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Contents
vol. 23 no. 1                        September 2009

In This Issue
6       Login / Disruptive Innovation
7       Upcoming Events
8       CT Online
10      Campus + Industry
38      CT Solutions
40      Advertiser Index
41      College/Company Index
42      Trendspotter / Personal Learning Environments

Focus
12      eLearning / Synchronous Tools
        by Judith V. Boettcher

Features
18      Digital Signage >>
        Signs of the Times
        Ready to invest in digital signage on your campus?
        Maximize your outlay with these five smart tips.

COVER STORY
24      Immersive Education >>
        Best of Both Worlds
        Immersive technologies are finding a foothold
        in higher education by combining virtual with
        real-world learning.

32      High-Performance Computing >>
        Expanding HPC and Research Computing—the Sustainable Way
        How one university is creating cost-effective growth
        models for data center and resource expansion that
        are also environmentally and community-friendly.

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Disruptive Innovation

Technology may push colleges and universities to turn the conventional education model on its head.

In July, 65 technology executives from campuses across the country gathered just prior to the Campus Technology 2009 conference in Boston to discuss the topic “IT Leadership and the 21st Century Campus: Insight and Innovation.” Through a jam-packed day of highly interactive panels, culminating in small group sessions, these IT leaders wrestled with some pretty lofty—knotty—issues.

I particularly enjoyed the group discussions that were teed up by Chris Dede of the Harvard Graduate School of Education (MA) talking about the works of his Harvard colleague Clayton Christensen—The Innovator’s Dilemma and The Innovator’s Solution—as well as Christensen’s latest, Disrupting Class, which applies the principles from the two Innovator books to education. Christensen’s premise is that most companies (and institutions) do little to encourage innovation on a grand scale, and instead focus on “sustaining innovations”—that is, innovations that keep the product or service going, but only create incremental improvements in it.

Disruptive innovations, Dede said, offer a new product that initially may not be as effective as what is currently sold to a broad audience, but meets an immediate specialized need of a smaller audience. Over time, the disruptive product is more nimble and responsive and evolves more quickly to meet the needs of a broader audience. Ultimately the disruptive innovation can drive out the standard product.

Applying these principles to education, Dede asserted that schooling (and by that he meant formal, institutionalized education based on the industrial model) is the sustaining innovation—it keeps going and a few refinements or fads incrementally improve it, but change is really on the edge of the entire institution. The disruptive innovation in education is customization, Dede said. The most prevalent form of customization in higher education is online learning, but as students demand more and more customization, as they are used to with Web 2.0 tools, Amazon, and other services, higher education has come under siege. While Dede did not mention this, to me private-for-profit institutions are a good example of this siege, in that they are offering services and programs that initially catered to a small, niche audience, but now are being used by students of all kinds.

After this backdrop from Dede, the IT leaders broke into small groups to discuss three provocative questions:

1) Do you concur that the conventional model of higher education is under siege in terms of cost, quality of preparation, and proportion of students who graduate?
2) Are efforts to customize/personalize learning for students underway on your campus?
3) In the next few years, do you intend to make substantial strategic investments in this type of technology?

The short answers to these questions were dishearteningly honest: Yes, higher education is under siege; the efforts to customize/personalize learning are occurring in some campuses, but only in isolated pockets; and there isn’t much going on in the way of investment in technology that would help.

How would you answer those three questions? Send me your thoughts at gfletcher@1105media.com. CT

—Geoff Fletcher, Editorial Director
UPCOMING EVENTS

September

**SEPT 13 - 17**
Association of College and University Auditors
2009 Annual Conference
 paranoia/so-events-and-seminars/annual-conference
Minneapolis, MN

**SEPT 14 - 22**
The SANS Institute
Network Security 2009
 paranoia/js2009
San Diego, CA

**SEPT 24 - 26**
National Association for College Admission Counseling
2009 NACAC National Conference
 paranoia/naacpnet.org/eventstraining/no09
Baltimore, MD

October

**OCT 11 - 14**
League for Innovation in the Community College
2009 Conference on Information Technology
 paranoia/league.org/2009cit
Detroit, MI

**OCT 11 - 14**
Association for Computing Machinery Special Interest Group on University and College Computing Services
2009 SIGUCCS Fall Conference
 paranoia/siguccs.org/Conference/Fall2009
St. Louis, MO

**OCT 11 - 15**
Oracle OpenWorld 2009
 paranoia/oracle.com/us/openworld/index.htm
San Francisco, CA

**OCT 15 - 19**
Consortium of College and University Media Centers
CCUMC 2009 Annual Conference
 paranoia/ccumc.org/node/2358
Greensboro, NC

**OCT 19 - 21**
College and University Professional Association for Human Resources
CUPA-HR National Conference and Expo 2009
 paranoia/cupaohr.org/conference2009/index.asp
Las Vegas, NV

**OCT 25 - 28**
Association for Information Communications Technology Professionals in Higher Education
ACUTA 2009 Fall Seminar
 paranoia/acuta.org
Portland, OR

**OCT 26 - 30**
Association for the Advancement of Computing in Education
E-Learn 2009
 paranoia/aaace.org/conf/elearn
Vancouver, BC

November

**NOV 1 - 6**
The Data Warehousing Institute
TDWI World Conference—Fall 2009
 paranoia/tdwi.org/education/conferences/index.aspx
Orlando, FL

**NOV 6 - 11**
American Society for Information Science and Technology
2009 ASIS&T Annual Meeting
 paranoia/asis.org/conferences/am09
Vancouver, BC

**NOV 7 - 10**
Council of Independent Colleges
2009 Institute for Chief Academic Officers
 paranoia/cic.edu/conferences_events/caos/2009/index.html
Santa Fe, NM

**NOV 8 - 11**
National Association of College Auxiliary Services
2009 NACAS Annual Conference
 paranoia/nacas.org
Honolulu, HI

**NOV 8 - 11**
American Association of Collegiate Registrars and Admissions Officers
AACRAO 19th Annual Strategic Enrollment Management Conference
 paranoia/aacrao.org/sem19
Dallas, TX

**NOV 17 - 18**
Kuali Foundation
Kuali Days VIII
 paranoia/kuali.org/kd
San Antonio, TX

December

**DEC 11 - 18**
The SANS Institute
SANS Cyber Defense Initiative
 paranoia/sans.org/cyber-defense-initiative-2009
Washington, DC

- For more events, go to: www.campustechnology.com/calendar
- To submit an event: Send an e-mail to Rhea Kelly (rkelly@1105media.com)
Features

The Air Gap: Isolating the Wireless Network to Secure Campus Data

The concept of an “air gap” in computing refers to the idea of isolating a computer installation to make it extraordinarily secure—so much so that it could almost be considered a closed system. While Lewis University (IL) isn’t taking the design to that extreme, CTO John Dalby still uses the term to describe how he has set up the campus’s wireless network to be separated from its wired counterpart.

Texas A&M Takes an Active Approach to Social Media Marketing

With an eye on increasing admissions applications, Texas A&M University launched a new marketing campaign via a microsite called “Do You Wonder?” featuring audio and video recordings of various aspects of university life.

