRESIDENT, NEW CHANCELLOR. The University of Redlands (CA) has identified a new president, Stuart Dorsey, to begin his term this coming fall. Dorsey will join Redlands after completing his role as vice president for Academic Affairs at the University of Evansville (IN). Current President James R. Appleton becomes Redlands’ chancellor. ▶ NEW PRESIDENT. Loyola College (MD) trustees have elected Rev. Brian Linnane as their 24th president. Linnane has left his role as assistant dean and associate professor at the College of the Holy Cross (MA), and started his new post at Loyola this past month. ▶ INTERIM PRESIDENT. William H. Harris took the reigns this past month as the Fort Valley State University (GA) interim president, and will serve during the Fall 2005 semester. Harris previously held presidential posts at Alabama State University, Texas Southern University, and Paine College (GA). ▶ PLANNING RETIREMENT. James E. Walker has decided he will retire after the 2005-2006 academic year, completing six years as Southern Illinois University’s president. ▶ OUT OF RETIREMENT? The Haywood Community College (NC) board of trustees has called upon Donald S. Stanton to emerge from retirement for a six-month stint as the college’s interim president. Stanton retired in 1999 from his post as president of Oglethorpe University (GA). The appointment will be contingent upon his acceptance, and the North Carolina Community College system’s final approval.
Today's students and faculty expect state-of-the-art Internet access—including broadband networking, wireless networking and online educational resources—on their campuses. They want access in administrative offices, residence halls and public areas. The challenge to university and college administrators is to maintain an open policy-based culture while providing the security necessary to protect confidential data, and defend against identity theft, viruses and worms.

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**NEWS**  ■ **PRESERVING HISTORY.** LexisNexis (www.lexisnexis.com) has teamed up with the University of Maryland to preserve images from the US Serial Set maps in a repository that will be easily accessible and searchable online. The US Serial Set is a vast historical resource that contains an ongoing collection of US government publications. LexisNexis has digitized nearly the entire set spanning from 1789 to 1969, including 325,000 documents drawn from nearly 13,000 volumes, 52,000 maps, and other official state papers. ■ **NEW TO CSUN.** California State University-Northridge will begin providing its engineering students with Web-based synchronous content from Elluminate Inc. (www.elluminate.com) to add dynamic interaction to its distance learning program. Company spokespeople say *Elluminate Live!* will replace an expensive and antiquated satellite-based teleconferencing system. ■ **TRAINS, PLANES, AND BIKES?** Bicycle theft has been an issue ever since the two-wheeler was invented. To combat it, the University of California-Los Angeles (UCLA) and Clancy Systems International (www.clancysystems.com) have teamed up to launch a new security program for bicycle locker use. The program allows members to reserve a locker space, locker location, and code, online or by phone; UCLA bike riders won’t be walking home bikeless anytime soon. ■ **OVERHAULING THE STUDENT LOAN SYSTEM.** Sierra Systems Group Inc. (www.sierrystems.com) and the Texas Higher Education Coordinating Board (www.theccb.state.tx.us) have signed a $4.3 million contract to develop and implement the new Texas Loan Program System. The migration project will enable the THECB to more effectively and efficiently process loans while allowing borrowers and higher ed institutions the ability to transact and access loan or grant information anytime, anywhere. The THECB is responsible for administering the state’s student financial aid programs, as well as providing support for a broad portfolio of loan products to help enhance students’ access to higher ed institutions in Texas. The migration project will continue until July 2006. ■ **LIBRARIES GET NEW SOFTWARE.** Sixteen university and college libraries are in the process of implementing an electronic resource management system from Endeavor Meridian (www.endinfosys.com). The Endeavor Meridian database will allow users to view and control a library’s electronic collections, reducing staff effort required to manage, deliver, and analyze eContent. Several of the universities include: The University of British Columbia (Canada), Ithaca College (NY), Syracuse University (NY), and Kansas State University. ■ **AGREEMENT TO SELL.** Proxim Corp. (www.proxim.com), a provider of Wi-Fi and broadband wireless equipment, has announced it will sell all of its assets to Moseley Associates Inc. (www.moseleysb.com), in a deal worth $21 million. Moseley will assume most of the domestic and foreign operations of Proxim. ■ **PEOPLE**  ■ **COURSEN HONORED.** Jeff Coursen, executive VP and COO of integrated communication and managed security services provider ATX Communications (www.atx.com), was honored at Drexel University’s (PA) LeBow College of Business Annual Awards and commencement ceremony. Coursen was recognized with the Outstanding Alumnus award for his “service to profession.” Coursen was recently promoted to executive VP after guiding the company through a complex corporate reorganization completed in April 2005.
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Download the Hartwick College case study from our Web site free and learn how you can give your campus an advantage.
Higher Ed Execs Pick Their Top Issues

The Syllabus2005 Executive Summit Survey report reveals what’s on the minds of decision makers in higher education.

IT DIRECTORS and other top-level executives in higher education met this past July at the Syllabus2005 Executive Summit (www.campus-technology.com/executivesummit) to focus on common issues and solutions. In order to provide context and a framework for a full day of productive discussions, Campus Technology contracted Eduventures analysts (www.eduventures.com) to perform a study of strategic IT concerns, using a survey instrument and expert interviews informed by an extensive scan of relevant research findings. Four broad areas emerged:

- Aligning IT with Institutional Goals
- Information Security as a Strategic Issue for Institutions
- Students as Customers: Online Student Services
- Digital Learning Technologies and Instructional Impacts

The survey instrument asked respondents to rate, using a five-point scale in descending order, the relative importance of seven strategic themes predominant in the literature. All seven themes received scores above 4.0, placing them all in the “somewhat important” to “extremely important” range. While only the most critical themes were introduced for rating in this portion of the survey and uniformly high scores were not a surprise, the relative ranking of themes factored into the development of a discussion framework, based on the four major areas listed above.

Another section of the survey asked respondents to rate each of 22 IT discussion topics on a five-point, descending scale of their interest in discussing each topic with peers. The first 10 top-rated topics are included in the chart, above right.

While the “strategic themes” responses shown below assign a relatively lower rating to instructional technologies, the chart above demonstrates that the application of technology to learning is of great interest as a topic of discussion. Emerging education technologies, digital content, and eLearning are all included among the top five topics that IT executives are keen to discuss.

The Flood Gates Open

From the first expert interview conducted in the study phase, to the final exchanges at the end of the Executive Summit meeting, recorded commentary and diverse views of participants abound. Samples follow:

Lev Gonick, VP for IT Services and CIO, Case Western Reserve University (OH): “We are going to see a handful of IT directors really help shape their institutions, versus continuing to be incrementally involved in reacting to changes.”

Mark Bruhn, chief IT security and policy officer and acting associate VP of Telecommunications, Indiana University: “It used to be a very unpopular position to take on university campuses, but more and more IT people are taking control—if not of the devices, than of the network connections to and from those devices.”

Mary Jo Gorney-Moreno, associate VP for Academic Technology, San Jose State University (CA): “The ultimate goal of our strategic plan is student success…. Our core mission is not to have the latest and greatest technology; it is to educate students.”

We’ll be sharing interviews, comments, and summaries with our readers and Web site visitors in the coming months. Join the ongoing discussion! CT
Driving IT Initiatives and Network Innovation

From early mobility projects to high-bandwidth research networks, IT—and Tracy Futhey—move the campus forward at Duke.

By Mary Grush

As CIO and vice president for Information Technology at Duke University (NC), Tracy Futhey oversees technology projects that have far-reaching impact on instruction, research, and the way people live and work on campus. While recently she is most often cited for her work with Duke’s iPod project (www.duke.edu/ipod), dubbed the iPod First Year Initiative, Futhey’s professional interests have spanned a range of innovative technologies, especially networked and mobile technologies. At Carnegie Mellon University (PA) in the ’90s, her projects included work on Wireless Andrew, an early campuswide wireless deployment, and on Handheld Andrew, which foreshadowed some of today’s emerging network and location-based services. Today, in addition to her role at Duke, she is board chair for National LambdaRail (www.nlr.net), the national optical research network. Her overall goal to “create dynamic research and learning environments” is met by innovation and enthusiasm both at Duke and at peer institutions across the country.

How have networked environments at colleges and universities changed over the years, and what are some of the biggest opportunities that have opened up? The biggest opportunity relates to broad access to these networks and the experimentation that has become possible as the networks have moved from being specialized—only available to a few—to true commodity networks. I was involved in the Wireless Andrew project at Carnegie Mellon University [nearly 10 years ago]. At that time, the idea of 802.11 wireless and what one would now consider to be broadband wireless access, was something that people in the mainstream simply didn’t recognize as having the potential that it eventually turned out to have.

So the networked environment itself encourages experimentation? The networked environment is an enabling capa-
bility that pushes people to try new things. There are new things that one might be compelled to do because of that mobility. I think of location-based services and context-aware applications—an entire applications area only emerging as a result of the mobility that’s being created by networked environments and the pervasiveness of networking. The more you’ve got broad access and experimentation through this commodity network—be it 802.11 wireless, or cellular and wide-area networking—and the fact that so many people are being connected so easily and inexpensively, without much effort, leads to a lot of individual situations where we can try new applications. These new uses are being tried by individuals who are not necessarily developers, but may be people who have a different perspective and a great idea worth trying. So, many of the changes I see relate not only to expanding access, but also to expanding the base of people who are trying to do different things because they are now enabled through the networked environment.

Who drives the experimentation? Students as customers, innovators in the IT department, or...? I would characterize that as having three major drivers, if one is to be successful in running a strong and forward-looking IT organization. One of those drivers would come from the students. And, increasingly, the students are coming in with more and more experience in using technology, and huge expectations about what technology can do and about access in virtually every aspect of their lives. The uses they’re looking for when they start out are primarily convenience uses: They are used to buying books from Amazon, and paying bills online. So we have to think, how do we make the campus operate efficiently and effectively in an online environment? And students’ willingness to adopt new technologies is a critical aspect of that first driver.

You mentioned the IT organization and its innovation in pushing ahead. That is the second leg of an important support structure. But a third one you hadn’t mentioned, that is absolutely critical, is the push and drive that needs to be coming from the faculty. And that relates to the use and support of technology both in the classroom and in the research environment. It’s the one that in many ways has driven us at Duke: Last year, with our iPod First Year Experience, and in the coming year, with the Duke Digital Initiative; our program to continue the iPod use and expand into other technologies.

Is there a fourth driver that you characterize as strategic? It’s associated with the second driver, although not exclusively. Duke has, as part of its academic strategic plan, a goal and a commitment to utilize technology throughout all aspects of campus life and the campus environment—be that in the classroom, in the research setting, or in the co-curricular aspects of student life. I view that as an institutional driver, one that I have to be constantly mindful of; one that I have to encourage and enable through the IT environment, providing support for both the faculty and the students. But whether you count three or four legs, they are all certainly necessary.

How is the iPod project expanding into the Duke Digital Initiative? Over the past year, the iPod project has made clear to many of our faculty and in many of our courses, the value of digital audio in a whole host of domains. And those who have started to use the iPods have said, in a large number of cases, that this has been an important enough experiment that they absolutely need and want to continue it. And we’ve had interest from other courses that haven’t yet tried it.

At the same time, part of what our evaluations identified last year is that, as great as the iPod experiment was for digital audio access, we had people who wanted to do things that aren’t confined to digital audio: digital video, tablet computing, collaborative areas. So we are continuing and expanding the project, adding the focus in those new areas. We are also shifting the project from class-based to course-based, so that any student in any year of his or her undergraduate program here at Duke, who is in a course using the iPods, would receive an iPod for that relevant coursework.

Please tell us about national and regional networking initiatives, specifically NLR and Internet2: What are the latest innovations, and what will keep momentum moving toward building services for all institutions? We’re making wonderful progress on the national, regional, and campus level, to start to take advantage of the newly available optical networking capabilities. We’re moving from the promise and the dream to the reality of having very high-speed access from end to end—one campus to another, one researcher to another—that was historically only practical to expect within campus lab environments. The projects that are going on now at the national level include NLR and Internet2. 12 has a project called HOPI, hybrid optical packet infrastructure, that is using NLR infrastructure. That and other projects at the national level are going to be introducing a whole new set of capabilities for faculty researchers. The regional build-out of optical networking has really been impressive over the last couple of years.

For me, one of the key elements in participating and mov-
ing those initiatives forward is providing faculty on our campuses with the best access to research capabilities and the fewest barriers to collaboration as possible. It is often the case that collaboration within a particular discipline occurs across campus boundaries rather than within a single department. So, through the high-speed optical capabilities that we’re trying to introduce, we can make sure that a faculty member at Duke, for example, can communicate and network with research faculty at the University of California-San Diego site, the other supercomputing centers, or you name it. I’m able to make sure that faculty have such capabilities on this campus, and to collaborate with their colleagues at other campuses, without regard for the fact that Durham, NC, where Duke is located, has historically not been viewed as the networking center of the world.

What can be done with grid computing, to improve research computing environments for our campuses? Grid and cluster computing are having an impact, not only within the research lab; they are also providing important opportunities for faculty to collaborate across disciplines. If we do it right, we’ll create opportunities for computing organizations to have a rejuvenated research computing support environment for faculty.

Cluster computing, for example, takes significant effort and system management to support; in some cases, faculty don’t want to do that themselves. So, as a central computing organization, figuring out how we can support our faculty, and creating flexible models to do that, creates an important opportunity for faculty and IT department interaction.

