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March 2011

Where's the REVOLUTION?

As the e-book market explodes, publishers and educators debate why e-textbooks lag behind.

SHINING A LIGHT ON RETENTION
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Register now: 2011 CT Virtual Conference
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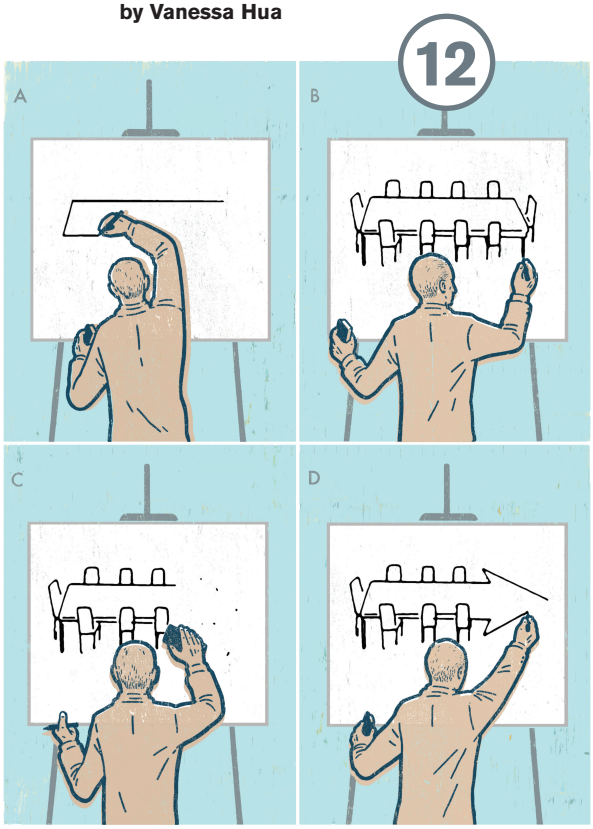

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by Jennifer Demski

Free registration for Campus Technology Virtual Conference! See page 49 for details.

Reading in the Dark Ages

It's 2011 already. What's the holdup with e-readers designed for the needs of academia?

I was on the subway, coming home from an appointment in Manhattan (I live in Brooklyn), when I noticed the young woman next to me reading through a sheaf of stapled paper.

Out of the corner of my eye, I looked more closely at her reading matter. (You become quite adept at "eavesreading" after a quarter-century of riding the subway.) What I saw amazed, amused, and annoyed me.

The packet the young woman held was a compilation of different essays on child development and learning (Erikson, Piaget, and the like). Judging from its cover page, I could tell the woman was a graduate student in education. This was clearly her child-development course "text."

My jaw dropped. When I was a grad student in the early '80s teaching freshman composition, I put together "textbooks" like this—essays from different authors published in different books, copied and collated by the local copy center where students would pick up their course packs.

Call me naive, but I am stunned—and peeved—that in 2011 college classes still issue photocopied course packs.

I'm going to assume that her professor obtained copyright clearance for reproducing these essays. (Which is more than I can say for my colleagues and me in 1983, when we assured ourselves that we were not violating any copyrights because we were using the texts for "educational purposes." University counsel must have been absent for that faculty meeting.) But why couldn't the instructor have done an electronic compilation through the school LMS, or Google Books, or Open Library? I'm sure that this young woman would have preferred to have these articles on her iPhone rather than in a stapled mass, whose over-copied, blurry text was certainly no testament to the unbeatable resolution of the printed page.

Lest anyone mistake me for an anti-print person, let me be clear that I am a paper-trained reader and I love physical books. (*N.B.:* I'm writing this essay for a print magazine.) I don't even own an e-reader or (gasp) an iPad.

But when it comes to college reading, I can't help but want to scream: Please, please, let's get a move on to electronic texts! Students spend a scandalous amount of money on bloated, overweight textbooks that are, most times, of no further use after the course is finished.

I'm not suggesting that reading a PDF is a more satisfactory experience than reading a textbook. And, as we have reported in the pages of this magazine, academic reading is not the same as reading for pleasure—the electronic readers out there (even the iPad) are still not optimized for reading for learning.

What is holding us up? As my dad would say, we can put a man on the moon, yet we can't make an e-reader that students can skim, dog-ear, and notate? *Please*.

Read John K. Waters' excellent article on where the e-textbook is headed on page 34. And send me your thoughts on this topic at the e-mail below. **CT**

—Therese Mageau, Editorial Director
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CAMPUS TECHNOLOGY

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UPCOMING EVENTS

March

MAR 13 - 16
Association of College and University Auditors
2011 ACUA Midyear Conference
acua.org/cpe_events/midyear_conference.asp
Orlando, FL

MAR 13 - 16
American Association of Collegiate Registrars and Admissions Officers
AACRAO 2011 Annual Meeting
aacrao.org/seattle
Seattle, WA

MAR 26 - APR 4
The SANS Institute
SANS 2011
sans.org/info/65598
Lake Buena Vista, FL

MAR 28 - 29
The Sloan Consortium
8th Annual Sloan Consortium Blended Learning Conference and Workshop
sloanconsortium.org/blended
Oak Brook, IL

MAR 30 - APR 3
American Society for Information Science and Technology
IA Summit 2011
iasummit.org
Denver, CO

April

APR 3 - 6
Association for Information Communications Technology Professionals in Higher Education
2011 ACUTA Annual Conference & Exhibition
acuta.org
Orlando, FL

APR 3 - 8
The Data Warehousing Institute
TDWI World Conference
tdwi.org
Washington, DC

APR 4 - 6
California Community Colleges Chief Information Systems Officers Association and SecureIT
CISOA/SecureIT 2011
secureitconf.com
Santa Clara, CA

APR 9 - 12
American Association of Community Colleges
91st AACC Annual Convention
aacc.nche.edu/convention
New Orleans, LA

APR 12 - 14
School & College Building Expo
scbexpo.com
Chicago, IL

APR 17 - 20
National Association of Campus Card Users
2011 Annual Conference
naccu.org/2011
Baltimore, MD

May

MAY 1 - 4
United States Distance Learning Association
2011 USDLA 5th Annual Conference
usdla.org/2011_national_conference
St. Louis, MO

MAY 3 - 12
The SANS Institute
SANS Security West 2011
sans.org/security-west-2011
San Diego, CA

MAY 8 - 12
Interop Las Vegas
interop.com/lasvegas
Las Vegas, NV

MAY 16 - 17
Educause
Enterprise Information and Technology Conference 2011
net.educause.edu/enterpriseconference
Chicago, IL

MAY 16 - 19
IMS Global Learning Consortium
Learning Impact 2011
imsglobal.org/learningimpact2011
Long Beach, CA

June

JUN 11 - 17
InfoComm 2011
infocommshow.org
Orlando, FL

JUN 12 - 15
League for Innovation in the Community College
Learning College Summit 2011
league.org/ls2011
Phoenix, AZ

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>> To submit your event:
Send an e-mail to Rhea Kelly (rkelly@1105media.com)

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CT Online

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Viewpoint

E-Procurement: Toward Technology and Culture Change

The success of e-procurement at any institution often depends on how the procurement department works not only with the technology, but also with the end users in academic departments.

The Myth of E-Learning: There Is No "There" There

A shift is occurring from classroom-centric thinking to a more holistic, multidimensional viewpoint and a greater emphasis on experiential learning.

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Features

High Speed Ahead

Purdue University (IN) is dramatically expanding its fixed and mobile wireless infrastructure to support mobile learning, including an upgrade to WiFi and a rollout of 4G services.

Master of Process Improvement

The new position of process-improvement facilitator is streamlining dual enrollments at the **University of Tennessee at Martin**.

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Migrating From PowerPoint: Make Online Teaching More Engaging and Interactive

Turn PowerPoint presentations into dynamic online content—with built-in navigation, interactive activities, and streaming video clips—while ensuring accessibility compliance at the same time.

The Next Big Thing in Digital Education: The Blackboard and McGraw-Hill Higher Education Partnership

A new integrated platform will allow instructors to pull content—e-texts, video, labeling exercises, and more—from learning object repositories directly into courses with just two or three clicks.

Migrating From a Legacy LMS to an Open Source Moodle Platform

Learn about managed open source, how seamless integration between SIS/ERP should affect a decision to make the transition, and special considerations for evaluating a move to Moodle.

NEED TO KNOW

Rescuing the Help Desk

Five years ago, **Charlotte School of Law** was the new kid on the block in North Carolina's higher education system. The institution opened its doors with 66 students and big aspirations in 2006. With such a small stable of teachers and students to serve, the school's four-person IT team handled all support requests manually.

Then the school started growing, and the manual process got harder to manage. With no room in the institution's budget for additional IT staff, Ryan Haylock, director of IT, began searching for a better way to handle manual asset inventory, patch management, software update services, and related functions. Read more at *campustechnology.com/articles/2011/01/20/rescuing-the-help-desk.aspx.*

In Box

"The challenge for instructors now is to identify what is best done face-to-face when much can be done online just as well and more conveniently for learners." —*Tony Bates, Vancouver, BC*

Read this and other reader comments at *campustechnology.com/articles/2011/01/19/the-myth-of-elearning.aspx*.

Newsletters

Campus Technology Insider (twice monthly) showcases the best of the *CT* print publication.

Web 2.0 (twice monthly) covers teaching and learning in the new web world.

News Update (weekly) provides breaking stories in higher ed IT.

IT Trends (weekly) is loaded with news and resources for the IT professional on campus.

SmartClassroom (weekly) includes news, resources, and peer viewpoints on implementing a next-gen classroom.

C-Level View (twice monthly) opens a forum for technology discussions among top-level campus execs.

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Web 2.0 Focus

Can Blogging Make a Difference?

A **Michigan State University** pilot study seeks a meaningful way to incorporate web 2.0 into curricula. Read more at *campustechnology.com/articles/2011/01/12/can-blogging-make-a-difference.aspx*.

Fujitsu recommends Windows® 7 Professional.

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Campus+Industry

TECHNOLOGY HAPPENINGS IN HIGHER EDUCATION

NEWS

NEW GRANTS FOR CCS. The US Department of Labor has announced the availability of up to $500 million in grant funds under the Trade Adjustment Assistance Community College and Career Training program. The primary goal is to fund two-year education and career-training programs that will help workers acquire the degrees and credentials needed for high-wage, high-skills employment. The deadline for grant applications is April 21; additional information is available at *workforce3one.org*.

EDU APPS MARKETPLACE. Google has introduced an education-focused area in its Google Apps Marketplace, which provides web applications that integrate with and extend Google Apps. According to the company, educators can use the site to find new web applications specifically intended for K-12 and higher education. The apps don't require additional logins, are available from the Google navigation bar, and can access data stored in Google Apps (with approval). Currently, the site features 24 applications, including Digication e-Portfolio, which allows students to showcase work online, and EduTone Connector for Moodle, a trial version of a utility that facilitates single sign-on authentication through Google Apps.

FACULTY-RELATIONSHIP MANAGEMENT. **Texas Wesleyan University**'s Center for Excellence in Teaching and Learning (CETL) has begun using Intelliworks' software-as-a-service constituent relationship management (CRM) platform to handle its interactions with faculty members. The software performs four primary functions: 1) event management, to track attendees and send post-event surveys; 2) monitoring of faculty interactions through phone calls, e-mails, and walk-ins; 3) e-mail campaign management, including e-mail open-rate and click-through tracking; and 4) reporting tools, to help assess the CETL program's effectiveness. Read more at *campustechnology.com/articles/2011/02/01/texas-wesleyan-taps-crm-to-manage-faculty-development.aspx*.

TEXAS WESLEYAN U is using CRM to measure the effectiveness of its faculty-development efforts.