Top Stories

- Purdue (IN) Builds 1,200-Node Supercomputer Before Lunch
- Jenzabar Rolls out Institutional Intelligence Suite
- U Central Missouri Moves to On-Demand eProcurement
- 7 Textbook Publishers Move to Electronic Format
- Suffolk U (MA) to Ramp Up Lecture Capture Deployment
- James Madison U (VA) Automates Admissions Notifications
- University of Illinois Delivers Its Portal to Mobile Users
- Desktop Virtualization: Real-World Experience in Higher Education
- Data Loss Prevention for the Higher Education Environment
- Improve Safety, Security on Your Campus With Two-Way Communications
- Unified Communications for Your Campus
- Streamlining University Recruitment With Integrated Technology
- The University of San Diego is seeing increased success with its recruitment programs. Thanks to an effort to replace disparate administrative systems with a single, unified solution, the university is making its enrollment goals.

In Box

“...I find Twitter great for sharing ed tech finds with my faculty, my students, the faculty’s students, other faculties, and the broader professional community.”
—Julia Hengstler, Nanaimo, BC

Read this and other reader comments at www.campustechnology.com/articles/2009/07/15/life-is-atwitter.aspx

Need to Know

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Campus Focus

University of Illinois Delivers Its Portal to Mobile Users

The University of Illinois at Urbana-Champaign’s website now features an option to access a site designed for mobile device users. “UI Mobile” strips out most of the graphics and sticks to the basics so that mobile users can get information. Read more at www.campustechnology.com/articles/2009/07/29/going-mobile-university-of-illinois-delivers-its-portal-to-mobile-users.aspx

Viewpoint

- Beyond Social Networking: Building Toward Learning Communities
- Why Invest in IT Training During a Recession?

WEBINARS

- www.campustechnology.com/webinars

Desktop Virtualization: Real-World Experience in Higher Education
Learn how the University of Maryland saved money, minimized user downtime, and increased agility with a virtual desktops solution that allows for quick provisioning of users and labs.

Data Loss Prevention for the Higher Education Environment
The University of Nebraska shares how it’s protecting critical information while maintaining an open and collaborative educational environment.

Unified Communications for Your Campus
Learn how Northcentral Technical College (WI) upgraded its voice, video, and data communications, and what challenges might lie ahead for your own campus.

In Box

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EXPANDING OPENCOURSEWARE. The University of Massachusetts-Boston is expanding its OpenCourseWare offerings (www.ocw.umb.edu), to help increase the retention rate of students who enter the university as freshmen from Boston public schools. Funded by a $60,000 grant from the Boston Foundation, the project will publish the archives of 12 additional courses required by undergraduate students to earn a bachelor’s degree, as well as develop workshops to be attended by Boston high school teachers. The teachers will be trained on how to use OpenCourseWare resources and given strategies on using and integrating them into high school classrooms, so that students are better prepared when they enter UMass-Boston.

CONTACTLESS PURCHASING. Morehead State University (KY) has upgraded its campus card system with a large-scale implementation of iClass contactless card readers from HID Global. More than 220 iClass readers across campus are managing purchases and privileges for access control, dining services, snack/beverage vending, copying and printing, laundry payment, and more. Beyond improving convenience for students and staff, the contactless readers are also revenue drivers: Since the iClass readers manage purchases campuswide, it’s now easier for students to spend and manage funds via the school’s EagleCard campus card. EagleCard-based vending sales have increased nearly 10 percent since the system was implemented.

CAMPUSWIDE WIFI. The University of South Carolina has selected AT&T to provide high-speed wireless broadband in more than 160 buildings across the campus, as well as for outdoor spaces. The campuswide WiFi service will provide public internet access for more than 30,000 students, faculty, staff, and guests, and also will carry the university’s intranet traffic. AT&T’s WiFi Services will provide round-the-clock network monitoring and a complete turnkey managed WiFi network service, including site survey, design, installation, repair, maintenance, and warranty of equipment.

VIRTUAL OPEN HOUSE. This summer, Texas Tech University hosted a virtual open house, held at College-WeekLive (www.collegeweeklive.com). The event included live video presentations from Texas Tech admissions, financial aid, and housing representatives, as well as a virtual booth where college-bound high school students could browse information and text chat live with campus administrators and current students. Additional booths featured details on campus housing and dining, where virtual tours of residence halls provided prospective students with a glimpse into campus life. The seven-hour open house event attracted nearly 500 visitors.

CONNECTING ON FACEBOOK. Partnering with customized Facebook application provider Varsity Outreach, Tulane University (LA), St. Norbert College (WI), and Pace Law School (NY) have launched Facebook communities where prospective and admitted students can build connections with each other, with current students, and with admissions staff. Via the schools’ Facebook applications, prospective students can find peers who live nearby, intend to pursue the same major, or share common interests. What’s more, the schools’ admissions offices can provide tailored information to prospective students and invite admitted students to network within a dedicated, invitation-only area.

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WEB CONFERENCING TOOLS

started out on campuses primarily as delivery technologies for eLearning courses. But their use has steadily broken out into other applications as campus personnel experience flashes of insight that Kathy Hoellen describes as: “Wow, we could use this eLearning tool for (fill in your favorite use here).”

Hoellen is the director of teaching and learning services at Clemson University. The South Carolina institution offers an interesting case study of how an early-on adoption of a synchronous web conferencing application (Macromedia Breeze, which is now Adobe Acrobat Connect Pro) for distance learning projects is now being deployed across campus to serve needs as varied as consortial campus courses, call center support, and staff training.

No longer confined to eLearning, Clemson’s web conferencing system is now a 360-degree campus application that’s become integral to the functioning of the university. Let’s look at a few of the ways in which the university has adapted the tool for uses beyond the standard eLearning course.

Consortial Learning

Clemson is a land-grant university and, as such, is accustomed to functioning as part of a consortium; indeed, collaboration and outreach are a part of its mission. Therefore, it only made sense that when enrollment in a highly specialized graduate class in materials science—Ceramic and Materials Engineering—fell too low to be offered at Clemson, Professor Eric Skaar, with faculty from other universities, decided to collaboratively offer the course in a synchronous online environment.

Skaar, a professor in the School of Materials Science and Engineering at Clemson, hosts and jointly teaches the class with faculty from Alfred University (NY), Coe College (IA), Iowa State University, Missouri University of Science and Technology, University of California-Davis, University of Florida, Pennsylvania State University, University of Arizona, The University of Arizona, the National Science Foundation, and the International Materials Institute for New Functionality in Glass.

For the course, familiarly known as the “virtual glass class,” each institution takes responsibility for three to four lectures. The technology allows students to collaborate on projects across institutions, via discussion, brainstorming, collective thinking, and critical feedback.
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tise, and perspectives than they would otherwise have in an on-site course.

Staff Development
An ongoing challenge in any IT organization is keeping faculty and staff updated and aware of new initiatives, technologies, and programs. For Clemson, the challenge is even greater as the university has outreach obligations to agricultural experiment stations across South Carolina. Travel to these outposts is time-consuming and costly. As one land-grant university educator put it: They needed a budget line item for car repair due to “deer encounters.”

To help keep travel costs in check, Clemson is using its web conferencing solution to broadcast a weekly Tech Talk series, providing staff development to the many research centers it works with as well as its 46 county extension offices around the state. Dubbed an opportunity to “learn tips and tricks from the trainers,” the series features topics chosen by participants, including everything from quotidian knowledge (“Intro to Vista”), to instructional support (“Creating Resources for your Online Courses”), to more tantalizing topics like “Taking the Dum Dum out of Dimdim,” in which participants were able to log in and play with Dimdim (a free web conferencing tool Clemson is promoting for student use) during the course of the presentation.

