Technology and the Learning Environment: An Interview with Lucinda Roy

Ownership Issues in Online Use of Institutional Materials

Distance Education: Effective Learning or Content-Free Credits?

What Do Information Technology Support Services Really Cost?

Plus:

Developing a Focused Policy Strategy: The Merger of FARNET and NTTF

Guaranteed Access to Campus Network Resources: Policies and Issues

Improve Morale and Reduce Stress: Communicate!
CURRENT ISSUES

9  Developing a Focused Policy Strategy: The Merger of FARNET and NTTF
   by Garret Sern, EDUCAUSE

10  Guaranteed Access to Campus Network Resources: Policies and Issues
    by Ardoth A. Hassler, Georgetown University

FEATURES

15  Technology and the Learning Environment: An Interview with Lucinda Roy
    interviewed by James Roche, EDUCAUSE

19  Ownership Issues in Online Use of Institutional Materials
    by Dan L. Burk, Seton Hall University School of Law

28  Distance Education: Effective Learning or Content-Free Credits?
    by Gregory D. Bothun, University of Oregon

38  What Do Information Technology Support Services Really Cost?
    by Karen Leach, Colgate University, and David Smallen, Hamilton College

VIEWPOINT

46  Improve Morale and Reduce Stress: Communicate!
    by Karen DeMauro, Clarion University of Pennsylvania

GOOD IDEAS

51  Riding the Crest of the E-Commerce Wave: Transitioning MIT’s Campus Computer Resale Operation
    by Joanne Hallisey, MIT

54  Taking Instruction to Where It Will Be Used: Tutoring Faculty in Their Offices
    by Eugene A. Engeldinger and Michael G. Love, Carthage College
There are two articles in this issue that underscore the relevance and importance of the recent CAUSE and Educom consolidation. The first is a message from EDUCAUSE President Brian L. Hawkins, who outlines the direction and goals of the organization. The second is a piece on another consolidation that will have a great positive impact on everyone in information technology in higher education—I’m referring to the article by Garret Sern on the merger of FARNET and NTTF.

The importance of the Hawkins piece is that it begins to answer many of the questions that surrounded the consolidation of CAUSE and Educom. The past several months have been a time of reflection and anticipation, not just for the EDUCAUSE staff and board, but for the membership and information technology community as well. Questions have been raised about what the new organization should be; how it can best represent its constituents; which programs, products, and services are still viable, and which may no longer serve the purpose for which they were created. Issues of institutional representation, conference structure, and dues rates have also been at the forefront of everyone’s thoughts about the consolidation.

In his article, Hawkins spells out the important issues, how they’re being handled, and what members can expect from EDUCAUSE. The association has already begun looking at every facet of its structure and will continue to do so in the months ahead. The consolidation presented the organization with a terrific opportunity to evaluate its products and services. Hawkins notes where that’s being done and what members can expect down the road. As the headline says, he is “charting a course” for EDUCAUSE, determined to create and maintain an organization that will help its members cope with the rapid and unprecedented change that is so much a part of higher education today.

Sern provides us with a view of other important changes affecting the organization as he outlines the consolidation of FARNET and NTTF and what it means to members. In short, it gives the organization a strong networking policy arm. With so much happening in the policy arena these days, it is critical for EDUCAUSE to have a strong representative voice in Washington. The name for the newly formed policy group is Net@EDU. Sern gives us a brief history of the two organizations, but most importantly helps us understand the important role Net@EDU will play for EDUCAUSE.

As Sern points out, “The new policy team will concentrate on researching and communicating Internetworking and telecommunications issues and will work to develop coherent policy networking strategies that reflect membership needs.” This is another course being charted, and the article tells us why these issues are important and how Net@EDU plans to reach members with information they need. The policy group is already busy hosting and planning conferences for such issues as the very high-speed backbone network (vBNS), discrepancies in the costs of communication services, and a workshop on the next generation of networking.

I encourage you to read these articles and let us know what you think. As a membership organization, EDUCAUSE thrives on your input and involvement. There are many ways to reach us. You can use any of the standard methods of phone, fax, or e-mail, or you can take advantage of two special opportunities and talk with our executive staff and board at the EDUCOM ’98 conference in Orlando in October, or the CAUSE98 conference this December in Seattle. At each conference, EDUCAUSE will have a booth in the exhibit hall where you can meet the staff and share your thoughts and ideas in a personal and informal setting. Not only does this give you the opportunity to learn more about your organization, but it gives us a chance to hear directly from you. If you can’t make it to the conference, give us a call or drop us a line at: 303-449-4430 (voice), 303-440-0461 (fax), or info@educause.edu.

As a membership organization, EDUCAUSE thrives on your input and involvement.
Charting a Course

by Brian L. Hawkins

On July 1, EDUCAUSE was officially launched, creating a single organization to represent the community of professionals interested in the management of information resources in higher education. It was born of the union between Educom and CAUSE, two highly respected and important professional associations which bring more than sixty years of combined service to the information technology community. The new organization was formed with the intention of

• creating a coherent and coordinated set of programs to serve all dimensions of the historic information technology (IT) functions on our campuses,
• providing leadership and a single voice on key policy issues affecting our campuses, and
• developing and enhancing meaningful member services to support the professionals within the membership community.

Over the past decade, virtually all of our campuses have experienced budget reductions, right-sizing, the elimination of duplicated efforts, attempts to create more leveraged resources, and efforts to create the greatest efficiencies possible. As higher education experiences unprecedented pressure for efficiency and accountability, our professional associations should not be exempt from similar efforts. While these pressures for efficiency were part of the rationale for the consolidation, equally important was the desire to leverage and strengthen the programs, advocacy, and single vision of a unified organization. I personally am humbled by the responsibility with which I have been charged to meet this challenge: capturing the opportunities and potential synergies that are before us is both exciting and daunting. In a period of unprecedented change in higher education, of extraordinary technological advances, and with unprecedented and insatiable expectations and demands of faculty, staff, and students on our campuses, the need to serve professionals in the broad area of information resource management has never been more important. In an attempt to meet some of those needs, a number of initial program directions have been identified.

EDUCAUSE will continue an emphasis on professional development. Professional development will be an integral part of EDUCAUSE, and will offer members a variety of opportunities. Already plans are being discussed to enhance the set of offerings available in an institute format, but perhaps more importantly a variety of network-based alternatives are being explored. We have a special obligation to provide our membership with current, relevant, and accessible educational offerings, to foster transformational thinking, and to facilitate professional relationships. As an organization charged with fostering the campus use of new technologies, we are mindful of the implicit obligation to lead by example. We will be exploring and developing ways to support our members' professional development using a variety of approaches, from traditional to experimental.

EDUCAUSE will play an active role in the advocacy of key policy issues that affect IT professionals and higher education in general. A key role for EDUCAUSE will be to educate and influence leaders beyond the higher education community, including those in corporate and government sectors, who have a stake in the information resources transformation that is affecting our campuses. Legislatures at the federal and state levels will continue to develop policies that will affect the use of information technologies at all institutions, public and private. The impact of policy developments will be felt as well at the international level. EDUCAUSE will not only give members a voice with respect to decisions being made, but will keep members well informed.
on these issues, assisting them and their campuses in addressing these issues in a meaningful and appropriate fashion. To achieve these goals, EDUCAUSE will seek opportunities to collaborate with other organizations as well as act independently in serving an advocacy role, influencing these external constituencies. The Coalition for Networked Information (CNI)—a significant collaboration between EDUCAUSE and the Association of Research Libraries—will continue its outstanding catalytic role in addressing networked information policy issues.

EDUCAUSE will keep members informed about IT developments that may affect their campuses. Our members who plan for, manage, and use information resources—information, technology, and services—are challenged to fully leverage the significant investment their campuses have made in them, supporting the growing information needs of staff, faculty, and students while positioning their institutions for the future. EDUCAUSE must keep these members informed of the innovations, structures, and strategies that will allow greater institutional effectiveness and efficiency. The association also needs to provide a forum for dialog between campus information resources managers and campus leaders at all levels, including presidents, provosts, and administrators. EDUCAUSE publications must have a strategy to assist not only the audience of IT professionals but also this broader academic community in understanding the challenges, tradeoffs, and opportunities that new technologies and services can afford a campus. To partially fulfill this need, EDUCAUSE has edited three books that will soon be in production, on IT and the new competition in higher education, on assessing the impact of IT on the campus and planning for the future, and on using technology to renew campus administration. These will be complemented by a monograph series that will deliver information on important and timely topics, including higher education IT policy issues. Finally, we will continue to use and expand the EDUCAUSE Web site as a primary communication/collaboration vehicle for sharing information through online publications and other information services.

EDUCAUSE will facilitate technology transfer through its programs and publications. Recognizing that our members represent a cross-section of the higher education information technology community, EDUCAUSE will make a special effort to meet the needs of the full spectrum of institutions in this organization.

A recent NSF grant has been obtained by the Net@EDU organization (the merged NTTF and FARNET organizations). The grant will allow EDUCAUSE to hold a workshop and to develop follow-up strategies related to transferring the advances developed by Internet2 to community colleges, comprehensive colleges, state agencies, etc. This is all very much in line with the technology strategy that EDUCAUSE has defined for itself, and more of this will be seen in the future. The results of these efforts will then be shared through various EDUCAUSE conferences, publications, and Web information services.

EDUCAUSE will actively engage in projects and dialogs that encourage the appropriate use of technology in teaching and learning. NLII will continue to be an important forum for identifying and working on key issues that affect the meaningful and widespread usage of
customized learning environments for students in today's world. Already the important standards defined by the Instructional Management Systems (IMS) project have made a major impact, and EDUCAUSE will work diligently in ensuring that this and other efforts will continue to support the NLII mission to harness the power of information technology to improve the quality of teaching and learning, contain or reduce costs, and provide greater access. Early EDUCAUSE efforts will focus on measures to attain deeper penetration of the NLII message within and across institutions of higher education. EDUCAUSE will link the NLII to other EDUCAUSE programs, including professional development and Net@EDU, to raise the awareness of information technology professionals and higher education leaders about the new types of support services required to attain the NLII goals. The teaching and learning thread will be woven throughout the EDUCAUSE agenda.

EDUCAUSE will make information and data available to members to provide the basis for assessment and comparison of institutional practices. The CAUSE Institution Database survey and service is being revamped. Revitalizing this research program to capture and provide ready access to the information and data that members need to more effectively manage and plan for information resources is an important challenge for EDUCAUSE. Identification of the most pressing IT issues, and timely capture of and reporting on strategies and practices for addressing these issues, are key goals of the association’s research and development efforts. An important strategy will be to leverage the EDUCAUSE Web site to provide improved information services based on this restructured program.

EDUCAUSE will continue to foster professional interaction through conferences and focused meetings. Regional, national, and international conferences will continue to give information technology personnel from all disciplines the chance to share their knowledge, network with their peers, and interact directly with industry representatives. In the fall of 1999 there will be a single, comprehensive conference. The challenge we face together is to make that conference experience meaningful and personally rewarding to participants, even though it will be a large and complex event. Our plan is to create a variety of conferences within that conference—a smorgasbord of choices—to identify a variety of internal communities with whom attendees can connect. We will also offer a variety of smaller conferences throughout the year in different geographic locations to further serve our diverse communities. Important to this goal is the continued affiliation with EDUCAUSE of a number of very successful events, including the Snowmass Seminars on Academic Computing (SAC), the CUMREC annual conference, and the annual conference of the New England Regional Computing Program (NERCOMP).

Looking back and looking forward

EDUCAUSE has a proud past, but its two parents had different missions, different cultures, and different foci. We are working hard to ensure that the best of these two heritages is preserved, while recognizing that the new entity needs to be more than the sum of its parts. We still have lots to sort out in consolidating these two organizations into one, but the values of the two parent organizations have guided the thinking as to where we are going and how we will get there.

All of this process is a bit ambiguous at the moment, but then so are the worlds of technology and higher education. Perhaps that is one reason we are so pleased with the new logo for EDUCAUSE. What precisely does the “e” stand for? Is it EDUCAUSE? electronic? education? How about all of the above? The ambiguity of both the logo and, more importantly, the issues we encounter on a daily basis as professionals in the management of information technology, is a mainstay of the new reality. Our challenge is to work together to effectively address this professional challenge through our services and programs.

While the launch is now over, the navigation as to where the EDUCAUSE organization will cruise is still to be determined. The crew has now largely been defined, but the role of navigator has not and will not be filled by a single individual. This is a role shared by the EDUCAUSE staff, the board, our members, and the participants in our programs and services.
Reducing the Barriers

by Richard P. West

A tenet of CNI is that data communications networks can have a profound impact on the availability, timeliness, and production costs of scholarly information. The Internet, by gaining widespread acceptance, would allow a single journal article to be shared by all. For current information there would be no need for inter-library loan transactions! Unfortunately, the vision and hope of improved dissemination of scholarly information via the Internet hasn’t yet occurred. What are the barriers that keep us from using the technology to the fullest extent possible?

Not all the barriers are technology related. Today’s networks have difficulty easily transmitting all things that are possible to be placed on a printed page. Images of a certain complexity still aren’t what we need in electronic versions to replace the print medium of the same quality. Most scholarly works, however, can be transmitted without problem across the network. Most of the barriers to improving the dissemination of scholarly material involve economic and security issues, not technological ones.

CNI has looked at the distribution of scholarly information from all aspects, not just technical. A few years ago, a task force sponsored by the Association of American Universities (AAU), with significant CNI participation, looked at the functions of scholarly publishing and how they might be affected by the use of networked information technologies. Many of the functions such as printing and distribution could be done much more easily via the network than through a printed form. Certainly, the speed with which information could be transferred from creator to user could be enhanced substantially by the network. Precisely because of the ease of access and transfer of information, barriers to the use of scholarly information were also enhanced.

In the cycle of scholarly publishing, authors particularly place high value on publishers’ assurance that the author’s work retains its integrity as the author intended. In print form, the publisher creates an article that is not easily modified once published. With networked technologies, the author’s work can be too easily modified and can be misrepresented intentionally or by accident. Also, publishers (and to some degree authors) want to obtain some economic return or payment on the use of the scholarly work. Only from sales do publishers gain revenue to allow for the funding of the publishing process.

The publishing process has several important economic stakeholders: authors, publishers, and the buyers of scholarly information. Most often the purchasers of scholarly information are university and other research libraries. During the last decade, the cost of scholarly journals, particularly in the sciences and technical fields, have increased at a rate faster than inflation. Certainly, university library budgets have not kept pace with the increased costs of the journals and monographs that would keep universities’ libraries current with the information needs of the major academic disciplines. As prices of scholarly journals have outpaced budgets, libraries have had to reduce the number of subscriptions to reduce costs. Those libraries would need to rely on inter-library loans to obtain copies of articles for their faculty and students and move to a pay-per-view approach for funding the information needs of their clientele. Since the dominant amount of the costs in preparing a journal are in producing the first copy of the journal, the total cost of the journal needs to be spread over fewer subscribers. Or in other words—a price increase to the remaining subscribers of the journal. Further, the task force found there were a limited number of journals in the sciences, and most research programs needed the most highly valued journals for their programs. The libraries felt the need to subscribe to a significant core of these jour-
nals, regardless of price. Subscriptions throughout the library had to be rationed to have the same dollars acquire a set of higher-priced journals.

The situation of supply-and-demand relationships in the scholarly journal market did not allow for the wide dissemination of scholarly information. Quick dissemination of information is a particularly good characteristic of the Internet; however, the advantage of the Internet is compromised by the economic barriers. The question became how to create a better market for the publisher, the author, and the universities that buy the peer-reviewed journals.

The Association of Research Libraries (ARL) has designed a project to help create a market in scholarly publishing. Working with publisher partners, the Scholarly Publishing & Academic Resources Coalition (SPARC) will support introduction of new, lower-cost, high-quality scientific journals that are alternatives to existing titles. By switching to the new alternatives, the ninety-four ARL library members of SPARC will create sufficient predictable revenue that the publisher can cover its costs of peer review, editing, and publication. With a more certain market, prices can be lower and price increases more in line with inflation rather than market conditions. The predictable market also allows the publisher to concentrate on shortening the time it takes to deliver information to readers. The first collaborator with the SPARC initiative is the American Chemical Society, which will introduce three new alternative titles over the next three years.

The SPARC project deals with the economic barriers to the distribution of scholarly information. As those problems are addressed, we are in a better position to use network technology to find new ways to store, distribute, and present scholarly information. These types of substantive experiments pave the way to delivering more fiscal and intellectual return on our collective institutional and national investment in data networks. Congratulations to ARL and the American Chemical Society for the first SPARC project. A successful start of the SPARC effort will enable the CNI program to fulfill its potential to our members.

Richard P. West (richard_west@calstate.edu) is senior vice chancellor of business and finance for the California State University System. He has chaired the steering committee of the Coalition for Networked Information since its establishment in 1990.

“...the question became how to create a better market for the publisher, the author, and the universities that buy the peer-reviewed journals.”

Charting a Course

(continued from page 5)

member committees, and most of all the members of this organization ... you!

In the months ahead we will be listening. We are planning a detailed survey of the readership of the Educom Review and of CAUSE/EFFECT this fall, trying to better understand how the membership can be served through the EDUCAUSE print and electronic publications. EDUCAUSE will continue the CAUSE tradition of having an active set of member committees who will be important in advising the management of our association. We look forward to the excellent advice we expect to receive from the EDUCAUSE’99 Program Committee. We will welcome your thoughts, as well, as we conduct a series of focus groups at EDUCOM’98 and CAUSE98 this fall about what you want to see in the EDUCAUSE’99 program. And, of course, your general feedback is always welcome. We invite you to send comments through any member of the staff or through the member committees, all of which are identified on the Web (http://www.educause.edu). You can also share your thoughts via e-mail or the Web, at info@educause.edu or http://www.educause.edu/comments.html.

We have set out on a voyage together, but the final destination has not been fully determined. It is up to all of us to chart the course. I look forward to the opportunity of sailing together.

Brian L. Hawkins (hawkins@educause.edu) became president of EDUCAUSE on July 1, 1998.

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Developing a Focused Policy Strategy: The Merger of FARNET and NTTF

by Garret Sern

Before the July merger of CAUSE and Educom, which created EDUCAUSE, plans were under way to ensure that the organization maintained an effective policy presence in Washington, D.C. In early June, FARNET merged with what was then Educom's Networking and Telecommunications Task Force (NTTF). The new organization, Net@EDU, will act as the networking policy arm for EDUCAUSE.

About FARNET

FARNET and NTTF share a tradition of promoting the development of higher education and public sector networking. Founded in 1987 as the Federation of American Research Networks, FARNET's original mission was to promote the advancement of science and education. It did this by assisting in the interchange of information and research using high-speed communication and related telecommunications techniques. Emphasizing the coordination of regional and backbone high-speed networks, FARNET was a primary information source for the government and industry before the Internet was privatized. It developed into a forum for state networks to share information, enabling them to implement interconnection strategies that best suited their financial resources and geographic challenges.

Beginning in the early 1990s, FARNET hosted a series of workshops on how the National Information Infrastructure (NII) and the Internet might affect the public sector. Workshop topics included: the NII and health care, practical NII implementation issues from the state perspective, developing network partnerships in libraries and K-12 education, and improving the ease and reliability of the operation of the Internet.

In 1995, FARNET opened a policy office in Washington, D.C., to monitor the legislative and regulatory environment, and reported developments to its members via e-mail in Washington Update.

The next year, FARNET received a National Science Foundation award to create a clearinghouse for tracking state-by-state development of information infrastructure. The mission of the States Inventory Project (http://www.states.org) is to promote the exchange of information among state and local policy-makers. The project also aims to facilitate comparative analysis to help states more efficiently develop and maintain their own information infrastructures. The clearinghouse has more than 4,000 entries in its database, divided into nearly 100 categories for each state, territory, and province in North America.

About NTTF

As part of Educom, the Networking and Telecommunications Task Force (NTTF) monitored the pulse of the federal government. Created in 1986, NTTF helps colleges and universities identify and communicate strategic networking and telecommunications policy issues. Most of its members are chief information officers from leading universities.

While FARNET has concentrated on issues related to internetworking, NTTF has (continued on page 45)
Guaranteed Access to Campus Network Resources: Policies and Issues

by Ardoth A. Hassler

Campus constituents have become accustomed to robust access to wide-area and local-area networks in their offices, residence halls, and labs. They expect similar access from home and other remote locations. Technology budgets, if they are growing at all, are not keeping up with the exponential growth in user demands. How is remote access best provided? Participants in a Current Issues discussion session at CAUSE97 in December 1997 in Orlando, Florida, discussed options and issues about providing access to campus resources, and there have been subsequent discussions on the EDUCAUSE CIO electronic discussion list. The options discussed include departmentally owned modems, university-owned modems, contracting with a third-party provider for local and/or national service, or using a wireless access. Some of the issues include providing authentication to the campus network, assuring network security, assuring privacy of information, keeping equipment current, charging or not charging users, separating personal e-mail from institutional business, and using institutional resources wisely.

Vision

The vision students, faculty, staff, and administrators have for campus network resources is one of ubiquitous access to technology resources. They expect access from classrooms, labs, libraries, offices, residences on and off campus, lounges—even from the campus green spaces. Constituents want high-speed connectivity for electronic communication, to access files on their local-area networks, to access library and Internet resources, etc.

Industry seems to be working toward a goal of providing “anytime, anywhere” access to technology. Such access must be robust, providing access to local, national, and international resources. It must be accessible from a variety of platforms and equipment—Windows, Macintoshes, and UNIX, to name three. It must be readily available twenty-four hours a day. And above all, it must be fast. In addition, because resources on most campuses are tight, solutions must be cost effective.

