DOCUMENT RESUME

ED 453 821 IR 020 705

AUTHOR	Warger, Thomas, Ed.
TITLE	The EDUTECH Report, 2000-2001.
INSTITUTION	EDUTECH International, Bloomfield, CT.
ISSN	ISSN-0883-1327
PUB DATE	2001-00-00
NOTE	98p.; For the 1998-1999 issues, see ED 428 748. Document printed on colored paper.
AVAILABLE FROM	EDUTECH International, 120 Mountain Ave. Bloomfield, CT 06002-1634; Tel: 860-242-3356 (one year subscription, $97); Web site: http://www.edutech-int.com.
PUB TYPE	Collected Works - Serials (022)
JOURNAL CIT	EDUTECH Report; v16 n1-12 Apr 2000-Mar 2001
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Academic Libraries; *Computer Uses in Education; Distance Education; Educational Administration; *Educational Technology; Higher Education; Information Services; *Information Technology; Technological Advancement
IDENTIFIERS	Technology Role

ABSTRACT

This document consists of 12 issues, an entire volume year, of the EDUTECH Report. The newsletter's purpose is to alert faculty and administrators to issues in educational technology. Each issue contains two feature articles, a page of news briefs, a preview of the upcoming issue, and a question and answer column. Most issues also contain brief quotations on education technology topics. The following cover articles appeared from April 2000-March 2001: (1) "Connected Learning"; (2) "How Ya Gonna Keep 'Em at Dot Edu after They've Seen Dot Com? Hiring and Keeping IT Staff" (Howard Strauss); (3) "Reorganizing IT for the Future: Doing It Ourselves" (Dagrun Bennett); (4) "The Ecology of Computing Services" (Michael Roy); (5) "Hot Issues 2000-2001"; (6) "Information Technology in the Consortium Setting"; (7) "IT Decision Making Really Is Different"; (8) "Preparing Technical Instructors through Multiple Delivery Systems" (Chris Zirkle); (9) "From Inside the Library: A Perspective on IT"; (10) "Bringing the Subject of IT into the Curriculum"; and (11) "Technology and Unrest in Educational Institutions." (MES)

The EDUTECH Report, 2000-2001

Thomas Warger, Editor

THE EDUTECH REPORT

April 2000

Volume 16
Number 1

The Education Technology Newsletter for Faculty and Administrators

Connected Learning

Distance learning, which is quite properly one of the hottest topics today in higher education, still raises hackles in some quarters where people say, "We don't do that." Of course, we've always really known that what happens in the back rows of our classrooms and lecture amphitheaters could be called "distance learning." So, let's talk about "connected learning" instead—for students in the same room and for those at the other end of a telecommunications link. Anyone not engaging this issue now is missing the formative phase of an educational development that shows all the signs of becoming permanent, pervasive, and important.

A scan of the horizon in technology-assisted learning shows quite a variety of activities. Most common are those based on the web or on videotapes shipped to students by express mail. Real-time broadcasts, with or without simultaneous feedback from students, has been one of the longest-running forms of connected learning but is now a much smaller part of the range of activity. Teleconferenced instruction is growing but is still a small fraction of the scene. Many courses that are conducted without any in-classroom meetings use several technologies (e.g., e-mail, web pages, web-mediated interactive programs, chat rooms, threaded discussion forums) to make up the instructional environment. In summary, the technologies span distance—the "here" and "there"—and time—the "now" and "whenever."

By far, the strongest growth in connected learning is in asynchronous modes, where the convenience of the students not able to be "present" on an ordinary class schedule is paramount. Courses delivered via the web also have the distinct advantage of requiring the minimum in specialized equipment, especially on the student's end of the connection. With the growing number of

continued on page 3

"The anomaly of the new market for scholarship is that both supply and prices have risen sharply because the growth of the scholarly community and the pressure on universities to produce ever-increasing amounts of economically useful knowledge have kept the market pressure high. For more than a decade, librarians have been in the middle, trying to meet the faculty and student demand for information while prices have risen spectacularly and the flood of new works has overflowed their facilities. Now, faculty members have finally realized that the monograph is on the endangered species list and that the library's collection of journals is eroding."

Stanley Chodorow
"Scholarship and Scholarly Communication in the Electronic Age"
Educause Review
January/February 2000

NEWSBRIEFS

DATA IN THE ACADEMY

The March 2000 publication of the Knight Higher Education Collaborative's *Policy Perspectives*, "The Data Made me Do It," explores the "irony and ambiguity that swirl around the uses of data in an academic setting. The central premise is that despite ample reason to know better, institutions of higher education commonly make poor or little use of data in arriving at important decisions. Campuses are awash in information, amass it in studies and surveys, and then fail to connect these data to "the larger conceptions of the institution's direction ... and its decision-making process." Part of the reason, the study suggests, is that the language of quantitative analyses strikes many as sounding too much like the language of business. Still, colleges and universities are businesses and make business decisions–only they seem reluctant to appear in that light. Another reason is that the widespread participation in academic governance produces a welter of groups and individuals who are not likely to agree on frameworks and data that should guide decisions. The essay concludes that institutions need to become more willing to move away from a model of data-collecting based on the methods of scientific discovery and closer to one that looks at data in light of the need to make institutional decisions and makes several suggestions about how that change might be accomplished.

Issues of *Policy Perspectives* can be found online at http://www.irhe.upenn.edu/pubs.

MATHFORUM TO BE PART OF ONLINE INSTRUCTIONAL PLATFORM

WebCT has purchased MathForum.com from Swarthmore College as part of a growing trend for academic enterprises to cross into the commercial sphere. Started in 1996 by Professor Gene Klotz on a grant from the National Science Foundation, MathForum facilitates the exchange of questions, answers, and discussion about topics in Mathematics and provides resources for Math teachers. WebCT, which sells software for creating online education courses, hopes to use MathForum.com as the model for forums in other academic subjects including biology, history, and English.

See http://www.mathforum.com and, for the *Chronicle of Higher Education* article on the WebCT acquisition, http://chronicle.com/free/2000/04/2000041301u.htm.

ED-MEDIA 2000

Sponsored by the Association for the Advancement of Computing in Education (AACE), this year's annual conference is expected to attract more than 1,200 participants from over fifty countries. The event program covers multimedia and telecommunications, with particular emphasis on: infrastructure, tools and applications, new roles for the instructor and learner, and human-computer interaction. The conference takes place in Montreal, Canada June 26 - July 1, 2000. The deadline for early registration is May 16, 2000.

See http://www.aace.org/conf/edmedia/advprog.htm for full information.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

Connected Learning...

continued from page 1

households equipped with a computer and Internet connection, it is in the interest of institutions and students that instruction make the most of the home investment in technology. "Synchronous" instruction, on the other hand—convening students at the same time—is less flexible in that regard and often requires more costly equipment, particularly if conducted via teleconference.

The cost structure of connected learning clearly pushes in the direction of higher student-teacher ratios than classrooms because of the extra "production" costs incurred to develop instructional materials and assistive media for technology-mediated delivery. Obviously, the cost of in-person instruction comes from the teacher's salary, the operating expenses of the facility (campus and classroom), and the gathering of students. Against this economic model, connected instruction saves on the latter two of these but is higher in preparation and delivery costs; those costs do not increase with the number of students, especially if the means of communication is the via the Internet to home computers.

Scalability

The most important feature of connected instruction, and its most politically and culturally explosive quality, is its scalability. As the number of students served by a course increases, the resource most strained as a consequence is the time and attention of the instructor. Freed of the constraints of classroom space, dormitory rooms, parking and other support facilities, the institution finds the teacher's workload the point of resistance to the scalability of instruction. In situations where faculty teach in classrooms and via telecommunication, the difference in workload entailed by the different forms of instruction is bound to be evident and troublesome.

If the student-faculty ratio is set by the in-classroom model, the economic viability of technology-mediated courses will be diminished. But if the standard is set or moved by the "connected learning" model, faculty will be subjected to strong pressure to do more work in the form of papers and exams to grade, student advising and assistance, and the extra efforts needed to sustain some kind of relationship with students who do not come to a classroom. Para-instructional aides for the teacher are one possible means of alleviating the burden of greater numbers of students, but as we know from experience with large courses of the conventional kind, the supply and suitability of that kind of assistance is problematic.

> *The pressure on faculty from the inherent scalability of connected learning instruction is one of the most critical problems facing higher education today. Without a remedy, faculty will resist change in the form and means of instruction.*

The pressure on faculty from the inherent scalability of connected-learning instruction is one of the most critical problems facing higher education today. Without a remedy, faculty will resist change in the form and means of instruction. But because technology-mediated instruction is the best chance we have to extend the opportunity for higher education and life-long instruction to a growing population, the need to do right by faculty is a high-stakes proposition. The degree and pace of expansion possible in bricks and mortar is just not adequate to the demand. The picture becomes even clearer if the scope is expanded to include the world beyond the United States where the education deficit is already more severe.

Retaining and accommodating

As a flurry of articles this winter in the *Chronicle of Higher Education* revealed, retaining students in non-residential, distance or connected courses poses special challenges. People who have neither the means nor the opportunity to be full-time students are likely to find the needs of family and work pressing on the time they wish to use learning. The point of the "ivory tower" ideal was to minimize the intrusions on study, but the breakdown of walls between learning and the rest of life will place ever more people in the situation of trying to learn while surrounded by competing calls on their time and attention.

By the same token, these students are beyond the reach of many campus-based support services such as skills tutors, faculty office hours, peer assistance and encouragement, calculus clinics, and reference librarians. Institutions of learning will need to figure out how to extend those services to a population it does not encounter in person. There is as yet no real indication whether these supports can be adapted to be effective through the

continued on page 6

The chief information officer job is not getting any easier. External pressures including the rapid onset of e-commerce, the deteriorating throughput of the Internet (while Internet2 technologies are still a ways off), and the shortage of qualified staff are all too evident. While information technology on campus is less insulated from trends in the world than it was even a decade ago, the major problems confronting the CIO remain rooted on campus. And it is there, too, that some of the solutions can begin.

Leadership role in eclipse

At one time the CIO was viewed as an expert to be trusted by all, even those without much understanding. While that might seem a topic for nostalgia, from an institutional standpoint it was a naive and unwise way to make major decisions. Since then, a lot of the shine has come off the position. Major planning processes with wide participation on campus were the next phase in the history of IT governance, but they also ran their course in recent years. Now a frequent phenomenon is the uneasy stand-off, where senior administrators and CIOs feel frustration with each other and go about their roles, beset by uncertainty as to what to expect of the other. Both parties feel that IT should by now be less exotic and exceptional in the suite of issues facing institutions, but the truth is that we are not there yet.

Isolation

The isolation of the CIO has also been exacerbated in many cases by the difficulty of building a solid staff who can shoulder more of the leadership burden. IT organizations of all sizes have settled into flat organizational schemes where the CIO has too many direct reports, and very few of the unit leaders get the chance to broaden their experience and function as understudies to their bosses. Turnover in any of these positions also leaves the entire organization in double jeopardy: the local skill of the last tenant is missing and the vacuum is at least partially filled by drawing time and attention from the CIO.

The proliferation of technical specialities to be covered has no doubt contributed heavily to spreading the talent and flattening the organizational shape. Furthermore, IT units feeling short-staffed will inevitably fill slots for specialized staff before adding or protecting associate director positions, but this dynamic ultimately works to the detriment of the CIO directly and the whole organization indirectly.

IT organizations of all sizes have settled into very flat organizational schemes where the CIO has too many direct reports, and very few of the unit or team leaders get the chance to broaden their experience and function as understudies to their boss.

To round out the woes, CIOs appear not to have made significant progress on the whole towards shedding the status as technical specialist within a layer of management where most colleagues are valued for their wider portfolio of skills. One token of this blockage is the rarity of promotion above the ashired level for CIOs. Most CIOs would prefer to feel more comfortable with their administrative peers and to see those colleagues more engaged in IT issues.

The perception that there is not yet a "profession" of IT (see Brian Hawkins, "Looking at Our Professional Field," *Educause Review,* January/February 2000) certainly detracts from the standing of CIOs, particularly when compared to the professional-school formation of librarians and the senior-faculty credentials of deans and provosts. Hawkins argues that IT-involved people on campus need to broaden their views and build professional credibility by transcending their specialized skills. While development of "information studies" curricula in graduate schools will be worth watching, it is clear that even in the best of scenarios they will not have much impact on the profession in the foreseeable future.

Saving the CIO

What could be sources of support and improvement of the lot of the CIO? Looking first on campus, several avenues might be tried.

Enlisting more help from within the IT organization can be built from direct investment of time and care in the development of staff. While this activity is always at least implicit in the CIO job description, it is all too easy to short-change under workload pressure. There are practical and psychological reasons for raising and protecting the priority given to staff mentoring. To the extent that junior colleagues can share in the directors' issues, they will feel encouraged to help address them. At the same time, they will gain the experience and self-confidence to step up to executive tasks.

Because the tenure of CIOs is, on average, four or five years, no time is too soon to accelerate the development of staff who might carry more weight during that term.

Network of colleagues

Another by-product of work overload is neglect of the network of peers and colleagues who are often best situated to provide useful advice and moral support. Skipping meetings, conferences, and lectures has a way of growing from a short-term expedient to a pattern of disconnection and isolation. We all have the (frequent) experience of finding that these colleagues are wrestling with the same trials and frustrations. But just as commonly, we hesitate to speak up unless asked, even when we know that another is struggling. With the increasing tendency of colleges and universities to join in consortia there is close at hand an almost-automatic connection to potential allies and supporters. An exchange of get-acquainted visits is an easy way to open that communication.

On-campus colleagues

Administrative retreat meetings are a good opportunity to educate and encourage colleagues to understand better the issues that they should be able to help address in the course of their normal and ordinary activity (as opposed to special occasions). Where a few years ago many such peers would hold back, saying they had too little knowledge of technical issues to participate, that attitude shows signs of receding. Every office and department on campus has learned the importance of IT to its own operation, and once they get beyond insecurity about depending so much on another department for basic support they can be convinced to look realistically at the role they can play in helping the institution normalize the place of IT among the issues it faces. Retreat settings are traditionally supportive of thinking outside one's basic portfolio and a good opportunity to draw out others with some encouragement.

Small occasions for enlightenment are not hard to invent. We too often overlook our own ability to give lectures or technology demonstrations for colleagues. Here, too, the benefit is mutual. There is nothing quite like an appreciative audience to give a boost to one's morale and the chance to give some insight as to what we feel is important.

> *To the extent that junior colleagues can share in the directors' issues, they will feel encouraged to help address them, while gaining the experience and self-confidence to step up to executive tasks. No time is too soon to accelerate the development of staff.*

Writing

Not everyone is a comfortable or effective writer. But few skills are as important to the success of any administrator or leader than the ability to write persuasively. For some reason, the IT profession seems to harbor a mistrust of writing even among those who write well. For many, IT first appealed as a discipline where hands-on engagement with the machines came as a relief from the academic regimen of reading and writing. But at the CIO level, those are exactly the skills that are most important to cultivate. Besides, good writing can win support and respect beyond the forum of committees and meetings. And like the sources of help and support, the activity of writing can be rewarding in itself, if it is not excessively painful to do in the first place.

What of the future?

All signs point to the need for CIOs to assert themselves as generalists and campus citizens. They also suggest strongly that the ability to cooperate comfortably with an ever-widening range of colleagues will be at a premium.

As IT continues to mature as a campus issue for the long term, we can expect more participants in the discussion about its nature and value. IT used to be about control; now it is about re-shaping work and the life of institutions, which it cannot do as long as it is regarded as a technical province.

Whether on one campus, among a system of institutions, or within a consortium of some type, the practice of IT will develop in the direction of collaborations and partnerships, which should also help to distribute helpfully the load of making expensive, high-risk decisions.

IT workers at all stages of their career should watch the evolution of the wider profession very carefully. We will recognize that our line of work has truly become a profession when formative and in-course educational opportunities become more substantial and correlate to improved prospects for advancement. For now, the profession is short of that threshold; we can and should help each other rather than just wait for change to happen or, worse yet, just complain. ■

Connected Learning...

continued from page 3

same technology-mediated methods as the instruction itself.

Standards

Controversy also surrounds the standards to be applied to connected learning. The initial impulse in higher education has been to insist that in-classroom courses must remain the standard and that any other forms of instruction will be measured against that model. Comparisons of student performance in classroom and non-classroom sections have been too few and largely uncontrolled for influences such as the opportunity to self-select for the mode of instruction or the effect of the novelty of the experience of technology. Still there is some reason to believe that asynchronous, technology-mediated courses can offer a very strong educational experience if all the circumstances are right.

The temptation to think that "outcomes-based assessment" offers a way out of the thicket on standards of quality in instruction can be strong. It is in fact one of the core tenets of the Western Governors University and indeed in much of the "reform" movement in education in general. But one of the lessons of the information age has been the importance of capabilities not directly taught or tested—the ability to become a constant and adaptable learner, for example.

Never has the specific content of an education been more quickly outdated than now. The premium is instead on the importance of learning how to learn, to deal with uncertainty and change, and cycle through different disciplines and skills. While there are no finished answers to how these requirements should re-shape academic standards, it is reasonable to think that the challenge is something other than figuring out how to extend the in-classroom model. What is needed is to focus on the assessment of success in learning and be less complacent about the supposed superiority of the in-class experience.

Transformation of social processes

We too easily forget that education is a fundamentally social process. The roles of instructor and learner are long-established social constructs that are now undergoing the beginnings of potentially radical change. The vastly increased ability of students to obtain information directly, without the mediation of faculty, librarians, or other authorities diminishes the faculty role of main information-dispenser and leaves everyone unclear about what should now be the primary role of the instructor.

> *The vastly increased ability of students to obtain information directly, without the mediation of faculty, librarians, or other authorities diminishes the faculty role of main information-dispenser and leaves everyone unclear about what should now be the primary role of the instructor.*

The switch from "sage on the stage" to "guide on the side" is not self-evident, at least in the eyes of faculty. Students do not come to higher education needing less teacher-mediated information than previously. In any event, the relation of information to knowledge is not easy to say and the teacher's role in connecting them is not as well understood as would be helpful.

The challenge is likely to arise from students perhaps in the future less willing to tolerate the differences in expectations and learning styles between themselves and their instructors. It is hard to predict the outcome of experience with the combination of direct access to ever-increasing amounts of information and the increasing rate at which old information is displaced by new.

An ideal outcome would be a new basis for cooperation between teachers and students, where the primacy of learning and research as everyone's permanent task comes to the fore. In this scenario the teacher's performance as a model learner would become very important and students would be more interested than ever in how their instructors educate themselves. From the teacher's standpoint, the means of inquiry and discovery would become the constant guides for informing their students.

Connectedness

Connected learning will likely hasten this transformation. By downplaying the traditional tasks of classroom management and shaping of group dynamics, this form of instruction will move attention away from the aspect of social control that the role of teacher has always implied. The connectedness of "connected" education is actually more often on a one-to-one basis.

Teachers using e-mail to supplement office hours and enable more direct communication with students

in large classes often report feeling more rapport with more of their students than had been possible previously. This isn't necessarily a comfortable feeling for all faculty, and, in fact, some may resist this additional burden on their time (especially those who are working under negotiated union agreements), but it is clear that this is a major transformation in this relationship.

By extension, the challenge of creating a teacher-student relationship across distance and separation will put a fresh focus on constructing those roles. Furthermore, the outcome is likely to be different across the number of people involved. In the classroom, teachers normally head off the individual impulses of students, as if herding cows—because of the need to "keep the group together" or to "prevent a few from dominating." But in technologically mediated instruction, the room for the individuality of students is greater and does not require as much suppression of differences in the interest of maintaining a decorous and orderly classroom. More of the interaction is bilateral, private, and susceptible to being modulated differently in each instance.

Another consequence of a more shared approach to more give-and-take in instruction will be the increased participation of students in the development of new knowledge.

Ownership

In the future, responsibility for activity in the "learning space" is going to be shared. Whether this happens because outcomes testing will predominate or because students will work technologically mediated instruction to their advantage, either would be a substantial change from what we have known until now. Students will not take initiative and authority from teachers, but may well share some of both with them. The opportunity to share in the work of discovery will be there as a stronger invitation than in the teacher-as-master classroom.

Another consequence of a more shared approach to more give-and-take in instruction will be the increased participation of students in the development of new knowledge. The trend to undergraduate research projects in conjunction with faculty has shown how this kind of sharing might happen, and how satisfying it can be for teachers and students.

Because technology-mediated instruction is typically based on recorded information—web pages, videotape, e-mail, and threaded online discussions, for example, faculty and the institutions that employ them will have to work out agreements on the ownership of courses and materials created in this way. The issue becomes especially important when faculty leave to work at another institution or wish to sell the course.

In many ways, teachers and students, learners all, will be pushed to revise their roles in education. While the outcomes are still largely conjecture, the processes of change are appearing, and clearly, "connected learning" is gaining momentum rapidly. ■

"Unwiring the world can have a huge impact, because it directly addresses the problems of health, educational, economic, and cultural opportunity. The most certain method of enhancing people's well being ... has always been to increase educational opportunity. Unwiring—unlike wired technology—tends to level the differences between rich and poor, because it works as well in remote regions as in modern cities, and is cheap enough to be spread everywhere."

M.I.T. Media Lab
Costa Rican Foundation for Sustainable Development
http://www.media.mit.edu/unwired

EDUTECH RESPONDS

Q. Secretaries and administrative office heads are always asking us whether they should continue to rely primarily on paper filing systems or make electronic files the main form of storage. What answer should we in IT services give them.

A. *It is surprising, but true, that this far into the era of word processing we still have not resolved this question. The main issue is probably to introduce some reasonable order to electronic, online storage regardless of how the paper vs digits matter gets decided. Unless someone in an office has evolved a good, coherent, extensible filing system on their server or local hard drive, they might do best to look at their paper files, decide which features of those are most satisfactory, and adopt them for electronic storage. The same test would apply for rules for naming files. In this way it is possible to build parallel filing systems, with the advantage that files can be retrieved at least as easily in the electronic form as in paper. Once the general approach to organization is settled it is easier to move on to more subtle points, such as how to build version control into the electronic filing system and whether to archive back files offline. The question of whether to make paper or electronic form the preferred version is too closely linked to each office's degree of comfort with its electronic technology to be able to shape through a general policy.*

Q. What does the term "multimedia" mean today? It seems to have become one of those words that had a specific meaning but now gets used rather loosely.

A. *Yes, with the greater ease of building sound, moving pictures, and graphics into electronic files that just a few years ago might have been just text, we now see many things called "multimedia." It might be more useful to distinguish between "media-enhanced documents" and "multimedia," where the first means text that has been supplemented by objects from another medium while the second has a structure that is not primarily textual. For most purposes, the distinction might not be significant, but most of us find working outside the bounds of text something for which we are not well prepared. How often have we heard someone say, "I'd like to put some multimedia in my web pages to make them more interesting"? The skill investment needed to make really successful media is substantial. Heading off unrealistic expectations is worthwhile, even if we cannot control how popular terms get used.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

96 00:59

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

May 2000

Volume 16
Number 2

The Education Technology Newsletter for Faculty and Administrators

How Ya Gonna Keep 'Em at Dot Edu After They've Seen Dot Com?

Hiring and Keeping IT Staff

by Howard Strauss

Once upon a time, two or three decades ago, universities were *the* place to be for anyone interested in computers. In many respects universities at that time were the dot coms of today. Universities had the fastest and newest computers, were doing cutting-edge software development, had the most eclectic group of techno-savvy colleagues, and had working conditions, benefits, and a culture that made working a delight for the computer professionals who gathered there. The dot coms of that era were awful places to be for the computer intelligentsia. Instead of working on neat new operating systems, compilers, or equation formatters, as they would at a university, the techies worked on drier-than-dust applications that had to be written in COBOL! COBOL, you'll recall, was a language designed for *COmmon* Business Oriented people and totally hid any of the neat inner workings of computers from programmers.

First of a two-part series

Nothing about IT people at universities was common. They were the high priests of the new technology. The work they did was vital, crucial, critical, central, essential, fundamental, and utterly inscrutable to anyone outside the innermost circles of the priesthood, including the faculty who were in awe of this new breed of advanced technologist.

continued on page 4

"Administrators at educational institutions have tended to think of technology as a benign force for organizational enhancement —not something that could effectively end their way of life. That attitude reflects a fundamental misunderstanding of the World Wide Web.... The Internet has changed the fundamentals of the economics of information. Although information is still costly to produce, the Web has revolutionized the way we reproduce it, lowering the cost of additional copies to nearly zero. The forces of competition will drive the price of information down to roughly the cost of its reproduction."

Van B. Weigel
"Free Degrees? They're Only a Matter of Time"
Chronicle of Higher Education
May 19, 2000

NEWSBRIEFS

THE RETURN OF COMPUTER SCIENCE

College administrators across the country are scrambling to accommodate the latest campus craze: majoring in the computer sciences. With the Internet economy producing a healthy supply of high-tech, high-paying jobs, computer science courses are experiencing a popularity unequaled since personal computers arrived in the early 1980s. A survey by the Computing Research Association of 156 departments in the United States and Canada found that the number of newly declared majors in computer science programs rose to about 21,000 in 1999—more than double what it was in 1995. It's a sharp reversal after nearly a decade of decline.

See Erin Caroll, "Computer majors clog campuses," *Philadelphia Inquirer,* May 13, 2000; http://www.phillynews.com.

THE NEW/OLD TATE GALLERY

Queen Elizabeth II has officially opened the Tate Modern, Britain's new national museum of modern art housed in a former power station on London's Bankside. Those who weren't invited to the gala opening party and couldn't make it to the official public opening can still visit the new museum online. The site offers a complete overview of the works displayed in each of its four themed groups. Though modern sounding, the four display themes, Landscape/Matter/ Environment; Still Life/Object/Real Life; Nude/Action/ Body; and History/Memory/Society, are actually based on the major genres of art established by the French Academy in the seventeenth century. Clicking on a section will bring up a list of rooms, each of which links to a short description and list of works.

For a virtual visit, see http://www.tate.org.uk/modern.

ONLINE CLASS GRADUATES

Seton Hall University has graduated its first online class of 33 students. Participants in SetonWorldWide, which allows students to complete master's degrees through the University's online campus, joined the on-campus Seton Hall University graduating Class of 2000 at the commencement ceremony on Monday, May 8. SetonWorldWide graduates include 12 students from the Master of Arts in Strategic Communication & Leadership program and 21 students from the Master of Healthcare Administration program.

Nearly 150 graduate students from across the nation as well as Japan, Germany, and the Dominican Republic are participating in SetonWorldWide today. The online programs are identical to the on-campus programs, and are developed and taught by nationally recognized professors and expert practitioners. Students study in a learning team cohort and complete the program entirely online. Each learning team is required to attend three on-campus residencies consisting of an orientation, a mid-program session, and graduation.

For more information, see http://www.setonworldwide.net.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

The Spiraling Demands on IT Staff and Budget

by James Dalton, Roanoke College

The CIOs of most institutions are faced with an ever-spiraling demand on IT staff and budget as well as continual justification of the resources for them. In an attempt to address the demands and justification, the CIO often turns to numerical budget and staffing comparisons between institutions. Such comparisons, although useful, are fraught with complexities.

In order to provide cost-effective services, CIOs must instead determine the cost of providing particular services based on the parameters in place at their institutions. The cost of providing the service must then be judged against its value to the institution. If the cost/value ratio is excessive then other options must be pursued. Each service that is improved or added must be judged in the same manner. The role of the CIO is to inform the users as to the true cost and the possible value in order to allow the community to do the cost/benefit analysis.

To justify budget and staffing many have tried to devise metrics based on FTE students or faculty or the number of computers. The various surveys done by different institutions provide important data that can help guide us in our decision-making processes. But much like global temperature data and the discussion of global warming, the number of variables makes reaching a widely accepted conclusion very difficult.

But as with global warming we can know the relationship between individual parameters even though we do not know all the causes and effects. The fact that we cannot reach agreement on the overall problem in IT demand does not mean specific action cannot be taken in those areas where we do know the cause and effect relationships. Some examples are:

- Number of hardware and software standards
- Customization of software solutions
- Complexity of network systems services
- Age of hardware
- Regional demand for technical staff
- Number of academic programs using technology and the level of use by each program
- Number of services

> *The creativity of the IT staff must not be squelched but the staff must clearly understand the importance of providing cost-effective solutions of significant value to the users.*

Increases in any of these areas will increase the cost and/or staffing requirements for any institution. Clear linkages must be established between services, the parameters above, and staffing or cost. This linkage directs the focus of the budget-staffing discussion on the services provided instead of the needs of IT.

Comparisons between institutions are often difficult due to the number of factors that come into play. The support cost for a highly customized administrative system for an institution located just outside of New York City will be much higher then an out-of-the-box administrative system for an institution in rural Virginia.

As technologists, we tend to enjoy new, different, and difficult projects but each of these tendencies increases the cost of support. Therefore, we must also understand the impact of our own decisions as we implement new or improved projects and programs. We all know technically elegant solutions may not be the best solution based on the parameters in place at our institution. The creativity of the IT staff must not be squelched but the staff must clearly understand the importance of providing cost-effective solutions of significant value to the users.

CIOs must then communicate both to their staff and their users the relationship between institutional decisions past, present, or pending and the technology requirements for the institution including staff and budget. By doing so the CIO gives the users sufficient information to determine if the service in question is worth the cost. The process of justifying budget and staffing should be primarily user driven, based on the services they need and local parameters influencing cost. Focusing the discussion on the cost of these services in light of the factors in place at the institution moves the discussion from an IT request to a community request. Providing users with the appropriate information allows them to be knowledgeable participants in this discussion. ■

James Dalton is the director of information services at Roanoke College.

How Ya Gonna Keep 'Em...

continued from page 1

If you worked at a commercial data processing firm you were a mere clerk. Keeping and retaining IT professionals back then was trivial for universities—you just chose the crème de la crème from the hordes of hopeful applicants who besieged your doors. The folks who didn't make the cut wrote COBOL programs or sold life insurance. It really didn't make much difference what they did.

Priests and peons

By the time the web arrived all of that had changed. The priests of IT had become the peons of the back office IT infrastructure. The accounting applications that the long-term lifers had avoided by joining a university were now the mainstay of university computing along with such terminally tiring things as e-mail, print servers, and the design of web pages that were outclassed by those done by twelve year olds. Bit by bit, as IT became a utility to the university and a commodity that everyone dealt with on their own desktops, IT became just another administrative function that provided an essential service. Getting the pay checks printed and doing the bidding of university bean counters was certainly essential, but not much more so than cleaning building and keeping the grounds neat.

In the past, IT folks came to universities to be part of the hot bed of IT innovation. Later they chose universities for their benefits, low-pressure work environment, and the ability to hang around bright people doing interesting things. Those bright people who in the past were other IT folks were now members of the faculty.

At universities the faculty are the stars. Once the IT folks were too, but that has changed. Something else has changed as well. IT is no longer just an administrative function and IT folks are no longer peripheral to the mission of the university. (The mission of the university is to provide education, to support research, and to raise money from alums, grants, the government, and anywhere else they can get it.)