WEB CONFERENCING PRODUCT GUIDE

**WHEN LOOKING FOR** a synchronous web conferencing solution, the features you need will depend on the intended use of the application. For example, if your initiatives are going to require multiple lecturers, as Clemson University’s (SC) multi-institution “virtual glass class” does, you’ll want an application that easily allows for more than one presenter. Not every product necessarily boasts every feature, and some do certain functions better than others, so you’ll need to comparison shop. A few functionalities to consider:

- **Video.** If you want videoconferences, rather than audio-based meetings, be aware that not every solution provides for video and that it will require cameras at participating sites.
- **Multiple presenters.** If you’re teaching a course with lecturers on multiple campuses, you’ll want a service that allows for easy hand-offs to and from more than one presenter.
- **Cross-platform functionality.** If you’re looking to web conference with other institutions (over whose systems you have no control), you’ll need a solution that works with different operating systems and multiple browsers (and multiple versions of those browsers).

- **Application sharing.** All web conferencing products allow presenters to share the documents on their desktops; some go further and allow presenters to share (and even highlight) their applications.
- **Whiteboard capabilities.** Some web conferencing programs feature a function similar to interactive whiteboards, enabling group collaboration and brainstorming.
- **Recording.** Capturing these meetings or classes may be important to you; most applications allow for this but check to be sure.
- **Teleconferencing and VoIP.** Depending on how you want people to participate remotely, you’ll need call-in options. If your campus is already using VoIP, look for a web conferencing solution that uses it as well.

Following are a few of the web conferencing vendors and products available to higher education institutions:

<table>
<thead>
<tr>
<th>Product</th>
<th>URL</th>
<th>Pricing Options</th>
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<tr>
<td>Adobe Acrobat Connect Pro</td>
<td><a href="http://www.adobe.com/products/acrobatconnectpro">www.adobe.com/products/acrobatconnectpro</a></td>
<td>Software license; annual subscription; monthly and pay-per-use fees</td>
</tr>
<tr>
<td>Cisco WebEx &amp; WebEx MeetMeNow</td>
<td><a href="http://www.webex.com">www.webex.com</a></td>
<td>Both products offer monthly and prepaid annual plan options</td>
</tr>
<tr>
<td>Citrix GoToMeeting</td>
<td><a href="http://www.gotomeeting.com">www.gotomeeting.com</a></td>
<td>Monthly and annual plans</td>
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<tr>
<td>Dimdim</td>
<td><a href="http://www.dimdim.com">www.dimdim.com</a></td>
<td>Open source</td>
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<tr>
<td>eBLVD Online Meetings</td>
<td><a href="http://www.eblvd.com">www.eblvd.com</a></td>
<td>Monthly and annual subscriptions, based on number of users</td>
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<td>InterCall (formerly Raindance)</td>
<td><a href="http://www.intercall.com">www.intercall.com</a></td>
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<td>ReadyTalk</td>
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<td>Vyew</td>
<td><a href="http://www.vyew.com">www.vyew.com</a></td>
<td>“Plus” and “professional” pricing, based on number of participants and options</td>
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<tr>
<td>Web Huddle</td>
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To reduce travel costs, Clemson uses its web conferencing solution to broadcast a weekly Tech Talk series, offering staff development to participants across South Carolina.

Call Center Support
The call center at Clemson uses Acrobat Connect Pro to manage communications for outreach as well as for staff communications within the center. The system provides a place for updating and archiving support issues, so that call center personnel can quickly familiarize themselves with the activity from the last shift. Users calling in for support use web conferencing and screen sharing for quick and easy resolution of technical issues.

Conference Participation
The university is also using synchronous tools to reduce travel expenses associated with presenting at conferences. A team of two who had submitted a conference presentation reduced expenses by having one person go to the conference and his colleague co-present via web conferencing.

The Ripple Effect
Synchronous online learning events are now standard elements of higher ed eLearning programs, and their success as learning tools—thanks, perhaps, to their ever-increasing ease of use and access—is proving contagious to other campus initiatives.

In this era of budget cutting, it just makes sense to look closely at the tools that we have and see how they can provide value in ways that go beyond their initial purpose. How many ways can tools ripple out from their original starting points? Now might be a good time to look around your campus and see what types of learning, meeting, and support needs might benefit from tools already in place!

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

SIGNS OF THE TIMES

by matt villano

Looking at digital signage solutions? Before you invest—or even if you already have—make sure you maximize your outlay with these five smart tips.

THERE’S NO QUESTION that in airports, train stations, and student unions alike, digital signage solutions have become efficient and effective ways of communicating important information directly to broad bases of users. The solutions are affordable; they’re eco-friendly; and they’re growing in popularity every year. Still, particularly in the world of higher education, the question remains: How can colleges and universities get the most out of the money they spend on this technology?

Here we provide five smart tips to maximize that outlay—all best practices from digital signage pros and academic technologist peers at Purdue University-Calumet (IN), Northwestern University (IL), Southern Alberta Institute of Technology, and The Ohio State University.

Tip 1: Place Wisely
You’ve probably heard the old saw: If a tree falls in the forest but nobody is there to hear it, does it make a sound? Well, that same kind of question can be applied to digital signage: If you purchase a solution but place most of the signs in inappropriate spots, are you really investing in digital signage? Unfortunately, the answer to this question is yes; you’re investing in signage that the wrong people are seeing. With digital signage, more than ever before because of the rocky economy, location is everything.

David McLees certainly wouldn’t argue this point. McLees is technology administrator for the School of Technology at Purdue University-Calumet, where last year in Calumet’s Anderson Building, school administrators decided to implement two digital signage terminals from Westinghouse. The big conundrum: where to put the screens.

At the outset of the implementation, McLees and his colleagues performed their own environmental assessment—they watched students go about their normal days, moving about the building. They also surveyed student groups, and asked them...
DIGITAL SIGNAGE

STUDENTS AT Southern Alberta Institute of Technology say that digital signs are now their primary source of information on campus.
where they’d like to see the signs, and where they would actually take notice of them.

In the end, this process revealed some unexpected results. While most of the school’s students entered the building through the front door (an obvious place for the signs, the administrators had thought), an even larger number of students seemed to gravitate toward two spots: a lobby in front of student advisor offices on the second floor, and the student lounge on the first. What’s more, the students were less likely to be moving through those areas quickly, would be more apt to have their attention attracted by the signs, and would have more time to stay through content loops or cycles. For McLees, these discoveries made the placement of the new signs a virtual no-brainer.

“If we had gone ahead and done this without the necessary research, there’s no question that we would have put the signs in the wrong spots,” says McLees. “Taking the extra time to see exactly where this technology would have the biggest impact made our expenditures that much more valuable.”

**Tip 2: Cash In**

Surprise: Digital signage solutions don’t have to be a drain on the IT budget—they can be a boon for it. Such is the situation at Northwestern University, where every quarter a relatively new signage implementation in the Norris University Center is generating real revenue for the organization that owns and operates the facility.

In early 2008, Marketing Manager James McHaley and other Norris staffers deployed a number of 40- and 46-inch LCD digital signage screens throughout the facility. On each of the signs, center technologists installed AxisTV, a content delivery system from Visix.

The system breaks content into different blocks on each screen, enabling Norris officials to broadcast three different pieces of information at the same time. With this advantage, McHaley opted to do what any enterprising marketer would do: He started selling ads. Space is sold in weeklong blocks, running Monday through Sunday. While university departments pay $20 per block, student organizations pay only $10.

“We try to extend goodwill to the students by letting them have a 50 percent discount,” notes the marketing manager, who adds that if departments don’t have their own ad campaigns, for an additional fee Norris will design campaigns for them. Usually, the ads are created in programs such as Adobe Photoshop or Illustrator and imported into AxisTV as JPEG files.