Today’s situation

Most chief information officers (CIOs) and directors of computing facilities report both anecdotally and quantitatively that they are dealing with exponential growth. K. C. Green’s report of the 1997 National Survey of Information Technology in Higher Education articulates how the use of e-mail, the WWW, and multimedia are becoming “common components of the instructional experience…”1

For example, Green’s 1997 survey reports that nearly one-third of all college courses make use of e-mail; this is up from 25 percent in 1996 and 8 percent in 1994. Numerous campuses report an increase in the number of students bringing computers to campus. At Georgetown University (GU), the academic HelpDesk sees an increase every summer, the traditionally “quiet” time, in the number of calls and an explosion of calls when the students and faculty return in the fall. Similarly, use of the Web at GU is growing exponen-
System utilization data tracked by the author at two institutions historically have shown that server use each spring is higher than fall and that increased use the following fall is equivalent to the previous spring.

**How did we get here?**

In the Current Issues discussion, the prevalent situation was one of “traditional” technology services being provided from a central organization. Some institutions charged back these services to departments; others funded them centrally. In most cases, the institution paid for technology except where researchers had external funding. The end user typically paid nothing, except, of course, that students paid tuition and occasional fees. These same institutions reported operating modem pools that were increasingly busy and often inaccessible. Complaints from users escalated.

There are many factors that make it difficult to keep pace with demand. Those discussed included:

- New products and new versions of products are being introduced continually. These rapid changes in technology make it difficult for institutions to keep current. Keeping a modem pool up to date, for example, is a particular challenge. As soon as many institutions upgraded to 28.8 modems, 56kb modems were introduced. Of course, the user’s expectation is that the higher speed modems will be available the day after they are announced.

Technology budgets are finite. All too often, institutions have funded the purchase of equipment with end-of-year or other one-time monies. Fortunately, Green’s survey reports a decline in those using one-time monies to finance information technology. This is indicative that many institutions are recognizing the need to shift technology expenditures from capital to operating expenses. This process usually requires long-range planning and budgeting multiple years into the future. At GU, for example, in fiscal year 1997, the academic computing operating budget was approximately $1.8 million. The long-range planning process identified an additional $2 million is needed. (See http://www.georgetown.edu/acs/CSAC/techplan/.)

Users have a “free” mentality. The constituents at numerous institutions, especially students and faculty, are accustomed to having computing resources provided on a “library model” where they do not pay for specific services. At many private institutions where students pay high tuition, technology fees or charges to contract with an Internet Services Provider (ISP) are often viewed as another form of tuition increase. While most schools charge for local telephone calls and meter long-distance use, no one is charging for e-mail messages, and no one wants to. Users often do not realize the cost for the infrastructure to support their “free” access. As one example, at the author’s institution the Internet connection in 1987 cost approximately $10,000 per year for a 56kb connection. By 1992, it was close to $30,000 for a T-1 connection. Today, the cost is approaching $125,000 per year for a high-speed, scalable Switched Multimegabit Data Service (SMDS) connection. These costs do not begin to address the connectivity required to achieve Internet2 speeds.

Use of home offices. There was discussion in the Current Issues session about the changing nature of some campuses. All too often, faculty come to campus to teach, hold a few office hours, attend a few meetings, and leave.

**Patterns of Simultaneous Use at Georgetown University**

![Bar chart showing patterns of simultaneous use at Georgetown University](chart.png)

*Note: The users of this system are predominantly graduate and undergraduate students and approximately half the graduate and undergraduate faculty.*
As more and more campuses wire their residence halls, reports of 70 percent of the students bringing computers to campus are not unusual. With increased computing power available in personal computers, the technology resources available on campus are desired at home.

Service options

Representatives from the schools attending the CI session articulated several options for providing connectivity and/or establishing alternative funding models. Among them are:

Allow distributed access. Central computing organizations, especially at large institutions, are increasingly unable to be “all things to all people.” Technology support is more and more frequently being provided in schools and departments closer to the end-user. Sometimes this distributed support is managed centrally; however, many departments fund their own. Some departments provide their own modem pools. Network security and integrity is a major concern, as staff in an individual department often do not have the expertise or technical resources to provide such services as network authentication.

Continue to operate university-owned modems. Some institutions continue to operate their own modem pools, and each institution must decide whether it can provide the services at no cost to the end user or whether users will pay a subscription or monthly charge. The University of Texas at Austin successfully operates a modem pool containing 2,960 modems and has developed a sustaining model based on charges their users pay. Similarly, Baylor University offers modem access for a monthly fee. Their models, however, do not address the “traveling scholar” issue of accessing the campus from local phone numbers in major cities.

Outsource remote access. Many institutions have chosen to outsource remote access to local or national Internet Services Providers (ISPs). An article in the Winter 1996 issue of CAUSE/EFFECT by Hassler and Neuman reports the experiences of seventeen institutions that have chosen to outsource remote access. It also articulates many of the issues an institution must face when it chooses to outsource remote access. Several sample RFPs are available on the EDUCAUSE Web site at http://www.educause.edu/ir/ir-library.html. The CREN Virtual Seminars on Networking also provides instruction on outsourcing remote access (see http://www.cren.net/).

Establish more robust connectivity. Wireless access, use of ISDN or leased lines, and cable modems are other options institutions may choose to provide or contract for. Some major metropolitan areas have wireless services commercially available and have made arrangements for special rates and services with companies such as Metronet.

Issues

Whether an institution decides to outsource access or to provide it in-house, it must address numerous issues. These may be broadly grouped into issues of authentication, security, and privacy; appropriate use; equity; and the changing nature of the university. Each involves a complex of considerations, a few of which are described here.

Authentication, security, and privacy

Authenticating users. Authenticating authorized users is probably the biggest challenge institutions face when providing access to campus resources. Many of the databases to which libraries subscribe determine whether a user is authorized to access it by looking at the IP address from which the connection...
originate. If the user enters the campus network from an ISP and does not go through some type of authentication server, it looks as though s/he is coming from the ISP's domain and is denied access.

More and more administrative information is being made available through the Web, and the number of institutions offering courses over the Web is increasing. Some institutions feel that the traditional use of passwords and personal identification numbers (PINs) is not adequate. Even with authenticated user identification and passwords, how do we know that it is Suzy Smith and not her sister?

Assuring network security. Networks and computer systems are only as secure as the least secure system on the network. Thus, allowing individual departments to operate modem pools is an option that most central computing organizations prefer to discourage.

Assuring privacy of information and intellectual privacy. Institutions have an obligation to assure and secure information about individuals, storage of files, etc. Often in partnering with an ISP an institution must make information about its user base available, including ID numbers, which are often Social Security numbers.

Appropriate use

Separating personal use, including e-mail, from institution business. Some institutions are beginning to think seriously about the ramifications of having university-owned equipment used for personal purposes. A statement of intent of use is often included in an institution's computer systems acceptable-use policy. For example, the GU policy states, "Georgetown University computing and network resources are to be used only for University-related research, instruction, learning, enrichment, dissemination of scholarly information, and administrative activities." (See http://www.georgetown.edu/technology/use/use.html) Faculty or staff members would not think of having their monthly bills sent to their business address, yet today not many people have separate e-mail addresses for personal use. For GU students, personal Web pages are limited to academic purposes.

Using resources for non-institutional purposes. Questions that are increasingly being asked relate to increasing demands for more bandwidth for casual, often personal, Net surfing. Should the institution bear the cost of non-academic chat and games? Often the cost of monitoring this use is greater than the cost of letting it go.

Using institutional resources wisely. An institution with finite money for technology must continuously promote prudent use of resources and strive for administrative excellence. Thus, it may face the tough decision of having to either outsource or charge for services that were once "free." Georgetown University was fortunate that a faculty committee actually recommended seeking a partnership with an ISP to provide remote access (See http://www.physics.georgetown.edu/~serene/report/report.html). Indeed, upgrading the modem pool at GU was estimated at costing between $500,000 and $1 million. Most faculty preferred to see money spent on a better campus infrastructure for academic use and for newer and better equipment for faculty, classrooms, and student labs.

Equity

Defining "mission critical" work. If an employee's work is considered "mission critical" to the institution but requires remote access to campus resources, should such access be provided by the institution? Departments have the option of paying the connection fee to the campus provider or contractor. However, how this is determined and old issues of the "have and have not" departments are again raised.

Providing different levels of service on and off campus. For faculty? For non-resident students?

Supporting part-time employees who do not have offices. Should they be provided with complimentary remote access?

Changing nature of the university

Alumni access. Should alumni have access? Should there be lifetime forwarding of e-mail? It is noted that alumni can often benefit from the institution's good deals with ISPs.

Distance education. E-mail may provide the only access to some professors and courses. With e-courses and the growth of distance learning, what access must/should the institution provide? How are "real-time" needs addressed? Is there a difference between gradu-
ate and undergraduate students?

Recommendations

In the CI discussion, some recommendations came forward.

Prepare for an increased demand for help desk services. Several institutions report that up to one-half of the calls to their help desks are related to modems and configurations for remote access.

Impose time limits. Several institutions report that modem pools with ten- to fifteen-minute time limits on some modems improve service. This type of service permits users to quickly check e-mail or the Web.

Begin cost sharing with users. Using an ISP or imposing a charge for remote access is moving into this category, and helps institutions stretch their technology budgets while improving services. One of the sentiments articulated by a participant in the Current Issues session was, "The institution does not pay for the gas for a faculty member or student to drive to the campus." And, once they get to campus, most institutions charge them to park! Most people today accept cable TV as another utility bill; the ISP may well be viewed as a utility bill within the next three to five years.

Offer tiered services. Continuing the analogy to television, television over the air is free, but one pays more for cable services, presumably of better quality. The University of California at Berkeley offers three tiers of service. In the first tier, access to the modem pool is free, but it is heavily oversubscribed. In the second tier, UCB offers a better service for $10 per month that promises "infrequent busy signals." The third tier offers the user the option of contracting with a local or national ISP for ISDN, cable-modem service, and leased lines as well as access from national and international locations.

Summary

The demand for technology is growing. It is incumbent on institutions to plan for access just as they plan for servers and desktops. Access to campus resources, and specifically authenticated remote access to campus resources, is an issue that requires broad, strategic thinking. Each campus must address the issues of access in the context of its own situation.

The author wishes to acknowledge and thank John W. McCredie, associate vice chancellor, Information Systems and Technology, University of California at Berkeley; Clair W. Goldsmith, deputy director, Academic Computing Services, University of Texas at Austin; and Donald L. Hardcastle, director, Information Technology Center, Baylor University, for information they provided to her via e-mail, internal documents, and the CAUSE CIO discussion list.

Ardoth Hassler (hasslera@gunet.georgetown.edu) is associate vice president for University Information Services and executive director for Academic and Information Technology Services at Georgetown University. Because of her previous presentations and papers on remote access, she was asked to chair the Current Issues session on this topic at CAUSE97. She will be chairing further Current Issues discussions on this topic at CAUSE98.
Technology and the Learning Environment: An Interview with Lucinda Roy

Lucinda Roy, Alumni Distinguished Professor of English at Virginia Tech, spoke to CAUSE/EFFECT Editor James Roche about her experience teaching online courses through the university's three-year-old Cyberschool. Roy, author of the recently published novel, Lady Moses, and several poetry books, teaches courses on creative writing, the civil rights movement, and literature.

Roche: Is there a risk, by doing things with e-mail and with less personal interaction, that students will never get to know their instructor's personalities and dynamic style of teaching? Or are there ways of maintaining that connection?

Roy: The question about whether we're going to lose human contact in the university environment is the predominant question that lots of us are asking, especially if we care about teaching. We do know it's the face-to-face energy that often exists in the classroom, the communal energy, that creates a wonderful space for learning. Whether there's a way to duplicate that [in an online environment] is questionable.

In one particular class, my students had videotapes. All of them did see me face to face. I wanted them to know that their professor was a woman of color, that she had a kind of strange personality, the eccentricities that would have made me decide to teach certain texts and not others. All those kinds of things are important: my body language, the way that I speak. I hoped that the videotape would at least capture some of that, even though it was something in the declarative mode, a series of statements. I had to imagine, pretend, I was a student for a while and imagine them answering some of those questions and asking questions.

As we start to think about what we can do with video, with voice, with data, we can do some amazing things that we could never have done before. Especially for those students who cannot come to campus, we need to think very creatively about how we're going to accommodate them. One of the problems we have right now is that we always think of the student as being eighteen to twenty-two and they'll come to class if they're not lazy. That's not the way it works. Fifty-four percent of students now are mature students. They cannot necessarily afford to get to campus; it's that particular community that we need to be thinking about now. I think we can do some things that we haven't even envisioned yet.

Roche: Any thoughts on what some of those things might be?

Roy: You can do a lot of things [with two-way, interactive video] that are interesting. As we become more adept at making sure that students can access us even in their homes, it will seem more natural. Let me give you an example. Right now, my students often e-mail me three or four times a day. One thing I've learned from this online interaction is that the ways in which we speak to each other [online] are very different from the way we would speak if we were face to face. Students working online are often much more informal early in the semester. Most teachers who love tutorials really love online interaction if it's designed well. You can have the kinds of dialogue you would not normally have in a public space.

Roche: Do you think that using e-mail as a means of correspondence will actually improve student writing?
"If you have a class of 300 to 400, you cannot teach well using all this interactive technology unless you are also going to build in some personal support behind it."

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**Roy:** One of the things I love about e-mail is the fact that for the most part, it is not an intimidating medium. Even students who are dyslexic sometimes really don’t mind sending e-mail, partly because they can spell check it anyway. There’s a sense that you can express yourself in e-mail as though you’re talking to someone. Students will often begin with smiley faces and they’ll talk in ways that they would not normally speak to a professor.

Something we have noticed in English is that when we’ve used Daedalus, it encourages students to write to each other. Even when they’re in the lab together, they have to write responses. You cannot learn to write unless you write. When the only channel of communication you have is the online channel, it is amazing how much people will write. Professor Len Hatfield, who has studied the use of Daedalus at Virginia Tech, has found that students write two, three, four times as much because they feel as though they can. They feel as though they must.

**Roche:** You said some of your students e-mail you up to four times a day. That’s a lot of work for the instructor. Do you think this is something that will alienate faculty or will change the dimensions in which we operate as faculty?

**Roy:** What we’re seeing now at Virginia Tech is that faculty who get involved in this can suffer from burnout very quickly. If you’re getting 300 e-mails a day from a class, what do you do with them? It’s really important, not just that we have a kind of administrative structure in place that allows faculty to take time off to work on this kind of thing, but also that faculty themselves understand that you have to create filtering systems. You have to have TAs. If you have a class of 300 to 400, you cannot teach well using all this interactive technology unless you are also going to build in some personal support behind it. You cannot imagine that you can answer all those queries well and improve the quality of education if you’re the only person doing it. It’s very frustrating. We do need to think about how anyone experimenting with this new environment has the kind of personnel support that they need. I don’t think we do very well at it.

**Roche:** Can you touch on the difference between having the technology versus thinking about the implications of using it in the learning environment?

**Roy:** Right now, it’s as though we’ve entered this huge cafeteria. We have all these different choices that we can make as far as technology. So something that will be important in undergraduate education is selectivity. There’s a term, “appropriate technology,” that we originally used when we talked about Africa and developing countries and continents to see how they could use technology that would actually be helpful to them. Years ago, we used the example of sending fifty tractors out to a part of west Africa, and they would sit there, nobody would use them, and they’d rust. They would sit there because they were not appropriate technology. We had no personnel to support them; there was no way they could be used well.

One of the things I see is people selecting from this menu in the cafeteria and making a plate that’s so ugly, you really wouldn’t want to eat it. At some point we have to decide how we want the whole selection to cohere. What really is appropriate for us? If there are students who just cannot get online, for example, then Internet technology is inappropriate. We need to think carefully about what’s best for us.

It’s confusing also because there are a lot of people suddenly involved in the education process who have their own agendas. Some are from the corporate world and really want to push a particular kind of software as the answer to everything. And because a lot of our upper-level administrators are not familiar with the new environment, they rely very heavily on their technology officers. So, the technology officers just have to get it right, which is ludicrous. There’s no way always to get it right.

**Roche:** If we get to a point when a student can sit on campus or at home and pick and choose courses from around the world, there’s the thought that the courses that will succeed are the ones that are taught by instructors who get up and not only educate, but entertain. Any thoughts on global competition?

**Roy:** The star lecture courses that are now being touted will be broadcast to many people. They certainly have a role to play and they will have a strong niche in the education com-

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1 Daedalus is a program which provides an integrated writing environment for its users. Students can use it to work collaboratively or on their own, to compose essays, have discussions, peer edit, etc.
community. I worry about them though, because the danger of broadcast teaching is that it is essentially a delivery system. It doesn't give you a chance to have a response mechanism. What I could see myself doing in that kind of arena is getting a package together that is essentially declarative, something that's full of different statements, lectures—here's me telling you what I know about poetry, how to write poetry, how to be creative. There would be an accompanying package—much as we do with textbooks—that would go to an on-site instructor, who has an ability to really work one-on-one with students and can customize that package for his or her students. That mechanism in the middle will prove to be much more important than we think it is right now. Those in the middle will have autonomy, I hope, in their classroom space, but they would customize and add to what they've received. They receive templates, really. There are some courses—particularly hard science courses, where you have to have a body of information before you can begin to move forward—that lend themselves to the other model, where you'll have a standardized course that's offered globally.

Roche: That brings up the difference between the haves and the have-nots. Students who can afford the technology have access to all these wonderful things; people who can't afford it don't have access. Minority students sometimes have less money and less access to technology. Is the gap widening? Is it creating other problems we haven't looked at?

Roy: It looks to some of us as though things are getting worse, just because of the individual contact we have with students. Having said that, though, there's lots of different strategies we can use to help with this. We're talking about outreach all the time right now. For institutions of higher education, the key to a successful outreach is information technology. If there's a way of combining outreach and information technology, then you can reach so many more people. You can start to bring them into an academic learning environment. For minority students, when you bring them into that environment, they change at a swifter pace, I believe, than any other students I've worked with. I'm talking particularly about African-American students. The skills they develop because they can see an immediate application and because suddenly they have keys to a world that previously has been barred to them—it is like leaping over the color bar. The students say, "This isn't white technology, this is my technology, too." It becomes a question of survival. It's true also for poor white students.

We can think about partnerships. The historically black universities haven't normally partnered with majority institutions very well. With technology, we can at least partner with their teachers. There's a way to do that now because almost everyone is online. It should be one of the first things we think about.

Roche: You have warned against having our eyes focused too much on the future without understanding the past. How does that apply to technology?

Roy: When I talk about putting our eyes back to the past instead of just focusing on the future, it's become my mantra. The origination point is more important than the destination point. The origination point will determine where you go. In the '70s and '80s, universities did most of their teaching in large lecture classes— not for the quality of learning, but to save money by teaching hundreds of students at a time. We knew, in a sense, that wasn't the best way to go, but it was cost-effective. What we're doing again and again is taking those kinds of practices and saying we can redo these at a cost of $100,000 and then send them out again. It's even more cost-effective because you can send it out to thousands. That's one of the examples of us not looking back to the past and remembering we were only focused on large lecture courses for monetary reasons, which is not always the best reason to do something. If we thought instead about the quality of education, and whether there was anything we could do that would both be cost effective and address quality, then we wouldn't repeat the same mistakes.

Roche: We have students coming into colleges and universities who seem more at ease with the technology and are probably more literate with the technology than some of the faculty. What kind of problems does this create? What kind of solutions do we have?
Roy: We underestimate the sense of discomfort that faculty feel when they realize that the students are more computer literate than they are. For example, when we started Cyberschool at Virginia Tech, I made some pretty severe mistakes in terms of not informing all of the community about what we were doing. We'd have our students go to other professors and say, “Where’s your Web page? Professor X has a Web page and if we miss class, we just download the lectures and read them.” The people who were the most proactive for us turned out to be the students. They were the ones saying, “We really need to move forward.” Imagine if you’re a faculty member, and a student comes up and says, essentially, there are things you ought to know that you don’t know. All of this fast-paced change has created a place of real discomfort for some faculty. I don’t think we should underestimate it. There are ways of making sure that faculty know they can get on board at any time.

Roche: You mentioned that students who take courses with instructors who are involved in technology tend to devote more time to those courses as a result of technology. A lot of faculty would love to embrace this. Is this because technology is a novel thing? In five or ten years, will technology have become another chalkboard or video?

Roy: I have a colleague who always asks, “What will happen when the gimmick is over?” He’s right. There really is that drive right now because it’s new. But very quickly, you come to expect technology as a right. Everybody, when they [temporarily] lost e-mail on AOL, just went crazy. It was their right to receive e-mail as it was sent. In America, it always surprises me how quickly people turn privilege to right. Now that it’s been established, I think it’s too late to turn it back. We still will be doing things with technology that are unwise, just as we did with the chalk. Look at how we used the chalk and chalkboard. You’d go into classrooms and all you’d see is the back side of the professor, scrawling away, talking to the board. We’ve accepted some bad practices.

Technology, to some extent, liberates the learners. It allows them to have a voice to say when things aren’t working.

Roy: We are inundated with information. How do you teach students to determine quality?

Roche: In a nutshell, what does Virginia Tech offer its faculty in the way of instructional development?

Roy: Virginia Tech has an instructional development initiative. That includes a faculty development initiative, which allows faculty to go through a three-day workshop and learn about the technology. We get the appropriate software and we learn how to use it. We get our computer as a gift. Before that, most of us were working in the dark. It was very hard for us to know what we could do because we had such a short orientation period.