> *The quality of IT service expected by students and faculty is on par with the best commercial software delivered by any dot com—and it takes the same kind of people and infrastructure to do it.*

But both the way education is offered and the kinds of things IT people do to support it has changed. Faculty now use IT everyday in everything they do. Web pages help deliver course content, do assessment (tests and quizzes), help students do research and assignments, let students check their grades, let them collaborate with other class members and with faculty, let them do "language labs" and view videos in their dorms, and much more. Universities now have more distance education, more alumni education, and more unconventional students. The quality of IT service expected by students and faculty is on par with the best commercial software delivered by any dot com—and it takes the same kind of people and infrastructure to do it.

Competition

The quality of a university's teaching, research, and its ability to attract students and make and raise money is now very dependent on the quality of its IT staff. The IT people that the dot coms need so desperately are the same people that are now needed by universities. Universities have to compete with dot coms to attract and hire those folks and will have to give their existing IT folk the new skills and work ethics required by these radical changes. Companies from Disney through Zingerman's have also started to compete with universities for education dollars. For the first time in history, commercial for-profit firms view education as a potential source of income and are becoming credible alternatives for some education.

Hordes of IT applicants no longer beat on the doors of universities. In fact it has become very difficult to keep the IT folks universities already have and extremely difficult and expensive to hire new IT folks. The number of unfilled IT positions has grown so large that universities have resorted to hiring consultants to do the work of IT people they are unable to hire. That is a very expensive option that costs about five times as much per day as regular full-time employees. Also consultants have a steep learning curve and tend to leave at the end of a project—leaving you to retrain the next high-priced consultant you'll need to hire. And when a consultant leaves, she takes her skills and knowledge of your systems with her.

Howard Strauss is manager of advanced applications at Princeton University and a frequent contributor to this publication.

Lifers and newbies

Universities now have two very different kinds of IT staff; lifers and newbies who require quite different incentives to keep them contented. Lifers, those IT folks who joined the university a zillion years ago and who planned to stay until they died, joined a university for quite different reasons than the newbies and have quite different expectations of what the university will provide. Newbies are recent hires who are usually much younger than lifers and much more likely to go somewhere else tomorrow. Although few lifers will ever leave the university they sometimes mentally quit and physically stay. If someone quits and leaves, at least their slot can be filled. If a lifer decides that he or she is too unhappy to do any real work, but doesn't see any need to find a new job when their current one has become so easy and comfortable then they have effectively quit and stayed. That is far worse than them actually leaving.

Another danger with lifers is that they may never really learn the new technologies. This will result in paying people who can't do the work that needs to be done and being unable to fill the slots they occupy. For them, training cannot be optional.

Lure of the dot coms

There is now a dizzying deluge of new technologies and growing demands for IT services. Dot coms are luring the best and brightest IT professionals. Staffing is the largest share of IT budgets—and it is growing rapidly. IT staff is also a growing share of the budgets of other departments.

The challenge for IT organizations is to keep both lifers and newbies contented, loyal, growing in their technical fields, and doing prodigious amounts of their best, most creative work for long periods of time. They must also hire new IT professionals at salaries that are affordable and keep them happy for as long as they stay, though most of them will not become lifers.

What do IT folks really want?

To meet these challenges it is necessary to first understand what IT professionals really want. Whether they are lifers, newbies, or new hires, all want to feel important.

> *There's now a dizzying deluge of new technologies and growing demands for IT services. Dot coms are luring the best and brightest. Staffing is the largest share of IT budgets—and is growing rapidly.*

Since faculty are really the stars at a university while IT folks are the stars at a dot com, making IT folks feel important at a university is a difficult challenge. The first thing necessary is to recognize that IT folks are not just another group of administrators. True, they are not faculty, but today, faculty depends very heavily on IT.

Working space is one issue. A trend on many campuses is to move administrators from offices into cubicles. This is done to save money and may work for accounting clerks and purchasing agents. But the work that IT folks do often requires intense concentration for long periods of time. Hearing six or seven other people talking to their spouses or children on the phone, discussing the latest stock market dip and arguing over how best to implement LDAP security, as one might in a cubicle, does not lend itself to focusing on designing EJBs and Java servlets for a new campus-wide portal. Your IT folks need private, quiet, well-equipped, comfortable offices of their own that will be their campus homes. After all, IT folks will spend more time there than at home.

Listen

All IT folks also want to feel they are making a difference and that their work materially affects the organization and their field of expertise. Their ideas, the work they do, and who and what they are need to be respected. Their ideas may often sound strange, be counter to conventional culture, or seem impossible to implement. But they must be considered anyway. All really new ideas seem strange in the beginning. Sometimes it will be discovered that an idea is really great if it is just expressed differently. Too many technical managers have learned that it is important to ask subordinates their opinions, but that actually listening to them is optional. It is not. To keep IT professionals contented they must really be part of the team and be included in decision-making.

IT people are like cats; lead them, don't manage them. They will respond to management—and especially micro management—by using their considerable talents to elude it instead of doing any useful work. At Bell Labs many years ago I had the pleasure of working for Ralph Griswold. He was an awful mana-

continued on page 6

How Ya Gonna Keep 'Em...

continued from page 5

ger. He was disorganized, tactless, loud, and had obviously never read a single paragraph on management. But he was an incredible leader. Dozens of other people and I voluntarily worked day and night for him and would have followed him to the ends of the Earth if he had even so much as hinted that we should do it.

While many workers want to work less, most IT workers want to work more—as long as they have something interesting and compelling to work on. They should always be kept too busy. They will fuss and moan about having too much to do, but if it is neat stuff, they'll be happy. It's okay to let them moan and complain. Being overworked and fussing about it provides them with a lot of job satisfaction. To keep them around, let them work on the most critical projects using the hottest technology. Make sure they understand the importance to the university of whatever it is they are working on.

Give them dull stuff to do, or not enough to do, and you might lose them. Even more dangerous is that they love to work so much that they will find something interesting to do even if you don't provide it. And they have much richer imaginations than you, so there's no predicting how they will choose to fill their idle time.

No matter how busy you keep your IT folks they will always find some time to explore and examine the latest stuff. Encourage it. Even if, for example, virtual reality Java portals are not in your five-year plan, having IT people learn about them will produce great benefits. Be sure they have the latest techno-gadgets too. The cost of a palm computer, a DVD drive, and a Java ring are well worth the undying loyalty of your IT staff. Playing with that kind of hardware and software will improve their technical knowledge, will provide them with bragging rights to their peers, will give them some reason to work at a dot edu rather than a dot com, and will in general make them happier and more productive.

Even if they spend some time playing games or checking out stocks and personal electronic gadgets on the web, ignore it. If they spend too much time doing this you probably haven't given them enough interesting stuff to do.

> *It is not enough for you to know that things are fair and equitable; your staff must feel it too. Count on the fact that they will talk to each other. You can't make things seem fair by keeping the truth quiet. Your staff will figure out what's going on.*

Once one's basic needs are taken care of, money in and of itself is not all that great a motivator, especially over the long term. More important is what money symbolizes. If Sondra thinks she has done a stellar job and gets a half percent smaller salary increase than Bryan who she knows has just done ok, she'll say she has been underpaid and will be very unhappy and unproductive. It will not make any difference if her salary is twice as much as Bryan's and the dollar value of her increase is also bigger than his. It will also not matter that you know she is not underpaid and in fact is one of your highest paid IT professionals. She is not really unhappy about her salary, she is unhappy about being treated unfairly and inequitably. She *knows* she deserved more than Bryan and didn't get it.

IT professionals need to be treated fairly and equitably in everything. You can often be fair to your staff by empowering them to make decisions themselves, especially ones that affect them directly. Recently four software developers who work for me had to be moved to four new offices. All their old offices had windows but only two of the new offices have windows. Each one of the developers indicated that windows were very important to him. Whoever I decided should not get a windowed office would view the process as being arbitrary and unfair. Productivity would probably drop for an extended period of time and there would be a big hit to loyalty and support of our IT organization. Instead I let them decide (with a deadline) how to allocate the offices. In a couple of days they had brokered a deal among themselves that they all felt good about.

It is not enough for you to know that things are fair and equitable; your staff must feel it too. Count on the fact that they will talk to each other and to people far and wide, across the university and beyond. You can't make things seem fair by keeping the truth quiet. Your staff will figure out what's going on.

When you have to do something that will be upsetting to staff, involve them in the decision early, be open, and admit that bad news is bad news.

People, especially your IT people, need to have some control over what they work on. An efficient manger will assign tasks to IT folks using TQM or whatever management fad is in vogue at the moment. A good leader will work with his or her staff to get them working on the parts of the project they'd most like to work on. Professionals *will* volunteer to do tasks they would quit over being assigned to if they understand the necessity to do them and feel they have some control over deciding to take them on.

Give your IT folks some control over their work environment too. Most of what they ask for will be minor things that you'll easily be able to accommodate if you don't let university policies and your tendency to say no to anything new or strange get in your way.

At a research organization, a new employee insisted that he could not work in an office that didn't have an acute angle in which his best ideas could collect. Two acute angles, he insisted would double his creativity. Of course all offices in the entire building had only 90-degree angles. In his rectangular office he was totally unproductive and in fact was very annoying to his peers. Then his supervisor asked if he would accept a partition diagonally down the middle of his office. It would make his office half the size and crowd him into a small triangle of an office. He loved it and did incredible work in his strange office with his chair facing into one of the acute angles where his thoughts could collect. The cost of the partition may have been a few hundred dollars. The gain was many times more than that. But the biggest challenge to turning this employee around was not the money. It was the kind of thinking that was able to deal with something out of the ordinary. If you want to keep and hire extraordinary people your policies and thinking will have to be as creative as the folks you hope to keep and attract.

In most cases you will not be asked to build diagonal partitions. An employee recently asked for a fan for her office and was told that the university did not supply them. She bought one herself for about $30. Was she happy? No. She thought she worked for a mean uncaring university that was unconcerned about the welfare of its employees. And she'll be sure to mention this to everyone she meets for the rest of her life and think about it every time she uses her fan. Management should not sweat the small stuff. It isn't worth it. Say yes to employee requests unless there is a seriously compelling and logical reason to say no. If the reason is really good your employees will understand and support you.

IT folks at a university expect to have a national or even international impact. They'd love to be able to say, "The sun never sets on the software I've developed." Be sure to give them the opportunity to do this. Have them present their work at conferences, encourage them to network electronically, and make it possible for their software to be distributed. If the university makes money from it, share the proceeds with all of the developers. ■

(continued next month)

"The Net is beginning to affect all of us—the way we create wealth, the enterprise, the nature of commerce and marketing, the delivery system for entertainment, the role and dynamics of learning in the economy, the nature of government and governance, our culture, and arguably the role of the nation-state in the body politic."

Don Tapscott
Growing Up Digital: The Rise of the Net Generation

In Future Issues

- *Continuation of Howard Strauss's "How Ya Gonna Keep 'Em..."*

- *University / K-12 partnership to develop instructional materials*

- *The growing role of consortia in higher ed IT*

EDUTECH RESPONDS

Q. We have helped several departments on our campus that wanted to put data records for artifact collections into computer databases. But the results were disappointing all around. Our clients felt we hadn't put their data in the right fields. Our programmers were sure their clients didn't understand their own data. We don't want to repeat that experience. What did we do wrong?

A. *This is a common story. Most likely what happened was a subtle but important mismatch of expectations for the project and an underlying difference in organizational schemes. If, for example, the collection of records was in "shoe-box" form (three-by-five cards in file boxes), sequence of storage was more than likely the principal feature of the file organization. In this scenario there has also been a relatively casual and changeable approach to entering data on the cards, even though on a riffle through the cards the consistency seems pretty good. Where the trouble begins is when everyone assumes that the data fields on paper can serve as a map to database fields. In flat-file systems (whether paper or computer) the fields in any record tend to have been thought out in terms of their relation to the object in question, whereas fields in a true database are actually defined in terms of how their definitions distinguish them from other fields in the record. One recommendation we have is to work with your clients to define an ideal relational database, rather than an electronic representation of the existing system. Another is to resist the temptation to think that converting and mapping data from a flat-file structure to relational always has to be better than re-keying everything—fresh keyboard entry by suitably qualified and supervised staff will often give a much better result.*

Q. A few of us are curious to know what is the origin of the word "hacker."

A. *There is quite a chain of different meanings behind the current, computer-related uses of the word. In the twentieth century, it came to mean a person who played tennis or golf casually, and not well. In earlier times it was associated with several different occupations: brick and tile making, turpentine gathering, and furniture making from rough timber with an ax. These are in turn related in the use of crude tools and an association with drudgery. And, there is also an implication that these workers were itinerant.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

THE EDUTECH REPORT

June 2000

Volume 16
Number 3

The Education Technology Newsletter for Faculty and Administrators

How Ya Gonna Keep 'Em at Dot Edu After They've Seen Dot Com?

Hiring and Keeping IT Staff

by Howard Strauss

Although universities traditionally have salaries lower than dot coms and other corporate workplaces, most universities maintain some degree of parity by including the value of their more generous benefits. "Sure we pay less," they shout, "but what about the value of our tuition-reimbursement plan?"

Second of a two-part series

For an employee with four children and a spouse all attending college, this benefit alone could be worth $35,000 per year and might even be tax-free. And then there's the five weeks or so of vacation compared to the typical two weeks at a dot com. With benefits, those extra three weeks could be worth $6,000 per year. There is no question that universities offer many thousands of dollars in benefits that most dot coms don't even consider. But they are worth very little to employees who can't use them. And employees who can't take advantage of certain benefits will see and resent the obvious inequity in having some people get many more benefits than they do.

Many of these wonderful benefits are really designed for lifers and for the managers at the top of the university hierarchy. The benefits do not consider the characteristics of recent IT hires.

continued on page 4

"Genuine intellectual inquiry is difficult, while using the Internet is not only easy, but provides access to a world where normal standards of intellectual responsibility are nonexistent, and where intellectual challenge may be avoided by a keystroke. The problem with such a cost-free world, to paraphrase Mark Twain, is that what costs nothing is usually worth the price. Emphasizing the Internet in higher education will distract students from intellectual growth, not promote it."

Scott Evans
Letter to the Editor
Chronicle of Higher Education
June 2, 2000

NEWSBRIEFS

DISTANCE EDUCATION POLICY FOR THE 21ST CENTURY

The American Council on Education has issued a primer on the issues an institution will confront as it plans to integrate, implement, and harmonize distance education into its existing policies.

Principal issues examined are: intellectual property policies with respect to ownership of a distance education course; institutional and faculty rights and responsibilities after a course is created; faculty compensation, teaching load, and acceptance; student access and privacy; potential liabilities associated with distance education courses (including copyright infringement liability); and accreditation and approvals beyond state and national borders.

The primer is *"Developing a Distance Education Policy for 21st Century Learning,"* American Council on Education. For more information, see: www.acenet.edu/washington/distance_ed/2000/03march/distance_ed.html.

PRESERVING DIGITAL ARCHIVES

The persistence of digital information remains an essential challenge in building the online digital library. A few libraries and library organizations are poised to develop limited digital archival repositories. Their progress may rely on the emergence of two elements that are currently absent: there is no widespread agreement about the minimum functional requirements of a digital archive; there is also little realistic understanding of the value of digital information.

For more information, see: "The Challenges of Preservation in Creating Digital Library Services," by Daniel Greenstein. The Website is at http://www.clir.org/pubs/issues/issues15.html.

RECYCLING COMPUTERS

NewDeal (http://www.newdealinc.com/) is software that restores the core of functionality to old computers. It has a point-and-click interface, like Windows 98, with two major differences. First, it runs on any PC, from a Pentium III model to a relic as old as the 286. Second, rather than paying $300 for software, $39.95 provides the user with a spreadsheet program, a word processor tht can read rich text files, e-mail and web browser. For less than $70, the deluxe version also includes a mini-database, a drawing program, and a kid-friendly version of the BASIC programming language.

Clive Smith, creator of GeoWorks, developed *NewDeal* with the goal of bringing computers to all school children. The company works in partnership with businesses, not-for-profit organizations, and governments. *NewDeal* has won many awards, including a *PC Computing* Most Valuable Product award and the *InfoWorld* Product of the Year award.

See: "Recycling Computers: A Simple Solution for a Complex Problem," by Sonia Jurich, in TechKnowLogia, May/June, 2000, www.TechKnowLogia.org.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

Transforming Scholarly Publication

The following statement is adapted from "Principles for Emerging Systems of Scholarly Publication," issued jointly The Association of American Universities, The Association of Research Libraries, and the Merrill Advanced Studies Center of the University of Kansas.

The current system of scholarly publishing has become too costly for the academic community to sustain. The increasing volume and costs of scholarly publications, particularly in science, technology, and medicine (STM), are making it impossible for libraries and their institutions to support the collection needs of their current and future faculty and students. Moreover, the pressure on library budgets from STM journal prices has contributed to the difficulty of academic publishers in the humanities and social sciences, primarily scholarly societies and university presses, to publish specialized monograph-length work or to find the funds to invest in the migration to digital publishing systems.

The participants [in the March 2-4, 2000 meeting in Tempe, Arizona] encourage broad discussion and endorsement of these principles by institutions of higher education, scholars, scholarly societies, and scholarly publishers.

1.The cost to the academy of published research should be contained so that access to relevant research publications for faculty and students can be maintained and even expanded. Members of the university community should collaborate to develop strategies that further this end. Faculty participation is essential to the success of this process.

With the creation, dissemination, and application of new knowledge central to their mission, institutions of higher education must work to create systems that will provide affordable access to all relevant published scholarship. To do this, faculty, university administrators and professional societies must work together to create the systems that will contain, and in some cases, reduce substantially the costs of scholarly publishing.

> *Electronic publishing adds yet another set of complex issues to the archiving and preservation of scholarly works. With libraries no longer owning copies and with the fragility of the electronic media, questions of what should be archived by whom and how are critical issues that need to be addressed.*

2. Electronic capabilities should be used, among other things, to: provide wide access to scholarship, encourage interdisciplinary research, and enhance interoperability and searchability. Development of standards will be particularly important in the electronic environment.

With the growing volume of scholarly research, it is increasingly difficult to uncover all of the relevant material published on a given subject. As more scholarship becomes available in digital form, this problem can be surmounted through powerful search systems provided that commercial, technical, and legal constraints do not prohibit such searches. The development of standards is critical to the implementation of cross-field searching and navigation.

4. The system of scholarly publication must continue to include processes for evaluating the quality of scholarly work and every publication should provide the reader with information about evaluation the work has undergone.

The academic community relies on the judgment of peers when assessing the quality of faculty work. Any evolving system of scholarly publication should allow for an evaluation process to take place as appropriate and should provide a transparent mechanism that informs the reader ... of the nature of the evaluation the work has undergone in its various versions.

5. The academic community embraces the concepts of copyright and fair use and seeks a balance in the interest of owners and users in the digital environment. Universities, colleges, and especially their faculties should manage copyright and its limitations and exceptions in a manner that assures the faculty access to and use of their own published works in their research and teaching.

As creators [of scholarly publications], faculty depend on copyright to protect the integrity of their work and on fair use to be able to use and incorporate the works of others with attribution in their own work.

continued on page 7

How Ya Gonna Keep 'Em...

continued from page 1

Recent IT hires are often young, single people with limited social skills. They are usually self-assured loners that are likely to stay at your university for a short time. They love the most challenging technical work and have few non-technical outside interests. They can barely manage themselves, and certainly do not aspire to manage anyone else, but they do want to be important anyway and get the perks that would go along with being a high-level manager.

It is a waste of time to offer a newbie benefits for spouses and children that he or she may never have. Providing benefits for people with five years of service is also not a draw for people who may not see their fourth anniversary. And many IT professionals voluntarily lose vacation days because they would rather work than go off on some vacation where they would be bored without the company of their computers. And when they do go on vacation, they are likely to use www.geekcruises.com (that's *geek* not *Greek*) that offers cruises that include 30 hours of seminars on one's choice of XML, Java, or database design.

Health care plans? These folks are young and healthy (until their diets of Twinkies and Jolt Cola do them in) and tend to ignore preventative health care anyway. Retirement plans? They are beyond the horizon for these folks. At any rate few will be employed beyond the vesting period and will accumulate very little in their retirement fund. However, they could use some help in choosing health care professionals and in getting suggestions about healthy life styles.

Overall, the benefits universities offer are great for lifers and the IT people who used to be attracted to universities. They are close to useless for many recent IT hires. Universities need to have benefits that attract these new IT people and that also keep the lifers and other folks who chose to work at a university because of the existing benefits. And they need to do this while maintaining a sense of fairness to all employees.

> *Overall, the benefits universities offer are great for lifers and the people who used to be attracted to universities. They are close to useless for many recent IT hires. Universities need to have benefits that attract these new IT people and that also keep the lifers.*

Changes HR needs to make

Although IT professionals used to be attracted to universities for the challenge and cutting-edge technology, they are now more likely to find that in a dot com. A dot com will also reward them with the highest standard of living *if the company is successful*. Since that's a big *if*, there is considerable risk involved in working for a dot com. A university cannot compete in offering an employee a higher standard of living directly. Instead they must compete on quality-of-life issues and the good possibility of indirectly raising an employee's standard of living. No one at a university has ever become a billionaire by cashing in on a university's stock options – since universities have no stock, many university folks have used their tenure at universities to incubate their clever ideas and turn them into very profitable businesses or patents. The freedom to develop one's own ideas in the company of great scholars and facilities and to profit from them is a quality-of-life issue of great value to many IT employees. This possibility must not only be allowed, it should be encouraged since it offers great benefit to both employees and the university. One benefit to the university sometimes overlooked is that it makes for happy employees who will be very productive and might just stay around.

Making benefits real

The things that improve quality of life are very subjective. Lifers will want different things than new hires. Single people will want different things than married employees with lots of dependents. HR needs to offer benefits that are much more flexible than anything being done today. Today, benefits benefit one group much more than another. This inequity should be eliminated. Tuition reimbursement for dependents is a fine benefit, but useless for someone who will never have dependents. Why should a person who has four children get thousands of dollars more in benefits than someone who chooses to have none? Does the university want to attract the best Java programmers or programmers who are the most fertile?

In a truly flexible benefit program every employee would get the same value of benefits. This might be an absolute number, a number based on an employee's salary, or a combi-

Howard Strauss is the manager of academic applications at Princeton University and a frequent contributor to this publication.

nation of these. For example, everyone might get a benefit package worth $1000 plus 15% of their salary. Employees would select from all the benefits available up to the dollar limit allowed. This would be fair to all employees and would allow every group to get the benefits that fit them best.

Allowing flexibility

In offering flexible benefits HR will have to allow things that it has never allowed before. For example, today universities offer vacation days, sick days, personal days, and often consulting days. Honest folks only use sick days when they are sick and usually lose those they don't use. Newbies rarely take all – or even most – of their vacation, and lose much of it. Some folks do consulting and take those days. Some don't. And some just claim to be doing consulting when they are really taking extra vacation days.

HR should aggregate all of the days off, except for holidays and temporary disability days, into a single pool of R&R days. At a typical university IT folks get twenty-four vacation days, two personal days, eight sick days and twelve consulting days per year. That's nine weeks and a day of R&R. First, round that up to ten weeks. Then allow employees to take it for any reason whatsoever. No sick days, no vacation, no personal days, and no consulting days, just ten weeks of R&R for any reason. Can any dot com compete with that? Join a dot com and get two measly weeks of vacation or join Euphoric State and get ten long weeks of R&R. This is virtually what universities offer anyway. It is just fairer, easier to administer, and repackaged to make it seem bigger.

While many lifers will take the ten weeks off, most newbies will be hard pressed to use even three weeks of it. That's a great opportunity for universities. Allow it to accumulate to six months or so, giving IT folks the option of taking a sabbatical, or offer to buy it back from them. Buying a week from an experienced IT professional at their regular salary will cost less than one fifth of what a consultant – who will not be as productive – will cost. The university gets an incredible bargain and the employee gets paid some extra money for doing great things for the university – which is what he or she wanted to do anyway. No dot com will do this. Buy forty-two weeks back from your IT staff each year and you've found the most cost-effective way to fill a new IT position.

> *HR needs to establish a real manager-equivalent technical track. This track should pay technical gurus and wizards the high salaries they deserve and give them the perks of managers without giving them the management responsibilities they wouldn't want anyway and would be disastrous at.*

Allow employees to work flex time whenever possible. Newbies will probably do it anyway, so allowing it avoids having managers annoy productive people who work better if they can work from 6am to 3pm or 10am to 7pm, rather than the standard hours. When they need to, let employees work at home.

Good rewards and perks

HR needs to establish a real manager-equivalent technical track. This track should pay technical gurus and wizards the high salaries they deserve and give them the perks of managers without giving them the management responsibilities they wouldn't want anyway and would be disastrous at. If managers get bigger offices, credenzas, carpeting, weather stations, or other signs of importance or accomplishment, then so should those on the techno-wizard track. When there is no real techno-wizard track, the wizards will insist on becoming managers as a reward for their great contributions. And you might just feel obligated to do it. That will result in the loss of a great technical resource and will cause chaos among the staff who report to the wizard.

You are sure to hear that dot coms give their employees free Cokes and often free snacks. You should too. You probably already provide free coffee to your staff. That does your cola-drinking newbies no good. Why should you offer only one beverage free? Because it is what *you* like to drink?

If free snacks everyday seems like overkill, have a weekly snack day. Buy some bagels, donuts, or whatever every Thursday for your IT staff. They'll love it and consider it a privilege far greater than its modest cost. No one will miss working on a Thursday. The truth is that the average person will only consume one or two bagels at a cost of about a $1. Over a year, counting colas, coffee, and snack day, it might cost as much as $5 per week per employee or about $250 per year. Who wouldn't give their most important employees a $250-per-

continued on page 6

How Ya Gonna Keep 'Em...

continued from page 5

year salary increase to make them much more productive, happy, and most important, much more likely to hang around?

Allow one-person groups for folks who would like a management title but who don't want to – and likely can't – manage anyone. Even if your ace authentication guru works alone in a dark corner of the computer center, it does no harm to let her call herself *Manager of Authentication.*

Let your staff have university owned computers at home. Give them the computer on their desk when it is replaced (every 24-30 months to keep them happy and productive). Buy them a modem too. As a reward for great service buy them a high-speed connection to the university from home. Providing a home computer for an IT professional allows him or her to work even more hours for you. It will not take many hours to more than pay for any home computer equipment you provide.

If you have any dress code at all, drop it. If programmers have to meet with users who might cringe at someone because of the way they are dressed, there will be lots of other things about your programmers that will upset them too. Have better dressed people meet with users. You could suggest – but not insist – that programmers keep a pair of shoes, a shirt with a collar, and a jacket on hand for emergency contact with users. You might even buy these for a programmer who thinks the request is too outrageous.

Your university probably has athletic facilities, a library, theaters, and possibly even tennis courts and a swimming pool. Make some or all of these available to IT folks free. A free ticket to a basketball game or a free pass to your weight room costs the university virtually nothing. Does a dot com have its own gym, tennis courts, pools, library, and theater? These are assets you can capitalize on.

Reward your IT staff with bonuses. Many IT folks get signing bonuses today worth thousands of dollars and then are rewarded again and again when they add to their dot com's bottom line. Empower your managers to give IT folks on-the-spot bonuses for doing great things like a major breakthrough on a project or bringing in a project ahead of schedule. Offer folks bonuses to stay through to the end of a long project. Give them referral bonuses. If you hire someone they referred then give the person hired and the person who referred him or her to you $500 or so. It will cost you a lot more than that to find a good person who will work well with members of your existing group. And you'll be getting a person recommended by someone whose work you know and trust.

> *Empower your managers to give IT folks on-the-spot bonuses for doing great things like a major breakthrough on a project or bringing in a project ahead of schedule. Offer folks bonuses to stay through to the end of a long project.*

Bonuses do not always have to be cash – and shouldn't be. Treat folks to lunch or dinner. Give out trophies and plaques. Newbies are unlikely to be athletes and will probably never get a *Championship Soccer Team* trophy. But you could give them a *Great Web Design* trophy that they will cherish and display forever.

One of the simplest, least expensive, but most often overlooked bonuses to give is a sincere thank you for a job well done. If it is done publicly and followed up by a nice e-mail message it can make someone's day.

Keeping them at dot edu

Some of these suggestions will cost a few dollars, but all of them will make your university a great place for IT people to be. Hiring new people, hiring consultants, or paying unhappy, unproductive people will be far more expensive. Upper management and HR may cringe at buying back vacation days, not keeping track of sick days, or thousands of dollars in your budget for snacks, bonuses, and trophies, but you will not be able to compete with dot coms by maintaining business as usual.

At universities the faculty will necessarily remain the stars, but you must find ways to make IT folks special too. Ignore them and they'll go away. To keep them you'll have to treat them in a special way. You also must remember that you have lifers and newbies with quite different needs. You'll need the flexibility to make both groups happy. It may be impossible to turn IT professionals back into the computer mystics that they were three decades ago, but you can give them their own hallowed environment in which they (and you too) can all live happily ever after. ■

Transforming Scholarly Publication...

continued from page 3

6. In negotiating publishing agreements, faculty should assign the rights to their work in a manner that promotes the ready use of their work and choose journals that support the goal of making scholarly publications available at reasonable cost.

By judiciously assigning the rights to their work, faculty members can help assure that scholarship remains affordably available to the community. In the publication process, faculty can choose to publish in journals whose access and pricing policies make their work easily and affordably available. All faculty members should know the cost of journals to libraries and should consider refraining from submitting their work and assigning copyright to expensive journals when high-quality inexpensive publication outlets are available.

7. The time from submission to publication should be reduced in a manner consistent with the requirements for quality control.

In rapidly evolving fields, lags of twelve months or more mean that scholarly history rather than cutting-edge research is the subject of publication. If published scholarship is to be a useful building block, it is imperative that the lag between submission and publication be shortened as much as possible for each field.

8. To assure quality and reduce proliferation of publications, the evaluation of faculty should place a greater emphasis on quality of publications and a reduced emphasis on quantity.

In the spirit of creating an environment that reduces emphasis on quantity across the system and frees faculty time for more valuable endeavors, faculty in research institutions should base their evaluation of colleagues on the quality of and contribution made by a small, fixed number of published works, allowing the review to emphasize quality.

9. In electronic as well as print environments, scholars and students should be assured privacy with regard to their use of materials.

The digital environment, in particular, makes it very easy to obtain data on users and use patterns, information that can have great marketing appeal. It is incumbent on the academic community to assure the privacy of individual users with regard to their use of scholarly publications or other source materials made available through our institutions, consistent with state and federal laws. ■

The full article is available online: www.arl.org/scomm/tempe.html.

"Many of us hoped that the electronic environments we were building would resemble the piazza of Milan, Italy. Here was one of the nerve centers of the global economy, able to maintain such a cohesive yet diverse environment, when other cities, including my own, San Jose, California ("the capital of Silicon Valley"), are struggling for a center, a sense of identity, and a purpose."

Steve Cisler, cited in "*The Watering Hole: Creating Learning Communities with Computers*," by Mary Fontaine with Richard Fuchs, The LearnLink Project, Academy for Educational Development (AED), *TechKnowLogia*, May/June, 2000.

In Future Issues

- *University/K-12 partnership to develop instructional materials*
- *The growing role of consortia in higher education IT*
- *The ecology of computing services*

EDUTECH RESPONDS

Q. Who should manage the college's web pages? It seems every year we try something different – committees, offices, special teams. Is there a best choice?

