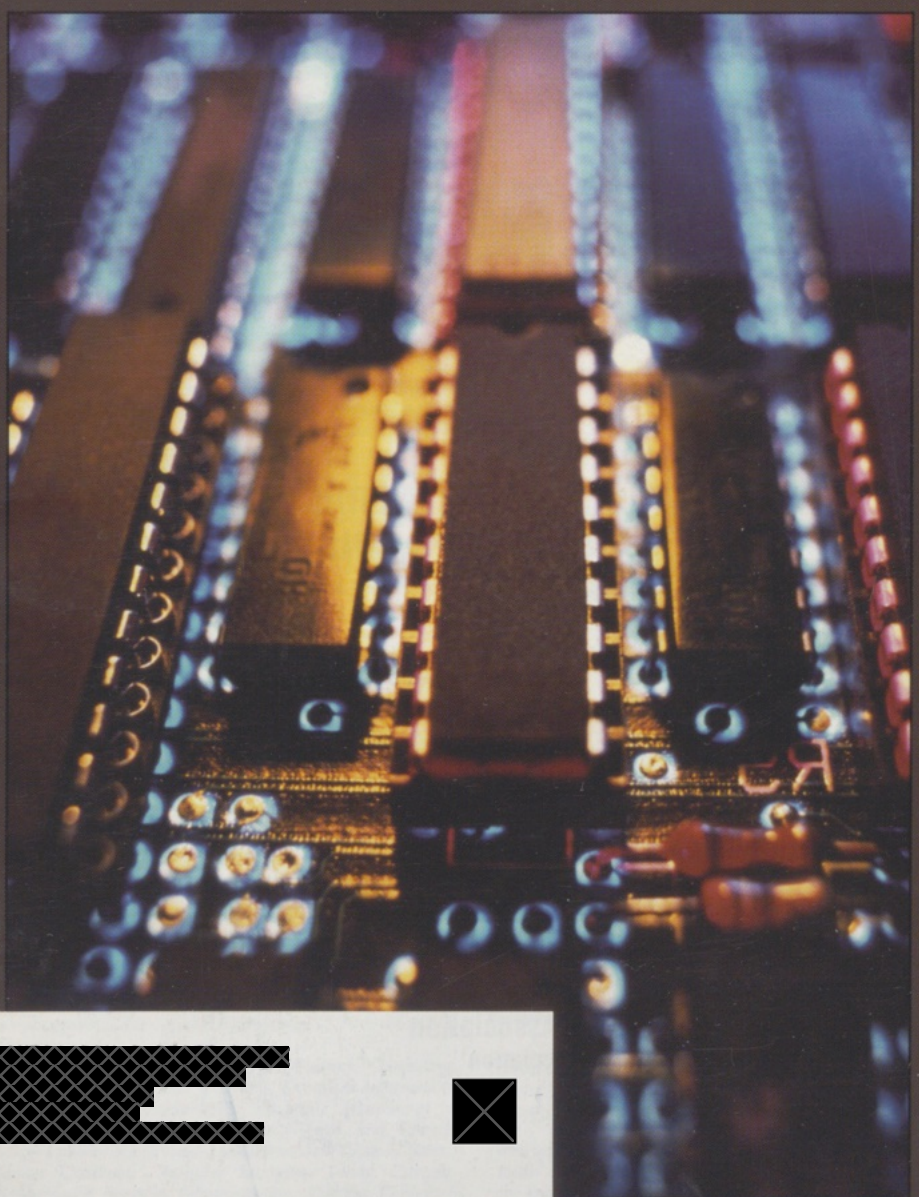
Information Technology AND Libraries

ISSN 0730-9295

Volume 22 Number 2

JUNE 2003



IN THIS ISSUE

- Providing Library-Based Instructional Support
- Building a New Infrastructure for Digital Media
- Collaborative Digitization Projects

Information Technology and Libraries (ISSN 0730-9295) is published quarterly in March, June, September, and December by the American Library Association, 50 E. Huron St., Chicago, IL 60611. It is the official publication of the Library and Information Technology Association, a division of the American Library Association. SUBSCRIPTIONS: Subscription price, $30, is included in membership dues. Nonmembers may subscribe for $55 per year in the U.S.; $60 in Canada, Mexico, Spain, and other PUAS countries; $65 in other foreign countries. Send subscription requests to *Information Technology and Libraries,* Subscription Department, American Library Association, 50 E. Huron St., Chicago, IL 60611; 800-545-2433; fax: (312) 944-2641; subscription@ala.org. Single copies, $20. Periodical-class postage paid at Chicago, Illinois, and at additional mailing offices. POSTMASTER: Send address changes to *Information Technology and Libraries,* 50 E. Huron St., Chicago, IL 60611.

Information Technology and Libraries publishes material related to all aspects of libraries and information technology, including digital libraries, metadata, authorization and authentication, electronic journals and electronic publishing, telecommunications, distributed systems and networks, computer security and intellectual property rights, technical standards, geographic information systems, desktop applications, online catalogs and bibliographic systems, optical information systems, software engineering, universal access to technology, futuristic forecasting, library consortia, vendor relations, and technology and the arts. *ITAL* welcomes unsolicited manuscripts. Submissions should follow the guidelines stated under "Instructions to Authors" on page 95 of this issue or on the LITA Web site at www.lita.org/ital/infoauth.htm. Manuscripts of feature articles, communications, and tutorials should be addressed to Dan Marmion, 221 Hesburgh Library, The University of Notre Dame, Notre Dame, IN 46556-5629. Books for review should be addressed to Tom Zillner, WILS, 464 Memorial Library, 728 State St., Madison, WI 53706. Software for review should be addressed to Andy Boze, Hesburgh Library, The University of Notre Dame, Notre Dame, IN 46556-5629.

ADVERTISING: The Goldman Group, 14497 N. Dale Mabry Hwy., Ste. 205N, Tampa, FL 33618; telephone (813) 264-2772; fax (813) 264-2343.

As a matter of policy, *ITAL,* as the scholarly organ of LITA, does not review LITA publications.

PRODUCTION: ALA Production Services (Troy D. Linker, Kevin Heubusch; Ellie Barta-Moran, Angela Hanshaw, Kristen McKulski, and Karen Sheets), American Library Association, 50 E. Huron St., Chicago, IL 60611.

Publication of material in *Information Technology and Libraries* does not constitute official endorsement by LITA or the ALA.

Abstracted in *Computer & Information Systems, Computing Reviews, Information Science Abstracts, Library & Information Science Abstracts, Referativnyi Zhurnal, Nauchnaya i Tekhnicheskaya Informatsiya, Otdyelnyi Vypusk,* and *Science Abstracts Publications.* Indexed in *CompuMath Citation Index, Computer Contents, Computer Literature Index, Current Contents/Health Services Administration, Current Contents/Social Behavioral Sciences, Current Index to Journals in Education, Education, Library Literature, Magazine Index, NewSearch,* and *Social Sciences Citation Index.* Microfilm copies available to subscribers from Proquest, Ann Arbor, Michigan.

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1992.∞

Information Technology AND Libraries

Volume 22, Number 2 June 2003 ISSN 0730-9295

Abstracts and contents pages of recent issues of *ITAL* can be found on the LITA Web site at www.lita.org/ital/index.htm.

cover design Kevin Heubusch ● **interior design** Dianne M. Rooney

President's Column

Pat Ensor

I am pleased to be able to inaugurate the Library and Information Technology Association (LITA) president's column in *Information Technology and Libraries (ITAL)*. It is part of an ongoing effort to increase communication and a sense of community within LITA. I feel the one print publication that goes to all members, and is read by many outside of LITA, could profit by giving readers a taste of what is going on within the organization, and *ITAL* editor Dan Marmion graciously agreed. The timing also means that I can get the column started and then make incoming president Tom Wilson do it! There's nothing like getting someone else to do most of the work.

LITA membership has expressed a need for greater communication in a variety of ways; I know, because I'm one of those members expressing this need for the last several years. However, I'm also part of the problem as I was on the board when some communication mechanisms, notably the *LITA Newsletter*, were lost! Speaking from my viewpoint only, we embraced, with the best of intentions, the potential of electronic communications, without realizing that more attention needed to be paid to organizing and conveying content. Worrying about the technical aspects, in other words, is not enough. Life is a learning process, though, and I believe that we are learning these lessons now.

I value communication highly in any organization that I am involved. The ideal I try to hold myself to is one of making communication a top priority, not an afterthought. I also try to remember that communication must be constant—it's not something you can do once and then check off the to-do list. There are other schools of thought that certainly have some weight to them; some feel that they have so little time to accomplish everything they need to do that communication is just not a high priority. Others believe that they carry out their assigned functions without providing the details precisely because it's their job and others don't need to be bothered with it. They might say that the members elected the LITA board of directors, and they expect the board to carry out its job without bothering others with the details.