You’ve been involved in significant network innovations. What have you learned about the nature of innovation? The most critical thing is tied to relationships with faculty. In general in universities, in running our computing organizations, we don’t take as great advantage as we might of our faculty’s experience and experimentation. In terms of a strategy, I’m very big on the notion of working with faculty; meeting with faculty in your computer science and engineering departments, in your school of medicine, in art, in any domain, and understanding what capabilities they need or may be creating. That’s the key to innovation: viewing technology not simply as infrastructure, but as the gateway that can help provide faculty and students with advanced capabilities. It’s not one-size-fits-all. There’s got to be collaboration and connection with the academic units, and with the faculty in particular, to understand capabilities and needs, and design around them. CT
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Open Source Finance Is Here

Why some big players are getting ready to trust their finances to a community-owned software system.

The Malaysian Word kuali (“wok”) may soon be a catchword in campus business offices, thanks to a community software development project simmering on the stove and soon to be served up to higher education.

This spring, a $2.5 million grant from the Andrew W. Mellon Foundation gave a boost to the Kuali Project’s (www.kuali.org) development of a new open source financial system for colleges and universities. The founding partners, Indiana University, the University of Hawaii, the National Association of College and University Business Officers (www.nacubo.org), and the r-smart group (www.rsmart.com) have been joined by four additional partners: Cornell University (NY), San Joaquin Delta College (CA), Michigan State University, and the University of Arizona.

Is the time ripe for open source software to move into the core areas that have traditionally been dominated by the large, proprietary software vendors? Recent shakeups in the commercial software world—such as Oracle’s (www.oracle.com) takeover of Peoplesoft (www.peoplesoft.com)—may have helped pave the way for a more community-based approach to critical applications. The progress of the Sakai Project (www.sakai.org), a community effort to develop a course management system, has attracted wide attention.

We asked Brad Wheeler, associate VP of Information Technology at Indiana University, to make the case for Kuali. Wheeler is also the chairman of the Kuali Project Board.

We seem to have passed a tipping point in the interest in open source, community-developed applications for higher education. Is that what you’re seeing? At Educause 2004 in Denver, there was so much interest in open source and Sakai that even we were surprised. Sakai changed the atmosphere surrounding open-source application development in higher education. But I don’t think the real story is about open source or about particular products. What’s really momentous is the pace at which the higher education community is coming together to meet its own needs. We are taking a more active role in producing software that is tailored to us and produced under our terms, as we did with Internet2 (www.internet2.edu) and National LambdaRail (www.nlr.net). Sakai and Kuali are just the two leading projects demonstrating the model for software.

What motivates interest in a project like Kuali? There are two principle drivers: customizing to higher education needs, and retaining control of our own destiny through community ownership of the intellectual property rights. Maybe accounting is accounting, but managing multi-year grants or state procurement law, or the need to look at financial reports over different periods of time or different...
collections of units, really changes the picture. The needs of higher education are not the same as corporate America. And no two institutions are the same: Authority, governance, and budget processes differ hugely, and each institution needs the ability to adapt to changing needs over time. A new president, for example, might move an institution toward either responsibility-centered management, or centralized budgeting and control.

But isn’t Kuali based on financial software that IU developed for its own use? Can other institutions adapt and customize it? Aren’t too many things hardwired into the program? Kuali is based on the overall design of the IU software, not on the software itself. If we started with a blank piece of paper, the project could not be completed at this price tag. We’re moving the proven design from an old technology base to a new one. Of course, everybody has wish lists. So an impressive Functional Council is working on the requirements, from both public and private institutions, with Kuali.

With an open source option, there’s a competitive market for peripheral services—and sane rates.

a separate set of representative specialists who scrutinize each module. Our architects and senior developers from all the institutions have been meeting intensively to work out the Kuali nervous system, abstracting the business rules and deciding what should go in which layer. A strength of the project is having input from the seven founding institutions.

What resources must an institution dedicate to adopting Kuali? Does Kuali call for more internal resources than a traditional commercial application? As is, Kuali costs less than a commercial product. It takes a certain amount of expertise to install any software, and you can hire, rent or outsource that expertise, or even use an ASP [application service provider] model and buy the cycles “turnkey” from someone else. One advantage of open source is that it provides a marketplace for buying those services. You have more choices, not just the companies which have been certified in a product by that product’s vendor. A number of commercial firms are now interested in providing Kuali services such as hosting, managing Unix boxes, or even providing a Tier One facility. Or, you may want to do all that yourself, but rent the specialists you need on an as-needed basis.

Now that there’s an open source option and nobody has the intellectual property advantage, there is a competitive market for these services, and the rates will be saner.

Will smaller institutions be able to use Kuali? Kuali will work for schools in the smaller Carnegie classes. The core of Kuali is the General Ledger module. Transactions are run against that module and it supports reporting, routing approvals, and the Kuali workflow. A small liberal arts college with 2,000 students can keep the books even if it doesn’t need a sophisticated procurement process or grant tracking right away.

What other licenses do you need to run Kuali? Do they diminish the independence from commercially licensed software? Big schools are implementing Kuali on Oracle, but the software itself is being written with open database interfaces. It will be able to use MySQL (www.mysql.com) or DB2 (www-3.ibm.com/software/data/db2), for example. As far as the Java tools (www.sun.com/java) are concerned, the evolution of the Java programming language is still in the hands of Sun. But there are no licensing fees tied to Kuali.

Must an institution be a member of the Kuali group and contribute to the development project in order to be able to use the software? No. It is economically efficient to want to interact with the community, to participate fully in the collective, but nothing is required. Just like Sakai, Kuali is based on an OSI-approved license agreement. We basically say take the software, live long and prosper.

What are the auditors going to say when I tell them we are switching to open source financial software? That’s a great argument for us. Indiana University has extremely rigorous financial controls and internal audit. Passing the internal audit scrutiny of Cornell, Michigan State, and San Joaquin Delta College in California, which is a tough state, should help bolster confidence that the software is being looked at carefully from the auditing standpoint.

If Kuali and other projects like it are demonstrating that the community development model can work for higher education, will we eventually see an open source SIS system, or maybe even a complete higher education ERP system? Is a student ERP next? If somebody chooses to take the model and do that, great. Indiana University is not interested in developing an open source student or HR system at this time. Open source is not a religion for us—it’s economics. CT

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Supporting Family

There’s no reason for a prickly relationship between the help desk and university staff.

THERE ARE FEW relationships more potentially contentious than that between the IT help desk and the people it supports.

“Some faculty members have all the social skills of a porcupine,” a help desk manager recently told me.

Meanwhile, a faculty member complained, “There are people on that no-help desk who act like they’re doing you a favor by even talking to you.”

Not surprisingly, my inquiries about support to both campus support professionals and faculty brought in a wide range of responses at various volume levels. Each side had horror stories to tell about perceptions of arrogance, indifference, and incompetence.

Yet, both also expressed gratitude, respect, and liking for the people on the other end of the phone line. Let’s face it: Life on the hotline is seldom dull and boring for anyone. But caught between juggling scarce resources on one side and sometimes overly high expectations on the other, what’s a help desk manager or director to do?

First, you need to realize that what you are dealing with is an ongoing relationship within the context of a community, and act accordingly. Second, as with any relationship, you need to properly set and manage the expectations of both parties.

The Power of the Relationship

Many years ago, running my own help desk, I learned that my regular callers were far more likely to be cooperative simply because over time and many calls, we’d come to know each other and the rules of the game. They knew that I understood their needs, and that while I would do everything I could for them, I had very limited resources with which to work. If they let their frustration over a particular issue push them into screaming, they knew that my motivation to help them on that case and those to come would be reduced accordingly.

The reverse was true as well: I knew not to let my own frustration boil over at them, for that would cause them to lose interest in working with me. Ours was an ongoing relationship and the cooperative connection had perceived value for both parties.

The relationship between the faculty and the help desk is exactly that—a relationship—and it needs to be considered as such. It extends well beyond any given incident or transaction. The vital first step toward making relation-
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ships work is for *both* sides, help desk and university staff, to understand that a) they are in fact connected to each other, that b) there is value for both, and that c) the connection will persist over time.

The first challenge for the relationship manager (who may be a support director or VP, or even a CIO, depending on the size of the institution) is to bring the parties to an awareness of the relationship. The second is to keep the relationship going. That responsibility can’t be delegated to the faculty; they are focused on other things. If the relationship manager doesn’t make it happen, it isn’t likely to happen at all.

Every phone conversation or e-mail is an opportunity for relationship building and maintenance. Accordingly, all support staff should be trained to consider “enhancing the relationship” as one of the primary goals to be accomplished in the call-handling procedure. Use your incident-tracker to alert your team to the individual quirks and preferences of the campus “customers.” Designate an account manager to be responsible for specific schools or faculty members on campus. The account manager might not take all of the calls personally, but he or she should review every case involving designated faculty customers, to make sure that nothing falls through the cracks. Once per quarter, the account manager should call the assigned faculty member to check in, subtly emphasizing the relationship by giving a status report and asking for feedback.

**Manage Expectations, or They’ll Manage You**

You know how you define the term “support,” but that’s only half the picture. How do the faculty members define support? Does it mean, “Teach me how to use Windows or Linux”? “Recover the file that I didn’t back up”? “Get somebody over here in the next two minutes to fix my projector!”? All of these can (and probably will) be included with their expectations, and you may find yourself frantically scrambling and juggling resources, trying to meet those demands.

Yet, where do the faculty members come up with these expectations? Where do the members of your own team come up with their ideas about what their role is supposed to be? The most common source is stories, the tales we tell about past incidents.

From the very first moment a faculty member hears about the help desk in conversations with others, impressions and expectations are formed. Perhaps another faculty member has been venting, telling horror stories about unresponsive reps and failed events. Or, the reverse may be the case: faculty bragging about the “water-walker” in support who “saved the day.” Either way, the listener will use such tales to form initial assumptions about what the help desk is all about, and the kind of treatment he or she can expect to receive in the future. Your reps share their own stories, and such talk sets the expectations for their listeners, too.

If you’re aware of what is being said, you can adjust your ongoing staff training accordingly.

Most importantly, you can’t wait for the phone to ring or the e-mail to arrive before you start the conversations with the faculty about appropriate expectations. By the time the calls and messages arrive, the assumptions have already been made, based only on what users perceive as their own needs and priorities. The author of the working definition of support at your school needs to be both you *and* the faculty.

If faculty make requests beyond your capability to deliver, be prepared to honestly show them why such services are out of reach—and in the process of those relationship-building conversations, you might even recruit some allies and advocates for increasing your budget to extend your capa-

"The relationship between the faculty and the help desk is exactly that—a relationship."

Mikael Blaisdell is principal of Mikael Blaisdell & Associates (www.mblaisdell.com), an IT support consultancy.
IN THE NEVER-ENDING EFFORT to better serve students, faculty, and staff via technology, some college and university campuses take the kind of initiative—even out-and-out risk—that results in advances previously thought impossible, or at least, far down the pike.

The 13 institutions we highlight here and on our Web site have pursued their technology challenges with the kind of doggedness that should serve as a model to other institutions wondering just how far they can push their own envelope. Whether it’s to advance foreign language learning through the use of digital technology; attract new students from previously untapped regions via superb Web portal services and customization; or improve the management, tracking, and security of chemical materials on the campus, the colleges and universities in this special feature have taken the initiative and followed through with people, process, and technology each step of the way. Most critical to the success of these initiatives are the vision and leadership of particular campus administrators, faculty, and staff. Equally important, in many cases, was the campus/vendor partnership forged to support the challenge and see it through. For those readers facing their own similar challenges, we say: Use these stories for inspiration, guidance, and even to make contact. And don’t forget to continue reading at www.campus-technology.com/innovators.
INNOVATION: Bringing Digital Technologies into the Immersive Foreign Language Classroom

INNOVATOR: Defense Language Institute Foreign Language Center

Challenge
At the Defense Language Institute Foreign Language Center, Monterey (CA), Dr. Jack Franke (a professor of Russian and coordinator of the European and Latin American School) and his colleagues realized that using digital technologies in foreign language classrooms would offer new possibilities for learning, as well as efficiencies for the institute.

The appearance of portable MP3 players in 2002 prompted a search for a complete technology solution. The main challenge identified was to convert existing analog technologies to digital ones. To put this conversion into perspective: Previously, students were issued Walkmans with about 200 audiotaapes; today, they are issued an MP3 player and 12 to 15 CDs. The cost savings is more than a hundred dollars per student. Each year, the center trains 3,200 students with about 200 audiotapes; today, they are issued an MP3 player and 12 to 15 CDs. The cost savings is more than a hundred dollars per student.

Technology Choice/Project Design
One of the major technology components was to be the SMART board from SMART Technologies (www.smarthtech.com). The institute had considered GTCO CalComp’s InterWrite SchoolPad, but SMART boards had already been deployed in DoD and “We went with the tried-and-true,” Franke explains. The Defense Language Institute is the largest foreign language institute in the United States; consequently, it was not feasible to install 500 SMART boards in a short time. The project design called for those schools that had begun the digitization project earlier to receive the interactive whiteboards first.

The project evolved in three stages. TEC-1, the first phase of the Technology-Enhanced Classroom project, incorporated a portable SMART board and LCD that could be moved between classrooms. TEC-2, the second phase, was the intermediate stage during which SMART boards were installed into each classroom over 15 months. A computer and VCR were connected to each SMART board. TEC-3, the third and present phase, is the inclusion of notebooks in the classroom for collaborative learning and task-based instruction, along with a wireless networked campus.

Key Players
The key beneficiaries are both students and faculty. Textbooks were digitized into Acrobat format and MP3 files were embedded into the books. All exercises and laboratories were digitized in MP3 format and linked to manuals or textbooks. Rather than search through boxes of more than 500 tapes, the instructor can immediately find a given sound file or book electronically on the server.

Results
This project resulted in huge savings in time and money, both of which savings are invaluable in an institute that intensively teaches seven hours a day, every single day of the year. Instructors can now send textbooks and sound files across the globe instantaneously and distribute entire courses on a couple of DVDs.