INTEGRATED LMS. Twenty colleges and universities are testing a new blend of course management functionality and textbook content that could facilitate the transition to a more digital curriculum. Put together by Blackboard and McGraw-Hill Higher Education, the integrated digital course system combines the latest version of Blackboard Learn, a learning management system (LMS), with McGraw-Hill's Connect and Create, all with single sign-on access. Connect is an application that helps faculty create digital course content and assignments and do automatic grading; Create lets faculty compile textbooks that use their own materials as well as content from the company's publishing portfolio. The integration is expected to be available this summer as part of version 9.1 of the Blackboard Learn platform. Read more at *campustechnology.com/articles/2011/01/27/blackboard-and-mcgraw-hill-test-new-course-system-in-20-pilots.aspx*.

CUSTOM TEXTBOOKS. In an effort to reduce textbook expenses for its 23,000 students, **Cerritos College** (CA) has partnered with Pearson to introduce custom texts into the school's courses. This spring, instructors in the Humanities and Social Sciences division will have the option to create customized texts in print-only or digital versions. The textbooks can include materials from multiple resources—both print and open source—as well as content written by instructors, such as introductory letters, information about relevant academic clubs, course descriptions, and other elements. The program also gives students and faculty access to Pearson's MyLabs online services, which include homework, tutorials, and assessments.

PREDICTION: E-LEARNING GROWTH. By 2015, 25 million post-secondary students in the United States will be taking classes online, according to a forecast from market research firm Ambient Insight. The report, *The US Market for Self-paced eLearning Products and Services: 2010-2015 Forecast and Analysis*, also predicts that the number of students who take classes exclusively on physical campuses will plummet from 14.4 million in 2010 to just 4.1 million five years later. Read more at *campustechnology.com/articles/2011/01/26/online-learning-set-for-explosive-growth-as-traditional-classrooms-decline.aspx*.

M&A, Etc.

JENZABAR GAINS E-COMMERCE TECH. Jenzabar has acquired retail e-commerce vendor Allurent. The pairing brings Allurent's cloud-based technology, which enables companies to interact and engage with constituents through the web, to the higher education market. CT

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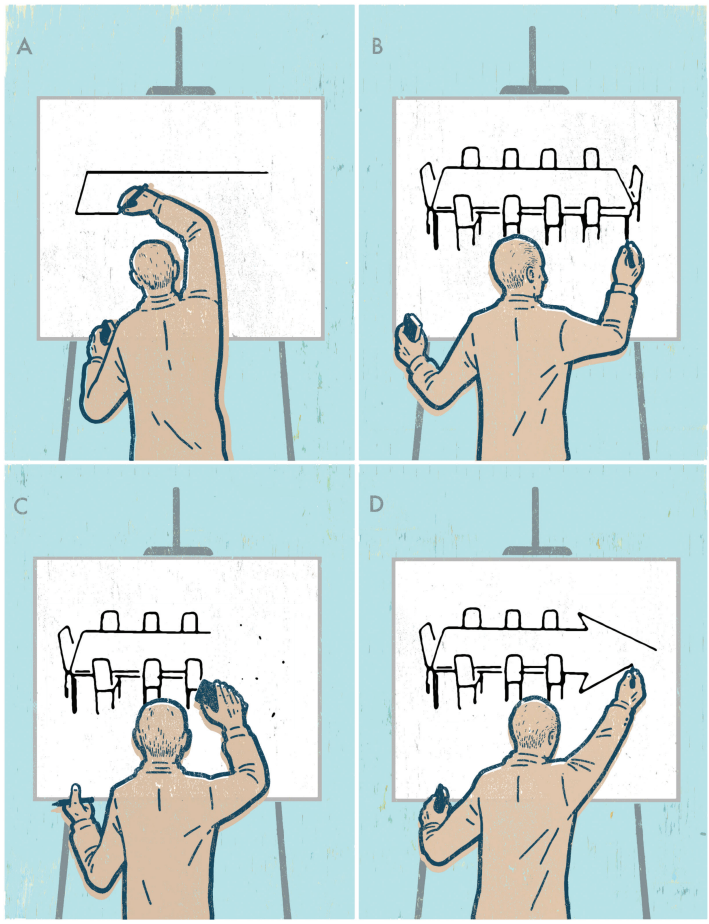
Project Rescue: Building a Team Effort

How our CIO rallied the troops to take on the challenge of giving more value to the campus community.



Dan Page

This is the second installment in a four-part series that follows the exploits of Gene, a well-established CIO of a sizable IT organization at a top-100 American university. At the president's back-to-school cabinet meeting, Gene learned of some deep dissatisfaction with IT's performance. As a result, he embarked with his team on Project Rescue, a quick-response effort to provide visible IT value to the campus.

AT THE POST-CABINET meeting with his staff, Gene had secured some initial buy-in for Project Rescue: He had persuaded all his team members to commit to thinking like the owners of an entrepreneurial business, not like technicians offering a commodity service. (For more on how Gene accomplished this, see *campustechnology.com/articles/2011/01/01/project-rescue*.)

Now, they had to deliver—quickly—something of value to show the campus that IT was listening. Gene scheduled a Project Rescue kickoff meeting for the next day with his leadership team. Even though each team member was on board with the effort, Gene still envisioned a room full of "FUD" (fear, uncertainty, and doubt). He realized that his team's desire to serve might be part of the cause of their troubles. In each corner of the IT organization sat a large backlog of work. People were so heads-down trying to get things done that they had lost sight of planning and communication. Between patching, maintenance, and over-the-transom requests, their entire operational approach had become a black hole of prioritization.

Gene also realized that he and his organization had become increasingly risk averse. The first year of Gene's tenure had been marked by major improvements that would have exposed IT had they failed: new e-mail, support for mobile phones, a new course management system,

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enhanced wireless. Four years later, all IT appeared to focus on—one might even say hide behind—was infrastructure and maintenance.

To quell his team's fears about the magnitude of the project, Gene established a simple methodology for the kickoff meeting: 1) Review and commit to operating principles; 2) brainstorm project ideas; and 3) commit to specific projects. Who could be intimidated by a three-point agenda like that? He'd find out on the morrow.

Planning and Governance

Gene started his meeting with two straightforward questions: How do we plan, and how do we know what work to do? He wasn't fully prepared for the animated and emotional two-hour discussion that ensued. His team members felt forced into being all things to all people. They were tired of new demands adding to a bottomless backlog. They believed that they always had to say yes. It was an impossible situation.

Once these frustrations had been aired, Gene asked everyone to step back and brainstorm ways to solve these problems. It didn't take them long to generate an impressive list—given their collective years and depth of experience, this was no surprise. After grouping the list items into natural categories, the group returned to the two questions that started the discussion: How do we plan, and how do we know what work to do?

Gene started his meeting with two fundamental questions behind IT operations: How do we plan? And how do we know what work to do?

They immediately realized that there were two fundamental elements of their planning and governance solution: transparency (helping their customers understand why certain projects move forward and others do not) and customer involvement (making people feel part of the planning process). To achieve this transparency and involve customers would require the following steps:

1) The IT organization would determine an operating capacity in hours, and share this with the university community. IT would commit to delivering a certain amount of time, across the university, in each of the following areas: project management, business analysis, software development, data management, server and system configuration and management, quality assurance, and training/support.
2) The IT organization would earmark a portion of its overall capacity for ongoing maintenance and operations and turn the rest of the capacity back to the university for joint prioritization.
3) Everyone in the IT organization would track time on task. By tracking time against capacity, IT could demonstrate to the community where it was spending time, where it had flexibility, and the human cost of implementing projects.
4) A monthly status report posted on the university intranet would keep the campus community apprised of project commitments, backlog, progress, and capacity utilization.
5) IT would resurrect a long-dormant planning committee comprising senior staff and faculty from across the university. Twice yearly, the committee would receive calls for projects from the campus community and prioritize the requests.
6) The committee would also reserve some capacity for smaller projects (taking fewer than 100 hours) and allocate that capacity to operating units within the university for them to prioritize locally.
7) The team committed to measure its efficiency against industry standards, and to share the results with the university community.
8) Through its project management office, the IT organization would work with partners across the university on the yearly budget process. IT would help turn business needs into project definitions, size project requests, and help write business cases for any need so large that it required a supplemental budget request.

The team readily saw how this approach would help all members of the university community understand where IT was most needed on campus and how IT was responding to those needs. Combined with external benchmarking, this transparency would help to build a deeper appreciation of the organization's effectiveness.

Project Prioritization

But Project Rescue needed to change more than how the IT organization planned and governed itself. IT had to take some visible action within the next 30 days to show constituents that it was listening.

Even though IT team members had just committed themselves to involving campus stakeholders in prioritizing projects, they knew they needed to decide—right now—which of the 200 or so projects in the backlog should be fast-tracked for completion within the month. In their decision-making, they applied the following filters: ▸

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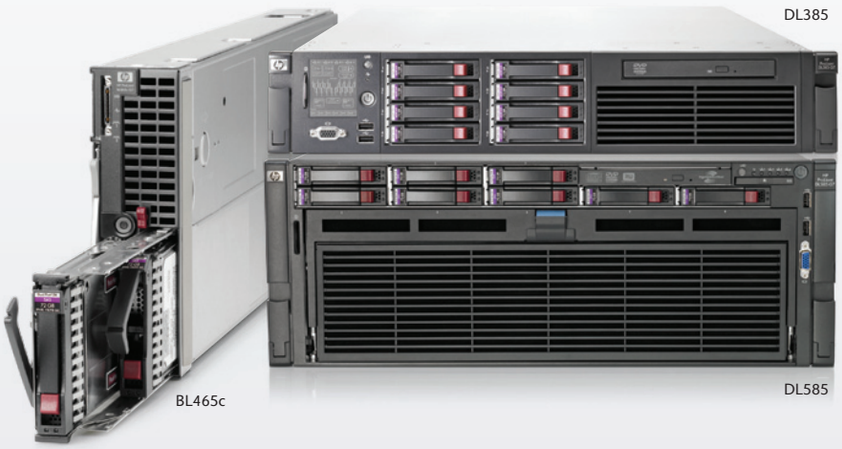

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- Impact: How many people would be positively affected?
- Feasibility: Did IT actually know how to accomplish the project?
- Readiness: If IT implemented the change, was the campus ready to use it?
- Financial: Could IT afford to do the project?
- Time to completion: Could the project be done within 30 days?

Using these filters, the team quickly settled on the following list of projects:

- Support for a broader array of mobile devices
- Increased wireless speed in major campus locations
- Launch of a student pilot program with the newest generation of tablets
- Integration with a hosted collaboration solution
- Hosted web videoconferencing using the existing single sign-on infrastructure

Making these decisions was tough for the team members, because they had to defer other important ideas—such as a new line of mobile applications for the campus intranet and a campus-only social network—that did not meet the criteria of feasibility, readiness, and time to completion. The team realized, though, that these bigger ideas would be perfect to put through the new governance process.

Reviewing Commitments

As day two of their one-day retreat raced toward evening (good thing Gene reserved the space for an extra day), Gene and his team were pleased with their progress. They were committing to each other not only to keep the trains running, but to expedite new ways of planning and governing—and to deliver some noticeable improvements. The projects they selected had a different feel from their usual slate: They could be quickly implemented, were a little risky, and were immediately visible to the community. It felt good to be back with an inclusive approach to governance, to be really thinking like owners in terms of measuring their capacity and consumption, and to be driving projects that would directly benefit the university community.

As the team dispersed for the night, Gene's thoughts began to race ahead. Did he have enough goodwill left to implement the governance ideas? Would the rest of the IT team accept the changes? They were off to a great start, but clearly much work and risk lay ahead. CT

***Stephen Laster** is the CIO of **Harvard Business School** (MA). He will be conducting a special session on CIO leadership at the Campus Technology 2011 conference in Boston, July 25–28. For more on the conference, see* campustechnology.com/summer11.