A. *There is an evolution of sorts in the practice of web site management and control. The first wave of college and university page sets were typically the product of one person or a small group of pioneers and were not "institutional" so much as idiosyncratic collections of links and text. Committees were often the next stage. Somehow, academic institutions reflexively entrust committees with sorting out issues touching on the nature of the place. And, perhaps not surprisingly, the second generation of web pages became earnestly inclusive of every organizational entity on campus. This was also the era of numerous, embarrassingly outdated, orphaned, and neglected pages. Stage three came when University Relations offices woke up (or were prodded) to realize that the institution was looking bad out on the web. This mobilization of the PR sector resulted in a campaign to impose standardization, filtering, and "targeted" information sectors (e.g., potential students, on-campus folks, alumni, beauty-contest judges). The fourth era, now taking shape, is a kind of truce in which the PR people recognize that the depth and dynamism of the web finally does not lend itself well to the methods of "publication" management. At the other end of the campus spectrum, the information pioneer-anarchists have had to concede that the web now meets the purposes of so many different groups and interests that the institution is bound to assert due control over what goes out there in its name. The saga is surely not yet over, but for now a recommendation: "front pages" benefit from good design, consistent appearance, and mode of navigation; "deep" pages can only be created and maintained by experts in those fields. We'll all need to play and share together.*

Q. As networked PCs replace OPAC terminals in libraries, how do we deal with the software problems on them? We used to be able to turn a terminal off and on again to re-set it.

A. *Re-booting is, unfortunately, still needed. Some means of laying down a fresh disk image from a server is also necessary. And we will have to dig into the "lock-down" options now coming into PC operating systems, too. The "personal" in "Personal Computer" continues to fare poorly in the public-access arena.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

July 2000

Volume 16
Number 4

The Education Technology Newsletter for Faculty and Administrators

Reorganizing IT For the Future: Doing it Ourselves

Dagrun Bennett, Franklin College

In the summer of 1999 the Computing Services department at Franklin College started a reorganization that has greatly improved our ability to provide service to the college community. The job functions are clearly defined, we have better cross training, providing better backup for each other, team interaction has been strengthened, and collaborative problem solving has become our way of dealing with issues that come up. There were several reasons for us to start this process: we needed to create a web administrator position; we had confidence in our ability to reorganize; and we needed to prevent staff burnout.

First of all, there was a rather urgent need. There has been a rapidly increasing emphasis on the use of the web for internal communication, recruitment and course development, but there was no one on campus whose job description included responsibility for the Franklin College web site. The network administrator was spending almost half his time on web maintenance simply because somebody had to do it. There was a Web Advisory Group overseeing development, but the result was uneven and disjointed, and even though we had attempted to develop standards for design and timeliness of information, nobody was making sure these standards were implemented consistently. Nobody was happy with our web site, least of all Computing Services, and nobody disputed the need to improve it, but it became clear that the administration did not fully understand the implications of continuing to ignore it. Without full-time attention nothing would improve, and, as we all know, standing still is the same as falling very far behind. At the spring meeting the Board of Trustees de-

continued on page 3

"The reading processed mourned by scholars who thought footnotes superior to endnotes – who preferred the process of interruption, midstream re-evaluation and jumping around – is the natural process of reading on the Web. Small children who would normally not read books with footnotes until secondary school know their way around bright blue hyperlinks. They learn that a Web site isn't complete without references to other sites, and that the cooler the site, the cooler its links."

Jenny Lyn Bader
"Forget Footnotes. Hyperlink"
New York Times
July 16, 2000

NEWSBRIEFS

PEOPLESOFT "DEMONSTRATION SITES"

The University of Akron (Ohio) and Lee Community College (Texas) will become "demonstration sites" as part of PeopleSoft's effort to develop with customers faster and more reliable ways to install the company's student information system software. The collaboration is expected to refined the project-management techniques and configuration "templates" that PeopleSoft has developed to help other four-year and two-year colleges install the software. Many institutions that had hired expensive consultants to manage their PeopleSoft projects have complained about exceeding their budgets and falling behind schedule. Company officials have said that a common management approach for institutions of higher education should help those institutions move rapidly to complete a PeopleSoft project.

See, Florence Olsen,"2 Colleges Will Help PeopleSoft Improve Its Installation Methods," *The Chronicle of Higher Education*, July 13, 2000.

ONLINE NEWSPAPER INDEX

Created and maintained by Web Wombat, OnlineNewspapers.com claims to index 10,000 online newspapers from around the world. These are offered by country (or province/state) in pull-down menus. For each country or state/province, newspaper titles are listed with links to the respective homepages. Throughout the site, users are invited to submit newspapers not listed. Though the pages for some listings are very slow to load, the site as a whole is a solid reference resource for a variety of users. [Michael de Nie, Editor, *The Scout Report*] In a similar vein, a new partnership between LookSmart and the Gale Group, called FindArticles.com, offers free access to the full-text of articles published in over 350 magazines and journals. [Also Michael de Nie].

See *The Scout Report*, July 14, 2000, Volume 7, Number 9.

EDUCAUSE TASK FORCE ON SYSTEM SECURITY

Unsecured computer systems on campus networks in higher education have figured in numerous denial of service and security attacks. On July 13, 2000 EDUCAUSE announced to its members the formation of a task force to find common security flaws and suggest remedies. Many known problems can be corrected by proper systems configuration and installation of updates. The EDUCAUSE Task Force on System Security will work with noted security experts and partner associations including Internet2 to identify short-term actions and long-term projects to address these problems in higher education.

Campus network administrators are being encouraged to find and fix the ten most common security holes by adopting the advice and methodology of the System Administration, Networking, and Security (SANS) Institute http://www.sans.org/topten.htm.

See the full announcement in the Current Issues section at the EDUCAUSE web site: http://www.educause.edu.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

Doing it Ourselves...

continued from page 1

cided that, for financial reasons, the web master position, which was in the strategic plan, would be put on hold for another year and maybe longer. After a short period of disbelief and dismay Computing Services decided that something had to be done.

Secondly, we felt confident that we had the skills to do something substantive. In 1996 the Leadership program at Franklin College received a grant from the Lilly Endowment to change the campus culture from a "knowing" to a "learning" organization.

Most of the staff in Computing Services had participated by this time in pilot teams, and cross-functional committees and workgroups, and had been trained in collaborative problem solving and consensus decision making. There were trained facilitators available to work with any group that felt that this would help their process, and Computing Services had already used a facilitator to help us develop a mission statement for the department.

Developing a mission statement sounds simple enough, but it forced us to really examine what we really meant by "customer service" and what each one of us was willing to commit to. With our new-found skills and a very able facilitator we were able to confront differences that we had tried to ignore in the past. Everyone was very pleased with the result – both the mission statement and the changes in internal relationships that began to happen.

The third reason for us to implement change was that since IT jobs are high stress jobs, some of the staff were beginning to approach the burn-out stage. We needed to provide a growth path that would re-energize them. Taking a look at job descriptions was a necessary step on that path.

Getting started

We started in late June with a half-day-facilitated retreat to discuss job descriptions. The changes happen very fast in IT, and jobs must grow and change to meet new needs, but it often happens in a haphazard way. There had been a consistent effort over the years to assign new tasks logically and to upgrade job descriptions to reflect reality, nevertheless every position had personal preferences and history that did not contribute to the department's ability to provide efficient service.

> *The first thing we did was to list all the tasks without regard to the staff member who performed them. We then started to group them logically – a difficult task, because in reality it is not possible to separate tasks from the people who have performed them.*

The staff as it was

Computing Services had a staff of nine, including me. We had a network manager, who also served as web master; a hardware technician/network administrative support person who was responsible for desktop hardware and backup for the network manager, and who also supported graphics and email; an administrative systems analyst who was responsible for the administrative information system; an administrative analyst/user support person who had primary responsibility for auxiliary systems, such as the Physical Plant software and help desk software, and provided backup for the administrative systems analyst; a user application support person responsible for desktop software as well as ResNet and supervision of student workers; a Teaching and Learning Center (TLC) support technician supporting all of the computing needs in the library; a department secretary; and a training coordinator (a part-time new position), created to develop a training curriculum for all staff and conduct workshops in productivity software.

In addition we had a number of student employees who proctored the labs and some who were members of the SWAT (Student With Access to Technology) team and helped other students network their own computers in the dorms.

The first thing we did was to list all the tasks that are – or should be – performed by Computing Services, without regard to the staff member who performed them. We then started to group them logically – a difficult task, because in reality it is not possible to separate tasks from the people who have performed them for a long time and have invested much of themselves in doing it well.

A half-day was not nearly enough

continued on page 6

Dagrun Bennett is Director of Computing Services at Franklin College, Franklin, Indiana.

This topic deserves a great deal of discussion both because of its great importance to colleges and universities and because of the amount of attention it is getting everywhere at the moment. To begin with, it is useful to distinguish among the primary attributes of any institution's Website: 1) the "official" public face to the outside world; 2) "official" communications and interactions meant for internal purposes only; and 3) everything else ("unofficial," meant both for external and internal purposes). By the way, the use of the words "official" and "unofficial" here is for shorthand only; this is an imprecise approximation of the idea of the difference between institutionally-mandated and that which is not.

Websites have proven to be a much larger and more complicated matter than anyone foresaw even just two or three years ago. Understanding the different purposes and natures of the different parts of the campus Website makes it easier to formulate the policies needed to administer them.

The front door

The official external Website, that is, the one that is there primarily for people outside of the institution to use (prospective students, alumni and donors, information-gathering agencies, other colleges, etc.), is generally thought of as another tool in the institution's communications strategy.

Concern about look-and-feel, image, navigation, consistency, and information accuracy is generally of primary importance, just as it usually is in the institution's viewbooks, brochures, annual reports, and other print publications that are intended for public consumption. It is appropriate to have a central authority of some sort for the external Website (and it is often the same person or department who handles the institution's print publications) so that matters of design, both esthetics and readability, are attended to consistently.

As in all such matters, this authority would generally have some sort of advisory committee to make sure everyone in the community has a chance to provide input. The responsibility for developing content is usually distributed throughout the institution, and each major area of the institution would be expected to participate in some way, but all such content would go through the person "in charge" and be edited before actually being put on the Website.

Understanding the different purposes and natures of the different parts of the campus Website makes it easier to formulate the needed policies.

Design is often done by the same person or group that designs print publications. The technical development and implementation might be done by folks at the institution who do other technical work (either in the computer services department or working directly for the person in charge of content and policy), or it might be outsourced. If the pages are designed by an outside organization, special care will have to be given to the means that will be used to modify and otherwise maintain them.

The inside site

The official internal Website has some similar characteristics, the main difference being that it is usually available to the institution's community only. Such things as registering for classes, looking up financial aid status, paying tuition bills, advising students, accessing course schedules, and creating student directories are usually included in this category.

There is usually a governing body of some sort (often chaired by the Registrar) to regulate all aspects of this part of the Website. In terms of the design, it is important to have a consistent look-and-feel and for the functions to work in similar ways on different pages.

All of the major administrative software vendors offer Web access to administrative information and Web-based processing of administrative functions, so there would typically be no need for an institution to design or program its own set of applications for those pages. Technical implementation is generally shared between the group responsible for administrative programming and the group responsible for server maintenance.

The deep pages

The third category is quite another matter. For these pages and areas of the Website, there is generally less need for control, consistency, image, and universal participation. These might include course sites, administrative and academic department pages, student pages, athletic team announcements, pages for faculty to share their research, committee meeting minutes, and so on. The audiences are both external and internal.

Much of this lends itself to templates, especially for people who do

not want to think about Web design but who do want to present information in an effective way, so that some amount of consistency may be achieved naturally. But that does not have to be the goal, nor does it have to be controlled very much (although institutional guidelines as to content may be given to educate people about the unethical and illegal use of intellectual property, and other similar topics). This of course all leads to a fairly chaotic site when looked at from an overall design perspective, but also an information-rich one.

Technical development and implementation (including moving content to an existing portion of the site) can be done by anyone, although there is usually a Webmaster in one of the technical services departments who is responsible for making sure that the site is running properly from a performance and technical standpoint, doing server maintenance, creating new portions of the site, watching out for dead links, and so on.

Putting them together

This is not meant to imply that there is a strict dividing line among these facets; there isn't. But if we think of the overall architecture, we might think of the institution's homepage and everything that is one or two links away from the homepage as the highly controlled external, official portion and any links beyond or outside of that as the unofficial portion. The internal, official portion should not be linked from the homepage, but be accessible to the community only through a highly secure route. The external and internal official portions need to be highly controlled and consistent and the rest of it does not.

Given all of this, it is important that the structure (committees, rules, guidelines, etc.) that an institution sets up for Web development not be overly bureaucratic, especially since the vast majority of the institution's Website is likely to be in the unofficial portion.

It makes sense to have a coordinating committee for the unofficial Website (especially for planning), but not a controlling authority. It seems right to provide support for anyone at the institution who wants to use the Web and coordination is important, but since most of the activity is very likely to be for the unofficial aspect of the site, control should be at a minimum. Providing templates, as mentioned above, can be a very useful service, as long as they are not so much rules as voluntary guidelines. Easy-to-use software that creates Web pages should be made widely available (end users should not have to learn HTML). Care should be taken, however, to ensure that the HTML tool chosen for wide use generates "lean" code, so as not to over-tax the server or incur inordinate delays in transmission over the Internet.

> It makes sense to have a coordinating committee for the unofficial Website (especially for planning), but not a controlling authority.

Commercial packages for courseware and support in how to use them should be made available for faculty who want them. Technical support services should be made available to those who need it for more advanced applications. But in general, the creator of the content and the creator of the Web pages to handle the content is the same person, for this aspect of the site. It is perhaps not an overstatement to say that Web page creation is on its way to becoming what word-processing was twenty years ago – a new addition to everyone's set of basic skills.

Reading the Web

For all the concern that goes into shaping Web policy and page construction, the fact remains that it is nearly impossible to know much about the readers. The official pages are, of course, directed to the readership that the institution has already identified and for which it has honed the presentation. But there is also a danger in thinking that the official pages suffice to represent the institution adequately. Prospective students (having come of age with the Web) will also want to see the student and faculty "unofficial" pages – that free-wheeling zone of the campus site – to complete their visit to the site

Another important aspect of the reader's experience that warrants careful attention in the design of the site is performance: how long it takes to load a page for a viewer half-way across the country. Large graphics, multiple frames, and imbedded scripts are all notorious for the drag they add to page load and transmission times and frustration for the viewer.

The surest way to get the full benefit of time and work invested in the Website is to remain aware of the value each of the three aspects brings to the success of the whole and to provide the infrastructure that is appropriate for each. ■

Doing it Ourselves...

continued from page 3

time to complete this, so we agreed to continue the process in weekly meetings that would be moderated by the same facilitator who had worked with us before.

What actually happened next was that I left for two weeks with my daughter who had just had a baby. I'm not at all sure if anything else got done during my absence, because there surely was an awful lot of talking and horse-trading. When I returned, I found a steady stream of people coming into my office to tell me about all the ideas they had come up with, and who would do what and how it would all fit together. The excitement was palpable, and we were well on our way to solving some very thorny problems.

By the time we had worked our way through it all, everybody had given up something and gained something else, and every position had well designed, focused job responsibilities. In most cases people gave away what they did not want and got something they liked, and two people had completely new jobs. Everybody had a real sense of ownership – these were not changes imposed from above, they were negotiated within the group and accepted by everyone.

By realigning jobs and tasks we had created a position for a full-time web administrator without adding a full-time employee, at the cost of increasing the part-time training coordinator from 20 to 30 hours per week and making better use of student employees.

The proposal we sent to the Cabinet included a complete plan for the transition period. The administration happily approved the proposal, and we started implementing the changes in September.

Implementation

These changes could not have taken place without extensive training for several members of the staff. Although on-the-job training is valuable, it was obvious that it would not be adequate; we had neither the resources nor the time for it. Extensive outside training was possible because the College had received a grant to prepare for technological change. The focus of the grant was end user and IT staff development.

> *In most cases people gave away what they did not want and got something they liked, and two people had completely new jobs. Everybody had a real sense of ownership – these were not changes imposed from above, they were negotiated within the group and accepted by everyone.*

We mapped out a 6-month transition period and evaluated training options. No sooner did we begin sending people to outside training than we were met with more challenges. Two key positions were vacated; not because of the reorganization, but because of other offers too good to turn down. Although at the time this appeared to be a problem, it turned out to give us the opportunity to further fine-tune the reorganization process. For example, instead of splitting network responsibilities between infrastructure and administrative functions, we combined these duties. All desktop hardware support became one position. User support, including desktop software administration, was blended with the duties of the administrative analyst who also provided user support on administrative software.

The result of the reorganization is that we ended up with a web administrator; desktop hardware support; an administrative systems analyst; a desktop software administrator; a TLC support technician; a network administrator; a help-desk support/secretary, and a training coordinator (30 hours).

Training

Five positions were targeted for extensive training. The type of training included desktop productivity software for the departmental secretary who took all levels of classes in Microsoft Office products. This position now provides front-line problem resolution as calls come in to the help desk.

The new web administrator, who in his former position as network manager had spent much of his time maintaining the web, was able to build on the knowledge he already had by enrolling in a web administrator certification program including both in-class and self-study courses. The courses covered Internet Business Fundamentals, JavaScript and CGI Perl. The Desktop Hardware Support person received training and certification from Compaq, allowing us to become a service site for desktop hardware. The Network Administrator enrolled in Microsoft Certified System Engineer track classes. This program not only provided in-depth knowledge of an NT-networked environment, but also added the basics of infrastructure, connectivity and the network backbone.

The technical support person for the Teaching and Learning Center took a class in NT core technologies, and now provides backup for the network administrator.

Spreading the training out over the six-month transition period gave time for everyone to learn a new task and then put it to practical use by applying the newly acquired skills on the job before proceeding to the next step.

What we learned

Computing Services is now a much more efficient organization. This is in part the result of streamlining job functions so that each staff member is able to focus on core responsibilities.

One of the best parts of this is that the jobs were negotiated and designed to provide a growth path for every staff member, and those who felt they were growing stale have had an opportunity to learn something new and rekindle the kind of enthusiasm that is necessary in a demanding environment.

It would not have been possible to accomplish this reorganization without the change in campus culture that is the result of the work done by the Leadership Program. A "learning" organization involves all its members in decision making and change. We used all the techniques we had learned, and have become a stronger team by working through some very difficult issues.

We believe that the process we employed is the most important part of the project, because the reorganization will be an ongoing undertaking as we strive to keep everyone focused and productive. The collaborative problem solving techniques are helping us resolve other issues as they come up, and everyone is comfortable with full interaction and participation in tackling major projects.

We have learned that by working in a collaborative setting, we are together stronger and smarter than any one individual. We have learned that disagreeing, rather than being a bad thing, gives us the opportunity to weigh all facts before we create the solution best suited for any situation. We have learned to communicate effectively with each other, and not be afraid to express our ideas or concerns.

Finally, it is also fair to say that what Computing Services did has reinforced the change towards a different campus culture. By accepting our proposal the administration acknowledged the value of our initiative and invited other groups to be pro-active in finding workable solutions to difficult problems. ■

"People treat information as a self-contained substance. It is something that people pick up, possess, pass around, put in a database, lose, find, write down, accumulate, count, compare, and so forth. Knowledge, by contrast, doesn't take as kindly to ideas of shipping, receiving, and quantification. It is hard to pick up and hard to transfer. You might expect, for example, someone to send you or point you to the information they have, but not to the knowledge they have."

John Seely Brown and Paul Duguid
The Social Life of Information
Harvard Business School Press
2000

In Future Issues

- *The ecology of computing services*

- *University / K-12 partnership to develop instructional materials*

- *Managing software vendor demonstrations*

EDUTECH RESPONDS

Q. The Media Services department on our campus has long been part of the library. As we look at academic support services on campus, it is hard to know whether M.S. should stay where it is or be made part of Information Systems. Any advice on this dilemma?

A. *Media services (aka, audio-visual) is a near-orphan on many campuses. At one time, the fact that these units were the keepers of a "library" of video tapes might well have destined them to be under the wing of the campus library. But all too often, little librarianship was exercised inside the media services unit; it remained an undigested lump within the system of the library, regardless of whether it gave good or poor service. Absent a television or film production unit with which to ally, media services – the business of VCRs, 16mm projectors, and slide projectors – rarely finds an easy and natural home. Unfortunately, the information systems group is not necessarily a more hospitable home, even though the advent of multimedia computing, projection devices, satellite downlink, and distance learning technologies generally shove media services in this direction. One way to break out of the either-or dilemma is to do some longer-range planning. Where do you forecast the technologies now covered by media services will be in the future? On most campuses, classrooms are acquiring more built-in media equipment, along with computer and network technologies. Thinking about the skills that are needed to support this should help decide with whom those folks need to work, learn, and lend support.*

Q. Is there any danger of copyright infringement in putting links to other sites from our web pages? Do we need to ask permission in some cases?

A. *Normally you should be safe enough with a link. After all, the URL itself serves as reference and citation. And for the most part, people who "publish" pages on the web do so in the hope of spreading information. But remember that the main way to get into trouble is failure to make clear attribution. Links in your pages should lead the reader to a suitable starting place in someone else's pages where the material to which you are pointing is identified and suitably introduced. It is also important to respect the context that the author has given; a site composed in frames can lose that context if you link to only one frame on the original page. And it never hurts to write and ask the page owner whether you have gotten things right.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

August 2000

Volume 16
Number 5

The Education Technology Newsletter for Faculty and Administrators

The Ecology of Computing Services

by Michael Roy, Wesleyan University

At a symposium called "Technology in the Academic Mission" the aim was to encourage a conversation about how technology might affect the tenure process. In the course of the discussions, one faculty member on the panel described her deeply ambivalent relationship with technology, likening it to an iceberg. According to her metaphor, the visible part of an iceberg (the part that sticks up) represents only a tiny fraction of its entire being, and the submerged mass remains mysterious in its proportions and dangers. After all, she extolled, witness the Titanic. She then proceeded to indict "technologists" who take perverse pleasure in the need for constant upgrades and who stubbornly refuse to appreciate the costs these upgrades exact in time, data, and peace of mind to "end users."

This metaphor of the iceberg and the Titanic is of course somewhat exaggerated, but it does speak to both the perception of technology as a dangerous entity and the gulf that exists between academics and technologists—the former becoming the human victims of the disaster and the latter some hybridized creature that has emerged from the wreckage in some not-quite-human form. To this faculty member, maybe the technologist is part of the frozen berg; my own image is the technologist as Borg—part human, part machine (a reference familiar to those of you who watch *Star Trek Next Generation*). At the very least, this metaphor underscores the gulf perceived between end-user and technologist, between faculty and technology; indeed, it suggests we don't yet have a common language with which to even begin a

continued on page 3

"Information discovery illustrates the complementary skills of computers and people. Humans are skilled at reading a few thousand words and extracting complex concepts. Faced with a billion pages (roughly the size of the web), they are helpless. Computers can index every word in a billion pages and search the indexes for simple patterns almost instantaneously."

William Y. Arms
"Automated Digital Libraries"
D-Lib Magazine
July/August 2000

NEWSBRIEFS

EDUCAUSE REPORT ON IT STAFFING

The IT staffing crisis is a campus leadership issue, not simply an HR or an IT challenge, according to a report released last week by EDUCAUSE, in cooperation with the College and University Professional Association for Human Resources and the National Association of College and University Business Officers. The briefing provides a set of general principles and some guidelines that can lead to success in meeting the challenge of retaining and recruiting IT staff, as well as a list of tactics that have worked for many campuses. A print copy of this report will soon be mailed to all U.S. institutional presidents and chancellors.

See: http://www.educause.edu/pub/eb/eb1.html.

ELECTION COVERAGE ON THE WEB

Released earlier this year, Web White & Blue 2000 is intended to "help voters, journalists, and others use the Internet to learn more about the presidential candidates, their campaigns, their scheduled debates this fall as well as the way the online resources are impacting politics in this presidential election year." The Best of the Best section provides links to election coverage and campaign material from a wide range of sources on the Internet. Beginning on October 1, the Rolling Cyber Debate is intended to provide a forum for candidates and their campaigns to continue debates online between the televised ones. Web White and Blue 2000 is supported by the Markle Foundation.

See *The Scout Report*, http://scout.cs.wisc.edu/report/sr/current/index.html, August 18.

HISTORY AND THE FUTURE OF THE INTERNET

Writing in *Ubiquity*, the on-line magazine of the ACM, James A. Dewar argues that history provides ample reason to maintain that the "Information Age" is indeed a development at least on a par with the invention of the printing press. Networked computing is the technological force behind the current revolution, having made possible for the first time many-to-many communication. Dewar reasons that the profound effects of the one-to-many publication made possible by the printing press presage even farther reaching consequences for the information age. The creation, acquisition, dissemination, and inter-linking of knowledge are all accomplished in substantially new ways at present. Some concepts, notably the ownership of information, that the history of printing has imparted to us, are now themselves seriously at risk of being outmoded.

The twofold conclusion of Dewar's essay is that the Internet should stay unregulated and that a "policy of experimentation" would in fact be the more enlightened approach. History suggests both a poor record of authoritative prediction on the course of technology and dire consequences of failure to recognize and exploit technological advantages in communication.

See: http://www.acm.org/ubiquity/views/j_dewar_1.html.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

The Ecology of Computing Services...

continued from page 1

conversation. Symptomatic of this troubling state of affairs was that at this particular symposium entitled "Technology in the Academic Mission," not a single technologist was invited to speak.

Sources of tension

What is it about technology and academic culture that produces such tension? If one assumes that technology has the potential to add value in the academic activities of teaching and research (perhaps a dangerous assumption!), what are some of the less-spoken-about obstacles to wide-spread adoption?

One of the most apparent obstacles is the difficulty academic culture has in incorporating technologists into their conversations. We are seen as Borg, as iceberg, and not on the same ship as the rest of the academic community. This, I suggest, has much to do with the relative newness of our profession. Unlike faculty, librarians, or university administrators—the types of jobs people who work at universities are most familiar with—the roles that I and others like me play on our campuses are relatively new.

Until recently, there were no professional training programs or certifications to become a "technologist." Indeed, even the word sounds strange. The career path one follows to arrive in these positions tends to be meandering, serendipitous and unpredictable.

A second obstacle to having an informed conversation about instructional technology on campus has been the two dominant messages for higher ed, amplified by the media and delivered by keynote speakers at technology conferences and in op-ed pieces in the *New York Times*. The first of these messages describes the technological education of the next generations—our children and grandchildren. Today's child, the speaker will tell you, will grow up with a host of technologies: cell phones, Palm Pilots, web newspapers, DVD, and ubiquitous high-speed network connectivity. When that child arrives at college in a decade or two, faculty will have an entirely new kind of mind to engage in the classroom—a mind that was formed by the Internet. The message here is that we have a responsibility as educators to learn these new technologies since the population we serve is increasingly dependent on and unable to engage with anything other than digital technologies.

> *One of the most apparent obstacles is the difficulty academic culture has in incorporating technologists into their conversations. We are seen as Borg, as iceberg, and not on the same ship as the rest of the academic community.*

The for-profit lesson

The other message (part two of obstacle #2) on the higher ed cyberpunditry tour comes from the emerging field of for-profit distance education. These speakers, armed with graphs of enrollment numbers and profit margins snaking their way steadily skyward, suggest that we in the non-profit sector of education will all be driven out of business by the likes of the University of Phoenix and other mavens of distance education. The message from this camp is truly of the Borg (for those of you who watched Star Trek)—resistance is futile. Why even bother trying to develop instructional technologies if these guys will eat you for lunch?

The problem with these two messages—both in their own ways a call to arms—is that they present the future as a foregone conclusion, and leave no real space for the participants in this transformation to have any say in what that future might look like.

A third, and I think more challenging obstacle, has less to do with the incompatibility of these broad claims about technology in general than with the subtle intellectual practices that are embedded in all academic disciplines. Apart from the most obvious uses of technology to facilitate communication, imagining change in any given discipline's approach to teaching, learning, and publishing requires an on-the-ground understanding of the details of the particular disciplinary questions and methodologies of any given field. Thus bulletin boards, email lists, course web pages, and on-line quizzing cut across all fields and are fairly easy to get people to integrate into their lives as professional academics and teachers.

To go further than that and imagine adopting technological approaches and to use primarily digital resources to transform a field's way of doing business is largely contin-

continued on page 6

Michael Roy is the director of academic computing services at Wesleyan University.

The Pew Grant Prog

Round I

The Pew Grant Program in Course Redesign has announced the second of three rounds of grant awards. The purpose of the program is to encourage colleges and universities to redesign their approaches to instruction using technology to achieve cost savings as well as quality enhancements. Redesign projects will focus on large-enrollment, introductory courses, which have the potential of impacting significant student numbers and generating substantial cost savings. Brief summaries of the redesign projects follow.

California State Polytechnic University, Pomona

Cal Poly plans to redesign General Psychology, which enrolls approximately 1500 students. To experiment with serving larger numbers, a pilot section based on videotaped content was created during the 95-96 academic year, increasing the number of students served to 120. Building on this, the redesign team will re-edit and re-shoot segments of the modules to improve production values and incorporate updated material, develop an interactive tutorial CD-ROM, and add web-based testing supervised by TAs in computer laboratories. The redesign will allow Cal Poly to increase the number of students served from 1500 in the traditional course to 2250 while reducing costs. The use of computer-based testing and CD-ROM tutorials will reduce faculty hours significantly and replace them with less expensive TA hours. As a result, the cost-per-student will move from $152 to $21, a reduction of 86%.

Carnegie Mellon University

Carnegie Mellon University plans to redesign Introduction to Statistical Reasoning, which enrolls 400 to 500 students per year. This is a second generation redesign of a traditional lecture-plus-recitation statistics course. Stage one created a lecture-plus-computer-lab design that gives students experience with designing and implementing analyses of statistical data using a statistical software package. Stage two will introduce an automated, intelligent tutoring system (ITS) that will monitor students work as they go through the lab exercises, provide them feedback, and closely track and assess individual students acquisition of skills in statistical inference in effect, providing an individual tutor for each student. CMU's 1991 redesign reduced costs from $227 to $195 per student Adding the ITS will further reduce costs from $195 to $138 per student or an additional 29% savings, resulting in an anticipated total savings from the two redesigns of 39%.

> *The purpose of the program is to encourage colleges and universities to redesign their approaches to instruction using technology to achieve cost savings as well as quality enhancements.*

Fairfield University

Fairfield University plans to redesign its two-semester General Biology course, one of the largest at Fairfield with an annual enrollment of 260 students. The current course is taught in a multiple-section model with 35-40 students per section. The planned redesign will condense all sections into a single large-classroom format. Students will work in teams of two or three around individual laptop computers, utilizing software modules that focus on inquiry-based instruction and independent investigations. Consolidation of the seven lecture sections to two in the redesigned course and the introduction of computer-based modules in the lecture and laboratory will result a planned cost-per-student reduction from $506 to $350, a savings of 31%.