It is certainly true that all of us are bombarded with information, and there is only a portion of life that can be assigned to professional associations—we have day jobs, right? So I hope that LITA doesn't end up bombarding you with useless, unwanted information. However, I think the pendulum needs to swing back toward providing more information than we have been, and I hope that I have contributed something to increasing communication. After all, if worst comes to worst, you will have the choice of deleting communications from LITA. If you don't receive any information at all, then that choice is taken out of your hands.

The best tool that LITA has for "pushing" communication to you, especially so that you know when to check the Web site for something new, is LITA-L, our electronic discussion list. If you have not already subscribed, go to the LITA Web site at www.lita.org and look for the section titled "LITA Membership." LITA-L is a bulleted item in that section. It is true that not just organizational news is covered there, but it is still the one list that has association business as a major part of its purpose.

The minutes of major LITA governance meetings have been appearing for a while on the LITA Web site; however, you have not always received notices when new items have been made available. In addition, agendas have not generally been published on the Web site. Notice of the availability of minutes and agendas have been something we have been trying to do more dependably; in addition, agendas are now being made available on the Web site.

The executive committee met on March 28; the minutes of the meeting should now be available through the LITA Web site. One item I would like to spotlight that also should further communication is our support of exploring a reactivation of the LITA newsletter function. This recommendation will go to the LITA board in June; if approved, appropriate groups will work out the implementation. The fact that this step is being considered now is the direct result of membership initiative, especially that of Walt Crawford, LITA past president and newsletter editor. Other members chiming in with their support also helped to bring this issue to the fore.

In fact, something that keeps LITA vital is the fact that member action can work! Communication is an area in which member leaders can also take an initiative. Send written reports about your business meetings or programs to LITA-L. If there is something your committee or interest group maintains on the Web site, send notifications to LITA-L when it is updated with new content. Genuine exchange of information is something to which we must all contribute.

I hope that you attend the ALA Annual Conference in Toronto this summer. LITA groups have worked hard to plan everything from three valuable preconferences (on e-books, technology disaster recovery, and recreating your library Web site) to fourteen different programs. LITA's meetings and programs at the Annual Conference are further described on LITA's Web site.

Do you want to meet more people within LITA or figure out how to get more involved? Make plans to attend the LITA Happy Hour on Friday, June 20, 5–7 P.M. You can "Grow with LITA" on Saturday, June 21, 2–4 P.M. As its

(continued on page 60)

Pat Ensor (Ensorp@uhd.edu) is Director of Library Services, University of Houston–Downtown, and President of LITA.

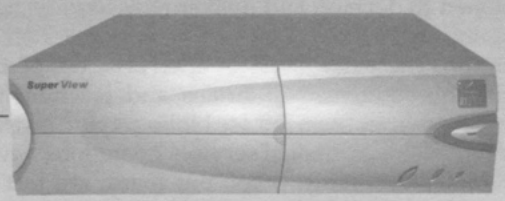
Share Videos & CDs... Over Your Network

Load your VHS and DVD videos or reference CDs on an Axonix server. Then share them over your network with easy web browser access. That's it. That's all.

Save time. Eliminate the hassle of tracking CDs, discs and tapes. Fast content access via LAN, WAN or the Internet. No tech support or training needed. Easy to use.

Save money. No more costly TVs, VCRs, DVD players, or multiple copies. Scrap old CD-ROM towers and reduce telecom costs. Very affordable. Nothing extra to add or buy.

SuperView™



Video Server

- **Full motion, full screen videos on demand**
- **Store and serve hundreds of hours of video**
- **Uses one-tenth the bandwidth at one-third the price**
- **Serve hundreds of users simultaneously**

SuperCD™

CD-ROM Server

- **Store and serve 1 to 512 CDs/DVDs**
- **Automatic user license monitoring**
- **Thousands of units running 24/7**
- **Award winning network appliance**

Call for a free, no-risk trial

800.866.9797
www.axonix.com

AXONIX®
IT Solutions Since 1983

Guest Editorial: The Changing Role of Libraries in Instructional Support

Susan Logue

The application of technology to instruction and to information access has proliferated greatly in recent years. Faculty have become increasingly aware of the need for expertise in developing instructional technology, and students expectations continue to rise. In this climate, libraries are seeing new opportunities for providing technology services for users.

Libraries have historically been early adopters of technology. They have developed online catalogs and provided patrons with vast information resources, first through telnet and similar applications and then through the Web. Often these developments have occurred through partnerships with campus organizations such as the information technology department and with the input of teaching faculty.

As technology has become commonplace in classroom and library instruction, libraries are developing new services and resources. The library is ideally positioned to develop and deliver new services because of its centrality to the overall instructional mission of the institution. These new services often arise out of existing relationships between librarians and teaching faculty that evolved from the need for bibliographic instruction.

Some instructional services operations have existed in libraries for many years, but many are just now being developed. This issue highlights examples of both. Howard Carter and Kevin Rundblad describe an operation that has provided a broad range of instructional services for faculty for over fifty years. As the needs of the faculty have changed, the services offered have also changed. They discuss new opportunities realized through partnerships with other campus organizations. Jacqueline Mundell, Coryl Celene-Martel, and Tom Braziunas discuss reorganization at a community college that has created a collaborative environment among the library, media services, distance learning, and the teaching and learning center. The result of the change is easy access for users and increased interaction between departments. Similarly, M. Claire Stewart and H. Frank Cervone show how more opportunities for better service to users resulted from the library's use of technology in electronic reserve, digitization services, and streaming media, and by co-locating academic technologies, the library's digital media services, and collection management.

This issue also includes examples of partnerships that have developed out of specific technology projects. In all cases, the library has had the expertise in instructional technology, a sound understanding of the information-seeking needs of students, and a vision for the future applications of technology. Adriene Lim describes a project that involves collaboration between fine arts faculty and the library to provide access to digitized images from a specialized collection of materials. She discusses issues related to project goals and process, responsibilities of the partners, software and hardware concerns, and next steps for the start-up project. Bella Karr Gerlich and Amy Perrier discuss a collaboration between the library and studio art faculty in developing instructional materials and in helping students with research and coursework. They describe collaborative projects such as digitization of slide collections, sound file delivery, and electronic reserves. Tara Dirst describes a collaboration with art history faculty to provide access to a slide library. Other institutions add to the collaboration by providing content and scripting for the database. She also analyzes several database options. Elizabeth Kraemer outlines a project that consists of developing a library instruction module with online courseware and supporting the faculty as they incorporate the module into classroom instruction. She also evaluates the specific courseware used.

This issue illustrates a variety of ways that libraries are providing new kinds of instructional technology services to meet changing users needs. By being keenly aware of changing instructional technology and remaining mindful of pedagogical needs, libraries are redefining their roles in the instructional mission of their institutions.

Susan Logue (slogue@lib.siu.edu) is Associate Dean of Support Services at Southern Illinois University, Carbondale.

The Village of ISS: Providing Library-Based Instructional Support

Howard Carter and
Kevin Rundblad

Institutions want courses that incorporate the latest instructional technology. Instructors cannot take advantage of new technology if they are unfamiliar with the tools and have limited experience with online learning pedagogies. It has been said that it takes a village to build a curriculum in the information age. Morris Library's Instructional Support Services (ISS) is such a village. ISS provides instructors with technical advice and access to current hardware, software, and multimedia techniques to meet their teaching objectives. Offering instructional designers, Web programmers, and video and graphics professionals, ISS is a one-stop shop for instructors who want to add technology to their courses.

Many colleges and universities want to offer courses that take advantage of the benefits of technology, yet often their faculty are unfamiliar with that technology. Having grown up with the Web, today's students expect more than a traditional lecture format from their classes.[1] Many facets of new technology can enrich course content, engage students, and encourage interaction among them.[2] Institutions must find ways to help faculty members use new technologies to create new courses and redesign existing ones. Instructors will need help using new skills, a hospitable environment for innovation, and a reliable infrastructure to support the endeavor.

Few faculty members have knowledge of the pedagogical issues related to online learning. Someone has to help them decide which courses would benefit from integrating Web-based components such as online course syllabus; schedules; content; and intracourse communications, like e-mail, bulletin boards, and chat sessions. The instructional support system that best aids faculty combines an understanding of the components of sound instructional design with expertise in applying the latest instructional technology.[3]

For the last five years, the national Campus Computing Project, a group made up of senior information technology (IT) officials from academic institutions, has made helping faculty integrate technology with their instruction a top priority. In many cases, instructors are offered limited opportunities to consult with IT staff, which usually focuses on issues of hardware and software. That level of assistance can work well if the instructor already has a good understanding of course-related technology or if the project is of limited scope. Instructors with limited knowledge or with larger, more complex projects will need a much higher level of support.