The single biggest impact of the project is the ability to use digital files in any classroom or laboratory, anywhere on the campus network. There are also “teacher folders” for all the instructors, and a cross-fertilization process that takes place among faculty within the school and the institute, to develop best practices.

Surprises
Franke says that the biggest surprise was the amount of storage necessary for digitizing audio and video to be accessed on the server. But the biggest obstacle was the learning curve of the faculty, most of whom are immigrants from countries around the globe.

Next Steps
Presently, the institute is deploying TEC-3, the third phase of the Technology-Enhanced Classroom project, in which Franke hopes to eventually see wireless networks in use in the classrooms. Of critical importance is the need for information assurance, and the institute must remain vigilant in protecting the networks from hackers and predators.

The next steps are continued training of faculty, integration of new technologies into the project, and developing programs such as LingNet (www.lingnet.org) to satisfy specific needs and goals. The institute is building a data center to enable connections throughout the campus and to its graduates. Finally, the institute is building a Broadband Language Training System that will incorporate a high-speed broadband network and allow for a Learning Management System for both resident and non-resident training.

Advice
“I would advise others to build technical support into the equation from the very beginning,” says Franke. “It is imperative that you have backups when Murphy’s Law rears its ugly head; otherwise, technology becomes a disability.” He also suggests that if support is needed, visit other campuses or schools to see what works and doesn’t. And plan for the life cycle of the technology—try not to have to replace everything at the same time.

Related Links and References
Defense Language Institute Foreign Language Center (www.dli.mil); The Global Language Network (www.lingnet.org); Smart Technologies (www.smarthtech.com); Foreign Language Portal (www.lovelanguages.com); and the Computer-Aided Language Instruction Consortium (www.ca-lico.org).
INNOVATION: Increasing College Access via a Web Portal

INNOVATORS: University of North Carolina system/ California State University System/ Xap Corp.

Challenge: UNC System
The educational and political leadership of North Carolina realized that a shifting high school population with rapidly growing numbers of underrepresented, first generation, low-income students—combined with significant losses in manufacturing jobs—meant that the state had to increase its college-going rate to provide for a better educated population, in order to attract new business and industry. A one-stop Web portal, www.cfonc.org, was developed as the cornerstone of a statewide college access initiative that has become a national model.

Technology Choice/Project Design
An advisory group consisting of educators at all levels from across the state recommended that Web technology be utilized as the underpinning of the statewide college access initiative. Telephone technology was also included, providing a toll-free call center to offer comprehensive college planning information to individuals not able to access the Web. (All information is available in English and Spanish.) Since North Carolina had decided on a one-stop location to provide students with information about how to plan, apply, and pay for college, a comprehensive Web portal emerged as the most logical solution. The state had limited financial resources, so finding a comprehensive, one-stop Web portal resource was a challenge. But that challenge was met when Xap Corp’s Mentor System (www.xap.com) entered the picture. By leveraging the state’s resources with grants from the Lumina Foundation (www.luminafoundation.org) and GEAR UP (www.ucvt.org/GEARup), plus partnering with the state’s loan guarantor, funds for the project were raised.

Key Players
“The 110 public and private, two- and four-year colleges and universities in North Carolina are the beneficiaries of our Web portal college-access initiative,” says George R. Dixon, senior consultant with the National College Access Partnership at the University of North Carolina. The governor of North Carolina and his Educational Cabinet (consisting of the presidents of the University of North Carolina system, the North Carolina Community College system, the NC Association of Independent Colleges and Universities, and the state superintendent of Public Instruction), drove this project. Bobby Kanoy, senior associate VP, who works out of the UNC System office, coordinates the Web portal college access initiative.

Results
Dixon maintains that the evidence is clear that a powerful, robust, user-friendly college-access portal will impact student behavior and, ultimately, college-going patterns for underrepresented, low-income, first-generation students. Those are the groups benefiting most from information not easily or conveniently obtained previously. According to Dixon, CFNC.org was deployed in the fall of 1999 and has already seen incredible success. Over 800,000 student accounts have been created to date. The Web portal has 5,300-plus authenticated student visitors daily, staying an average of 16 minutes per visit. Thus far, over 225,000 admission applications have been submitted via CFNC.org. The college-going rate in North Carolina has risen from 57 to 65 percent in just five years.

Surprises
“The most pleasant surprise was how readily the entire educational community in North Carolina K-12, public and private, two- and four-year institutions and rallied around the college access focus and pulled together to help students better prepare for and a post-secondary experience,” says Dixon. “Gaining buy-in from the top, and including all engaged educational partners, is the key to success.”

Next Steps
Continuing to improve the portal’s career/academic/financial planning services is a priority, as well as moving all North Carolina institutions to exclusive users of the CFNC.org application because of the ease to students. Currently, about 90 percent of all 110 North Carolina institutions of higher ed use the CFNC application exclusively (the other 10 percent use it in addition to their own). All apps are customized to each campus.

Advice
Dixon says: Identify a highly placed educational administrator as “champion” for your state’s college access initiative; get early buy-in from all interested parties, particularly from admissions directors and school counselors.

Challenge: CSU System
In response to California’s fiscal pressures stemming from 1978’s Proposition 13 and the severe economic downturn of the early ’90s, California high schools have had severe reductions in the number of counselors available to help students learn about postsecondary educational opportunities. “This has contributed to the worst state ratio nationwide, currently 951 students to one counselor, based on a US DoE report,” says Allison Jones, assistant vice chancellor of Academic Affairs for the California State University System. An alternative had to be developed that could effectively provide the necessary information to help students and their families learn about post-high school educational opportunities.

Technology Choice/Project Design
CSUMentor (www.csumenitor.edu) is a Web-based portal system, also designed by Xap Corp. (www.xap.com). The portal was created in close collaboration with CSU campus administration and staff, with the vision of a student-centered (rather than a school-based) information system, available 24/7, and free-of-charge to students, families, counselors, and campuses. Xap’s founding CEO, Allen Firstenberg, saw both the frustrations of existing systems and the power of the Internet to bring people together from all across the state, despite the growth and diversity of the California population.

Key Players
California freshman and transfer students are the key recipients of CSUMentor, as it provides them with information about CSU campuses, admission requirements, the ability to track coursework to meet admission requirements, information about financial aid opportunities, the capability to transfer application data into the DoE’s FAFSA via the Web.
and the ability to apply online to any CSU campus. “Designing the project was a system-wide effort using CSU campus and system representatives, high-level campus administration, campus staff who work regularly with potential students, and central IT support to help guide Xap,” says Jones.

Results
Jones says the response to CSUMentor and its usage and growth has far exceeded expectations, with nearly two million online applications processed since its inception. For the college year 2003-04, nearly 95 percent of total applications received came through CSUMentor. “This percentage far surpassed CSU’s goal,” he says. Furthermore, CSU campuses have benefited from the receipt of electronic applications, allowing campuses to be able to build more effective and responsive enrollment management policies. CSUMentor has served as a guiding light for numerous other states that have subsequently developed similar Xap Mentor systems to respond to their educational community needs.

Surprises
CSU administrators continue to be surprised at the growing number of students who choose to apply electronically. As new systems are implemented, however, there is a learning curve. What’s more, although administrators assumed the campuses would immediately see the value of the online application (and some staffers did understand it immediately), other campuses took a couple of years to “get” the value proposition.

Next Steps
CSUMentor continues to evolve to meet the changing needs of the CSU campuses and their diverse student populations. A tutorial for the entire site has been implemented, and audio tutorial “walk-throughs” for students and counselors are provided to help students complete their applications.

Advice
CSUMentor is a model for portals because of its comprehensive approach to college admissions. To succeed faster, says Jones: Engage campus staff early on and involve the staff who directly affect the success of the project; during the design phase, discover the needs of the educational community; articulate goals and objectives—and be willing to accept change; and always be willing to revise the site to meet new needs.

Technology Choice/Project Design
According to Director of Purchasing and Business Services, John Riley, “We were a happy user of a previous eProcurement system, but it did not support our laboratory security and safety initiatives. SciQuest (www.sciquest.com) offers a Web-based system, the LifecycleT materials management solution, with a method of ordering and managing lab materials while also enhancing the research effort; it seemed to be the only supplier in the industry that met our research needs with a suite of usable products. Due to their experience with eProcurement, we knew what to look for, including standards, scalability, and extensibility. Our SunRISE system (Research Intensive Systems Enhancement; www.asu.edu/sunrise) utilizing the SciQuest technology is integrated with our financial management system, Advantage, from American Management...
Systems (www.ams.com). A key feature we were looking for was the ability to rapidly adopt system enhancements jointly developed with the 15 or so other large research universities using at least parts of the system. ASU included the following LifecycleT modules in the deployment: Chemical Manager, Supplies Manager, HigherMarket Selectsite (eProcurement), Spend Director (budget module), and Settlement Manager. Everything integrated with ASU’s WebAuth authentication—a secure, centralized authorization system that provides the user with a single sign-on environment. In fact, adoption of WebAUTH was a key driver, as were the hundreds of scientific suppliers already available in a science catalog, the ability to add ASU’s key suppliers, the ability to adopt business rules that allow approval of ASU purchasing card transactions, and integration of SunRISE to Advantage (although the team did have to build some interfaces that would translate the larger data fields available in SunRISE to the smaller data fields used in Advantage).

Key Players

Although the SunRISE system was initiated by Purchasing and Business Services, many key user departments, plus Administration and Finance II, play a direct role in its implementation. The system is part of a three-prong Laboratory Security Program being implemented university-wide. The Implementation Team is made up of 55 key individuals from departments that are directly impacted by the deployment of this system. The project is monitored by the VP of Administration, director of Purchasing, and director of Administration & Finance Information Technology. An eCommerce Team was formed in Purchasing and Business Services to drive the implementation and deployment effort.

ASU Department of Police Services and the Tempe Fire Department will integrate SunRISE into their new mobile systems, to identify hazardous materials when responding to laboratory emergencies. The university’s Environmental Health and Safety Department can instantly access the data needed for comprehensive reporting. Key stakeholders (e.g., research specialists/lab managers/lab safety officers; environmental health and safety officers; and departmental administrative personnel) were engaged early in the planning stages of the project, helped make implementation decisions, and also became early adopters. “SciQuest hosted many focus-group meetings for our team and several Webinars in their continuing development of the product,” says Riley. “They continue to be an important part of this project, and we meet on an ongoing basis as each stage is developed.”

Results

ASU is the first higher ed customer of SciQuest to implement a full-life-cycle chemical management system that tracks chemicals from researching a product, ordering the product, inventorying it in a stockroom, issuing it and then tracking the container, to disposing of it. Says Riley, “Because it is such a huge project that impacts so many different areas, and because of the complexity involved, we are still in the pilot stages of Phase One, implementation of SciQuest’s eProcurement module, and the deployment of the chemical management module. We discovered that many labs needed assistance in entering their existing inventory into the system. Accordingly, Purchasing and Business Services retained three of our most qualified laboratory science students to work full-time over the summer to complete this bulk data-entry project.” Riley also reports that ASU researchers find value in the capability to do advanced product searching, in the improved productivity created by identifying materials by all or part of their molecular structure or properties, in the ability to rapidly obtain internal stock that is excess to other lab’s needs, and in a vastly improved procurement cycle time.

Areas currently using the eProcurement module report that the Web-based system is easy to use, and they find it to be very intuitive. They can easily determine which materials are already available on campus and thus can be delivered rapidly; can compare products to identify the one most suitable for their intended need; and can mark containers as either available for disposal or available for redistribution.

ASU will now be able to facilitate research capacity by reducing the time researchers spend in material acquisition and chemical management. “We expect this system will reduce the time spent in administrative matters by a minimum of one hour per lab per week,” says Riley. “For our 1,000-plus labs, this is a savings of 52,000 hours per year, or the equivalent of gaining the research capability of 25 researchers per year. Competing on the basis of speed allows us to attract premier researchers through our ability to get their respective labs functional as fast as possible. We also now have the ability to expand our research efforts while complying with new security mandates. And the three laboratory safety officers from the Biodesign Institute, Chemistry, and Engineering have been especially effective in developing a master internal chemical database that would compose approximately 90 percent of chemicals used within the campus labs.

“But surprisingly, the greatest impact lies in the cross-functional relationships devel-

Materials and financial management integrate at ASU.

Surprises

Says Riley, “SciQuest did not have a great deal of experience with how higher education institutions function, in general. There were communication gaps that caused frustration on both sides. And because SciQuest products are continuously being enhanced, sometimes very rapidly, the sales people did not always know about new features. To their credit, however, we found SciQuest very responsive in resolving these concerns.”

Next Steps

ASU will continue to target specific departments for training in Phase One, while working with SciQuest to develop a comprehensive chemical database as the university moves into implementation of Phase Two.

Advice

ASU chose to be a beta site for the implementation of SciQuest Chemical and Supplies Manager. “Our greatest advice,” says Riley, “would be to make sure you conduct a complete feasibility study as to what your needs are versus what the product can deliver. Overall, this will save an enormous amount of time during kickoff and implementation.”

2005 Campus Technology Innovators
Challenge
As a major academic medical center, University of Miami’s Miller School of Medicine and the university’s Jackson Memorial Medical Center recognized early on the significant role of wireless networks in supporting the delivery of healthcare, education, and research activities. By enabling timely communications, a mobilized workforce, and providing real-time access to patient data, WLANs could improve overall patient care and increase the efficiency of healthcare delivery through better resource management and more streamlined administrative procedures. Additionally, with the blurring of lines between biomedical and IT disciplines, the university’s medical and medical education facilities saw the need to migrate to a pervasive WLAN deployment that could take full advantage of this convergence.