Riverside Community College

Riverside Community College plans to redesign Elementary Algebra, a four-credit course, enrolling 3,600 students annually in 72 sections. The redesign involves converting four hours of weekly lectures into participation in a Math Collaboratory, weekly Spotlight Sessions and an extensive math tutorial and counseling support system. The Collaboratory, an interactive lab where students work with faculty, tutors, and other students, will make use of a web-based artificial intelligence program (ALEKS) that generates individualized assessments, study plans, and active learning sets. Spotlights will target known student trouble spots, with students attending as many or as few as needed for clarification of material. The goal of the redesign is two-fold: 1) to encourage students to take an active role in their own learning, building on timely assessment, preferred learning styles, and faculty guidance and 2) to move from a seat-time model to one based on subject matter mastery. Redesign will produce a 45% cost-per-student reduction from $206 to $113, which represents an annual savings of $333,576.

The University of Alabama

The University of Alabama plans to redesign Intermediate Algebra, a pre-General Studies course enroll

ing 1500 students each year, in order to address poor student performance. Nearly 60% of the students in the fall 1999 course earned a D, F, or W grade, and students often take the course two or three times before passing. Modeled in part on the Virginia Tech Math Emporium, the course redesign involves the development of a student-centered, computer-assisted, self-paced tutorial course that allows the individual student to focus precisely on his or her questions and difficulties. The redesign will reduce the cost-per-student from approximately $122 to $86, a 30% savings.

University of Dayton
The University of Dayton plans to redesign Introductory Psychology. The redesign will enrich the current course, lead to better subject matter mastery and higher student satisfaction, and create a stronger sense of belonging to a community of learners. Network-accessible, interactive applications and simulations will illustrate key theories, concepts, and research findings/methodologies. Students will engage in collaborative activities with other students and the instructor. Cost savings will be realized by 1) reducing faculty staffing requirements by nearly two-thirds and 2) reducing traditional student seat time by more than 90% while increasing student time on task from 10% of total contact hours to 80%. The result will be a projected decline in the cost-per-student from $139 to $78, a savings of 44%.

The University of Idaho
The University of Idaho plans to redesign three pre-calculus courses, enrolling 2450 students, and replace them with a learning center modeled after the Virginia Tech Emporium. The goals of the redesign are to increase both the student success rate and the retention rate of math knowledge needed in subsequent courses. Streaming video lectures, tutorials, and most exams will be computerized Just-in-time assistance by graduate and undergraduate assistants will be available who will also facilitate small group learning. The new active-learning model plans to reduce the cost of offering all three courses from $235,069 to $103,593, a reduction of 31%.

The University of Iowa
The University of Iowa plans to redesign the first semester of its two-semester General Chemistry course. The redesign goals are to reduce the drop-failure-withdrawal rate, now as high as 30%, and to make the content more relevant to the students' future majors. Cost savings will be realized by substituting two instructors for the current three; automating homework grading; and decreasing the number of students who must repeat the course. This will reduce the cost-per-student from $277 to $220, or 21%, representing an annual savings of about $74,000.

Projects will focus on large-enrollment, introductory courses, which have the potential of impacting significant student numbers and generating substantial cost savings.

University of Massachusetts at Amherst
The University of Massachusetts at Amherst intends to redesign Introductory Biology, a course serving 700 students each fall semester, about 20% of the freshman class. Interactive classroom technology has recently been introduced into one of two large lecture sections. The course redesign has five components 1) online, class preparation pages; 2) online quizzes; 3) more use of interactive classroom technology; 4) supplemental instruction and peer tutoring; and 5) an instructor apprenticeship program. Active learning approaches, recently adopted in the course, have increased the cost of the course from $174 to $199 per student The redesigned course will reduce the cost-per-student to $117, producing a savings of 41%.

The University of Tennessee, Knoxville
The University of Tennessee, Knoxville plans to redesign Intermediate Spanish Transition, an introductory language course for which over 60% of entering students register as a result of language placement scores The current course structure is unable to provide enough sections to satisfy student demands. The redesigned course will substitute online diagnostic homework exercises for one in-class period per week. Immediate feedback on all graded assignments will be given via online assessments, eliminating the time-consuming activity of grading for instructors. Rather than dealing with skill-based practice in class, instructors will have more time to emphasize active speaking skills and cultural awareness The redesign will produce cost savings by offering one-third more sections of the course with significantly reduced labor costs, resulting in a cost-per-student reduction from $48 to $32. Cost savings will amount to approximately $32,832 annually while serving 513 additional students. ■

continued from page 3

gent on the particular history and trajectory of any given discipline. For example, for a variety of reasons, Classical Studies has turned out to be way ahead of most other disciplines in the Humanities with respect to the number of electronic resources available to them. And therefore, it is relatively easy for faculty to join into this conversation and be productive and see the value of this new approach to teaching and publishing.

Other fields lag behind in terms of the size of the community involved in these digital endeavors, and lack a critical mass of digital resources and networks of the human kind. Faculty in these fields may be eager to get involved, but simply cannot get anywhere without having to either create all of the resources on their own, or spend their time creating the (human) networks necessary for this sort of community to grow.

Finding critical mass

If more than a superficial adoption of technology into the curriculum for any given department turns on the existence of a critical mass of colleagues and resources for the particular discipline, one of the vexing problems for those of us who work on college campuses is that it is very hard to imagine building up such a critical mass on our isolated campuses.

While the tendency towards interdisciplinarity has bolstered the membership of any given intellectual community on campus (and, in fact, one can look at areas such as American Studies for examples of interdisciplinary fields that have been hard at work re-thinking their pedagogy for the Internet), the tenure process, still primarily organized around departmental lines, has continued to push faculty to develop finer and finer specialties within smaller and smaller sub-fields, resulting in very small intellectual micro-communities whose members rarely reside in the same zip code or even area code. Many, if not most, faculty live out their intellectual lives not with their faculty colleagues on campus. Their primary scholarly identities are organized not by the colleges in which they teach, but by the journals, professional societies, and disciplinary organizations in which they participate, all of which are primarily intercollegiate.

Other fields lag behind in terms of the size of the community involved in these digital endeavors, and lack a critical mass of digital resources and networks of the human kind.

The good news in this is that if a college more or less keeps up with its infrastructure (desktop and network), the various disciplines will continue to innovate and you can count on simply riding these waves of innovation without having to do all or even most of the work yourself.

For every Greg Crane who commits so much of his scholarly life to creating the Perseus Project, there are hundreds of Classics professors who can now use these resources to reinvent their pedagogy. Lagging slightly behind these major research initiatives might be not only necessary, but perhaps even desirable. At the level of software, it also seems to be the case that it is safer to simply ride the wave of commercial or consortial innovation and to resist the considerable temptation to "roll your own" applications, a lesson that administrative computing learned ten years ago, and that academic computing is only now beginning to come to terms with.

The changing culture

Despite the fact that there exists a gulf between technologists and the faculty, despite the claim that these cyberpundits don't really understand higher ed and the nature of the academic enterprise, despite the fact that real changes in scholarly practices within any discipline are largely driven by forces internal to that discipline, clearly there are very powerful changes taking place in our culture at large, and in academic culture in particular. Many of these changes involve technology. Some are even driven by technology.

Students are and will continue to be arriving on campus increasingly familiar with and expecting to be taught with and present their work using digital technologies. Given the potential market for educational services growing as a result in our shift to an information economy, there will be increased pressure on existing institutions of higher ed from new players in this marketspace, including both small start-up operations and large multinational behemoths.

If, as I have suggested, real change in the higher education academic profession is driven not by individual schools, but by the individual fields of study and their allied professional societies, journals, and communications channels, where does that leave us?

The ecology metaphor

If all of these forces, new technologies, and different roles are considered as a whole, I argue that the most useful way to consider the problem of what to do next is to frame the question not in terms of technology but in terms of ecology.

None of the systems and people that are involved in these transformations exist independently of one another. While there is a certain amount of cross-fertilization with the outside world, the daily work of trying to optimize the technical and social environment so that the use of technology in teaching and learning can take place—sometimes in classrooms, sometimes in computer labs, sometimes in cyberspace—primarily takes place within the confines of a single campus. Every change that we make has effects within this system.

The work of creating a culture receptive to this approach is in fact far more complex and challenging than the development or installation of any given piece of hardware or software. To switch metaphors ever so slightly, moving from icebergs to oceans, one plausible approach to technology is the approach surfers take to waves. You paddle out on your surfboard and look at the waves coming in. You find a wave that looks like it might be a good wave, and you get yourself into position and if you are lucky you get a good ride. But the ride always ends and you then have to paddle back out and pick another wave. I suspect that this metaphor is more productive than the iceberg metaphor, since it at least suggests that the interaction between the person and the environment (faculty and technology) has the potential to be positive. When ship meets iceberg, we know who always loses.

As part of an academic planning process that took place three years ago at Wesleyan, some of our faculty were asked to write essays that spoke to the future of liberal arts education. Two of our Arts faculty, Jeffrey Schiff and Ron Kuivila, chose to write about arts education in an age dominated by mass media. While they were not speaking exclusively about teaching the Internet Generation (this was slightly before URLs were appearing in every TV and magazine advertisement), they chose as the title for their paper "Surfing the Tsunami," which to me sounds just right.

Thinking about change

The surf is up. It certainly wouldn't hurt to buy a bigger board. But at some point the waves will get to be too big and will be coming in too fast. We can for the time being enjoy the ride. But the reason we are all slightly worried is that we recognize that it will be otherwise and we need to be prepared for this. Thinking of change in an ecological rather than a technological sense may be a first step in those preparations. ■

Editor's Note: Information Technology Services at Wesleyan University surveyed the faculty about the services and facilities they plan to use in the near future, to help ITS prioritize future projects. Leading the list of those technologies was a course web page, followed closely by Webboard, and quizzing software.

"The legal and social precedents set by Metallica v. Napster—and half a dozen other e-music lawsuits—are likely to ramify into film and video as these, too, move online.... Music, according to a National Research Council report released last November, is the 'canary in the digital coal mine.' "

Charles C. Mann
"The Heavenly Jukebox"
Atlantic Monthly
September 2000

In Future Issues

- *Our annual Hot Topics Issue*
- *Computing between institutions: the consortial experience*
- *Leadership and decision-making*

EDUTECH RESPONDS

Q. The campus network is slow. In some places and at some different times it is slower than others. We know we are overdue to upgrade the network, but we know that will be expensive and will not happen all at once. Where should we begin? How will we know what measures we might take will really make a difference?

A. *This unenviable dilemma plagues a good many campus networks. Most of them are showing the effects of growth over time in their extent and number of points served and the unrelenting increases in traffic across them. From our experience with computers themselves, particularly time-shared systems of a generation ago, we can probably forecast that relief will require further investments in hardware. No amount of fine-tuning can remedy a basic shortage of the equipment that makes computing, and now networking, possible. But we also know, again by analogy, that incremental upgrades also have their limits: architectures become outmoded; the paradigm changes, and then more-of-the-same does not help. How many campuses added T1 lines just about when Napster was ramping up, and saw that additional bandwidth consumed within days (at most)? In sum, the challenge is to ascertain what the campus network design should be now and to begin implementing it, rather than hoping to play keep-up in the old model. At the same time, it is now urgently necessary to understand where the governing bottlenecks are in the networks we have, where the next ones will be once those are relieved, and generally what can you target and improve during this tricky interim between the existing network and the new architecture.*

Q. Should our campus library be leading the charge into the digital future for texts or continuing as the champion of paper books and archival materials?

A. *The snap answer is, of course, that the library should embrace technology and start breaking the news to its constituency. After all, information technologies are "converging," aren't they? To be sure, libraries and librarians are very much aware of that need. But they are also the appointed guarantors of what has worked powerfully well over the centuries: books well cared-for and defended against all nature of predations. Even if protecting books turns out to be a rear-guard operation, there is hardly a task confronting us that is more critical to carry out well.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

September 2000

Volume 16
Number 6

The Education Technology Newsletter for Faculty and Administrators

Hot Issues 2000-2001

Beginning in 1986, our September issue has traditionally offered a survey of the hot campus technology issues for the coming academic year, based on a poll of a sampling of our subscribers. Since 2000 is such a round number, this year we also took a glance back over the past decade of "Hot Issues" articles, to see what has changed and whether anything has remained constant. First, our findings for 2000-2001:

Napster. Since the advent of the MP3-sharing service, the flow of possibly illegal digital copies of music has surged on campus networks. Campuses have been forced to decide what to do about Napster, with the sharp awareness that doing nothing would be just as definitive a step as taking action. This issue may seem like the newest of the new, stemming from a company that had barely been hatched when we were writing this article last year. But our respondents report that the Napster controversy has had so much impact on campuses precisely because it reprises issues that have been big campus concerns for years: demands for network bandwidth, intellectual property safeguards versus fair use, censorship and intrusiveness, appropriate uses of campus computing resources, and even basic questions about IT policy making. When issues straddle technology and other areas, who establishes policies and on what basis are such hybrid policies decided?

Although a number of campuses have officially banned Napster, the topic is still very fluid at this writing, with further legal decisions coming up, students finding ways around campus controls, new technologies being developed that allow direct sharing without a central server, and even the proliferation of "cuckoo eggs,"

continued on page 3

"In its various applications, technology has given increased sharpness to the question of how one ascertains a student's mastery of knowledge and skills. The growing use of web-based programs of instruction has helped create a more intensified atmosphere of accountability for both traditional and nontraditional providers of post-secondary education."

The Knight Higher Education Collaborative
"The Mission and the Medium"
Perspectives
July 2000
Volume 9, Number 3

NEWSBRIEFS

TRAINING WOMEN FOR LEADERSHIP IN IT

As the "digital divide" is fast becoming a household word, the importance of women's access to information technologies is emerging as a priority. "Training Women for Leadership and Success in IT," by Nancy Taggart and Chloe O'Gara, reviews empirical studies of factors that may impact women's access to and participation in technology training in developing countries. Reaching out to women through IT training not only broadens their opportunities but also brings greater innovation and diversity to Internet societies of the future. See the September/October 2000 issue of *TechKnowLogia*, www.techknowlogia.org.

NAPSTER USAGE DRAWS LEGAL WARNINGS

The lawyer for the rock band Metallica and the rap artist Dr. Dre has sent letters to Harvard, Columbia, and other prominent universities asking the institutions to restrict students' access to the online music-sharing service Napster. Howard King, who in April filed a lawsuit against Napster alleging copyright infringement, wrote to each of the universities that they have "a moral, ethical and legal obligation to take appropriate steps to assure [they are] not a willing participant in and an enabler of the theft of intellectual property through Napster." In addition to Harvard and Columbia, the letter was sent to the presidents of Stanford, the University of Virginia, Boston University, the Georgia Institute of Technology, MIT, Princeton, the University of Michigan, the University of California at Berkeley, and UCLA.

For more information, see *The Standard*, September 8, 2000; http://www.thestandard.com/article/display/0,1151,18402,00.html.

E-BOOK DEVELOPMENTS

Software giant Microsoft Corporation and top online retailer Amazon.com Inc. have said they are teaming up to sell digital books in the latest boost to the electronic alternative to paper and ink. The deal will give Amazon a custom version of Microsoft's Reader software for downloading and displaying text on a personal computer or handheld device, the companies said. That is a major step by Amazon, the top Internet bookseller, toward opening a digital bookstore and making its debut in the nascent industry. Microsoft believes deals like the one with Amazon will convince publishers to roll out digital books quickly. In fact, the company thinks 100,000 titles could be for sale by the end of next year.

In addition, Adobe Systems Inc., the largest maker of Web publishing software, said it was buying Glassbook Inc., a privately held developer of consumer and commercial software for distributing and displaying digital books.

Source: "E-Books: As Hot as 'Fahrenheit 451'?" Reuters, August 28, 2000. See http://www.zdnet.com/zdnn/stories/news/0,4586,2620877,00.html.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

continued from page 1

Napster song files that are deliberately tampered with to frustrate those who try to use them. This may be a passing storm or a new permanent feature of our Hot Issues list, but it is very much on people's minds this year.

Staffing. Nothing gets done in technology without good people. Many directors are frustrated or even despairing about the difficulty of attracting and retaining the technical and user support staff their department needs to do a good job. A good economy, exceptionally low unemployment, and a boom in technology enterprises have raised the problem to a new level.

Directors in cities lament the high salaries in their markets, the heavy competition for talent, and the luring away by nearby industries. Directors in outlying areas lament the few applicants for their positions, and try to devise ways to make their institutions more attractive. Directors with heavy legacy investments worry about their exposure if the people with the essential skills ever leave. Directors with hot new technologies worry about training their staffs to deal with them, and then discovering that job opportunities in other organizations are irresistible for people so trained.

In a classic irony, many directors have labored to get IT considered a mainstream part of the campus. Now some are finding that HR policies that aim to recruit and keep qualified IT people (salary levels, attractive and even creative benefits, attention to retention) also tend to increase the disparity between them and the rest of the campus employees.

Legacy Systems. The retro look is out. The predominance of the web in so many areas of commerce and life has suddenly made legacy administrative systems seem unreasonably dated. Older systems that were valued for their functionality, comfortable familiarity, and low monthly payments, like a well-used car, suddenly come up dramatically short. It is no longer just a matter of slapping a GUI front-end on the old system. The recent clamor for a web look-and-feel and web functionality calls for more than a new front end. They require a new self-service way of doing business, something that turns out to be much harder to graft onto older, transaction-based systems.

> *The predominance of the web in so many areas of commerce and life has suddenly made legacy administrative systems seem unreasonably dated. Older systems that were valued for their functionality, comfortable familiarity, and low monthly payments, like a well-used car, suddenly come up dramatically short.*

The demand is being pushed in large part by a new crop of users, called students. In the older world, administrators and staff were the main users; students were mainly viewed as addresses to send things to. Now many people see the students as perhaps the primary interactive users of the administrative systems. Many directors are pondering what this means for their current system.

Vendor Meltdown. Just when many campuses are being motivated to look seriously at replacing their legacy systems (whether developed in-house, bought from a company that is no longer in the forefront of development, or bought and then modified to the point of going off maintenance and becoming a custom system), the dangers of purchasing and installing a new system have come under an intense spotlight. Tales of disastrous projects, huge costs, defective products, and mergers and buyouts have circulated in the press, among IT directors, and most importantly, among non-IT campus decision makers. Many campuses are making the decision to move forward, but they are finding they have to confront serious questions about risk and the future. However, many believe that standing still has just as many risks.

To Portal or Not To Portal? Is "portal" even a verb? Yet? The portal is another issue that is clearly new, since it had barely entered our vocabulary at this time last year. Campuses are pondering whether there should be a central web location that takes all the services a student (faculty member, staffer, alum, etc.) could desire and puts them into one place that is specifically personalized. In one view, "all services" includes things beyond the traditional pale of campus features like grades and registration, and reaches out to encompass hometown weather, sports scores, customized news, even ads for plane

continued on page 6

Again this summer faculty all across the country sat through training sessions for HTML, PowerPoint, and related materials-construction topics. If the workshops included a segment on copyright and fair use an inevitable pall of gloom came over the room and its already-anxious learners, whose thoughts ran to, "You talked us into coming here to learn how to do all these neat things, and now we hear that it is all illegal."

Laws

The statutes governing copyright and fair use are the bedrock of intellectual property law. The U.S. Constitution, in Article 1, Section 8 provides the original basis for copyright in U.S. law: [The Congress shall have power] "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." The U.S. Code, Title 17, sets out in detail the specific provisions of copyright law and stands as the basic source of statute and procedures for carrying the provisions of Article 1, Section 8. The "Uruguay Round Agreements Act" (1994) further strengthens copyright provisions for digital materials, specifically by granting perpetual copyright to software authors and instituting civil and criminal penalties for illicit copying of audio and video tapes.

In the past decade, U.S. law has been powerfully shifted in the direction of European policies on copyright, which put more emphasis on intellectual property as a commercial good than a societal benefit. The Berne Convention of 1988 stands as the most influential statute for copyright on the world scene and serves as the foundation of numerous international trade agreements.

The fundamental premise behind all of these laws is that every document or—increasingly—every information artifact has an owner and that this owner has enforceable rights in the marketplace of information. No material with the status of copyright can be used without the permission of the owner. A zone of exception is carved out for "fair use," which is itself limited in scope and hardly the basis for any significant use of copyrighted materials.

Policy

Most academic institutions now have some form of policy regarding intellectual property. In most cases (but not invariably), that policy's major objective is to create a distinction between work done by faculty and by administrative staff. The faculty are granted copyright to most works that they write—the usual exceptions being where substantial funding or other support has been provided by the institution. Without this provision, faculty would be viewed legally as "employees," whose work is otherwise owned by the employer. As a practical matter, most articles and books written by faculty are not claimed as property by colleges and universities.

> *The premise behind all of these laws is that every information artifact has an owner, and that this owner has enforceable rights in the marketplace of information.*

Principles

The most important principle about the context for intellectual property today is that all participants in the information age need to be aware of the force of copyright. Slogans such as, "information wants to be free," have not yet dented the armor of copyright. And as a matter of political reality, the academic community has been unable to marshal the influence needed to widen the fair use provisions of U.S. law or to resist the extension of stringent copyright for electronic forms of expression. In this year's congressional session, legislation to give copyright protection to databases is under deliberation—with very little awareness on campuses or effective advocacy from those who would object most vocally to the proposed change to make "sweat of the brow" labor on data sets a new principle for copyright protection. Those interests that are more attuned to the commercial value of information are not so dormant in their political outlook.

Whether by virtue or necessity, living with copyright needs to be accepted in academic practices in higher education, including the use of digital objects—texts, graphics, photos, video, and sound, where compliance has been notoriously lax. But the very circumstance of training sessions for multimedia and web creation sets up another important principle that must shape thinking about copyright on campus: more of us all the time are becoming creators of items for which we have a copyright.

Why should that matter, given that very few curricular and scholarly materials attain the commercial value that would warrant enforcing copyright? One answer is that copyright can be viewed as an extension of the familiar academic practice of

citation and acknowledgment of sources. Nobody would be well served by an erosion of citation practices brought on by loose practices in copying. Another important reason is that by asserting copyright an author is better able to prevent a subsequent copier from appropriating that right.

If, for example, homework problem sets in chemistry were copied and re-used several times in different places without the knowledge of the faculty author of them and then incorporated into someone else's textbook, the textbook author could end up benefitting from work that actually belongs to someone else. For this reason, inserting the standard copyright notice ("Copyright," followed by the © symbol, the author's name, and the year) on web pages and other easily copied documents is a good practice—if not an infallible guarantee of compliance.

Fair Use

By far, the aspect of copyright that attracts the most attention and occasions the most misunderstanding is fair use. Section 107 of Chapter 1, Title 17 of the Copyright Act defines exceptions to copyright. A range of uses (journalism, artistic expression, as well as education) are cited as legitimate bases for infringing on another's copyright. But despite the common misconception, educational use does not give blanket authorization to copy.

There are four criteria that need to be weighed in assessing what is fair use: (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work. The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors.

All four of these guides apply to all situations for which fair use might be sought. In most cases good-faith compliance is determined by a standard of reasonableness. In most situations, common-sense judgments about what is reasonable are sufficient. It is important to note, however, that for music and multimedia there are more stringent rules. A good compilation of sources regarding those categories of material is at the Stanford University "Fair Use" multimedia references page: *fairuse.stanford.edu / multimed.*

> *The most important principle about the context for intellectual property today is that all participants in the information age need to be aware of the force of copyright.*

Examples

Literary anthologies are a prime example of fair use issues. As a general principle, if the custom compilation of copied works replaces books students might otherwise purchase, the use is not on firm ground for fairness. If copies are used in lieu of purchase repeatedly, the claim is again weak. Also, works out of print but for which the copyright is still in effect cannot be presumed open to indiscriminate copying.

Digitized materials placed on "reserve," analogous to the traditional practice of photocopying for placement at the library reserve desk pose a special problem because if widely available on the web, they could be ruled more like a publication than the truly limited circulation normally accorded reserve materials.

Music and multimedia are particularly difficult to assess for fair use. In general, only very brief passages, the functional equivalent of "quotations" are permissible, and there are few standard, quantitative measures to rely on.

Photographic images are another difficult category, partly because the long-standing practice of making 35mm slides from book illustrations would appear to give credibility to making digital images on the same basis. But, again, if those images are not restricted to classroom instruction, their fair-use status might be questionable.

Courtesies and Permissions

Two easy methods for avoiding copyright infringement difficulties are readily available. One is to contact the owner to ask permission, which is often granted for limited, instructional use. Commercial publishers also routinely negotiate fees for copying their materials. In many noncommercial cases, the mere courtesy of contact to request permission to copy is valuable. Most academics are frankly flattered to receive such requests and likely to grant them. A kind of golden rule applies, by which awareness of one's own concerns regarding published materials encourages the seeking and granting of permissions. ■

continued from page 3

tickets and places to go on spring break.

If this does turn out to be a worthwhile idea, should a campus develop its own portal or buy a commercial product, complete with portal management services to arrange all those disparate online features? And what about those ads? On some campuses, they have been uncontroversial, a transparent non-issue. On other campuses, a storm is a-brewing. Finally, what is the relationship between the portal and instructional management software? Should a campus have one unitary system for providing classes with a place to chat and share resources? Should that system be integrated within the framework of the portal? And again, what about the ads? Are they worse when they appear in the context of a course? Some IT directors remind us that the portal question touches basic issues about how the institution sees itself and how it might be rethinking its essential role, far beyond the usual IT issues.

Distance Learning. How much of an institution's educational value should be expected to flow through an electronic pipeline? And exactly what role should the faculty play in making that determination? The question of online learning is becoming more real and less theoretical. Institutions are coming to grips with the possibility of a real shift in what and who they compete with. Many schools now are keeping an eye on a specific online learning project in their neighborhood or in their niche, and are wondering if they will be ready to compete if and when that newcomer picks up steam. Meanwhile, institutions are still hammering out the role of their traditional faculty in selecting online projects, designing them, setting standards and expectations for them, and carrying them out.

Wireless. The potentially astronomical cost of a really complete wiring job (every student desk in every dorm room, every study chair in the library, every seat in every classroom, and every desktop where a campus employee might be working, especially given that our campus buildings are often too dangerous or too expensive to route wires through) has always made us pause and ask if there wasn't a cheaper alternative. As early as 1992, our Hot Issues article raised the question, "Will wireless transmissions make us regret all the money spent on trenching?" This year saw renewed focus on the possibility of omitting traditional premises wiring in favor of radio modem connections to each computer.

Many schools now are keeping an eye on a specific online learning project in their neighborhood or in their niche, and are wondering if they will be ready to compete if and when that newcomer picks up steam.

Armed with the new IEEE 802.11b High Rate Wireless LAN standard, manufacturers have started to provide affordable equipment that supports connection speeds that begin to rival the de facto minimum standard, 10 Mbps shared Ethernet. Some campuses have announced they would soon become "totally wireless." There are two meanings given to this phrase. Some schools mean they will provide wireless connectivity virtually everywhere, supporting the nomadic use of notebook computers by students in classrooms, labs, and sprawled on the grass. A very small number of schools have taken a gamble and leapfrogged over copper, planning to rely on radio antennas instead of wall jacks to connect their students. Perhaps this most strict construction on the term "wireless" should be "wire-free." Even schools not willing to make this radical departure have felt compelled to study the potential of wireless modems before they take their next expensive step in completing the jacking in of their campuses, particularly as they ponder how best to provide ubiquitous communication-rich classroom environments.

It may turn out, as so often, that this question is not a simple either/or issue. Wireless networking may just represent the logical and necessary infrastructure for "anytime, anywhere" computing. The ground that IT is expected to cover may have expanded once more.

Looking Backwards

Have we made any progress at all in the last ten years? Have we put any worries behind us, once and for all? Are there constants that weave their way in and out of our past, giving a hint about the future? We looked over the past ten years of Hot Issues articles to search for clues.

Funding and Planning. Ten years ago, one of the hot issues was the struggle to get IT recognized as a major campus issue, on a par with faculty salaries, facilities maintenance, and financial aid. Related to the lack of high visibility was the chronic lack of funding, which has appeared regularly on the Hot Is-

sues list as a major obstacle to progress. Partly due to the high price tags on technology improvements and partly due to increasing demand for high quality administrative data and smoother student services, IT has finally reached the top level of attention on most campuses.

Funding is still a major concern of the people we surveyed, especially since every major advance has created a need for more steady funding for replacement, maintenance, and staffing. But the higher visibility of IT has also created a thirst for more specific and effective long-term planning.

Institutional management wants to be reassured that its investments in IT have a long-term value. More of our respondents are spending more of their time trying to carve out plans, developing a planning process that includes the right people, and straining their crystal balls for a reliable vision of what the future holds.

Staffing and Organization. This topic has appeared frequently on the Hot Issues list and stubbornly remains there. The contributors to Hot Issues for 1989-1990 were prescient enough to predict the eventual need for a network manager: "[Some of those surveyed] feel as if the decisions involved in wiring for campus buildings, communications protocols, line troubleshooting and maintenance, and the costs and red tape of wiring under public roads could easily be a full-time job, maybe for more than one person. Of course, it rarely is, with, in most cases, the computer center director doing most, if not all, of the legwork as well as providing the leadership." And did we mention pulling wires through crawlspaces? (Be sure to leave this article lying out where the new hires in your networking group can see it.)

Reorganizing the IT Units (and sometimes the Library) has loomed large at times over the last ten years, often seen as a way to meet the supply-and-demand crisis in technical and user support. Some campuses are still tinkering with how they organize their units, but it is not often seen as a fundamental question now.

What is still a hot topic is whether the importance of IT should be reflected by having a position at the cabinet level solely dedicated to IT issues.

Gone

Issues from past lists that seem a bit quaint now, but were once ranked as hot: choosing CASE tools, the Recession, whether a campus really needs its own BITNET node, how many faculty really need their own Internet connection, whether the Internet is here to stay, what technology to use for a CWIS (Campus-Wide Information System). And of course: Y2K.

Rate and Direction of Change. It is hard to judge how fast you are moving when everything around you is moving too. Fifteen years ago, or even ten, the higher education campus was likely to represent the first and perhaps only contact with information technology for most of its students, faculty, and employees. The burden of support was great, but the institution's ownership and control over the environment was almost feudal. That world has been transformed. Institutions are carrying out their IT strategies in a much more open, interconnected environment.

But in fact, much more than just the IT environment has changed; institutions themselves are looking hard at what it will take to continue their special brand of excellence into the next decade. Those who are involved in providing the right IT ecosystem to foster the school's goals know they have an important role to play—and they know everybody else is watching. ■

"Soon you'll hear the term 'ASP' as much as you heard 'dot-com' last year. The acronym is for 'Application Service Provider.' Simply put, it means you don't buy software anymore. Instead, you subscribe to a software service delivered by an ASP."

Scott Berinato
University Business
September 2000
Volume 3, Number 7

Need a consultant? EDUTECH International provides consulting services exclusively to colleges and universities: www.edutech-int.com.