What should be next on Gene's agenda? Share your thoughts at campustechnology.com/projectrescue.

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Planning for Disaster

One community college system stages a yearly summit to help member institutions hone their emergency-management skills.

TWO YEARS AGO, when the Virginia Department of Emergency Management (VDEM) stepped up its efforts to ensure that the state's institutions were adequately prepared for emergencies, the **Virginia Community College System** determined it needed a better disaster plan. Some of the new state standards came in response to the April 2007 **Virginia Tech** shooting, while other efforts were focused on emergency management in general.

"We're governed by a lot of state initiatives and mandates that dictate our actions," explains Mary Savage, emergency preparedness and safety manager for the 425,000-student community college system. "These government groups all have some level of oversight in terms of our emergency, continuity of operations, and disaster-recovery plans."

At the time, VCCS was already in the middle of implementing technology-based notification systems for its individual schools, but the system wanted to take its emergency planning a step further. "A few of us got together with the system president and decided that a summit would be the best way to roll out some of these initiatives at the campus level," says Savage. "We wanted attendees to go back and say, 'Hey, we learned these planning tactics or emergency drills, and we're going to use them on campus.'"

Curtis Parker

The Summit

Savage and Joy Hatch, VCCS' vice chancellor of IT, worked together to develop an annual meeting where the leaders and administrators from the system's 40 campuses could learn about disaster planning. The COOP/DR Summit (named after VDEM's Continuity of Operations Planning mandate) serves as a training ground for attendees, who can then put the newfound knowledge to use at their own schools.

The two-day event comprises a keynote presentation and breakout sessions on a range of disaster-planning topics, from how to communicate during a crisis to the importance of testing your recovery plan. For the 2010 summit, for example, Brian Wisniewski of **Carnegie Mellon University**'s (PA) Software Engineering Institute spoke about best practices for leveraging IT for business continuity, while Jeffrey Kraus of VCCS discussed social media's role in continuity planning. Speakers and panel members are recruited from individual colleges within the system, as well as from local organizations such as Dominion Virginia Power, VDEM, and the Virginia Professional Fire Fighters.

Attendees also are able to visit with vendors to learn about new products and services that can help institutions design effective emergency plans and comply with government regulations. Last year's vendors included Cisco, which showcased the potential of its WebEx technology for telecommut-

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The presence of finance professionals at a disaster-management event helps strengthen the ties between funding and emergency planning.

ing, and Vital Sign Media, a company that installs defibrillators on campuses that agree to put up its digital displays. (See "2010 COOP/DR Summit Vendor Participants," below.)

Savage and Hatch select the vendors based on their solutions' relevance to the college environment. Notes Hatch, "It's a constant collaboration as we travel and as we're exposed to different vendors and their disaster-management solutions, automated notification systems, and other useful products. When we see something that might be beneficial for our college system, we sign them up for the next COOP/DR Summit."

Rounding up Attendees

Most of the VCCS campuses send between four and six people to the annual summit, which is centrally located in Roanoke to ensure a good turnout. That translates into about 200 attendees. Hatch and Savage focus primarily on pulling in VCCS' presidents, safety directors, and upper administration staff, including each campus's vice president of finance and administration.

"We encourage [the senior staff] to bring everyone who is responsible for making sure that the colleges are in compliance with emergency-preparedness initiatives," says Savage, who adds that the presence of finance professionals at the event helps strengthen the ties between funding and emergency planning.

"In Virginia, a lot of the grant and emergency-preparedness funding is tied to local municipalities and emergency-management organizations," she explains. "It's important that our VPs of finance and administration see this connection, and see how their involvement can lead to more financial support for their schools."

For the 2010 COOP/DR Summit agenda, including downloadable presentations, go to *vccs.edu/policymakers/2010coopdrsummit/tabid/824/default.aspx*.

Using Social Media

At the most recent COOP/DR summit, those unable to attend could keep up with the event on Twitter, where the hashtag #VCCS-ready was used to identify tweets being broadcast (and retweeted) by attendees and speakers. Hatch recounts that VCCS set up a Twitter account and asked participants to "follow" that account throughout the course of the conference.

"We realize that technological collaboration these days goes beyond e-mail and text," says Hatch, who sees the conference's simple use of Twitter as a good way to interest attendees in employing such solutions at their schools. "We're trying to get our college leadership team to recognize these new media tools, and incorporate them into notification systems and other processes."

After all, notes Savage, today's students are more attuned to their mobile devices and social media than they are to traditional alert methods such as phone calls. "The bottom line is that students use social media more than their colleges do when it comes to information dissemination," she insists. "Our attendees walked away with a better understanding of that—via the breakout session on the topic, and the Twitter feed activity—and took that knowledge back to their schools."

Best Practices

To other college systems looking to replicate VCCS' success with a collaborative emergency-management effort, Hatch advises, "Start your planning early, and have a focus." Every year, her team starts with a list of 10 or more disaster- and emergency-planning points for the summit agenda, and then whittles that down to just a few key areas. It's vital, emphasizes Hatch, to make the conference lineup relevant and timely by, for example, incorporating information about new legislation or mandates.

And don't be afraid to ask attendees what *they* would like to see on the agenda—what their particular pain points are. This can be done via a simple e-mail survey in advance of the event, or via a social media tool like Twitter.

"No one wants to sit through a two-day conference listening to information that has nothing to do with what he or she is performing on a daily basis," says Hatch. "Give the people you're inviting a chance to provide input, and then use the event as a vehicle for delivering guidance and information on those areas of concern." **CT**

Bridget McCrea is a freelance writer in Clearwater, FL.

2010 COOP/DR SUMMIT VENDOR PARTICIPANTS

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They Even Do Windows

Color laser multifunction printers can do it all: print, scan, and fax. *CT* looks at what's available for under $1,000.

WHO SAYS YOU CAN'T have it all? Today's color laser multifunction printers can meet the document needs of most small offices, with all-in-one printing, faxing, and scanning. While they may not provide the kind of high-end performance in each area that you would expect from a dedicated device, these compact units can save both office space and money. Indeed, in our survey of the top color laser multifunction printers (MFPs), *CT* found nearly 20 models that are priced under $1,000.

As with any all-in-one device, you should consider what features are most important to your office setup, since not all MFPs are equally adept at each function. If your office tends to print a lot, for example, focus your attention on print speed, paper capacity, or the ability to handle double-sided printing automatically.

While functionality differs from printer to printer, all models at this price point share a few features:

- All are Windows and Mac compatible.
- All but one include fax functionality. (The Lexmark X543dn, priced at $770, does not.) The rest offer up to 33.6 kbps in fax transmission speed.
- All provide USB 2.0 and Ethernet network connectivity, and several have additional options.

Okidata MC361

In the following charts, we highlight the standouts in connectivity; supported memory; print speed; and bargains under $600. (Note: All prices are the manufacturer's suggested retail price; the reseller price may be up to 50 percent lower. The lists are based on manufacturers' specifications compiled by GovConnection.com and from the manufacturers themselves; *CT* has not done any product testing to verify manufacturers' claims.) For a complete listing of all the color laser multifunction printers in our survey—sortable by printer feature—check out *campustechnology.com/0311_mfps*.

Printers Under $600

Each of these five models is an all-around best buy for users on a budget, although the trade-off in some cases is decreased media capacity, slower black-and-white printing, less standard memory, or lower print resolution.

NAME	PRICE	B&W PRINT SPEED (MAX)	B&W RESOLUTION (MAX)	STANDARD CAPACITY (# SHEETS)	STANDARD MEMORY
Samsung CLX-3185FW Color Laser Multifunction Printer	$399.99	17 ppm	2,400 x 600 dpi	130	256 MB
HP Color LaserJet Pro CM1415fnw MFP	$449.99	12 ppm	600 x 600 dpi	150	160 MB
Okidata MC361 Color MFP	$549	25 ppm	1,200 x 600 dpi	350	256 MB
Brother MFC-9010CN Digital Color All-in-One	$549.99	17 ppm	2,400 x 600 dpi	250	64 MB
Xerox Phaser 6128MFP Color MFC	$599	16 ppm	600 x 600 dpi	251	384 MB

Photos courtesy of Okidata, Lexmark, Brother, Samsung, HP, Xerox

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Supported Memory

Lexmark X544n

These 10 models boast the highest amount of supported memory, or upgradable capacity. Memory is an important consideration, since it helps boost print speeds, especially for large files such as high-resolution photos. If multiple users send their jobs to the print queue—or your office receives large faxes—you'll want to ensure that your MFP has the memory to cope. Two of our featured printers support up to a whopping 1,380 MB of memory.

NAME	SUPPORTED MEMORY	STANDARD MEMORY	COLOR PRINT SPEED (MAX)	PRICE
Xerox Phaser 6180MFP/D Color Laser (double-sided printing)	1,380 MB	384 MB	20 ppm	$949
Xerox Phaser 6180MFP/N Color Laser	1,380 MB	384 MB	20 ppm	$799
Okidata MC361 Color MFP	768 MB	256 MB	23 ppm	$549
Okidata MC561 Color MFP	768 MB	256 MB	27 ppm	$749
Samsung CLX-6250FX Color Laser Multifunction Printer	768 MB	256 MB	25 ppm	$899
Lexmark X543dn Color Laser MFP	640 MB	128 MB	21 ppm	$770
Lexmark X544n Color Laser MFP	640 MB	128 MB	25 ppm	$898
Brother MFC-9010CN Digital Color All-in-One	576 MB	64 MB	17 ppm	$549.99
Brother MFC-9120CN Digital Color All-in-One	576 MB	64 MB	17 ppm	$649.99
Brother MFC-9320CW Digital Color All-in-One	576 MB	64 MB	17 ppm	$699.99

Samsung CLX-3185FW

Connectivity

In case there isn't a network port nearby, three wireless models give you the flexibility to set up your MFP anywhere in your office, without the hassle of running a cable. In addition, these machines all offer RJ-45 10/100 Base-TX Ethernet connectivity, USB 2.0 Type B ports, and RJ-11 ports for a fax line connection. As for wireless capability, one unit meets the 802.11 b/g standard, while the other two offer the slightly faster 802.11 b/g/n.

NAME	CONNECTIVITY	STANDARD CAPACITY (# OF SHEETS)	STANDARD MEMORY	PRICE
Samsung CLX-3185FW Color Laser Multifunction Printer	RJ-11 port RJ-45 Ethernet port Wireless 802.11 b/g/n USB 2.0 Type B port	130	256 MB	$399
Brother MFC-9320CW Digital Color All-in-One	RJ-11 port RJ-45 Ethernet port Wireless 802.11 b/g USB 2.0 Type B port	250	64 MB	$699.99
HP Color LaserJet Pro CM1415fnw MFP	RJ-11 port RJ-45 Ethernet port Wireless 802.11 b/g/n USB 2.0 Type A port USB 2.0 Type B port	150	160 MB	$449.99

Print Speed

When it comes to black-and-white printing, these seven models are the jackrabbits of our surveyed MFPs, with three capable of reeling off 31 pages per minute. Just be aware that speeds may drop when printing in color.