Many resources are required to help instructors incorporate technology into their classrooms and courses, but the final number of specialists an instructor will need depends on the size and scope of each project. Examples of specialists include instructional designers, Web programmers, graphic artists, photographers, and video producers who may be found in the IT department; the campus center for teaching; and various academic departments such as art and design, photography, journalism, radio/television, and computer science. The specialists at the library help instructors by identifying resources, securing copyright permissions, and helping to create online material that will aid instruction. According to Altschuler and McClure, "to build a curriculum in the information age, it takes a village."[4] At the Morris Library of Southern Illinois University Carbondale (SIUC), that village is called Instructional Support Services (ISS).

Library-based Instructional Support

Institutions have tried many approaches to promote technology in the classroom. Some have developed incentive programs to increase the use of technology in teaching. When Johns Hopkins University determined that faculty needed help from a support staff with expertise in both technology and pedagogy, they established minigrants to encourage faculty to explore technological solutions to instructional problems.[5] They established the Center for Educational Resources, which provides faculty with support in the use of technology and media for education by serving as a planning and production resource.[6] At Cornell University, grant funds were allocated to assist twenty faculty members per year in redesigning their courses. It was hoped the experiences of grant winners would lead to greater interest and enthusiasm among the rest of the faculty for using technology in instruction.[7]

Many institutions have made instructional support a part of the library's mission. Major has described a community college's user-oriented center staffed by library-based instructional developers where instructors could get assistance in applying specific instructional methods and strategies. The library was a logical location for such a center because of its long tradition of providing services to instructors. The library was also seen as the center of emerging interactive techniques, such as video and computers. From the library it would be relatively easy to

Howard Carter (hcarter@lib.siu.edu) is Manager, Instructional Support Services and Web Coordinator at Southern Illinois University Carbondale. **Kevin Rundblad** (krundbla@lib.siu.edu) is Instructional Development Librarian at Southern Illinois University Carbondale.

incorporate technology into the delivery of instructional development information.[8]

Of the fifty-eight respondents to a 2001 survey from the Association of Research Libraries (ARL), 48 percent said that their library offers instructional support services to some degree.[9] The Instructional Technology Center at the University of Wisconsin-Whitewater's library provides satellite teleconferences, multimedia design and development assistance, training sessions, consultation and production services, computer and equipment maintenance and repair, and creation of instructional graphics. The Multimedia Development Center, with a tenure-track multimedia specialist, assists instructors with designing and developing their own multimedia materials. Workshops are given on topics of hardware, software, design, and authoring. The goal is to empower the faculty to create their own multimedia programs.[10]

At Cornell University, instructional support is part of the mission of the library, and librarians help instructors by providing courseware development support. Faculty members are given help in creating Web pages, manipulating digital images, designing databases, and authoring multimedia programs. Instructors also have access to advanced hardware and software. The library also administers a UNIX-based Web server to house the instructional materials. The focus is on providing assistance so faculty can complete their own projects rather than establishing a development shop for producing programs for faculty use. The advantage of this strategy is that faculty can become more fully aware of the benefits technology can bring to their courses and become even more creative in how they use it. Questions of pedagogical design, however, are seen as outside the scope of the library's expertise. Instructors are referred to other campus resources, such as the Office of Instructional Support.[11]

The Village of ISS

SUIC and its Morris Library have a unique approach to serving the instructional technology needs of the university's instructors. The emergence of new technology prompted the SIUC library to make an early reassessment of the services it provided to promote instructional advancement. The instructional support function was restructured to meet the changing needs of faculty who were trying to incorporate new technologies into their courses.[12] The library has provided instructional technology and audiovisual support since 1949. In 1960, it began assisting faculty with instructional development. Instructional evaluation was transferred to the library in 1979. Video production was added in 1981. Since then the library has added instructional designers, Web programmers, graphic designers, and a corps of very talented graduate assistants and undergraduate student workers. Today, instead of looking all over campus for technology expertise, instructors only have to go to ISS in Morris Library to get the technology help they need. ISS is perhaps the most complete facility at any university for providing instructors with the help they need to fully use technology to meet their teaching objectives.[13]

Organizationally, ISS is under the Library Affairs Associate Dean for Support Services. Support Services also includes Systems, the Instruction Coordinator for Bibliographic Instruction, and Reserves. ISS has a manager and two other librarians, one full-time and one half-time. There are five administrative/professional staff members: an instructional designer; the WebCT administrator; video producer; interactive video specialist; and instructional evaluation specialist. There are nine civil service employees including an office manager, Web programmers, video technicians, audiovisual equipment specialists, and a graphic designer. Graduate assistants perform most of the routine production work in ISS, and undergraduate student workers provide assistance in reception, graphics, instructional evaluation, equipment distribution and monitoring, and other services. In addition, the head of the Regional Center for Distance Learning and Multimedia Development has a quarter-time faculty assignment to ISS, and a three-quarter-time appointment with the regional community college consortium. The Regional Center is a resource center colocated with ISS that supports community colleges and public schools in southern Illinois. ISS is also a key player in the Academic Technology Center (ATC), a partnership between the library's Support Services and the campus IT department. The partnership is manifested in the location of the IT Customer Service Center (CSC) on the main floor of the library, the jointly developed and presented Seminar Series workshops on Microsoft Office products and other user software packages, and collaboration on accessibility and other issues of common concern. Figure 1 illustrates the organizational relationships of ISS.

The services provided by ISS include instructional development, Web course development, custom Web programming, graphics and digital imaging, video and photo production, instructional evaluation, instructional technology, and distance learning. The goal of ISS is to be the one-stop shop for instructional technology support on campus. Whether an instructor wants to create a simple Web page with a syllabus and office hours or wants to design an entire distance learning course with streaming audio and video components and deliver it via interactive video conferencing, ISS is able to assist from start to finish. Whether an instructor wants to have a television and VCR delivered to a classroom, wants a video converted from PAL to NTSC, or wants test answer sheets run through the optical scanning machine, ISS is the office they call. As a result, ISS receives approximately seven hundred work orders for

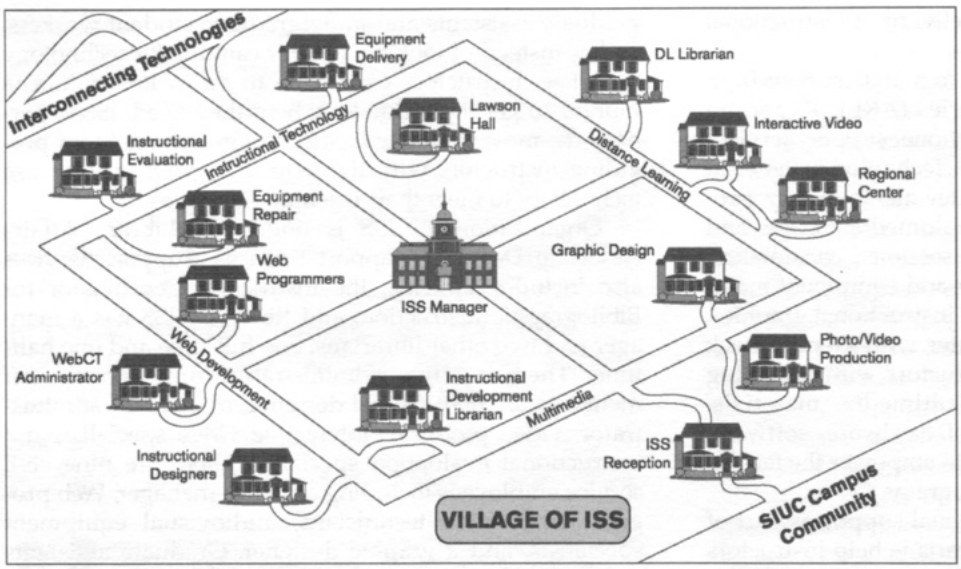


Figure 1. ISS Organizational Relationships

Web development and graphics services, and scans more than 250,000 answer sheets each year.

When an instructor needs any course-related technology, he contacts ISS to discuss the scope of the project and the desired outcomes. The ISS manager assembles a team to design, develop, and implement the solution. ISS staff work on a wide variety of activities at any given time from the mundane to the complex. Skilled graduate assistants work closely with the instructional designer, Web programmers, and graphics staff to create a product that is pedagogically sound and aesthetically appealing. The staff is encouraged, indeed expected, to find solutions that are efficient and elegant, making use of the latest software and techniques in ways that are supportable and sustainable.