When I became associate dean, it seemed that we had lots of people in Arts & Sciences, a faculty of 600, doing some wonderful things. But there was no cohesion there. We had somebody in Mathematics repeating what someone in Statistics had done. We had someone in English using exactly the same kind of software as someone in Biology. They wanted to down and check the screen. That is a good thing. If I get that kind of feedback, I know how to change what I’m doing. As long as you are willing to adapt, the technology will continue because it allows that incredible response mechanism. It allows you to really listen. If we allow the technology to help us do our listening for us, then we’ll be really strong. If we just think of the technology as a place where we can speak as teachers, then it will be a mistake.
Ownership Issues in Online Use of Institutional Materials

by Dan L. Burk

Introduction

Institutions of higher education are quite literally in the business of creating, acquiring, and disseminating information in a variety of formats. Over time, any college or university will amass a substantial portfolio of text, illustrations, photographs, software, and other creative works acquired by solicitation, commission, or contribution. Because digital computer networks are becoming common on campuses, the digitization of these works has also become increasingly common. Such digitized materials are routinely being made available online. Indeed, colleges and universities have turned to the Internet as a preferred medium for disseminating the wealth of material under their control.

Educational institutions may choose to offer digitized materials on the Internet for any of a number of reasons: as a public service, as a contribution to scholarship, as a special benefit to alumni, or as a means of self-promotion. A few examples of new uses for old materials include:

- a private college that sponsors an annual lecture by a distinguished scholar, and has recorded and transcribed these lectures for many years. Some of the transcriptions have been published in the college's magazines. The college now wishes to put the audio files and transcripts in a scholarly archive available on the World Wide Web;
- a professional school that has produced an attractive annual report for alumni and other capital campaign donors. The report contains photographs of students, faculty, notable alumni, significant institutional events, and listings of faculty accomplishments. The school now wishes to put the report on its Web site in order to help highlight its accomplishments, attract new students, and solicit contributions;
- a public university that publishes an alumni magazine. The magazine includes articles on timely topics, solicited from free-lance writers. The university now wishes to place twenty years' worth of the magazine's contents on a Web site for alumni; and
- a private university that recently appointed a new faculty editor for a scholarly journal published by the university. As a promotion to attract new subscribers, the journal's editor wishes to make a searchable, full-text archive of the journal available on the Web to subscribers.

Each of these scenarios raises questions about proprietary rights when analog materials are transferred to a digital format. The ability of institutions to transfer materials from previous media to networked digital systems may, in many cases, be limited by laws that regulate the ownership and use of intellectual property. This article addresses several of the intellectual property issues that arise when an educational institution provides Internet access to materials that it previously published in another format. Specifically, this article will focus on express and implied transfer of copyright, rights of privacy, and rights of publicity when materials are transferred from analog to networked digital media.

Scope of discussion

The questions addressed here are a subset of the intellectual property problems that face an educational institution when its faculty, staff, or students place material on the Internet. On a broad scale, digitization of analog materials raises complex legal and institutional issues: What is the scope of the institution's...
responsibility for the actions of its students, faculty, and staff? Is it legal for a faculty member or student to make an unauthorized digital copy of a third-party document, given the rules of copyright fair use? Can the institution monitor such activity consistent with the principles of academic freedom? The answers to those questions can be intertwined with difficult issues of institutional ownership, control of digital materials, and the scope of the work-made-for-hire doctrine.

The scope of this article, however, is narrower, and such problems, while related to the topic, will not be discussed here. Rather, this article will examine situations in which the institution transfers to the Internet materials for which it has obtained rights in another medium, such as print. This analysis will focus on situations in which the institution itself has disseminated digitized works, rather than situations in which the institution might be vicariously liable. Issues related to university acceptable-use policies or the review of student or faculty Web pages, with their attendant issues of academic freedom and freedom of expression, lie beyond the scope of this discussion. Additionally, questions of authorship under the works-made-for-hire doctrine will receive only limited attention, as I have previously analyzed this topic in some detail elsewhere.1

Copyright in digital media

Transfer of printed or other material to the Internet will most frequently raise issues of copyright. We generally think of copyright as exactly what its name implies: a right to make copies of a work. Copyright does, in fact, confer an exclusive right of reproduction. However, the right of reproduction is only one of five exclusive rights conferred by copyright ownership. The copyright also comprises the right to distribute copies, the right to make adaptations of the work, the right to publicly perform the work, and the right to publicly display the work.

Copyright extends to a wide variety of subject matter associated with hypermedia, including text, graphics, photographs, motion pictures or other audiovisual works, musical compositions, sound recordings, and computer software. However, the scope of copyright in digitized works is a matter of some dispute. To qualify for copyright, the material must be original and fixed for more than a transitory duration in a tangible medium of expression. These qualifications for copyright protection were developed in the world of print media and do not always map well onto the world of digital media, particularly in a networked environment.

For example, copyright questions have arisen regarding so-called "RAM copies." In automated information processing and retrieval systems, digitized information is reproduced and stored in computer memory whenever the information is accessed. This storage may occur in RAM, or it may occur in temporary "cache" files on magnetic media. In the case of networked computer communications, temporary copies may be made on several intermediate machines as packets are routed to their final destination.

Some court decisions suggest that copies of a program loaded into RAM may be relevant for copyright purposes. Because the RAM copies are accessible and endure for more than a transitory duration, some judges have said that the copy in RAM may be an infringing copy. This, in turn, implies that intermediate digital copies of copyrighted works, including copies of works in Web browser caches created during the operation of network applications, may be infringing copies. In turn, digital transmission of those copies over a network would presumably constitute a distribution of copies.

Overlapping rights

Digital media also involve the exclusive right of adaptation. Adaptation occurs when an author mixes another author's work with his or her own original expression to produce a new work. This might occur, for example, when a poem is set to music to become a song, or when a novel is adapted into a screenplay for a movie. It arguably also occurs when analog materials are adapted to HTML or other digital formats for posting on the Internet. For example, if text is being incorporated into a multimedia work, the addition of sound, graphics, and similar original expression by the multimedia author transforms the adapted work into a new work based in part on the initial text. Even if obvious additions such as music, graphics, or animation

are not made, the transformation of the text to digital format—into a type of software file—may by itself constitute an adaptation.

Similarly, the rights of public performance and display are at issue when analog materials are put online. It may seem obvious that graphics or text on the Web are being displayed; when they are accessed by an Internet user, the materials are clearly displayed on the user's computer screen. It is less intuitive that graphics or text are being "performed," but this is what occurs under the definition in the copyright statute.

The implications of this analysis are somewhat startling: When material is posted on a digital network, it is almost certainly being simultaneously copied, distributed, adapted, publicly performed, and publicly displayed. This type of simultaneous overlapping use was not a characteristic of traditional media such as print. Printed materials may be reproduced and distributed by means of photocopiers, but this activity is unlikely to raise questions about public performance and display. Unauthorized broadcasting of television or radio programming may raise questions regarding public performance and display, but probably not regarding reproduction and distribution. The same was true of video tapes, sound recordings, and other analog media. Use of such media might raise questions about one or two of the copyright exclusive rights, or perhaps different exclusive rights at various times, but never all the exclusive rights at once.

In a networked environment, however, copies of copyrighted material are routinely made and distributed as a necessary part of the network's operation. Of course, if the owner of the work placed the work on the Net, then we can infer that the owner intended such copying, distribution, performance, and so on to occur. But if placement of the work on the system is unauthorized, the normal operation of the computers and computer networks will result in repeated and widespread copyright infringement.

Scope of institutional rights

This overlap of rights can cause problems for institutions wishing to digitize what appear to be their own materials. Educational institutions may lack the rights they need to digitize such works and place them on the network. For example, in one of the examples given above, a university might have obtained rights to publish—that is, to reproduce and distribute copies of—stories solicited for its alumni magazine. But it is unlikely that the university secured the right to adapt, publicly perform, and publicly display the stories. Such rights were simply not necessary in a print-based world, and so they probably were not considered at the time the work was solicited. But, as shown here, these rights are central to electronic distribution of such stories on the Internet. Unless the college or university obtained all rights to the stories—that is, unless it obtained a transfer of copyright ownership—it may well have to go back to the author to obtain additional rights for electronic distribution.

Work-made-for-hire

In some instances, an institution may be able to claim ownership of all rights in a previously published work because the institution is considered the author of the work. Institutions can be authors under the doctrine of work-made-for-hire; works created by employees of an institution will often fall into the category of work-made-for-hire. In that case, the institution, rather than the person who created the work, is considered the author. In such instances, because the institution owns all rights to the work, it may use the work in any manner it wishes, including transfer of the work to new media. However, this unusual claim of authorship may be of limited use in the type of situation considered here. Although the work of administrators and staff, created in the course of their regular duties, likely falls within work-made-for-hire, application of the doctrine to full-time faculty is highly problematic...

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2 Burk.
Fair use

Outside of the works-made-for-hire situation, the work's creator will normally be considered its author, and institutional use of the work will have to rest on some other claim of right. Sometimes the copyright statute permits use of copyrighted works without a license or transfer of rights. Indeed, one of these special exceptions may appear to be an attractive—but probably unwarranted—justification for unauthorized transfer of materials to computer networks. Educational institutions might be tempted to say that the placement of materials on a network is a fair use of the materials. This argument may seem appealing because colleges and universities are accustomed to justifying unauthorized use of copyrighted works on the grounds of fair use. To be sure, many unauthorized educational uses of copyrighted works probably are fair use, but the fair use exception to copyright is not a carte blanche for every institutional use of a copyrighted work.

A full discussion of copyright fair use exceeds the scope of this article, but a limited treatment is in order. Fair use provides a limited privilege allowing otherwise-unauthorized use of protected works for purposes such as scholarship or criticism. Typically, fair use will involve a minimal use of a portion of the total work, such as a quote or excerpt, and the portion taken would not substitute for the work in the marketplace. For example, quoting a few lines from a book in a book review is a classic example of fair use. Taking all of a work, especially for commercial purposes, should usually trigger concern that the use exceeds the statutory privilege.

Education is a preferred activity under fair use, and many of the institutions that might place digital materials on their Web sites have not-for-profit status. However, each of the examples cited at the beginning of this article contains elements that signal the activity may exceed fair use. All of the examples involve placing the entire work or collection of works, rather than excerpts, on publicly accessible networks. Also, not-for-profit status is primarily a designation for purposes of taxation; such status does not necessarily mean that no money changes hands at the institution, or that the institution is not engaged in activity that might be considered commercial for purposes of copyright. Additionally, many of the proposed uses in the examples may fall outside the strict definition of “educational.” Institutions may be placing materials on public networks in order to promote their services and attract enrollment, rather than to engage in instruction. Finally, and most important, materials placed on publicly accessible networks will often substitute for authorized copies of the work.

Express and implied licenses

If the college or university is not the author of a work and its aim extends beyond minimal fair use of the work, then it will have to gain the rights to the work via contract before posting the work on the Internet. If the college or university is not the author of a work and its aim extends beyond minimal fair use of the work, then it will have to gain the rights to the work via contract before posting the work on the Internet. In many cases, an institution’s past practices will pose a serious impediment to the new use of the work. For example, the institution may have neglected to secure a written agreement related to commissioned, contributed, or solicited works. Record keeping as to the author’s identity and whereabouts may be poor. Locating and securing express permission may be time-consuming or even impossible.

In other instances, a written contract may have been secured, but may contain no provisions related to allocation of copyright. Even if an institution has had the foresight to both secure an express agreement and make express provision regarding allocation of copyright, it may nonetheless have failed to foresee the transfer of the work to a new medium, such as digital networked media. In such cases, the contract’s copyright provisions may not address rights like public performance or public display, which may not have been seen as relevant to use of the work at the time the contract was executed.

In the absence of express provisions governing a situation, courts will infer the existence of a contract, or license, from the conduct of the parties. For example, as suggested above, if a copyright owner places a work on a computer network, we can infer that he or she must have intended for RAM copies to be made and distributed in the course of network access to the work. Similarly, if someone submits an article to a journal, we would reasonably infer that the author intended that if the article is accepted, copies of the work would be reproduced and distributed in the
course of publishing and disseminating the journal. Other common practices may also indicate assent to publication. For example, it may be common practice in certain fields to allow an institution’s journal to print a speech delivered at a scholarly symposium that took place at the institution. A court could infer that the author of the speech, by delivering it at the symposium, reasonably intended that it would be published in the journal.

However, hindsight reconstruction of implied licenses has its limits. The actions of the parties may not clearly indicate their intent with regard to new uses of the material, if indeed they had any intent at all. Additionally, the copyright statute itself imposes a limit on the usefulness of implied-license doctrines: the statute mandates that exclusive rights or ownership in a copyrighted work can be transferred only by an express writing. Thus, an unwritten contract that might be inferred after the fact can at best convey non-exclusive rights in the copyrighted work.

In situations where a written contract exists, courts will look to the language of the contract as an indication of the intent of the parties. Even if the contract does not explicitly discuss “electronic rights” or “online use,” language in the contract may inform the court’s decision. There is a fairly large body of case law dealing with contractual rights to exploit creative works in new media, such as television or videocassette, that were not explicitly mentioned in old contracts. Courts have tended to conclude that when the new medium was completely unknown and unforeseen, a contract should not be construed to include rights in that new medium. However, when the parties to the contract were sophisticated in the relevant industry, courts have tended to conclude that contracts should be construed to include new media unless the author included language expressly reserving such rights. Courts have especially been persuaded that broad, contractual language referencing use “by any means now known or hereafter invented” should be construed to include new media. It is likely that these interpretive trends would be extended to computer networks, as they have been to past media developments.

Recent electronic rights decision

Educational institutions may look for some guidance in Tasini v. New York Times, which discusses implied and express contracts, as well as a special provision of the copyright act dealing with republication of collective works. Collective works include periodicals such as magazines and newspapers, which comprise individual contributions. In the Tasini case, copyright infringement claims were brought by six free-lance writers who had sold articles to a variety of periodicals. In most cases, the writers sold their work based on verbal agreements, although in one case a written contract granted “first publication rights.” The periodicals subsequently licensed their contents for use in digital media, including dial-up access databases containing only the text of the articles, and image-based CD-ROM products containing photographs of the periodicals as published.

The authors asserted that the publishers had no rights to reproduce their articles in these new media. The publishers argued that the right to republish the works in digital format was inherent in the agreements to publish the works in print format. They also argued that the copyright act allowed them to include the writers’ works as part of reprinting the periodicals, albeit in a different medium.

The court held that transfer of rights to republish the articles in new media could not be inferred from oral agreements or even, in the case of the express contract, from the language granting “first publication” rights. According to the court, “The right to publish an article first cannot reasonably be stretched into a right to be the first to publish an article in any and all mediums.” However, the court also held that the publishers had the right under the copyright act to republish the works as part of reprinting past issues of the periodical “collective works,” and that the right extended to new media such as dial-up databases and CD-ROM products.

Although this court decision may appear to clarify the question of electronic rights in previously published materials, there is reason to regard the Tasini holding with caution. First, the trial court’s decision is pending appeal, and appellate review may or may not uphold the decision. Appellate confirmation of the decision could be persuasive to other

courts, but would establish legal precedent in only a geographically limited area of the northeastern United States, and the current trial court ruling carries no precedential weight at all. Second, the trial judge's reliance on the "collective works" republication right of the copyright act may be questionable. The decision focuses primarily on the author's right of reproduction, without recognizing or analyzing the problem of RAM copies. Further, the opinion gives only cursory consideration to the problem of overlapping rights, offering a superficial and arguably inaccurate discussion of the right of public display. It is inconceivable, for example, that a court would consider a radio broadcast, film adaptation, or dramatic reading of the contents of any given print magazine to fall within the statutory revision privilege related to collective works; it is unclear why digital "broadcast" should be so considered. The result in Tasi is an artifact arising from the superficial resemblance that electronic media bear to print media, in that both display text. Thus, future decisions about the permissibility of transferring materials to "new media" may likely be grounded in the type of contract analysis reviewed above, rather than esoteric provisions of the copyright act.

Rights of privacy and publicity

The discussion of proprietary rights has to this point focused primarily on copyright. But copyright is by no means the only issue involved in transferring materials to the Internet. For example, transfer of certain materials to the Internet may involve invasion of privacy. American law recognizes several different rights of privacy, but the version of the right that is most applicable to this discussion concerns the commercial appropriation of a person's likeness. The classic version of this privacy tort involves publication of a person's photograph in a newspaper, typically as a human interest story, rather than because the individual has engaged in a newsworthy activity. This could be relevant when institutions propagate the "persona"—that is, the image, likeness, or other personal attributes—of private people on publicly accessible networks. This might occur in the example of the annual report above, if it contained images of students or alumni. Internet distribution of photographs portraying an individual is comparable to a worldwide broadcast of the individual's likeness. Similarly, placing an audio file of a speech on the Internet is comparable to a worldwide broadcast of the individual's voice. Such widespread distribution of the persona may extend impermissibly far beyond the more limited distribution in print or on magnetic media.

Closely related to the right of privacy is its more commercial cousin, the right of publicity, which generally pertains to public figures. Like invasion-of-privacy torts, the right of publicity grows out of state law, and so may vary from state to state. Infringement of the right of publicity usually involves the appropriation of a celebrity's likeness for commercial gain. Unlike the private citizens in the newspaper photograph cases, celebrities cannot easily claim invasion of privacy when their likeness is published. They are, after all, celebrities because their likenesses are so frequently published, so their images are hardly private. However, because they make their living from public appearances, unauthorized use of their likeness for commercial purposes may threaten their livelihood. Therefore, the law may protect that image as a commercial asset. The right may also extend to characteristics of the celebrity other than likeness, such as a distinctive manner of speaking or singing.

Consequently, some care may need to be exercised with regard to Internet posting of photographs of public figures or celebrities who have visited an institution or participated in institutional events. Such public figures might include prominent guests who have spoken at commencement, who have been honored with institutional awards, who have appeared at the opening of new structures, or who may have attended alumni events. Presumably, the fact that such individuals are public figures whose appearance was photographed or recorded at a public event affords some degree of First Amendment right to disseminate the photograph or recording. Additionally, the public figure likely should have had some reasonable expectation that an appearance at the event would be recorded and discussed. But the extent of such an implied license to disseminate the public figure's likeness is unclear, especially if the college or university is reaping some direct or indirect fi-
nancial advantage from using the picture. As in the case of copyright, the scope of institutional rights in this area would ideally be defined by an explicit right of privacy/right of publicity waiver. However, institutions are just as likely to have failed to secure such waivers as they are to have neglected to get copyright agreements, or where a waiver has been obtained, to have failed to address the use of the individual’s likeness in new media. In the past, courts faced with extension of the right of publicity to new media have applied the same principles of contract interpretation discussed above. Without express contractual language allocating rights of privacy or publicity, the rights will be subject to implied contract analysis. As in the case of copyright transfer, a court would consider the parties’ knowledge and experience, their prior behavior, and the custom of the industry to determine the parties’ reasonable expectations. So the question for transferring photographs to digital networks will be whether such use should be anticipated as part of permission. As the use of the medium becomes more common, and awareness of the medium grows, such an expectation may be routinely inferred. However, it is less than clear now whether express or implied permission for print distribution means it’s okay to reproduce that image on the Internet.

Institutional responses

The discussion above outlines several situations in which unauthorized transfer of materials to digital networks may leave educational institutions liable for copyright infringement, right of publicity violations, or other misappropriation of proprietary rights. This, in turn, suggests that educational institutions should consider methods to assess and minimize possible exposure to infringement liability. There may be a variety of such methods, but the most workable option for many institutions may be to develop an intellectual property compliance checklist that must be reviewed or approved prior to transfer of materials to digital format. Using this kind of a checklist for pre-publication clearance is standard procedure for many commercial corporations. Before an advertisement, brochure, or other publication goes out the door, it is reviewed by corporate counsel for copyright compliance, trademark compliance, right of publicity compliance, and so on. Educational institutions may need to consider implementing similar review mechanisms.

Proprietary rights audits

The necessity of considering such a traditionally commercial-sector measure underscores the new reality of digital publication that colleges and universities face. Traditionally, the high cost of typesetting, printing, and distributing print materials required publishers to be highly capitalized. Intellectual property compliance was primarily a concern of wealthy, specialized businesses. But digital networks drastically lower publication costs. By enabling low-cost preparation and worldwide dissemination of materials, digital media have allowed almost any institution to become a publisher. However, with this new role come the traditional concerns and liability exposure of a publisher. To the extent that educational institutions are now operating as publishers, they must begin to address the same issues that have traditionally been addressed in the for-profit business sector. Ironically, many institutions that can now afford to be publishers may be poorly positioned to afford the costs of pre-publication review and liability exposure.

Additionally, in an educational setting, the mechanism of pre-publication checklists must be deployed with some caution. However much educational institutions are beginning to resemble traditional publishers, much of online publishing in colleges and universities is quite different from corporate advertising or publication. Most particularly, online scholarly publication by university faculty differs markedly from corporate publication. Indeed, scholarly publications traditionally have not been subjected to institutional pre-publication review in the print world. Implementation of such review should presumably be no more appropriate in digital media than it has been in print media. At minimum, starting such a review for scholarly faculty publication would raise serious questions of academic freedom and expression.

Even when considering pre-publication review for non-academic publications, the institution should review the degree of burden that compliance checklists will impose on university operations. For example, very few uni-

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CAUSE/EFFECT
Vol. 21 No. 2, 1998

26

Publication review for online materials generated by their administrative units. Additionally, creating multiple centers for review creates a risk of uneven compliance, depending on the competence and diligence of each office. Other approaches, such as designation of a departmental “intellectual property compliance” officer, or review by faculty committee at the departmental, college, or university level, might be implemented to meet the particular needs and constraints of individual institutions.