EDUTECH RESPONDS

Q. What role should department chairs and deans of academic divisions play in the planning and budgeting of IT?

A. *There is an increasingly serious need to bridge the gap between institution-wide initiatives in IT and the individual projects of faculty. Department chairs and deans are ideally situated to shape program, planning, and allocations on behalf of their constituents but have all too often not accomplished that end—or even identified it as one they should "own." For a long time, it was possible to argue that technology required specialized expertise that deans and chairs just did not have unless they were from the computer-comfortable minority of the faculty. But that day has passed, and now it is reasonable to expect that IT issues be considered mainstream and addressable by academic administrators at all levels. Two important matters are at stake: IT involvement has spread widely enough among faculty so that it is no longer possible for them to advocate effectively as individuals; and the number and cost of academic projects in IT now require that they be prioritized relative to all the other projects competing for funding—a need that could be well met and mediated by deans and department chairs.*

Q. Why have IT web pages largely vanished from the front-door pages of so many colleges and universities?

A. *That is indeed a curious development, especially given other evidence that IT is much more readily acknowledged as important on campus than even a few years ago. One possibility is that IT departments no longer feel the need to "advertise" their existence. And even though the web can be an excellent means of publication for a wide range of information that the community needs from the IT folks, there may be a deeper problem in this phenomenon of lowered visibility. IT departments have, after all, been by and large besieged in recent years and have possibly grown weary of high visibility. Libraries seem to be almost universally represented, and by substantial numbers and depth of pages. While libraries have a longer history of "documenting" their resources and services, IT has surely learned the value of publishing information that otherwise needs to be dispensed piecemeal—and repeatedly. It might also be that staffing constraints in IT push information-publishing to lower priority. Or maybe our profession still, deep in its heart, views documentation as an inherently low priority.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

SYR 132 10/04/00 #6 01:07

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

THE EDUTECH REPORT

October 2000

Volume 16
Number 7

The Education Technology Newsletter for Faculty and Administrators

Information Technology In the Consortium Setting

Some involvement with collaborative projects in academic information technology appears likely for almost all institutions of higher education. The past two decades have seen universities and colleges partner with computing hardware manufacturers, technology-transfer and business-incubator enterprises, and with the K-12 sector of education. Now a strong trend is building for strategic associations with peer institutions.

A consortium is a voluntary association in which the members retain independence of action and identity while agreeing to cooperate on selected topics. They vary in size from two or three to twenty or more. There is even a consortium of consortia—The Association for Consortial Leadership. Some mix colleges and universities, private and public, large and small. The participating schools might be within sight of each other or spread over more than a thousand miles. Some share physical facilities and cross-enroll students. Others meet only periodically or, increasingly, over the telecommunications wire. What is driving this movement?

Over the sustained period of a strong economy and low inflation that still continues, observers of higher education have forecast that the faster-than-inflation growth of costs in academe could not continue. Indeed, the cost trend has slowed considerably in just the past few years. And over the same spread of years, the commercial world has gone through dramatic restructuring and dislocation, converting the accumulated productivity gains made possible in large part by information technology to reduce operating costs and transform entire industries. Higher education has encountered second-order effects from these developments, seeing dramatic changes in age demographics—as continual education has become necessary in the workplace and post-graduate educa-

continued on page 3

"Skeptics suggest that satisfying diversity requires you to dumb down the interface or to go for the lowest common denominator, but we believe they're wrong. Satisfying the needs of diverse users often leads to more creative solutions that are beneficial to all users."

Ben Schneiderman
"Credit for Computer Crashes? Creative Solutions to Usability Problems Can Serve All Users."
ACM / Ubiquity
October 3, 2000

NEWSBRIEFS

CATALOGUE COLLECTIF

Researchers interested in the holdings of French libraries and lesser-known French "centres de documentation" will want to visit the Catalogue Collectif de France (CCFR). A project of the French Ministries of Culture and Education as well as the Bibliothèque Nationale de France, the CCFR is divided into two sections, by institution (Répertoire des Bibliothèques) and by document search (Localisation de Documents). Répertoire des Bibliothèques allows users to search 3,900 institutions (Bibliothéque) by name, location, and type of library. Search results include contact information, a brief history, a description of the collections, and details about the services offered. Plans for the CCFR in 2001 include the addition of another eight million bibliographic records from university libraries and the national library's collections. At present, all help documentation and navigation is only available in French. Catalogue Collectif de France: http://www.ccfr.bnf.fr. English Introduction: http://www.ccfr.bnf.fr/rnbcd_visu/ acc1_eng.html. (From *The Scout Report*, Copyright Internet Scout Project 1994-2000; http://scout.cs.wisc.edu, September 29, 2000, Volume 7, Number 20.)

TEACHING GOALS INVENTORY

The University of Iowa offers an online self-assessment of instructional goals. The purpose of The Teaching Goals Inventory (TGI) is threefold: (1) to help college teachers become more aware of what they want to accomplish in individual courses; (2) to help faculty locate Classroom Assessment Techniques they can adapt and use to assess how well they are achieving their teaching and learning goals; and (3) to provide a starting point for discussion of teaching and learning goals among colleagues.

College and University teachers might find it helpful to complete the TGI when they are: developing a new course, revising a course writing or re-writing their philosophy of teaching, or participating in a curriculum review. See http://www.uiowa.edu/~centeach/tgi/index.html.

APPLICATIONS ONLINE

Colleges and universities have been tinkering with the idea of moving their applications online as either a downloadable/printable document or an online submission form since the mid-1990s. Methods vary by school and even by department, but the goals are the same: to streamline a tedious and inefficient process. Research by the National Association for College Admission Counseling shows that the number of schools offering online applications is growing. Last year, 77 percent of schools surveyed had online applications on their respective Web pages, up from 68 percent in 1998 and 60 percent in 1997.

See Jon Surmacz, "Killer Applications: Colleges Continue to Move Applications Online, Saving Time and Money," in *WebBusiness* magazine, http://webbusiness.cio.com/archive/092600_apps.html.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

continued from page 1

tion virtually necessary for all knowledge-based work. But for the most part, higher ed institutions are structurally unchanged from forty or even fifty years ago.

The consortium offers the possibility of changing some aspects of how colleges and universities function without forcing substantial internal and core changes to the institutions themselves. Consortia offer the promise, if not always the reality, of cost economies of scale and scope. They also provide at least the theoretical opportunity to share and dilute risk, develop new ventures for which costs are mitigated by sharing, and the opportunity to reduce program redundancies through complementarity—the cultivation of different specializations that are then shared among the members.

The special case for IT

As cooperative ventures, loose affiliations, and new consortia have been formed, synergies in IT have begun to rise in the agendas of these groups. IT on most campuses is still a function fighting for its share of nourishment; it is the ugly duckling, late arrival, or unexpected guest (who shows no sign of going away). It is reasonable, then, to propose that IT get special attention as a candidate for a substantial place in the also-new realm of interinstitutional cooperation. There is a strain of wishful thinking here, to be sure: because re-apportioning expenditures to accommodate the costs of IT poses uncomfortable political challenges on campus, it seems appealing to look instead off campus for ways to feed the demand.

Several trends in technology encourage hope for this hypothesis. Standardization has greatly reduced the differences in how IT is conducted on campuses, making equipment, configurations, and practices noticeably more uniform across schools than many aspects of the academic enterprise.

The Internet and other forms of telecommunication have lessened the importance of distances and geography. While most education is still classroom-based and rooted to a common place and time, the ability to span distances and accommodate differences in time (i.e., asynchronous learning) is spurring exploration of new ways to conduct instruction and to provide mission-critical information systems, such as library IT and Internet access. Faculty and staff development, and related support services, are increasingly regarded as potential grounds for cooperative work, whether or not commuting distances accommodate in-person interactions.

More subtly, the extent to which the IT profession has been organized and unified also contributes importantly to the viability of consortial work in IT. Staff at all levels in IT probably find themselves more in accord with their colleagues on other campuses than they do with their own campus leadership and clientele. One of the oldest truisms in the IT profession is that on the home campus problems seem unique and intractable, yet colleagues encountered at meetings away from home have remarkably similar stories to tell and listen more attentively and supportively than non-IT colleagues at the home institution. IT professionals are inclined to believe that potential allies are likely to be found "outside."

Ventures that work

Some of the earliest and most fundamental successes were—and continue to be—joint purchasing alliances. During the 1980s, volume discounts on hardware purchases were the glue for numerous new cooperative relationships among institutions. And while the commoditization of hardware and software has lessened the unique value of consortia for volume discounting, the practice is still worthwhile in fields such as subscriptions to library online information services.

Shared information systems were prominent features of consortial IT at the end of the mainframe-domination and before minicomputers reigned. Many colleges arranged remote access to time-share systems before they had their own on-campus hardware. In the same era, multi-campus university systems typically developed centralized administrative computing applications. These tended to break up once it became feasible to provide sufficient compute cycles locally and to program with third-generation software tools. But there are now sporadic signs that the trend might swing back towards some degree of centralization. Library functions are increasingly moving to consortial, regional, or state-wide collaborations. In the more formally structured (and geographically proximate) consortia, calendar, course schedule, job placement, and student insurance applications are among the information systems likely to be migrated to a collective approach.

Collaborative learning via distance-bridging technologies is growing beyond the bounds of individual campuses and has been in recent years targeted by granting agencies interested in promoting cost efficiencies.

To a limited extent, research and development in technology has also been successful in the consortial setting although it is possible that the commercial potential of techno-

continued on page 6

Harmonic Diversity and Car

by Albert DeSimone

Everything That Rises Must Converge — Flannery O'Connor

Diversity of culture, intellectual endeavors, and operational practices creates the complex society that is the college campus. Web/IT professionals are faced with the challenging and rewarding task of projecting this multi-faceted society to the even more diverse Internet community. And that community expects more and more from the campus portal: minimal-click access to thousands of pages facilitated by a quality search engine, collections of information for particular communities (students, prospective students, visitors, in-service personnel, alumni), and attention to individual needs.

Applying a common look, feel, and navigational pathway amid this diversity is the job of the webmaster team. Aware that the same look and links will not be appropriate for the many disparate and independently developed campus websites and also that any effort to mandate design characteristics and elements will be met with justifiable resistance, the team must lead by example and suggestion.

A flexible design, controlled at the primary homepage and secondary page levels (to issue an institutionally sound and complete message) should give way smoothly to the diverse campus entities that issue their own messages. This is harmonic diversity: institutionally complete top-level design which accommodates and influences levels of difference within the websites complementing the campus portal.

Albert DeSimone, Jr. is a management information specialist in University Computing and Network Services, University of Georgia

Harmonic diversity

A design philosophy that emphasizes function and content is the cornerstone of a harmonically diverse portal. Other elements include a common set of identifying images, a process of consensus for managing change, and unambiguous ethical policies.

At the University of Georgia, the Georgia Web Group created the Seven C's of WebService Design to provide a set of guidelines for webmasters. These guidelines emphasize content and comprehensiveness, as well as a sensitivity to portal visitors and their comments. We believe that knowers of information should be providers of information.

> *This is harmonic diversity: institutionally complete top-level design which accommodates and influences levels of difference within the websites complementing the campus portal.*

Community

Campus webmasters often find it natural to create a link to the university's primary page. However, it is often less natural to create links to secondary pages, even though such links can support the institutional message and eliminate duplication of effort. Comprehensive student, in-service, public service, visitor, alumni, and similar community-based pages unencumbered by internal organizational structure encourage a deeper level of cross-linking. Also, a diverse group of campus webmasters is more likely to bring a stronger identity to their community-based pages. This identity influences those webmasters to share links and content to complement the secondary pages.

Individualization

Accompanying the development of the campus portal is an ever-increasing requirement to explore and exploit the tools, techniques, and technologies that enhance the individual's experience of the Web. Portals deploying "My" features allow visitors to select content and those appropriate to their particular interests. While the diversity of individuals is certainly more difficult to accommodate than the diversity of communities, individualization enhancements will add value to subsequent visits to the website.

Information related to individual-selected areas can be pushed to "My" participants. Encouraging and empowering departmental webmasters to contribute push information specific to their students, personnel, and alumni will ensure a more complete flow of information to the individual.

Visual identity

A set of images and logos, easily accessible from the web, encourages campus webmasters to create a visual connection to the university. At the University of Georgia, a page of images and logos serves as a download area for campus webmasters. Graphical elements on this page are provided in a "mix and

match" format. These graphical elements can be combined in a way suitable to the page on which they will be used. This flexibility, as opposed to a rigid set of fixed images, can ultimately suggest a "consistent visual hierarchy" among the campus portal websites.

Cascading Style Sheets extend this visual consistency to the textual elements making up a Web page. Font styles, sizes, and similar appearance attributes can be distributed throughout an entire portal with globally linked style sheets.

Managing change

A redesign of the University of Georgia's primary homepage for 1999 began with an analysis of comments and questions from portal visitors. This, coupled with supporting statistics for all visitors over a period of time, prompted the redesign. Reaching consensus on such a change is an iterative process requiring input from three different, and increasingly broader, groups:

The formal webmaster team. At the University of Georgia, this is the Georgia Web Group. An initial design—to which the group should not be strongly attached—is created. Experience has shown that acceptance of a new design "as is" by the next broadest group is unlikely.

The campus webmasters group. This communication is effected through an e-mail discussion group. Suggestions are made for change, reviewed by the webmaster team, and subsequent designs are offered to the campus webmasters group until an acceptable degree of consensus is reached.

Visitors. Off-campus individuals (a sample of about 30) who have sent mail to the Georgia Web Group are requested to review and comment on the page. If significant changes are made by the webmaster team, the campus webmasters group is invited to review the page. The final new design is linked to from the current homepage with a request for comments from all visitors. Significant changes are brought to the attention of the campus webmasters group. Although tedious and lengthy (but typically no more than six weeks), this change management process results in a high degree of consensus.

> *Cascading Style Sheets extend this visual consistency to the textual elements making up a Web page. Font styles, sizes, and appearance attributes can be distributed throughout an entire portal with globally linked style sheets.*

Sharable search database

Providing a quality search service for campus portal visitors has become a requirement. Having the search entry form on the primary homepage is of even greater service to these visitors. In addition, a sharable database that can be restricted to a single campus website promotes a consistent search interface throughout the portal.

Ethics policies

An official policy statement on the ethical and legal use of the Internet and the World Wide Web, binding to all faculty, staff, and students, is an invaluable resource for the webmaster team. We are fortunate to have a very complete online document (online) describing this policy and a support team to handle incidents in violation of the policies: www.uga.edu/compsec/.

Appropriateness

A campus portal developed collegially, as opposed to centrally, engenders and supports intellectual and cultural diversity within the academic enterprise. This approach, however, does not discount the need for centralized and cooperative control of the portal's most visible pages and at least a portion of the information pushed to individuals. University administrators and communications officers have a reasonable expectation that the campus portal should be used as a tool to send a sound, positive, and complete institutional message. Harmonic diversity acknowledges the strength of difference which enhances this institutional message, and the institution. ■

Seven C's of Webservice Design

Comprehensiveness: Complete coverage with respect to organization and function. *Currentness*: Accuracy of static information. *Client-orientation*: Responsiveness to requests from the viewing audience. *Clarity* over coolness: Simplicity of page design and directness of hyperlink pathways. *Courtesy* over coolness: Length of time for a page to load is reasonable. *Compatibility* without compromise: Sensitivity to and support of different browser environments. *Cross-linking* and validation: Multiple access paths to the same information, with a method to check the validity of links sitewide.

This article also appears online at: http://www.georgia.edu/design/harmony. Adapted and re-printed here with permission of the author.

continued from page 3

logy developed on campuses will prove a long-term restraint on the willingness of institutions to share R&D work.

Less amenable projects

Failures and resistances have cropped up as well and provide insight on what is more difficult to accomplish collaboratively.

Academic curricula, which are so fundamental to determining the agenda and priorities of an institution of higher education, have proven very difficult to move into the consortial setting. The curriculum is set principally by faculty acting under the discipline/department structure, which tends to be rooted firmly in each campus. That part of IT that is tied directly to supporting the curriculum is therefore bound to be campus-centric as well. Network technology and staff technical training may escape the campus orbit sufficiently to become consortial initiatives, but courseware development support and classroom technology design, acquisition, and support are less likely prospects because of their ties to faculty and curriculum.

Administrative work processes and their related data handling have also proven highly resistant to the kinds of compromise and standardization necessary to move them into shared systems. The most notorious examples are probably in the registrar/student records functions. Colleges or universities that have tried to arrive at academic schedules identical to those of neighbors with whom they want to cooperate can testify to the difficulty of altering campus patterns and habits.

Perhaps most disappointingly for IT, cooperation in staffing has also been very difficult to advance consortially. End-user support positions are inevitably tied to direct relationships with the people they serve. Faculty and administrative staff have both insisted on near-captive relationships with IT staff. Even the work of setting up help desks and other means of end-user support had to overcome the clientele's reluctance to loosen their grip on favorite IT individuals. The proposition that a single source of some aspect of support—statistical computing, for example—is nearly impossible to carry out against that resistance.

Inherent problems

Every campus, even in a state system of public higher education, has its own personality. It consists of "history," finance, agenda, priorities, schedule and the catch-all category normally termed "campus culture." Each of these in its own right is sufficient to halt a cooperative venture. The confluence and conflict of these in a multi-institutional setting is the very heart of difficulty in the life of a consortium. Viewed from the particular discipline of project management, it is easy to see how many constraints and arbitrary preconditions come into play.

The legendary inefficiency of committees becomes magnified in consortial work. The difficulty of even convening a multi-institutional committee can be daunting and discouraging. These groups bear the additional handicap of having a lower priority in the worklife of the individuals who come to it.

There is also an inescapable tension between competitive and cooperative modes of working. "Competition" is not necessarily direct and specific among cooperating institutions. Still one often hears that cooperation entails compromises that amount to a lower standard of achievement (or a slower implementation schedule) than would be the case if the institution were acting on its own.

Another token of this "competitive" attitude could be called the "not invented here" prejudice: bringing back to campus an idea that had its origin in an off-campus meeting is often a problem. In the background, there is a strange dichotomy between everyone's easy willingness to agree to cooperation in the abstract and in general terms and the very real difficulty of making it happen on a daily basis.

Finally, consortial decision-making invariably turns on a balance between near-term and longer ranged objectives. At some point in every project there is a discussion of whether one or more of the participating institutions is in the position of having to decide to go along with the others because preserving the consortium for the future (when accord always seems a stronger prospect) or to resist the current project because it does not fit with the home-campus agenda or priorities. Almost nobody in these situations has the possibility of putting aside the strictly institutional portfolio and acting as a "citizen" of the consortium.

Factors for success

Nothing is more insidious in undermining the spirit of consortium than the feeling that some members are less equal than others. Most successful consortia find both practical and symbolic ways to support a sense of parity among the members. Part of this effort consists of a stipulation that each member institution is uniquely excellent, yet gracious enough to allow the others to entertain the same thought. A good sense of humor in the delegates to these meetings helps, as well.

External pressure, when it exists, also promotes harmony in a consor-

tium. The rate of growth in health insurance in the near past has led many consortia to cooperate in aggregating their business so as to increase their bargaining leverage. In IT, Napster has done wonders in the past year to promote improved consultation among network managers on different campuses. But defensive banding can be counterproductive if it appears to be anti-competitive in the public view, as it did several years ago with regard to financial aid.

Timing in the affairs of a consortium takes on special weight and sensitivity. Because multi-institutional deliberations consume time and move slowly, projects are vulnerable to being undermined by impatience, particularly where the sense of urgency varies among the members. The threat to pull out of the collective effort and go alone at a faster pace is one of the most often-brandished threats in these discussions, whether used as a tactic or merely from frustration. The reverse is also true: an institution that is uncomfortable with any aspect of a project can easily bring pressure on the others by slowing down the timeline. As a result, long lead-times tend to facilitate consortial work by allowing a margin for the extra negotiation inherent in the group projects.

New initiatives are generally more promising for consortium initiatives even though these will often not be perceived to be as urgent as projects aimed at resolving present problems. The difficulty with current topics is that each institution is somewhere in the course of dealing with them already, and any joint approach to a resolution must involve hammering out the inevitable differences in current practices. It would be easier, for example, to plan ahead for how a consortium will obtain DS3 data network capacity than to coordinate how to cope with current bandwidth shortages.

By the same token, old issues are also easier to take up consortially than current issues. For example, is now the time to return to thinking about information systems that were proposed and then deemed infeasible in the past because the technology was not quite ready (example: database-to-web or gopher six or eight years ago)? Again, the key point is that where work is not presently in progress there are fewer differences to iron out.

But most importantly, and elusively, consortial action places a premium on vision. Seeing beyond the campus perimeter fence turns out to be a surprisingly difficult thing to do. The perspective required to see and enact projects among institutions is simply not the same as that needed for operation on the home campus and cannot be taken for granted in one's colleagues. The problem is likely to be that too many ideas seem right for collective action, and discovering which are in fact reasonable to pursue is hard.

While consortia are not new to higher education, their value and durability in the IT field is still a work in progress. It will be interesting to see whether IT will become less campus-centric than has been the case to date. ■

"Technology offers the potential for remarkably efficient individualized learning, but this learning model is by no means a new concept. Nineteenth-century American schools, generally one-room schoolhouses, featured students of many ages and skill levels working on a variety of lessons in a single classroom."

Bethany Baxter
"Returning to the One-Room Schoolhouse"
Commentary
September/October 2000

In Future Issues

- *When doing strategic planning for IT is <u>not</u> a good idea*
- *What, if anything, IT has to do with institutional quality*
- *New system implementation: basic guidelines for success*

Q. Is it now practical to do high-quality videoconferencing over data networks? Doesn't that require more bandwidth than is usually available?

A. *"Yes" to both questions. Video codec ("coder-decoder") hardware—the device that handles telecommunication for videoconference applications—now typically supports video-over-IP technology, as well as the long-entrenched ISDN mode of communication. After at least a decade when ISDN was essentially the only option for transmitting videoconferences, other means of transport are now blossoming. The ITU standard for transmission over ISDN is H.320. There are several new standards now: H.321 for video over ATM at the same data rates and quality as for H.320, H.324 for low-quality video over ordinary phone lines, H.310 for considerably better video (MPEG-2) over ATM. The protocol for video transmitted as IP data is H.323. In principle, it can be implemented in current LAN and WAN environments, but in reality it does not perform at all well unless operating in isolation from other data traffic. H.323 is a "best effort" approach to transmission, actually the same TCP/IP collision-detecting packet technology we know from ethernet and Internet applications. High-quality interactive video over general data networks is one of the much-anticipated features expected in Internet2.*

Q. Ideally speaking, which faculty is it best to have on institutional IT advisory committees?

A. *Of course, part of the answer is that the choice of representatives needs to be decided by faculty themselves, through whatever governance policies apply. But the question is worthy of consideration from other aspects. For most of the history of "academic computing," the faculty reps were the early adopters; on many campuses, these are still the typical choices. Do they represent the interests and issues of the "middle sixty percent" of faculty—those who are not the vanguard but do rely on IT in their work? One line of reasoning is that aggressive representation is good for the whole user community. Another is that these folks might as well be on the committees, as you will have to deal with them at some point anyway. Yet a different approach is to encourage a steady flow of new participants, for their fresh contributions and also for "education." Tomorrow's provost or vice president is a faculty member today and where but in committees will faculty acquire any familiarity with IT governance?*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

November 2000

Volume 16
Number 8

The Education Technology Newsletter for Faculty and Administrators

IT Decision Making Really Is Different

In IT, we have often felt that we were "making it up as we go." This has been true enough at times. On other occasions the contrast between the seeming unpredictability of IT trends and projects has stood out only too sharply against the calmer patterns of much else in campus life. Now that the novelty has worn off, too much is at stake for anyone to really believe such a thing, but still there has to be some accounting for the level of discomfort that persists with regard to decision-making in information technology. Why is it not more like libraries, physical plant, faculty governance, endowment management, or any of the other staples of campus life? To be sure, all of those fields bring change and new challenges all the time, but they do not have the renegade status of IT. Surely it is not enough to say that IT is new, the academy is old, and IT will be old hat, too, after another century or so. There must be other reasons why this facet of academic management cannot beat the rap of being "different."

Some reasons are obvious: the pace of change in this field is unusual to our thinking and experience; many early predictions and promises have gone famously wrong; IT is a costly addition to the economic model of the university—which has little flexibility in any event. The upheaval the computer has brought to both academic disciplines and administrative processes has brought many people a personal kind of discomfort and provoked defensiveness and resentment. Few of us are overly intimidated by our ignorance of other worlds of knowledge on campus (physical chemistry, Jacobean drama, and Hindi come to mind), but many feel directly confronted by IT. Yet for many years deans and department chairs have been able to say, "I just can't deal with this stuff;

continued on page 3

"While hardly any of us in higher education noticed, a new, parallel universe of postsecondary credentials sprung up in the 1990s. You see it now in job advertisements, on the Web, and in the IPO market: an educational and training enterprise that is transnational and competency-based, confers certifications not degrees, and exists beyond governments' notice or control. And it is much bigger than you think."

Clifford Adelman
"A Parallel Universe"
Change Magazine
May/June 2000
www.aahe.org/change/

NEWSBRIEFS

DIGITAL IMAGING TUTORIAL

An online tutorial created by the Cornell University Library offers information on the use of digital imaging to convert and make accessible cultural heritage materials. It also introduces some concepts advocated by the Library, in particular the value of benchmarking requirements before undertaking a digital initiative. It features up-to-date technical information, formulas, and reality checks designed to test your level of understanding. The tutorial is funded by the National Endowment for the Humanities. Users are asked at several points in the tutorial for feedback to help shape its on-going development. See www.library.cornell.edu/preservation/tutorial/contents.html.

THE CASE OF THE LINUX KERNEL

Jae Yun Moon and Lee Sproul have published a paper studying the circumstances under which the Linux operating system came into being. The real fascination with Linux stems from the fact that it is not an organizational project. No architecture group developed the design; no management team approved the plan, budget, and schedule; no HR group hired the programmers; no facilities group assigned the office space. Instead, volunteers from all over the world contributed code, documentation, and technical support over the Internet just because they wanted to. This paper analyzes factors contributing to the Linux kernel story and explores how those factors could be brought into play in formal organizations that are managing distributed work. See the full article in *First Monday* at www.firstmonday.org/issues/issue5_11/moon/index.html.

3-D OVER THE WEB

The ability to quickly and reliably transmit 3-D images over the Internet could make everything from shopping for real estate to playing video games a lot more "real." A team of researchers from Lucent Technologies' Bell Labs and Caltech have demonstrated a way of compressing "digital geometry" that allows 3-D data to be downloaded much faster and more efficiently than is possible with current standards. Compression of video and audio, squeezing digital data into as few bits as possible, has become commonplace on the Web. But the same compression tricks that work so well for audio and video don't work nearly as well for geometry, which involves huge and complex data sets. "Geometry is already appearing in many different places on the Internet right now and will eventually become available on a broad basis," says Peter Schröder, one of the researchers involved in the project and a computer scientist at Caltech. As the demand increases, so will the need for sophisticated tools for transmitting the information over the Net.

The article is "Data Compression: 3-D Over the Web," by Alexandra Stikeman in the November/December issue of MIT's *Technology Review*, and is at www.techreview.com/articles/nov00/benchmark4.htm.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

continued from page 1

somebody else will have to decide." So, it (IT) seems to affect everyone; very few claim to be unfazed by it; and almost anyone, it seems, can beg off dealing with it. All of this constitutes the mythology—not a good substitute for a rational understanding.

Some portion of IT's difficulty is simply that it is in some ways truly more complex than the other activities in academe. Almost invariably it is not at the engineering level that the complexity troubles anyone beyond the handful of technical staff who actually have to deal with the stuff. Instead it is the conceptual novelty of things like computers that work faster all the time and yet make the network work slower or ftp packets that fly across many network segments and then get seriously delayed in an invisible bottleneck where least anticipated that contribute to the malaise. The norms of predictability, accountability (who is responsible for the network slowness?), and affordability ("I can't just sit here for the five minutes it will take for this file to download.") are unclear, to say the least. We have learned the hard way that junior faculty who fix colleagues' printers or HTML code take a terrible risk at tenure time. But we have not realized, on many campuses, that some reasonable analysis of what the burden of glitches is and how many of what kind of worker is needed to deal with them is necessary.

Shifting paradigms

The paradigms have shifted too quickly for many of us, too: mainframes and minis, micros, networks, and now Internet-capable cell phones. This pace of change in the alignment of devices (none of these have really gone away—they have just become more or less visible) has had complex reasons for happening, but what really registers with most people is that even in retrospect it all looks too unpredictable for comfort.

If the past—which in IT terms means two years ago—seems confusing, then the future appears all too baffling to forecast. And here, again, the problem is not so much that things like the quicker-than-imagined onset of gigabit ethernet are causing the upset, instead it is that this particular development was not a response to any apparent plan or need. We persist in thinking that consists of confronting problems, studying and worrying them, and then devising some solution. What urgent institutional or educational need did Napster get invented to solve? Why would we ever contemplate 100 mbs switched ethernet "to the pillow"—just because it is possible? Will next year's students expect to beam the lecture notes from my PDA to theirs? In IT the relationship between "problems" and "solutions" does not play out by the same rules that seem to govern how we think about campus safety, leaky roofs, or how many sections of Psych 101 we need.

> *In IT the relationship between "problems" and "solutions" does not play out by the same rules that seem to govern how we think about campus safety, leaky roofs, or how many sections of Psych 101 we need.*

Problems, innovations, revolutions, red herrings, solutions, delusions, and opportunities are distressingly hard to tell apart. Napster is a bane to network performance and notions of ownership and fairness but might just be, at the same time, one of the most intriguing new paradigms of information sharing we have ever seen. The problem is that we do not recall hearing anyone ask for it. And 100 mbs ethernet sounds like a folly for e-mail and web surfing—and it would be—but turns out to be just about right for full-motion video to the desktop. How many of us have any inkling what the educational value of high bandwidth is going to be—that is, before we have the luxury of looking back on it as history?

Competency

Now this is the heart of academic darkness. How might we define competency to make IT decisions? What should be the threshold of true, factual knowledge required to make decisions millions of dollars, or even to serve time on the committees that hear out these matters? The curriculum committee is unlikely to have a member who thinks Latin is the language spoken in Latin America. But the IT advisory committee surely has members who don't know a hub from a switch from a router from a multiplexer from a modem. Those differences do matter; and Latin is not close enough to Spanish or Portuguese to satisfy most of us as an answer.

And so what is the president to make of the recommendation that has been passed by the Dean, who (sort of) got it from the CIO, who danced it past the oversight committee? Who is competent in this picture? Would we build the new

continued on page 6

There is no shortage of aids to better process and decisions in IT management. The following selections can serve as samples of the advice and guidance available. Some of these are descriptions of processes and practices; some are analyses of common errors in planning; others are descriptions of training workshops.

The descriptions of the various resources are drawn directly from online sources that are cited at the bottom of each selection.

UCI Pyramidal Model

This is a process model specific to administrative computing but also applicable to IT planning in general.

The UCI "Model for Sustaining Administrative Improvement" utilizes a set of process improvement tools —plans, performance targets, customer feedback, and "effectiveness principles." These quality improvement tools are built on foundations and principles which are, in turn, grounded in a set of goals—broad, institutional goals as well as specific administrative productivity and service goals.