ISS Departments and Services

Instructional Design, Course Development, and Custom Web Programming

Much of the work of ISS centers on the course design and development staff. The instructional designer often has the first look at an incoming project. She helps the instructor translate the vision of what is needed, defining it into concrete tasks, developing a work order, and passing it along to the production staff. This process requires teamwork and open communication often resulting in many drafts and revisions. The instructional designer has a deep understanding of online pedagogy. She is adept at adapting traditional lecture-and-blackboard classes to the Web-based environment. She listens to the instructor's ideas and goals and suggests technology that can be used to achieve the desired ends. The instructional designer finds ways to create Web-based learning through interactive content, online assignments, and testing. She is also well versed in online interactive communication tools, the strengths and weaknesses of streaming multimedia, and methods to engage the learner. She reviews Web pages with a critical eye, suggesting effective and creative ways to display the content, such as graphics, rollovers, and pop-ups. For new initiates, she may suggest small steps that can be done quickly and easily. Some instructors have a firm understanding of the capabilities of technology and are comfortable managing a course that aggressively exploits those capabilities. For them, the instructional designer can steer them to the latest techniques while keeping them focused on the presentation of instruction and not just on the latest bells and whistles.

The instructional designer works closely with the Web programmers to create the applications, pages, or effects the instructor wants. They include the WebCT administrator, applications programmers, and a librarian who specializes in multimedia development. The programmers use Perl, SQL, and other programming utilities to create database-driven Web pages, Web forms, surveys, and other applications to meet the needs of the instructors. ISS programmers have access to servers that are owned, operated, and maintained by the library. These servers, in addition to those administered by Systems for library support, house the WebCT service, multimedia applications, and development projects. ISS manages three Unix-based Sun servers colocated with Systems machines, a remotely located machine containing Windows 2000 Server that runs the interactive voice response (IVR) system and video servers, and a development server within ISS itself.

The WebCT administrator supports more than 450 courses across campus. He assists instructors with uploading course pages, creating approximately fourteen thousand instructor and student accounts, resetting passwords as necessary, and cleaning up after the course is completed. Using Respondus, a separate program that works with WebCT, he can create online exams and quizzes that

automatically report scores to a Web page for students to access after they have taken the test.

Although the primary mission of ISS is to assist instructors with the technology they need for their courses, ISS programmers may also work on projects in support of other campus-related functions as time allows. Clients include the Student Recreation Center, the Office of Research Development and Administration, and faculty doing research projects not directly related to their course offerings. Programmers are encouraged to explore new applications and capabilities that may not be needed currently, but have potential for future use. Recently, such applications include ASP.NET, SPSS, and Windows Media.

Graphics, Video, and Teleconferencing

ISS also has extensive graphics and video support services. A graphic designer and student assistants provide a variety of print and digital production services. These include creating logos, posters, library handouts, announcements, certificates, and advertising and promotional materials; scanning 35mm slides for in-course and reserves use; and creating graphics for Web courses and Web pages as well as other layout and design projects. The graphics staff also digitize photographs and other materials for Special Collections and Archives.

The video production and photography section provides instructors with a wide variety of services ranging from simple tasks such as videotaping classroom lectures and duplicating tapes, to complex assignments such as scripting, shooting, and editing educational videos. Going beyond tape distribution, many videos are converted for presentation on the Web and added to course Web sites. Sometimes the videos are compressed to fit on CDs or VCDs for easy computer presentation purposes. All productions may be placed on reserve in the library or accessed electronically via a Web site. Instructors who are considering adding video components to their courses may come to ISS to discuss their ideas and get practical and artistic advice from the video production staff. ISS has complete camera packages and editing facilities for creating virtually any type of video product. Numerous academic departments have made use of this service to create videos that demonstrate procedures essential to their curriculum. The videos are made available to students for review outside the classroom or laboratory. The video section also offers international videotape conversion, an invaluable service for faculty with ties to global institutions. Conversion of reel-to-reel and audiocassette tapes to digital formats is also provided. Staff members also photograph class activities for use in instruction and they photograph important library events for archival purposes.

Another dimension for course delivery is interactive video conferencing. Video technicians and telecommunications specialists in ISS support seven distance learning classrooms across the campus that are equipped with video conferencing technology. Staff members assist instructors in developing conferencing sessions and scheduling classrooms. They also provide technical support and training in the use of the equipment. The instructional designer works with faculty to take full advantage of the instructional capabilities of interactive video. Interactive video has enabled several instructors to reach students at dispersed locations around the state with lecture sessions conducted from on-campus classrooms, and remote instructors to reach on-campus students.

The interactive video conferencing capabilities provided by ISS are a valuable resource for the university, the community, and the region. ISS is a major technical support resource for the delivery of interactive video throughout the state. ISS staff members were instrumental in engineering the Illinois Century Network, a statewide network of broadband connections for state agencies and educational institutions.

A distance learning librarian is also assigned to ISS. She is assigned one-half time in ISS and one-half time as a reference librarian specializing in science and medicine. She is a first point of contact in the library for off-campus students. She assists SIUC students around the world in accessing library resources and insures they receive any materials needed for their courses. She also serves as an online reference provider through the library's Web site.

Instructional Technology and Instructional Evaluation

For more than fifty years the library has served the audiovisual needs of the university's instructors by distributing equipment across campus. A variety of resources ranging from 16mm projectors to DVD machines, slide projectors to video projection units (VPU), and television-VCR combinations to laptops are available through the ISS Instructional Technology department. Instructional Technology also has facilities for repairing damaged or faulty equipment. In addition to supporting classrooms throughout the campus, members of the unit provide services in Lawson Hall, which houses many of the university's large classrooms and auditoriums. The ISS staff recently participated in the development of a plan for upgrading the Lawson Hall infrastructure as part of an initiative in 2003 to improve the physical condition and the quality of instructional technology in the university's classrooms, laboratories, and auditoriums.

Another long-standing service provided by ISS is instructional evaluation (IE), which centers around the optical scanning system. IE processes all campus examinations and faculty/course evaluations that use "bubble-sheet" technology, amounting to 250,000 to 300,000 answer sheets per year. Test scores are made available to the instructor by e-mail, posted directly to a course Website through WebCT, or distributed by green-bar paper printout. The staff in IE prepare statistics for the instructors at their request. Instructors use a standard course evaluation

form available from ISS to obtain feedback from their students. Some departments have developed, with assistance from IE, their own evaluation forms using the optical scanning technology. These forms are tailored to the needs of the particular department and can focus on specific areas of interest. IE runs about twenty-five hundred different jobs each year. A job may be ten tests for a PE class, a batch of eighteen hundred faculty evaluation forms, or a set of evaluations for eighty different sections of history. IE provides one of the few ISS services that is available to students. Graduate students who wish to use bubble-sheets to conduct surveys can have the sheets processed in IE and they may request some basic statistical analysis. IE also assists graduate students with project design to take full advantage of the technology and avoid its pitfalls.

Partnerships and Collaboration

ISS is not an isolated village. It maintains a partnership with the campus IT department and a close working relationship with the Regional Center for Distance Learning and Multimedia Development. ISS also has collaborative projects with national library organizations, including ARL, and the American Library Association (ALA).

Academic Technology Center

Since 1992, Library Affairs has partnered with IT to improve campus connectivity and access to library materials.[14] In 2001, the ATC was created to bring together the services of the IT Customer Service Center (CSC), with the library's ISS and systems departments. The ATC was formed to focus the combined skills and resources of IT and support services on their joint instructional technology initiatives. The CSC is located on the first floor of the library and consults on campus network access to students, faculty, and staff. CSC also assists ISS by helping solve student and instructor problems with their WebCT accounts. One of the major facets of the ATC collaboration is the joint development and delivery of workshops on widely used software products, such as the Microsoft Office suite and Macromedia Dreamweaver, and on the use of SmartBoard equipment. Teams consisting of one member from ISS and one from IT jointly develop the workshops and alternate presenting them or present them in tandem. Office managers for ISS and for CSC also work closely to ensure high levels of communication between the agencies. The long-term goal is to have a centralized point of access for technology-related issues.