McHaley discloses that revenue from the ad program has increased each academic quarter. “We know it’s popular based on the increasing number of ads we receive,” he says. “It is definitely a unique way to advertise and it reinforces the other forms of advertising out there.”

**Tip 3: Get Students Involved**

Here’s something that every savvy CIO knows: Constituents respond better to technology initiatives when they are included at the planning and creation stages. This is why the simple act of involving students in a campus digital signage initiative can make a tremendous difference in the way those students feel about the technology.

Case in point: Southern Alberta Institute of Technology, a Canadian polytechnic school, where last year, school officials worked with vendors NEC Unified Solutions, TTUFF Technologies, and mount specialists Peerless Industries to deploy SAITView, a digital signage network comprised of 20 displays in nine different locations across campus. Once the network went live, technologists augmented the solution with software from Omnivex, to provide a way for the students themselves to create the content that would cycle through signs over the course of a given day.

Under the new signage program, John McConomy, the school’s new media unit manager, says student groups are routinely invited to create their own content and submit it through a website for upload to the signs. “It’s not corporate messaging; instead, it’s student messaging, and that makes a huge difference in terms of how the content is received,” he maintains. McConomy notes that a school administrator approves the content before it’s posted online. “So long as the stuff isn’t commercially generated, we’ll
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Digital Signage

Resources

Listed below are web addresses for companies mentioned in this article. Each URL will take you to the company’s product overview page, where you can find the link to digital signage systems.

NEC Unified Solutions: www.necunifiedsolutions.com/digitalsignage

Omnivex: www.omnivex.com/products

Peerless Industries: www.peerlessmounts.com/products/browse categories.aspx

TTUFF Technologies: www.ttufftech.com

Visix: www.visix.com/axistv.html

Westinghouse: dss.wde.com

gladly put it up.” As part of the program, SAIT technologists also run student-generated newscasts on SAITView four times a week—once as a live show; three other times as reruns.

Metrics indicate the digital signage “involvement” approach is working wonders. Every year, SAIT conducts a survey of students to find out how they are receiving their information. Last year, 80 to 85 percent of them said their primary source of information was SAITView. Demand for more monitors was so high that since the initial implementation, the university has invested in an additional 15 signs.

“There’s no question that student involvement has driven their interest in this new technology, and that’s something we’re delighted to support,” McConomy says. “As a technologist, when you can make that kind of impact with your primary user base, you know you’re doing something very right.”

Tip 4: Avoid Burnout

Sure, the LCD screens commonly found in most digital signage solutions are great for clarity and color. But, as with many LCD displays, there is a downside: Leave the same image on the screen for too long and the image starts to burn an imprint in the face of the monitor.

Technologists at the new Wexner Center for the Arts at The Ohio State University faced this problem firsthand earlier this year when, for a current art exhibit, they implemented a 4-by-4-foot LCD video wall composed of digital signage monitors from NEC. The wall screens—four in all—are turned on at least 12 hours a day with the same information. A fifth monitor, near the door, is on 24 hours a day, listing the day’s events. According to Stephen Jones, senior design engineer at OSU, this puts all five of the screens in a “high-risk” situation for burn. “It’s a subtle problem, but you can see outlines of the words and images when the monitor is not on,” he points out. “In an art gallery, it just doesn’t look very nice.”

To combat the problem, the video wall monitors are routinely shut off at night. But to save the fifth 24-hour monitor from the burn-through, Jones and his colleagues created their own screen-saver type program that “burns” monitors in the opposite direction by running gray static. It turns on at night, running static on the lone machine for six hours to reverse the effects of blue and white lettering that doesn’t change all day.

“It’s not rocket science, but it’s working to preserve the life of that screen,” says Jones. “Once you make the investment in digital signage, it’s important to make sure you take care of it.”

Tip 5: Take Full Advantage

Using a digital signage solution to advertise the next student government meeting, fraternity rush, or flower sale is one thing; relying on the solution to broadcast alerts and messages in the event of an emergency or crisis is another.

While a handful of institutions such as Kentucky State University, Boston University, and the University of Wisconsin-Oshkosh have started broadcasting emergency information over their digital signage solutions, a recent study by technology solutions hub CDW-G indicates that, surprisingly, a majority of colleges and universities are not using digital signs for this purpose yet.

The study, “This Is a Test—This Is Only a Test: Updating America’s Emergency Alert Infrastructure,” was published in early 2009, and notes fewer than 5 percent of the 1,448 respondents reported that their city, state, and local government or school relays emergency information via modern media. Among the largely unused media the study cited: text messages, e-mail, digital signage, IP sirens, and outdoor speakers.

Yet, Huston Thomas, public safety business development manager for CDW-G, maintains that embracing digital signage as a method of distributing mass notifications works because digital signs are now ubiquitous on most campuses and, inherently, they generate interest in the content they display.

After all, Thomas points out, “The keys to mass notification are ubiquity, redundancy, and making sure everyone knows that the messages are out there. Digital signage is one solution that meets all three [criteria].” What’s more, he adds, many established digital signage vendors offer software (or partnerships with software developers) to convert regular digital screens into monitors that can receive emergency messages wirelessly and broadcast them at any time.

The bottom line: If you’re going to invest in digital signage, exploit it to its full potential. And keep your eye on this technology as it continues to evolve; who knows what’s next for the rich information channel you may already have in place!

Matt Villano is senior contributing editor of this publication. He is based in Healdsburg, CA.
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BEST OF BOTH

By Rama Ramaswami
Aaron Walsh coined the term “immersive education” for a reason. “As educators, we know that people learn best by doing,” he says. “When students are doing something rather than reading or learning about it, they learn better. Immersive environments help students retain more information and speed up their learning. There’s an enhancement in the way they learn.”

Walsh, a faculty member at the Woods College of Advancing Studies at Boston College and director of The Grid Institute, has been working in immersive environments in education for over a decade. He has won recognition from Campus Technology as one of our 2009 Innovators (see www.campustechnology.com/innovators), as well as from organizations like Computerworld, which in 2007 named him as one of the 40 most innovative people in technology, citing his work on immersive education as an “…innovative, promising technology which holds the potential to significantly affect society in the near future.”

Immersive environments—which utilize technologies like simulations, virtual reality, augmented reality, Second Life (see photo at left), and the like—have long held sway in the gaming world, where advances in digital, information, and online technologies have helped to create mind-boggling artificial spaces that absorb users into an alternative or amplified reality.
Immersive education employs the same technologies, but unlike gaming, immersive education doesn’t isolate students in an imaginary world, but rather uses the technologies to bridge the conceptual with the concrete—giving students a virtual laboratory, if you will, in which to work out real-world problems.

Walsh explained the reason behind this hybrid approach in a 2007 interview with the virtual weblog Terra Nova:

Initially we wanted... all learning materials to be presented inside of the environment itself, thinking that a single seamless environment would be best. And while that may be the case for the entertainment industry... for education there’s no reason why all content has to be delivered inside of the virtual environment. In fact, it can be quite restricting to do so. Why not simply open a browser window when necessary, allowing students to use a wide variety of learning content that can’t (and probably shouldn’t) be shoehorned into the virtual environment?