These components constitute a model depicted as a pyramid. Program elements nearer the top of the model are increasingly specific, supported by the more fundamental components nearer the base. The component parts of the model are interrelated, with elements toward the top of the pyramid dependent on the clarity and success of the underlying elements. This construct is more than illustrative. The organization and integration of program elements lend structure and sustainability. And, as a behavioral model, this program recognizes that changing the patterns of a bureaucracy requires altering the dynamic of values, expectations, rewards, disincentives, and belief systems that define the "administrative culture" of the University.

http://www.abs.uci.edu/depts/vcabs/programo.html

Taylor and Schmidtlein

Writing in the November/December 2000 issue of The Technology Source, *Alton L. Taylor and Frank A. Schmidtlein argue that current planning practices are skewed in the direction of technology and infrastructure, neglecting development, training and support.*

> *These quality improvement tools are built on foundations and principles which are, in turn, grounded in a set of goals—broad, institutional goals as well as specific administrative productivity and service goals.*

The rapid development of instructional technologies, their complexities, and their substantial costs could lead one to conclude that most institutions are engaged in extensive planning to guide their investments in this area. However, as of 1998, just under half of U.S. colleges had a strategic plan for information technology, more than 60% did not have a financial plan, and only about 20% had a curriculum plan (*Campus Computing Survey*, 1998). The American Association of Higher Education has recommended that institutions consider devising a strategic plan that addresses the policies and issues, educational tasks, and funding plans for information technology. The National Commission on the Cost of Higher Education (1998) has urged college and university leaders to articulate the results of self-reviews to the campus community and institutional constituents with information on a variety of expenditures, including technology.

These recommendations for planning highlight a need for thoughtful consideration of technology costs, but such planning in this rapidly changing environment requires great insight. Without needed research on technology issues, the tendency to invest too large a portion of available funds in infrastructure, equipment, and software will continue, while far too little money will be appropriated for the other costs noted above, particularly course development, training, and technical support.

http://horizon.unc.edu/TS/commentary/2000-11a.asp

Leadership for standards

While many acknowledge the value of standards, some actively advocate their development. Their efforts aim to give a solid foundation for interchange among information systems.

The Postsecondary Electronic Standards Council leads the higher education community in leveraging the value of electronic standards for data exchange. We support the use of existing electronic standards set through official standards-setting bodies as well as open industry collaboration. We provide guidance

to identify these standards. We set new industry standards when there are no national or international bodies to do so. We aggressively work with schools, associations, government agencies, and software and service providers to adopt these standards. We actively encourage the creation and maintenance of an infrastructure for electronic exchange of education-related data.

http://www.standardscouncil.org/index.htm

Flashlight

The TLT Group, now the home for the Flashlight program, offers a handbook-model for cost analysis. An article by Stephen C. Ehrmann addresses the assessment of costs and value in the use of technology.

The TLT (Teaching, Learning, and Technology) Group offers the Flashlight Cost Analysis Handbook. The Handbook demonstrates how to analyze the ways that current and proposed educational uses of technology consume time, money, space, and other resources. Such models can be used to improve the way current activities use resources, to forecast resource use by proposed new activities, or to report on total costs.

Examples: The instructions are illustrated by examples from both actual and fictional studies of technology-related activities for distant learners and on-campus students at Indiana University Purdue University Indianapolis (IUPUI), the Rochester Institute of Technology, Washington State University, and George Mason University. Some of these examples are summarized in an essay published recently in *Change Magazine*.

http://www.tltgroup.org/programs/fcai.html

Article by Stephen C. Ehrmann: *http://www.tltgroup.org/resources/fquestions.html*

EDUCAUSE/ NACUBO primer

Here is an approach to planning that brings together the perspective of IT professionals with those of business officers. It is also noteworthy for its straight-on approach to complexity.

This publication, *Information Technology, Systems, and Services in Higher Education: A Primer* is intended to help information technologists understand institutional priorities and to help business officers understand information technology, systems, and services.

> *With greater understanding of the power and complexity of information technologies and electronic information resources, campuses can direct the potential for transforming higher education in the 21st century.*

With greater understanding of the power and complexity of information technologies and electronic information resources, campuses can direct the potential for transforming higher education in the 21st century.

This publication, which grew out of the longstanding relationship between EDUCAUSE and NACUBO, was originally prepared as a chapter in the sixth edition of College and University Business Administration (CUBA), NACUBO's encyclopedic reference book on the key aspects of campus administration.

http://www.educause.edu/asp/doclib/abstract.asp?ID=PUB5004

Educause Leadership Program

Boulder, Colorado
June 17–21, 2001

This program aims to confront and demystify the perception that IT leadership is inherently impossible, or at least impossibly arcane.

A popular myth is that leaders are born and not made—that leadership is the province of a few charismatic individuals, unattainable by most of us through experience and learning. At the EDUCAUSE Institute Leadership Program you'll start the process of debunking that myth. You'll work together with institute faculty and fellow participants in highly interactive and intensive sessions to develop the skills necessary to lead your information technology organization.

Presidents rightfully expect IT organizations to provide excellent services, conserve institutional resources, support the organizational mission, and enhance the institution's standing among its peers. This is a tremendous challenge! If these challenges can be met, it will be through the enlightened efforts of individuals who work in these organizations. The Leadership Program focuses on real-life issues and the skills necessary for IT leaders to flourish.

http://www.educause.edu/inst/L011/about.html ■

continued from page 3

Fine Arts Center on this model of decision-making? And what should the professionally responsible CIO do when enmeshed in this set of circumstances?

The onus of ownership

There is a hint of a basic problem in the preceding quandary. When IT leadership acquires an inappropriate level of ownership because others, who should be sharing it, either cannot or choose not to shoulder their share, the result is ultimately bad. On first look, breezing a (good) plan through a process where participants are unable to scrutinize as they should sounds like a dream come true for the CIO. But in the end nobody really respects a system that allows this to happen. Some part of the tough role the CIO has today can be attributed to the fallout from this mode of decision-making—even where no disastrously wrong decisions were made. (In those instances we tend to pin the blame on someone and pass right by the lesson that the process had its flaws, too.)

The guild of IT managers cannot seem to shake the memory of days when the rest of the campus had no choice but to take its word unchallenged—at least until it made a bad mistake. Though it seems counterintuitive, sharing knowledge, educating faculty and administrative colleagues, informing the campus community, working in genuine partnerships, and sharing ownership are actually in the best interest of good decision-making in IT. It is all too tempting to think that soft or flawed examination of IT plans or assessment of performance is a free ride for an activity that it nobody else understands, cares about very deeply, or wants to "own." In actuality, nobody is fooled in this situation, and the guilty knowledge eventually turns to alienation.

Irrational constraints

Once a decision is made and a project under way, the academy's general weakness in formal methods of management can unravel even a good plan and call the good decision back into question, quite unfairly. In particular, we do a poor job of dealing explicitly with the fundamentals of project management. Every treatment of this methodology comes down to some form of the idea that there are three variables to balance: specifications, schedule, and funding. (We have already gone past the degree of exposure this concept gets in many projects.) The short version of what often prevails runs like this: "Any deviation from the laboriously hammered-out specs would be a compromise in quality and therefore simply wrong. There is no chance of getting more money. We were told that quite clearly. If it takes longer than we thought, well, we never seem to get anything done on time around here anyway." Of course, what is really happening is that two of the three variables have been frozen in place before the project even begins. If schedule slippage is the worst that happens, then we are very lucky.

How do we get this dysfunctional about projects—building a set of web pages, a videoconference suite, the IT infrastructure of a new building (where many architects still think the data and telephone infrastructure is a post-construction concern)? It starts with failure to grasp the fundamentals of balancing that conceptual triad. But the more immediate expression of the problem, particularly for IT projects, is that the specifications were unbearably hard to settle, and now nobody wants to return to them; all the undercurrents of discomfort with competency and ownership come back. And, usually, senior administration has imposed an inflexible rule and dire warning about cost constraint because they, too, do not want to go back into negotiating the balances. They lock down the variable they know they can control—the money.

The commonplace wisdom is that any committee will expand project specifications unless you hold them in line with the budget club. And even if later it turns out that if the specifications were wrong or the schedule just a fantasy, if the project stays under budget it might get counted officially a success. But as we know, the lore of the project then runs, unofficially, "We were foolish—as usual; for 2% more we could have done it right."

Whether that hindsight is correct or not, it is a symptom of weakness in project management—maybe just in failure to articulate the true constraints the project faced, but possibly in rigidity resulting from fear and distrust. To be sure, parking lots and other apparently low-tech projects can go wrong in the same ways, but for IT projects, the combination of "cultural" uneasiness with the issues coupled with our general weakness (again, cultural) with project management puts them at higher risk.

Risk

We academics are hopelessly in the dark about risk. In the business world, risk is more explicit and urgent. It brings success or failure in ways that are palpable and obvious. Educational institutions are more like trusts: they are designed to avoid risk—for good and for bad.

We tend not to think sensibly about risk. If we put in fifty percent more network drops in the new office building, what is the risk that we are wasting money? If we stick to a conservative estimate, we're not taking a risk, are we? Well, yes, if it

turns out (and it always does) that before long offices specified for one person now have three, and the cost of adding drops after the walls have been finished is much higher. In other instances, risk might present itself in terms of making some choice now or delaying in the hope that the choice will be clearer or easier later on. That dilemma often arises just before a shake-out in some field of technology, such as several years ago when Unix workstations seemed the answer to high-horsepower processing needs for individuals and the choice of vendors and Unix flavors was at times paralyzing.

Gain and loss

The players in these dramas, much like the institutions themselves, are largely sheltered from the immediacy of gain and loss. There are very few incentives to save money: budget surpluses get swept away at the end of the fiscal year (though, in fairness, so do many overruns). Doing a job better generally needs to be reward in itself. Doing a job considerably less well is rarely grounds for job loss on a campus. Against this backdrop, most will choose to stick with the sure and easy ways. They will see no benefit in taking risks. When confronted with unfamiliar or threatening issues, they will tend to delay and avoid action. If these assertions are true, and if discomfort with technology decision-making is also true, then the disincentive to incur risks probably gets stronger when IT is the topic.

As a result, a "head-in-the-sand" response is not unusual when trouble is brewing (e.g., the network is getting awfully slow), the causes and solutions are not clear, nobody is willing to share the problem, everyone is motivated to wait until both the problem and the solutions are clear-even if the cost of doing nothing before the crisis hits are high. In that scenario, the next development is finger-pointing. The shame of this outcome is manifold: those who could have helped but did not continue to escape their fair share of responsibility; the real issues get eclipsed by the push to assign blame; and the blamed party is going to be either demoralized, hypersensitized, or reduced to cynicism. In any of those eventualities, a person the institution needs to be effective is made less effective for the future.

Less different

Information technology decision making would benefit from being less different from other topics on campus. Similarity is not automatically a good thing, but when decisions run afoul of so many of the inherent weaknesses of academic management, and those faults are felt even stronger because the issues are thought "different," ways need to be found to reduce the charge of anxiety.

Wider ownership of IT issues, even though the tasks of education and persuasion promise to be tedious, should be beneficial. Clearly, this objective makes a heavy demand in time and patience. Still, we need to be in the business of enlightening—because it is the mission of the university and the only way to win the necessary allies for IT.

More concerted attention to formal project management should also bring a better level of comfort with IT projects. All of the constituents should be encouraged to share the concepts and vocabulary of balancing the variables. Being more explicit about choices and trade-offs seems hard to accept in academic culture. If it feels too much like "business" or "management" many on campus get resistant. If it feels too much like craven compromises, it runs against notions of "excellence." But maybe if it works a few times, those sensitivities will lessen.

If rewards for success cannot be raised, at least protections for those who take responsible risks could be increased. If a project manager says, "I can't be sure we'll have that lab ready by opening of the semester but would like to try," everyone affected should be asked to weigh in on the assessment of risk. If the decision is then made to go ahead, the manager should be "covered" for that decision.

Lastly, less "shock of the new" might help reduce the perception that nobody is able to predict the course of technology. We tend not to brief our peers on developments before they are upon us, for fear of raising expectations or forecasting inaccurately. But the benefit of some reasonable foresight might warrant a renewed effort to prepare everyone. ■

In Future Issues

- *IT issues today in academic libraries*
- *Developing curriculum in collaboration with K-12*
- *Smarter ways to approach IT training*

EDUTECH RESPONDS

Q. We do surveys once a year to assess how well we are serving our users, but we don't feel the results tell us anything really new or useful. What else can we do to get feedback for planning our services?

A. *First, you should be congratulated for having taken the basic step of doing a regular assessment. One further step you could take would be to make part of your annual survey vary each year to address concerns you already have and for which you would like to ask your users' responses. Alternatively, this section of the survey could be used to air options you are considering for the near future. An annual survey can give you a steady, year-to-year picture and also have some flexibility to be more topical as needed. In addition to surveys, focus groups are a widely used method for assessments. For example, you might want to find students who never use public computing labs and ask their views on campus IT. And don't overlook your own staff. They connect with the campus community in many ways and can be asked what they hear and see, and also what they think when they put themselves in the users' shoes. It is important to realize that assessment means more than a few ratings and numbers. There are quantitative and qualitative dimensions to it, and many sources of information to be tapped if only we are open to them.*

Q. On our campus, end-user training is a function that can't seem to find a permanent and comfortable home. Academic Computing used to do most of it, and then when we started a help desk we thought training would be part of that, and now the Human Resources office offers some courses. None of this is working very well. What are we doing wrong?

A. *What you report is a widespread trend. At one time using computers was essentially impossible without training and those who were just starting did not have much self-confidence to branch out to new software or more advanced features. But people are more likely now to try a new software program, with the hope that it will be intuitive enough so they can figure out pretty well how to use it on their own. Those folks are less likely to want to come to a formal class, even though we keep thinking that is what we need to provide. We need to think of training as a professional specialty that cannot just be the second priority of staff who have more pressing things to do. Figuring out what people really need is the start.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

SYR 132 12/05/00 #7 16:22

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

THE EDUTECH REPORT

December 2000

Volume 16
Number 9

The Education Technology Newsletter for Faculty and Administrators

Preparing Technical Instructors Through Multiple Delivery Systems

by Chris Zirkle, Indiana State University

The nation's colleges and universities are facing several challenges impacting the nature of courses and degree programs they offer. Ever-increasing competition for students and calls for improved "ease of access" have driven institutions to create new approaches to course delivery methodologies and degree requirements. Legislators and taxpayers have called for better quality and more accountability in post-secondary education. Instructors are in need of constant professional development and technical updates. In response to these pressures and many others, several institutions are seeking to improve their educational programs with new information technology tools.

The state of Indiana is in the process of converting the state's technical colleges to a system of community colleges. These institutions have historically offered a wide range of technically oriented associate degrees in a variety of disciplines. The state already has one comprehensive community college, Vincennes University, which also offers a broad array of technical associate degrees. The state's commitment to a unified community college system with articulation to the state's four-year institutions has required many of the instructors from technical disciplines to pursue additional degrees, namely bachelor's and master's degrees.

The Department of Industrial Technology Education (ITE) at Indiana State University (ISU) offers bachelor's and master's degrees in human resource development, technology education, and

continued on page 3

"On the whole, institutions tend to be conflict averse. In the collegial atmosphere of most colleges and universities, conflict is avoided at all costs. We know conflict is inevitable in any change process. You will always encounter differing opinions, perspectives and feelings. How you manage the differences will determine the quality and results of the change process."

P. Sanaghan and R. Napier
"Change in Higher Education."
Business Officer Magazine
October 2000

NEWSBRIEFS

BLUETOOTH

Bluetooth, a standard that allows electronic devices that are within 30 feet of each other to share information, was developed in 1998 and is backed by a Who's Who of tech giants, including Intel and Ericsson. The technology is just now showing up as an add-on for laptop computers and in a few high-end cell phones.

By the end of the year, Bluetooth-enabled devices will probably number only in the tens of thousands. However, the backers of Bluetooth have a much grander vision. They want it to become ubiquitous—unifying all cell phones, laptops and handheld gadgets. The name Bluetooth comes from Harald Bluetooth, the Danish king who unified Denmark and Norway in the 10th century.

Ian Fried, CNET, "Will All Hail Bluetooth?"; http://www.zdnet.co.uk/news/2000/48/ns-19462.html.

FOR SCIENTISTS WHO LOVE TO TEACH

Hosted by Cornell University, this website offers a number of resources and tips for scientists who teach. Collected from undergraduate courses in evolution, ecology, and animal behavior, but applicable to a range of science courses, the materials include writing assignment ideas, peer review guidelines, discussion tips, hints on using the web, reading lists, exam questions, and sample syllabi, among others. The site also contains some annotated links for teaching, biology, writing, and TAs. A nice, straightforward collection of useful resources, many of which may be of use to teachers in any discipline.

See: http://instruct1.cit.cornell.edu/courses/taresources/.

From *The Scout Report*, Copyright Internet Scout Project 1994-2000 http://scout.cs.wisc.edu/.

THE INTERNET AND LITERATURE

"Writers have to belong to the time in which they live—not in a way that makes them biographers or documentarians, but artists who both comment and interpret what is going on around them. Too many writers are bowing out of the whole Internet age and not realizing that this is the biggest revolution of our lives since God knows when. I wanted to be part of it. It seemed to me that I could use the idea of the Net and of e-mail—not in a gimmicky way, but to talk about some interesting issues around identity and where the boundary lines are between a fiction world, an imaginative world, and the world in which we usually live."

From "Logging in with...Jeanette Winterson." *Chronicle of Higher Education*, Monday, December 4, 2000.

http://chronicle.com/free/2000/12/2000120401t.htm.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

Preparing Technical Instructors ...

continued from page 1

career and technical education. The department has recognized that many students interested in the programs are employed professionals seeking new skills and knowledge, older students with associate degrees seeking a bachelor's degree, or adults simply wishing to make a career change. Many of these students are time-bound and place-bound. They are unable to come to campus and participate in a traditional on campus degree program. Technical instructors from Indiana's two-year colleges fit into these descriptors. They need a way to get a degree at a distance.

Multiple delivery methods

The ITE department began offering courses in 1990 through the Indiana Higher Education Telecommunication System (IHETS), a state-funded consortium of eight member college and university campuses initiated by the 1967 Indiana General Assembly. This system utilizes digitally compressed satellite technology to reach over 325 sites across the state. IHETS sites include many of Indiana's college campuses, public schools, libraries, hospitals, and other accessible facilities. One of the several IHETS studios at Indiana State University serves as the classroom for the two-year instructors.

From this studio, they can simultaneously interact with instructors at other IHETS sites. This arrangement also allows for videotaping of classes, which are distributed to the technical instructors with no access to an IHETS site, or who may have to teach a class at their home institution at the very time the class is being broadcast. In 1997-98, ITE added Internet courses.

As a result of this addition, two-year instructors have the option of taking courses through one of four delivery formats: traditional on-campus delivery, IHETS satellite, videotape, and the Internet. The Internet group is the fastest growing. Many instructors experiment, some taking courses on campus and others via alternate delivery methods.

> *The issue of class participation is an assessment concern. The level of class participation can be difficult to judge when the technical instructor is in a satellite TV studio 150 miles away, or sitting in front of a computer screen.*

Each faculty member in the ITE department teaches at least one course each week via multiple delivery. After each class, videotapes of the session are mailed to students who requested this mode of delivery. The instructor then accesses the course Web site and posts lecture notes, presentation slides, audio/video files, and other information that students taking the course via the Internet may need. Some educators use Blackboard's CourseInfo software to support their Web instruction; others have custom-designed their own course sites.

Interaction issues and assessment concerns

Delivering courses in a number of different formats has created interaction issues. With the exception of those technical instructors taking the class on campus, lack of eye-to-eye contact is an issue for IHETS, videotape and Internet students. Faculty members are unable to view student reaction to the presentation of material. There are also limitations on some types of learning activities.

Cooperative group activities and hands-on, psychomotor activities are limited, especially for those technical instructors taking a course on the Internet. Participation can be difficult to monitor, as well. Finally, response time is a concern for those using the videotape option. They receive a videotape of the class several days after it is broadcast on IHETS. They have to view the tape, and then make any inquiries to ITE faculty afterward.

With technical instructors at various distances, it can be problematic to assess performance. The issue of class participation is an assessment concern. The level of class participation can be difficult to judge when the technical instructor is in a satellite TV studio 150 miles away, or sitting in front of a computer screen.

Since the ITE program curriculum is designed to assist technical instructors with the development of their teaching skills, it can be difficult to assess "stand-up" teaching skills at a distance. ITE faculty are also challenged to return technical instructor classwork in a timely

continued on page 6

Chris Zirkle is Assistant Professor in the Department of Industrial Technology Education at Indiana State University, Terre Haute, Indiana. *This article is reprinted with permission from the November issue of T.H.E. Journal.*

What criteria would suffice to justify our fascination with technology in education? Do the intellectual, practical, and moral problems of our times require us to build new tools and methods to do our work? Can instructional technology give us advantages worthy of costs and disruptions it brings? These questions resist answers and become only more insistent with each passing year.

Some cases are already well known, even well worn, in our recent history. The landings on the moon would have been impossible without accelerated calculation of travel paths, forces, distances, and the other factors in space travel. Advances in scientific medicine in the same years have had undeniable impact on our history. The application of engineering principles to manufacture of everyday goods has changed the material basis of our existence to an extent we can hardly comprehend.

Shaped by technology

These massive commitments to technology, most conspicuous in the middle part of the twentieth century—when they seemed new—have had deep and persistent influence in education. More precisely, the impact has been felt in teaching and curriculum.

The lessons drawn from the recent history of technology have been large, expensive, and sustained mobilizations of resources that have led directly to huge and transformative change. This is not change in the manner of previous times; the ability to make things different seems more accessible to us than it ever had to our predecessors.

But there are some other things that we know also. It never was necessary to send humans into space for the scientific aims of space exploration. The task would have been shorter, cheaper, and far less costly without the burden of supporting life in those space vehicles. That argument was made repeatedly at the time, but those voices did not prevail.

In a similar vein, as impressive as medical advances have been in the past half-century, the truth is probably that improvements in sanitation and other less revered forms of technology have had a greater impact on public health than the scientific breakthroughs that most impress us. The perilous decline in overall health in the former Soviet Union, due largely to the collapse of civil-engineered facilities and even the basic food supply, should restore some perspective to our understanding of what has actually had the most significant impact on public health.

These massive commitments to technology, most conspicuous in the middle part of the twentieth century —when they seemed new—have had deep and persistent influence in education. More precisely, the impact has been felt in teaching and curriculum.

Yet the resources we are willing to commit to the high-tech end of the health and medical spectrum continue to grow amid signs that some of our most important advances—the near eradication of tuberculosis, for example, are being undone by poverty and our neglect.

We know also, of course, that our production of consumer goods has developed outside any real connection to need. Furthermore, it widened the gap and tension between rich and poor and accounted for a massive depletion of natural resources.

Following the model

Our notions of what has been successful in the recent past has set our predispositions in education. It is ironic that even where instructional technology is not at issue, or is rejected or questioned, the underlying themes in the educational enterprise are shaped by technology.

We believe in the wholesale and systematic modification of things as disparate as behavior, health, moral sensibility, the environment, and even basic matter. Purposeful campaigning and the mobilization of considerable resources have yielded results in all of those. We have become comfortable with the view that education is an integral part of the application of knowledge to the resolution of problems meriting high priority.

It is ironic that we do not recognize the influence of our experience of technology when we look at the educational enterprise. Computers, telecommunication, scientific instrumentation, multimedia, databases, and digital images seem new and intrusive to many in the instructional community. Assuredly, they do compete for resources with

other urgent needs: the wage/salary costs of our labor-intensive approach to instruction, the high plant costs of campus-based education, and the increasing financial aid to mitigate the impact of our educational method on students. Some part of the disparity between our embrace of technology in everyday life and our reluctance to admit it in education is simply that it puts unwelcome strain on our economic model of instruction.

Some differences we know

The study of chemistry has been changed forever by the advent of the computer. The whole sub-discipline of physical chemistry depends on it, occupying ground between empirical study and the theoretical domain. The computational basis of physical chemistry connects operations on accessible matter with ideas about the inaccessible.

Geology has been transformed by chemically-based techniques for dating. Techniques of modeling and simulation have opened new lines of study in economics. Psychology has learned much from computational models of perception and intelligence These are just some of the examples of transformations we can ascribe directly to the application of technology.

And some we do not know

Has writing improved since the adoption of word processing? Is mathematics substantially different since the arrival of computers? Has the study of history changed importantly in the "information age"? The answer to all of these is "no," minor changes not withstanding. Fifteen years ago, academic administrators often asked whether the encroachment of computers and allied technologies would be limited to a sub-set of disciplines. That argument is rarely heard now. The popularity of word processing, e-mail, and the web have largely worn down resistance to the spread of electronic technology across the disciplines. Would we be justified to think that all fields of study will be improved by the use of information technology?

The answer must be "no," because the evidence is not there. But the question rests on a false premise anyway. The real transformations that have been observed give little help when we look at other academic fields or at instruction in general. Nevertheless, almost all writing now passes through a computer at some stage. Even basic bibliographical work is now almost conducted through databases—the engines behind the online catalogs.

> *Some part of the disparity between our embrace of technology in everyday life and our reluctance to admit it in the instructional program is simply that it puts unwelcome strain on the economic model of education that we are reluctant to bring into question.*

What difference does IT make?

With some answers in, others uncertain, and some negative—if the test is profound transformation—what value should we place on instructional technology, in any of its forms?

Some part of our difficulty with the question is that we have trapped ourselves into thinking about specific technologies and uses while forgetting that engagement with technology as a topic of study in itself perhaps the fundamental issue. The standard of direct, instrumental application of computation, lasers, or other engineered devices is not a useful or appropriate test of technology's value in learning. It might be worth considering that one of the great challenges for education today is to engage and investigate IT in advance of conclusions about specific values it might have.

Information technology also provides a perspective from which to examine some of our cherished, received notions about preferred methods of instruction. There is some evidence that even e-mail exchanges can lead to a more personalized contact between instructor and students in large courses than was possible previously. We persist in thinking in-person is better—even if in the back row of a lecture hall—and that telecommunication increases separation. Nobody would make such a ridiculous claim for the telephone in ordinary life, yet it is still made all the time in education.

The jury is still out, but has it been given the right charge? Students of literature, mathematics, law, and every other discipline still need more experience with information technology before knowing what they will understand in substantially different ways through it. ■

continued from page 3

fashion, especially when it arrives via regular mail, e-mail, fax, or in person.

Faculty development

Teaching courses through multiple delivery formats requires a high level of expertise on the part of the ITE faculty. Faculty development is a top concern. Most need familiarization with the university computer network.

The ability to create Web pages and Internet courses is a necessity. Perhaps most important is the ability to transfer traditional, standard course material to the satellite system and the Internet. These needs, along with others, have created numerous professional development challenges for ITE faculty.

Those technical instructors taking classes on campus can meet with ITE faculty before and after class meetings, and can access five computer labs to send e-mail, participate in live chat sessions, and complete assignments.

For technical instructors participating from off campus locations, ITE faculty supplement e-mail and telephone contact with a variety of other options. Technical instructors on IHETS can communicate with ITE faculty through satellite transmission, which allows for audio communications, while those taking courses via videotape send written reactions via mail, fax, or e-mail on a weekly basis.

Technical instructors utilizing the Internet option use mailing lists, chat rooms, and discussion boards to communicate with ITE faculty and each other. ITE faculty have also experimented with online office hours where participants can log on at specified times and communicate via an office chat room.

ITE faculty members have become well versed in streaming technologies, where videotapes can be converted to audio/video computer files and placed on the Internet.

When assignments require a performance component, off campus class participants can videotape themselves and send the videotape to the ITE faculty member, who then streams the file onto the course site for viewing.

Many faculty in the ITE department have participated in training sessions to learn how to utilize the various technologies that support multiple delivery platforms. Indiana State University sponsors the Course Transformation Academy (CTA), a development program designed to give faculty members the time and resources they need to investigate, create, and employ alternative instructional strategies. The CTA offers semester-long workshops for groups of 15-20 faculty members, as well as an intensive, one-week summer workshop.

> *As they work with the technologies, faculty members use asynchronous and synchronous tools to discuss pedagogical issues, course design considerations, and assessment strategies*

Participants use hands-on projects to learn about creating Web-based broadcast and interactive video courses about incorporating supplementary technologies, such as videotapes and audioconferencing, into their instruction. As they work with the technologies, faculty members use asynchronous and synchronous tools to discuss pedagogical issues, course design considerations, and assessment strategies. They receive information concerning three important university subjects: policies on intellectual property and copyright issues, distance education student services, and resources available to assist faculty members in course development and delivery.

During the CTA, participants have opportunities to work on aspects of their own courses as they complete projects designed to enhance their technological competencies.

Supporting the instructors

Indiana State University also has a Faculty Computing Resource Center (FCRC) designed to provide faculty with one-on-one consultations, and to conduct workshops and demonstrations on a wide range of topics. Full-time technical experts staff the FCRC, but much of the assistance provided to faculty is given by part-time student workers, who are in many cases very familiar with specific software applications, web page development, and audio or video manipulation.

Much faculty learning is on-the-job and from interaction with other instructors. Faculty share experiences, ideas, and new discoveries, many made by trial and error, as they work with the multiple delivery format.

Other issues

All these issues have created other concerns for faculty, not the least of which is the time constraint that is imposed by the multiple delivery modes. While the maximum number of students in an ITE course is

generally capped at 40, the number of distance students can easily be 75% of that total. This results in a significant number of e-mails, phone calls, and other requests for information from distance students who do not have immediate classroom access to the instructor.

Instructors are given the equivalent of a two-course load for each multiple delivery format course they teach. As the programs have grown in popularity, class size continues to be an issue.

Supporting the students

Faculty members are often the first point of student contact for technical problems. While technology has allowed the department to deliver the courses, it is not foolproof.

Students have periodic problems with the satellite transmission, and many experience difficulties with accessing course sites on the Internet and performing such tasks as live chat, or online office hours. While the university has established a toll-free technical support line, students still turn to ITE faculty for many concerns. This creates yet another time constraint.

The ITE department is also concerned with issues of quality and consistency. Are all four groups receiving the same level of instruction? Is there enough interaction for those at a distance? Do on campus participants get the same exposure to technology that distance students receive? These issues are discussed on a frequent basis by ITE faculty.

Positive benefits

The multiple delivery format has produced several positive benefits. The department has experienced increased enrollment; most classes offered by the multiple delivery format in the fall of 1999 were closed due to high enrollment.

Technical faculty members from Indiana's two-year institutions represent a significant number of students. In the spring of 2000, over 30 of these individuals were pursuing a bachelor's or master's degree in Human Resource Development or Career and Technical Education, the two programs offered through the multiple delivery format.

ITE faculty members, despite the increased workload, see the multiple delivery format as a professional growth opportunity. It requires them to keep current with the latest instructional technologies and computer hardware/software changes. It also allows them to extend their sphere of influence from beyond the traditional campus.

Currently enrolled in the department are students from Michigan, Missouri, Pennsylvania and Texas. Most students believe this instruction has helped strengthen both the content and discussion in classes.

The multiple delivery format is firmly established in the department. It has enabled the department to deliver courses to meet the specific learning needs of their students, no matter where they are located. Most importantly, for Indiana's two-year college faculty, it has provided a way for these individuals to obtain the required degree credential. ■

"The cost of magnetic storage is dropping rapidly; as of Fall 2000 a gigabyte of storage costs less than $10 and it is predicted that this cost will drop to $1 by 2005. Soon it will be technologically possible for an average person to access virtually all recorded information. The natural question then becomes: how much information is there to store? If we wanted to store 'everything,' how much storage would it take?"