Technology Choice/Project Design
With millions of square feet of classroom, hospital, clinic, laboratory, and administrative space to cover, wireless networking would be a strong supplement to traditional cabled infrastructure, to provide network access. The medical school and hospital looked at several WLAN technologies and needed to find a product that was easy to deploy, required minimal maintenance, and minimized the site surveys required. Additionally, administrators knew they needed real-time rogue access point (AP) detection and mitigation capabilities. Standards, scalability, and extensibility were also key factors in choosing a wireless technology for the mobile healthcare strategy. The Miller School of Medicine is large, with many departmental moves and changes from one facility to the next. Administrators needed a platform that could easily support these constant shifts in density and coverage requirements.

Support for future applications was another key concern. The selected infrastructure had to meet the rigorous demands of current and future hospital applications, ranging from wireless patient charting systems and mobile EKG machines—beds that monitor patient vital statistics and relay them to nurse stations—to wireless video transmissions that educate patients about their health issues.

The WLAN initiative team eventually selected Meru Networks (www.merunetworks.com), because the entire Meru WLAN system could operate on one channel to deliver converged voice, data, and even video services with automatic coverage optimization and load balancing, to compensate for shifting user density and application loads.

Key Players
Clinicians/faculty, patients, hospital administrators, visiting professors, guests, and IT staff all stand to benefit from the WLAN. According to Chris Bogue, director of Information Technology, and Information Security officer, “Our primary technical lead was our network manager, Frank Rodriguez, with his technical support staff. We evaluated several technologies with a focus on providing information access anytime, anywhere at the medical center. The design centered on enabling secure access to electronic medical records, enabling future technologies such as wireless voice, video and data services, as well as upcoming RFID initiatives. We have a highly skilled network engineering staff experienced with wireless networking, telephony, and information security. Our primary concerns with deployment, management, and maintenance of a wireless LAN covering some three million square feet of indoor space were ironed out once we set up side-by-side pilots of similar WLAN technologies. We are currently working with IBM (www.ibm.com) to deploy a voice-activated communication system on the wireless network.”

Results
Wireless networking is a natural fit for a highly dynamic and mobile clinical environment. However, implementing wireless technologies in hospitals poses myriad technical challenges unlikely to be found in other mission-critical enterprise wireless networking environments. Says Bogue, “Our primary concerns were adherence to stringent security requirements, addressing numerous autonomous administrative domains, mitigating reliability concerns, addressing uncertainty surrounding device types and applications, dealing with limited IT resources, and constantly changing density requirements for voice and data services. Overcoming these challenges is no small matter. To do this on the scale of the University of Miami/Jackson Memorial Medical Center is tremendous testament to other institutions that the promise of mobile healthcare is indeed achievable.”

With the completion of Phase I, most of the U of M/Jackson Memorial Medical Center divisions—including the Bascom/Palmer Eye Institute; facilities in West Palm Beach, Naples, and Deerfield Beach; and several other clinics—have WLAN coverage and are tied together via private wireless bridges. To date, wireless APs have been deployed for student use in medical school lecture
Technology Choice/Project Design
OneCleveland began as an extension of the Case gigabit IP network. Gonick offers the technical details: The Layer 3 (L3) network, designed with the assistance of Cisco Systems (www.cisco.com) and now managed by Case partners at IBM (www.ibm.com), is built on an all-fiber-optic infrastructure capable of handling growth. Today, OneCleveland and its subscribers move gigabit-speed routing between the nearly 100 institutional subscribers and their respective multi-building facilities, accounting for more than 300 Cisco Catalyst 6500 Series switches. The network architecture consists of multiple 10 Gbps core and distribution L3 switches with multiple 1 Gbps uplinks to the address. OneCleveland’s network interconnects with Case as metropolitan area networks (MANs) building an L3 core, which will utilize Dense Wave-length-Division Multiplexing (DWDM) with 1-Gbps connections at the edge where...
subscribers join. Dual paths throughout make the network highly resilient and reliable. Gonick is watching the growing number of institutions within the OneCleveland community that are now making free public wireless services available as an additional layer of mobile connectivity at various museums and city, county, health care, and education facilities. Partnerships with OARnet, Platform Labs, Internet2, NLR, and the emerging OH1 provide OneCleveland’s subscribers either direct or aggregated access to these key regional and national transportation systems. Commodity Internet-bound traffic today approximates 500 Mb/sec and is scalable.

Key Players
Initially conceived and driven by Gonick, the design and rollout of the OneCleveland gigabit network effectively delivers nearly unlimited bandwidth to community partners (subscribers), helping to create a network and platform for innovation and provocative application development. Gonick offers a brief history and profile of OneCleveland: The initial OneCleveland Board includes partners from higher education—Case Western Reserve University, Cleveland State University and Cuyahoga Community College—plus the Cleveland Municipal School District, Cuyahoga County, the City of Cleveland, Cuyahoga Public Library System, Greater Cleveland Regional Transit Authority, Metro Health System, Cleveland Clinic Foundation, and ideastream (ideastream.org; PBS/NPR WLVZ/WCPN). The group of technology visionaries appointed by their CEOs was charged with the technical design, business case, and development of community mindshare. Over the past year, OneCleveland has been run by two executives, Scott Rourke (CEO) and Mark Ansboury (CDO), with an executive on loan, Dennis Risen, who serves as the organization’s technical director. From the outset, OneCleveland has also included technology vendor partners led by Cisco Systems, IBM (which successfully bid on network operations management), Intel Corp. (www.intel.com), Sun Microsystems (www.sun.com), and regional fiber company Cavalier Telephone. More recently, strategic relations with Time Warner Cable (www.timewarnergabcable.com), Adelphia (www.adelphi.com), and First Energy/First Communication (www.firstenergycorp.com) have provided better access to frontiers like Akron, Youngstown, and Canton.

Results
OneCleveland is much more than a fiber optic network delivering gigabit-speed connectivity and broadband wireless services to the region’s governments, schools, universities, museums, and healthcare institutions, says Gonick. It is both a vision and a technological platform for helping to reinvigorate the economic foundations of this once-leading manufacturing giant. “Most important, it has become a common rallying cry, both among those seeking the messy vitality of the Internet age, as well as the most-respected city elders who understand that their legacy is intimately linked to the success of OneCleveland,” Gonick observes.

Gonick points out the IT manager’s perspective: Case now has a model in which it is no longer trading off bandwidth for budget. By wholesaling commodity Internet access through the regional aggregation model, OneCleveland has removed what Gonick calls a “major Tylenol-3 headache,” and provided all of OneCleveland’s subscribers with nearly unlimited bandwidth for collaboration and the baseline activities of running the region’s public and non-profit assets. The growing ubiquity of wireless services has led to a significant paradigm shift in the management of technology within OneCleveland, says Gonick. Everything from how offices are built and how people work, to ways to procure and support mobile computing, has helped to introduce new opportunities and challenges.

From the perspective of business attraction and retention, and catalyzing new products and services, OneCleveland has helped to validate numerous new broadband wireless services being introduced among the network’s subscriber base. It has also helped to validate advanced, high-definition video-based services from television over IP to thousands of interactive video conferencing collaborations made possible by partnerships with Radvision (www.radvision.com). There is even some early experimentation underway with Sony (www.sony.com) and LifeSize (www.lifesize.com) in the area of near-high-def-quality video conferencing. New private sector investors and technology parks have been formed that explicitly leverage those public and non-profit institutions subscribed to OneCleveland. Building and construction developers are working with OneCleveland to design communities of the future. Innovators like Hexagram Inc. (www.hexagram.com) are now delivering meter-reading technologies (water, gas, electric) over Wi-Fi, another dimension of the digital city initiatives associated with OneCleveland.

Surprises
In very forward-looking projects, it’s sometimes difficult to separate the surprises from fulfilled dreams, but for Gonick, the most stunning and rewarding aspect of OneCleveland has been the growing number of collaborations that cut across traditional sectors and boundaries within the community. Meaningful collaborations—between the Cleveland Museum of Art and the Cuyahoga Public Libraries; between the Cuyahoga Public Libraries and Cleveland Hopkins Airport; among the regional health care providers; and among Case, Cleveland Clinic, Cleveland Institute of Music, and the Cleveland Municipal School System in the direct delivery of interactive, near-high-definition science education, healthcare education, and music education—are all underway. OneCleveland has also helped

OneCleveland has provided all of its subscribers with nearly unlimited bandwidth for collaboration, and for running the region’s public assets.
technology evangelists in helping to transform, or at least provoke, their respective institutions," says Gonick.

Next Steps
Through Case’s leadership, and with key help from key vendors like Cisco Systems, OneCleveland has been able to transform a city of smokestacks and heavy industry into a digital city of the 21st century where technology is leveraged in ways to meet the business, civic, and educational needs of the residents.

OneCleveland is now expanding beyond the boundary of its name, moving into neighboring Summit County in Northeast Ohio. The network has already attracted big business, and Gonick reports that businesses from as far away as Korea are exploring the network as a venue for testing new high-bandwidth applications. The capacity of the network is also very attractive to researchers and prospective graduate students, and is being used to market the university as a destination of choice for serious researchers.

Finally, over the next 12 to 18 months, OneCleveland will be offering additional value-added services to its subscribers, most notably support for the world’s first community computing platform. The Community Computing Platform, launched over the summer of 2005 with support from Sun Microsystems, will allow Case and the OneCleveland community to offer Web servers, blogs, Wikis, and other computational-based services running over OneCleveland to advance the community’s priorities.

Advice
Executive sponsorship matters, advises Gonick. Support from the CEOs, presidents, and thought leaders in the community is an essential prerequisite. Equally important, says Gonick, is “continuing to encourage the articulation of local community priorities; encouraging the leadership to take the ‘big bet’ has been vital.” Local community-based computing centers, students, faculty leaders, physicians, librarians, engineers, entrepreneurs, and wireless aficionados have all contributed to the dynamic of rising expectations and the articulation of needs, he points out.

Is success itself a challenge? Says Gonick: “We are now living through some challenges, including the challenge of delivering services to a growing number of institutions as well as to a growing geographic footprint.” But there’s no doubt about Case living through it, and thriving with OneCleveland.
Results
The College of Computer and Information Sciences has moved to SoftGrid for application delivery, and central IS has moved one of its public labs to it. The pilot for Xythos is being used by a couple of hundred people; rollout of both technologies to the entire campus will occur throughout the fall 2005 semester.

Two factors set this project apart: 1) NU is taking advantage of a relatively new technology—SoftGrid application virtualization environment—on a large scale; and 2) the solution is designed and delivered through collaborative efforts between central IT and a college unit, “too often not achieved on college campuses,” says Mickool, “but for us it has been a mutually rewarding partnership.”

Xythos changes people’s ability to share information easily, and makes their data portable so that they can access it in many more locations. This is important because NU users work in various locations at various times—behind a desk on campus, at home, at an Internet café. Because users have control of file-sharing capabilities, less administration is required by IT, which no longer has to set up a network share for particular groups or maintain access permissions. In addition, because users share files, they no longer will have to send many large attachments through e-mail, positively impacting overall bandwidth and performance. SoftGrid has many benefits:

Simplifying remote campus support and updates. NU can package applications at its Boston location and then automatically update all other sites. This eliminates the need to send technicians to remote campuses for updates, patches, and last-minute deployments.

Anytime, anywhere application access. SoftGrid’s ability to detach the machine from the user simplifies end user support and enables more flexible lab management. Because SoftGrid-enabled applications can be delivered on-demand, anyone can log on a computer at any location across campus or at NU’s remote sites and, via Active Directory, immediately obtain all their necessary apps.

Accelerating application deployments. By eliminating application conflicts, regression testing, and on-site deployment, NU can cut turnaround time for deployments in half.

Eliminating application conflicts. NU can run what were previously conflicting applications on the same client without concern—and without spending time on regression testing. This is particularly important for the lab environments, which run large numbers of applications with varying versions.

Surprises
“Honestly, the biggest surprises were that the solutions were cool and worked!” says Mickool. “They are really going to change our capabilities to deliver services and our community’s options for consuming them.” One big obstacle for the NU was users’ ability to rethink how these technologies would fundamentally change what they did and how they were doing it, in order to take the risk to change, Mickool explains. The other big obstacle was freeing up and scheduling people to work on these initiatives. “Everyone is so maxed out dealing with crises and maintaining the status quo, it is very difficult to invest time in initiatives that change the status quo, no matter how positive the long-term return is,” Mickool observes.

Next Steps
The next step at NU is to roll out the SoftGrid and Xythos technologies campuswide so that the institution can realize the maximum benefits. The university will then turn to using these technologies to really personalize the experience. The goal is to be able to automatically authorize and deliver applications to individuals through the university’s portal, and based on personal attributes. “Consider the possibility that when a student registers for a certain course, he is immediately given the ability to access and run the statistics package that is the required tool used in that course,” suggests Mickool.

Advice
“Press everyone to think differently,” Mickool advises. New expectations sometimes need to be met with revolutionary approaches, tools, and practices, he explains. He suggests looking at it from the point of view of how you as an individual would want to do business with your organization. “You don’t want to be treated as a faceless number or part of some vanilla, one-size-fits-all technology solution available 9 to 5, so why would our fellow faculty, staff, and administrators?” he asserts, adding, “Keep this mindset with you for the long term, but make sure you take small first steps so that you can implement them. Don’t get bogged down in trying to solve all the problems up front.”

Challenge
An historically black institution in Baltimore, MD, Coppin State is dedicated to helping its 4,000 students succeed in the face of obstacles. With limited financial support, many students must maintain jobs during the course of their studies, and their obligations at home sometimes precede their course responsibilities. Coppin State needed to offer its students a flexible, effective and inexpensive way to improve learning, studying, and information retention. In addition, the university was looking for a way to expand class time beyond the four walls of the classroom—all of which would give students a better opportunity to succeed.