NAME	B&W PRINT SPEED (MAX)	COLOR PRINT SPEED (MAX)	STANDARD CAPACITY (# OF SHEETS)	STANDARD MEMORY	PRICE
Okidata MC561 Color MFP	31 ppm	27 ppm	350	256 MB	$749
Xerox Phaser 6180MFP/D Color Laser (double-sided printing)	31 ppm	20 ppm	450	384 MB	$949
Xerox Phaser 6180MFP/N Color Laser	31 ppm	20 ppm	450	384 MB	$799
Brother MFC-9460cdn Color Laser All-in-One	25 ppm	25 ppm	300	128 MB	$949.99
Lexmark X544n Color Laser MFP	25 ppm	25 ppm	250	128 MB	$898
Okidata MC361 Color MFP	25 ppm	23 ppm	350	256 MB	$549
Samsung CLX-6250FX Color Laser Multifunction Printer	25 ppm	25 ppm	450	256 MB	$899

Vanessa Hua *is a freelance writer based in Claremont, CA.*

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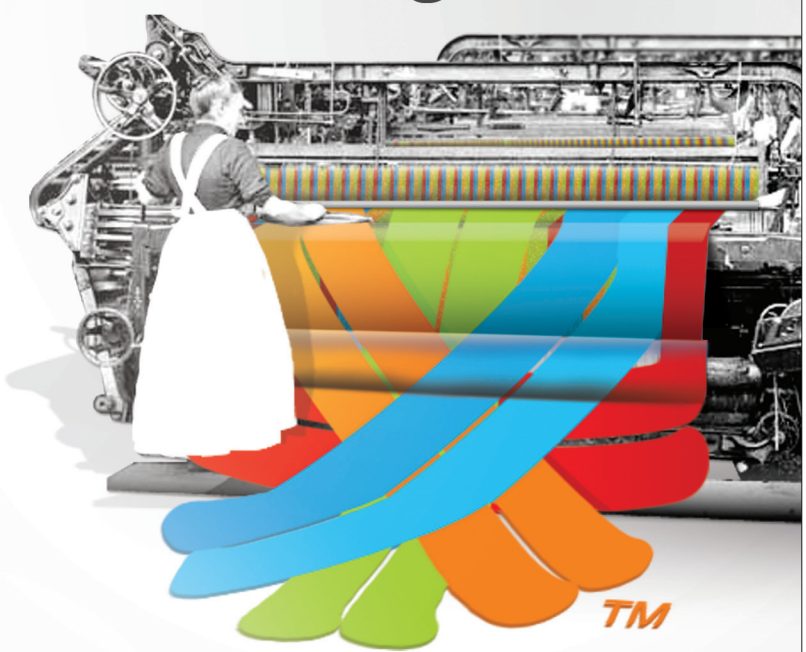

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In the push to improve student performance, two universities institute comprehensive, data-driven systems to assess their departments.

By Dian Schaffhauser

putting the focus on performance

FROM THE EXCESSES OF Wall Street to the whole mortgage mess, the issue of accountability has become part of a heated national conversation. It is a debate to which higher education is certainly no stranger. But now, with tuition rates at private and public schools rising precipitously—and state budgets shriveling—the cries for increased accountability are growing louder. To add fuel to the fire, several recent media reports have questioned the very value of a college education in light of the bleak job prospects for new graduates.

So how do schools prove their worth—and constantly improve? How do they answer the questions: What are we doing, why are we doing it, and how are we doing?

James Steinberg

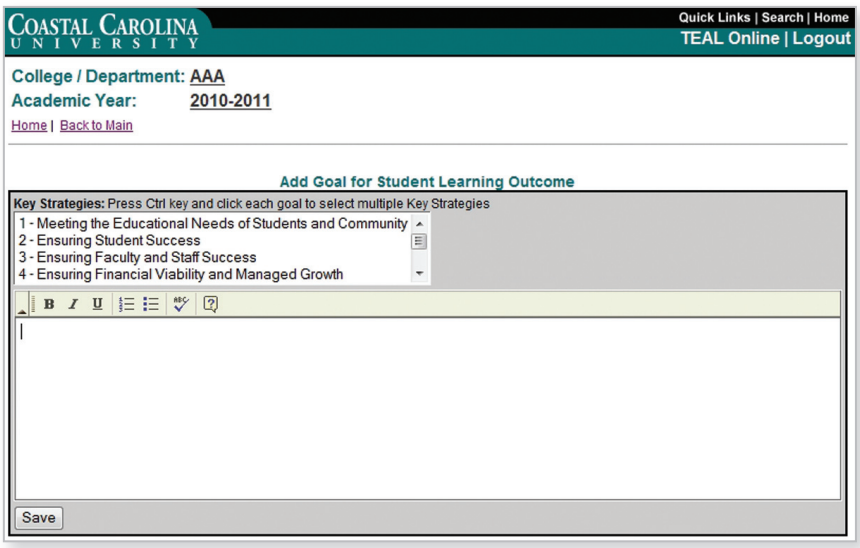
One thing is clear: The task of assessing a school's performance can no longer be carried out just within the walls of the office of institutional research. The foundation for student success is laid in departments—academic and even non-academic—scattered across campus. And in the drive to improve student performance, many believe, each of these areas must be held accountable.

That's a lesson that Barbara Buckner learned in 2007 when she accepted the position of associate provost for assessment and accreditation at **Coastal Carolina University** (SC), a four-year public institution with 8,700 students, mostly undergraduate. Buckner was hired specifically to help the university prepare for its regional accreditation with the Southern Association of Colleges and Schools. The idea was for Buckner and a newly formed committee to develop a plan to assess the academic colleges.

When she delivered a draft of the plan to the university's new provost, he told her that she needed to include student affairs, even facilities—totaling about 50 departments or "units," as they're called on campus. Each unit was then expected to develop a set of goals related to servicing students, and to measure changes related to those goals.

Buckner's experience is typical of the changing role played by the office of institutional research on campuses nationwide. No longer strictly focused on duties related to accreditation or government reporting demands, the research team increasingly finds itself playing the role of cheerleader, facilitator, and manager of the accountability process campuswide. Its charge: to help the campus community draw the arc between strategic initiatives set in the president's office and activities taking place on the ground. Accountability efforts provide the scorecard.

"You should design your data and reporting system to meet the needs of your institution. We couldn't go to a vendor and ask to do this." *—Barbara Buckner, Coastal Carolina University*



COASTAL CAROLINA'S TEAL Online system provides templates to guide academic and administrative units through their mission statements, goals, objectives, and data.

What Assessment Means

For Buckner, her first task was to establish a framework for assessment. Many of the units at Coastal Carolina were already handing in annual reports, but, Buckner declares, "They were bragging reports: 'These are all the great things we've done this year.' They'd list publications and accomplishments, but they'd never assess anything. They'd never answer, 'Why is it important that that is what we've accomplished?'"

For the units, the first step in the new program was to set broad goals. "Then we asked the units to narrowly define how the goals would be met," explains Buckner, "either through a student learning outcome or objectives." For example, one of the financial aid unit's broad goals is to improve access to education. An objective that feeds into that goal is a comprehensive review of institutional merit-based scholarships to measure the effectiveness of the awarding policy.

The assessment committee quickly discovered that it would need an automated system to collect the data and reports generated by each unit. The university had been using Assessment Plan Composer, an online application created by the **University of South Carolina**, to gather information specific to student learning. The system was unable to handle the assessment data coming from non-academic areas, though, so the university decided to develop its own electronic repository in-house.

Technology in Education to Advance Learning (TEAL) Online was introduced in fall 2008. Built using open source software, including MySQL, PHP 5.3.2, and XSLT, it includes a template for each academic and administrative unit to guide them through their mission statements, goals, objectives, and data.

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development, and research or scholarship. In each case, the category ties back to the student. For example, community outreach might entail service-learning projects or environmental stewardship. As part of the template, the unit must also describe what metrics it uses—whether a standard norm, a survey given to students, or some other mechanism for measuring results.

During the academic year, each unit collects the data, which is published to TEAL Online. The unit analyzes the results and writes a summary report, typically about a page long. A director or dean is responsible for reading and approving the report, since it serves as the basis for next year's plan and also impacts how university funds will be allocated.

TEAL Online doesn't reflect everything happening on campus at Coastal Carolina, Buckner notes, but it provides an assessment schedule that keeps each unit focused on continuous improvement. It also keeps the university's strategic initiatives front and center for faculty and staff, since the goals and objectives must tie into them.

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One practical benefit of the repository is convenience: All data and reports reside in one location and are accessible online by authorized users. This helps Coastal Carolina create reports for outside agencies, such as accreditation organizations, and also provides a measure of accountability. "Everyone on campus benefits from the improvements and deep analysis of activities taking place in all units," says Buckner.

In-House Development

Initially, Buckner thought development of the system would take about a summer. She had another thought in mind, too: to create an application that could be sold to other institutions, similar to WEAVEonline, a commercially available program for assessment and planning. Three years and many iterations of software later, she recognizes the naiveté of those initial beliefs. "Now that we've designed it, unless somebody is going to copy exactly what we're doing, this couldn't be sold," she admits.

While creating TEAL Online has been no picnic, Buckner is adamant that the university could not have found a prepackaged alternative. "You should design your data and reporting system to meet the needs of your institution," she explains. "Our needs are different. We couldn't go to a vendor and ask to do this."

Setting up the system was just the start, however. Next came user training, divvied up over seven workshops, only one of which focused on the assessment system itself. Others taught people how to write a mission statement, a student learning outcome, or, in the case of non-academic units, an objective; how to read the results; and how to create rubrics.

"The job is huge," says Buckner, "because it affects every corner of this campus, and you have to make sure people understand what assessment is." Instituting the program has been a major institutional change: Some units have adapted well to the new system; others haven't.

According to Buckner, the political science program has probably been the most successful at making the transition. The program has been using the ETS Major Field Tests for years, "but never looking at the data," she says. Once the program's faculty actually analyzed the data, they realized that they had a number of students who weren't doing so well. The department heads decided that they needed to make certain courses prerequisite, and instituted some major changes in the curriculum. As a result, students are doing better on their ETS tests, which is one of the metrics that the program now uses for evaluating how well its curriculum meets student needs.

In non-academic units, the student

IN SHORT

Coastal Carolina University
coastal.edu
Setup: One main campus, 8,700 students, mainly undergraduate
Assessment tool: TEAL Online (*coastal.edu/tealonline*), developed in-house using open source software, including MySQL (*dev.mysql.com*), PHP 5.3.2 (*php.net*), and XSLT (*w3.org*)
User base: Every department, academic and non-academic
Take-away: The university's assessment committee doesn't tell departments what goals to measure, but the committee provides training to help people understand what a good assessment looks like. "They know what their goals are," says Barbara Buckner, associate provost for assessment and accreditation.

National University
nu.edu
Setup: 28 campuses, 28,000 students, mostly graduate
Assessment tool: Accountability Management System from TaskStream (*taskstream.com*)
User base: Every academic program
Take-away: Jack Paduntin, vice president of institutional research and assessment, believes that the structure of an institution plays a major factor in how assessments can be applied. "When a faculty member makes a recommendation on how to improve a particular outcome, the private not-for-profits have the budget flexibility to support that kind of priority," he says. "I talk to a lot of people in public colleges. Although they may have that kind of information, it doesn't guarantee that it's part of the budget allocation or resource prioritization. For us, it's a drive."

affairs department is leading the way, because the person in charge of the department's TEAL Online work really understands the purpose of assessment. "She pushed that group a little bit this fall to triangulate its data and came up with some good questions to ask around retention," says Buckner. "Instead of just saying, 'We have a retention problem,' she asked, 'Why do we have a retention problem?' and used the data. That's the key."

By focusing on a limited number of metrics and monitoring the impact of program changes, Buckner believes Coastal Carolina is getting better at asking why: "Why are the results the way they are? Why did this unit decide to take a certain action?" The expectation is that the analysis will help move the institution forward, action by action.

A Faculty Demand for Change

At Coastal Carolina, the drive for accountability came from the top down. At **National University**, a nonprofit institution with 29 campuses mainly in California, the impetus for change came from the faculty itself.

National U has about 28,000 mostly graduate students, studying any of 100 programs. For years, assessment technology consisted of Microsoft Word. Each year, the lead faculty members in each academic program would write up a Word document that outlined the learning outcomes planned for the coming year, including information about the type of test that would be used to measure effectiveness and what the target measures would be. The document would be printed out and put into a folder. Every five years, a program review would take place. If the faculty member who wrote the annual reports had left the university, the folder would often be lost and the five-year review would be meaningless.