Regional Center for Distance Learning and Multimedia Development

Since its creation in 1997, the Regional Center has been colocated with ISS in Morris Library. It is funded primarily through a Higher Education Cooperation Act (HECA) grant from the Illinois Board of Higher Education and is shared by two higher education consortia: the Southern Illinois Collegiate Common Market (SICCM) and Southwestern Illinois Higher Education Consortium (SIHEC). With a director and a few graduate assistants, the Regional Center works with the two consortia to provide community colleges and public school teachers with services that parallel those provided by ISS to the university community. Its mission is to enhance teaching and learning by exploring innovative instructional strategies and sharing expertise in the southern Illinois region. Services include training faculty and staff in distance learning, multimedia development, and emerging technologies. The Regional Center sponsors workshops, seminars, and consultation opportunities for members of the consortia including SIUC. The Regional Center has awarded more than two hundred minigrants to faculty in the region since 1997 for development of distance learning and computer-mediated instructional courses and applications. ISS staff teamed with the Regional Center to deliver a week-long Web Camp on the SIUC campus for teachers from the university and around the region. The goal of the Web Camp was to give in-depth, hands-on instruction in the latest Web development and multimedia tools. ISS staff members taught workshops in online pedagogy, use of WebCT course management software and streaming multimedia, and use of video and graphics in Web design. By sharing equipment, software, expertise, and funding opportunities, the relationship between ISS and the Regional Center is beneficial to both and provides valuable service to the region.

ARL and ALA

In recent years, ISS has expanded its scope to include working with library-related organizations to create Web-based, online career development courses. In 1998 a partnership began with ARL's Office of Leadership and Management Services (OLMS) to create the Online Lyceum. To date, twelve courses have been created for the Online Lyceum and have been delivered numerous times. Content is supplied by topic experts selected and employed by ARL. ISS is responsible for the instructional design, custom programming, graphics, and multimedia components. Project management is a shared responsibility of ARL, OLMS, and ISS. The courses reside on servers that are operated and maintained by ISS staff. The success of the ARL arrangement and the reputation of ISS for quality work led to a similar agreement with the ALA to produce an online course and provide technical training for ALA staff. ALA provided the content and ISS provided the technical expertise. The course is accessed from machines owned and operated by ALA. The experience gained from these projects has enhanced the ability of ISS to provide quality assistance to the SIUC faculty. Within these courses, new technologies can be explored and used in creative ways.

Keeping Up with the Technology

One of the major challenges that must continually be faced by ISS is the need to remain current with emerging technology trends. Because not all students will have access to broadband connections all the time, media components must be accessible using both high-speed and dial-up operations, and be compatible with both Windows and Macintosh operating systems. These considerations can create the need for multiple or layered delivery methods. ISS staff work to find new ways to deliver educational content and to encourage instructors to use the technology. The development of a call-to-server audio recording capability is an illustration of that activity.

The ISS multimedia specialist is very interested in adding a personal dimension to Web-based courses. He has developed a creative way for instructors to provide streaming audio and video for their course environments. He believes that streaming audio and video components within courses can help students, particularly distance students, feel more like they are in a classroom environment—especially if they can see and hear their instructor and classmates. Many times course Web sites contain only text and images. Usually this is because the instructors do not know how to use digital audio, streaming technologies, or other media applications. There are two ways to make the Web-based course development process more efficient while also adding new media technologies. One is to develop training seminars that provide a hands-on experience with the software applications. ISS provides this training, but many potential users hesitate to begin the long learning process.

The other way is to develop applications that will make it easy to produce media projects using technology that is already understood. With this approach, ISS has adapted an Integrated Voice Response System (IVRS), commonly a business call-center technology, to let faculty easily create streaming audio applications that are delivered via Web-based courses. IVRS can capture the caller's voice and save it to a server, which allows users to record audio segments from the telephone. ISS has used IVRS for instructional applications from simple audio-only presentations to streaming multimedia presentations for online courses. The result is that online courses are enhanced with media created by facilitators, course participants, and guest speakers located anywhere in the world via the telephone. IVRS can be used by both facilitators and participants to record their own audio introductions. This process has been incorporated into a recent course developed for ARL. Class participants may also call in questions that are answered by the facilitators. Guest speakers may record audio elements for use with a portion of a course. IVRS can also be combined with other media. It is so easy to use that students could create their own media pieces for class presentations. One professor recorded voice-overs for his PowerPoint slides from home, and then the slides were matched with the recorded audio and delivered as an integrated multimedia presentation with Synchronized Multimedia Integration Language (SMIL).

IVRS has limited hardware and software requirements, so it was easy for the ISS staff to activate. It uses a Windows 2000 server and Dialogic 4 Port Voice Board. The software used is Pronexus VB Voice 4.3 Toolkit, Announce! Audio Recording and Editing, Visual Basic 5.0 or above, and Helix Producer or Window Media Encoder for converting files to streaming format. The IVRS recording process requires little or no training for the user, so it can be used quickly and easily.

The IVRS database administrator in ISS creates a database record that includes the user's name, e-mail address, and a personal identification number (PIN), which is linked to the user's information. This PIN is sent to the user along with the telephone number to the system and instructions for recording.

When the user calls IVRS, she is greeted with a voice message giving instructions on the use of the system. A Visual Basic (VB) interface accepts the incoming call to the IVRS board if lines are open. ISS has a four-port board at this time, which means that four simultaneous calls can be taken using four incoming telephone jacks. The introduction message is played and the user's call is passed on to the next control, which asks for the user's PIN.

The user enters the PIN using the telephone keypad. The VB control searches the Access database PIN field for a match. If the PIN is valid, then the user's call, together with the information in their last name and first name database fields, is passed on to the VB Voice record control. If the PIN is not found in the database, then the user is not allowed access to the system.

When the user is finished, she can listen to the file, save it, or rerecord. The system can be set to detect a certain interval of silence to initiate these prompts automatically. The ISS system is set at four seconds. The VB Voice record control then proceeds to the exit message, which tells the user goodbye and hangs up. The user can also just hang up and the file is automatically saved. The sound file (.wav file at 8 KHz, 8-bit mono) is saved in a designated directory on the server. The VB Voice record control uses the user's last and first name in the file name to identify the person who created the file. It also adds eight additional random characters to make the file unique, otherwise the file would be overwritten each time a user makes a new recording. For example, a file created by Kevin Rundblad may look like: \RundbladKevin8000s3r2.wav when saved on the server. In this way the media developer always knows who created the file and, with the time code on the file, when it was created. This file can now be downloaded by the media developer in ISS and encoded into a streaming format for use on the Web.

Conclusion

In higher education, keeping up with the rapid change in technology as it applies to instruction is a daunting task. Instructors who must remain current with developments in their field, manage the day-to-day operation of their classes, and complete the tenure process are not always able to maintain current knowledge of the technological tools. Students are very sophisticated users of Web-based content and have high expectations for course appearance and delivery. Use of varied programming techniques, graphics, and multimedia within courses is almost a necessity. ISS provides instructors with the vital assistance they need to update their traditional courses and include these elements. ISS maintains the breadth of expertise, the equipment, and the software to create learning environments that are pedagogically sound, aesthetically appealing, and that effectively incorporate appropriate new technologies. Through its partnerships and collaboration with other campus and national organizations, SIUC's Library Affairs enhances its ability to provide high-quality instructional support in a village called ISS.

References and Notes

1. Glenn C. Altschuler and Polley McClure, ". . . and Colleges Must Create Technology Plans," *Chronicle of Higher Education* 48, no. 19 (Jan. 18, 2002): B16–17.
2. Zsuzsa Koltay, Ben Trelease, and Phillip M. Davis, "Technologies for Learning: Instructional Support at Cornell's Albert R. Mann Library," *Library Hi Tech* 14, no. 4 (1996): 83–98.
3. Joan S. Mitchell, "The Changing Face of Instructional Technology Centers," *Bulletin of the American Society for Information Science* 16 (Aug./Sept. 1990): 7–8.
4. Altschuler and McClure, ". . . and Colleges Must Create Technology Plans," B16.
5. Todd Kelley and Connie Vinita Dowell, "Incentive Programs to Support the Use of Instructional Technology by Faculty at a Major Research University and a Leading Liberal Arts College" (paper presented at the annual conference of EDUCAUSE, "Broadening Our Horizons: Information, Services, Technology," San Francisco, Calif., Dec. 3–6, 1996). Available online at www.educause.edu/ir/library/html/cnc9660.html.
6. Andrew Albanese, "JHU libs. Helps with Technology," *Library Journal* 125, no. 18 (Nov. 1, 2000): 13–14.
7. Altschuler and McClure, ". . . and Colleges Must Create Technology Plans," B16–17.
8. Howard T. Major, "User-oriented Instructional Development: An Opportunity for Community College Libraries," *Community & Junior College Libraries* 5, no. 1 (1987): 19–30.
9. Carolyn A. Snyder et al., *Instructional Support Services: SPEC Kit 265* (Washington, D.C.: OMS, Association of Research Libraries, 2001).
10. L. Roger Yin and Roger F. Krentz, "Birth of a Proactive Instructional Technology Center: A Case of System Change," *THE Journal* 23, no. 4 (Nov. 1995): 86–88.
11. Koltay, Trelease, and Davis, "Technologies for Learning," 83–98.
12. Susan Logue and Barbara Preece, "Instructional Support in the Changing Library Environment," *Technical Services Quarterly* 17, no. 1 (1999): 13–22.
13. Snyder et al., *Instructional Support Services*, 9–12.
14. Carolyn A. Snyder et al., "ATC: All That Collaboration," *Library Administration & Management* 16, no. 4 (fall 2002): 194–97.