INNOVATION: Dramatically Improving Student Note-taking and Class Retention

INNOVATORS: Coppin State University / Tegrity Campus

NEW NOTE-TAKING technology helps Coppin State traditional and non-traditional students meet studying challenges.
Technology Choice/Project Design
Coppin State chose the Tegrity Campus solution from Tegrity (www.tegirty.com). According to the university’s VP/IT and CIO Ahmed El-Haggan, “What struck us about Tegrity was that it was a technology that impacted and improved fundamental learning behaviors—listening to lectures, taking notes, studying—with minimal change in classroom behavior for both the instructor and the student. While the underlying technology is complex, it’s simple for our students and faculty to use, and can benefit all students, traditional and non-traditional. In terms of scalability and extensibility, the technology could easily be implemented across the entire campus in a short period of time; we employed a pilot program prior to implementation to ensure that it would be appropriate, beneficial, and worth the investment. Other technologies included in the deployment: Blackboard’s course management system (www.blackboard.com), already in place; Tablet PCs to capture written communication by professors; and audio and visual recordings, projectors, document cameras, and wireless microphones and cameras, many of which were already installed in our 40 ‘smart classrooms.”

Coppin State instructors continue to teach as they always have, and the students maintain their normal classroom behaviors, both within the institution’s existing technology infrastructure. The software simply provides anytime access to the recorded classroom experience. The addition of the Tegrity digital pen allows students (who do not wish to use or don’t have access to laptops and tablet PCs) to take handwritten notes during class. The technology then records the class or lecture (and lectures across campus), automatically populating the archived lectures in the university’s course management system. Later, students can view their notes online, exactly as written in their notebooks, and double-click on any notation to hear and see the professor explain a particular concept again. Or, they can replay the entire class online.

Key Players
Assessment and implementation of the technology (Learning on Demand, Coppin’s Tegrity Project) was a campuswide effort, and came under the auspices of the Information Resources Management Committee (including El-Haggan and other top administrators, and student affairs representatives), the Office of Information Technology, Office of the Provost, the Faculty Information Technology Committee, and the Student Advisory Board.

Results
The initiative resulted in saving students a great deal of study and learning time by allowing them to re-access classes and lectures at any time of the day or night. Response has been “overwhelming,” says Habtu Braha, chair of the Faculty Information and Technology Committee and professor of Economics. “Our students have jobs on top of their school work—many have responsibilities at home. They’re facing the pressure to succeed academically, despite considerable financial challenges. Now they have flexibility. They have an effective learning tool that conforms to their unique situation.”

Coppin State commissioned the A-HEC (www.a-hec.org), a non-profit research and educational organization, to conduct an objective survey of its students and faculty to determine the impact of the technology. Nearly 90 percent of the student respondents said that the new technology contributed positively to their learning, and 94 percent indicated their desire to use the note-taking solution in some or all of their future classes. Fifty-four percent indicated that they believed that the technology solution helped to improve their grades in the course in which it was used. “For our instructors,” says Sadie Gregory, provost and VP of Academic Affairs, “the enthusiasm and success that students are reporting has led to similar sentiments. The rate and extent of adoption by the faculty was unprecedented. We had originally designed the pilot project, which concluded this past spring, to involve two faculty using Tegrity for two courses. Due to high demand, we expanded the pilot to include 10 faculty and 12 courses. When we held our technology conference at the onset of the summer, to train the faculty on the technologies available to them on campus, we had a 99 percent turnout rate, largely due to the growing interest in this technology. At the conference, 30 instructors signed up for summer training, unpaid, in order to use the new solution in the fall.”

This summer, Coppin State’s Office of the Provost designed a mini-grant for the sum-

The rate of faculty adoption was “unprecedented.”

Surprises
Though welcome, the overwhelming adoption by the faculty was the biggest surprise. And while the larger-than-expected pilot program called for the enlistment of additional tech support, it was, for the most part, unneeded.

Next Steps
Coppin State is planning to equip all of its classrooms across campus with microphones and cameras to make the note-taking solution accessible to all students and faculty, and will also explore the possibility of investing in movable cameras that can “follow” the more mobile instructors. The university is also discussing the possibility of installing additional microphones in the classroom, aside from those worn by the professors, in order to better capture student comments and questions on audio recordings.

Advice
Says El-Haggan, “To get a feel for the technology, implement your own pilot program, or formulate a dry run where a select group of faculty and students are provided the equipment to use for a week or two. Introduce your faculty and students to the technology in advance of a course so that they are all well-prepared, and can take best advantage of the solution. Also, be sure to arrange for the appropriate technical support, if only to reassure the faculty and students that help is available when they need it.”

See additional innovators on our Web site at www.campus-technology.com/innovators.
RICH MEDIA

The word “rich” means different things to different people. Bill Gates can rightfully be called rich, with an estimated net worth of $50 billion. But in the world of academic technology, perhaps the most common use of the word “rich” is in conjunction with “media.” Rich media has become synonymous with just about every type of interactive technology, from collaborative whiteboards, video conferencing, and real-time online tutorials, to Web-based meeting software. These applications have emerged as the centerpieces of distance education programs at colleges and universities across the country. However, as these interactive technologies continue to evolve, experts say that only a handful of schools are employing rich media that is truly rich.

“A lot of what is available through rich media today is a copy of what we already have in face-to-face education,” says Rich Mayer, a psychology professor at the University of California-Santa Barbara who has studied rich media for the last decade. “What we need is media that truly promotes learning—media that takes what already goes on in the classroom environment and makes it that much better.”

Redefining Med School with Rich Media

Technologists at the University of Vermont have answered this call with authority. In August 2003, the university’s College of Medicine—where all incoming medical students receive a laptop when they arrive on campus—unveiled a new integrated medical curriculum that revolutionized the way medicine was taught. Instead of separately teaching subjects such as gross anatomy or the nervous system, the school reorganized its curriculum to embrace a more holistic and interconnected approach.

Under the new system, for instance, students would learn about the physiology of the heart while they dissected one. According to Jill Jemison, eLearning manager for the College of Medicine, the idea was to build a new curriculum that revolutionized the way medicine was taught. Instead of separately teaching subjects such as gross anatomy or the nervous system, the school reorganized its curriculum to embrace a more holistic and interconnected approach.

University officials dovetailed the debut of their new curriculum with a new technology component that revolved almost exclusively around rich media. Working within the confines of a learning management system from Blackboard (www.blackboard.com), IT staffers developed a bevy of new interactive technologies designed to incorporate real-world learning from real-life doctor/patient situations. This effort began with exam-building software from Respondus (www.respondus.com) that enables faculty members to upload existing or new question pools from word processing programs, and combine those with audio or video files in the Blackboard system, to deliver Web-based tests. All questions are approved by a committee, and all questions correspond to 900 “competencies,” or learning objectives that UVM faculty have identified as central to what it takes to become a doctor.

“The way we do it, all learning activities are informed by this giant database of what someone
disciplines such as histology and notes that the review tool is particularly ten words, audio, video, and more. She access to files in a variety of genres: writ-
ing and distributing exams with the help of interactive technologies, UVM’s approach also uses rich media to make sure no one is cheating. Thanks to tech-
ology called Securexam from Software Secure (www.softwaresecure.com), the school administers Web-based exams in a secure environment that literally locks down all other computer functions until the test is complete.

In order to make sure students take exams in a controlled environment, test-taking students must report to proctored exam rooms and log on to their laptops. Securexam’s browser automatically pop-
ulates part of the exam password, based on its encryption technology; for added security, the rest of the password is sup-
plied by the proctor. The technology even facilitates off-site exams, too. Thanks to the lockdown browser approach, all that the students need in order to take the test outside of the college’s Burlington cam-
pus is a computer room and a proctor.

The final piece of UVM’s rich media puzzle comes in the form of SearchLX, a powerful search tool from Learning Objects (www.learningobjects.com). The tool enables students and faculty members alike to search all of the content in the Blackboard learning management system. Jemison bills it as a “stellar” review tool for students, giving them access to files in a variety of genres: written words, audio, video, and more. She notes that the review tool is particularly useful for some of the image-based disciplines such as histology and

INSIDE RICH MEDIA

A number of rich media experts say that a surprising number of students fall victim to issues pertaining to firewall controls. The problem arises because at a time when identity theft and other security threats are at an all-time high, few students have their personal firewalls configured to allow incoming data to stream unchecked.

in the Blackboard learning management system. Jemison bills it as a “stellar” review tool for students, giving them access to files in a variety of genres: written words, audio, video, and more. She notes that the review tool is particularly useful for some of the image-based disciplines such as histology and

educators work solely with distance edu-
cation students interested in developing the next wave of rich media. In the process, they employ the latest and greatest forms of rich media and interactive technologies, says IIT Assistant Director Karl Kapp.

The program’s rich media immersion begins with homegrown audio sensor software that allows instructors to engage in two-way audio communication with their students. Next, with the help of Java-
based Symposium conferencing software from Centra (www.centra.com), instructors can also break their classes into groups, and students in those groups can interact in real time through collaborative whiteboards.

To further enhance communication between students and instructors, IIT uti-
izes ECP Connect, a program from Interwise (www.interwise.com) that manages data and voice conferencing. It has also employed the new Breeze product from Macromedia (www.macromedia.com), which essentially is designed to enable users to participate in online meetings and conferences where they can share presentations, view videos, conduct polls, chat, and more. “This combination of technology enables us to quite literally sketch out ideas as they materialize,” says Kapp. “The notion of doing that online is simply revolutionary.”

While Breeze is the newest compo-
nent of IIT’s repertoire, the real high-
hlight of the program is its commitment to rich media applications that incorpo-
rate real-time video as a learning tool. The school’s reliance on digital video conferencing is nothing unique, but in addition to broadcasting video-over-IP along with voice and text, IIT also incorporates Macromedia’s Captivate software to record an instructor’s on-
screen mouse movements for those hard-to-follow instructional lessons. With the help of this step-by-step learning tool, IIT offers rich media classes in many of the products actually used to create the rich media: Dreamweaver, Flash, and Authorware from Macromedia, as well as Photoshop from Adobe (www.adobe.com), and more.
The IIT program is a one-year endeavor, followed by an internship or dissertation at program completion. In addition to the abundance of technological knowledge, the program also strives to impart to students something about the theory of rich media. Here, Kapp says the emphasis is distributed in every class where educators are encouraged to help students uncover which specific applications of rich media are truly rich. Will video enhance this lesson? Does an audio file add anything other than bandwidth? By asking questions like these, Bloomsburg University educators get students to think critically about how to apply the technologies they’re learning about, and how to apply those lessons to field experiences in their internships and beyond.

“At the end of the day, there’s no better way to teach students about interactive technologies than to use interactive technologies,” says Kapp. “Everything about our program—from the subject matter to the lessons themselves—is designed to embrace the richness of rich media completely.”

Alternate Approaches

At the Wharton School of the University of Pennsylvania, technologists have explored different types of innovations in interactive technologies for synchronous communication, but one of their most successful undertakings operates asynchronously, as faculty members and students see fit. These rich media efforts revolve around a collaboration program called Webcafé, a glorified bulletin board designed to facilitate collaborative study partnerships, as well as extracurricular project planning for activities in and around the Philadelphia community.

The effort began back in 1998, as a portal for students in only 25 select classes. By 2003, every student in the school’s 450 business and management classes was given the opportunity to use it. Today, Webcafé is open to all students and faculty members, plus some staff, with 7,500 concurrent users at any given time. Rob Ditto, senior IT project leader, says Webcafé has become one of the most commonly used technologies on Wharton’s campus, second only to e-mail.

To use the system, users simply log on with a standard Web browser, from wherever they might be. Behind the scenes, Webcafé runs on software from EMC Documentum (www.documentum.com), an enterprise content management tool that helps users create and share any number of files, including digital text documents, engineering drawings, still images, audio and video files, and many others. Ditto says he wrote a separate program that enables students to upload assignments to a secure server, and allows faculty members to exchange comments with students in a secure environment that stores the comments as part of a gradebook database. The software also features more lifestyle-oriented collaboration spaces, which students use for more practical purposes such as maintaining a database of summer sublets, or voting on which stocks are the best bets for investment.

“For both students and faculty members, this simple approach really does enhance everyday goings-on around Wharton,” says Ditto. “We found this was the best way to build upon what happens in our classrooms.”

Because it is asynchronous, the Wharton solution addresses one of the most prevalent stumbling blocks for rich media: bandwidth. Generally speaking, most interactive technologies sap gigabytes of network bandwidth, so institutions that run mission-critical applications on the same network may not have much bandwidth left for the rich media apps.

Another element of the bandwidth issue revolves around student connections: Streaming connections require 150 Kbps of bandwidth, or roughly one-third of standard DSL line throughput. Short of requiring all students to have a connection of minimum speed, there’s no foolproof way for a school to ensure that all students are connecting at speeds that enable them to follow instructors in real time. In most cases, when bandwidth is an issue on either side, at least some students will experience five- or 10-second delays, effectively rendering the benefits of rich media useless.

To ensure that bandwidth isn’t a problem for their students, technologists at the College of Engineering at Villanova University (PA) have whipped up a blend of old-fashioned technology and even more archaic transportation. At the end of every distance education class, IT staffers help faculty members wrap class materials into Zip files, usually no larger than 150MB. Next, depending on a student’s connection, the staffers either make these Zip files available for standard download, or they burn the files onto a CD-ROM and then send $5 or $10 to overnight it via the US Postal
Service. With this approach, Seán O’Donnell, director of Distance Education, says that instead of downgrading quality to serve the lowest common denominator, the school is able to respond to the individual needs of students with all types of connections.