About four years ago, the faculty began pushing for an alternative. Jack Paduntin, vice president of institutional research and assessment, worked with a group of faculty representatives to select a third-party program to run a pilot in the school of business. The pilot failed miserably—not because the software was bad, insists Paduntin, but because "the capability of my office wasn't up to the level that could support the institution."

A large group training effort turned into a giant complaint session. "When you have 50 people in a room, everybody has their own problems," says National University's Jack Paduntin.

According to Paduntin, the training for the new system consisted of telling the faculty, "This is good to use. Here's your login and passcode. Go ahead and do it." Drily, he adds, "It doesn't work that way." A large group training effort turned into a giant complaint session. "When you have 50 people in a room, everybody has their own problems," he notes. "The problems would never end."

Armed with lessons from that failure, his office revisited the issue of assessment the following year and took a different approach. While there was nothing wrong with the application that the school had tried the previous year, it now had a tainted reputation. Rather than battle to save the program, Paduntin brought in an alternative: Accountability Management System from TaskStream. Given how the first pilot project had crashed and burned, Paduntin's decision to deploy the new system across all 100 programs in the university, with a three-phase approach to training, was gutsy. "We were confident that our new approach to training would have a much better impact on the overall program's success," Paduntin says. And he was right.

The first phase was a repeat of the big group meeting, but this time it consisted of an explanation about how the software had been chosen and what it offered. At the meeting, Paduntin also announced that his staff would visit faculty in small group sessions. And rather than have each faculty member set up the software for his department, Paduntin's team took care of it instead.

"We built each program a home," he explains. "We handled anything that was labor intensive, anything that involved typing, any information we had access to from the catalog or other sources. Then we introduced faculty to the system one-on-one. We walked them through it and told them, 'This is your house. You can move the furniture anywhere you want. This is the frame we built for you.' We didn't just give them login information."

As a result, the faculty felt more comfortable with the software and could focus on what mattered to them: learning outcomes and program assessment. "They didn't have to worry about secretarial work or other things not critical to them," says Paduntin.

The third phase of training brought together any faculty members who were still having problems for additional help. During that first year, Paduntin's office did a total of 130 training sessions.

A Facebook for Assessment

TaskStream provides a repository for assessment information by using a workspace design. Each program has its own workspace, in which the program's faculty members collaborate. "It's a Facebook for assessment. I can have 10 people access my space and I can create a topic in such a way that it's organized for my team to understand assessment," Padun-

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tin says. "Faculty get a little more excited doing that, because they don't need to have an office meeting. They can talk about assessment at any time. That's the beauty of it."

Most National U programs have between 10 and 12 learning outcomes. In the Education Specialist Credential program, for example, one learning outcome is "Understand current laws." For each planning cycle, the program decides how many outcomes will be assessed and how that assessment will take place. Faculty members then gather that information from their classes and feed it to the lead faculty member through TaskStream. The lead member compiles and summarizes the data, which in turn helps the faculty improve the curriculum and make a case for their budgets.

During an annual review, a council of faculty members evaluates each program. A major part of that review is examining the validity of the assessment. Only after the assessment passes muster does it go through the budgeting process.

Accurate assessment can play a key role in effective budgeting, says Paduntin. If a faculty member says his students don't learn because a lab is too old, for example, the assessment results can support a request for upgrading the lab. In the four academic cycles during which TaskStream has been in use, National U has allocated about $800,000 specifically for improvements based on assessment results.

The university administration can also monitor the materials in the repository to learn who's on track with the planning work and who might need an e-mail reminder.

Each year, the university holds an assessment summit, at which faculty share their experiences. Paduntin feared that faculty would object to using the data maintained by TaskStream because it would expose problems in their programs. The opposite has happened. "Faculty have always wanted to do a good job," he says. "They do program improvements all the time, but they might not be good about showing it." Now, notes Paduntin, they take pride in demonstrating how they're going to help students learn.

Paduntin has no doubt that these across-the-board assessment efforts are helping National U improve student learning. At the same time, they also make his job of meeting accreditation requirements much easier. National U is accredited by the Western Association of Schools and Colleges, but it also has another 18 accreditations for particular programs and schools. "Those accrediting agencies change their requirements over time," says Paduntin. "We need to be very current with them, and the technology we use to help us with that needs to be as supportive as possible."

Accurate assessment can play a key role in effective budgeting: If a faculty member says his students don't learn because a lab is too old, the assessment results can support a request for upgrading the lab.

And Paduntin feels that those assessment requirements will only grow more stringent over time. Referring to the federal government's recent moves to more closely legislate the operations of for-profit, publicly traded companies in the education field, Paduntin anticipates a day when private, not-for-profit schools—such as his—could come under similar scrutiny.

"We have very good assessment results, but we might be asked by accrediting agencies to publish all those learning outcome results," he cautions. "It's not a requirement now, but it might be. We always need to have that foundation to be ready for that type of compliance requirement. If the software we select can actually answer those different requirements, we want to use it." CT

Dian Schaffhauser is a senior contributing editor of this magazine and contributes regularly to CampusTechnology.com.

ASSESSMENT-MANAGEMENT SERVICES

WHILE NATIONAL UNIVERSITY uses TaskStream (*taskstream.com*) to manage its assessment program, a number of other companies also sell solutions to help institutions with continuous-improvement efforts. Below are a few examples:

Educational Informatics rGrade: rgrade.com

Jenzabar Capture: jenzabar.com/products.aspx?id=920

LiveText: livetext.com

SAS Enterprise Intelligence Suite for Education: sas.com/resources/product-brief/sas-eise-higher-education-brochure.pdf

Tk20: tk20.com

WEAVEonline: weaveonline.com

Improved grades for 74% of students

Tegrity Fall 2010 Survey Results* with over 6,800 unique responses

*Results from Fall 2010 survey conducted across multiple universities and colleges using Tegrity.

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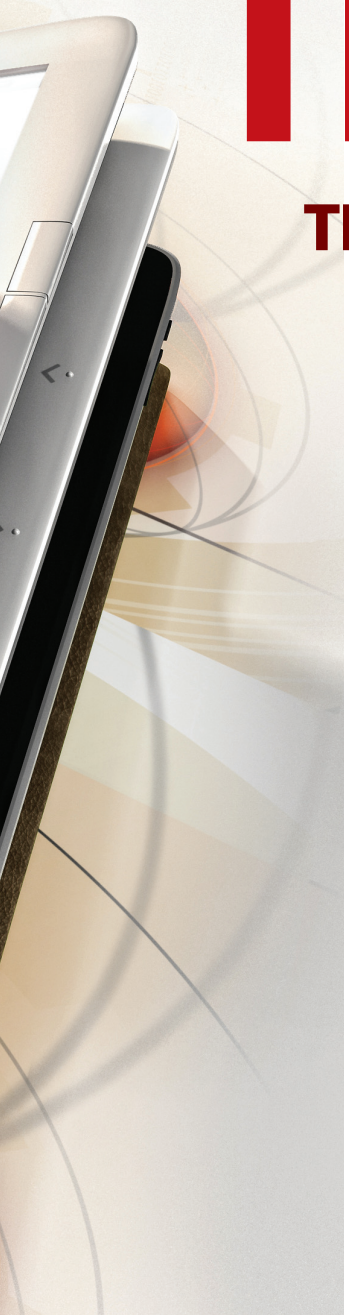
In a recent survey of 6,880 students using Tegrity's award-winning Lecture Capture solution, more than 7 out of 10 said it improved their grade in the course. Why is Tegrity more effective than traditional lecture capture solutions? Because we take a different approach. With Tegrity, students can do more than just click and watch a recording. They can search within the content, collaborate with their instructors and fellow students, and even place their own bookmarks in the recording live during class. With Tegrity, study efficiency soars, leading to higher course completion rates and better grades.

As the e-book market explodes, publishers and educators debate why e-textbooks lag behind and what they should even look like. **By John K. Waters**

Ryan Etter



CAN TECH TRANSCEND THE TEXTBOOK?

AFTER TRAVELING A LONG, tortuous road, the much-anticipated e-book revolution has finally arrived. Any doubt that the future of the book is digital has been laid to rest. Kindles and iPads sold like hotcakes during the 2010 Christmas shopping season, and Forrester Research expects the recipients of those devices to spend more than $1 billion on e-books in 2011, and $3 billion by the middle of the decade.

So where's the revolution in the e-*textbook* market? According to the National Association of College Stores (NACS), digital books currently account for less than 3 percent of textbook sales. NACS expects that percentage to reach 10 to 15 percent by 2012, while researchers at Simba Information predict that e-textbooks will account for more than 11 percent of textbook sales by 2013. But even this relatively swift growth rate represents a trickle compared to the flood of e-book sales on Amazon.

"To state the obvious, academic publishing is slower to change," says Vineet Madan, vice president of strategy and business development in McGraw-Hill's Higher Education group. "But so is the market we serve. There's a lot at stake for students. The money they spend on a textbook is an expense related to an outcome—a grade, which gets you to a credit, which gets you to a degree, which, hopefully, gets you to the job you're looking for. As long as the online experience doesn't offer significant value over the print experience, I believe the preference in consumption will still be toward print."

"Everything those students have seen up to this point has been junk. Present me with a PDF on a screen and I'll take a book any day." *—Matt MacInnis, Inkling*

That preference has shown up starkly in some recent surveys. Three-quarters of the students queried by both NACS and the Student Public Interest Research Groups said they'd rather use a paper-based textbook than its digital cousin. Eighty percent of the students queried in the fall 2010 College Student Tracking Survey, commissioned by the Nebraska Book Co. and conducted by Crux Research working with Harris Interactive, said they bought new textbooks; 72 percent bought used textbooks; 20 percent were renters; and only 8 percent bought digital textbooks.

Matt MacInnis, co-founder and CEO of e-book publishing startup Inkling (not the same company as Inkling Books), sees these responses as an unsurprising reaction to the current state of e-textbook publishing.

"All it means is that everything those students have seen up to this point has been junk," MacInnis says. "Come on. Present me with a PDF on a screen and I'll take a book any day."

An Interactive Experience

MacInnis, along with partners Robert Cromwell and Josh Forman, started their company in 2009 to take advantage of a then-unreleased device that promised to change the digital publishing landscape: the iPad. Before going out on his own, MacInnis worked at Apple for eight years, managing the company's international market development for education. He started Inkling, he says, after years of watching technology's power to change the way people learn go unexploited.

"It was frustrating to watch," he says. "No matter how much power there was in the laptop, the teacher would still whip out the textbook, and we were thrown back into the 19th century. I really wanted that to change, and the iPad gave us the opportunity to make that change."

MacInnis agrees wholeheartedly with McGraw-Hill's Madan that an e-textbook *must* provide a "significant value over the print experience" to win the hearts and minds of students.

"It has to be appreciably better than using a book," he says. "A book provides a really good user experience. It doesn't crash. It's predictable. You know exactly what you're going to get. Simply putting a textbook on a Kindle or a Nook is actually a worse experience. You're working entirely within the constraints of the book, but you're taking away the convenience and reliability of the book."

MacInnis talks a lot about "the constraints of the book" and how textbooks of the future must transcend those constraints. For its part, Inkling has done away with the book metaphor entirely: The company refers to its e-textbooks as "titles," and the Inkling platform presents the content of its titles as sets of "cards" that can be shuffled, so to speak, to suit the needs of the student and requirements of the professor. Audio, video, animation, assessment banks, and other content can be integrated within a single title, and the text becomes just one type of raw material used to create what MacInnis calls "an interactive digital experience."