(President's Column continued from page 50)

sponsor, the Membership Development Committee notes, this is an "open-house networking opportunity." The LITA Web site has information on locations for this and other programs.

Finally, for a splendid opportunity to feel part of the LITA community, join me at my president's program on Monday, June 23, 2–4 P.M., then afterwards, make plans to attend the program reception. The president's program is your opportunity to share in the enjoyment of scholarship and award winners, as well as a chance to hear from Brewster Kahle, digital librarian of the Internet Archive, as he talks about universal access to all human knowledge.

> The goal of universal access to our cultural heritage is within our grasp. With current digital technology we can build comprehensive collections, and with digital networks we can make these available to students and scholars all over the world. The current challenge is establishing the roles, rights, and responsibilities of our libraries and archives in providing public access to this information. With these roles defined, our institutions will help fulfill this epic opportunity of our digital age.[1]

I am honored to have served as the president of LITA, and I thank each and every one of you for the support you have provided. You are LITA!

Reference

1. Brewster Kahle, LITA President's Program at 2003 Annual Conference, LITA Web site. Accessed May 20, 2003, www.ala.org/Content/NavigationMenu/LITA/LITA_Events_and_Programs/LITA_at_ALA_Annual_Conference_2003,_Toronto,_ON/2003_LITA_Presidents_Program.htm.

An Organizational Model for Instructional Support at a Community College

Jacqueline Mundell, Coryl Celene-Martel, and Tom Braziunas

The Instructional and Information Support Services (IISS) division at North Seattle (Wash.) Community College brings together the college's Library, Media Services, and Distance Learning (DL) units, and the Teaching and Learning Center to support instruction campus-wide under a dean with a required MLS. With its active instructional focus, the Library is integral to the division. IISS is also the administrative home of Interdisciplinary Studies. This organizational model promotes interaction, collaboration, and innovation among disparate units that have the same overall goal of fostering teaching excellence and student success. A connection to Internet II and a campus gigabit backbone make possible a variety of advanced technological options to enhance instruction.

One of the ways North Seattle (Wash.) Community College strives to achieve its mission of being "a supportive, responsive teaching and learning environment distinguished by its commitment to openness, innovation, and excellence in education" is through a newly structured division.[1] The Instructional and Information Support Services (IISS) division brings together administratively a variety of units with campus-wide instructional support responsibilities. Included are the college's Library, Media Services, and Distance Learning (DL) units, and the Teaching and Learning Center (TLC), which provides professional development for faculty and staff.[2] The managers of these units and all the librarians report to the IISS dean, who reports to the vice president for instruction.

During the 2002 reorganization of divisions, it was hoped that the campus-wide, subject-neutral focus of IISS would also provide fertile ground for growth of interdisciplinary studies programs at the college, and it became the administrative home of Integrated Studies, U.S. Cultures, and Global Studies programs. This is also a good fit because instructors involved with the Integrated Studies program, a National Learning Communities Project, are very actively engaged with other elements of the division including the library, DL, and TLC. The Integrated Studies program has pioneered the use of online components to enhance or fully deliver team-taught courses. Participating faculty have received accolades from colleagues at other institutions for this forward-looking work (see figure 1).

The paramount objective of fostering student success is deeply rooted in this community college's culture. The challenges around achieving it are typical for the type of institution it is. Students' educational needs fluctuate greatly with the economy and the job market. For example, North is experiencing a surge of interest in academic transfer versus professional/technical courses, and is now attracting younger, full-time students wanting to take courses during the day. Instructional support mechanisms must be able to respond quickly to changing needs of the student population. Organization of the division to include campus-wide instructional support elements enhances collaboration and facilitates building and strengthening relationships among disparate units with the same ultimate objective. There are many ways that the organizational model influences relationships and collaboration, but the focus of this article is how it enhances instructional support for integrating technology in the classroom.

Making Use of Special Opportunities

Seattle was the first community college district nationally to be connected to the Pacific Northwest Gigapop regional data transfer center (GIGAPOP Internet II). With its connection to this network, North upgraded the campus to a gigabit backbone. The college has utilized its Internet capability to offer online courses that feature video streaming (video-on-demand) and other multimedia materials developed by telecourse companies or by the college's own faculty. The Seattle Community College District was given its own television cable channel by the City of Seattle as part of an arrangement with AT&T Broadband. SCCTV broadcasts and video streams telecourses to Seattle-area neighborhoods.[3]

The technological infrastructure of the college also includes a download satellite dish, a live-interactive video-teleconferencing system (ITV) linked to off-campus sites through the statewide K–20 Educational Telecommunications Network System, and several Polycom Stations for videoconferencing from almost any on-campus location. More details can be found in the Media Services section of this article.

The Library, Technology, and Instruction

Libraries in higher education are struggling to achieve or maintain a position of importance within the institution.

Jacqueline Mundell (jmundell@sccd.ctc.edu) is Dean of Instructional and Information Support Services, **Coryl Celene-Martel** (ccelenem@sccd.ctc.edu) is Assistant Manager/Instructional Technologist of the Teaching and Learning Center, and **Tom Braziunas** (tbraziun@sccd.ctc.edu) is Director of Distance Learning at North Seattle (Wash.) Community College.

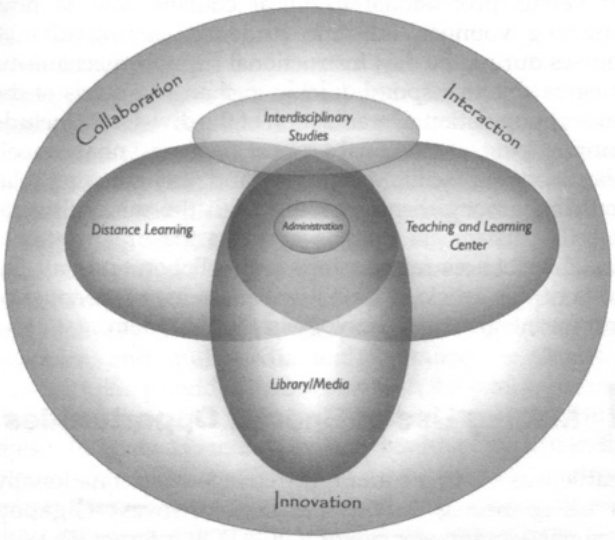


Figure 1. Instructional and Information Support Services at North Seattle Community College

In *College and Research Libraries News*, Hisle lists the top issues facing academic libraries as identified by the Association of College and Research Libraries (ACRL) Focus on the Future Task Force. One of the issues making the top ten was "The role of the library in the academic enterprise," which recognizes the need to maintain the academic library as central to the purpose of the institution. Hisle notes that librarians feel they must "emphasize information literacy instruction and the importance of the teaching role of librarians," and show "that the library remains central to academic effort."[4]

At North, several dean positions were left open for more than a year while the college reorganized its administrative structure. Given that instruction is the main focus of the college, it is important for the library that after the downsizing of administration occurred, it maintained a dean position (with an MLS requirement) reporting to the vice president for instruction. The division, which had previously included TLC as well as library and media services, was also expanded to include a growing DL program and a curricular area required for the associate of arts degree offered by North. Other options were considered, including placing the library under a noninstructional unit such as information technology (IT).

Librarians at North have faculty status and are on academic calendar appointments. They benefit from a strong faculty union and an institutional culture of shared governance. They are active participants in policy and decision making for both the library and media center, as well as in college governance through individual committee work. Although not directly involved with the management of DL or TLC, they benefit from the close ties and communication practices within the IISS division. Consultation, collaboration, and information sharing are the norms.