Authentic Learning

According to Thomas Reeves, professor of learning, design, and technology at The University of Georgia and formerly a scientist responsible for designing interactive systems for military training and medical education, the best immersive scenarios are those that involve “authentic activities” that simulate the real world but that also engage students in real-life problems and events. “What I’m interested in is serious immersion in real-world activity,” Reeves says. “For example, for a Unicef ecology program, we sent students into the field to assess new-growth and old-growth trees, local pig farms, run-off water, and so forth. Then we ran simulations of the same environment, and had the students bring data back from the real environment, then go into the simulation, integrate that with EPA and other data, and write research reports based on all this data. They went back and forth from real to simulated.”

While immersive education has its detractors—one comment posted on Walsh’s blog interview, for instance, decries the approach as “fake education”—Walsh staunchly defends its value. “An immersive environment engages the learner’s mind and leads to better learning results,” he says. “The military and medical industries have been using virtual reality simulations for over 30 years. Now we’re using it for broad-based education.”

Walsh’s declaration of the “broad-based” use of immersive environments in education is probably several years ahead of the reality (see “An Immersive Future?” above). Nonetheless, there is no doubt that a small but growing number of universities around the country are using immersive education approaches to achieve critical educational outcomes. Here is a look at several of these projects, each using slightly different immersive
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IMMERSIVE EDUCATION

technologies, but all seeking to enhance student learning by merging digital and real environments, to achieve the best of both worlds.

Virtual Practicum

Health care is probably the field that has and will continue to benefit the most from immersive education techniques because of its need to safely expose its students to the high-stakes, sometimes even life-and-death, experiences that they will be facing in their real-world practices.

One of the pioneers of using virtual environments in medical training is Joseph Henderson, professor of community and family medicine and director of the Interactive Media Laboratory (IML) at Dartmouth Medical School (NH). At the forefront of a movement to combine emerging technologies with new instructional design, Henderson has developed what he calls a “Virtual Practicum” for continuing medical education. What he and the IML team are trying to do, he says, is to mix old and new media and traditional and innovative teaching methods. “The pioneering aspect of our work is using technology to communicate. It’s a combination of traditional education with the active things that students can do by using simulation and dealing with various pieces of information.”

Henderson describes the Virtual Practicum—whose modules students can download and install on their computers—as a technology-based “virtual clinic” or “virtual mini-fellowship” that approximates the world of clinical practice. For example, a program on HIV patient care uses interactive video, sound, and graphics to move the student through a virtual clinic that includes an orientation, a learning resources room, encounters with a virtual patient, and interviews with real patients. By simulating actual medical practice, the Virtual Practicum teaches students to “work in the swamp,” Henderson says. “Often, we teach theories and a systematized way of looking at the world. We don’t prepare people to function in a less deterministic world where decisions are often made without all the knowledge.”

He makes sure to point out, though, that the technology is only a backdrop to the human element. “A senior practitioner and mentor would act as a coach guiding the student,” he says. “The simulations are activities where one is playing with pieces of the active world, like a pianist playing arpeggios. It’s a reflective practicum in a technology-based environment.”

A technology-based ‘virtual clinic’ at Dartmouth Medical School simulates encounters with patients to prepare students for work in the real world.

The Augmented Anesthesia Machine

The merger of physical and virtual spaces, it turns out, can also achieve learning outcomes that had been elusive in only simulated or only physical environments. Over a decade ago, the Center for Simulation, Safety, Advanced Learning, and Technology at the University of Florida took on the challenge of improving medical technician training to reduce the serious problem of operator error. According to one study, for example, 75 percent of anesthesia machine-related accidents resulting in death or brain damage are due to user error. Scientists at the center attribute user error, in part, to a lack of understanding of how the machines work, so they created a web-based simulation engine and dozens of downloadable medical-machine simulations to help address the conceptual gaps in students’ technical training. These simulations make manifest the abstract inner workings of the equipment (for example, the invisible oxygen flow of an anesthesiology machine), something students don’t get to visualize or experience when just working with concrete (and very opaque) equipment.

IMMERSIVE EDUCATION BUILDING BLOCKS

SINCE THE MAJORITY of higher ed institutions are unlikely to have the funding or technology to create virtual learning environments, the Immersive Education Initiative (IEI)—a nonprofit global alliance of universities, research institutes, and businesses—offers free open-standards educational resources. The IEI is a project of The Media Grid, a standards group that provides free frameworks and technology to create immersive environments, using three open-source toolkits: Sun Microsystems’ Project Wonderland, realx3d, and Open Cobalt.

Boston College faculty member Aaron Walsh directs the The Media Grid and the IEI project, and he and his colleagues are committed to disseminating “pre-made,” “reusable” immersive environments for a growing array of academic disciplines—such as biology, psychology, chemistry—to achieve their goal of the broad-based use of immersive environments in education. “The body of material is growing,” Walsh says. “We have specific and special-purpose simulators. In some, each of the learners needs to install the software and connect to virtual worlds. We also have group systems where a bunch of students can use the same computer—this is good for K-12 students. Mixed-reality technologies are also available, where the software creates 3D environments in the air. Our mission is to get the technology into the hands of educators. It is fundamentally a nonprofit activity, because this is technology that benefits humankind. Not sharing it would be like having access to books but not allowing people to read them. Our driving force is to educate people.”

For more information, go to www.immersiveeducation.org.


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However, the center soon realized that they faced another challenge: Students’ performance improved on conceptual testing (a 2006 study confirmed this), but some students were still not able to transfer that conceptual knowledge to the actual operation of the machine. “For some students it is difficult to take the VAM [virtual anesthesiology machine] and map it to the real thing,” says John Quarles, a graduate student at the university who is doing his doctoral research on interactive computer graphics. The center needed a way to provide “some learning scaffolding,” he explains.

So the question became: how to help these struggling students transfer abstract knowledge to the concrete domain? The center turned to work done in the 1990s by Paul Milgram and Fumio Kishino on “mixed reality,” or what Quarles calls the “co-location of virtual objects and real objects in the same space.” Using magic lens technology (a tablet-like digital overlay that filters physical objects to reveal hidden information or to enhance data), along with webcams and 2D optical tracking with infrared markers and infrared LEDs embedded in the anesthesia machine, the center created an “augmented anesthesia machine” or AAR. Essentially, the AAR is an actual anesthesia machine augmented by the overlay of a magic lens that reveals its inner functioning while the student operates the machine. For example, holding the magic lens tablet (about the size of a netbook computer screen) over the actual machine’s oxygen control knob, and then turning the knob, the student will see on the tablet an animation of the direction of the real oxygen flow.

“It’s as if you were looking at the inner workings through a window,” says Quarles. This kind of immersive, mixed learning, he believes, significantly “improves training transfer into real world demands.”

UW-Madison’s ARGH project augments reality by connecting students to virtual interviews, photos, videos, data, and other informational material in real time.

ARGH! That bridge between the conceptual and real world underlies what researchers at the University of Wisconsin-Madison are doing in their development of “augmented reality” (AR) educational games. The ARGH is a project of the university’s Academic Advanced Distributed Learning Co-Lab (AADLC), whose mission is “to provide expertise, facilities, and administrative services to enable the research and development activities of our academic, K-12, government, and industry partners.”

The LGL’s specific charge is to work closely with local middle schools, community organizations, and nature centers to develop and study the educational effect of AR games designed to enrich students’ experiences of their neighborhoods and natural surroundings. Called Augmented Reality Games on Handhelds (ARGH), the project explores the use of emerging mobile technologies in learning.

Partnering with Harvard University (MA) and MIT in a three-year research project funded by the US Department of Education’s Star Schools Program, ARGH is creating and testing location-based AR games for middle school education. Graduate students at the university design and build the games; middle school teachers who sign up to participate in the project receive a stipend and can earn continuing education credits.