"We're not trying to replicate a book experience at all," MacInnis says. "No hokey page transitions on screen and that sort of thing. We take advantage of the interactive capabilities of the iPad, in part, by doing away with the constraints of the book. It's the only way to take advantage of the opportunities afforded by the iPad."

Inkling is betting big on Apple's category-redefining tablet, but its gamble may not prove too risky. After all, Apple sold close to 15 million iPads between its April 2010 launch and Christmas. In its recent report, *E-Textbooks in Higher Education*, Simba Information cited "the spate of pilot programs" for the iPad in colleges as a key indicator of a bright, digital future for e-textbooks on the popular device. But MacInnis is also hedging his bets. While Inkling is currently iPad-focused, the company is platform-agnostic and will support other tablet devices as they make their way to the market.

Several big-name academic publishers, including Cengage Learning, John Wiley & Sons, Wolters Kluwer, and McGraw-Hill, are placing their own small bets on Inkling's digital publishing platform. MacInnis says McGraw-Hill moved especially quickly to put some of its content on the Inkling platform. A deal with that publisher was actually struck before the iPad was launched on April 3 last year.

"Our notion is that technology has been underleveraged to develop more compelling and engaging learning experiences," McGraw-Hill's Madan says. "As we look at evolving our

ONLINE EXCLUSIVE: John K. Waters looks at Google's new cloud-based e-books service.
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A FEW SECONDS FROM NOW, police surveillance cameras will see two little girls walking to school,

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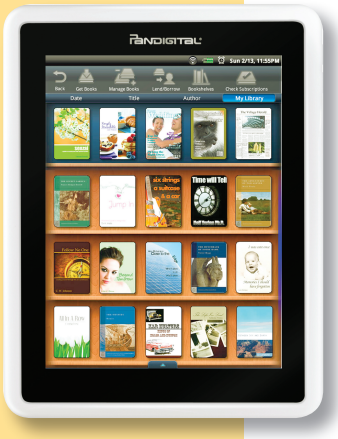
NEW E-READERS STICK TO THE SCRIPT—FOR NOW

WHILE E-READERS HAVE CAUGHT FIRE among consumers of novels and nonfiction alike, they have managed to generate only a squib of damp smoke when it comes to textbooks. As *CT* noted in "The Device Versus the Book" (May 2010; *campustechnology.com/articles/2010/05/01/the-device-versus-the-book.aspx*), students in three e-reader pilot programs last year found the Sony Reader, the Amazon Kindle, and the Barnes & Noble Nook seriously wanting.

It's a view shared by many faculty, too. "Studying is not the same as reading," says Shawna Coram, a business professor at **Florida State College at Jacksonville**. "You read a novel and it's a linear advance, page by page, through the book. But when you're studying a textbook, you do a lot of flipping back and forth, and that's not so easy to do with an online book right now. They're getting better, but they're not there yet. That's why I've made it an option, but haven't switched over completely to e-books."



If educators had hoped to see manufacturers respond to such critiques, the latest crop of e-readers unveiled at the annual Consumer Electronics Show (CES) in January will probably disappoint. Compared with the dozens of e-readers launched last year, only a handful of new entries debuted this year. And while the new e-readers have been nicely augmented with better e-ink, color, and a few annotating and highlighting tools, they still don't give students the freedom to browse, dog-ear, flip, and scan that a physical book does.

Tablets don't necessarily offer these ways to interact with text either, but that fact didn't stop them—and not e-readers—from being the talk of this year's CES. Indeed, it seemed as if every Joe with a soldering gun and an LCD had an entry. The industry's rapid response to the iPad—the release of 80 competing tablets in one year is nothing short of astonishing—may be the biggest indicator of where, ultimately, the whole e-textbook argument is headed. While e-readers may flourish in the short term by offering a digital replica of the printed page, the long-term future probably belongs to products that will, in the words of Inkling CEO Matt MacInnis, provide "an interactive digital experience."

The whole e-reader versus tablet debate may become irrelevant, however, if the books-in-browsers movement catches on. And there are signs it's happening—at least in the general consumer space—as evidenced by a recent conference cosponsored by the Internet Archive and O'Reilly Media that was entirely devoted to the subject. Simply put, browser-based books give readers the ability to access their e-books across multiple devices, ranging from desktop computers to smartphones—and e-readers.

Some of the industry's heavyweights are positioning themselves to take advantage of this flexible delivery mechanism. Amazon recently announced that consumers will soon be able to read their Kindle books on a browser, with no download or installation required. Google, too, is offering similar browser access to readers of its e-books. In both cases, users will be able to sync their libraries across their various devices.

So what does this mean for e-textbooks on college campuses? In the short term, browser-based books suffer from the same shortcomings as e-readers. Kindle users will see much the same functionality on the browser-based product as they do on their e-reader, while Google's browser-based product can't highlight sections or annotate the text.

The best days of the books-in-browser movement may lie ahead, though. Unlike the books that appear on today's e-readers, browser-based books have the capability to become far more dynamic thanks to HTML5 and Flash. Indeed, browser-based books may be perfectly positioned to ride the transition from today's digitized textbook pages to tomorrow's interactive, dynamic content. Right now, browser-based books display a replica of the print product—because that's what's available. As publishers start to produce the educational content of tomorrow, incorporating video, sound, interactive quizzes, and more, the concept of e-textbooks in browsers—whether displayed on an e-reader, a tablet, or some other device—may come into its own.

products, it's really about how we deliver more engaging experiences that drive better teaching and learning outcomes. We're all being pushed increasingly into the business of providing outcomes, but we're still exploring how we can best accomplish that."

Exploring and Investing

While many publishers are exploring the kind of compelling e-textbook concept espoused by Inkling, they are not ready to bet the farm on it—yet. Indeed, McGraw-Hill is among five major academic publishers—including Pearson, Cengage, Wiley, and Macmillan—that partnered in 2007 to sell e-textbooks that emphasize fidelity to the print textbooks. Essentially, these e-textbooks offer exact digital replicas of their paper counterparts, including page numbers and page layout.

The joint venture, known as CourseSmart, currently offers a catalog of more than 15,000 e-textbooks, including over 90 percent of the core textbooks in use today in North American higher ed—available for an average of 60 percent less than a printed textbook. It also boasts a large selection of "eResources" and digital course materials. And the company partners with other e-book distributors, such as Jones & Bartlett Learning, Elsevier Science, Sage Publications, and Princeton University Press.

"When you look at a CourseSmart book on your iPad, you're seeing the same thing as a student sitting next to you in class who prefers to use the print book," explains Sean Devine, CourseSmart's president and CEO. "The benefit there is that when the faculty member says, 'Everyone turn to page 343 and look at the graph in the upper right-hand corner,' all students are literally on the same page."

The CourseSmart e-textbooks can be accessed through a PC and a web browser, but also downloaded and read on an iPad, iPhone, and iPod Touch. The books support what are fast becoming

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Dr. Chris Dede
is an renowned author and Professor of Learning Technologies at Harvard's Graduate School of Education.

Nancy Knowlton
is globally recognized as a thought leader in the application of technology products in education.

Cedric T. Coco
2009 Chief Learning Officer of the Year by Chief Learning Officer magazine.

Tim Bajarin
is recognized as one of the leading industry consultants, analysts and futurists, covering the field of personal computers and consumer technology

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standard features of the e-textbook, including keyword search capabilities, highlighting tools, clipping features, note-taking options, and e-mail links. In the next six to 18 months, the company plans to introduce the ability to link to Wikipedia, Google, and other sources on the internet, Devine says.

Despite these enhancements, the CourseSmart e-textbooks still seem worlds apart from the Inkling concept of a product that completely transcends the book. But Devine, who's been working in the electronic book space since the 1990s, believes that too much can be made of this divide. In his view, the e-textbook market is in a transitional period—a period that he doesn't expect to take long.

"We've been talking about electronic textbooks for about 15 years as the next big thing," he says. "One thing that's different today is that all the stakeholders—the publishers, the hardware makers, the software producers, the consumers—are getting behind the idea. That's very different from what we saw when the e-books first emerged in the late '90s. And when you have companies like Amazon, Google, and Apple getting into the game, that starts to break down barriers pretty quickly."

It's probably in anticipation of these barriers falling that textbook publishers, including some investors in CourseSmart, are testing partnerships with companies like Inkling. "We're jazzed about the coming digital revolution," says Don Kilburn, president and CEO of Pearson Learning Solutions. "We have traditionally been a textbook publisher. Now we're an educational content and services provider. Every day we are creating new types of content."

As Kilburn describes it, the Pearson approach blends the kind of content-delivery model offered by Inkling with a focus on learning outcomes.

"We all talk about textbooks, but I'm more interested in what we're doing with the content paradigm," Kilburn says. "One of our biggest initiatives is to think about how we create content. We're creating content that is modular, that revolves around learning objects based on course objectives, that is built in ways that are measurable, and from which we can actually begin to get some outcomes."

While he admits it's a cliché, Kilburn says that he sees the future of the e-textbook as more evolutionary than revolutionary.

"The content hasn't been designed for the medium yet," he explains. "That's where we are right now. The first TV shows were broadcast radio shows; the first iterations of digital content delivery have been static e-books, flat pages. But we're going to see text combined with more robust apps that engage the student and use the medium for both graphic display and interactivity in ways you could never achieve with a static textbook."

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A Different Approach

Not everyone believes that the transition will occur so rapidly, though. In the opinion of Eric Frank, co-founder of Flat World Knowledge, there's plenty of demand now for digital textbooks that resemble actual books, and he believes that demand won't dry up any time soon.

"It's fun to talk about all the bells and whistles," says Frank, whose company publishes commercial open source college textbooks. "It's sort of sexy, and everyone nods their heads and says, 'Yes, that's the real use of technology, not a flat reading experience online.' But I don't think that's what the market is really looking to technology to do today and in the next five years. I think what consumers are really looking for right now is technology to take the costs of using this content down, and to be able to take full advantage of the malleability of online content to improve it for their own purposes."

Flat World Knowledge's e-textbooks are essentially digital replicas bundled with some useful editing tools, but its publishing and delivery model is bleeding edge. Flat World's offerings are open and *customizable* e-books published under a Creative Commons open license. Anyone can access the books for free online. Students can also buy paperback versions of the books, PDF downloads, audio and e-reader versions, and study aids. The books are available for the iPad, the Kindle, and other popular e-readers, as well as iPhones, MP3 players, and other media devices.

"What consumers are really looking for right now is technology to take the costs of using this content down."

—Eric Frank, Flat World Knowledge

"What we're trying to bring to the mix is the best of the old world—a publishing sensibility that quality and who the author is matters, that the editorial development work a publisher does actually adds value—combined with an open license that gives our customers the tools to really control the content in a much more profound way than was ever possible before," Frank explains. "I'd argue that professors would generally prefer to add their own two cents and integrate a video they found on the web that they thought was a perfect example of something, rather than to take someone's spinning 3D image and try to teach around it."

Flat World's "malleable content" model was what first drew Miles McCrimmon, a professor of English at

J. Sargeant Reynolds Community College in Richmond, VA, to the company.

"Our department, like so many others around the country, was interested in weaning itself from the traditional textbook model and the inevitable compromises of the textbook selection process," he says. "The minute we agreed on something every three years, we would have to begin this patchwork process to make the text work in our classes. We thought Flat World might offer an alternative."

The company, after talking with McCrimmon and his colleagues, offered him a publishing contract instead. McCrimmon's first textbook, *The Flat World Knowledge Handbook for Writers*, hits the virtual shelves this month.

"It's a book that anyone can use off the shelf, and it's meant to be competitive as a first-year [composition] textbook," he explains. "But I've come to characterize it as more of a beginning than an end. My job was to start the conversation through this baseline text. A year from now, I'll be able to click on a number of URLs and, one hopes, find dozens of different versions of my book. And I'll be able to see which chapters were the most useful, and which were not. It's just much more of a dynamic relationship between the author and the end user."