Peter Lyman and Hal R. Varian
SIMS–University of California Berkeley
http://www.sims.berkeley.edu/how-much-info/

In Future Issues

- *IT issues today in academic libraries*
- *Developing curriculum in collaboration with K-12*
- *Smarter ways to approach IT training*

EDUTECH RESPONDS

Q. We have been unable to come to agreement campus-wide about whether laptop computers are better than desktop models for students and faculty. Some say the ability to take and use them many places is valuable. Others say the greater cost to buy and the greater risks of breakage, loss, and theft make them a poor choice. Who is right?

A. *There are signs that laptops as we have known them over the past ten years need to be viewed in a new light. Until maybe five years ago, laptop computers were in fact both considerably more expensive to buy and more prone to damage and other hardware failure. Many people also did not like the smaller screens and lower-resolution displays. Today, laptops are still more expensive than desktops, but their qualities and durability are much better than before. But what is changing the picture for laptops is wireless networking. The great appeal of laptops was always thought to be their portability, but that promise was substantially undermined by the need to connect to a network. Wireless networking may be here, finally, to correct that defect. We have always known that students work at a number places during the course of a day, and not all of those are equipped with network jacks. It will be interesting to see whether the campuses that are supplementing their infrastructure to include wireless connectivity see a rise in laptop use.*

Q. When we purchase new equipment, what else should we be doing in order to protect the institution? Does it make sense to treat the purchase more like a contract, and subject it to legal review?

A. *Assuming that you are talking about purchases from reasonably trustworthy sources, there are probably not important advantages in supplementing the purchase order with other, "contractual" provisions. But, still, some terms and conditions are worth checking. Who, for example, is responsible for insurance while the goods are in transit? It should be the vendor; you should find out. An idea worth considering is to make your own set of "Terms and Conditions" for purchase, delivery, and (if applicable) installation. If you draw these up carefully, get them reviewed by legal counsel and the purchasing authorities, and then have them ready to use for any substantial purchases in the future, you can get some benefit without the aggravation of last-minute negotiations on T&C for every purchase.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

January 2001

Volume 16
Number 10

The Education Technology Newsletter for Faculty and Administrators

From Inside the Library: A Perspective on IT

Libraries have been discussed here and many other places in the context of re-organizations with IT departments. Issues on the digital side of librarianship are the express purview of organizations like the Coalition for Networked Information and D-Lib. But what is the view from a representative academic library, absorbed in the daily business of curriculum and research support? Librarians here follow the cutting-edge developments from a distance, although with interest. In this way librarianship is no different from any other profession. The purpose here is to look at the ways libraries have already changed—and are still changing—in response to information technology.

The bedrock of libraries has always been their collections. Now even that certainty has become less solid. Acquisitions continue, though slowed in some cases by restricted budgets and in most others by rising costs. Very few believe they need to acquire fewer books or other materials. Overall it is probably fair to say that fewer books are being purchased by libraries, but that trend is shaped in part by the patrons' requests for other "materials": e.g., audio and video tapes, CD-based resources, and now DVD as well. For their part, librarians have moved resources from paper subscriptions to electronic, to stretch budget dollars but also to position libraries for what is anticipated to be an accelerating trend away from possession and towards assurance of access, mostly via electronic means.

There is other evidence that the notion of "collection" is crumbling. Inter-library loan has grown strongly in importance to supplement the holdings of every library. Few libraries, for that mat-

continued on page 3

"Most of us are generally familiar with the idea that property owners may deed rights or donate easements limiting future development or exploitation to a non-profit organization, while continuing to live on their land or in their historic property. With the increased attention that businesses and individuals are paying to the value of knowledge assets, it should be no surprise the conservancy metaphor is now being extended to intellectual property."

David Bearman
"Intellectual Property Conservancies"
D-LIB Magazine
December 2000

NEWSBRIEFS

THE REPORT CARD IS OUT

Produced in collaboration with the Pew Charitable Trusts, *Education Week*'s fifth annual 50-state report card on public education finds that "states need to strike a better balance among academic standards, testing and the tools students and schools need to succeed." At the site, users will find the full text of this detailed report, including an executive summary, an examination of issues and trends in standards and testing, standards-related policy tables, a review of the states, state report cards, and state policy updates. Numerous charts and tables are used throughout the text.

See http://www.edweek.org/sreports/qc01
From *The Scout Report*, Copyright Internet Scout Project 1994-2000. http://scout.cs.wisc.edu/

GOING PAPERLESS

The University of Texas is following the lead of other large and tech-oriented institutions in creating a "paperless campus." Chief information officers at many universities say that in the next few years electronic deliveries might become the norm, even at the nation's small colleges.

The proposal raises a number of questions: Should the university provide a required e-mail address for students, or should they be allowed to pick their own? Should the university use existing mail servers for the plan or should it purchase or designate new servers?

See: Scott Carlson, "The Paperless Campus Is the Future, Most Universities Agree, but a Few Obstacles Remain." *Chronicle of Higher Education*, December 18, 2000. http://www.chronicle.com/daily/2000/12/2000121801t.htm

---

SCIENGINEERS

The great wall separating scientist and engineer (or, if you prefer, research and development, or the lab and the factory), is tumbling down. Not because scientists or engineers suddenly recognize each other's significance and importance. It's because business and industry simply demand it. Over the years, intellectual nebulosity settled over the wall between the fields of research and development. Now the wall is breaking down. Many developments—political, scientific or economic, depending on your viewpoint —are driving this trend.

Organizations cannot sustain themselves without research. In an era where innovation is key, organizations should encourage research to serve their parochial interests, if nothing else.

R. Raghuraman, "Now Hiring: Sciengineer." *Ubiquity/ACM*, Issue 43, January 9-15, 2001. http://www.acm.org/ubiquity/views/r_raghuraman_3.html

---

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

continued from page 1

ter, stand alone today; most belong to regional associations or consortia. Online catalogs increasingly bring the ability to show listings (often HTML links) for materials not housed in the home collection.

There have even been speculations on what libraries might learn from the example of Amazon.com, where a combination of high technology and the lowest common denominator of demand shapes a new mode of books distribution. Are collections even necessary? Not far behind is Napster, where ownership itself seems in question as a precept. What future would libraries have, as institutions, if in the future information were exchanged in a minimally brokered or mediated system? These are the frontiers of thinking related to collections and by no means widely supported in the library community.

Collection and possession

Still, possession of printed paper is not what it used to be, neither as an end in itself nor as the unquestioned means to assuring access. Regardless of the merits of this trend, it is important to note that it has come about without wide discussion in the academic community. In very few instances has a deliberate policy of de-emphasizing the "home" collection been undertaken. No library would care to be accused of taking that direction, regardless of the rationale.

In effect, the capabilities brought to libraries by digital information technology have brought a near-crisis in the activity known as "collection development." The term denotes a convergence of decisions and processes inside the library that result in purchases of books, periodicals, and other "materials." As noted above, to some extent the term has even been extended to include acquisition of access rights, on a license or subscription basis.

Collection development is in reality a fairly passive exercise: the budget for purchases is carved up and allocated to academic departments via a formula that is common to most academic libraries. Requests for new acquisitions trickle back to be charged against the departmental quotas. Not unusually, staff librarians supplement this process by adding selections according to their own judgment and sense of needs in the collection. It is not really as simple as that, but neither is it much more, in most cases.

Still, possession of printed paper is not what it used to be, neither as an end in itself nor as the unquestioned means to assuring access. Regardless of the merits of this trend, it is important to note that it has come about without wide discussion in the academic community.

Most academic libraries are overdue for a discussion of the criteria for collections development. The conversations needed are internal and external—within the profession (and the local staff) and the faculty and students. What must be bought and held? What can be secured through some assurance of access short of physical possession? How do questions of medium (paper or electronic formats, for example) connect with choices of subject areas to be covered? What does the availability of all of ancient Greek literature in electronic form tell us about the urgency of buying (or replacing, repairing, and otherwise tending) paper books in Greek history and literature? That is pointedly controversial, to be sure, but not far afield from the discussions needed—and typically not taking place.

Stewardship

A second bedrock tenet of librarianship is, logically enough, stewardship over the collected volumes. Here, too, the digital era has added special pressures to what we normally consider a well-understood topic. Safeguarding the condition of books, replacing lost volumes, repairing the worn or damaged—these tasks the library's user community takes for granted. But stewardship actually begins with the commitment to retain books and other materials indefinitely, or nearly so.

With publication growing and diversifying at a pace that is literally impossible to comprehend (the "information explosion"), by what criteria do we decide what still merits a place in the finite storage ranges of library buildings? Where is the library that could hope to build new additions fast enough to keep all of the old with all that we might hope to add?

On the smallest scale of decision-making comes the choice of whether to repair, replace, or just discard a worn book. Many of these happen to be art history books—some scholarly treatises with illustrations, others mostly collections of images with identifying information. In the latter case, at what point would we decide

continued on page 6

The following is condensed, but only slightly edited, from a real e-mail sequence on a real college campus. The names have been changed for the usual reasons. The scenario is so familiar as to not require an introduction. But it does run to a happy ending, and through a dialogue worth contemplating.

Troubling questions

Sorry to hit you with the connection issue this early in the new year, but it's a reality that needs to be dealt with. Students were unhappy last semester and were speaking publicly about their unhappiness. Today I sent you a straightforward note about it in case you decided (as you apparently did) to forward it to others in authority and make it an issue. Sometimes you need to keep the pressure on....

If you don't know the details of this instructor's experience, he was saddled with more than his share of hardships—unable to get a connection to the departmental server for most of the semester, due presumably to a wiring problem. This left him without a projector. He struggled through the course with people either grouped around the server's monitor or a large-screen TV.

He made it through but is taking the next semester off. I'd like not to experience again what he did last semester, and I expect all adjunct and full-time staff would agree....

These are some questions from a Biology adjunct and financial contributor. Some of these are tough to answer, but they shouldn't be.

During the semester, what can we do when we have problems such as these? Whom do you call to address night-time wiring problems when suddenly your classroom falls off the network at seven p.m.? Who is responsible for repairs when such problems arise on campus? How do you expedite repairs to avoid long-term outages? What's a reasonable time before you start screaming that something doesn't work?...

First stirrings of response

Good question about tech service outside nine-to-five, Monday-to-Friday. We ought to decide that....

Well, the Faculty Advisory Committee asked about this last year at a meeting with the appropriate administrative support folks and got told the faculty would need to justify it, as they saw no need. Basically, we "decided" but were ignored. We still don't have evening technology support for our teaching mission....

> *Who is responsible for repairs when such problems arise on campus? How do you expedite repairs to avoid long-term outages? What's a reasonable time before you start screaming that something doesn't work?*

I met with the Biology chair this week as a follow-up to the e-mails about availability of network support in evening hours and related issues.

He has requested some network test and network jack repair tools and is willing to have his student tech types be available from five p.m. until seven p.m. or so, Monday through Thursday, when most of our evening courses are going on. They would respond to service calls when a computer projection system blows a bulb or when instructors can't get on the net or similar types of problems.

The test equipment plugs into the cable connecting to the computer and tells the tech if it is the cable, jack, or network problem. With some spare cables and spare jacks most of those problems would be a ten-minute fix.

The common source of problems has been people forgetting to unplug the cable when moving projector carts between classes. The other low tech problem is blown bulbs. Those also could easily be replaced right on the spot.

It does not sound like a bad idea to me, but I am aware Network Services might be nervous about other people messing with "their" jacks. Or, there might be larger issues I am not aware of. I wanted to run this one by you before pursuing it. Thoughts?...

This sounds like a really sensible way to help cover those evening hours. Suggestion: I think Network Services staff should provide whatever training, orientation, and instructions for these student workers at the outset. That would be a good, practical step and would help give Network Services a personal connection to these folks—and that should reduce anxiety about who those kids are, what they are doing, what they know and don't know, etc.

I wouldn't be satisfied with Biology just saying, "We'll train them ourselves."...

... a Case Study

I like your idea about training and the sense of connectedness. I will run that training concept past Biology to make sure we have a meeting of the minds on this and not a turf contest. Stay tuned....

Technology and politics

I have talked with the Biology chair a bit about how to support folks using the network for instruction in the Science Center during evening hours.

He is proposing that we use a couple of Biology tech types to respond to trouble calls after the Network Services folks have gone home. If you would agree to have a training session so that those techs could walk through how to do repairs with your people, they could handle the likely, standard problems—replace a bad cable, repair a broken jack, or replace a projector bulb. They could also report network problems to your folks so those get dealt with whenever and however.

The techs would need some test equipment (which I am willing to buy them) to plug into the jack to troubleshoot the problem and they would need some nuts and bolts and a tool to replace a jack (nice if you would keep us in those). I would pay for the cost of the Biology techs.

Let me know whether you think this would work. Or, if you have another idea, give me a call. I would see this as an experiment to be evaluated after a semester. I would like to order test equipment asap, while we work out the details, so please let me know what you think.

A solution in view

That proposal is a good one.

Our technician will forward you information, including a suitable vendor, regarding the unit needed to test a jack and a data cable. She is currently certifying that the list of Science classroom jacks you forwarded to the helpdesk are live and working.

Short of a building or hub outage, any problems will likely be due to a physical problem from the wall plate out (cables, broken jack). If it is something beyond that, the process would be to log the call with the helpdesk, as only the Network Services staff would have access to the data closets for further troubleshooting.

> *Let me know whether you think this would work. Or, if you have another idea, give me a call. I would see this as an experiment to be evaluated after a semester. I would like to order test equipment while we work out the details.*

Please have someone at Biology contact our technician to schedule a training session for the Biology techs and go over the process. Also, thanks very much for putting this together....

Discussion

Every campus has its own reasons for whatever degree of mistrust and non-communication exist. All face those problems at one time or another. Part of the problem underlying the above scenario is failure to recognize and deal with the changing pattern of instruction: more courses taught in evening hours and by adjunct faculty. But there is also a significant degree of habitual non-communication in the background.

Too often we let rules and roles substitute for the flow of information necessary for the reasonable solution of problems. Roles and responsibility lead us to create rules that give a false sense of finality and resolution.

We might also be tempted to ask how many folks it takes to fix one network jack. Fair enough, but one of the things we know about campus life is that there are generally more than enough people around. The problem is that too many of them are outside the normal loop of communications. The interesting challenge is to find ways to re-involve more of them without waiting for a crisis to prompt us.

In truth, information technology does nothing in itself to make communication more efficient from the aspect of how many people need to participate. In this case study, a department chair, dean, and several IT administrators needed to intervene—not because the problem was particularly difficult, but because the normal circuit of communication had gone deaf.

We have perhaps gone too far in the direction of thinking that clean and clear paths for problem resolution and the assignment of responsibility are sufficient to guarantee accountable support service. It might be more realistic to expect that active listeners, and more of them, are what is needed. ■

continued from page 3

that accessible online collections lessen the need to keep that category of book? On the other hand, might "print on demand" technology (digital collections of text ready to be sent to a book-printing device upon establishment of the right to copy or the payment of a royalty) restore the ability to own books that until now would only come back into print if attracted by a mass market? Stewardship is a topic that libraries and librarians might want to bring forward before the issues get more heated under pressure from constrained resources.

Catalog

The list or enumeration of the collection is also at the core of what we understand a library to be. Originally constrained to what is owned and housed by the library, it has been extended now to include works outside this scope, let alone physical possession. This change is more public and recognizable than the shifts and rumblings in collection development and stewardship.

But for librarians, the extended range of items contending for classification and inclusion causes disturbing difficulties. The most obvious of these is the sheer size of the task. Cataloging the Internet would be equivalent to bailing an ocean. But other challenges derive from the uncertainty of sources, the volatility of documents on an electronic network, and even the emergence of new document types (e.g., e-mail, threaded discussions, and multimedia).

To contend with these complications of traditional cataloging, librarians have developed online finding aids that stop short of the detail and authority of catalogs per se but still provide useful guidance. Lists of links to vetted information sources are another way in which the guide function of the catalog has been adapted to less tractable information.

Knowledge and guidance

Not to be overlooked, librarians themselves have always been essential to our core concepts of what a library is and what it provides to its patrons. While little more than a decade ago the library profession seemed strained to accommodate itself to computers and networks, that challenge has receded. Libraries have always included technical processes, and today's tools have not proven impossibly difficult for most librarians. For the most part, library users do not need instruction as much with search engines and navigational aids so much as with the identification and evaluation of sources.

Most immediately and fundamentally, librarians must try to encourage and lead campus discussions about how the core characteristics of libraries are changing. For too long there has been a siege mentality, as libraries felt more uncertainty and threat than had been known for quite a while.

It might seem something of a paradox, but in the age of vastly extended access to information, the needs of patrons have moved more toward help with the "content" of the disciplines they are studying than with reaching that information.

The special challenge for bibliographic assistance in academic libraries today is to find ways to promote more active cooperation with faculty, who in many cases are also struggling with the greatly expanded scope of information available in their fields of study. All too often students come to the reference desk with questions that reveal just how disoriented they are and—by implication—their instructors might be.

Opportunities

Most immediately and fundamentally, librarians must try to encourage and lead campus discussions about how the core characteristics of libraries are changing. For too long there has been a siege mentality, as libraries felt more uncertainty and threat than had been known for quite a while.

Now the rest of the educational community is beginning to show signs of discomfort, while libraries are relatively better adjusted to the challenges of digital information.

Instructional outreach could be substantially increased and specialized for academic disciplines. The day of the general introduction to bibliographical resources has run its course. Improved partnership with faculty will be necessary to develop stronger offerings to students across the whole curriculum. The staffs of smaller libraries will undoubtedly need to rely on colleagues at regional and consortial neighbor institutions to help cover the spread of disciplines necessary.

The increasing use of courseware management software opens an ideal opportunity to explore a larger

role in curricular support. CMS systems include electronic course reserves, shared "libraries" of HTML-based resources, and extensive opportunities to link and cross-reference information. In short, the task of marshaling, organizing, preserving, and exploiting greater amounts of information than in the past will open chances for librarians to work closely with classroom faculty.

Archives and special collections

Most libraries house archives and special collections that are seriously under-used in the institution's instructional program. The reason to look at these with fresh eyes in the light of digital technologies is that scanning, database, finding aids, and the Web lift many of the barriers to using these materials in the curriculum. A real opportunity exists for even small libraries (academic but also public) to bring forward unique information that is generally kept locked away.

In the academic world, the true economy of the web consists of the exchange of information: giving as well as receiving. Until now much of the information brought into wider circulation via the web has been published materials transposed into digital format (e.g., topographic maps, back issues of journals, and scanned monographs). But ventures such as the American Memory Project and the American Social History Project have shown us how to convert all-but-forgotten information objects into compelling resources.

Librarians have the opportunity to revisit their archives and special collections in collaboration with faculty and students to assess how their contents might be used and made more accessible. In the era of networked information, the unique holdings of libraries represent a distinctive contribution most institutions can make to scholarship.

Technological explorations

Twenty years ago, librarians had to be dragged into the age of the network. But today there is no reason why libraries should need to wait for others to discover the utility of new tools that might well influence changes not yet anticipated. Personal Digital Assistants (such as the Palm Pilot and competitors) could have substantial potential as aids to gathering personalized information—especially in their ability to "zap" information by infra-red broadcast. E-books, this year's hot item, open interesting questions about the future of reading media. Both of these technologies are within the means of most libraries to acquire for experimentation. Library buildings are good candidates for wireless Internet, given the extent of space in them not yet networked and the fact that students tend to colonize whatever useful spaces they can find in them.

IT and the Library

None of the above requires any organizational change for libraries. Furthermore, most of these ideas fit within the long history of useful adaptations and fundamental self-sufficiency that have been justifiably proud traditions of libraries.

Rather than waiting until forced by circumstances or, worse, the late recognition of change on the part of faculty and students, libraries have good opportunities now to lead the discussion of their own futures. ■

"Networks greatly facilitate the sharing of relevant knowledge within a community joined by like interests. As a result, the lowest common denominator of informed awareness tends to be much higher online than it ever was in the context of broadcast media. Plus, this informed awareness tends to increase much faster."

Rick Levine, Chris Locke, Doc Searls, and David Weinberger
The Cluetrain Manifesto: The End of Business as Usual
Perseus Press, 2000

In Future Issues

- *Smarter ways to approach IT training*
- *Applications prototyping and rapid deployment*
- *E-commerce comes to campus*

EDUTECH RESPONDS

Q. How should we decide when to upgrade to the next release of an operating system? We have Windows 95, 98, NT, and ME in use on campus and various releases of Apple and Unix systems as well. The number of systems and variations only increases and the policy implications are unclear.

A. *It seems a long time since operating system upgrades brought clear-cut and important advances in functionality, at least from the viewpoint of users as individuals. In fact, it is not unusual now to think about upgrades in defensive terms—when it is important to change in order not to be left behind or left vulnerable to problems that soon nobody will care to address. But another perspective is actually more important today. If we look at just the Microsoft environment, most of the development is now focused on how computers can work in shared spaces—Exchange Server and Outlook, for example. The best approach is to keep the decisions at a high level in campus IT governance. A campus-wide technology committee (or a suitable subcommittee) might be tasked to decide or at least recommend when and why to decide. We should know by now that this is one of those technical decisions that the IT support organizations make by themselves only at great political risk. The goal must be to combine technical understanding with a fresh look at impact and cost across the whole organization.*

Q. Small, PDA-style devices seem to be more numerous all the time on campus, at least among faculty and staff, yet they never get mentioned in discussions about IT directions and planning. Might they someday have a significant role on campus? How can we know when it is reasonable to start planning to support them?

A. *The time is probably here already or coming very shortly. While these devices have not caught on among students, by and large, the advent of information machines costing half or less of what the cheapest "computer" costs should get our attention. It is feasible now, technically, to transmit text from one of these devices to others within infra-red broadcast range. Soon faculty will be zapping notes directly into student hand-helds. Library catalog systems are also working on the ability to download the results of bibliographic searches. We have been so concerned with computers; we could easily fail to anticipate the next device.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

February 2001

Volume 16
Number 11

The Education Technology Newsletter for Faculty and Administrators

Bringing the Subject of IT Into the Curriculum

Although we are probably all convinced that information technology is one of the transforming forces of the twenty-first century, it is surprising to note how little treatment it receives as a theme in the college and university curriculum. Of course it is not totally absent; it surfaces as topics across most of the curriculum, from music, sociology, journalism, and psychology to computer science. But so far the representation is, for the most part just topical, depending on the interests of individual faculty and approached from the perspective of the disciplines in which they work. What we are missing is an appropriate level of awareness of this, the great story of our time, and the academic scrutiny to help us think about it even as it unfolds.

Some symptoms from the student experience of computing on campus suggest why this study is important and what difficulties we incur for not addressing it. The remarkable divide in views on intellectual property occasioned by the Napster controversy shows that many students are thinking quite differently about rights and property from how their faculty and administrators see the same issues. Student unawareness of the nature and properties of data communication networks (campus IP and the Internet) leave them not just ill-prepared but largely oblivious to issues of privacy (or, rather, the lack of it), electronic community, and the qualities of the numerous technologies that make up the Internet.

But the students are not the only ones in the dark. How many faculty could pass even a basic quiz on the electronic resources available at their own campus library? What do they know about

continued on page 3

"The real history of progress is the unfolding of endless layers of surprise. What constitutes surprise can, in itself, be rather surprising, too. What do we really imagine, for example, would amaze, really *astonish*, somebody from a hundred years ago who visited our world? The probability is that it's not what we would immediately expect, the massed ranks of gizmos and technologies, but the more fundamental, everyday changes we take for granted."

Jonathan Margolis
A Brief History of Tomorrow
(2000)

NEWSBRIEFS

SHAPING THE NATIONAL HIGH-TECH AGENDA

The high-tech industry trade group AeA (formerly known as the American Electronics Association) recently released a list of what it considers the top public-policy issues. The report found a clear need to improve high-tech education in U.S. undergraduate institutions and noted that the "decline in high-tech undergraduate degrees, in short, is a critical problem that jeopardizes the long-term health of the industry." The report also called for the continuation of the moratorium on Internet taxes and a uniform online privacy standard. Among the recommendations the AeA made to the President and Congress was a call for block grants to provide schools with more funding, especially in those areas that may not be able to afford the latest technology.

(Edupage, January 31, 2001, citing Reuters, 31 January 2001.)

BUILDING BLOCKS FOR STANDARDS IN DELIVERY OF ONLINE COURSES

Education experts agree that the real advances in online learning will come about in small pieces: the quizzes, simulations, and graphs that professors can use in the classroom. But first, we need standards for creating and transforming those pieces. Children's Lego blocks are a simple way to think about the process. Each individual object or course needs to fit with other objects—and to work with different learning management systems. Several organizations are at work on this, including the AICC and IMS. Vendors such as WebCT and Blackboard are also behind the effort. A boost for standards may come from the Department of Defense, which wants to put 30,000 courses online—and has the economic clout to enforce its choices.

Abstract from "Building Blocks," *University Business*, Volume 4, Number 1, February 2001.

INTERNET POPULATION CONTINUES TO GROW RAPIDLY

The changing online population: It's more and more like the general population. During the second half of 2000, when much attention was focused on the struggles of dot-com firms, the overall Internet population continued to grow at a healthy clip as women, minorities, those earning between $30,000 and $50,000 flocked online, and parents with children at home flocked online. In fact, there were substantial gains across the demographic board as millions of newcomers joined the online world and millions of others expanded the activities they perform online.

The increase in online access by all kinds of Americans highlights the fact that the Internet population looks more and more like the overall population of the United States. However, there are still some notable demographic differences when it comes to access.

"More online, doing more," Pew Internet Project, February 18, 2001.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

The Subject of IT...

continued from page 1

the share of institutional resources that now go into IT and how that (growing) share affects other things they value, like library acquisitions, classroom and laboratory upgrades, salary and benefits—to cite just some obvious examples.

Campus administrators need to understand the impact of IT on all aspects of the institution's life, including that of its students. Policy skirmishes over bandwidth usage, pornography, and harassment via e-mail in recent years give a sample of difficult ethical and legal matters for which there is really no community consensus.

The need for teaching

We usually think of "teaching" in the IT user context as analogous to "training" but that is not the real need for a range of issues that go beyond how-to instruction. In the academic curriculum, teaching is more than just delivery of established wisdom; it is also probing, reflection, research, consensus-building, development, change, and discovery. All of these activities are needed and overdue as we try to understand IT and its place in the academic enterprise.

A more "academic" way of thinking about IT in the educational setting would have practical, immediate benefits as well as long-term value. Even raising awareness of technology as a subject worth thought by people who do not identify themselves as technology specialists would be useful. It is hard to reconcile the scope of IT usage with its very low profile across most of the curriculum. Most people have no idea how a campus network, for example, works and so do not have even a rudimentary grasp of what it means to be part of an electronic community—until it breaks down or brings unwelcome intrusions on their activities. In the short run, it would be beneficial to know the comparative impacts of different network activities. That knowledge would put some factuality and reason behind usage guidelines and also help the campus community move in the direction of better-informed individual behaviors. We made similar efforts in the 1980s on energy conservation and in the 1990s on materials recycling. Those are practical but minimal contributions to better understanding; they would also set a base for something like a conceptual ecology of information technology.

In the academic curriculum, teaching is more than just delivery of established wisdom; it is also probing, reflection, research, consensus-building, development, change, and discovery. All of these activities are needed and overdue as we try to understand IT and its place in the academic enterprise.

The last thing the college and university curriculum needs now is the addition of a new, massive thematic category. For that reason alone it would probably be better to think about infusing the IT subject content into disciplines and courses that already exist. And it would also be unfair and unwise to rule that these topics belong exclusively to computer science—which on many campuses already makes some effort to work this ground. We have realized that writing is not just the purview of the English department, and so we should understand that IT is wider than computer science.

Academic impact

In all academic disciplines some common needs are raised by the extensive use of electronic sources of information. How are scholars to assess their information sources? The ease of copying and excerpting information makes distinction between original and derivative sources more difficult than for paper sources. The widespread use of abstracts in lieu of full text (which if available entails further steps to acquire—and often payment of an access fee) probably contributes to intellectual short-cuts and superficial use of sources.

When good information is found on the Internet, what permanence does it have? Scholarly information on paper has a longevity that can lead us to make unwarranted assumptions about similar information found in electronic form. If you find something once, can your readers find later, too?

Review and vetting of information in the online environment is nothing like that in the world of printed materials, but this difference is not readily apparent. And because most of the online materials are accessible without the mediation of faculty or librarians, students are left to make their selections without the guidance they do get with printed sources. From the faculty view, the prospect of students finding and using elusive information can be unsettling: how are they to know what those sources really are? And when Web searches can turn up

continued on page 6

On February 15, 2000, Educause announced the release of "eduPerson," an information-directory standard specific to higher education. Excerpts of the press announcement are reproduced here. The full document is available online at http://www.educause.edu/news/2001/02/eduperson.html. Also included here are excerpts from Internet2® briefing materials on projects related to directory construction: Directory of Directories and Shibboleth.

eduPerson

A joint working group from Internet2® and EDUCAUSE has announced the release of "eduPerson," a key building block for services that provide seamless access to network-accessible information regardless of where or how the original information is stored. Widespread adoption of the eduPerson standard in institutional directories will enable a broad and powerful new class of applications to be deployed across higher education.

"This is the first step in building an environment that opens new dimensions for sharing information across organizations," said Keith Hazelton, Senior IT Architect, University of Wisconsin-Madison.

The eduPerson specification provides a set of standard higher-education attributes for an enterprise directory, which facilitate inter-institutional access to applications and resources across the higher education community.

For example:

•A faculty member teaching a class at one institution would be able, through a brief series of pull-down menus, to authorize access to the class Web site for students who are enrolled in a linked class at another institution.

•An institution could agree to license a database for students in a particular school, and then use attributes within eduPerson to implement the access controls.

•Scientific researchers could reserve specialized computing resources at distant locations using local services.

•A directory of directories within higher education could be created, allowing a user to search effectively and simply through multiple institutional directories in parallel to find public information for a particular person.

> *The eduPerson specification provides a set of standard higher-education attributes for an enterprise directory, which facilitate inter-institutional access to applications and resources across the higher ed community.*

The development of eduPerson has been assisted by technical expertise from the lead IT architects of universities such as University of Wisconsin, Georgetown University, the University of Washington, and MIT. EDUCAUSE and Internet2® are providing operational support and serving as an interface with other communities of interest within higher education. Keith Hazelton, University of Wisconsin, leads the project team. Other institutions that contributed significantly to the work leading up to version 1.0 include: Brown University, Carnegie Mellon University, the University of Memphis, Michigan Technological University, Penn State, Tufts University, the University of California Office of the President, the University of Michigan, and the University of Southern California.

Directory of Directories

The Directory of Directories for Higher Education, a project of the Middleware Architecture Committee for Education(MACE), is investigating technology to support inter-institutional directory searching.

Major project goals are:

•To investigate and develop a service for directory searching, otherwise referred to as a "Web of People."

•To employ the use of other MACE-related activities and infrastructures where appropriate. These include: the Internet2® Middleware Initiative and its work regarding the understanding and definitions of institutional identifiers, authentication schemes, and registries of people data; the eduPerson object class definition for inter-institutional resource sharing and common data descriptions; the LDAP-Recipe to define and develop thoughts and methodologies towards the more uniform configuration and deployment institutional directory services.

•To allow each institution complete control over the data and the privacy issues concerning that institution.