In a typical ARGH game-based course, students walk around a real-world community or natural setting, using simple handheld computers equipped with Windows Mobile 5 and GPS software. As they walk, the game players see themselves as icons moving on a map. When they reach specific locations, the GPS software triggers virtual interviews, photos, videos, data, and other material that adds to or “augments” reality.

“Let’s say we’re walking around the farmers market in Madison,” says Mark Wagler, an ARGH project manager at LGL. “There’s so much to see. There’s music, food, people making marketing pitches—it’s a very rich environment. While we’re walking around, the computer gives us additional information. A
stand may be selling spinach. The computer could show a video interview with the farmers, and we could see the hoop houses where they raise their spinach, tomatoes, and flowers.”

Next, says Wagler, the students might view old photos, learn the history of the market, and “interview” real or fictional characters. “To turn this into a gaming kind of environment, we would have roles—you might be a restaurant buyer. We’re all getting different information, but we have a common challenge: The market is going to close because the city is building a large covered building that will change this environment. The challenge is: What’s the answer to this?” Each role receives different information, so to come up with solutions, the students need to work collaboratively—another benefit of the game.

This immersive environment is an improvement over traditional instruction, Wagler says, because the connections to actual places and people, and the variety of informational materials available to the students in real time, provide learning opportunities that would not have been possible otherwise. And while the games have been designed for middle schools so far, “the concept will work at any age level,” he says.

He adds that future designs will also bring the games indoors, making them suitable for just about any environment. “Our games have all been outdoors because of the use of GPS,” he says. “But you can do it with WiFi indoors in museums. We’re working on new games for the iPhone that you can play indoors.”

Wagler believes that immersive educational approaches like AR games work “very well in natural and cultural environments. You can use it for subjects from forestry to farming to biology—a whole range of things that are outdoors. But it’s also useful for history, contemporary culture, economics, geography, sociology—anywhere you can use data to augment actual observations. The field is new, but I can’t tell you somewhere where it wouldn’t work.”

Rama Ramaswami is a business and technology writer based in New York City.

Resources

Interactive Media Laboratory
virtual clinics: iml.dartmouth.edu/education/cme/index.html
Virtual Anesthesia Machine:
vam.anest.ufl.edu/simulations/simulationportfolio.php
Local Games Lab:
lgl.gameslearningsociety.org

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WASTE HEAT from a rack of Notre Dame's high-performance computing equipment provides inexpensive wintertime heat for a local public arboretum.
Expanding HPC and Research Computing—

THE SUSTAINABLE WAY

by mary grush

How one university is creating cost-effective growth models for data center and resource expansion that are also environmentally and community-friendly.

INCREASED DEMANDS FOR RESEARCH and high-performance computing—along with growing expectations for cost and environmental savings—are putting new strains on the campus data center. More and more, CIOs like the University of Notre Dame’s (IN) Gordon Wishon are seeking creative ways to build more sustainable models for data center and resource expansion. Wishon is not only the CIO, but he’s also associate vice president and associate provost at Notre Dame, indicating the central role he plays in supporting the data and resource needs of both administrative and educational programs, as well as, increasingly, the university’s strategic effort to grow the size and scale of its research initiatives.

Recently, CT spoke with Wishon about efforts underway at Notre Dame to respond to the upswing in HPC and research computing at the university while reducing costs and the environmental impact of program growth.

Campus Technology: As CIO at Notre Dame, are you seeing increasing demands on your data center, especially from HPC and research computing?

Gordon Wishon: The strategic objectives of the institution [to grow its research programs] are changing the nature of the demands on the IT organization, and we are facing these challenges in an era of significant economic challenges. At the same time, we’re trying to focus on sustainability and preserving the environment. This all places a significantly different and sometimes new set of challenges on the IT organization, as it does at most educational institutions.

As our research program grows we are anticipating significant growth and demand for data center-provided services. Even if we didn’t have such a focus on expanding our research programs, we would continue to see growth in that demand, driven by the need to continually update and improve the productivity of our administrative processes and the services that we provide to our students and our faculty.

[Bottom line,] we are anticipating an increase in demand on our data centers. Handling the growth in a way that is both cost-effective and sensitive to environmental concerns is front and center for us right now.
CT: Is IT support centralized at Notre Dame?

Wishon: Historically we have been much more centralized in our IT support model and strategy than most research universities, such as my previous institution, Georgia Tech, where the responsibility for IT service and support was very highly decentralized. In recent years there has been a growing trend [in higher education] back toward centralization, even at those institutions that are highly decentralized. There’s a recognition now by the deans and the heads of academic units of the true cost of providing IT services for their faculty, particularly services that are increasingly required to be administered in a more professional way so as to address concerns about security and risk to the institution.

At Notre Dame we are hopeful about developing a support posture that effectively captures the best of both centralized and decentralized environments. I’m currently collaborating with our vice president for research, as well as the deans, to determine the best support model going forward.

CT: And how does server virtualization fit into the picture?

Wishon: Virtualization, of course, is a key technology that we are using to address some of [our challenges]. We’ve done some work to estimate the growth of demand for services, and the growth of the number of server platforms within our data center. Our projections suggest that at the current rate of growth over the past two years—even without factoring in a significant increase in demand driven by research—by 2010 we will see a growth in the number of servers on our data center floor from the current 558 to more than 700. If we were to meet all these growth requirements with the former architectural approach of standing up individual servers and application suites to support each new application, we would have 700 individual platforms or clusters of platforms, with the concomitant increase in power consumption and cooling requirements.

Two years ago, we began to experiment with virtualization in our data center, and in fact, of the 558 servers your data center floor through virtualization, but you’ll also achieve some real net savings over time. Do you also have plans for using cloud services toward similar ends?

Wishon: In the longer term—and I know some institutions are already heading in this direction—rather than achieving our net savings through virtualization, we’ll begin to promote and increasingly rely upon cloud solutions, or if you will, outsourced solutions that take advantage of much greater economies of scale. I hap-

“If we achieve a 50 percent virtualization rate by 2010, we will effectively flatline our growth in power and cooling consumption, avoiding over a million dollars in annual costs.”

If we achieve a 50 percent virtualization rate by 2010, we will effectively flatline our growth in power and cooling consumption, avoiding over a million dollars in annual costs.

CT: What will you gain from doing that?

Wishon: What we’re hoping to achieve as we grow to the projected 700 servers by 2010 is a 50 percent virtualization rate. If we can get more aggressive with our virtualization as we continue to grow, we hope to meet this growth demand of 700 servers without substantially increasing the number of physical platforms on the floor beyond the number we have in place today.

That has some obvious effects on reducing power consumption and the demands for air handling and cooling. If we can achieve a 50 percent rate of virtualization by 2010, we will effectively flatline our growth in consumption of power and cooling, with the effect of avoiding over a million dollars in annual costs.

CT: So you will not only reduce growth of the number of physical servers on your data center floor through virtualization, but you’ll also achieve some real net savings over time. Do you also have plans for using cloud services toward similar ends?

Wishon: In the longer term—and I know some institutions are already heading in this direction—rather than achieving our net savings through virtualization, we’ll begin to promote and increasingly rely upon cloud solutions, or if you will, outsourced solutions that take advantage of much greater economies of scale. I hap-

CT: Are there other strategies similar to virtualization that you are leveraging within the data center?