“We’re ready for anything,” he boasts. “But believe me, if you’re a distance education student paying for one of our distance education classes, you wouldn’t want to go into the race with a Pinto, you’d want a Porsche.”

**Stumbling Points**

As O’Donnell explains, schools can work to eliminate bandwidth as a problem for rich media on campus. One obstacle that has established itself as a more formidable challenge to the development of rich media is “educator comfort.” According to IIT’s Kapp, educators in fields such as engineering and science are comfortable enough with technology to explore new products as they come out. However, in fields such as English and history, where educators don’t rely on technology nearly as much or as frequently, Kapp says faculty familiarity with rich media drops dramatically, necessitating a learning curve that can debilitate a push for change.

In the latter cases, Kapp says faculty members are most likely to use rich media to do nothing more than mimic the experience in the classroom. While these educators might go through the trouble of hooking up a streaming videofeed during lectures, the application won’t offer anything beyond this feed itself, a poor experience in the classroom. While these experiences might be a great learning tool, they are comfortable enough with technology to explore new products as they come out. However, in fields such as English and history, where educators don’t rely on technology nearly as much or as frequently, Kapp says faculty familiarity with rich media drops dramatically, necessitating a learning curve that can debilitate a push for change.

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One way to increase educator comfort levels with rich media is to make it easy for instructors to take advantage of the technology as a way to supplement what goes on in class. At Drexel University (PA), for instance, the school’s IT department launched what they call a “Rich Media Drop Box” to automate the process of digitizing content to be used with interactive technologies. The system hinges upon command line encoders from Sonic Foundry (www.sonicfoundry.com), which cost about $20,000 apiece.

To use the system, faculty members drag and drop text, audio, and video files into a special folder on the school network; the files are then transported to an encoding farm, where they are converted into digital content that can be used in just about any rich media environment. Access to this encoded content is through RSS syndication. According to John Morris, Drexel’s coordinator of Academic Technology and Web Services, the school processed more than 400 objects during a recent 10-week pilot program with 10 faculty members.

“Once the faculty members learned that this made it easy for them to digitize content, the Drop Box was something that really resonated with our faculty members,” he says. “One way to ensure rich media is rich is to make it accessible for everyone.”

Even with accessibility bases covered, rich media presents two other sizable challenges for colleges and universities looking to increase interactivity across the board. First is security—Villanova’s O’Donnell and a number of other rich media experts say that a surprising number of students fall victim to issues pertaining to firewall controls. The problems arise because at a time when identity theft and other security threats are at an all-time high, few students have their personal firewalls configured to allow incoming data to stream unchecked.

What’s more, when students log on to a rich media application, and their operating system asks them if they want to allow the stream through the firewall, many students decline because they are afraid of leaving their machines vulnerable to attacks from elsewhere on the Web. Perhaps the biggest challenge with rich media is the way a school uses it to support human cognition. Mayer, the UCSB psychology professor who also authored the recently released Cambridge Handbook of Multimedia Learning (Cambridge University Press, 2005), has studied the cognitive science since 1995, and insists that there’s a huge difference between a technology-centered approach and a learner-centered approach.

In theory, Mayer says that rich media can be a valuable tool. In practice, however, he insists that few, if any, schools actually use the technology the way they should. Looking forward, Mayer notes that in order for rich media to be more than just a fad, inventors must devise a way for users to rely upon rich media for something that extends and amplifies the ordinary classroom experience without detracting from it at all.

“We’re not even close to seeing rich media that, for lack of a better word, is rich,” he says. “The technology has the opportunity to revolutionize learning, but if it’s developed poorly, we will turn off more people than we attract.”

Matt Villano is senior contributing editor of this publication.
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The wheels of payment processing can grind exceedingly slow, but ePayment advances are changing all that.

As tuitions continue to rise, some colleges and universities are revolutionizing the way they accept the big bucks: They’re accepting payment electronically. Whether through online credit card transactions or electronic payment systems that enable students to transfer tuition money from a bank account to the bursar, a growing number of institutions are looking at innovative ways to increase convenience and respond to student demands.

Among these innovators are Indiana University, the University of St. Thomas (MN), the University of Georgia system, Thomas Edison State College (NJ), Bowdoin College (ME), and Abilene Christian University (TX). Here are their stories.

To infiNET, and Beyond
Making good on one’s tuition bill at Indiana University used to be a lot like making good on a parking ticket. The school printed bills and mailed them off to the parents of students. Parents, in turn, would write their checks, stuff them in pre-addressed envelopes, and send them off to a lockbox processor at a bank. Sure, parents could come to the bursar’s office and pay in person, but most opted for the mail.

As a result, the tuition payment process took days, sometimes even weeks, in cases where a parent was delinquent or bounced a check. After years of dealing with unpredictable cash flow, IU school officials set out to change the system forever on most university campuses. The goal, says Barry Walsh, senior director for eBusiness Services, was to find a way for parents to pay tuition faster and boost cash flow across the board.

After building a homegrown solution to handle electronic payments, Walsh improved the solution with QuickPAY, an electronic payment portal from infiNET (www.infinet-inc.com). Today, once students register for classes, the portal offers parents two different options for paying tuition bills online: First, parents can pay with a credit card, much the same way they’d...
order books or music from Amazon.com. Alternately, they can pay through what’s known as an Automated Clearing House, or ACH, which is essentially a debit card payment that deducts directly from a bank account. On the back end, Walsh and his associates receive notification every morning regarding how much money was paid electronically the previous day.

The best part? Rather than waiting for check transactions to clear, the money is transferred immediately, and all delinquent payments are the responsibility of the credit provider, not the school. “We were trying to squeeze cost out of the value chain,” says Walsh. “By eliminating human steps in the process, those resources can be directed to something more value-added than collection.”

Eliminating Chargebacks
At the University of St. Thomas (MN), technology officials recently adopted QuickPAY for a completely different reason. Prior to 2005, the school’s only electronic payment option for tuition was credit card payment through its Peoplesoft (www.peoplesoft.com) ERP system. Because the state of Minnesota does not allow private institutions to directly charge the credit card “chargeback” fees back to the cardholder without the assistance of a third party (see box, page 49), St. Thomas was losing money each and every time a cardholder paid a bill.

Toward the end of 2004, Treasurer Susan Rose launched an exhaustive effort to find a third-party vendor to recoup the chargeback fees from cardholders, and line up an alternate electronic payment system option to facilitate ACH transactions that deducted tuition payments directly from user bank accounts. The effort culminated in January 2005 with the school’s launch of infINET technology to meet both needs.

The new alternative had an immediate impact. While prior to the new system, 40 percent of St. Thomas’s students paid their tuition bills online with credit cards, Rose says that with the new mix of ACH payment option, chargeback plan, and eBilling, online payments are up 145 percent, with a 31 percent increase in online credit card payments alone. Rose estimates that more than 60 percent of all St. Thomas students are paying for school without ever writing a paper check.

More importantly, in the first quarter of 2005, credit card costs to the university were down by 81 percent. Rose proclaims this combination of strategies is cementing the effort to drive more students to pay online, eventually eliminating paper and in-person payments altogether. Along the way, she adds, the school has been able to automate many other finance operations, as well.

“Our ePayment initiative has helped to streamline everything,” she says, noting that while the school previously catered lunch for finance employees during registration week so they could work straight through, this year, Rose plans to take the staff out to lunch to celebrate the automated process and the recouped fees. “Providing electronic payment is one thing, Providing it without the fees is something else.”

Federating via TouchNet
When it comes to electronic payments, infINET isn’t the only option. Over the last few years, institutions have turned to solutions from CASHnet (www.cashnet.com), Paradata (www.paradata.com), and Diebold (www.diebold.com) to enable students and their parents to pay tuition online.

Technologists with the Board of Regents of the University of Georgia system have chosen yet another alternative for their 35 colleges and universities: a commerce management system from TouchNet Information Systems (www.touchnet.com). Some of the larger schools in the University of Georgia system have independently offered dif-
and standardize the security of critical financial information.

Of these, Graham says the goal to increase security is a top priority. In the past, because institutions chose their own systems for electronic payments, there was no security standard; some systems were more vulnerable than others. In a few cases, Graham admits, banking information was potentially compromised. Under the new system, however, all UGA schools must adhere to top-notch security inherent in TouchNet’s technology.

“Do I think everyone will adapt to this transformation overnight? Not at all. There’s quite an effort that goes into changing the mindset of a user base,” he points out. “No matter how we look at it, though, for all of us to be unified on one system just makes more sense.”

While the University of Georgia system turned to TouchNet to help manage geographic diversity, Thomas Edison State College (TESC) called upon the vendor to help manage billing and electronic payments for its virtual campus. The school, a state institution with nearly 11,000 students, is a center of distance learning. From its inception in 1972, TESC relied upon telephone operators to register students for classes every other month. Most students would dial into the school’s Trenton, NJ headquarters, enroll, and read off their credit card numbers to an operator at the other end of the line. Some students would employ an even lower-tech strategy—selecting courses from a printed catalog, and mailing in a form with a check. Behind the scenes, operators would transfer billing information to the school’s bursar, who would process it accordingly. The whole process took weeks.

Then, more recently, CIO Drew Hopkins and Bursar Philip Sanders joined forces to modernize the entire approach and make electronic payments a reality. The duo purchased the TouchNet Commerce Management System, and had in-house programmers customize it to interface automatically with the school’s Colleague ERP system from Datatel (www.datatel.com).

In no time, the new system generated so many efficiencies that Hopkins and Sanders redeployed elsewhere three of the four employees who previously spent whole days entering data from phone and mailed payments into the computer. Eventually, these efficiencies opened up other avenues for TESC, too; once managing billing and payment cycles became easier, the school expanded its registration to a monthly schedule (instead of every other month),

THE CHARGEBACK DILEMMA

HANDLING PAYMENTS electronically isn’t as easy as it seems. Ever wonder how credit card companies make their money? Aside from financing charges, the answer is simple: chargebacks. Every time you pay for something with a Visa (www.visa.com) or MasterCard (www.mastercard.com) credit card, the vendor sends a small percentage of the transaction directly to those credit providers. This fee is transparent to buyers; in most cases, vendors simply have subsumed chargeback fees into the price of every object. At colleges and universities, however, it’s not that simple.

Many schools, including Indiana University and the University of St. Thomas (MN), have gotten fed up with losing the 1 or 2 (sometimes 3) percent chargeback fee to credit card companies. Do the math: If students are paying upwards of $10,000 or $12,000 a semester for tuition, and they’re charging the money on their credit cards, guess how much schools are forking over in chargebacks? A lot—in some cases upwards of $300 per transaction.

In response, these schools and others are fighting back, preventing students from using Visa and MasterCard credit cards so that institutions don’t have to pay chargebacks at all. Interestingly, these schools also have aligned themselves with big-box retailer Wal-Mart, which is currently embroiled in a lawsuit with Visa over the chargeback issue. Barry Walsh, senior director for eBusiness services at Indiana, assails the chargeback as an “ugly” part of the payment business, and says it’s hard to justify the convenience of online credit card payment when the non-profit public school forks over thousands of dollars a semester to the credit card companies.

“For small schools, it might not be that much of an issue,” he says. “But for big schools like us, you’re talking about a ton of money going right back to these guys.”

A handful of schools have devised creative ways to counterbalance chargebacks, adding universal service fees (usually $55) to every credit card transaction, no matter what the amount. Since Visa doesn’t allow convenience fees on its transactions, however, most schools have employed another solution: Automated Clearing House, or ACH, a debit card payment that deducts directly from a user’s bank account. Will the chargeback issue drive more schools into the arms of electronic payment systems that focus on ACH? Stay tuned.
a move that has resulted in what Hop-
kins describes as modest but steady enrollment growth.

“We anticipated some degree of enrollment growth with [automated electronic payments], but we never anticipat-
ed it so quickly,” says Hopkins. “Never in our wildest dreams did we think our sys-

Variations on a Theme

Bowdoin College performed an experiment in mid-2004 that had interesting results. CIO Mitch Davis and some of the school’s IT staffers set out with a video camera to chronicle the process of a new employee getting hired and paid. The video crew followed paperwork from one person to the next, recording every step along the way.

When all was said and done, the tape had recorded more than 50 manual steps—a whopping number even by Davis’s standards, and he was relatively familiar with the school’s antiquated approach. The tape was not for naught; after watching it again and again, Davis embarked on a thorough process review to fix all of the inefficiencies with the hiring system, and with the school’s payment systems in general.

In May of 2005, this effort led the liberal arts school to purchase a pair of new financial software packages from financial management and business intelli-
gence vendor Blackbaud (www.blackbaud.com). One system, The Financial Edge, will tackle financial management by enhancing communication across all monetary and payment systems, and will automate all of the payment processes Davis documented in his video.

Specifically, this is expected to help college officials ensure that the organiza-
tion uses the annual budget as a man-
agement and planning tool to make resources go farther, automate purchasing for tighter control of spending, and decrease the amount of time spent on tracking money it is owed. While the system does not yet enable students to pay tuition bills online, Davis says this feature will be available soon, as the

At the University of Georgia System, John Graham says increasing the security of the payment process is a priority. Previously, with disparate systems across UGA, there was no security standard at all.

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But the system was far from perfect. It required hours of maintenance; performance was spotty.

By 2003, the old billing software was in dire need of replacement. That’s when Gary West, director of Student Financial Services, set out to find a new system. West investigated a number of electronic payment systems, but all of them meant revolutionizing billing to the point of generating two or three bills (for tuition, housing, campus purchases, etc.) each month. Instead, he wanted a new system with minimal change for the end user.

Ultimately, West decided that the best solution was to improve the old ACU system with an electronic billing service from Sallie Mae. The solution, technically referred to as a managed service, has made Sallie Mae’s technology the centerpiece of ACU’s financial applications. The school runs a file that produces a snapshot of each student’s account at the time of a bill.