•To document thoughts, perspectives, progress, methodologies, failures, discoveries, etc. of this project to better explain the happenings.

•To work with appropriate international experts to foster interoperability ad alignment with similar initiatives.

•To make such a service real for the world-wide academic community and influence how such services would be deployed in the commercial sector.

Middleware defined

Middleware, or "glue," is a layer of software between the network and the applications. This software provides services such as identification, authentication, authorization, directories, and security. In today's Internet, applications usually have to provide these services themselves, which leads to competing and incompatible standards. By promoting standardization, middleware will make advanced network applications much easier to use. The Internet2® Middleware Initiative (I2-MI) is working toward the deployment of core middleware services at Internet2® universities.

Shibboleth

The goal of this project is to create cross-institutional authentication and authorization services on the Web. It will focus on a relatively "simple" need: to share a Web page (or CGI service) with individuals or groups from various institutions, using the credentials and directories of their respective institutions.

This project will prototype or complete an implementation that satisfies this "simple" need. For example, if gettes@georgetown. edu tries to authenticate to a Web page at the University of Washington, he will be challenged for credentials, and use his email address, Kerberos principal, or X.509 certificate, along with related material (password, tickets, etc.). The Web server will then use known authentication techniques (such as userid and plain-text password, Kerberos, LDAP and PKI) as appropriate to authenticate against his home institution, and will grant or deny access to the page.

Authentication defined

Authentication is the process of establishing whether a real-world subject is who or what its identifier says it is. Identity can be proven by something you know, such as a password; something you have, such as smartcards, challenge-response mechanisms, or public-key certificates; or something you are, as with positive photo identification, fingerprints, and biometrics.

> *Authentication should be accessible to any application that wants to use the service. Implementing single sign-on, to whatever extent possible, has real benefits to both users and the overall IT environment.*

Authentication should be secure. It is the service that enables all activities in the networked world. Authentication should be accessible to any application that wants to use the service. Implementing single sign-on, to whatever extent possible, has real benefits to both users and the overall IT environment. Authentication should be efficient; it should not tax the resources of either the system or the user. Authentication should be effective. Applications should not have to be customized to use alternative authentication schemes.

Authentication technologies

A significant number of schools use Kerberos as an authentication tool. Kerberos has the advantages of encrypting passwords and enabling some degree of single login. This can be done using Unix-based ids as the principal id. DCE and Windows 2000 use forms of Kerberos as well. There are other schemes, such as SSH, that can encrypt passwords. Digital certificates may also be used as an authentication option. For example, SSH has an agent mechanism and allows the use of public keys in place of encrypted passwords. Used this way it can do single sign-on for login sessions, and possibly for other sorts of sessions as well. However, use of public keys and certificates requires campuses to provide all the rest of the services that comprise a public key infrastructure.

Authentication techniques such as smartcards and biometric devices are rapidly developing but still immature. They incur significant expense with specialized hardware needed at each keyboard. (Although some new smartcards can be plugged directly into USB ports.)

Among the many resources and services that require authentication is the directory. At the same time, the directory can be the repository for much authentication information, including digital certificates and passwords. This intimate relationship between directories and authentication necessitates a coordinated development of the two services.

See: http://middleware.internet2.edu/core/authentication.shtml ■

continued from page 3

hits in either feast or famine, how is a researcher to know when the result is truly representative? The kind of orientation that a library bibliographical training session provides does not suffice for these problems; students and faculty working together over time will eventually set new standards and good practices.

Organization of retrieved electronic information presents another set of challenges for which there are not yet good answers. Some form of "bookmarks" or "favorites" is probably the most common way of coping with keeping track of sources. Three-by-five cards were never an ideal organizational medium, but they did have rather good permanence and durability. It is also likely that page prints from Web browsers are the common answer to the problem of preserving documents encountered in electronic form.

Databases (bibliographical and general) have simply failed to catch on among academics, which has to lead us to wonder how meta information for online materials is being conserved by those who retrieve them. Persistent URLs and other means for conserving the access trail to networked information might someday alleviate this difficulty, but we are not likely to see those capabilities soon. So practical, short-term approaches to organizing retrieved electronic information remain for now improvised and idiosyncratic; academic practice has yet to notice this vulnerability to information loss.

IT and changing social roles in education

Classroom faculty and their allies in the library used to have more control over the information sources their students consulted. But the self-service model of the Web is rapidly ending that regime. Students now exercise much more independence in where they find resources to complete course assignments. That loss of authority is almost certainly irreversible. The new reality is a shift of social roles, where students are far less constrained in choosing the information they use to complement what the instructor brings to a course.

Students are also increasingly able to choose peers with whom to collaborate as they work their way through a course. E-mail makes it quite easy to build a network of social and academic correspondents far beyond the home campus, let alone the enrollment in a class. An instructor really can no longer presume that at most a few classmates constitute the assistance a student might find during a semester. That aid can range from a "borrowed" term paper to conversation about the content of the course. The explosion in "information" is paralleled by a comparable expansion in the scope of peer contacts that students build during their college years. That this should escape the notice of teachers and not be incorporated into approaches to instruction is unfortunate. Here, too, is an opportunity to make electronic community a subject of exploration in courses, rather than leaving "outside" a kind of gray market of knowledge at the edge of educational awareness. The campus is now just a starting point for students in their contacts and communications.

The kind of orientation that a library bibliographical training session provides does not suffice for these problems; students and faculty working together over time will eventually set new standards and good practices.

IT usage and impacts

Campus network administrators have learned only too well that a few very high-bandwidth user sessions can saturate as much bandwidth as is available. Technological countermeasures are time-consuming and ultimately ineffective or even provocative in the view of those with the time, talent, and inclination to get into a contest over them. There is a rapidly growing gap between the official rules for computing and network usage (minimal as they are) and the actual behaviors of people in every segment of the campus community.

One of the illusions that the current network environments on campuses foster is that each user is an isolated individual in the local context but with connections to everyone else, usually thought of as "out there." The notion that one person's network applications and usage patterns would affect others in the home environment typically goes unrecognized. In this context it is very difficult to set usage guidelines that will carry genuine support in the campus community or that can be enforced.

A network looks astoundingly different when viewed on a traffic-analysis monitor. Aggregate impacts and individual usage spikes give a view sharply at odds with the delusion of isolation, anonymity, and

secrecy that the user community holds. This gap in perception is widening dangerously, with the potential to pit IT staff against the users resulting from the breakdown in shared perspective and knowledge.

How different might the picture be if the gap were narrowed? Making usage graphs available online, with appropriate captioning, is one way to fill in for users the information they do not now have. But still, many people will not find their way to those displays or find that presentation compelling. More extensive encounter with the realities of networking would have to be devised in order to raise awareness usefully. Making network usage intrinsic to coursework across the curriculum could set the stage for realistic assessments of usage impacts and costs and benefits.

Technological awareness

Yes, the only constant is change, and so the educational task is not just a matter of explaining today's IT facts and issues. Too often the pace of change and the difficulty of forecasting are used as excuses for not trying harder to keep the community informed about the nature of the technology in place, or soon to arrive. Much could be gained from a better and more widespread appreciation of the comparative rates of change. PCs, for example, are nearly ubiquitous but are evolving not nearly so fast as the smaller, cheaper hand-held devices, which might soon overtake them for many information-utility tasks.

Futurology is risky but can be made less so if the current picture is drawn more clearly. We can be concerned less with predicting when and how palm-top devices will replace PCs than with looking at how many are in use already and how well or poorly they fit into campus IT services and awareness. The prospect of information appliances that can actually be taken and used everywhere is sufficiently intriguing to warrant better visibility—and not become something that overtakes the unaware.

Turning from hardware, the current nature and future directions of Web search engines stands out as another technology whose details have a much stronger effect on academic work than is recognized. Search software is now usually a combination of several technologies and strategies—all of which influence the outcomes of searches. While these tools become ever more essential to coping with the information explosion, how they actually work and what implications their construction has for our work is largely ignored. Their ease of use (and the availability of alternatives when we are not happy with the results from a particular engine) makes us entirely too complacent about how they work their "magic." The challenge for educators is to figure out how differences in things like retrieval and indexing techniques affect search results.

Law, ethics and IT

If better understanding of IT can be developed in higher education, the important legal and ethical issues already upon us can be addressed more reasonably. Censorship, filtering, and restraint/denial of access are repeatedly raised as remedies to problems real and imagined. Once they are proposed, the discussion becomes hopelessly polarized. The danger is in making drastic decisions on criteria that are incomplete and premature. Matters of intellectual property are even more difficult and profound to consider. One of the best potentials in IT is to ease the division between givers and takers of information, but to achieve it we will need a much better exploration of the IT context of knowledge. ■

"Artificial life is just one of the fields that is helping us step down from the pedestal by showing us just how much we have in common with every other living thing on this planet and perhaps on other ones too."

Mark Ward
Virtual Organisms (1999)

In Future Issues

- *Approaches to network authentication of users.*
- *Student services and information online.*
- *New infrastructure for IT-based instruction.*

EDUTECH RESPONDS

Q. What questions about information technology are prospective students and their parents asking today as they evaluate colleges and universities?

A. *The question is easier to answer in terms of what questions we who know campus computing environments know they should ask. Over-all, students coming out of high school or from a work life seem to expect ISP-like service when they reach campus. Despite the complaints one hears often enough about ISPs, they generally provide a low-visibility, utility-like service to computer users. Perhaps for this reason students may be unprepared to ask questions about campus network performance; they might also not know to ask about usage rules, on-campus sources of user assistance, or questions about how much technology is available and used in classrooms and labs. Most students have had prior experience with e-commerce via the Web and are likely soon to begin asking informed questions about whether the institution conducts student administrative business in that way also. And, as long as high school introductions to computing focus on keyboarding, students are not likely to come to higher education with the expectation that they will need training in order to acquire skills beyond word processing and Web surfing. For suggested questions for prospective students, see EDUCAUSE's "Guide to Evaluating Information Technology on Campus."*

Q. Is there any indication that students who are in a position to choose between going to class in person and taking that course electronically instead will choose the online version.

A. *While there is not a great deal that is documented on this topic, there are some indications that we should not assume students will always think being there in person is better. We tend to have a complacent assumption that sitting in a classroom is invariably more personal or direct than any form of electronic contact and communication. If the class is large, the classroom experience is not likely to be intimate. E-mail and threaded discussion forums might actually improve the degree of connectedness missing in large classes. On the other hand, some students might prefer to take some of their courses over the network, reserving the choice about when being there is distinctly better. Of course, part of the answer is to experiment with electronic extensions to basic classroom-centered courses and so avoid the all-or-nothing risk.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

THE EDUTECH REPORT

March 2001

Volume 16
Number 11

The Education Technology Newsletter for Faculty and Administrators

Technology and Unrest in Educational Institutions

If the trend toward online education carries as far as the most optimistic predictions, will there still be schools—including colleges and universities—at all? These institutions have proven sturdy survivors of changes and upheavals of all kinds. The safe bet would be that they will evolve and adapt to the impact of telecommunications, too. Information is, of course, available in overwhelming quantity outside the scope of institutions of higher education. But that has been true since probably the middle of the nineteenth century, when printing for the mass market began. Will the twenty-first century see a comparable revolution in the sources of instruction available to people? If so, will educational institutions still be the providers? In an era where information technology so readily flows outside traditional, institutional boundaries what will they provide that will warrant their continuation?

Assuming online, technologically-mediated instruction is an acceptable mode of education (although that is a discussion not universally viewed as finished), where is it leading us? So far, it has not established itself by any measure as an enterprise able to sustain itself economically, let alone drive bricks-and-mortar institutions out of business. It is too soon to know whether providers of this form of education that are not schools, colleges, or universities will be able to establish and sustain themselves. There is not yet any indication that providers of instruction who are not part of corporate or institutional organizations can thrive independently. The ever-growing cadre of adjunct instructors in higher education still depends almost entirely on finding employment

continued on page 3

"I'm an anthropologist, and I came into the technology part because I saw the way it was going to be a good resource for people. We have a number of people like that who are able to work with the I.T. people and say, 'Here's what an educational environment should have.' Very often, that's not there. You've got people doing their tech stuff, and you've got people doing their educational stuff, and they don't even know how to ask the right questions of each other.... It's like two different cultures trying to communicate...."

Brian Donohue-Lynch
"Logging in with ..."
Chronicle of Higher Education
February 20, 2001

NEWSBRIEFS

ARIA DATABASE

Designed and maintained by Robert Glaubnitz for both singers and fans, this site indexes information on over 1,200 arias from 170 operas, offering some 380 translations, 1,000 aria texts, and 233 MIDI files. Visitors can undertake a quick keyword search from the splash page or proceed to the main page for advanced searches and browsing by alphabetical entry or resource type (translations, MIDI file, operas, etc.). The entries are cross-referenced, and most include links or information on finding recordings and related materials. Also included on the main page are a what's new listing and a collection of briefly annotated links. See: http://www.aria-database.com.

From the *Scout Report*, Copyright Internet Scout Project 1994-2001; http://scout.cs.wisc.edu/.

MAKING WEB SITES ACCESSIBLE

Dr. Cyndi Rowland has written a white paper on the accessibility of college and university web pages for users with disabilities. Providing an accessible website is crucial because it permits students with disabilities a more level playing field than before. It is also by far the most economical means to provide materials in an alternative format for students with disabilities. There is also an increasing number of cases being investigated by the Department of Education Office for Civil Rights, which contends that accessible information is as important as accessible buildings.

The Federal government and numbers of state governments are passing fresh legislation underlining the necessity of providing materials, especially educational materials on the web in accessible formats. See http://www.webaim.org/ articles/whitepaper.htm.

From AAHESGIT-A65: Equal Access to Technology, March 2, 2002.

A FIELD GUIDE TO THE DOT-COMS

The last few years have seen a proliferation of companies that promise to help universities get into electronic education. From software providers to courseware designers to companies that market your courses for you, they all have two things in common: they are young and rapidly evolving, and they are hard to tell apart—even their names tend to be indistinguishable.

If you cannot remember whether it is eCollege that puts your courses online and eAcademy that resells them or vice versa; or if you despair of ever being able to tell the difference between, say, eKnowledge, FTKnowledge, and JonesKnowledge there is now a field guide.

Angela Chnapko, "A Field Guide to the Dot-Coms." *University Business*, March 2001.

The EDUTECH REPORT is published each month by EDUTECH International (**http://www.edutech-int.com**), 120 Mountain Avenue, Bloomfield, CT, 06002-1634; (860) 242-3356. President and Publisher: Linda H. Fleit (lfleit@edutech-int.com). Managing Editor: Thomas Warger (twarger@edutech-int.com). ISSN #0883-1327. One year subscription, $97. EDUTECH International also provides consulting services, exclusively to higher education.

continued from page 1

in traditional institutions of learning. A few faculty have left their academic employers to try an independent existence as teachers, creators of instructional materials, or explorers of new technologies and pedagogies. But they are now still pioneers, and it could be argued that much of what they take with them on leaving—courses, syllabi, materials—still bears the stamp of institutional origin. As a result, what outside-the-walls instruction there is looks very much like the "inside" original, only transposed in medium.

Other modalities

What forms might some alternative modes of education take? Answering this question helps us identify the competitors and assess how successful they are or might become in the future.

The oldest options are still possible: tutored or self-education. These options pre-date institutions of learning, but for obvious reasons are practical for only an elite few. Of necessity, our concern is with mass education. If access to information were the core of education, we might expect IT to be a boon to self-instruction, and public libraries would have made self-instruction the dominant approach a long time ago.

Home schooling is receiving some attention as an alternative for families unhappy with public schools. In this scenario, the family essentially agrees to supply a framework of shelter and discipline to replace that provided by the school. For home-schoolers, IT-based materials and communications do seem to lessen somewhat the isolation from resources normally aggregated by educational institutions. Still the appeal of home schooling appears limited in scope and not an appreciably more viable alternative than self-instruction or tutoring—from which it is in fact little different.

An option on the increase at the primary and secondary school levels is the alternative school. These might be specially-created schools within the public system or free-standing and outside that structure. These "charter" and private schools might receive a stronger financial impetus if some form of voucher funding comes out of the politics of school reform. The availability of IT-based information and communication undoubtedly lessens the operating costs.

If access to information were the core of education, we might expect IT to be a boon to self-instruction, and public libraries would have made self-instruction the dominant approach a long time ago.

Cross-over between high schools and higher education is another trend on the increase. Students are taking college or community college courses while completing their senior year in high school in some communities. The practice is mostly limited to commuting to the college campus for those courses. So far, there is little evidence of online higher education courses providing the alternative. How successful advanced high school students might be as consumers of online college-level courses would be an interesting test of the boundary between high school and higher education.

That alternate forms of schooling should be more prevalent for pre-college and university education has a number of explanations, but one not often mentioned is that the main business of assigning credentials in education has moved to colleges and universities, which now provide the entry-level degree for much of the workforce. In part, the controversy over the role of new, standardized tests in public schools is a conflict between the public policy and institutions of higher education, based on concerns that college admissions standards are no longer the guide they once were. But to some degree, the public believes that competency-based assessment is more appropriate for the times, given the skills demanded by the workplace and the fear that failure to improve education could lead to loss of prosperity for the whole society.

Strain in the schools

High school seniors often carry less than a full load of courses, a curious development at a time when in the wider public few people feel adequately educated—particularly with regard to their prospects for work and career growth.

Colleges and universities complain that high school students could be better prepared for further study, which only sharpens the questions about the light senior year in high school. Despite some opportunities for high school students to begin early on higher education coursework, the articulation between these levels of education is not good. If preparation for college or university study is not a sufficient guideline for schools for those students who go on

continued on page 6

Does ASP Make Se

The ASP (Application Service Provider) arrangement is an intriguing way of outsourcing certain parts of an organization's IT operation, with the promise that it will save the organization money in the long run. These arrangements are relatively new to higher education, but virtually every top-tier higher education software vendor is scrambling to arrange for a partner or other means to provide ASP options for their clients in light of the possibility that ASP may be a cost-effective solution.

ASP arrangements come in many flavors. For example, an ASP arrangement for a typical college might look like this: Hardware, technical support services, the database management system, and the data would be kept off campus and maintained and supported by an external company, the ASP. All hardware and software would be owned by the ASP. The college would subscribe to the ASP service, paying a monthly fee. The fee would either be fixed or based on the numbers and kinds of users. In effect, the college would be "renting" the application. Users on campus would access the information system either through the Internet or through a private communications network. First-level user support for the system (i.e., problems with it not running correctly) would be provided remotely by employees of the ASP. Not included in the basic ASP arrangement would be services such as implementing, customizing, enhancing, and adapting the system, as well as training and supporting functional users. These services may be available in more extended ASP arrangements, or the college could provide them using internal staff.

The Application Server Provider (ASP) Solution

	Potential Advantages	Potential Disadvantages
Cost	Possibly save money	Actual costs unknown at this time; ASP may not reduce some major categories of cost
Timing	Costs are spread over time	Some plans charge by usage; costs could rise
Staffing	Easier than recruiting in-house technical staff	Overdependence on outside firm
Control	Turn responsibility for operations over to others	Loss of control over level of service
Risk		ASP is untested in higher education; may not match needs

Cost

Most vendors of higher education systems are just now in the process of negotiating with ASP partners and developing their business models for their ASP offerings. Relatively few deals between the software vendors and ASP providers have actually been struck so far. Pricing for the ASP alternative right now is pretty much guesswork on the part of the vendors. Six months or a year from now, this will be much better known.

Even knowing the price of the ASP services, it is difficult to calculate the impact it would have on the cost of the overall project. Implementation of a new application system, for example (a time when an ASP arrangement is most often considered), would require a very comparable level of effort from users, applications programmers, systems analysts, and project managers whether the application is hosted by an ASP or not. The savings from the ASP option are in hardware, system support, and other "back room" technical areas.

Even if some savings could be realized on this lower level of serving the technical needs of keeping the platforms and applications running, most of a college's cost is generally at a higher level. A college typically requires outside experts in both the software package and the needs of the functional users. Schools get that from the software vendor itself, from an implementation partner, or from other contractors. This is precisely the arrangement that has proven so expensive. Getting these services from a single firm that is also providing traditional ASP services would not make the professional support services any less expensive.

With regard to outsourcing hardware and servers, organizations can benefit if their current operation is highly inefficient, if they lack a method for financing the capital cost of the hardware, or if operating the hardware is a major distraction from their core business.

Timing

An ASP arrangement can help avoid front-loaded costs and turn the system into an operating rather than a capital expense. On the other hand, ASP prices are typically calculated by the "seat." As a college grows more dependent on its administrative information system and adds more users (including faculty, students, and alumni), and these users become more active, the cost would likely rise over time.

Other financing methods are available for spreading out the cost of the project.

Staffing

One reason that a college might choose ASP is that it doesn't have sufficient technical staff, or is not able to recruit and retain technical talent. The ASP replaces some of the in-house staff; this is an essential part of the potential cost savings. Savings are generated especially when more than one organization can share the cost of a staff member. The drawback is that the customer then becomes totally dependent on the ASP for these functions. Understandably, many colleges might not be comfortable in this position.

Control

It is attractive to think of having the applications work in a turnkey fashion, with all of the headaches transferred to the ASP. The secret of a successful ASP engagement is to work out appropriate Service Level Agreements (SLAs) that spell out how much down time will be accepted, how quickly certain kinds of problems will be fixed, how fast the screens will run, etc. The difficulty is making sure that the vendor is able to fulfill these SLAs and having effective measures to take if the vendor fails to meet the customer's expectations.

One observer has pointed out that the ASP takes on the same level of importance to a company as its bank, but without the same level of regulation that the banking industry works under. Last summer Pandesic suddenly announced it was closing. This company had been started by Intel and SAP to offer ASP services in e-commerce. Pandesic's 100 or so customers found that their SLAs could not force Pandesic to stay in an unprofitable business or to pay for the cost of their transferring to another ASP.

Risk

ASP is untested in higher education, and it may not match the needs well enough in the long run. The core concept of ASP is "one-to-many."

The ASP firm enjoys the cost efficiency of supplying the same application to many customers. This works best in the most basic form of ASP, where the customer's business process is fairly simple and the technical support services provided by the ASP are fairly generic. Higher education falls higher up the scale toward complex, highly customized business processes (especially in the student-information area), the need for knowledgeable, specialized support, and the need to integrate with other applications outside the core information system. That end of the ASP model begins to resemble the form of outsourcing that is sometimes called applications management.

One observer has pointed out that the ASP takes on the same level of importance to a company as its bank, but without the same level of regulation that the banking industry works under.

Forms of outsourcing have been available specifically to higher education since 1968; still today, fewer than three percent of the institutions in the University S. use full outsourcing for their IT operations. Similarly, higher education software providers who went strongly toward ASP in the past did not find much interest. ASP relies on economies of scale, so ASPs will have to generate enough customers in higher education to make that work.

It remains to be seen whether the ideas underlying ASP will prove to be an attractive concept in higher education. Higher education applications, especially student administration and advancement, are probably less cut-and-dried than the applications that have been successfully ASPed or outsourced in industry, such as e-commerce, human resources, and payroll.

Questions

The campus information system is very important to the core business of a college. Schools are also usually very concerned about being able to ensure the quality of service that is being provided directly to the campus users and giving the campus users a large measure of control over the system. Turning the operation of the system over to an outside company raises questions such as: Who will decide when upgrades, patches, and fixes are applied, and how will these be reconciled with any customizations that the college has already made? Who will troubleshoot problems that are not the result of flaws in the software, but of mistakes in how the system has been adapted to the college's business processes? If there is a difference of opinion about where the responsibility lies, how will it be resolved? How secure and private will the data be? How will the college continue to function if communication to the ASP is temporarily disrupted? If the ASP goes out of busi-

continued on page 7

Technology and Unrest ...

continued from page 3

to further schooling, what other standard might they use? The difficulty in finding workable alternatives now dominates the growing public back-lash against competency tests, which are vulnerable to criticism because unlike college-admission tests they do not have an obvious purpose beyond increasing failure rates in the name of improving education.

While schools are targeted for "reform," there seems not to be any discernible interest in changing modes of instruction, except in the case of home schoolers. While IT infusion for schools has been intensive in the past few years, nobody is suggesting that it replace the traditional picture of students in classrooms. IT is basically an add-on in primary and secondary education, and students are more likely to experience it as an alternative means of learning when outside school, at home.

Strain in higher education —— In higher education the signs of strain with regard to the durability of institutions are coming to light in numerous contexts.

Cost pressures are growing, especially for students at public institutions. To a degree largely unknown by those students and the general public, the costs of student financial aid and of technology have been leading contributors to rising tuition and fees. Colleges and universities struggle to buffer the effects of cost growth by making more financial aid available and see their operating costs increase as they, like the schools, try to treat technology as an add-on. There is little interest in using technology investment as a lever to drive down other areas of cost—particularly in personnel. And so, at the heart of the cost-increase problem is a genuine reluctance to change the methods, productivity, or the cost structure of the institution.

Issues have also arisen in the demographics of colleges and universities. Students generally have some degree of choice of institutions and so keep alive a corresponding degree of competition among them. Student populations are fairly mobile within geographic regions and even over wider distances, indicating substantial latitude to respond to differences among colleges and universities.

> *By and large, faculty are hard-pressed just to withstand increasing workloads, caught between the need to be more productive and the professional uncertainties entailed by any major change in how they conduct instruction.*

For faculty, the shift to reliance on adjuncts has weakened their power within the institutions by restricting their occupational mobility. They have been relatively passive with regard to the transformative potential of information technology in education. By and large, faculty are hard-pressed just to withstand increasing workloads, caught between the need to be more productive and the professional uncertainties entailed by any major change in how they conduct instruction.

Colleges and universities face a potentially combustible combination of restive students and paralyzed faculty. So far, the tension between faculty and students has been contained by the institutions. The equilibrium could be upset if information technology should emerge as an enabler of student choices. Faculty are discovering that IT threatens to increase their work loads and to shift influence to the students. On-line instruction, even where it is an extension of traditional classroom pedagogy causes teaching tasks to spread considerably outside class hours. The professorate is in fact just about the last workforce not yet dealing openly with issues of productivity—the drive to accomplish more work with the same level of resources.

Potential breaking points —— Despite the failure of commercial providers to make inroads at any of the levels of institutional education, they have at least theoretically the potential to provide a future realignment of interests between students and faculty. Schools, colleges, and universities could be vulnerable to cost-based competition because of their large fixed costs for physical plant, staff, libraries, and now IT infrastructure.

But students continue to have little experience or thought of education outside an institutional setting and show little sign of seeking changes. In fairness to them, however, we should note that they would face the burden of testing the value of new educational credentials. Still, will they remain indefinitely within the institutional fold? Regarding faculty, at what point might they decide that commercial or alternative institutions offer them a better outlet for their work and a greater degree of control over their role in the educational process? **TW**

Does ASP Make Sense For Your School?...

continued from page 5

ness, or if the college decides to switch ASPs, how will the college's data be extracted and moved to the new system?

Other considerations

There may be a very specific disadvantage for a school that already owns its administrative software. In the primary ASP model, the ASP owns the software and the customer leases it. In the case of a college that already "owns" its software, the standard business model that ASP operators have worked out won't apply. In this case, the college would have to forge its own deal. Assuming that some kind of deal could be worked out to license back the software to the ASP operator to run on its servers, the parts that would remain would be hardware and support. This arrangement would probably reduce the financial benefit from the ASP model.

Furthermore, most administrative systems today are not ready to use "out of the box." Power and flexibility on the one hand, and at least in some cases, the immaturity of the software in the higher education arena on the other, may combine to require much adaptation and setup during implementation and after. This makes it an even bigger stretch for the concept of one-to-many ASP delivery.

Summary

The ASP alternative may not radically shift the economics of the situation that many colleges face today. Despite that, and despite the many open questions that remain about the ASP model for higher education, there is enough potential value in the ASP approach to make it possibly viable for the future. Certainly any college going through a software selection process today should ask each software vendor to supply information about its ASP offerings. Although ASP is relatively new for this kind of application and it will be difficult to determine in advance whether the quality of service, response time, uptime, and other factors will be satisfactory, there is enough potential benefit in an effective ASP arrangement to make it worth serious consideration. **LF, JS**

"In working with faculty, administrators, and students, I find so many times individuals and organizations need more support with dealing with and recognizing their attitudes and perceptions than the specific training and new knowledge 'we technology enthusiasts' believe is important (no offense intended). In ourselves, our groups, and institutions, we must balance getting things done and concern for others, giving directions, eliciting others' opinions, being independent, yet being a team member and player. In other words, if we want faculty and administrators to support new directions and ways of thinking, we must find ways to balance the dimensions of individual and institutional power and community in order to promote flexibility, so that in any given situation, they feel ownership in the process."

Joyce Pittman
University of Cincinnati
Posting to the PT3 listserv
Preparing Tomorrow's Teachers to Use Technology
February 22, 2001

Let us know...

*Please contact us if you would like to reprint or republish an **Edutech Report** article. You may e-mail us at reprints@edutech-int.com or call us at 860-242-3356. We are also glad to have comments or questions from readers.*

EDUTECH RESPONDS

Q. What measures can we use to help us evaluate the effectiveness of the campus IT help desk?

A. *Among the common metrics, one often hears that a resolution rate of sixty or sixty-five percent on the original call for help is a kind of gold standard. But this and other statistics (numbers of calls, average time to resolution, etc.) can be misleading. For one thing, some kinds of calls—printer trouble-shooting, for example, should probably have a much higher fix rate on the first call for help. The reasonable expectation for really unique, "interesting" problems of the kind you get from people who are normally highly self-reliant and only call the help desk when those rare and difficult problems crop up is bound to be low. Is that a bad thing? And what about questions having to do with non-standard platforms (that OS2 computer that failed to re-boot after a power outage) or specialized applications (that simulation for testing the tensile strength of bridge girders)? The standard help desk metrics might be complemented by asking some different questions. How many calls are about software or hardware not officially supported? What do we do in those instances? And, who actually manages a problem report through to resolution? If it is the help desk, that is the right answer. If it is the user, then that is a throw-back to before help desks were invented and when computer users had to be self-supporting or persistent in nagging.*

Q. We are discovering that various media (audio and video tapes, slides and digitized images, for example) are kept in a surprising number of unrelated places around campus. This must be wasteful and ineffective. Does everyone face this problem?

A. *Yes, they do. Take the example of video cassettes. When those were a new technology they proliferated on campus faster than people's realization that these objects were not terribly different from books with regard to how one houses and circulates them. So, a large number of them ended up in the library. But a much larger number were still bought and held by individuals (faculty), departments, and other organizations not the library. Now with the passage of time and the experience of how onerous it is to care for those things when that is not your job, people are looking around for someone else to take on the "librarianship." Centralizing these collections should save on purchase duplications and handling costs.*

EDUTECH INTERNATIONAL
Providing Information Technology Services to Higher Education

EDITORIAL OFFICES
120 MOUNTAIN AVENUE
BLOOMFIELD, CT 06002

FIRST-CLASS MAIL
U.S. POSTAGE
PAID
Bloomfield, CT
Permit No. 117

Joan Kad
ERIC/IT
Syracuse University
621 Skytop Rd, Ste 160
Syracuse, NY 13244

printed on recycled paper

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☒ This document is covered by a signed "Reproduction Release (Blanket) form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").