Wishon: Another opportunity in the data center is the use of technologies such as Oracle RAC [Real Application Clusters]. While Oracle RAC does not initially reduce costs or environmental impact, we believe that over 10 years it will significantly reduce the cost of ownership, thanks to reduced maintenance costs and higher availability—because it’s a much more scalable and manageable architecture. It also will help us to avoid adding more platforms in our storage environment, and in our database environment. So that’s very
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similar to the way virtualization is allowing us to avoid adding more hardware in the data center.

**CT:** What are some examples of things you’re doing to reduce environmental impact?

**Wishon:** We’ve attracted public interest about an effort where we’re looking at ways to recapture waste heat. Historically, of course, the heat generated by computing platforms and servers in our data centers has just been exhausted to the atmosphere, thrown away. As server platforms are growing in use of blades and tacking on more chips and processing power into the same space, that’s generating not only increased power consumption and cooling requirements, it’s also generating additional heat. If we could find a way to capture waste heat, perhaps recycle it in some way, then once again we’d have a method of reducing the environmental impact and reducing our carbon footprint.

**CT:** So what are you doing to move in this direction?

**Wishon:** We have a couple of successful initiatives that have been coordinated by and were the brainchild of our Chief Technology Officer Dewitt Latimer and a scientist in our Center for Research Computing, Paul Brenner, who have helped the city of South Bend, [IN], to reduce some of its energy requirements by recycling waste heat.

In the first example, the city runs an arboretum/greenhouse facility that contains a display of southwestern American flora, that was a donation from a biologist here at Notre Dame a number of years ago. The winters in South Bend are particularly harsh, and the city was finding it increasingly difficult to heat that greenhouse display facility through the long winters, especially in the face of rising energy costs. So, since we have collaborated with the city to build out a metropolitan area network, it turns out that the arboretum facility sits within close proximity of some fiber that connects the university to parts of the city. We were able to simply take a rack of high-performance computing equipment, particularly dense computers that generated a lot of waste heat, and sit it right down in the greenhouse facility. So what was waste heat is now being used to help heat that greenhouse facility. That not only lowers the costs for the city of South Bend to heat the greenhouse, it also allows us to move that rack off of our data center floor, so we don’t have the burden of cooling that particular suite of equipment.

We’re looking at other ways to leverage this notion. We have another pilot project now with the city of South Bend and its sewage treatment facility, [also] coordinated by Latimer. Sewage treatment facilities try to raise the temperature of solid waste material to a certain point in order to generate bacterial activity that breaks the waste down into byproducts, one of which can be fertilizer. So, rather than hauling the material away to the landfill, the treatment facility can generate a revenue source—provided it is able to raise the temperatures long enough and to the right levels to produce useful fertilizer. So we are engaged in an effort to capture waste heat from the data center, direct it over to the sewage treatment facility, and help the city to solve the waste treatment problem and offset some of its costs.

**CT:** It seems like IT’s role is not only changing within the university, it’s changing within the community as well.

**Wishon:** As we go forward, we’re going to focus on awareness and education as well as our technology initiatives. I think we can all do much better than we have done in the past in addressing environmental concerns and our impact on the environment. **CT**
Selecting an Alert Notification System: Seven Key Considerations

Securing and protecting today’s college campus is a challenge. On one hand, even simple events like severe weather demand a well-thought-out means of reaching students, faculty and staff quickly. On the other hand, institutions place a high value on open access to campus, and on student privacy. Your challenge is to keep students and faculty safe and informed, within the constraints of any higher education institution.

Consider these seven points as you augment your existing notification plan or build a new one:

1. **Determine threats and risks.** Before purchasing any type of security service or product, experts recommend that you conduct a thorough assessment of your organization’s potential threats and risks. These can vary depending on such things as geographic location, building use and building construction materials. Generally, risks are broken down into categories such as natural, utility, human and hazardous. Be sure to involve representatives from all areas of the campus.

2. **Review your emergency plan and evaluate its effectiveness.** You already have one, right? Pull it out, dust it off, and go over it with all of the parties involved. This should be a regular activity anyway, since technology and potential threats both can change rapidly. An emergency plan should include information on procedures, policies and equipment — basically the “who, what, when, where and how” of responding to a campus emergency of any type. Also part of reviewing your emergency plan is to involve outside trained professionals to complete a thorough gap analysis of the plan. At this stage, the benefits of using an emergency notification service may become apparent.

As a communication service, alert notification services differ from mass notification system. Mass notification systems typically involve the broadcast of a loud noise or explicit instructions through strategically placed loudspeakers in critical areas, while alert notification services use personal communication devices such as landlines, PDAs, e-mail, cell phones, pagers and fax machines to help users proactively alert recipients of potentially dangerous or emergency situations.

3. **Define alert notification service objectives.** Once it has been determined that an alert notification system would be beneficial to a campus or organization, the next step is to decide in what situations the service will be used. This may include human factors (saving lives/critical information), operational (continuity), image and reputation (satisfaction) or general applications.

4. **Compare features of alert notification services.** You need to understand the various features that are available in alert notification services today so you can evaluate their importance to your campus. Some areas for comparison include service flexibility, language translation capability, geographic redundancy, service operation, service scalability, ability to customize groups, and user ability to respond to alerts.

5. **Know the pricing structure.** When selecting an alert notification service, it is very important to understand the pricing that will be associated with the service. Is the service in-house or supplied by an Application Service Provider? Is pricing based on per license or per call? Understanding how your organization will utilize the service will help guide you to the right pricing structure.

6. **Complete a risk/expenditure analysis.** There are several ways to determine return on investment for an alert notification service. Some of the areas that should be examined and analyzed include costs, potential savings, timeline and approvals.

7. **Research and secure funding.** There are numerous opportunities available to assist organizations with funding for homeland defense, safety and violence prevention systems, school safety and school emergency planning (REMS). Also, the American Recovery and Reinvestment Act is providing over $100 billion in government spending as part of stimulus packages. Eligible uses include assistance for institutions of higher education -- both public and private -- for modernization of educational facilities. Emergency notification systems, access control systems, and digital video surveillance systems all may qualify. Funds are controlled by individual state governors; more information is at the U.S. Department of Education website, www.ed.gov/policy/gen/leg/recovery.

A security professional can be a valuable resource in helping you identify when and for what uses such grants are available.

When considering an alert notification service it is important to not focus only on dire emergencies. Alert notification services use advanced technology to help broadcast messages to large numbers of people in a very short period of time and can have far more impact when used even for more routine purposes. Overall, an alert notification service is a relatively inexpensive item to add to your emergency preparedness arsenal — and have become an essential part of today’s campus.

For more detailed information, please visit adt.com/education.
Web-Based Learning Platform

New to the US, It’s Learning is a web-based learning management platform created by the Norwegian company It’s Learning AS, designed to manage and enhance the educational process for students, instructors, and administrators. The software-as-a-service solution allows users to create and deliver text, images, sound, and video for courses, collaborative projects, online discussions, tests, or presentations. The material can then be saved to an ePortfolio, and used for student assessment. Other features include plagiarism control, blogs, project forums, discussion boards, audio- and videoconferences, secure messaging/e-mail, grade books, and online exams. Pricing is based on an annual license for each student and instructor. www.itslearning.net.

Remote Power Management

Para Systems has introduced the Minuteman RPM 1521, a two-outlet IP-addressable device that allows users to remotely manage power for connected devices. Via a secure web browser interface, users can cycle power off and on, reducing downtime and providing a fast resolution to equipment lock-ups. Designed for use with security systems, telephone/VoIP systems, servers, and network peripherals, the RPM 1521 allows each receptacle to be independently monitored and managed, including scheduled shut-downs and reboots. The device also provides protection from power surges and spikes that can damage equipment. Contact vendor for pricing. www.minutemanups.com.