The choice among various review options will be largely a matter of institutional risk management: the benefits of increasingly greater scrutiny must be weighed against a realistic measure of the institution’s likely exposure to liability for intellectual property infringement. Factors to consider in choosing a review method may include: how often institutional materials are likely to be placed on publicly available networks, the type of materials most likely to be transferred to such networks, the resources available for pre-publication review, the bureaucratic delay caused by more elaborate review, and the history and internal culture of the particular institution. Increased likelihood of exposure to liability will tend to dictate a more stringent approval process, unless the institution lacks the resources for review, or is willing to incur the potential liability. At a bare minimum, however, even the most resource-constrained or risk-tolerant institutions should consider distribution of the compliance checklist as an informational tool, if not as a review requirement.

Rights acquisition

As a second component of a proprietary rights compliance program, educational institutions should develop a policy for acquiring rights in new media. Regardless of past oversights or mistakes, colleges and universities should take steps to avoid ownership problems in the future by articulating a coherent approach to newly commissioned or solicited works. This will likely include a standard form or license embodying the policy. Of course, one approach to the matter is to do nothing about ownership allocation of invited or commissioned works, rather than require a standard transfer. An institution can certainly

SAMPLE PRE-PUBLICATION REVIEW CHECKLIST

Copyright
Identify the source of all copyrightable works including:
- text
- graphics
- photographs
- animation
- film clips
- musical compositions
- sound recordings
- software
- databases
- other
- Has the institution obtained “electronic rights” to each work?
- Alternatively, is the work owned by the institution, or a work made for hire?
- Alternatively, is the use to be made a fair use?

Right of privacy or publicity
Identify the use of any individual’s persona including:
- image
- likeness
- voice
- name
- other
- Has the individual depicted given written permission for online use of his or her characteristics?
- Alternatively, is the use within a First Amendment reporting privilege?

University counsel offices are equipped to handle the workload that would be generated by pre-publication review of the institution’s online materials; in the case of smaller universities and colleges, there may be no permanent legal office. To ease some of the burden, colleges and universities might establish benchmarks that would trigger review by either inside or outside legal counsel. Or, institutions might spread the responsibility for review over administrators of subsidiary academic units such as colleges or departments. However, assignment of such responsibility to subsidiary academic units does not wholly solve the problem of burden; few deans or department chairs will welcome the additional burden of pre-publication review for online materials generated by their administrative units.
choose to seek new permission or clarification for each future use of works in new media. This approach might be desirable for institutions where the cost of developing and implementing a rights-ownership policy exceeds the expected benefits of the policy; for example, at a small institution that seldom invites or commissions such works, or has chosen not to make such works available via electronic media. However, this approach should be adopted as a conscious choice in the management of the institution’s intellectual property portfolio, rather than as an unconscious default due to neglect or ignorance.

At the far end of the rights-management spectrum, institutions may attempt to simplify rights management by simply demanding authors to surrender all rights in solicited or commissioned works. For copyright, this would require a signed writing, which would likely include the language discussed above about transfer of rights in “any medium now known or hereafter invented.” However, many non-institutional contributors, visiting speakers, and distinguished guests may be reluctant to transfer all rights, and may elect instead not to contribute or speak. Even if the institution has sufficient leverage to induce some speakers or contributors to sign the transfers, the policy may be viewed as overreaching. These considerations, together with the potential burden on the institution of monitoring and policing a large intellectual property portfolio for which the institution would be the exclusive owner, may militate in favor of some intermediate position. Educational institutions may be able to require the transfer of only specific rights that will accommodate both their management needs and the interests of the author. For example, since copyright is infinitely divisible, an institution might opt for the transfer of a non-exclusive right to use materials in future media.

**Conclusion**

Transfer of previously published materials to the Internet may implicate a variety of proprietary rights. Because of the nature and operation of digital networks, educational institutions will frequently lack the necessary permission or ownership of rights for such online usage. In order to avoid infringement liability, some type of audit of the materials may be necessary prior to placing them online, in order to determine whether the institution has secured the necessary permissions, licenses, or rights ownership. Different levels of review will be appropriate to different educational institutions, depending on their individual determination of likely exposure. Additionally, educational institutions should give prompt attention to development of policies on securing the electronic or “new media” rights to materials acquired in the future.

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Lucinda Roy...

(continued from page 18)

share. That’s why [we] started Cyberschool. It was really just a term to think of working together as a group, as faculty, trying to help each other and share our ideas with each other. What was very important, though, was to have the blessing of the upward administration. To some extent, [the work] does take you away from your department. Dean Robert Bates in Arts and Sciences understood that faculty were at risk, and so was careful to build in some safeguards so that faculty could succeed. We’re still learning and we still have a long way to go. We need to keep on listening to faculty, staff, and student concerns. That’s the key to success.

James Roche (jroche@educause.edu) is director of Communications at EDUCAUSE.
Distance Education: Effective Learning or Content-Free Credits?

by Gregory D. Bothun

Introduction

In the past three or so years, the Internet has rapidly penetrated American households. Development of Web browsers like Netscape and Internet Explorer has allowed more people to access the rich array of products now available for downloading. Such functional access opens new markets for the commercial sector. In turn, this has led to a significant congestion on the Internet, which, in part, has motivated a consortium of universities to form the Internet2, or I2. Part of the justification for I2 is the opening of distance education (DE) markets.1 Almost every major American university has some DE offerings on the Internet. While earning college credit via correspondence is nothing new, one hopes that the use of network technology will provide considerable rigor and value to this process rather than simply offering credit by e-mail. Whether Internet-based DE actually does is the genesis of this article.

For two-and-a-half years, the University of Oregon has offered four ten-week DE classes, including Physics 161: Energy and the Environment; Physics 162: Alternative and Renewable Energies; Astronomy 121: Solar System Geology; and Astronomy 123: Cosmology and the Origin of Life. To date, about 150 students from around the world have taken these courses; it is their feedback that supplies the data used in this paper to assess the condition of Internet-based distance education as well as its market potential.

These four classes were not developed specifically for the distance education market; rather, they are regular University of Oregon classes taken by hundreds of students each year. Web-based textbooks were written for these courses and tested there before they were offered as DE courses.2 As a result, the distance education student is exposed to the same course material as the in-class student and has the same homework assignments and examinations. This facilitates a direct comparison of the range of performance between the DE population and the in-class students. Students in the in-class population, however, generally take these courses to satisfy a Natural Sciences requirement for graduation and may not be particularly interested in the material when they enroll. In contrast, some of the distance education students select the courses because they are interested in the specific material. We factor the effect of each kind of selection into our analysis.

Questions to assess in distance education

The University of Oregon’s foray into the distance education market was done very much as an experiment. This experiment was designed to yield data on the following issues:

Can DE students reliably and efficiently access all the curriculum materials so they can complete the course requirements in ten weeks?

Of the 150 DE students enrolled in the four courses, 125 completed the requirements in eight to ten weeks. This proves it is possible to deliver courses in this manner, which reflects the information-oriented nature of survey courses. Such courses require little student mentoring, which more easily allows students to work at their own pace.

Does DE technology allow students to become reasonably engaged with the material?

Responses from distance education students varied on this issue. Many students reported being significantly more engaged than the on-

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campus students and prepared content-rich Web pages as part of their coursework. These students asked many questions through e-mail and seemed genuinely interested in the topic. Others, however, admittedly tried to coast through with minimal effort and rarely had substantive questions. Often, these students were difficult to keep in touch with and ignored exam deadlines. Further, there is a weak but important correlation between homework quality as well as student engagement and the reliability of Internet access. Some students had poor ISPs, resulting in unreceived e-mail. This caused noticeable performance problems.

Is there a significant difference in homework and exam grades between DE students and on-campus students?

DE students tended to receive higher grades than on-campus students for the same courses, but it should be noted that many of the DE students are self-selected and therefore highly motivated. Indeed, the initial onset of this experiment drew mostly this population, and their performance was always in the top 5 percent compared to the on-campus students. As time wore on, however, less motivated students began to enroll in the DE classes; they earned lower grades than the initial respondents. That helped fill out the bell-shaped curve. Table 1 summarizes the grade distribution of the in-class and DE populations.

Formally, the difference between the two mean GPAs is significant. However, twenty-five DE students received a grade of Incomplete. If those Incompletes were converted to Fs, the mean GPA of the DE population drops to 2.58, and the dispersion significantly increases (although the grade distribution would no longer be normal). For the DE students who completed the course, the lower dispersion and higher mean shows that few earned grades lower than C-plus.

Are there special difficulties associated with administering exams in DE courses?

In general, students take exams by e-mail at scheduled times. Instructors e-mail a few questions at a time to DE students. Once answers to those questions are received, more questions are sent. In principle, each exam has a time limit. But there are several problems with this approach. First, some students fail to log onto e-mail at the appointed time. Second, there is significant variability in the reliability of the students’ ISP e-mail service. And finally, there is a limit to the kinds of exams that can be given via e-mail.

Clearly, e-mail is a poor vehicle for an exam; this is perhaps the most unsatisfactory part of Internet-based distance education. To address this, the University of Oregon has developed a robust and clever Java exam applet, which is timed and self-proctoring. Initially, most of the DE students claimed their browsers could not run the applet. However, because of the applet’s tremendous flexibility and its ability to allow for a fairly rigorous exam, we will soon require each DE student to have a Java-aware browser as a condition of enrollment. This will aid the instructor in other ways, as well, as many of our Web pages have embedded, interactive Java applets as an integral part of our courseware.3

Is the instructor’s time investment manageable or prohibitive?

Demands on instructor time vary hugely from student to student. Some DE students are independent, think about the material, and ask thoughtful questions. Others require more hand-holding and are less efficient at getting through the course. Because of this, it’s impossible to scale Web-delivered DE courses. Having six distance education students in a term, for example, is more than twice the work of having three students. In general, DE stu-

<table>
<thead>
<tr>
<th>Population</th>
<th>Number</th>
<th>Mean GPA</th>
<th>Dispersion</th>
</tr>
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<tbody>
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<td>In-class</td>
<td>2000</td>
<td>2.83</td>
<td>0.68</td>
</tr>
<tr>
<td>Distance Educa</td>
<td>125</td>
<td>3.08</td>
<td>0.45</td>
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Table 1: Grade distribution, in-class and distance education students

Students are more of a challenge to the instructor than the in-class student. They ask more questions and want, quite naturally, more interaction with the instructor. As the interaction is asynchronous, it becomes a significant time drain when more than just a few students are enrolled. For these reasons, the University of Oregon caps enrollment at fifteen DE students per ten-week term in Internet-based courses.

Demographics of the DE market

The demographics of the 150 DE students taught to date allows a natural division into five groups. These groups and their percentage contribution to the total empirically define the DE market and are described below:

Group 1: (20 percent of total) This group consists of professionals who are older than twenty-five and seeking continuing education to help in their careers. Members of this group perceive the courses as having the potential to make an immediate impact on their careers. Most took Physics 161 and 162 and are employed in the energy industry.

Group 2: (10 percent of total) This group consists of so-called life-long learners. Most of its members are age fifty or older, and retired or nearing retirement. And for most, these DE courses offered them their first exposure to the Internet. The ability to engage in a learning mode while using the Internet was a major motivating factor for these students. Often they would find substantial new material relevant to the course all on their own.

Group 3: (25 percent of total) This group consists of the non-traditional student who has tight time and place constraints. Often these students who work nearly full time, have young children, or do not live near campus for one or more terms. This group was split evenly between one-time traditional University of Oregon students who had evolved by circumstance to become DE students, and students who live in other states and countries.

Group 4: (25 percent of total) An increasingly large component of our DE classes since January 1997, this group is made up of high school students seeking college credit.

Group 5: (20 percent of total) This is a new group that emerged in September 1997, when the university's schedule of classes inadvertently listed DE classes as Independent Study courses. The error resulted in a large demand for these classes by regular, on-campus students. These enrollees seemed to believe that taking DE classes would be the easiest and cheapest way to fulfill their course requirements.

Student performance vs. demographic group

Individual performance in DE courses is linked strongly to the student's demographic group. Some illuminating feedback from students in each demographic group is contained in the Appendix. Far and away, Group 1 students were the most responsible, asked sensible questions, accessed the material in a timely manner, and were generally a pleasure to work with. They were clearly motivated to learn and apply the course material and had no problems with the format. Students in Group 2 also were easy to work with, but were motivated more by this new process of learning than the actual course content (although they generally received good grades).

In sharp contrast, the students in Groups 3, 4, and 5 exhibited a wide range of performance and motivation. Many had difficulty pacing themselves and had to cram much of the coursework into the last two weeks of class. It's clear that these students require a more structured format than the self-paced, free-form process the Internet allows. Students in these demographic groups simply lack the self-discipline and time-management skills of individuals in Groups 1 and 2. As a result, managing these students takes more time than teaching them. Because students from Groups 3, 4, and 5 form the bulk of the DE market, however, it is vital for the university to develop a more structured mechanism. This is particularly true for the high school seniors in Group 4, most of whom received grades of Incomplete because they did not access the material on a regular basis. In general, these students did not seem to have the emotional maturity or parental guidance necessary to efficiently handle a self-paced course. In some cases, the parents of these students blamed the instructor for their children's failure to access the course material. As a result, the university has instituted a pre-screening procedure for high school students who want to take DE courses. They must enter into a "contract" with the instructor, attesting that they...
have reliable Internet access and promising to do the work. Although the pre-screening process has reduced enrollment among these students, those who do enroll are more successful.

Conclusions and future directions

The previous analysis sets the stage for putting our empirical results into a broader context. Doing so allows the University of Oregon to offer some strategies for colleges and universities that offer distance education courses via the Internet. Our experimental data allows for partial answers to three fundamental questions:

1. Does effective learning occur when using the Internet as the primary means of delivering a course?

   The answer is a qualified yes. The quality of learning depends on the student’s level of motivation. Some students—notably those in Groups 3, 4, and 5—do not seem to grasp the concept of a self-paced course; that is, they had trouble understanding that they had to access the material, do the assignments, think about the information, and ask questions of the instructor via e-mail. It seems pointless for students without that skill set to attempt these courses. That they enroll anyway suggests that their primary motivation lies in the perception that Web-based courses offer an easy way to get university credit.

   Why do they seek easy classes? The answer lies in an honest appraisal of our customer base. Students in these classes typically have little inherent interest in the subject matter and are enrolled to earn a grade in order to fill some distribution requirement of graduation. By the measure of the distribution of grades, one could say that adequate learning had occurred in the DE circumstance, and that the value added of the physical lecture in assisting them to obtain a decent grade is nil. As a result, the nature of Internet-based distance education is a hybrid of effective learning and easy credits. The difficulty of giving rigorous exams in the DE environment certainly contributes to this. But the same is true for the on-campus version of these classes.

   In general, independent of the medium, an instructor can sense when a student becomes a learner—rather than merely an absorber of information—by the kinds of questions he or she asks. Significantly higher-level and more frequent questions emerge in the distance education setting compared to on-campus lectures. While that is not proof that more effective learning can occur in the DE environment, the combination of self-selection and the DE student’s need to question the instructor can promote more effective learning for some students. This is the real educational value of distance education. Rather than simply increasing the credit count, colleges and universities can offer courses to motivated and interested students who otherwise would not have a means of learning the material. As long as some balance between real learning and easy credits is maintained, the distance education enterprise is worth pursuing. The concern is that, in an attempt to ramp up the DE market for revenue or other reasons, the balance will shift in favor of the easy credits.

2. What is the nature of the market for distance education?

   The distance education market is not yet focused toward a particular demographic, but is rather diverse. Colleges and universities should therefore exercise maximum flexibility when designing their DE offerings. For instance, offering a topical class like Physics 162 is an excellent way to respond to a new learning need in the commercial sector. This suggests that feedback from the commercial sector on course offerings could increase the chances for success in the DE market. Still, the market for distance education courses is not large. While the University of Oregon limits enrollment to some extent so as not to over-burden instructors, the school gets fewer than 500 inquiries about these courses a year. It is clear that motivated, self-selected students will do well in distance education courses. But are there enough of these students to sustain the market?

3. How far should distance education go as a substitute for the on-campus experience?

   There are two issues here. The first one is the demand the college or university places on its faculty when it adds distance education courses to the mix of class offerings. Treating DE courses as an add-on to normal teaching duties is clearly inappropriate. A separate sup-

   (continued on page 36)
South Dakota Board of Regents

Serving as a connection between higher education and state government, the South Dakota Board of Regents governs the six institutions that make up the public higher education system in the state. The combined headcount for the institutions—Black Hills State University, Dakota State University, Northern State University, South Dakota School of Mines and Technology, South Dakota State University, and the University of South Dakota—is just under 26,000 students.

The board office is located in Pierre, in the center of the state on the Missouri River. The South Dakota Board of Regents is a governing board, which means that it has control over all major systemwide and institutional decisions. The board’s operating budget is $306 million, which includes funds for K-12 special schools for the deaf and the blind and visually impaired that the board also oversees.

South Dakota is a rural state that does not tax income and has no major industry. The public higher education system fights to stay out of the lowest ranking nationwide in average faculty salaries, yet faculty teach eight courses a year while maintaining average class sizes. So, though it spans two time zones and as much as 455 miles between campuses, the university system is a unified one, sharing its scarce state resources. The Board of Regents takes a coordinated approach to many of the university functions, from systemwide databases to offering collaborative majors. The board works creatively to get the most out of its funding.

Standardization

The institutions in the South Dakota Unified System of Public Higher Education have common course numbers, code structures, policies, and procedures. And to function efficiently as a whole, the databases also stretch systemwide. Regents Information Systems (RIS) coordinates systemwide computing resources for the higher education community, including technology implementation and planning for both academic and administrative functions. RIS is located in Vermillion, nearly 300 miles southeast of the Board of Regents office.

By sharing products that are licensed to the Board of Regents, the universities are able to take advantage of many products that they wouldn’t be able to purchase individually.

After an analysis in 1994 identified a number of inadequacies with the system’s student information database, officials decided to replace it. The new student information system (SIS), which is in the final stages of implementation, addresses problems associated with the year 2000 and provides increased accessibility, among other improvements. Datatel, the SIS vendor, was chosen partly for its record of customer support, a service the South Dakota system couldn’t address with its small staff. But Bob Burke, SIS project director for the Board of Regents, explained that while Datatel had worked with systems before, the South Dakota system presented new challenges: “I think we offer some uniquenesses because in some ways we have very separate campus missions and at the same time we have a very central system mission.” The South Dakota system needed to be able to work with data in both contexts.

Standardization is an important issue, as the board staff is often called upon to provide data and information to state legislators. Director of Regents Information Systems Warren Wilson explained, “Policy makers look to the board or the board office for answers to a lot more questions because we have the voice for all the institutions.” Data are requested often and for any number of details, such as faculty qualifications or the number of students majoring in a certain field. Paul Gough, director of policy and planning, says that such demands are high in South Dakota. “I think there’s probably more pressure here than in other states because others might have a stronger and larger legislative staff which could do its own digging,” he said, noting that South Dakota also has a very short legislative session, which puts a time crunch on information requests.

Director of Information and Institutional Research Carol Stonefield explains that part of serving the state means accounting for what’s going on in higher education. “System information gives us the opportunity to respond quickly and accurately, to use our resources wisely and efficiently, and to increase our accountability,” she said. But while it’s important for each of the campuses to standardize their information, it’s just as important for the databases to provide adaptability in reporting, as the board staff can’t count on standard questions from legislators or from the board. “We need the flexibility to answer questions we haven’t yet thought about,” said Gough.

Creative streamlining

While the institutional system has created economies of scale by standardizing and sharing systems, the Board of Regents has also juggled dollars, and even majors, to fund critical projects. One such program, Reinvestment
Through Efficiencies, has been in essence a 10 percent redirection of the system's resource base. With the funds that have been captured, the system has been able to implement projects such as the new student information system. A big contributor to the captured funds was a reworking of the processing functions for admissions and financial aid, and the elimination of more than fifty positions throughout the system. A consolidated Enrollment Services Center, which operates with ten employees, was created for all six universities.

Low-enrollment courses were also examined as part of the reinvestment project, which is in its third year. Courses were filtered out based on class size, and 159 programs were eliminated throughout the system. But, said Executive Director Robert T. Tad Perry, "You have to be careful, because you want a quality educational experience that gives people choice." So last year the system adopted a new tactic: base the critical mass on enrollment numbers systemwide, rather than institutionally, and create collaborative majors. Through the use of technology-enhanced classrooms, French, German, and physics programs are now each shared among three universities. A student will take classes from each of the three institutions, and a degree is awarded by the home institution. Stonefield told of a French professor whose perspective significantly changed with the new arrangement. His department is now all of the faculty with whom he worked from the other two schools. "It's not just going out and talking to his next-door neighbors, but rather it's people he communicates with electronically. It's opened up a lot of opportunities and it's changed his way of thinking about delivery of programs," she said.

Lesta Turchen, senior administrator and chief academic officer, similarly described a two-year pilot project in business education. "Each institution identified a specialty area within the business curriculum, and they will deliver that specialty to the other campuses utilizing PictureTel, the Internet, and RDTN [Rural Development Telecommunications Network]," she said. Gough added, "There's a whole PhD program that's shared between two universities: atmospheric, environmental, and water resources. It's on opposite sides of the state."