However, instead of printing bills itself, the school sends these digital files electronically to Sallie Mae, which reorganizes some data elements, prints the bills, stuffs them into envelopes, and mails them out. Sallie Mae receives payments via the US Postal Service and online, and processes every one of them. Most importantly, Sallie Mae agreed to send ACU its money daily, instead of holding the payments for 15 to 30 days to earn additional revenue from interest, as some other vendors do.

For end users, the process is seamless. But behind the scenes, West says that switching to this electronic model has made everything about billing and payments easier and more efficient than ever before.

“We’ve essentially outsourced our entire billing and payment functions,” he says, adding that Sallie Mae charges roughly $1 per statement. “Our bills look the same, but we’re handling a fraction of the work we used to, and I’d say everyone is better off.”

Matt Villano is senior contributing editor of this publication.
99% of Companies Have Firewalls or Antivirus Software.

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The advent of wireless computing has provided educational communities at all levels the speed and flexibility for connectivity once thought nearly impossible without traditional wired Ethernet installations. This relatively new technology raises several cautions, however, that need to be examined before making the decision to integrate wireless with existing infrastructure, or building a network from the ground up. We must also consider how this effort can be applied, what hardware is used in sending and receiving wireless, and most importantly, how the learning process can be enhanced with its use.

Philip Mugridge, director of academic computing for Eastern University (PA), recently addressed these issues for EU, and his thoughts are behind the following contexted responses.

Let’s first examine some of the basic terminologies, standards, and hardware. Wireless involves the use of radio waves...
transmitted and received through access points located in strategic areas of a room or building. The access point is hardwired back to a switch or hub, which relays the data to a server or out to the Internet. Desktops or laptops are equipped with wireless network cards which send and receive data to the access points at specified frequencies within established protocols and standards.

Three wireless standards are in use today: 802.11a, 802.11b, and 802.11g. Most widely used is 802.11b, commonly known as Wireless Fidelity, or Wi-Fi. It provides data transmission comparable to a typical wired Ethernet connection at 11Mbps. Its range is around 300 feet, making it suitable for most home and small business installations and LANs.

The most recent standard, 802.11g, builds on the previous two protocols and is backwards-compatible with both .11a and .11b. It can transfer data at more than 54Mbps, up to 275 feet. Both .11b and .11g standards work on the 2.4Ghz frequency.

Hardwired installations utilizing Ethernet cable (with Category 5, 5e, or 6 wiring) provide the safest, most dependable and secure method for sending data over long or short distances. Because the cable is shielded and installed in ceilings, walls, and under floors, it is far less subject to outside interference, and gives consistent data transmission rates.

The Ethernet wire is connected to a desktop or laptop computer on one end, and a patch panel and switch on the other. The switches are then connected by fiber or in older installations, copper) to central servers. Installation is labor-intensive, often requiring extensive planning to overcome older building design. Costs vary, but an outlay of $125 to $175 per jack is typical, in addition to costs for switches, racks, and switch closets.

**Caveats**

Ethernet installations are essential for high-traffic, ultra-secure applications. Engineering, design, database, and other traditional uses require the bandwidth and stability inherent in Ethernet, which is a mature technology. Wireless, on the other hand, is an emerging process. While security is rapidly evolving to meet the needs of all administrators, there are still shortcomings that may allow unauthenticated users to “sniff” for a wireless network without cables or in-room switches. Adding wireless to a popular gathering spot enables students to check e-mail, send messages and files to friends or professors across campus, and allows collaboration on a scale impossible even three or four years ago.

**Side Benefits of Wireless**

The growing pervasiveness of this technology has simple origins: As consumers, a typical wired Ethernet connection at 11Mbps. Its range is around 300 feet, making it suitable for most home and small business installations and LANs.

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**Side Benefits of Wireless**

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Most important, wireless is a facilitator on several levels: With proper authentication/encryption, accessing student data from residence halls and public areas is safe. Students can thus collaborate on the Web, check course syllabi, instant message friends, send assignments to their professors, and check on the status of their laundry from their residence hall. Parents can access student accounts from home, deposit money in individual school debit accounts, and provide for their children many, many miles from home.

Pervasive computing and attendant issues follow both student and professor into the classroom. Because a laptop, tablet, or PDA in class is such a departure from the traditional notebook, paper, and pencil, some professors may be wary of the inherent distraction of Web accessibility during instruction. Browsing the Web or instant messaging a friend during a lecture can be a common occurrence; taking notes can become secondary to instant entertainment. At that point, allowing laptops in class for note-taking may not be the best answer to meeting students’ needs for technology.

It is important to recognize that technology in general (and computing in particular) has a socio-personal element that students easily integrate into their lives. Collaboration is as important to today’s users as the “blog,” a highly individualized response to thoughts, opinions, and trends on the Web. Contrast this to the first generation of computing, which saw a much longer period of adjustment to what essentially were business tools and the occasional electronic bulletin board.

Wireless computing, whether incorporated into new construction or added to existing structures, can revitalize classroom instruction. If laptops are viewed as portals rather than notetaking word processing tools, opportunities arise for the entire class to concentrate on the same statistical data, database, or political Web site while being challenged by the professor to solve the daily dilemma. Facts can be checked instantly, curriculums viewed (MIT’s Open CourseWare, a revolutionary concept wherein hundreds of actual classes are offered free on the Web, is a good example; ocw.mit.edu/index.html), and opinions shaped and changed as the discussion develops.

All of this can be facilitated by a wireless laptop cart wheeled into a standard classroom equipped with an access point. Most exciting, perhaps, is the idea that the Socratic method and technology can merge seamlessly without wires. Learning can take place using tools that students have assimilated since grade school. Wireless takes the process one step further, allowing them the freedom to take those tools to the next classroom, dorm, or back home, to continue reaching for and responding to knowledge. Our challenge: to creatively channel this integral relationship between student and technology, while recognizing its potential to continually expand educational horizons.

David Black is President of Eastern University. SunGard SCT (www.sungard-sct.com) is publisher of President to President: Views of Technology in Higher Education (2005), from which this article is excerpted, and is corporate sponsor of the New Presidents program. Marylouise Fennell, co-editor of President to President, is coordinator of the New Presidents program, and senior counsel to the Council of Independent Colleges (www.cic.edu). Scott D. Miller, also co-editor, is president of Wesley College (DE), and chair of the program.
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NOT LONG AGO, a highly publicized report suggested that the eLearning boom had gone bust. The report, *Thwarted Innovation: What Happened to e-Learning and Why* (Zemsky and Massey, University of Pennsylvania, 2004; www.irhe.upenn.edu/WeatherStation.html), took a hard stance. Another finding suggested that the “bust” was possibly a natural milestone in the process of innovation, and was only a bust due to the overly rigid and unimaginative applications of the online technologies. The study predicted that the next boom would happen when online programs used “flexible combinations” of people, facilities, and technology to meet learner-centered career and lifestyle goals. This is happening now.

The next wave of the eLearning innovation is in progress and, according to some, is succeeding in paying its own way. Programs portending the potential for a boom in online learning within traditional institutions of higher learning are those at Boston University (butrain.bu.edu/cpe), Penn State University (www.worldcampus.psu.edu), the University of Florida (www.doce.ufl.edu), the University of Illinois (www.online.uillinois.edu), and the University of Massachusetts (www.umassonline.net). Collectively, these institutions offer over one hundred online undergraduate and graduate degrees, certificates, and programs in fields as diverse as financial planning, homeland security, pharmacology, forensic toxicology, business, and philosophy.

These institutions are using a variety of models to design and deliver their programs. The models reveal differences in how schools fund their initial programs, in their strategies for designing and developing programs, and in the processes for branding and marketing them.

Interviews with the leaders of the programs revealed many similar characteristics, as well. For example, each of these online programs is administered as a cost center within its institution. When asked whether the Penn State World Campus was making money, Associate VP for Outreach Gary Miller shared that the university’s goal for the World Campus is to “recover the cost of delivering any program and, where possible, to develop a positive cash flow.” Positive cash flow (when it happens) is used to support courses that don’t cover costs, to provide funds for innovation and updating of programs, and to share revenue with the sponsoring academic units. This, too, is the message from the other institutions; each is thriving with steadily increasing enrollment and revenues. Yet, the characteristics of these successful online programs echo those of any successful economic endeavor.

**Start-up Funding**

The institutions profiled here require that their online learning divisions be self-supporting and self-sustaining, yet start-up money (venture capital) has been essential for launching the programs. Boston University, for one, initially partnered with an external for-profit company for design and development of a financial planning course, in return for a percentage of tuition fees. That partnership enabled a shared-risk scenario: BU could invest in the content development and repackaging of the program for online delivery as well as the infrastructure to provide the necessary student services. Penn State and the University of Illinois Online both received grant support from the Alfred P. Sloan Foundation. And UMassOnline received internal capital from a university fund.

To ensure that an online program can be successfully launched and is self-sustaining...
over time, Bill Riffe, head of the University of Florida Distance, Continuing and Executive Education program, uses scaling criteria to help determine whether or not to offer a program: Can the program grow large enough (200 to 250 students) to support revenue-sharing with the colleges? Can it be self-sustaining in two to three years? This often means ensuring that a cash reserve is available to support a program as it is getting launched. One of the earliest programs launched at the University of Florida is the professional Doctor of Pharmacy program that consistently has over 500 students.

External and Internal Partners
Another shared characteristic of these online programs is that they do not try to do everything themselves. Each institution partners with other internal and external groups, as needed. For the production of courses, some institutions partner with groups such as instructional designers and developers. Others contract out market research and marketing, an expertise not easily found within higher ed. Still others work with partners to develop a substantive “branding” of their online entity. Most institutions use a course management system such as WebCT (www.webct.com) for their delivery infrastructure and to support student services.

In the early years of the online program at Boston University, John Ebersole, associate provost and dean of Extended Education, says that his team partnered on the development of both degree and professional development programs. On the academic side, BU’s online program has partnered with Embanet (www.embanet.com) on master degrees in Criminal Justice, Occupational Therapy and Management, and for a doctoral degree in Physical Therapy. In professional development, BU partnered with Acadient (www.acadient.com) for its popular financial planning course. Extended universities are now developing courses themselves and working with third parties for marketing help. In the academic degree area at BU, the largest and oldest online program is a master’s degree in Criminal Justice, with about 500 students.

Relationship to the Academic Units
The faculty and deans at each of these institutions are heavily involved in the launch, design, development, and delivery of online programs. David Gray, CEO of UMassOnline, believes one reason for that program’s success is that “we have built the structure inside the university, not as an appendage outside the university.” This means that courses are taught predominantly by regular permanent faculty, and that adjuncts, when used, are under the supervision of the regular faculty. In this model, the deans and faculty are partners with the UMassOnline center.

Still, there are exceptions, and differences between academic degrees such as the master’s and professional degrees and those programs designed for certification and skill-focused programs. The financial planning program at BU is self-paced, facilitated by grad students with access to a subject-matter tutor. These facilitators provide a personalized support system from Edpath (www.edpath.com), provider of diversified services to eLearning.

When they participate in online programs, traditional college deans and faculty benefit from the revenue-sharing with the colleges. Most online institutions retain a portion of the tuition for the shared services such as the delivery infrastructure, student support, and marketing. Revenue-sharing helps to provide a common incentive among all program partners, particularly as university budgets are stretched.

Programmatic Notes
The majority of successful online programs target career professionals who are searching for degrees and certificates to further their careers. In response to these needs, online pro-

“Can the program be self-sustaining in two to three years?”

grams in areas such as business, health professions, engineering, agriculture, criminal justice, information studies, and technology are abundant. But, institutions are now branching out into surprising areas—the “lifelong learning” areas that we predicted in the first boom of online learning. The University of Florida, for one, offers a master’s degree in Latin which is currently at capacity, and in 2004, U of I Online announced a program leading to a BA in Philosophy.

eLearning as a Business
The similarities between a start-up business and these online institutions are hard to miss: The need for start-up and reserve capital, partners, outsourcing, and contracted expertise and services are typical economic success criteria. The next phase of growth? Extensions to the global market. The University of Florida may be the most progressive in this area, partnering with Brazil, Germany, Peru, Ecuador, Thailand, Scotland, and Australia for programs in pharmacology, forensic sciences, and audiology.

Are we making money yet in online learning in higher education? “Yes” may not be appropriate, but in certain pockets and in certain programs, the answer is a cautiously optimistic “Absolutely!” Sustaining the revenue over the long term, and over the range of programs needed by learners for careers and life-long learning, are challenges to come.

Judith V. Boettcher is principal and founder of Designing for Learning (www.designingforlearning.info), offering consulting and advising in teaching/learning technologies for higher education.
THINK BACK TO when you were in third grade and class was dismissed for recess. Would the teacher tolerate a mad scramble for the door, with kids forming a logjam, kicking and screaming to get out? Of course not. If nothing else than to avoid being sued, your teacher would ensure that everybody formed a neat and orderly line and filed out in an organized fashion. Occasionally, the teacher might let well-behaved or high-achieving students move to the head of the line, while those who misbehaved (or forgot their homework) got stuck at the end of the line. This is a very basic analogy of how quality of service (QoS) works on a data network.

Why QoS?

With the growth in voice, video, and data traffic on converged computer networks, establishing QoS is essential. QoS is a set of rules and parameters that determines network traffic prioritization. Think of an Ethernet switch that, like the teacher in the example, is responsible for getting traffic out the door in the correct order and in a timely fashion.