Chat Tool for Recruitment

Intelliworks has launched Intelliworks Chat, a web-based tool designed to optimize student service and inquiry management on college and university websites. The tool enables admissions and enrollment departments to offer real-time responses to prospective student questions, directly from the institution’s website (an optional desktop console is also available for chat agents). Features include the ability to: integrate chat sessions with Intelliworks CRM and attach cases to individual contact records; push relevant web content to students; respond to common questions with pre-written messages; locate web visitors via Google Maps integration; connect chats with Google Analytics; and use pre- or post-chat surveys to collect information on constituents. Pricing starts at $1,000 per user per year. www.intelliworks.com. CT
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- Joanna Reza, Cal State and Private School Instructor

for Students

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- Evan Alan, High School Student

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<table>
<thead>
<tr>
<th>ADVERTISER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADT Security Services</td>
<td>37</td>
</tr>
<tr>
<td><a href="http://www.adt.com/education">www.adt.com/education</a></td>
<td></td>
</tr>
<tr>
<td>AVerMedia Technologies</td>
<td>16</td>
</tr>
<tr>
<td><a href="http://www.avermedia-usa.com/presentation">www.avermedia-usa.com/presentation</a></td>
<td></td>
</tr>
<tr>
<td>Campus Technology 2009 Virtual</td>
<td>31</td>
</tr>
<tr>
<td><a href="http://www.campustechnology.com/virtual">www.campustechnology.com/virtual</a></td>
<td></td>
</tr>
<tr>
<td>Campus Technology 2010</td>
<td>35</td>
</tr>
<tr>
<td><a href="http://www.campustechnology.com/summer10">www.campustechnology.com/summer10</a></td>
<td></td>
</tr>
<tr>
<td>CDW-G</td>
<td>C2-3</td>
</tr>
<tr>
<td><a href="http://www.the21stcenturycampus.com">www.the21stcenturycampus.com</a></td>
<td></td>
</tr>
<tr>
<td>College Brain</td>
<td>39</td>
</tr>
<tr>
<td><a href="http://www.15desks.com/ondemand">www.15desks.com/ondemand</a></td>
<td></td>
</tr>
<tr>
<td>Datatel</td>
<td>27</td>
</tr>
<tr>
<td><a href="http://www.datatool.com/connection">www.datatool.com/connection</a></td>
<td></td>
</tr>
<tr>
<td>Digital Architecture</td>
<td>9</td>
</tr>
<tr>
<td><a href="http://www.digarc.com">www.digarc.com</a></td>
<td></td>
</tr>
<tr>
<td>eCollege</td>
<td>17</td>
</tr>
<tr>
<td><a href="http://www.pearsoncollege.com/newrules/ct">www.pearsoncollege.com/newrules/ct</a></td>
<td></td>
</tr>
<tr>
<td>Epson</td>
<td>11</td>
</tr>
<tr>
<td><a href="http://www.epsonbrighterfutures.com/ctech">www.epsonbrighterfutures.com/ctech</a></td>
<td></td>
</tr>
<tr>
<td>Fujitsu Computer Systems</td>
<td>15</td>
</tr>
<tr>
<td><a href="http://www.fujitsudailyfuel.com">www.fujitsudailyfuel.com</a></td>
<td></td>
</tr>
<tr>
<td>Gov Connection, Inc</td>
<td>29</td>
</tr>
<tr>
<td><a href="http://www.govconnexion.com">www.govconnexion.com</a></td>
<td></td>
</tr>
<tr>
<td>Jenzabar</td>
<td>23</td>
</tr>
<tr>
<td><a href="http://www.jenzabar.com">www.jenzabar.com</a></td>
<td></td>
</tr>
<tr>
<td>LG Electronics</td>
<td>C3</td>
</tr>
<tr>
<td><a href="http://www.lgcommercial.com">www.lgcommercial.com</a></td>
<td></td>
</tr>
<tr>
<td>Lumens</td>
<td>5</td>
</tr>
<tr>
<td><a href="http://www.mylumens.com">www.mylumens.com</a></td>
<td></td>
</tr>
<tr>
<td>Nelnet Business Solutions</td>
<td>36</td>
</tr>
<tr>
<td><a href="http://www.campuscommerce.com">www.campuscommerce.com</a></td>
<td></td>
</tr>
<tr>
<td>PC Mall Gov, Inc.</td>
<td>13</td>
</tr>
<tr>
<td><a href="http://www.pcmall.com">www.pcmall.com</a></td>
<td></td>
</tr>
<tr>
<td>TechSmith Corp.</td>
<td>C4</td>
</tr>
<tr>
<td><a href="http://www.camtasirelay.com">www.camtasirelay.com</a></td>
<td></td>
</tr>
<tr>
<td>Verizon Wireless</td>
<td>21</td>
</tr>
<tr>
<td><a href="http://www.verizonwireless.com/gov">www.verizonwireless.com/gov</a></td>
<td></td>
</tr>
</tbody>
</table>

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Subscription rates for non-qualified subscribers are: US $24.00, Canada $39.00 (US funds), International $75.00 (US funds).
1. **What is a PLE?** The term personal learning environment (PLE) describes the tools, communities, and services that constitute the individual educational platforms learners use to direct their own learning. A PLE is frequently contrasted with a learning management system in that an LMS tends to be course-centric, whereas a PLE is learner-centric. A typical PLE, for example, might incorporate blogs where students comment on what they are learning, and their posts may reflect information drawn from across the web. While most discussions of PLEs focus on online environments, the term encompasses the entire set of resources that a learner uses to approach the task of learning.

2. **Who is doing it?** University of Bolton (UK)…University of Mary Washington (VA)…Baylor University (TX)…Penn State…The University of British Columbia…

3. **How does it work?** Instructors or institutions generally provide a framework for student study that might be a desktop application or a web-based service and could include links to web tools, as well as traditional research and resources to which students can add their own network of social contacts and collection of educational resources. As ideas are generated, problems queried, and content created, feedback becomes the combined output of peers, colleagues, and friends as well as experts and critics.

4. **Why is it significant?** PLEs represent a shift away from the model in which students consume information through independent channels such as the library, a textbook, or an LMS, moving instead to a model where students draw connections from a growing matrix of resources that they select and organize. A PLE is created from self-direction and therefore the responsibility for learning rests with the learner.

5. **What are the downsides?** The process of self-directed learning requires a degree of self-awareness. Some students may have never taken the time to think about their own metacognition or to reflect on how they learn best. These less experienced students may not be ready for the responsibility that comes with building and managing a PLE.

6. **Where is it going?** The PLE is a result of the evolution of Web 2.0 and its influence on the educational process. As such, the concept is likely to become a fixture in educational theory, engendering widespread acknowledgement of its value.

7. **What are the implications for teaching and learning?** The concept of the PLE marks a fundamental change in the role resources (people and media) play in teaching and learning. In an environment where information is ubiquitous, the goal for the student shifts from a need to collect information to a need to draw connections from it—to acquire it, disseminate it, and collaborate in its use.

Excerpted from the EDUCAUSE Learning Initiative’s (ELI’s) “7 Things You Should Know About…” series that provides concise information on emerging learning technologies and related practices. To read the entire PLE tract and to see others in the series, go to www.educause.edu/eli/eliresources/7thingsyoushouldknowabout/7495.
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