Stonefield pointed out that individual institutions tend to compete to fill gaps and add programs, which may not be the most efficient use of a state's resources. "The Board of Regents can really represent and coordinate the whole system, all of the institutions. I think that has the potential for putting a much better perspective on higher education—it is more equitable, and priorities are in the right places," she said.

Perry described an incentive funding plan that the board is using to in-
crease quality throughout the system. He explained that when money is distributed based on whether institutions get students in their classrooms, it sets up a situation where universities compete for the student population. Said Perry, "It does not necessarily mean that there's anything of qualitative value going on, since you're only counting the quantity part of the equation. ... It became very apparent to us that the way we were funding campuses was dysfunctional to the purpose of our goals."

When the board proposed that the institutions concentrate on quality, legislators suggested that performance variables be factored into their funding. The board took 5 percent off the top of the base budgets of the institutions and set the money aside in five pools; if the universities perform well over the next year, they earn their money back. Incentives include increasing the number of resident students (out-of-state students bring their own incentive of higher tuition), growing academic programs in areas that benefit South Dakota's economy, increasing academic quality (based on students' progress), increasing collaborative efforts among the institutions, and raising external dollars.

**Tools to work with**

Investments in technology are necessary for the Board of Regents to streamline its initiatives and share resources. About a year ago, five information technology goals were identified for the higher education system. Ben Dar, vice president for technology at Black Hills State University, described those goals: Every student will have access to and be proficient in using technology appropriately to his or her discipline; faculty will have access to appropriate technology to improve the teaching and learning environment; every building and room will be wired and, where appropriate, provide access to local, regional, national, and international information resources; universities will have the capacity to send and receive educational programs and instructions to and from anywhere at any time; and necessary support will be provided for an efficient and effective learning environment.

Dar was recently asked to serve as a consultant to help the Board of Regents draft a system technology infrastructure plan, which would help achieve these goals. Coordinating with the institutions, Dar identified five broad instructional technology areas: campus backbone, campus building wiring and connections, campus technology classrooms, campus computers, and instructional technology support. Working with those, Dar set up a series of spreadsheets to map the resources and identify needs across the system.

"The two broad issues in my mind for instructional technology are access and use," explained Dar. The first four goals and areas fit into the access category, and the last, support, addresses effective use. "The infrastructure is the foundation for allowing access to the super-information highway," he said, and he cited networking as an example. Without the physical elements, the transfer of files and communication is not possible. Network administration, or support, is necessary to make the process effective and efficient.

**Beyond the system**

Institutions in South Dakota have taken their ability to collaborate beyond the public higher education system. South Dakota's research institutions are partnering regionally and nationally to gain access to high-speed networks. And South Dakota boasts one of the most unified library consortiums in the United States.

The Great Plains Network (GPN) is a consortium that South Dakota has created with five other states: North Dakota, Nebraska, Kansas, Oklahoma, and Arkansas. Funded in part by the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR), the states are connecting through a high-bandwidth network to share resources among their universities. The states based their proposal to NSF on a common thread, earth systems science. They plan to use the high-speed network to access data from the EROS (Earth Resources Observation System) Data Center, a federal facility in South Dakota that collects archives of satellite imaging of the earth.

Three of the six South Dakota system institutions—the South Dakota State University, the School of Mines, and the University of South Dakota—are members of Internet2. Those memberships reflect an investment of approximately half a million dollars a year for the next few years. USD Director of the Office of Research Royce Engstrom explained, "South Dakota recognizes that we can't be left behind in this movement; it's too important a transition not to be a part of it."

Engstrom emphasized the level of cooperation that projects of this scope involve, saying, "It's really a good example of cooperation at its best—there's cooperation within the state, cooperation with other states, cooperation with NSF. It's really a partnership, and it shows what can be accomplished when groups of people get together."

Within the state, the South Dakota Library Network (SDLN), whose data center reports to the director of RIS, also reflects the state's collaborative approach. A computer automation consortium for libraries, SDLN comprises forty-seven libraries and is currently run by a staff of two people, plus student help, who are familiar with computer operations, user training, and the terminology of librarians. Started as a consortium in 1988, SDLN is supported by member fees and includes the major libraries in the state, in addition to...
a sampling of federal, hospital, specialized, and school libraries. As a service to its members, SDLN provides an online card catalog, an automated circulation system, serials, acquisitions, interlibrary loan, and inventory, and hosts a variety of reference databases on their servers. The institutions each have their own computer centers, but public libraries do not, so SDLN effectively acts as their computer center as well.

Gary Johnson, director of SDLN, explained that the few other states that do have statewide library systems are not as diverse and inclusive in their memberships. He also said that it's rare to combine the computing and library help calls into one center. “Here we are one group, and we understand the terminology of both sides. It's easier to provide solutions that way,” Johnson said.

Communication

While the Board of Regents will set a direction or tone on a project, “the details of putting it into effect will be quite often a cooperative effort or consensus decision-making procedure so people are more aware and more comfortable,” said Stonefield. Committees, such as those for SIS and the technology infrastructure initiative, include both institutional and functional representation, assuring that all areas have a voice. Wilson explained that one of the biggest transitions for him in moving from a single institution to the South Dakota system eight years ago was the increase in communication and coordination. “It’s phenomenal—exponential,” he said. “Instead of one academic affairs officer, you’re working with six plus a board office member. I don’t think a day goes by without some type of system meeting.”

One of the challenges is communicating effectively while being so spread out. E-mail and conference calls are critical, of course, and there’s a fair amount of traveling as well. And, Turchen noted, one of the goals of the office will be to use PictureTel when it’s not in use for classes. Increased use of the videoconferencing facilities is about a year away, after a bit of adapting and remodeling, she says. But most important in the communication is the willingness to work together. Said Burke, “I think we’ve developed a strong trust in the communication. People have freedom to say what they need to say, and I think we’ve fostered that trusting environment. You can have e-mail, but you have to be able to talk to the person on the other end.”

At fewer than ten per square mile, people are another of South Dakota’s scarce resources, but Perry notes that throughout the system people put a lot of energy into their work. Said Wilson, “South Dakota is small enough that you really know people all the way across the state. There are a lot of ties. I think that develops a sense of responsibility.”

Still, coordinating among so many so far away takes a lot of effort, as each institution has its own identity and mission. “We certainly have our differences,” said Burke. “But we have to find some common denominators to share work.” Wilson explained, “You have six institutions, two special schools, and a board office. You’re trying to get everyone together to agree on a direction and move that way, and it just takes an enormous amount of communication, patience, and skill—and sometimes a big step.”

Executive Director
Robert T. Tad Perry

Robert T. Tad Perry is the executive director of the Board of Regents and an avid supporter of technology. Perry was taken on board four years ago to address several objectives, two of which mentioned technology directly; he was also charged with the task of creating a truly unified university system. “Unified system” is one of Perry’s four themes, along with management, accountability, and quality—and these themes are not just abstract visions. Paul Gough, director of policy and planning, has them scrawled on a Post-It note stuck to his computer monitor.

“My view of technology is that it really underpins what we want to accomplish in the system.” Perry says, explaining that investments in technology enable the board to capture efficiencies in the system. And the system approach—sharing resources—is critical for public higher education in South Dakota. “If we did not have the RIS staff operation built in, if we had to do this with six institutions, and fight all the battles you have to fight with setting up databases, much less getting agreement on things and managing the resources, I would need about twenty people in this office just to fight those battles.”
Distance Education...

(continued from page 31)

In contrast, the physical lecture for large, information-oriented survey courses may add no value to the student. Doesn't that translate into an obvious direction? Shouldn't universities simply develop more-or-less-automated survey classes to accommodate the flexible needs of many students and free faculty to teach more meaningful courses and mentor students?

For at least fifty years, many lower-division courses have been taught by lecture to students who attend simply to fulfill a distribution requirement for graduation. It is unclear why we need to keep doing this in an era of viable digital alternatives. In the long run, these alternatives can save institutions from spending money on constructing additional 200-seat lecture halls to accommodate an outmoded style of teaching. The ironic triumph of distance education may well be an increase in general mentoring activities on college and university campuses and the overall revitalization of faculty who long ago burned out on service teaching.

Greg Bothun (nuts@moo2.uoregon.edu) is a professor in the Physics Department at the University of Oregon.

APPENDIX

FEEDBACK FROM REAL DISTANCE EDUCATION STUDENTS

The following are excerpts from conversations with five DE students.

Phillipe of Montreal: Age 30+ — Group 1 (Physics 162)

I have to tell you that the course has provided me with a lot of interesting basic information on alternative energy, which is bound to be further developed in the years to come. The province of Quebec has a new energy policy that opens the door to alternative energies, such as biomass and wind power. I work as an environmental consultant and have worked on environmental planning for a number of hydroelectric projects. More recently, I have participated in environmental feasibility studies for cogeneration projects. It has been a very pleasant experience to follow this course through Internet and it has allowed me to find a number of interesting [Web] sites on the matter.

Al of California: Retired Coast Guard — Group 2 (Physics 161)

I really enjoyed the objective way this material was presented. It helped confirm some of my instincts. Even if scientists are funded by the government, I tend to believe them first, so I do believe we are running out of oil and a replacement is needed soon. I think the barrels game is being played to help the disinformation machine gain more ground in the public arena. I hope the scientists that work on this problem don't fall for any of the B.S. the... governments put out. I appreciated the way you delivered the straight poop and I liked many of the Internet sites I found. It gives me something to do in my golden years.
Carlos of Argentina: Age 21 — Group 3 (Astronomy 123)

I guess we come to an end of this course. I want to thank you for your stimulating guidance through this course. I never imagined it would be that interesting. I learned lots of new things, I confirmed some others, I discarded wrong concepts, and it was fun. I have been reading about astronomy and related topics but somehow without much order. This course helped me to straighten things up. And I found many doors to open in the future (which I plan to do).

Karen of California: Age 39 — Group 3 (Astronomy 123)

Distance education via the Internet is only for those who are self-motivated and willing to do their own research and a lot of extracurricular reading on their chosen subject. Or, at least, that was my experience. You are hampered by not attending a lecture and being able to ask questions and have them answered on the spot. It takes a bit of the spontaneity out of the learning experience. I, myself, did not miss interaction with other students, because I'm older and quite honestly, probably a lot more serious about the learning experience than they are; I have a better perspective on the value of time and how I want to spend it. The best things about it: the opportunity to go into depth with a subject, even though it is a basic course. In a regular classroom setting at the undergraduate level, you don't get this opportunity. Working at your own pace is nice, as well, although I would have liked more homework assignments. At the same time, working full time, trying to run an adult life, and taking astrophysics was certainly a challenge! Utility-wise, it's a great choice for people like me who are pursuing, in my case, a second bachelor's and then a master's degree. It allows me to work full time and go to school without having travel time or taking up my weekends. I really enjoyed it.

Matt of Oregon: Age 16 — Group 4 (Physics 161, 162)

For someone in a small community, the Internet distance education program is a blessing. My high school and the local community college have limited courses, especially in areas unrelated to the average worker. To continue my education in science, the only option open to me was distance education. As soon as I found Internet-based courses, I immediately enrolled. The difference between Internet courses and conventional distance education is fast communication. When I was ready for the next section, all I had to do was click a hyperlink. If I had a question, all I had to do was send e-mail and I would usually have an answer within hours, if not sooner. Another plus is the wealth of information that the Internet provides. Often I would find hyperlinks in the lectures that pointed to sites that had more in-depth information on certain subjects. After all of the research that this class required, I am convinced that now I could find just about anything on the Internet. I would have to say that there are very few bad factors to this program. The only thing that I struggled with was the flexibility of the schedule. It is easy to get behind when no one is pushing you forward. However, for someone who is willing to rise to the challenge, I think that this type of class is a learning experience in responsibility, independence, and research, as well as the subject material.

While the above requires little comment, this feedback does reinforce two important points: (1) Topical classes like Physics 162 are an excellent way to respond rapidly to a new need in the commercial sector. This strongly suggests that success in the DE market depends on feedback from the commercial sector in terms of course offerings. (2) Self-motivated students will do well in the DE enterprise. The comments from Karen and Matt are particularly telling in this regard. This, of course, is obvious but begs the key question: Are there enough students like them to sustain the market?

"For someone who is willing to rise to the challenge, I think that this type of class is a learning experience in responsibility, independence, and research, as well as the subject material."
What Do Information Technology Support Services Really Cost?

by Karen Leach and David Smallen

Leaders of IT organizations are troubled by the lack of reliable benchmarks or comparative data on which to base decisions about support services. Presidents are mystified by total cost of ownership (TCO) studies that appear in the popular press and higher education publications. The numbers quoted in these studies don’t seem realistic in light of actual expenditures on campus. Institutional trustees, concerned about rising annual costs for information technologies, are asking hard questions about the impact of services on the educational program and the value the institution is getting for its investment. The COSTS project aims to obtain consistent and reliable data, analyze it in meaningful ways, and develop benchmarks for IT services. This article describes the project’s origins and work to date and reports initial results in three support services areas.

In November of 1996, Steven Gilbert, moderator of the American Association for Higher Education’s technology listserv, was experiencing a personal technology support crisis. His laptop computer was down for repairs, his office server was experiencing problems, and he found himself unable to function in the Internet world on which he depends. In a posting to the listserv, he wrote:

As I’ve been suffering the effects of my own personal “support service crisis,” I’ve realized that there are a lot of people who want the same thing I do. We want powerful, effective tools that are utterly reliable, available, and easy to use. We want to spend our time figuring out how to use these tools to improve teaching and learning—how to do our work more effectively and efficiently. We don’t want to spend much time figuring out how to use these tools and their successors... or how to cope with unexpected limitations or anomalies. We especially don’t want to spend time trying to get our machines fixed or dealing with software packages that interfere with each other in mysterious ways. And we want the full costs associated with these capabilities and services to be highly predictable. We’re willing to pay a premium for all this, but we’d like that premium to be as low as possible.

Gilbert went on to detail the kind of support services he felt were desirable.

This listserv posting prompted the authors to realize how few information technology (IT) organizations have a strong understanding of the various costs of delivering IT support services and their components across the industry. Yet we are asked periodically by our senior administrators about benchmarks that our institutions could use to evaluate the services we deliver.

Intrigued with the idea of pursuing a solution to this challenge, at a “birds-of-a-feather” session at the 1996 CAUSE conference a week later in San Francisco, we provided attendees with a proposal to participate in a project to gather some preliminary data to help develop reasonable benchmarks for, and estimates of, the cost of delivering excellent IT support services. Fifty people agreed to participate, and the COSTS project was born. To increase potential participation, the audience was expanded to include the IT directors at the fifty-four schools in the Consortium of Liberal Arts Colleges (CLAC). A year later, after preliminary results were presented at the 1997 CAUSE con-
ference more than 100 institutions joined the project.

Project organization
The project is organized around short- and long-term goals, a conceptual framework, test hypotheses, and templates for data collection.

Goals
Clearly defined goals are necessary to explain the project to potential participants and keep our efforts on track. The short-term goals of the project are:
- Identify and understand examples of IT services at institutions of higher education.
- Develop ranges for the unit costs of providing IT services based on institutional characteristics.
- Test simple hypotheses about the unit costs of providing IT services.
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- Develop ranges for the unit costs of providing IT services based on institutional characteristics.
- Test simple hypotheses about the unit costs of providing IT services.

The long-term goals are:
- Identify a core of IT services that should be common to most institutions of higher education.
- Identify exemplars for each IT service, that is, institutional approaches that deliver exceptionally high levels of service at identified cost levels.
- Develop benchmarks that are useful for comparing the costs of providing IT services among various institutional categories.
- Determine components of the total cost of ownership (TCO) for desktop computer equipment in higher education.

Conceptual framework
Information technology services in higher education fall into two categories: those that deal with the care and feeding of the infrastructure and those that provide the related support services (see Table 1). Infrastructure-related services involve aspects of acquiring, installing, maintaining, and replacing things on an annual basis. Whether the replacement costs are part of the annual operating budget or are to be viewed as deferred maintenance (as many colleges have done in repair of their building infrastructure), they are real costs related to providing the necessary IT services. As such, they must be considered as part of any analysis of the cost of providing these important services. Support services are those areas in which budget components are largely staff driven and relate to provision of support to users of the infrastructure. Ultimately, the COSTS project aims to study all of these services.

Grandmother hypotheses
Early data analysis indicated it would be useful to have common hypotheses against which to test the data in each service area. One project participant, Richard Parker, suggested the notion of grandmother hypotheses; that is, simple hypotheses that even your grandmother would know to be true:
- Economies of scale—The unit cost of a service will decrease as the number of units increase.
- Outsourcing—The unit cost of providing services decreases with the degree to which they are outsourced.
- You get what you pay for—As service levels increase, the unit cost of providing the service increases.
- Complexity—The unit cost of a service increases with the complexity of the environment in which that service is provided.

Table 1: Categories of IT services

<table>
<thead>
<tr>
<th>Infrastructure-Related Services</th>
<th>Support Services</th>
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<tbody>
<tr>
<td>Desktop Hardware/Software</td>
<td>Training</td>
</tr>
<tr>
<td>Acquisition/Replacement</td>
<td>Help Desk</td>
</tr>
<tr>
<td>Installation</td>
<td>Administrative Information Systems</td>
</tr>
<tr>
<td>Desktop Repair</td>
<td>Curricular Support</td>
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<tr>
<td>Network</td>
<td>Research and Development</td>
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<td></td>
<td>Web Development</td>
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<td></td>
<td>Other...</td>
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</table>

“Whether the replacement costs are part of the annual operating budget or are to be viewed as deferred maintenance..., they are real costs related to providing the necessary IT services.”

\footnote{Parker is Director of Academic Computing at Harvey Mudd College.}
Data collection/templates
We focused on one service at a time, developed a template for the data to be collected, and distributed it via e-mail to the group, with a short deadline for submitting data. Participants were promised quick turnaround and preliminary analysis in exchange for their efforts in collecting and providing data. As an incentive, and to demonstrate this could be done, we provided the data for our own institutions (Hamilton College and Colgate University) in the initial e-mail request for each service. The agreement was that institutions must submit data to receive any detailed results.

Results of data collection for the first three areas—network services, desktop repair services, and administrative information systems—are reported below, using the grandmother hypotheses as a framework for discussion.

Network services
Network services refers to those activities of maintaining the infrastructure (wiring, fiber, hubs, and so forth) and the servers on the campus network, including the connection to the Internet. Cost of the initial building wiring, fiber runs, or electronics are not included. We asked participants to include the cost of the main servers for the library (OPAC and databases) and those that provide general campus information (Web server, public lab servers), but not the cost of departmental servers that provide only information for their departments. The costs of licensing and maintaining application software (e.g., statistical packages, administrative information systems) were excluded, while costs related to maintenance of operating systems were included. Data elements that were requested for network services are listed in Table 2.

Sixty colleges and universities from the U.S. provided data. These institutions are heavily networked, including residence halls. Network environments combine shared, switched, and fast Ethernet segments in buildings, with most of the campuses using FDDI as the core backbone technology and a smaller number using ATM. On most campuses there is a mix of technologies, as networks are in the process of upgrading to increase speed and support emerging uses of multimedia technologies.

Descriptions of the network environments and institutional characteristics such as number of ports, computers, students, and employees helped provide a context for understanding the institution and the necessary divisors for calculating unit costs. See Table 3 for a summary of these characteristics for the responding institutions.

We distinguished between active network ports and used network ports. Active network ports are connected to hub electronics—a computer could be plugged into an active port and connect with the network without any further work in the wiring closet. Used network ports have an actual computer or printer

<table>
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<th>Table 2: Network services data elements</th>
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<tr>
<td><strong>FTE staff</strong></td>
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<tr>
<td><strong>Budget components,</strong> i.e., dollars budgeted for:</td>
</tr>
<tr>
<td>salaries</td>
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<tr>
<td>student help</td>
</tr>
<tr>
<td>contractual arrangements</td>
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<tr>
<td>consulting</td>
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<tr>
<td>materials</td>
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<tr>
<td>professional development equipment</td>
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<tr>
<td><strong>Infrastructure,</strong> i.e., number of:</td>
</tr>
<tr>
<td>active ports</td>
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<tr>
<td>used ports</td>
</tr>
<tr>
<td>computers</td>
</tr>
<tr>
<td>students</td>
</tr>
<tr>
<td>employees</td>
</tr>
<tr>
<td><strong>Total replacement costs and replacement cycles for:</strong></td>
</tr>
<tr>
<td>servers</td>
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<tr>
<td>network electronics</td>
</tr>
<tr>
<td><strong>Description of network and service levels</strong></td>
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<tr>
<th>Table 3: Network services institutional characteristics</th>
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<tbody>
<tr>
<td><strong>FTE Network Staff</strong></td>
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<td>-----------------------</td>
</tr>
<tr>
<td>Active ports</td>
</tr>
<tr>
<td>Used ports</td>
</tr>
<tr>
<td>FTE Students</td>
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<tr>
<td>Employees</td>
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</table>

Caveat: As with any survey, estimates are the best that can be obtained, especially when describing staff who provide a number of services.
connected to them. For institutions in the early stages of networking their residence halls, the number of active ports may be considerably higher than the number of used ports. The number of used ports is a better predictor of the effort required to provide network services. Our analyses focus on averages, trends, and ratios, rather than absolute numbers. For example, a summary of the costs per port appears in Table 4.