There are a variety of services to meet changing user needs. The library has the usual online public access catalog and an array of electronic databases and e-books available to patrons. North continues to move to online and electronic resources to enhance off-campus access, meeting the need for resource access any place and any time. Instruction is a major responsibility and is illustrated by several significant initiatives. A two-credit course taught partially online, Research in the Electronic Environment, is offered several times a year. In 2003 it is also an optional course, customized as needed, for students enrolled in Integrated Studies. This is one of the collaborations coming out of new relationships forged by the organizational change. An additional five-credit course, Research for the Twenty-first Century, is taught quarterly through a statewide DL consortium, Washington Online, by a librarian from one of the three Seattle Community College campuses.

Librarians also offer information literacy instruction to classes and collaborate with instructors to assist students with the research process. North's librarians work with academic division faculty to introduce to their classes appropriate electronic research and resources. Two library classrooms, including one that is computer-based, are scheduled at the discretion of the librarians. Another recent collaboration born of reorganization opens these classrooms to use by the DL program for optional on-campus student orientation and for proctored midterm and final exams. Classroom space is currently at a premium at North so these new arrangements are especially welcome. The librarians also schedule, through TLC, special workshops for faculty on topics such as e-books.

Media Center Services

It is common to see media services staff all over campus since they not only maintain the numerous permanently-installed data projector systems in classrooms, but also are called upon for all sound and video set-ups campus-wide.

In addition to these "bread and butter" services, the media center maintains a collection of video and audio tapes, CDs and DVDs, and provides listening and viewing spaces. They house and manage a state-legislature-created ITV system that was installed in K–20 institutions in the early 1990s. The classroom set-up allows for a certain amount of local control during presentations and plenty of interactivity between the connected sites. Satellite downlink programs are also managed by Media Services and are typically held in this classroom, although they may be redirected to other meeting rooms on campus.

ITV technology has allowed North to share several live courses with its sister colleges, Seattle Central Community College and South Seattle Community College. In this way, offering classes with lower enrollments at any one particular campus can become cost-effective.

New in the fall of 2002 was the addition of Polycom, an IP-based video conferencing system. North received an EDA grant from the Department of Commerce to purchase the system and provide a different model of instruction. Because it is IP-based, this equipment may be deployed anywhere on campus that has a network connection. One of its potential uses is providing instruction for chemically sensitive individuals in a manner that gives them the feel of being part of the classroom. The system is currently being used for course delivery to a specialized off-campus program, and Polycom units are now available to provide great flexibility in streaming of live classroom instruction from science laboratories and any other campus location. There are also potential administrative uses for both Polycom and ITV.

Teaching and Learning Center

TLC at North began with funding from a Title III Grant in 1993. A group of faculty and members of the Professional Development Committee identified a cross-disciplinary need for an instructional development resource center on campus, including technical assistance, access to specialized equipment and software, and a dedicated, continuously available workspace. The concept was popular, and willing volunteers manned the space until hard funding was secured. Currently TLC is staffed by a full-time assistant manager/instructional technologist and several part-time assistants. TLC staff serves approximately 105 full-time and 230 part-time faculty.

In accordance with the college's Strategic Plan, TLC works to foster student success by facilitating the instructional development process for faculty and providing training for staff. Whether faculty are developing content for the classroom, collaborating with colleagues in their own or across disciplines, investigating innovative pedagogical techniques, or seeking to improve their professional skills, TLC helps them accomplish their goals. TLC also shoulders the task of bringing a highly diverse campus community up to speed on new hardware and software systems.

Workshops in TLC

Each quarter, TLC offers a slate of forty to fifty noncredit, one- to two-hour, professional development workshops on a variety of topics.[5] Faculty and staff are encouraged to present workshops in their fields of expertise and suggest topics for useful future workshops. Emphasis is frequently on instructional innovation, pedagogy, diversity training, and exploration of technology in teaching. Instructors have opportunities to present to colleagues in their own field, and opportunities to network and collaborate across disciplines. When faculty from different divisions meet in TLC, ideas for innovative new courses and new methods of teaching traditional content often result.

Part-time Faculty and TLC

TLC expands opportunities for part-time faculty to network among colleagues, offers equipment and technical support they would not otherwise have access to, and provides comprehensive quarterly orientations especially geared to part-timers' needs. Campus resources, benefits, responsibilities, and general information are provided to aid part-timers in meeting the challenges of teaching in a higher education environment.

TLC Resources

In addition to a twelve-seat computer classroom with projection system for workshops and training, TLC has state-of-the-art Windows- and Macintosh-based workstations for individual use. Resources include CD-ROM burners, color and black-and-white printers, and several image and slide scanners. Each computer has standard Microsoft workstation and desktop and Web publishing software in addition to recent versions of such multimedia workhorses as Adobe Photoshop and PageMaker, Macromedia Flash and Dreamweaver, and various other image manipulation and presentation software packages. These resources are of particular interest to part-time faculty, who must often share office space and may not have access to such specialized software at home, and to staff whose office computers are not outfitted with specialty software or hardware.

There are several digital cameras and laptop computers configured with network interface cards for short-term checkout to faculty and staff. A conference room is available for groups of twelve to fifteen people and a small collection of assessment-related materials available for deans and faculty preparing for program review and accreditation. Assistance is available for individual faculty and staff creating projects. A staff member is available to troubleshoot and answer questions about technology problems.

Multimedia in TLC

In 1998, assistance with multimedia projects was added at faculty request. More and more faculty make use of this resource every year. The increasing popularity of online courses, as evidenced by the ever-growing numbers of students registering for these courses at North, is boosting faculty interest in multimedia enhancements to content delivery, whether or not they have used it before and whether or not they intend to actually teach online.

Video and audio production and editing, 2-D animation, graphic imaging, and Web design and development are no longer assumed to be far beyond the average faculty member's capability. The available range of options stretches from fully online deployment of content, to Web-enhancement of an on-campus course, to making the switch from overhead transparencies to PowerPoint in the classroom. For the first time, many instructors are exploring the possibility of enhancing already content-rich courses with some form of rich media or online enhancement. Both training and production assistance are provided by TLC staff.

Creating Rich Media in TLC

Although faculty interest in multimedia and Web-based instruction is rising, challenges remain to the wholesale adoption of these techniques as baseline instructional standards. Some software is highly technical with a steep learning curve, and instructors do not have a lot of time for lengthy production techniques. The instructional technologist in the TLC facilitates the process of production for faculty, enabling them to comfortably attempt and successfully produce their own projects in a timely fashion. Cut-to-the-chase software instruction, streamlined production procedures, and creative integration of multimedia production with content development address the major barriers to inclusion of multimedia materials in course content. Software instruction focuses exclusively on what is needed to accomplish the task at hand; lengthy production tasks can be scheduled to run overnight or repetitious tasks automated for quick execution; content for the course can be visualized and developed with multimedia materials in mind from the beginning, rather than "gilding" multimedia onto content later.

A successful example of an instructional project that smoothly integrated TLC resources from start to finish is a recent content acquisition expedition to Hawaii by a geology instructor. A digital video camera and a high-end laptop were borrowed from TLC, the instructor was able to film the volcanic features, preliminarily edit footage on location, post images to a class Web site, and communicate asynchronously with students in his online class about these observations and potential follow-up field activities. Upon return, he captured the footage using TLC video editing and encoding capability, and posted it to his course Web site for use in future classes.

A Summer Institute on Online Learning

An example of one of the innovative instructional support services that originated in TLC is the Summer Institute. North hosts an intensive week-long training session each summer to support faculty toward completing DL projects that involve use of new online technologies and proven pedagogical approaches. DL and TLC staff collaborate with several faculty leaders throughout the district to plan and implement the institute.

The Summer Institute brings together about two dozen faculty from three community colleges in the Seattle district for an assemblage of thirty workshops and roundtable discussions on course design and delivery, presentations on many courseware tools, and many hours of open computer lab, during which faculty mentors work individually with other participating faculty to complete their specific online learning projects. Mixing experienced and new online faculty catalyzes ideas and accelerates skill building for all participants, not just those officially doing projects. A Web site created specifically for the institute incorporates daily participant contributions to a list of distance learning resources.[6]

Workshops are offered at different skill levels. Participants select from different development tracks and attend concurrent sessions. Each chooses a project to complete during the institute. Projects may include developing a new online class, integrating a Web site into an on-campus class, or using new multimedia technologies with existing online materials. At the conclusion of the institute, all participants share their accomplishments in presentations to the group and invited guests. Personal self-assessments of accomplishments and barriers are also shared through online surveys.

Each year's institute sets the stage for a greater integration of DL and professional development efforts across the colleges. This collaborative effort has fostered grassroots activities that will lead to a stronger, more unified DL program within the Seattle Community Colleges.