Barkan believes that the high price of paper textbooks will ultimately drive students and teachers to embrace less expensive e-textbooks. But he expects the transition to take a while—as long as a decade—as publishers sort out the best way to deliver academic content. In the meantime, students will be using both digital and paper textbooks.

"Textbooks are expensive: $100 to $150 in many cases. When I heard about Flat World's 'freemium' model, I thought, 'What could be better for a student than being able to read a textbook for free online?'" *—Steve Barkan, University of Maine*

A Matter of Money

In all the debate about how today's technology can be used to reinvent the textbook, it's easy to overlook something as straightforward as cost. To Flat World's Frank, it's one of the primary factors driving the e-textbook market today. That's also what matters most to Shawna Coram, a business professor at **Florida State College at Jacksonville**, who is using Flat World's *Organizational Behavior* and *Personal Finance* textbooks primarily as a cost-cutting strategy for her students.

"Our students struggle, as all students do, and if the content is as good—which it is—and I can give them the option to get a free textbook, I feel that it's my obligation to do that," she says.

The same is true of Steve Barkan, a professor and chair of the department of sociology at the **University of Maine**. "A lot of my students are first-generation students, and many work 30 hours a week during the semester just to pay their tuition," notes Barkan, whose book, *Sociology: Understanding and Changing the Social World*, was published by Flat World in September. "Textbooks are expensive: $100 to $150 in many cases. When I heard about Flat World's 'freemium' model, I thought, 'What could be better for a student than being able to read a textbook for free online?'"

Barkan believes that the high price of paper textbooks will ultimately drive students and teachers to embrace less expensive e-textbooks. But he expects the transition to take a while—as long as a decade—as publishers sort out the best way to deliver academic content. In the meantime, students will be using both digital and paper textbooks.

"A model like Flat World's makes the most sense right now for students, both from a price standpoint and a flexibility standpoint," he says. "Students can get the textbook for free online and read it anywhere in the world. But if they want a print copy, which lots of students still do, they can get a black-and-white version for about a hundred dollars less than equivalent textbooks in my field."

Inkling's MacInnis, on the other hand, feels that students are simply not thrilled by the idea of flat e-textbooks, not matter how customizable or cheap—and the anemic sales record of e-textbooks compared with that of e-books is proof enough. He insists that students and professors will embrace e-textbooks fully only when the publishers let go of the "book" and exploit the technology offered by a new generation of devices and software.

"Once we put something better in front of them that could never have been a book," he says, "when they get used to being able to listen to the opera while watching the Italian and English scroll by, when they get used to being able to quiz themselves on the spot and get real feedback from the device on how they're doing and have it feel like a lot of fun, then they'll wonder how they ever used a book in the first place." CT

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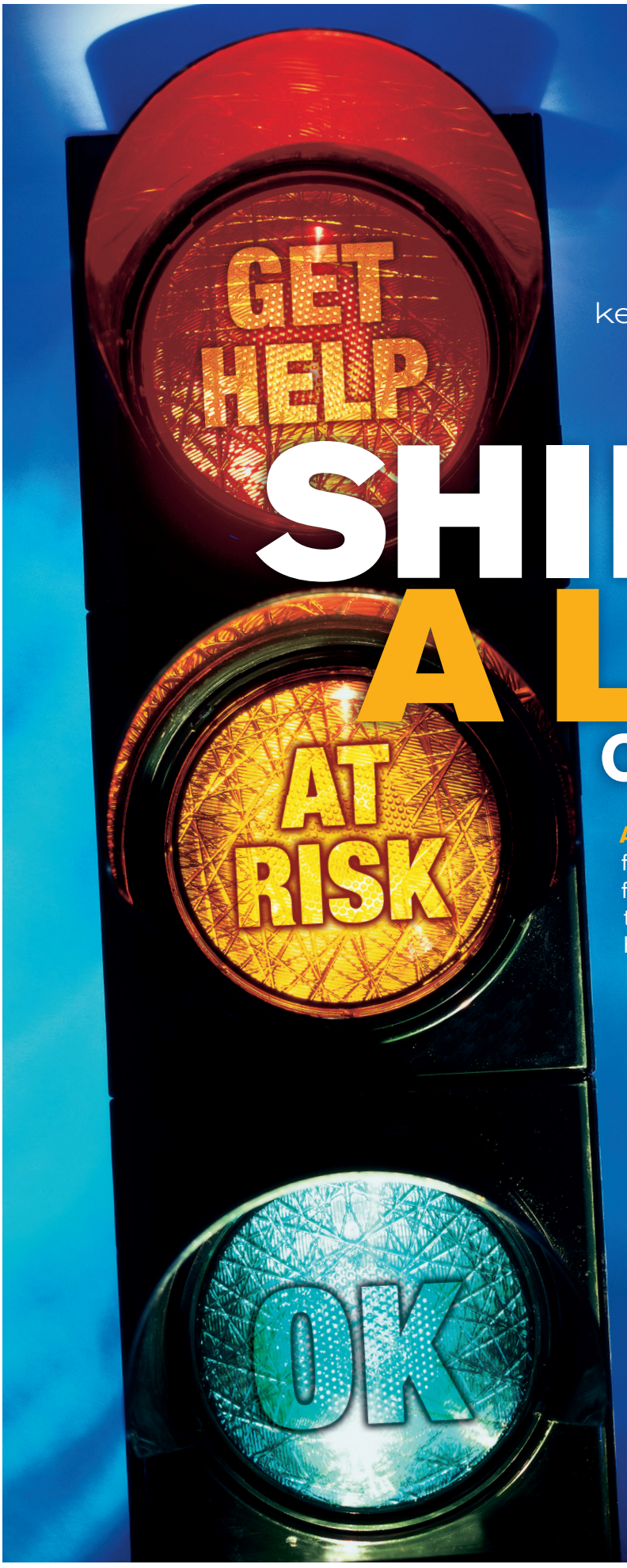

Three institutions created their own customized programs to keep at-risk freshmen in school, with positive results.

By Jennifer Demski

SHINING A LIGHT ON RETENTION

AMERICAN HIGHER EDUCATION is suffering from a dropout pandemic. About 30 percent of freshmen at four-year colleges don't return for their sophomore year, according to a 2010 report by the American Institutes for Research. Such a high failure rate threatens to make a mockery of President Obama's goal for the US to have the highest proportion of college graduates in the world by 2020. It also hits employers and taxpayers hard. The report, *Finishing the First Lap: The Cost of First-Year Student Attrition in America's Four-Year Colleges and Universities*, estimates that, between 2003 and 2008, states and the federal government spent $9.1 billion in appropriations and grants on students who dropped out after freshman year.

With stakes this high, colleges and universities are pushing to understand the dropout issue and find solutions to keep students in school. And just as there are myriad reasons why students drop out, institutions are discovering different ways to address the problem. Here, *CT* takes a look at the efforts of three universities that are making headway.

Carroll University (WI)

Five years ago, Douglas Hastad, the incoming president of Carroll University, made it clear that, in his view, the most important indicators of the university's success were the graduation and retention rates. Sure enough, soon after the new president's arrival, Jim Wiseman, VP of enrollment, was tasked to find a way to improve the student retention rate. Wiseman, who had great success using predictive modeling in the school's enrollment process, decided to see if the same approach could work with retention.

Wiseman immediately focused on the transition from the freshman to sophomore years, when the most students drop out. His first challenge was determining which data would best identify those freshman students who were at risk.

"A lot of people associate 'at-risk' with academics," notes Wiseman, "but that's just one factor in why a student may be driven to leave school." In addition to academic data, Wiseman wanted to utilize data from the admissions office, the financial aid office, the registrar, the athletics department, student life—basically any office that compiles student data. He then planned to weight each type of data according to its historical impact on student retention. There was one big problem, though: Each department had its own data management systems, and housed its data in individual "silos" across campus. Wiseman had no way to access *all* of the data from a central location.

Wiseman knew that he needed to bring in a technology powerhouse to break down these silos and securely access and analyze their data. In 2008, Carroll University partnered with Jenzabar to develop Jenzabar's Retention Management Solution (RMS). The university already had a strong relationship with Jenzabar: The company was Carroll's ERP provider and had recently become its portal provider, too.

"Our relationship with Jenzabar has been wonderfully symbiotic," says Wiseman. "They launch the product; we test it on campus; we give feedback; and then they make changes. We're on our third version of the RMS, and the features just keep improving."

"A lot of people associate 'at-risk' with academics, but that's just one factor in why a student may be driven to leave school." *—Jim Wiseman, Carroll University*

IIT's Early Warning System helped increase its freshman-to-sophomore retention rate from 85 to 93 percent.

Data on freshman students feeds directly from the university's Jenzabar CMS into the RMS. Using a mathematical model derived from the school's historical retention data, the RMS analyzes the data nightly to predict how likely each student is to drop out.

"We began with almost 200 data points," explains Wiseman. "As we started running them through the model, we threw out those that were revealed to be redundant, unreliable, or irrelevant." Among the data analyzed are high school transcripts, historical retention rates sorted by major, out-of-pocket tuition payments, grades, the assessment of late fees, campus employment earnings, open holds, student alert forms, involvement records, and parent- and student-survey information.

"These are the data points that worked for our university," notes Wiseman. "I've helped other schools with their retention systems, and every school tends to be a little different. Some data points overlap, but every school seems to have its own unique factors that affect student retention."

Reports on at-risk students are generated by the system's dashboard, which uses a customized formula to categorize students according to the probability of their leaving. This allows the university to proactively intervene in a way that's appropriate for each student's situation. "The dashboard functions almost like a stock market ticker," explains Wiseman. "It actually shows arrows going up or down for each individual student." Students are classified as safe, at-risk, or critical, depending on the trajectory of their data. When a student is identified as

being in trouble, his profile is used to identify an adviser, coach—any faculty member with whom he has established trust—who can contact the student in an effort to resolve any issues.

With 725 freshmen to monitor, Carroll University also decided to create a new department, the Office of Student Success, whose sole function is to increase student retention rates. "It's a marriage between the high-tech approach of using predictive modeling to identify students that need attention and the hands-on approach of having supportive staff who can intervene quickly to work with those students," says Wiseman. "This two-pronged approach is what makes our system work."

In the year after Carroll instituted its system, the freshman-to-sophomore retention rate jumped 2 percent, and the university has maintained that higher retention rate in the years since. "In this down economy, we're noticing more students with financial issues," says Wiseman, "so the fact that we've maintained that initial 2 percent increase is a strong indicator of our system's success."

Illinois Institute of Technology

Rather than partner with an outside vendor as Carroll University did, IIT decided to build its own student retention system. It didn't hurt that project leader Matthew Bauer, the director of undergraduate advising since 2007, had taught computer science at the school for 15 years. Bauer used his expertise to develop the IIT Early Warning System in PHP and MySQL.

"Developing it in-house gave me more freedom," explains Bauer, "because the system was within our portal and thus not limited by our data center's development restrictions. And because I was one of them, the faculty gave me a lot of leeway. They understood that it wasn't going to be a clean, fully developed system on day one. They also knew how easily I could update and improve the system, and I encouraged them to suggest improvements."

By creating the system in-house, Bauer was also able to develop a predictive model that would work within IIT's unique academic environment. It's not uncommon for a student to change his major during his first year of college, but IIT's focus on engineering, science, and architecture means that a student who suddenly realizes he'd rather study social science is likely to leave at the end of the semester.

"The driving goal of the system was to get information about any issues with the students from the teachers as early as possible—as early as the first or second week of the semester," says Bauer. "That way, you can have an adviser talk to the student as early as the second or third week of the semester to find out what the issue is. Is it a standard maturity issue? Is it time management? Is it study skills? Does he want to change his major from computer science to architecture? Or, does he want more of a liberal arts education?"