We account for replacement costs, even though most institutions have not built these costs into annual operating budgets. We asked each institution to provide the total replacement value of servers and electronics and an estimate of the replacement cycle it would use if replacement costs were built into the annual operating budget. As expected, there was variation in projected replacement cycles with ranges from two to seven years for servers and three to ten years for network electronics. To apply a common estimate for the replacement cycle of electronics and servers, we computed the average cycle times for the entire group and then applied the average cycles (four and five years, respectively) to the actual replacement values for each institution. This helped to factor replacement costs into all subsequent analyses, regardless of whether the college had the money allocated in the annual operating budget. Using this approach, replacement costs represent, on average, 35 percent of the costs of providing network services, with salaries and contractual expenses representing 28 percent and 14 percent of the annual operating costs, respectively (see Figure 1).

Economies of scale

There is a certain amount of overhead necessary to provide network services to a college campus, regardless of the size of that network. This is most commonly reflected in the number of staff in the network services area. Correspondingly, economies of scale should result in lower unit costs as more devices are connected to the network. The data from the sixty respondents support this hypothesis. While variations exist, lower unit costs appear to be achieved for used ports as the number of ports increases (see Figure 2).

Outsourcing

Colleges rely on outside organizations to deliver some portion of their network services, the most frequent being hardware and software maintenance and Internet connections.
to and from the campus. How are the unit costs associated with providing these services affected by the reliance on outsourced network services? The data for the institutions participating in our study do not reveal any significant difference among the unit costs for outsourcing versus in-house approaches.

Service levels and network complexity

Most campuses described similar service levels for network services. Coverage for network outages was generally during business hours, with some personnel on call in the evenings. Most institutions had T-1 connections to the Internet.

Although responding institutions have a variety of network topologies, use a variety of equipment, and are supporting a diversity of protocols and hardware platforms, there is no discernible way to confidently relate these components of complexity with effects on the unit costs of providing network services. While it seems reasonable to assume that more complex networks would exhibit higher unit-service costs, it is also possible that increased complexity would be reflected in lower service levels.

Some further observations

Our preliminary analysis suggests that the full cost of network services is not yet reflected in the annual operating budget for IT organizations. Participating institutions are investing heavily in wired campuses, providing high-speed connections to the students in residence halls as well as throughout academic and administrative buildings. Early adopters of networking are in the process of upgrading their campus network infrastructures to support higher speeds. In general, the costs of upgrading the infrastructure will represent a significant portion of the ongoing cost of providing network services.

As instructional applications of technology become increasingly dependent on campus network and Internet-based resources, campus residents will expect their networks to function on a seven-day-a-week, twenty-four-hour-a-day basis. The implications for staff coverage, now generally provided on an informal call-in basis or outsource arrangements, can be substantial. The challenge for campuses will be to define service levels associated with various unit costs. At this point, the data collected do not provide substantial insight into the relationship between service-level expectation and unit cost.

Desktop repair services

Maintaining desktop computers and printers has become a regular part of providing IT services, and the ninety-three institutions that contributed data on this service area have been providing this service in two basic ways—using significant outsourcing or using their own staff. The data elements requested were basically the same as for network services, with computers substituted for ports. Institutions were instructed to report only the costs of providing repair of institutionally owned computers and printers and not to include costs or revenues related to repairing personal equipment or internally charging departments for repairs. Because this service focuses on maintaining existing desktop equipment, no replacement cycles were requested.

For all participating institutions, staffing levels are generally low, averaging 1.8 people per institution. On average, salaries, materials, and contractual arrangements make up 47 percent, 25 percent, and 17 percent of the annual budget, respectively, but these averages mask some significant variations among the institutions in terms of budget components. Annual unit costs per computer ranged from $53 (25th percentile) to $145 (75th percentile) with a median of $102.
Economies of scale

The data collected support the general conclusion that economies of scale result in lower unit costs per computer as the number of computers being serviced increases.

Outsourcing

There are significant differences in the way the responding institutions provide desktop repair service. Forty-eight of the colleges use some minimal contractual services (less than 10 percent of the budget). On average, there is about a 15 percent cost difference between the group that outsources more than 10 percent and the group that outsources less than 10 percent, with the in-house group averaging $122 per computer and the outsource group averaging $108 per computer. The difference is more dramatic when considering those institutions that devote more than half of their budgets to contractual arrangements versus those that spend less than half on those services. The cost per computer for the outsourced group was less than half that of institutions that primarily provide the service using their own staff.

Service levels and complexity

It was difficult to relate the service level associated with various unit costs, as most institutions do not maintain detailed records on the time-to-repair function for desktop equipment. Most respondents said computers are generally repaired within a certain time period if parts are on hand and within a longer period if parts had to be ordered.

One recent study comparing technology support in educational institutions to that in business environments suggests, "When an educational PC fails, it simply gets taken out of service for several days. A business computer is usually repaired within a matter of hours. Therefore, downtime for educational computers is two to three times higher." This is more likely to be true for public and departmental computer labs than for equipment on faculty or staff desks.

While participating institutions report generally similar expectation levels for equipment repair, there could be considerable variability in meeting these expectations; however, no data submitted support this hypothesis. Institutions in the study generally support both Macintosh and Windows desktop environments and included a range in age of equipment on campus. We were not able to confirm or deny the hypothesis that a less diverse hardware environment results in lower unit costs.

Some further observations

Desktop computer maintenance is an essential service in any technology environment, not only for institutionally owned equipment but also for the increasing number of computers being brought to campus by students. A number of institutions indicated they can generate enough income by providing repair services for students to subidize the maintenance of institutional equipment. The potential for lowering net unit costs by providing repair services to students might be examined in more detail. Such a service is similar to generating revenue by providing long-distance telephone service to students.

As students, faculty, and staff become increasingly reliant on technology for teaching, research, learning, and operating the business of the college, expectations for service levels will rise. One participant summarized the expectations at his campus by noting, "The users call when they have any kind of problems and they expect immediate attention." Another indicated, "Our users have come to expect almost immediate response (during working hours) if they have a machine that is not working."

Further work needs to be done to study the relationship between unit costs and quality of service provided as measured by average downtime for equipment.

Administrative information systems

Centralized information systems continue to play an important role in transacting the business side of the college. Regardless of the technologies used, these systems provide fundamental information that supports decision-making by admissions, financial aid, registrar/student affairs, business office, and alumni/fundraising. Support services include systems analysis, programming, and operations. Twenty-nine institutions submitted data in this area. Not all of these institutions are supporting the same collection of applications; four of the institutions are using software developed in-house, while the others are using packages from vendors. The major components of the annual budget for this service area

"We were not able to confirm or deny the hypothesis that a less diverse hardware environment results in lower unit costs."


7 We report data from twenty-eight responding U.S. institutions.
are salaries (63 percent) and software maintenance (17 percent).

Economies of scale

The basic functions performed by an administrative information system are similar across institutions. For most of the institutions, the total cost of providing these services falls in a narrow band, from $200,000–$500,000 (see Figure 3). Therefore, regardless of size, a certain amount of overhead is necessary to provide basic administrative support services.

Outsourcing

None of the institutions in our study contract with a company to manage their administrative information systems (commonly called facilities management). However, a common issue faced by all colleges is whether to develop software in-house or to license integrated packages from a vendor. Nearly all of the institutions responding in this area have chosen this second route. It is commonly believed that institutions choose this approach with the goal of increasing functionality, providing higher levels of support, or minimizing the need for technical support staff. Among the responding institutions, the average staff size is smaller for those that license integrated packages, but average unit costs are approximately the same for both groups (see Table 5).

Service levels and complexity

Supporting integrated administrative systems can be a complex process. These systems are generally built on a database foundation and often require significant technical knowledge for effective use. It is likely, therefore, that the improved functionality that vendor-provided solutions promise (hence, higher service levels) comes with lower staffing needs, increased software licensing fees, and demanding hardware requirements. This appears to be reflected in the proportion of budgets devoted to these service components. We have not been able to determine whether the improved functionality is actually realized, or whether reduced staffing levels create a roadblock to achieving higher service levels.

Some further observations

The data template components for this area reflect the ongoing cost of operating these systems. Hence the initial, and often substantial, acquisition costs for hardware and software were not generally reflected in the data provided by the institution. In the future we intend to incorporate an amortization analysis for the servers, similar to that done for network services.

While the data template reflects centralized costs, it is often the case that the newer administrative systems require powerful desktop computers to utilize the full functionality of the software (e.g., access through the Web and use of sophisticated client/server architectures). The upgrade costs at the desktop level are not reflected in this template. As with the other two services, our analyses raised as many questions as they have answered. This is consistent with the goal of promoting better understanding of the complexity of these services.

Table 5: Administrative information systems
average staff and unit costs

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Conclusions and future directions

A growing number of colleges and universities are participating in the COSTS project (including more complex and larger institutions), suggesting that with further participation it will be possible to develop benchmarks for unit costs that may be useful across institutions, even among a variety of institutional types. The simple analyses we have done provide valuable insight and point to some interesting avenues for further investigation. Relating unit costs to service-level expectations is particularly promising for understanding the differences exhibited by institutions and has the potential to help identify exemplars for further study.

Further progress depends on a substantial increase in the number and variety of institutions willing to make the effort to be introspective about their IT support services. The project goals are focused on developing a common understanding of campus IT support needs. In this era of the support services crisis, a better understanding of our options is essential.

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FARNET and NTTF...

(continued from page9)

been involved in a broader range of telecommunications policy issues. NTTF has responded to a number of requests by the federal government for public-sector input on telecommunications-oriented subjects.

In 1988, NTTF organized its first annual conference in Washington, D.C., bringing together leaders from government, industry, and the public sector to discuss developments in telecommunications policy. Keynoting this year's "Networking '98" were Federal Communications Commission Chair William Kennard and John Hart, 3Com Corporation's senior vice president and chief technical officer.

In 1996, NTTF led a meeting on higher education's role in networking development. With FARNET, NTTF facilitated the germination of what later became known as Internet2, an effort to reestablish higher education's leadership role in internetworking.

What the merger means

Both FARNET and NTTF played distinct and important roles in developing the Internet in the academic and public-sector communities. Their union within EDUCAUSE allows the organization to be a more effective policy and information resource for its membership. Under the EDUCAUSE umbrella, the new policy team — Net@EDU — will concentrate on researching and communicating internetworking and telecommunications issues and will work to develop coherent policy networking strategies that reflect membership needs.

Within a few months, Net@EDU will host a series of workshops dealing with issues relevant to the higher education and state network communities. With backing from the National Science Foundation, the merged entity in August held a small, invitation-only workshop to discuss the April 2000 expiration of the very high-speed backbone network (vBNS) program. Another summer workshop explored the discrepancy in the pricing of advanced data communication services and the factors influencing these circuit costs. And coming soon is a workshop to determine how to prepare the nation's 3,000-plus higher education institutions for the next generation of networking. See http://www.educause.edu/netatedu.html for more information.

Net@EDU will relay networking policy developments to EDUCAUSE members through its free e-mail reports, the weekly Washington Update and occasional "Special Reports." To subscribe to Washington Update, send e-mail to gsern@educause.edu.

Garret Sern (gsern@educause.edu) produces EDUCAUSE Washington Update for Net@EDU and is a policy analyst at EDUCAUSE.

"Under the EDUCAUSE umbrella, the new policy team will concentrate on researching and communicating internetworking and telecommunications issues and will work to develop coherent policy networking strategies that reflect membership needs."
Improve Morale and Reduce Stress: Communicate!

by Karen DeMauro

How do you maintain employee morale in a time of decreasing budgets and increasing demands? Communicate! Awareness of the larger picture can reduce those unpleasant surprises that erode morale. Additionally, time spent building strong relationships with your users pays dividends in the long run. The ever-changing nature of our industry can translate into high stress levels but also affords high opportunity levels. Help your staff see the cup as half full, and do it with a sense of humor. This article discusses some strategies that have helped my departments through times of 0 percent raises, personnel shortages, and projects gone awry.

As managers in higher education, we all face similar issues: tight budgets, the move toward accountability, overworked and understaffed departments, and the migration of technical personnel to the higher-paying private sector. Because money often is not a feasible inducement to enter or stay in the higher education technology market, something else must take its place. Determining what that is for your staff members can't be done unless good working relationships are developed, and that development won't happen unless you start talking.

Communication is the key to helping your staff members feel good about themselves and their jobs. I have found that an improvement in morale and a reduction in the stress level among my staff naturally follow when communication is used effectively.

No matter what our job descriptions say, those of us who manage people really have one important task: to help our staff do their jobs and to make our bosses look good. I have found that if you do the former, the latter will follow. We can accomplish this by acting as a conduit for information sharing, as well as by determining how our employees define job satisfaction and by working with them to assure their positions meet that definition. This article will cover six points that I try to keep in mind when working with my colleagues, whether they are my staff, the general university user community, or upper management.

Keep everyone talking

Share news as you hear it. Pass on anything you hear from upper management levels (only things you are free to discuss, of course). This gives your staff members a view of the big picture and, more importantly, lets them see how important their contributions are to that picture. Showing people how their jobs tie into institutional and system goals and how their performance has a ripple effect throughout the organization fosters a sense of belonging to the whole, and helps dissipate the sense of isolation. This isolation is quite often felt by technologists who work mostly back rooms and interact more with equipment than with people. Likewise, if you read or hear anything of interest about technology, higher education, or local news, pass it on. We constantly pass around magazine articles or post snippets from electronic publications on our departmental listserv.

Building relationships with your users is important. Concentrate on the user areas that need some extra attention and bridge mending. Some problem areas, however, are not evident. Our department recently performed its first five-year self-study. One of the issues that came through loud and clear was a perceived lack of communication with the faculty, and some of our strongest critics were lab supervisors or coordinators. To help rectify the situation we implemented lab-coordinator meetings to share information. During those meetings, we have discussed the implementation of our new automated student CN account project and how it affects the labs, the installation of a...
shared server to house standard software to give the students a common look and feel across the university, lab security, Web page development, and various problems experienced by the labs. We also try to involve the faculty in all university-wide committees that we chair.

Get your staff known outside of the department. This can be a problem with technical people, who can get caught in the computer room and rarely see the light of day. Although many claim to prefer it that way, are you doing them and the department a disservice by allowing it to continue? Gently coax them out of there. Have your staff use their own names instead of yours when they write memos or issue general announcements to the university community about interruptions or changes in service. And take advantage of the many vehicles that can be used to keep everyone talking, such as staff and user meetings, brown bag lunches, listservs, e-mail, committee memberships, and good, old-fashioned socializing. To build relationships with users, try user meetings. Users are unfamiliar with how technology can simplify their jobs and make them more efficient. As technologists, we know the capabilities of the technology but don't know enough about other jobs to determine how technology can help the users at work. User meetings accomplish a merging of the minds that can lead to better use of the technology.

Our user meetings run weekly, bimonthly, every other week, or monthly as decided by the departments. We discuss everything from report requests and hardware upgrades to short-term and long-term goals and the introduction of new technologies such as Web and intranet capabilities and client/server data marts. We've had some rough relationships with a few of the administrative departments, not an unusual situation in our industry. However, these situations have improved tremendously now that we all better understand the issues that the others face. We also have a number of weekly internal staff meetings for various areas within the department as well as bimonthly full-staff meetings. These are used to discuss the status of various projects so everyone is aware of what is happening within the department and how it may affect them personally. We also use these meetings as brainstorming sessions, gripe sessions, and mini-training sessions. For example, the department developed its mission statement, goals and objectives, and identified its strengths and weaknesses at the full-staff meetings.

We also have had training sessions, conducted by knowledgeable staff members, covering the use of Schedule+, changes in our Usenet configuration, and modifications to our virus protection download procedures.

There is no doubt that all of these meetings take time, and that's the last thing an over-worked, understaffed technical department has. However, the goodwill that is developed and the sharing of knowledge, both within the department and with the user base, eliminates a lot of the wasted time and effort that result from misunderstandings and projects gone awry. Productive user meetings prod us to spend our time more constructively up front to avoid problems rather than after the fact, cleaning up the mess. Even when we go through periods of heavy workloads, everyone recognizes that we still derive benefit from the meetings, and we don't want to stop them. Monthly brown-bag lunches, open to the full university community, have proven to be a popular communication tool. We invite everyone to request topics and to host sessions. We have discussed progress on the project to install CNet, the university-wide network, and held sessions on how to perform searches on the Web, how to use Schedule+, and tips for creating an effective newsletter.

Listservs have worked equally well to improve communication, and the use of this software has exploded across the University. Professors create them for their classes, various committees have developed them to facilitate communication between meetings, each users' group has a listserv, and an university-wide list is available for use by anybody to announce events, furniture availability, system downtime, etc. E-mail is used heavily on our campus, and it is a tremendous time saver. Time is not wasted in trying to remember to call someone or by playing telephone tag, and the message is automatically documented. It can be saved and retrieved as a reminder at any time and takes less time than a formal memo.

Committees are another effective communication vehicle. Encourage staff members to join university-wide committees to get to know individuals they don't normally meet in the course of their day and to learn of other perspectives on campus. Committee work is ad-

“As technologists, we know the capabilities of the technology but don't know enough about other jobs to determine how technology can help the users at work.”
mittedly time-consuming, but well worth it when used judiciously.

Old-fashioned socializing is the final communication vehicle I’ll discuss. Of course, you can’t force people to get together after office hours, but you can help develop a working environment in which people enjoy each other’s company enough to want to spend some time together. For example, members of my staff get together once after each semester to celebrate (or perhaps to commiserate about) the passing of another semester. Several of us also volunteer for various activities, such as a local cancer walk/run, which was organized by a fellow staff member. If your campus is in a small town or rural area, chances are your staff knows many other employees through their children, church, and other organizations. All of this helps build better relationships that improve the morale and lower stress levels in your department.

**Let your staff solve the problems**

Why did you or your predecessors hire the people who work for you? Most likely, it was because they had the expertise to do the job or could learn it. Yet many of us believe that because we’re department heads, we should know all of the answers and be able to do everyone’s job. This is just not feasible in today’s environment. No one can know it all, and there is no shame in admitting that you rely on the experts in your department to answer some of the questions.

If you try to solve all problems and resolve all issues, at the very least you will become a bottleneck. Even worse, you will undermine the self-esteem of your staff and the confidence the users have placed in them. Your role is to help when asked and to give general direction when necessary. The users and your staff members are closest to the issue and they will come up with the best answer. You may have to direct that answer differently because of a political issue they are unaware of, but it will essentially remain their answer.

Once the work is completed, always give credit to those who deserve it. If you are praised for work performed by a staff member, make sure the individual understands who actually did the work, and equally as important, pass on the compliment to your staff member.

**Invest in your staff**

Invest both time and effort in your staff members. Human nature and office politics will always create problems; be there to listen and try to defuse the situation. Always strive to have all parties leave the conversation feeling they’ve gained something, even if it was just an ear to hear them out.

Ask questions and learn your staff members’ personal goals. It’s a little like asking, “What do you want to do when you grow up?” Help define their goals, if necessary, and work to align them with departmental and institutional goals. Then invest the time and effort to help your staff attain those goals. People work better when they are doing something they like.

Take the time to jointly define departmental goals. Our five-year self-study really helped us in this respect. We put forth the effort to identify our mission and goals and, even more importantly, our strengths and weaknesses. We then went to work on our weaknesses as a team, and we continue to do so.

Realize that not everyone will be happy with your department’s services. When the criticism comes, back up your staff in front of others. If there is a real problem, resolve it privately with your staff. Most problems arise from a lack of communication that has led to a misunderstanding or a bad working relationship.

Everyone has limits. Recognize those limits and work within them. This is tricky because there is a fine line between holding people back and letting them work within their limitations. Push a little and see how staff members handle their own limitations. Talk with them, find out how you can help, determine their attitudes. If the work still doesn’t get done, you’ve probably hit someone’s limit. A more difficult situation is when someone stretches beyond his or her capabilities and doesn’t recognize it. Trying to resolve that situation without disillusioning a hard worker can be a delicate matter.

Invest not only time and effort, but money. In our industry, training—including conference attendance and structured courses—is critical and well worth the time and money. Not only does training hone skills and teach tools your employees need to do their jobs, it improves morale and self-esteem. Paying for training shows people they are valued by the organization. Most universities include travel and training in the same budget line, and that is the line
that is most vulnerable when budgets are cut. Still, it’s good practice to put as much money in your training budget as possible, even if you have to rob your supply budget to do it. Two years ago, I had a $5,000 budget for training and travel for 19 employees. Last year I increased it to $10,000 and this year I upped it to $20,000; we set a departmental goal to get everyone to at least one training session or conference this year.

Training does not have to be expensive. We maintain a library of training videos and CDs for various software products and operating systems. These, combined with a VCR/TV, a PC, and a training schedule, can create a cost-effective training corner. We’re also setting up a CD-ROM tower on a server to make these resources available to a larger audience.

**Employees are people, too**

Your employees are your colleagues and must be treated with respect. My version of Robert Fulghum’s book, *All I Really Need to Know I Learned in Kindergarten*, is, “Do what your mother told you.” She taught us to say “please” and “thank you.” This holds true when speaking to employees as well as others. For managers, this means making requests rather than barking commands.

Own up to mistakes and apologize. At the same time, be tolerant of others’ mistakes. Errors are not signs of weakness, but proof that we are all human. A bad situation can only get worse if your staff hides their mistakes from you out of fear.

Recognize that your employees have personal lives outside of the office. Be flexible without inviting employees to abuse the system. Allow staff members to occasionally leave a little early or take a long lunch for personal reasons. Work out arrangements for compensatory time or personal leave if a significant absence is needed. Be careful about being a clock watcher, or you will get a clock watcher in return. Most of my employees have put in much more overtime than they ever take in compensatory time.