Still, who wants to deal with QoS? Why not just keep voice, video, and data traffic separate? Why introduce more complexity to the network? These may be some of the questions you are asking yourself when considering what a converged network has to offer. Reduction of infrastructure and operation costs is a common goal in converged network implementations, but you may find that user collaboration and increased productivity are the ultimate benefits of a converged network.

In the past, a solution to network congestion and bottlenecks was to throw bandwidth at them. But although a properly designed network with ample bandwidth (and within the campus IT budget) is very important, it does not single-handedly ensure that video or voice will work effectively on a converged network. Without QoS, voice and video traffic may break up and arrive at varying intervals, causing delay and jitter, making a conversation or video unintelligible.

QoS and VoIP. Simply put, if you choose to deploy voice-over-IP (VoIP) on your college campus, QoS on the data network is a must. Campus personnel and students have an inherent expectation of service and quality. Campus IT must strive to meet or exceed that expectation, so a VoIP phone should meet the same expectations of a regular land line. Unfortunately, that’s not always the case. In certain situations, VoIP can act just like a cell phone in an area of bad coverage, including problems with echo, dropped or garbled calls, or slight delays, making a conversation intolerable. Yet, a properly designed data network with QoS can alleviate, if not prevent, these problems. (After all, who wants to be the person whose job it is to walk around the campus picking up VoIP handsets and saying, “Can you hear me now?”)

QoS and video-over-IP. In addition to voice, video conferencing and distance education have been moving into the IP world, as well. In the past, college campuses have offered dedicated distance learning in classrooms with closed, fixed telecommunications circuits. Now, college campuses have the opportunity to utilize streaming video over IP and plug...
their portable video conferencing/distance education equipment into any network data port on campus.

To obtain this flexibility, QoS is a must. In fact, QoS is more critical with video than audio because in video, you are dealing with both video and audio. If a person’s facial expressions or mouth movements do not match the audio, communication can be misinterpreted. IP video also demands more bandwidth than either data or voice-only traffic, potentially leading to new congestion on a network that might have been fine previously.

In addition to addressing QoS when deploying converged networks, the campus IT department should assess the overall network (bandwidth, physical infrastructure, etc.) to guarantee that voice and video will work on the current IP network. Often overlooked, cabling infrastructure plays an important role in any network. The infrastructure, including all copper and fiber cables on campus, should be reviewed to make sure it meets transmission standards. Companies such as Viola Networks (www.violanetworks.com) provide network assessment tools to determine whether a network can handle a converged network deployment.

**QoS Features and Techniques**

Because of the increase in multimedia applications riding on networks, many networking equipment manufacturers have no choice but to provide QoS features on their equipment, or be left in the technological dust. These features allow campuses to establish end-to-end QoS on their network. 802.1p, diffserv, and RSVP are some of the QoS techniques available for ensuring stable transmission of voice and video traffic.

**802.1p.** The 802.1p standard was defined by the Institute of Electrical and Electronics Engineers (IEEE) for assigning network traffic prioritization. 802.1p is often described as a “best effort” QoS method because it delegates traffic prioritization on the fly, and does not take into consideration the congestion of a network path.

Network traffic is prioritized into eight levels (0-7) designated by a three-bit field at the beginning of a network frame (e.g., an Ethernet frame). The 802.1p protocol works at layer 2 (layers 2 and 3, mentioned later, are defined by the Open Source Interconnection model) on a network. An Ethernet switch port will separate traffic, based on the frame’s prioritization, into different queues: high, medium, normal, and low. The switch will ensure that all traffic in the high queue is sent out before traffic in the middle queue, and so on.

In a perfect network, where every switch is non-blocking and there are no traffic bottlenecks, you could get by with just 802.1p as the only means of QoS. Unfortunately, unlimited and unhindered bandwidth doesn’t exist on most college campus networks, and other features may be necessary.

**Diffserv.** TCP/IP is capable of defining prioritization for use with QoS. Part of the IP packet has been designated as a type of service (ToS) field to prioritize traffic, much in the same fashion as 802.1p. Differentiated services (diffserv) use this field to determine QoS for IP packets. Diffserv employs various queuing methods in addition to traffic prioritization to manage the flow of traffic across a network at layer 3. Unlike 802.1p, diffserv applies QoS prioritization to an entire flow of IP traffic instead of individual packets. In a high-speed network, diffserv will probably be the QoS method of choice, but when bandwidth is constrained, resource reservation protocol (RSVP) should be considered.

**RSVP.** RSVP is another form of QoS that guarantees effective transport of traffic across a network. It works with routers along the entire path to reserve resources at each node along the path. Basically, RSVP carves out a guaranteed connection from end to end, for each transmission.

**Bandwidth shaping and limiting.** In addition to QoS, bandwidth shaping or limiting may be necessary to ensure that heavy users (like students downloading “non-school related materials”) do not impede the bandwidth needed by converged network applications. Bandwidth limiting can set a threshold on the maximum amount of bandwidth one individual can use; this prevents a user from monopolizing the campus network bandwidth and potentially jeopardizing needed bandwidth for other applications and users. Packeteer (www.packeteer.com) is one vendor offering products for bandwidth control, QoS, and management.

**Getting Started**

If your institution is moving to a converged network, some consideration must first go into the data network, to ensure that the traffic plays nice and follows the rules. Initially, your campus IT department should examine the network to see if it is up to handling the added bandwidth that voice, and especially video, introduce. Once the network is in shape, QoS and, potentially, bandwidth shaping and limiting can be introduced to ensure proper delivery of voice/video traffic.

In the end, the goal is to make sure your voice and video traffic will get along, providing your campus with a state-of-the-art, multimedia-rich network. CT

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**Peter Gray is a network systems consultant with Elert & Associates, an independent technology consultancy (www.elert.com).**
Conferences consider online communication and community debate.

**Online Deliberation 2005/DIAC-2005**

Will online forums help foster an informed citizenry, ready to participate in the democratic process? The world’s experts in deliberative democracy and human-computer interaction came together this past spring at Stanford University (CA) to discuss how technology can change the way people interact and, ultimately, make collective decisions. In an opening plenary panel session, Carnegie Mellon University (PA) ethicist and philosophy professor Robert Cavalier described PICOLA, a Public Informed Citizens Online Assembly (caae.phil.cmu.edu/picola/index.html) that uses software developed at CMU. His project’s goal is to create a high-telepresence environment for online deliberation into which the user is easily immersed in the virtual world.

**Democracy online**

**The ‘crucible’ of deliberation**

New York Law School professor Beth Simone Noveck examined the nature of deliberation and the role of technology. “We are witnessing the emerging phenomenon of decentralized groups that are able to take action using the new tools that are available to them. If only we can better figure out how to make the shift from the ‘interface’ to the ‘deliberative interface.’”

**Augmenting intellect**

Special guest lecturer Douglas Engelbart (best known as the inventor of the computer mouse) elaborated on his talk, “Bootstrapping: Accelerating the Evolution of Collective IQ,” during an informal evening discussion group. “Humans’ capabilities depend upon their augmentation system,” explained the human-computer interaction pioneer.
INBOX 2005—The E-Mail Event

Industry groups are working hard to make e-mail technology straightforward for campus users. At this summer’s INBOX in San Jose, industry leaders met to discuss anti-phishing, compliance, best practices, mobile apps, and more. Sessions like this Executive Roundtable included top leadership from companies like CipherTrust (www.ciphertrust.com), Cloudmark (www.cloudmark.com), IronPort (www.ironport.com), MailFrontier (www.mailfrontier.com), and Sendmail (www.sendmail.com).

Higher education on the list

After a high-level plenary discussion with industry leaders, CipherTrust CTO Paul Judge stopped to tell CT: “There is still a lack of fundamental knowledge about the e-mail ecosystem and how e-mails move around the Internet. In academia, there has been lots of work looking at Web or DNS traffic. But there is a huge opportunity for research around e-mail…room not only for new research, but for partnerships between universities and companies, to have data and information-sharing relationships—to create new research and employment opportunities for students.”

An exchange about e-mail

Companies dealing with spam filtering and other e-mail administration issues lined the aisles of the INBOX exhibit floor. Most of the companies serve higher education as well as corporate customers—especially service providers like AppRiver (www.appriver.com), whose reps told Campus Technology that they feel their higher ed customers are responding well to their hosted anti-spam service model. CT
Generate Those Reports

Computer Systems Odessa has released LeadingReporter 1.0, a professional business photo-reporting tool for project managers in higher ed. LeadingReporter allows users to lay out and generate professional-looking meeting, trip, conference, or seminar reports from a set of related digital photos and images, off of a Mac or PC. LeadingReporter is priced at $149. A free 30-day trial version is available from www.leadingproject.com/reporter.

Record, Play, Rewind

Tegrity Campus from Tegrity offers a campuswide class capture and digital student note-taking system for students, easy for any user to install. Institutions can automatically record each professor’s lectures and deliver them online, fully in-sync with students’ notes. Students can replay entire classes online—or click on any word in their digital notes to hear the professor explain a specific point all over again. Campus reinforces learning by giving students time-saving, flexible ways to learn and study—boosting study efficiency, enrollment, student satisfaction, and graduation rates. Pricing varies based on number of FTE students. www.tegrity.com.

Manage Multiple PowerPoint Presentations

Grass Roots Software has announced the availability of Powertool, a new playback application for PowerPoint users. The product features dual-screen support and a simple drag-and-drop interface. Powertool makes it easy for educational presenters to access multiple PowerPoint presentations simultaneously and project a slideshow onto a second monitor or data projector. The application also allows presenters to manage sidetracks, unexpected questions, and time shortages during presentations—adding a whole new level of interactivity to PowerPoint. Powertool starts at $89. www.grassroots-sw.com.
Take It on the Road
Toshiba’s digital products division has introduced the TDP-SW25U wireless projector, a high-performance, portable presentation tool for mobile professionals and educators. The TDP-SW25U features a lightweight design and is ideal for use in almost any room size, say company spokespeople. Its digital light processing (DLP) technology enables bright, high-quality images with 1,800 ANSI lumens, a 2000:1 contrast ratio, and native SVGA 800x600 resolution. Because it weighs only 6.8 pounds, users can easily transport the projector from classroom to office, or when traveling. Priced at $1,299. www.toshiba.com.

Take Control of the Network
The Network Physics NP-500 appliance with NetSensory OS provides insight into network application performance, without adding server or client agents to the network. The NP-500 can be installed in under an hour, and can automatically discover all licit and illicit network applications, bandwidth consumption, and IP addresses of users and servers on the LAN and on the Internet. This capability gives educational IT managers the ability to easily detect and control malware and improper use of Internet connectivity, and identify the users responsible. Price starts at $25,000. www.networkphysics.com.

Low-Cost Spyware Protection
With Packet Hawk from Tangent, campus departments can provide hands-free, network-wide protection against spyware, all from a central management console. Packet Hawk automatically finds, removes, and blocks spyware, adware, pop-ups, malware, games, instant messaging clients, P2P tools, and a host of other security threats. With the hands-free solution, administrators never have to touch a single PC or download updates. Definition updates are provided as part of the automated process, and real-time monitoring prevents future infections from occurring. Desktops across the entire network are automatically updated, saving institutions tens of thousands of dollars annually. Prices start at $1,495 for the appliance and software. (Once installed, say company spokespeople, the cost per user is less than $1 per desktop per year, dependent on the number of desktops.) www.tangent.com. CT
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Tom’s Tablet Tips

10 Use the tablet’s open-form factor to achieve greater interactivity in your classroom.
   ▪ Your students can no longer hide from you—or from each other—behind their monitors or displays.
   ▪ As an instructor, you don’t have to constantly duck down to access the computer that stores your presentation.

9 Add life and color to your presentations on the spot with informative pen annotations (digital ink).
   ▪ Your handwriting adds a personal touch, so make pen annotations directly onto your projected slides and visuals.
   ▪ Using the tablet’s pen, you can easily make freehand diagrams on the fly.

8 Share. Post your presentation before and/or after class, including all your pen annotations.
   ▪ Your students will appreciate your annotations as they would “extra help.”
   ▪ Software options like Microsoft OneNote (office.microsoft.com), Agilix GoBinder (www.agilix.com), and Tegrity Campus or Tegrity WebLearner (www.tegirty.com) help turn annotated presentations into effective study aids.

7 Incorporate electronic textbooks and related digital materials.
   ▪ You can project, explore, and enhance these materials during class.
   ▪ It’s easy to provide the entire class with updates and enhancements, as needed.

6 Listen! Don’t forget the audio capabilities of your tablet.
   ▪ Enhance your presentations with pertinent audio clips.
   ▪ You can even use the speech-to-text conversion capabilities of your tablet during your materials preparation time. Enjoy “La-Z-Boy computing!”

5 Collect, grade, and return your assignments electronically.
   ▪ You’ll enjoy the benefits of going paperless with digital ink markup.
   ▪ Save copies of your students’ graded work—paperlessly, of course.

4 Take a walk! Carry your tablet and move around the classroom, while using wireless projection.
   ▪ Get to know your students better, even the ones who opted for the back bench.
   ▪ Switch to projection from a selected student’s tablet.

3 Use interactive software and visualizations, and access online resources during class.
   ▪ Create templates for assignments and quizzes.
   ▪ Use graphing functions and involve students in charting and graphing.
   ▪ Consider concept mapping software and other visual applications that can be manipulated in the classroom environment.

2 Leverage the features of the tablet operating system.
   ▪ Use the Windows Journal tool that comes with tablet PCs. It allows you to copy a Web page and then make digital markups.
   ▪ Remember, your Windows Journal markups are searchable.

1 Wield the power of the pen!
   ▪ Train your students to use their tablets for pen-based notetaking.
   ▪ The whole class can share their pen annotations on your presentation slides.
   ▪ Easily convert handwritten passages to text.
   ▪ Be spontaneous and encourage collaboration! CT
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