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One of Bauer's biggest challenges was to persuade teachers to submit student attendance and performance data on a regular basis. The first iterations involved paper attendance sheets: "The amount of data entry that needed to be done and the amount of paper moving around were unbelievable," laughs Bauer. And then there was the online system that required teachers to log on and enter each student's academic and attendance information, which "was way too much extra work," he says.

Bauer then configured the Early Warning System to automatically generate a customized e-mail, containing course-specific lists of students (with both their names and student ID numbers), that is sent weekly to every teacher with freshman and sophomore courses. In their replies, the teachers put notes next to the names of any students with attendance or academic problems: "missed one class," "poor exam," or "not doing homework," for example. Each reply is sent to a dummy mailbox that parses the e-mail and loads the information into the system's database. "The teachers only have to type in information for the students who they feel may need help," says Bauer. "It's a system that probably wouldn't scale up to meet the needs of a big university, but for a small engineering school like ours, it works." More than 50 percent of the IIT faculty now submit student data on a weekly basis.

On Monday mornings, the Early Warning System sends customized e-mail reports to each of the school's advisers, listing any of their students who had more than one absence or issue reported by their professors during the previous week. Reports are also sent to the school's athletic coaches, ROTC unit leaders, and the school's disability office. "Basically, anyone who has a just cause for interest in the academics of a student will be sent a report every Monday that lists any students with whom they should follow up," explains Bauer.

Factoring in these advisers, coaches, and other mentors, Bauer estimates that between 70 and 80 percent of IIT's faculty and staff are involved in the Early Warning System. And that involvement is paying off. Before the Early Warning System, IIT's freshman-to-sophomore retention rate was around 85 percent; it's shot up to 93 percent in the three years since the system was implemented. In a school with a freshman class of 400 to 500, that means IIT is retaining 30 to 40 more students each year than before.

"You know those cases where we realize at the end of the semester that a student was never attending class?" says Bauer. "That just doesn't happen anymore. We find those problems earlier. And because we find them earlier, we can do things to help the student. We can get them out of these situations before it becomes a financial headache for them. The students, in general, are happier about their experience at IIT, and even if they end up leaving, they're not leaving mad."

Purdue University (IN)

Both Carroll University and IIT developed systems that alert university offi-

cials when to intervene with an at-risk student. While Purdue University's retention system also notifies advisers, it puts primary responsibility for a student's success squarely on the shoulders of the one person who has the most control over that success—the student himself.

In 2004, when Purdue began developing Signals, as its student retention system is known, it made one other decision that was outside the norm: The system would be designed around a course-specific algorithm rather than follow an across-the-board institutional model. As a result, a student's at-risk status would be based on statistics tied to each course rather than aggregating the data into a single big picture.

Signals, which currently focuses on freshman-level courses, mines data from the university's Blackboard Vista CMS and SCT Banner. "We look at three ports of data," explains John Campbell, associate VP for information technology at Purdue. "First, we look at the academic preparation of the student, such as standardized test scores, which are pretty influential historically in the first year of college. Then we look at the effort the student's putting forth in class: How often is he interacting with that course's page within the CMS? And then we look at his performance in terms of grades."

After these three points of data are run through the course-specific algorithm, the student's status is displayed in the form of a traffic signal whenever he logs into a course's home page on the CMS. A green light indicates the student is doing well; a yellow light indicates that he is potentially at risk; and a red light indicates that he should get help immediately. "We want to give the data right to the students," says Campbell. "We want our students to become self-guided learners, to become aware of where they are in their learning."

Because freshman-level courses tend to have multiple sections throughout the week, and the algorithm compares the student's performance with that of students in each section of a course, the Signals system is updated only once a week. This way, the fact that a student with a Tuesday section contributed heavily to the course's Blackboard discussions on Sunday and Monday nights won't negatively affect the status of a student whose section falls on a Thursday.

When students click on the traffic signal, they're given specific guidance from the course instructors, such as reminders of when office hours are scheduled, or information on the math help desk. As the semester goes on, these guidance messages increase in intensity; faculty are encouraged to be blunt and direct. "We're finding that the tone of the message—increasing that intensity—is an important factor in how you reach out to the student," says Campbell. "We're trying to produce what we call 'actionable intelligence.' It's not enough to just identify the students at risk. We want the students to take action."

Since Purdue began piloting its retention system in 2007, more than 11,000 students have experienced Signals. For each course that participated in the pilot, Purdue divided the course sections into groups: an experimental group, in which the students were given the Signals system, and a control group. Among those students using Signals, Purdue has consistently seen 10 percent increases in the number of A or B grades, and 30 percent fewer failing grades. There is also a 65 percent increase in the number of students who seek help when encouraged to do so by the Signals system. Furthermore, the data from the pilots show that the Signals students seek help earlier in the semester.

"Throughout the process, we've done student focus groups," says Campbell. "When we ask students what kind of grade they think they'll get in a class, they give a wishy-washy reply. However, when I ask them what color their signal is, they can tell me immediately, without hesitation. Students are paying attention."

Purdue recently partnered with SunGard Higher Education to develop Signals for cross-platform use with a variety of course management and administrative systems, and the underlying algorithm is being adapted for use by other schools. Purdue implemented its new and improved version on campus in January. Updates include increased automation, which allows the system to process data on a larger number of students, and a snapshot view that allows students and their advisers to see the signals for each of the students' courses on a single page in Blackboard Vista. **CT**

Purdue University's retention system puts primary responsibility for a student's success squarely on the shoulders of the one person who has the most control over that success—the student himself.

Jennifer Demski is a freelance writer based in Brooklyn, NY.

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CAMPUS TECHNOLOGY Focus

Virtualization Helps Students Cross Digital Divide

Widely distributed campus networks are a necessity for any college or university today but are a huge IT headache to manage. With budget constraints and increasingly rapid changes in technology, campus IT leaders are realizing the need to change how they manage desktops, with an eye toward cheaper acquisition and extended PC lifecycles, savings on labor costs and equipment disposal, and centralized desktop management. The concept of desktop virtualization – moving processing power and software away from the user's desktop to centrally located servers, where it can be managed far more easily – is a perfect solution in many ways for higher education.

By using what's known as Virtual Desktop Infrastructure (VDI), campuses can achieve centralized provisioning of desktops and applications, for better security, patch management, backup, and recovery. VDI frees up IT staff to pursue more pressing initiatives, simplifying the headache of desktop management in offices, classrooms, labs, libraries, and elsewhere. With VDI, desktops are provisioned in minutes, allowing IT to respond quickly to last-minute faculty requests for new applications.

The technology moves user desktops to a central server, eliminating the need to track, maintain, and secure the desktop computers scattered across campus. Instead, operating systems and applications are maintained in a central location by IT staff with controlled access to desktops.

Students and faculty access a "virtual" version of their own desktop whenever they log on, for a PC-like experience that provides ready access to RAM, disk, and I/O resources. Personal items such as documents, settings, and bookmarks are stored separately and automatically blended into each user session, delivering a fully personalized desktop.

From a single management console, the institution can upgrade each desktop on a central server. Re-imaging a lab full of computers becomes a simple matter of deploying a master copy from a central server-based unit, for dramatic time and cost savings. One such virtual desktop solution is called VERDE, from Virtual Bridges. It supports a broad range of software, including Windows, Linux, and Apple operating systems and desktops. The same installed image is used for virtual desktops for any of those machines, so that specific software needn't be installed on each Windows or Macintosh machine individually.

The advantages of virtual desktops in higher education include data security and compliance. "The combination of blending the efficiency of IBM's cloud provisioning infrastructure with the best-of-breed VDI capabilities of Virtual Bridges strengthens our regulatory and security posture, while also enhancing our analytical computing deployments with flexible and efficient customer platforms," according to James Kaylor, a senior director of information systems and technologies at the University of Pennsylvania, which is a joint customer of IBM and Virtual Bridges. "The enabled VDI workload from Virtual Bridges is tightly integrated and deployed easily into our infrastructure."

The Virtual Bridges solution also includes an offline VDI capability that can push some processing to the client level. If a connection is lost, the desktop remains available, giving IT the flexibility of allowing users access to desktops regardless of location.

There's another distinct advantage to a Virtual Bridges VDI solution: Virtual desktops can help in extending the life of older PCs. Because VDI shifts most of the processing power to a central server, there's no need to continually upgrade desktops with new and more powerful PCs. That can save substantially in labs, for example, where frequent upgrades are common in order to provide additional desktop processing power. With the virtual desktop hosted on the server, those less-powerful machines can be used as clients for a long time to come. That's a clear savings in PC acquisition costs, as well as end-of-life disposal issues.

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Student-Driven Content

OERs open the door for students to take control of the learning process. By Mary Grush

The release of the iPad—and the subsequent flood of competing tablets onto the market—may finally kick-start the e-textbook revolution (see "Can Tech Transcend the Textbook?" on page 34). As publishers debate how to take advantage of these devices, it's a good time to revisit the possibilities of open educational resources (OERs). *CT* asked Trent Batson, executive director of the Association for Authentic, Experiential, and Evidence-based Learning (AAEEBL), and MERLOT Executive Director Gerry Hanley for some updates.

CAMPUS TECHNOLOGY: What trends in OER should we be aware of today?

BATSON: [The important issue] is not that you have course content either in books or from other, web-based sources, but *who is doing the search* for the resource. Textbooks, in whatever form, are almost always assigned by the teacher, thereby robbing the student of an important learning exercise. But the activity of students searching for pertinent resources—particularly OERs—on the web is not scaffolded so extensively, so it is more challenging and rewarding.

CT: By having students search for their own course materials, how are costs impacted?

HANLEY: In the **California State University** system, we've launched the Affordable Learning Solutions (AL$) initiative (*als.csuprojects.org*), which provides both faculty and students with convenient tools for searching for OERs that can complement or substitute for publisher materials. When students can't afford course materials, they don't have to go without but can find relevant OERs with our OER Finder tool. Students type in the ISBN of a textbook and the finder generates a list of related OERs in the MERLOT and OER commons. We currently have over 1,500 open textbooks in the MERLOT collection as well.

On the AL$ website, we've also included a section on how faculty can shift responsibility for course readings to students, by having them work with the campus reference librarians to research available library resources as course materials. This relates to the point that Trent made about putting students in control of finding the resources for their learning.

Finally, we have a section on using open source authoring tools to produce OERs—to support authoring both by students and by faculty. The AL$ website is open for anyone to use.

CT: How else can student participation in the sourcing and creation of OERs change the education experience?

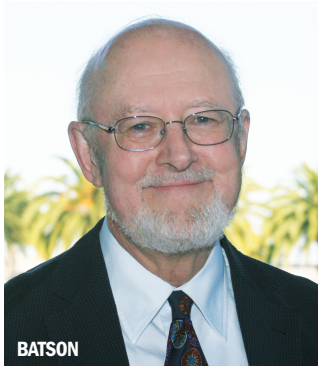
BATSON: The overarching question is not so much about open versus proprietary educational resources. Of course, the cost of educational resources is a very important factor. But the truth is that educational resources are no longer scarce but so bountiful as to be overwhelming. Therefore, the real issue is that the nature of work in our culture has changed.

College grads will, on average, change jobs every few years and therefore need to be self-directed learners. They must be prepared to operate in a non-scaffolded learning environment—real life. Students in college are no longer a captive market in terms of access to information and knowledge, since it is so bountiful. And, for their success in life, they can't afford to be a captive.

By allowing students to employ OERs of their choice, in addition to resources from books—electronic or print—the CSU system is moving in the right direction, preparing students for the knowledge economy and the job realities of today. **CT**

Editor's note: For more info on the related topic of e-portfolios, don't miss this year's AAEEBL World Portfolio Summit, co-located with Campus Technology 2011, July 25–28 in Boston.

HANLEY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