**Don’t sweat the small stuff**

If you want to set a good example for your department, you must first reduce your own stress level. When you are uptight and ready for combat, the general stress level in your department will skyrocket and morale will plummet. Avoid conditioned responses; instead, think about what is really important. Everyone will do something that annoys you at some point. Don’t sweat it. Concentrate on the good and the annoyances will pale by comparison.

Some of the small stuff truly is so small it should not worry a manager. Take, for example:

**Chronic lateness:** If an employee is often five to ten minutes late for work, think before you get annoyed. We have been conditioned to abhor tardiness and extol timeliness since our first day in kindergarten. Instead of falling into a conditioned response, ask yourself what time the employee usually leaves at the end of the day? Does he or she usually work through lunch? Is the worker on call after hours or available to work on weekends when needed? Why is the employee late? Is there a child care problem? If you don’t think before you act, you could make the situation worse.

**Staff meetings that start late:** There must be an unwritten law in academia that says 1:00 p.m. really means 1:10, or 2:30 really means 2:40. This was my pet peeve, until I found people usually are late because they are helping a user or are in the middle of an operation that cannot be interrupted until it’s completed. Occasionally, someone forgot about the meeting, but that wasn’t usual. Now, instead of getting annoyed, I spend the time visiting with the rest of the staff. Rather than feeling that the time is wasted, I am using it to reinforce good relationships with my employees.

**Personal phone calls:** At the very least, managers frown on personal phone calls at work as a waste of time, a notion formed when we were teenagers and our parents limited the time we could talk on the phone. Of course, if the use of the phone for personal business is abused, it must be addressed. However, you have to determine what constitutes abuse versus a conditioned response.

**Overwork:** We’re all susceptible to this stress-builder at times. Learn how to organize and make lists. But don’t expect to cross everything off of your list every day. Consider the wisdom of Richard Carlson, author of *Don’t Sweat the Small Stuff*, who reminds us that when we die, our in-baskets will not be empty. In other words, don’t create stress by struggling to complete your list because as you check things off, you will always be adding new tasks.

The solution? Be flexible. How often have

“It’s good practice to put as much money in your training budget as possible, even if you have to rob your supply budget to do it.”
you placed an order only to learn that the requested item is obsolete and you have to take a new model with slightly different functionality (and not always with backward compatibility)? Learn to expect and even welcome change, because there is no avoiding it.

Of course, in many instances (I might venture to say most instances) stress comes from outside of your department. Working with users, especially non-technical, higher-level management, can create some extremely stressful situations both short- and long-term. How you handle these situations will affect morale in your department. So be conscious of your reactions. You can’t change other people or past events, but you can change your reaction to them. When you find yourself under stress and ready to explode, go for a walk across campus. Visit someone unrelated to the stress. Exercise naturally lightens your mood and visiting gets your mind off of the problem. It also makes you more visible across campus and gives you an opportunity to build stronger relationships with others. If a walk won’t do it for you, close your door and take some time to compose yourself. It is better to be out of touch for a little while than to lash out at someone or say something you will regret.

Two questions I try to ask myself to put things in perspective:

Will this matter in five years?
Is this worth getting sick over?

The answer is always “no.” But if you find you are getting sick and you don’t see a workable solution, it may be time for you to move on.

Just smile

As managers of customer service departments, we will always face stressful situations. That is why it is so important to maintain a sense of humor. Remember, you set the tone for your department. Learn to laugh at yourself. My employees joke about my lack of both height and memory, because I do.

Be aware of your facial expressions. You don’t always know what impression you are giving others. Make it a rule to smile at everyone who enters your office. When a staff member comes in with bad news, a smile puts the person at ease. And smiling automatically lightens your mood. If someone has come in with good news or just to talk, you’ve set a light tone. So make it a habit to smile at everyone.

Always look for the humor in things, and encourage your staff to do the same. Even when you are fuming and ranting, you can always find something to laugh about. Make it a goal to laugh at least once in every meeting, even if it’s at your own expense.

Conclusion

Of course, my staff doesn’t work in a constant state of bliss just because we have implemented these six points. And I don’t profess to have all of the answers. But I have seen effective communication turn people around. It won’t stop the overtime, it won’t increase the paycheck, and it won’t completely stop the griping. It can, however, make a job more enjoyable, build self-esteem, and engender a more positive attitude. And maybe next time, the griping will be done with a smile.

Karen DeMauro (kdemauro@clarion.edu) is director of Computing Services at Clarion University of Pennsylvania.
Riding the Crest of the E-Commerce Wave: Transforming MIT’s Campus Computer Resale Operation

by Joanne Hallisey

Reengineering efforts, vendor consolidation, and rising costs prompted MIT to convert its computer resale store to an online catalog operation that will enable students, faculty, and staff to purchase computers, peripherals, and software through a World Wide Web interface. The next phase of the project will generate requisitions through MIT’s financial system and process orders and invoices via the Internet through electronic data interchange with the project’s local vendor partner.

A key recommendation from MIT’s process reengineering efforts several years ago was to decrease the cost of doing business at the Institute through vendor consolidation, and the MIT Computer Connection (MCC) — the campus computer resale operation — was targeted for study. Increased customer demands, rapidly changing technology, and diminishing margins were making it difficult to continue the operation of the MCC on a cost-recovery basis. Initial study results recognized this and recommended that MIT consider closing the resale store and replacing it with an online service. A Web-based catalog, MCC/Online, was developed in a preferred partnership with NECX, a local vendor, to enable the online purchase of computers, peripherals, and software. Like the original MCC, the new purchasing model continues to provide the ability for students, faculty, and staff to purchase at education prices.

Goals

The MCC/Online and the partnership with NECX were developed to provide more direct access to computers and related products for the MIT community. Goals of the project are reflected in the comments of Diane Shea, acting director of purchasing at MIT: “Partnerships are essential if MIT is to reduce its vendor base and achieve lowered costs for acquiring goods and services. Partnerships also allow us to take advantage of technologies like electronic commerce, order fulfillment systems, and ‘just-in-time’ capabilities. By employing electronic commerce, MIT can reduce the costs of paperwork to process requisitions and invoices; by reducing the number of vendors, the purchasing volume with a vendor increases, providing greater leverage in reducing prices.”

How we got here

The initial project team was charged with choosing a vendor partner. In February of 1997, a Request For Solution was sent to thirteen potential partners across the United States. We received seven responses and, after careful vendor analysis, narrowed the selection down to three finalists. Selection criteria included cost of products, support, delivery, ability to inventory, product breadth (especially with the key education vendors), shipping, and Internet capabilities. It was critical that the selected vendor establish relationships with our key educational vendors and that the company have expertise in Web-based commerce. All of the re-

"By employing electronic commerce, MIT can reduce the costs of paperwork to process requisitions and invoices; by reducing the number of vendors, the purchasing volume with a vendor increases, providing greater leverage in reducing prices."

Good Ideas

this article is online at http://www.educause.edu/ir/library/html/cem982a.html
“In the next release of the catalog, the items in a customer’s ‘shopping cart’ will automatically be entered into an electronic requisition for processing by SAP, MIT’s financial system.”

The initial transition to the MIT Computer Connection nears completion. The MIT Online purchases from NECX have grown to more than $6 million and the sales volume at the end of FY 1998 exceeded $1 million per month. The original staff of nineteen has been reduced to five. Staffing decreases were accomplished over a period of several months, and all but two of the positions were vacated by attrition. When the project is completed, we anticipate that the head count will be three consultants and one manager.

The MCC retail store is currently being renovated into a showroom displaying products that have been tested on the MIT network by Information Systems and that are listed on an IS Recommended Products Web page. Customers visiting the showroom can try out the recommended machines and discuss their specific needs with an onsite consultant. Personal purchases may be made from the machines in the showroom or elsewhere.

Individuals use credit cards to place personal orders. Because access to the catalog is limited to the MIT community through the use of digital certificates, individuals can access the catalog from any Athena workstation or, using the Netscape browser, they can access the catalog from their dorm room or from home. Orders are shipped to the U.S. address indicated by the customer.

NECX has contracted special pricing for MIT and has created an MIT-specific products page on the Web featuring the recommended equipment and software for use on the MIT network. NECX works cooperatively with MIT to keep this information up to date. In addition, this Web page serves as a doorway to the NECX catalog of more than 30,000 products. While not all products are eligible for education discounts, a recent market basket study shows that NECX is competitive in all product lines.

This means that MIT customers have easy access and searching capability for product information, availability, and pricing for thousands of products in one catalog location. The catalog offers detailed specification sheets, links to manufacturers’ Web pages, and tools like PowerSearch and Memory Express to help customers find the right products. For now, departments can browse the catalog, identify products, and send orders through MIT requisitions to the MCC or the purchasing department for processing. In the next release of the catalog, the items in a customer’s “shopping cart” will automatically be entered into an electronic requisition for processing by SAP, MIT’s financial system. Once the order is approved, it will be sent to NECX via the Internet using electronic data interchange (EDI). Invoices for these orders will be sent to the Institute via EDI and automatically entered into SAP for approval prior to payment.

Initial results

Our early evaluation indicates that the partnership has pluses and minuses. On the plus side are the long-term savings. Although it is difficult at this stage of the project to estimate the total savings, some very tangible savings are already apparent. Savings from cost of goods from the partnership are estimated at $350,000 for the 1998 fiscal year. The initial transition eliminated the existing MCC inventory, which averaged $2.5 million. This has reduced carrying costs and the risk of inventory obsolescence for MIT. As mentioned above, we have realized a significant reduction in staffing (thirteen positions eliminated, with one more expected by project end). Savings from the reduction in processing of requisitions, purchase orders, and invoices will be realized over the long-term, and we anticipate that with an annual volume of 6,000 requisitions, this amount will be significant. The catalog provides increased visibility for the products recommended by IS; if more customers purchase these products, IS should continue to monitor the sales data for feedback and improvement.
**The Networked Academy**

December 8-11, 1998
Washington State Convention & Trade Center
Seattle, Washington

CAUSE98 is an excellent opportunity to share new ideas with colleagues from around the world. This year's theme — The Networked Academy — focuses on the tremendous impact that networks and the Web are having on the work of all information professionals.

The plenary sessions, track presentations, interactive poster sessions, small group discussions, corporate presentations, and other settings offer an exciting variety of ways to meet new colleagues and learn about new developments in our field. Listed below are our general session speakers for this year and the tracks for the topics covered by our presenters.

Check the EDUCAUSE Web site often for the latest CAUSE98 information.

**General Session speakers:**

- **Molly Broad**
  President, University of North Carolina • Developer of a systemwide strategic plan for information technology for the California State University

- **Charles Garfield**
  Company restructuring and redesign consultant • Computer scientist for Apollo XI • One of the nation's preeminent presenters on high achievement

- **Steve Jobs**
  Interim CEO and cofounder of Apple Computer, Inc. • Founder, chairman, and CEO of Pixar, the Academy Award-winning computer animation studio (creators of Toy Story)

**Conference tracks:**

- Distributed Computing and Networking Technologies
- Applications Development in the Age of the Web
- Changing Organizational Structures and Information Professional Roles
- Staff Development and Training to Meet the Needs of a Distributed Environment
- Curriculum Support in the Networked Academy
- Providing Support in a Networked Environment
- Information Architectures, Standards, and Policies
- Achieving Results Through Business Process Reengineering and Work Process Simplification

Detailed conference information and registration form are online at [http://www.educause.edu/conference/c98/c98.html](http://www.educause.edu/conference/c98/c98.html)
Taking Instruction to Where It Will Be Used: Tutoring Faculty in Their Offices

by Eugene A. Engeldinger and Michael G. Love

If college faculty are to keep pace with the rapid changes in the technology available for teaching and learning, academic support services departments must be prepared to provide training and faculty development opportunities. This article reports on the experience of one small, private college and the practical and philosophical considerations behind the decision to tutor faculty and staff in their offices.

Introduction

One of the most difficult issues facing higher education is the quick pace of change, particularly in the type and amount of new technology available for teaching and learning. With these changes comes some frustration among faculty, who find themselves unable to keep pace with what’s new and incorporate more instructional technology into their classroom repertoires. As a result, some faculty members have become insecure and defensive about the value of their current teaching methods. Thus, they withdraw from opportunities to learn more about instructional technologies and even deny that the new technologies might be preferable to what they are doing in the classroom now.

Smart institutions address these concerns with training. Classroom instructors need and desire help in learning how to use new technologies and how to incorporate them into classroom instruction.

An institution can provide the necessary training in a variety of ways, but a central element of success on all campuses must be the enthusiastic involvement of campus support services, including the library, media services, and the computer center. This is the route taken by Carthage College.

Carthage is a four-year, liberal arts college affiliated with the Evangelical Lutheran Church of America, with an enrollment of 1,688 FTE and about ninety faculty. The college has a campuswide network, with a fiber backbone and twisted pair to the desktop. All faculty offices are completely networked, as are all student residence hall rooms, student computer labs, and most classrooms. The college supports both PCs and Macintosh platforms through a client/server, token ring architecture with a Banyan network operating system. In early 1993, the computer center was merged with the library, thereby creating Academic Information Services (AIS), headed by a newly created vice presidential position reporting to the president of the college. The following year, Media Services was added to AIS.

Because of the strong belief in the electronic teaching library concept, and a belief that the network is the library, a holistic computing philosophy prevails. This means, in essence, that virtually all staff and public access computers should be networked, and that, as much as possible, all information and general applications should be accessible from anywhere on campus. As we all know, distributing this much access capability to all desktops is one thing, but ensuring that it can be put to most efficient use by the college community can be quite another. In our case, it soon became apparent that increases in user services and training were imperative. Some positive action was required to increase computer literacy among the campus community.
Traditional approaches and their deficiencies

Carthage, like many colleges, uses several traditional approaches to teach our faculty how to use new hardware, software, databases, and information resources:

- Special classes and workshops are conducted for groups of interested individuals.
- Point-of-use aids and documentation are created and kept alongside equipment and used as needed.
- Wild card e-mail messages, called Help Yourself bulletins, are distributed to help computer-literate or adventurous users configure their computers for special applications themselves.
- Special technology events, such as our Faculty/Staff Technology Day, are conducted at the beginning of the fall term each year. Each April we hold Computer Awareness Week to encourage students and faculty to participate in educational technology events.
- Students trained as Information Technology Assistants staff computer labs and the library to help computer users.
- In addition, we maintain our technology help desk with computer, library, and media services staff.

The traditional approaches provide much-needed assistance to many faculty members, but not enough. In-service sessions and workshops are usually held in the library, in computer labs, and in our electronic classrooms. In many cases, these locations house equipment with which our faculty is not familiar. The workshops and demonstrations usually are attended by individuals who are at different levels of proficiency with technology and who, in all likelihood, learn at different rates. For a few, the pace of instruction will be too fast, but for others, it's too slow. For some, the examples demonstrated will be helpful, while for others they are irrelevant, and perhaps even a barrier to their learning. In some cases, the workshops take too much time, given the limited benefit some attendees feel they reap. And the timing of the workshop might not be most conducive to the person's learning readiness. The workshops were often scheduled with the convenience of AIS staff in mind, rather than at times better suited to faculty and staff schedules. And the hands-on training tends to be clumsy because of the lack of uniform computing skills among the participants. Indeed, the participants in these workshops (whether students or faculty) rarely constitute a homogeneous group. The level of computer skills is too diverse for instruction to satisfy all participants equally. For these reasons, many individuals failed to take advantage of the sessions offered.

The real solution, it seems, was there all along. As we observed our staff assisting students in the library and computer labs, we came to realize that one of the reasons reference librarians and lab assistants are successful is that we are tutoring students at their greatest readiness to learn. We are helping students when they have assignments due; thus they are highly motivated to assimilate the skills we impart. Applying these lessons to training faculty (whose workshops also are sparsely attended) seemed a logical step.

Based on these observations, we concluded that many faculty and staff could benefit from the same kind of personal attention that we make available to students and others who use the labs. But at least two things militate against it: The labs are not as easy for faculty to access as their office equipment, and the labs are not as private as their own offices. In their offices, it would be more acceptable to have help, because no one (especially students) would observe the tutoring. And, of course, office tutors would be regular staff and not the students who routinely staff the labs—which could make faculty more responsive to the idea of tutoring.

It had seemed to us that we could provide the type of instruction that suits the learning style of the individual, on equipment with which the learner is familiar and at a time that is most opportune, that is, close to the time of actual need.
groups to the program was not because the idea lacked merit, nor was it thought to be unnecessary. Rather, both groups were concerned that staff resources might not be adequate, and we might be stretching ourselves too thin. Still, the AIS Advisory Group endorsed the plan.

To get the program off the ground, wild card e-mail messages were sent to all faculty and staff, explaining the program and providing examples of what might be reasonable tutoring projects. Fliers were created and distributed to all mailboxes, and a short announcement was published in the campus electronic newsletter, Reality Bytes. Again, the idea was praised, but concerns were raised about our limited staff resources. Nonetheless, we moved forward with the plan, and within weeks the program was in operation.

As might be expected, the tutoring sessions go beyond learning a few computer software packages; faculty are sampling various instructional technologies, ranging from basic computing to communications between computers and data services to delivery and storage of digital, audio, and video information. Because of the breadth of topics, assistance from all AIS units would be required to make this program work. Computer staff, media specialists, and librarians all would participate and act as tutors.

The Media Services Coordinator assumed the role of tutoring coordinator and became the point person for communication by faculty and staff regarding tutorial needs. This is the person whom faculty are to contact to schedule an appointment. The Media Services Coordinator conducts an interview to determine the technology needs of the requester and to estimate the amount of time necessary to conduct the session. Usually between fifteen minutes and an hour is scheduled at the mutual convenience of learner and tutor.

Benefits to the faculty

An obvious benefit of such a program is the positive relationship developed between the faculty and the AIS staff. In the first place, just implementing the program shows that AIS staff members care and are sensitive to faculty needs.

The majority of the tutoring is done on the faculty desktop, because that is the equipment the person will use most often. A few tutoring sessions are being done on specialty equipment, that is, equipment that is not likely to reside in any particular office, but rather is housed at a central location. Examples of this are CD-ROM burning and video editing in the Media Center, scanning documents in the computer center and library, and creating electronic portfolios in the curriculum library. Thus, anything mounted on the campus network and available in faculty or staff offices would be tutored in an office. If the equipment is not accessible in an office, tutoring would be done elsewhere, usually in an AIS work area.

Pedagogically, the program meets the needs and proclivities of our users better than other faculty development efforts. One important benefit is that the trainer uses the equipment that the learners are actually going to use when doing their real projects.

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the task within a particular time frame. Strong motivation prompted by time restraints and actual projects will increase the probability that the procedures will be learned and that the experience will be a success.

Privacy of the instructional session is important for many faculty, but not for all. In the privacy of an office, with only the AIS staff member observing and coaching, the learner is free to make mistakes that nobody else will see. Additionally, it is convenient for the learners to ask basic questions of the tutor and expose their ignorance in ways that many might not be willing to do in a group instructional session.

There is little doubt that faculty who adopt new technologies and use them well can gain in stature. Self confidence frequently is buoyed, and the technologically adept faculty are sought out to provide help and advice to colleagues.

**Benefits to the AIS staff**

In addition to the benefits accruing to faculty, the program has advantages for the college support team. At the very least, this service exhibits unquestionable proof that the AIS staff are committed to technical training that is relevant and individualized.

A major benefit for AIS staff is that the program provides a structure for delivering services that must be offered anyway. This program returns control of work priorities to AIS staff, as tutoring sessions can be scheduled at mutually beneficial times. The staff need not feel they must lay projects aside and immediately attend to a request for help, nor feel guilty if they cannot handle a situation immediately. Because a tutoring time can be scheduled, the AIS staff can continue with their projects, and the faculty member will know when help will be available. In large measure, the crisis-management approach, so common in many computing operations, can be reduced.

These tutoring sessions allow AIS staff a chance to work more closely with individual faculty on their projects. AIS staff learn first-hand the faculty members' needs, as well as their technological strengths and weaknesses. When AIS staff know these things, they are able to identify and recommend hardware and software that might benefit the faculty member.

Sessions in the individual offices give AIS staff a better sense of what kinds of hardware and software are in use by individuals throughout campus. Other useful bits of information include condition of the equipment being used, and whether there is a mismatch between resources that are in the office and a faculty member's computing needs, skills, and technological aspirations. If there is a mismatch, more appropriate equipment can be installed. Or at least, recommendations for upgrades can be made to the appropriate individuals or offices on campus.

Another benefit is the realization that not all machines are configured in consistent ways, or in ways that best serve the user. Undoubtedly, there will be little uniformity of machine set-ups—or uniformity of equipment, for that matter—among the faculty. This in itself is a major reason why instruction in groups using lab equipment is less successful than it could be. Tutoring sessions provide AIS staff with insight into more general problems faced by the faculty as a whole. If only a simple fix is required (restoration of an icon, for example), this might be done during the tutoring session. If the reconfiguration requires more time, another appointment can be made to correct the difficulty. During the tutoring session, the faculty member's level of technical competence will become more obvious. This will be detected merely by watching the faculty member work, and through conversation about the project under way. Awareness of general faculty technical readiness is very useful for planning other workshops and for planning campuswide technology upgrades.

In addition to their own technology needs, faculty expectations of their students may become obvious as the tutor and faculty member work together on the project. This knowledge provides insights into student needs and affects the way we configure resources in student computer labs, the workshops we give to students and faculty, and the training given to our lab assistants.

**Conclusions**

Our experience so far suggests that our earliest fears regarding our ability to meet the demands were unfounded. We have had a number of requests for service, but as it happens, we were not inundated. Indeed, we have found that tutoring in the offices has not created as great a drain on our staff resources as we origi-
nally feared it would. Perhaps that is because the tutoring service is not the only service program, nor is it the primary one. Because we also hold workshops and special events, and most importantly, maintain a help desk, the tutoring sessions are easy to incorporate into our workflow. In fact, some tutoring results directly from queries originally directed to the help desk. Because much of the assistance needed by our faculty proved to be manageable over the phone, it was not always necessary to schedule time in their offices.

The major lesson learned so far is that our users, being such a diverse group with different learning styles, need different training options. The tutoring program takes a very personalized approach, and so it is much appreciated. Even better, offered in conjunction with other training, this pedagogical approach provides an alternative for those who do not learn as well in groups with more generalized instruction.

Last, but certainly not least, brush fires and individual user crises are handled in a fashion that allows for better utilization of staff time, while providing a valued service to our users. Adding tutoring services in the offices to the other training activities, while originally a daunting idea, did turn out to be a wise decision.

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E-Commerce...

(continued from page 52)

experience reduced support costs.

There are many other benefits that have accrued from the project. The Internet catalog access is easy, and the partnership has brought prompt delivery of in-stock products. MIT has been able to keep the value-added services of pre-sales consulting and the demonstration showroom. End users take more responsibility in the purchasing process and in resolving post-sales issues like returns and order tracking. The vendor maintains the online catalog and, in our case, is in close proximity to MIT. Students, faculty, and staff are able to purchase from home or office, making it more convenient for them.

On the minus side, there is some loss of control that occurs in a vendor partnership. The face-to-face, post-sales service that existed with the reseller storefront has been replaced by a telephone and e-mail customer interface. “Immediate gratification” inventory is no longer available to the MIT community; last-minute or emergency purchases are referred to reseller locations in the local community. There were some short-term costs associated with the initial learning curve, the inventory clearance, and some layoffs. We have found that NECX is new to the higher education market and requires some adjustment. Delivery to the customer’s desktop is not always realized, because many products ship via UPS ground service as a default. This leaves products at a receiving location for final delivery by MIT staff. We are considering using an alternative shipper as a default for all MIT purchases to guarantee desktop delivery. Sales were not as high as NECX had expected initially, although the volume has increased steadily each month.

As with most dramatic changes, the transition to an online catalog has been met with mixed reactions. Key to our success will be communicating the wider Institute goals of the project to the MIT community. Excellent training in pre-sales support and customer service are also important in winning broad acceptance, and MIT and NECX will continue to work on improving the partnership.

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Joanne Hallisey (hallisey@mit.edu) is manager of the MIT Computer Connection.
The Future Compatible Campus
edited by Diana G. Oblinger and Sean C. Rush
Anker Publishing Co., Inc., 1998,
304 pages, $35.95
ISBN 1-882982-19-3

Reviewed by Polley Ann McClure

It is quite clear to most higher education professionals that technology must become an integral part of their institutions' operations, teaching and learning, and strategic planning. Less obvious is how this transformation will occur.

It is easier to recognize that something must be done than it is to know how to do it, particularly in the relatively new and ever-changing arena of information technology. How does one articulate needs, develop sound plans, and effectively carry out those plans for the campus of the future?

One helpful tool is The Future Compatible Campus: Planning, Designing and Implementing Information Technology in the Academy, the newest offering by Diana G. Oblinger, Sean C. Rush, and an array of savvy contributors who have been trailblazers in such efforts.

Oblinger, who is the manager of Academic Programs and Strategy for IBM, and Rush, who is general manager of IBM's Global Education Industry, have brought together educational leaders who share their real experiences in integrating information technology into colleges and universities. This is not a theoretical reverie: It is firmly grounded, providing concrete information and advice for those who are in the position of leading technology initiatives at their institutions.

Wisely, the book covers a wide range of topics related to information technology in higher education. Chapters examine such issues as formulating a vision, a mission, and goals; developing investment strategies; planning and implementation; improving student satisfaction; enhancing teaching and learning; re-envisioning libraries; and evaluating success. Also covered are technical matters, such as developing a network infrastructure, and project management strategies.

This is a book that is rich with ideas, useful caveats, and practical strategies. Each chapter is an accessible blueprint and offers references and suggested readings. While each chapter has value on its own, together they offer a handbook, a seasoned guide that shows us a path to making information technology serve higher education.

The Future Compatible Campus can assist all of us in framing a workable plan and translating that plan into action. We know that we must prepare for the future; Oblinger and Rush help us do so with intelligence and forethought.

Reviewer Polley Ann McClure is chief information officer at the University of Virginia and chair of the EDUCAUSE Board of Directors. This review was adapted from Multiversity magazine.

Managers As Facilitators: A Practical Guide to Getting Work Done in a Changing Workplace
by Richard G. Weaver and John D. Farrell
(Berrett-Koehler Publishers, Inc., 1997, $27.95, 250 pages)
ISBN 1-576750-16-7

Reviewed by Barbara Horgan

With today's focus on teamwork, this book is a valuable addition to any manager's bookshelf. It emphasizes successful groups rather than individual achievement. The authors begin by distinguishing among three roles: manager (doing things right); leader (doing the right things); and facilitator (helping people do things). The facilitation model described in the book includes four elements: task, self, group, and process.

The most valuable parts of the book, however, are handy tables that outline specific questions, tools, and tips for facilitating successful groups. Management theories and approaches are followed by specific, step-by-step instructions on implementation of tasks ranging from drafting a charter, to conducting effective meetings, to resolving conflicts. Especially useful is the book's last chapter, which describes quick fixes for fifteen common group problems.

The authors also focus on what they consider to be key facilitation skills, such as active listening and managing conflict. Conflict, the authors note, can be viewed simply as “unre-
"Managers, who are often responsible for or involved earlier in decisions that result in change, need to acknowledge staff who are grieving over the loss that accompanies change, feeling at the bottom of a new learning curve, or have insights to offer."

Solved differences" that are important to successful, dynamic groups. A chapter entitled "Facilitation as Change Management" has particularly useful insights and tips on dealing with staff reaction to change, a process the authors describe as a natural one that can, like conflict, result in better ideas.

The authors encourage readers to avoid labeling opponents to change as "resistors." Instead, they suggest, think of staff as progressing through stages of adopting change. Managers, who are often responsible for or involved earlier in decisions that result in change, need to acknowledge staff who are grieving over the loss that accompanies change, feeling at the bottom of a new learning curve, or have insights to offer.

"Managers As Facilitators" is an excellent reference for both novice and experienced managers and team leaders. It provides a practical set of tools about group processes and interpersonal dynamics and proves valuable both as a refresher and as a primer.

Reviewer Barbara Horgan is director of information technology at the University of Washington, Tacoma.

Trust in the Balance: The Foundation for Business Success
by Robert Bruce Shaw
(Jossey-Bass, 1997, $25, 256 pages)
ISBN: 0-787902-86-1

Reviewed by Mary Molinaro

Few issues are as critical to the success of an organization as trust. But as more organizations move toward shared leadership and team-based management, building trust becomes difficult. And a lack of it can undermine even a well-planned reorganization.

Trust in the Balance addresses the issue of trust in an easy-to-understand manner without presuming to serve as a how-to manual. And while it targets corporate leaders, the principles it outlines easily transfer to academia.

Shaw starts by examining the basic elements of trust and how it develops within an organization. He explains relationships and levels of trust, and uses a number of real business situations as examples.

The second part of the book details the key principles of building trust: achieving results, acting with integrity, and demonstrating concern. Some chapters close with assessment surveys for determining performance on issues of trust within an organization or team.

The book also examines the role of leadership and an organization’s culture in the level of trust among a corporation’s employees. And Shaw points out how situations such as downsizing and reengineering can erode trust.

He also suggests strategies for dealing with a lack of trust.

Many who have experienced change in a large organization maintain that trust is hard to win and easy to lose. Further, Shawn notes, it is much easier to build trust than to regain it once it has been lost. He suggests strategies for handling both situations, using real-life examples as illustrations.

This book should be on the must-read list for any leader who is contemplating reorganization, downsizing, or a move to shared leadership.

Reviewer Mary Molinaro is director of information technology at the University of Washington, Tacoma.

Thoughtware
by J. Philip Kirby and David Hughes
(Productivity Press, 1997, $35, 271 pages)
ISBN 1-56327-106-0

Reviewed by Alan McCord

It is puzzling that 46 percent of Fortune 500 companies failed during the 1980s, even though most used state-of-the-art management programs like Total Quality Management and Process Reengineering. Kirby and Hughes argue that these programs represent "old thoughtware" that conserve traditional ways of doing business. Distance education and e-commerce, the authors note, are two examples of higher education's struggle against traditional thinking and work processes. What these institutions need, they say, is some "new thoughtware."

Higher education's use of a multitude of change programs, the authors note, is merely "programmatic addition." Its reliance on such "bolt-on initiatives" as process improvement, administrative downsizing, outsourcing, and TQM has not proved successful, say the authors, who argue that these programs are too conservative. And there's evidence to support their claim: most colleges and universities still
operate on a one-year planning and budgeting cycle; many look to the institutions’ financial statements as a measure of effectiveness; and most continue to focus administrative time on managing the budget rather than on developing human capital.

In Thoughtware, the authors propose to replace the old framework of central authority, division of labor, departmentalization, and limited span of control with a new one: distributed authority, knowledge of the whole, meaningful measurement, and reducing time to action. Thoughtware introduces the thought-provoking concept of “allowment.” Kirby and Hughes dismiss today’s buzzword—empowerment—as a hollow promise, saying that without information, skills, and authority, empowerment can be more dangerous than helpful. Allowment is a key element of the new organizational framework.

Finally, Thoughtware proposes a cascading “installation plan” for new thoughtware, beginning with the existing management team, moving to a transitional management structure, and, at last, instituting an ongoing process of evolutionary management. For each stage, Kirby and Hughes propose specific activities with concrete outcomes. This useful blueprint could be adapted to most institutions.

Of course, installing new thoughtware in any institution requires a unified commitment by senior management and effective and persistent sponsorship of the change process. So, implementing the ideas contained in Thoughtware as simply one more “bolt-on” program won’t work; indeed, the authors’ intent is just the opposite.

Reviewer Alan McCord is director of Operations Management for the Information Technology Division at the University of Michigan, and is chair of the EDUCAUSE Editorial Committee.

Building a Web-Based Education System
by Colin McCormack and David Jones
(Wiley Computer Publishing, 1997, $49.95, 446 pages)
ISBN 0-471-19162-0

Reviewed by Karen L. Smith
Whether you are building your first Web site or looking for a quick reference to Web tools, Building a Web-Based Education System will meet your needs. This text plus CD plus Web site package offers a comprehensive approach to Web course design that includes definitions, tutorials, examples, basic templates, and comparisons of software tools. The charts comparing features of commercial packages are particularly useful, for they allow even inexperienced users to make informed decisions regarding the tools they need. Templates are clear instructional guides and models that faculty can transport to their own Web sites to make start-up a breeze.

Chapter 9 offers an overview of three Web classroom builders. This comparison examines the strengths, weaknesses, and functions of these complex tools. Page images and tables help readers understand the tools and how they can be applied to personal course-development efforts. Tables 9.6 through 9.9 are particularly useful, for they offer an at-a-glance comparison of how the three top Web class builders handle four major tasks: information distribution, communication, assessment, and class management. The discussion of assessment and tracking (Chapter 7) is particularly useful, for it describes both sides of the issue: how the technology can enhance and detract from the assessment process. The page-review log found on the CD is an excellent guide for limiting subjective evaluations by helping Web-site reviewers focus on key issues. The resource URLs in the book and CD did not all work; however, the publisher’s Web site provides corrections and updates to those who have received a USERID and password.

This book is an excellent guide for beginners and advanced users. It contains useful reference tools, excellent templates for jump-starting the Web development process, and clear explanations regarding the “hows” of Web development. Its biggest weakness stems from the lack of foundation in learning theories. Treat it as a great training tool and use it in conjunction with theoretical and applied materials to address the issues of how we can use technology to add value to existing approaches to education and let learning goals, not the technology, guide our decisions.

Reviewer Karen L. Smith is director of the Faculty Center for Teaching and Learning at the University of Central Florida. She coordinates efforts to provide professional development support for faculty and help them complete curriculum innovation projects.
Readers Respond

I would encourage anyone interested in assessing the impact of IT to look at the results of a project sponsored by the Coalition for Networked Information (CNI), a partnership of EDUCAUSE and the Association of Research Libraries. A description of this project, called Assessing the Academic Networked Environment, can be found on the CNI Web site at http://www.cni.org/projects/assessing/. The manual by Charles McClure and Cynthia Lopata gives excellent guidance on what should be thought through before implementing campus surveys as well as a sample survey.

Seven institutions are working with CNI to continue work on assessment and to develop instruments that address a number of aspects of networked information services use. Progress reports are available from: Brown University, Dartmouth College, Gettysburg College, King’s College London, Mary Washington College, University of Washington, and Virginia Tech. In addition, Christopher Peebles of Indiana University, has done some impressive work on assessment, which was presented at the 1997 CAUSE conference, and to which the CNI assessment site provides a link. Other links are provided to sites that offer very rich resources in this area, including the Flashlight Project (see http://www.tltgroup.org/).

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Virginia Tech has embarked on an impressive number of instructional technology projects over the past few years. For example, the internally-funded Center for Innovation in Learning has sponsored sixty-six grants to faculty for over $1.5 million. These projects typically involve the use of new technologies in the “transformation” of a course or set of courses. The Instructional Services division, which administers the grants, is providing consultation on assessment and also coordinates the assessment of these and a number of other technology-based initiatives. Until this spring, they relied for quantitative evaluation on a set of student surveys that had been developed internally for a project sponsored by the Alfred P. Sloan Foundation’s asynchronous learning initiative. In January, the Flashlight Project (sponsored by Annenberg CP/B and the AAHE) released their Current Student Inventory (CSI), which Virginia Tech adopted and is integrating into their assessment program. The CSI should provide opportunities to compare findings with other institutions who also use Flashlight instruments. Instructional Services is also using qualitative methods, primarily semi-structured interviews of faculty developers and students enrolled in the “transformed” courses. Many of the interviews are videotaped to share the results and impact of course transformations with interested outsiders.

A sample assessment report (for the Sloan-funded ACCESS project) can be found at http://www.edtech.vt.edu/access/. For information about Flashlight, see http://www.tltgroup.org/. Virginia Tech is online at http://www.vt.edu/.

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Educational Technologies
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At The California State University I am directing a two-year project titled Case Studies in Evaluating the Benefits and Costs of Mediated Instruction and Distributed Learning, funded in 1996 by the U.S. Department of Education with additional support from The California State University. We have data from nine campus case studies, six involving various forms of television delivery and three based upon computer applications. Five of the cases are published and available at the project Web site http://www.calstate.edu/special_projects/.

Case Study Findings:

Benefits—(1) Learning outcomes for students enrolled in electronically mediated courses (as measured variously by course grades, exam scores, student surveys, faculty surveys, field supervisor surveys, and alumni surveys) are essentially equivalent to those for regular classroom instruction. These results are consistent with other comparative studies (see Thomas Russell, “The No Significant Difference Phenomenon,” http://tenb.mta.ca/phenom/phenom1.html). (2) Student access is improved for cases...
that involve delivery of instruction to sites remote from the campus classrooms.

Costs — The estimated direct costs of distributed instruction differ from classroom instruction in two basic ways: (1) The fixed or “start-up” costs of mediated instruction are greater than the fixed costs of classroom instruction. (2) The incremental or marginal costs of mediated instruction (the costs of adding more students to a given course in a given year) are less than the incremental costs of classroom instruction. Any forms of distributed instruction are subject to economies of scale, and at some level of annual course enrollment, distributed instruction can be less expensive than classroom technology. Also see: A. W. (Tony) Bates, Technology, Open Learning and Distance Education, 1995; Sir John Daniel, Mega-Universities and Knowledge Media, 1996, esp. p. 62; and Greville Rumble, The Costs and Economics of Open and Distance Learning, 1997.

Cost Simulation Model — The project has developed a model (BRIDGE) that is being used to compare the costs of a campus offering a substantial amount of its FTE in distributed instruction with the costs of a campus offering all of its instruction in classroom mode.

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In May 1996, May 1997, and January 1998, The College of Wooster offered week-long Web tools workshops to a total of forty faculty members, funded by grants from the College’s Hewlett-Mellon Fund for Institutional Renewal (see http://www.wooster.edu/acs/workshop/). Following the workshops, dozens of courses were offered that incorporated e-mail discussion groups and Web pages. Surveys in 1996 and 1997 gathered student responses to the use of these technologies in their classes. Faculty members distributed and collected surveys in class; nearly 100 percent of the students in the twenty classes surveyed participated for a total of 339 responses. The results:

• Overall, students found LISTSERV e-mail discussion groups and Web pages valuable.
• Students found LISTSERV e-mail discussion groups more valuable than Web pages.
• Whether a student had his or her own computer did not affect how valuable students perceived these technologies.
• Contrary to expectations, students in classes with the most active e-mail lists complained less about the number of messages and found the list more valuable than students in classes whose list had fewer messages.
• The instructor is the most significant factor in determining whether students found these technologies valuable.

A full report on this study is forthcoming in Campus Wide Information Systems (M CB University Press), and I will be presenting on this topic at the Educom ’98 post-conference session this fall being hosted by Rollins College. Sessions on our research from the last two Consortium of Liberal Arts Colleges (CLAC) annual meetings are available at: http://pages.wooster.edu/pharriman/clac97/ and http://pages.wooster.edu/pharriman/clac98/.

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At the University of British Columbia, Vancouver, Canada, we are nearing the end of a three-year project studying costs and benefits of telelearning—the use of computer communication technologies for teaching. The project is looking at seven projects, using seven software applications for telelearning (Web CSILE, HyperNews, Virtual-U, Lotus Notes, NetMeeting, Visual Page, and one still in development). The cases analyse the costs and the benefits, using my ACTIONS model (access, costs, teaching functions, interactivity and user-friendliness, organizational issues, novelty, and speed). The study is also looking at indirect benefits, such as the opportunity for increased enrollments, campus traffic reduction, and internationalization. Part of the study includes the development of cost models, to predict costs and benefits of different combinations of face-to-face teaching and telelearning for various enrollment targets.

Data for most of the studies have now been collected, and the case studies should be released between September and December 1998. Reports on indirect benefits and costs models are due between January and April 1999. The study is funded by the Canadian
Federal Government and is part of a $13 million National Centre of Excellence Telelearning project headed by Dr. Linda Harasim and Dr. Tom Calvert at Simon Fraser University.

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The Stanford Learning Laboratory (SLL) was established in 1997 by Stanford President Gerhard Casper and the Commission on Technology in Teaching and Learning (http://learninglab.stanford.edu/) to enhance the learning experience of Stanford students and create a model for judicious use of pedagogically informed learning technology. In-depth assessment is critical to our mission. In all its projects, the Lab conducts a comprehensive assessment using both qualitative and quantitative methods to evaluate the project’s effectiveness, utility, impact, and deployment barriers. The projects continue for several iterations to refine courses and learning activities.

One example of a Stanford Learning Lab project exploring at a fine-grained level the interactions of students and technology is a humanities course entitled “Introduction to Humanities: The Word and the World.” In the fall of 1997 SLL piloted the course, focusing on five significant texts in order to introduce freshmen to the methods of inquiry used by researchers and scholars in the humanities. The course consisted of lectures and discussion sections but also featured a Web-based discussion “backbone.” The Web environment provided content, supporting, and enrichment materials on all five texts, posed and collected short-answer questions prior to each lecture, and provided both lecture and section forums.

SLL funded an “Assessment Team” (A-Team) of six core individuals and five advisors which worked with the teaching and technology teams to define teaching and learning issues, goals, and questions that motivated the investment in Web technologies, and an assessment plan to address the questions of the various stakeholders. The assessment plan used a variety of tools (surveys, interviews, video taping, Web-statistics) to evaluate utilization and effectiveness of elements of the Web backbone, answer questions posed by the stakeholders, and build a picture of the general use of technology by the ninety undergraduates in the course.

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Seton Hall began with a three-pronged approach to assessment: understanding and improving the learning, teaching, and materials with respect to information technology. Through an external grant and continued efforts in the Teaching, Learning, and Technology Center, the University has woven assessment and quality assurance, with technology, into the fabric of its teaching and learning.

The university administered a nationally normed survey to gather information on student learning preferences, followed by a baseline technology proficiency inventory. This provides a student profile useful for course development as well as to understand the impact of technology in a summative way.

As technology is brought into the curricula, a number of faculty keep journals to document their experiences. The journals focus on the cognitive, behavior, and affective changes occurring with the use of technology.

At the end of the semester, students participate in focus groups and complete a survey based on the work of Chickering and Gamson to detail whether the use of various technologies improved learning outcomes.

The thread that ties Seton Hall’s assessment with technology is communication. Assessment results are shared widely via faculty technology training and program enhancement, throughout University Computing, and to the executive level. Seton Hall is now assessing the learning environment as it is impacted by technology beyond the classroom, such as student services and student life.

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NOTE: Due to space constraints, we were unable to include the full text of all responses to this question in this print publication. Full responses are accessible on the Web at http://www.educause.edu/ir/library/html/cem982d.html.

Next Readers Respond Question:

Have you developed or are you in the process of developing Service Level Agreement (SLAs) with the customers/departments that your IT organization supports at your institution? If so, please briefly describe your experience and provide the URLs for the SLAs or related documents that are sharable on your Web site.

Send your response via e-mail to Elizabeth Harris, CAUSE/EFFECT managing editor, eharris@educause.edu.