A Model for Multiple Technologies in College Classrooms

North Seattle Community College's DL program is another integral component of the instructional support facilitated by IISS. The DL program is multidimensional, forged by the convergence of several forces: new national educational directions; special needs of faculty and students in community college settings; and diverse teaching and learning options facilitated by rapidly evolving technologies.

Distance Learning Infused within the College Culture

As of fall 2002, the college has developed nearly one hundred different DL courses and offers a subset of thirty-five

DL sections each quarter.[7] More than fifty different faculty teach DL classes at the college, with full-time and part-time instructors represented equally. Annual DL enrollments have experienced robust growth rates, averaging 25 percent per year over the past five years. The breadth of its online course offerings enables the college to offer an AA degree fully online. In addition, the completion rate for online courses taught at North over the past three years is 82 percent, consistently surpassing the average completion rates for online courses at other community colleges throughout the state.

North's DL courses go through the same rigorous development and review processes as their on-campus counterparts. Few faculty teach only distance-based courses. While divisions and faculty provide leadership on DL options for students, they work collaboratively with the DL staff team, which includes a director and two assistants. An apt analogy would recognize faculty as the pedagogical "movers" of DL fundamentals while DL staff team members represent the technological "shakers" in the picture. A collaborative spirit and unity of purpose are natural products of an instructional support system in which all stakeholders have a voice in decisions and all participate in design and delivery.

Other key instructional support components are:

- the philosophy that "one size does not fit all" for either faculty or students, such that the unique needs of each discipline are recognized and supported through the availability of a range of teaching and learning options;
- a trial-and-error spirit that encourages exploration of new technologies;
- a training program involving partnerships between the faculty and DL staff team; and
- two-way support between faculty and staff throughout the entire gamut of activities from initial training to curriculum design to course delivery to student support and finally maintaining and revising DL materials.

To further harmonize this medley of educational compositions, the college has established a formal, inclusive group of faculty, student, and administrative personnel to advise on pedagogical and logistical issues in DL.

A Distance Learning Toolbox: One College, Many Choices

Faculty and the DL staff team have instituted a variety of technology options for developing and delivering online courses. For the student, the look and feel of an online class may vary from instructor to instructor. Key instructional elements within most of North's online classes are familiar to the student, however, despite differing technologies, because instructors generally learn how to develop their distance courses from each other and thus share very similar approaches.

Although many online courses are unique, the DL staff team has adhered to the philosophy that what works best for the instructor usually works best for students. Their goal is thus to create a flexible culture where use of technology is scalable to fit into the pedagogical needs of each discipline as well as to merge with each instructor's style and level of technical expertise. High-end asynchronous discussion tools are central to online humanities courses, for example, while online science classes require sophisticated Web-based testing and grading technologies. A range of technological options is even built within some classes, such that students with broadband connectivity to the Internet (about 40 percent of online students) can use the video-streaming capabilities of the college's Gigapop system. Students without broadband can take the course online and view the video portions via cassettes.

The DL team works to provide a DL toolbox comprehensive enough to give faculty the ability to create effective online delivery and evaluation methodologies that will lead to the achievement of the same outcomes as for on-campus course counterparts. Standard DL assessment tools include problem sets, journals, discussion room participation, projects, and proctored written exams.

Popular DL software such as FirstClass, WebCT, FrontPage, Dreamweaver, and Blackboard are all supported. These design and course management systems produce effective, user-friendly, and richly featured online curricula as reported by both faculty designers and student users. The features associated with some of these products are highlighted below.[8]

FirstClass

FirstClass is a unique online communication tool. Although it provides little structure for course content and minimal course management capability, it allows for complex discussion-based and peer-evaluation group work online. It has earned accolades in the corporate world for its power to catalyze collaborative business atmospheres. These qualities are essential for the teaching/learning style of communication in online Integrated Studies courses, for instance, that emphasize small group seminars and group writing projects.

The learning experience of the student is enhanced by the greater ease and depth of communication that FirstClass offers through its entirely different super-enhanced messaging system. Message fonts are customizable, incorporation of graphics is effortless, and insertion of comments within other messages is intuitive.

For many of these same reasons, FirstClass works as well for handling group writing assignments as it does for basic online communication. Groups are easy to form and monitor. Students and faculty can work easily together and receive instant feedback without the need

for additional submission forms. Documents can also be shared by large groups or one-to-one without difficulty. Students can see the comments as they exist within the work rather than in a submission form removed from the paper. Rewrites can be easily included so that progress is clear for both the student and the instructor.

WebCT

The WebCT courseware offers powerful management and instructional tools for both online and on-campus courses. North has an annual license for unlimited use, making this software quickly and broadly accessible to all faculty to experiment with or fully incorporate into any online or on-campus classroom designs. Because no additional costs to the college are incurred, valuable flexibility is provided in how and when WebCT is applied, and it is thus positioned as the bread and butter courseware for the campus.

WebCT's communication tools include asynchronous discussion boards, live chat rooms, and an internal e-mail system. The discussion boards easily handle busy exchanges of messages, long threads of conversation, and document attachments. Students and faculty can personalize their own discussion room features, compile and download messages, separate "read" from "unread" postings, and conduct searches on names or topics. The e-mail system eliminates the need for faculty to keep track of outside e-mail accounts. The WebCT system also automates many aspects of student tracking, assignment submission, grading, and testing including self-evaluation modules and anonymous surveys.

Each student's individual history of page use is recorded and can be monitored. WebCT also provides a portal through which students may easily access any of their other WebCT classroom accounts, immediately check on updated e-mail and discussion room postings, and receive important college announcements.

The courseware does not include a content development tool. Web pages must be designed elsewhere, and some faculty might feel the need for a rudimentary knowledge of HTML coding to fine-tune some features. In general at North, Web pages are designed in FrontPage or Dreamweaver and either uploaded into or hyperlinked to the WebCT courseware shell.

FrontPage and Dreamweaver

These software programs are the faculty's primary tools for designing Web pages. FrontPage is a content-rich online design and course management tool that carries the advantage of a short learning curve. Taught each quarter in TLC, FrontPage has proven to be a quick and comfortable way to introduce new faculty to the pedagogy and technology of online learning. Dreamweaver is another easy-to-learn Web site development software preferred by more experienced online faculty for its clean HTML code production, its receptiveness to design changes that follow course evolution, and its compatibility with popular, high-end multimedia applications such as Flash.

The college has a server specifically designed to allow fully interactive online classes to be implemented and delivered using FrontPage and Dreamweaver. With the campus-licensed FrontPage software loaded on work and home computers, faculty can easily manipulate their Web pages. Several course templates are available to help new instructors get off the ground. North's IT and DL staff provide nearly constant technical support to instructors.

Blackboard

This online courseware is also used by some faculty. It is hosted at a statewide consortium of community colleges called Washington Online, which provides constant technical support at reasonable per-student rates.

Ways to Communicate, Collaborate, and Create

The DL staff team provides a comprehensive training program in collaboration with TLC. A quarterly series of workshops guides faculty through the technical aspects of online course development as well as the use of online and multimedia components in on-site classes. These and other DL-oriented workshops also cover pedagogical principles, best practices, design practicalities, course development and approval processes, and copyright issues. After the workshops, the DL staff team works individually with all instructors to complete online course development, assists with the steps in the curriculum approval process, and expedites the delivery of these online classes.

Teaching workshops to clusters of full-time and part-time faculty together allows ideas to be shared and cross-pollinated. Strong participation by full-time faculty promotes continuity in the program. Successful online course designs are carried forward and elaborated. Pedagogical insights are shared from one workshop to the next, year to year.

Each year, two faculty members serve as on-call mentors, with a commitment of three hours per week, for faculty who are developing or delivering online classes. At North, the faculty mentors have enthusiastically adapted their roles to include workshop presentations on different courseware products, co-development of online Integrated Studies courses, and technical and logistical support of faculty at all hours. As a result, many more instructors have taken their first steps to learn new technologies.

Stipends further create incentive for development of new online courses. An approach has been to team experienced and novice DL faculty members in developing new online courses. Knowledge and responsibility is thus shared between these faculty members through the first

term's implementation of the course. A support system is also being devised in which experienced faculty train new instructors in the practicalities of teaching already existing online courses.

Measuring Success

DL staff carefully monitor educational effectiveness of distance learning courses in order to respond to student needs. Through an online survey form which students may submit anonymously at the end of each quarter, students are requested to describe their challenges and successes with the technical features, design elements, and logistical support tied to DL. Student comments have been enlightening and have greatly influenced the operation of the DL program. Close collaboration between staff and faculty keep this feedback loop working. Positive survey responses, increasing enrollment, high retention rates, and strong faculty involvement point to a successful DL model at North Seattle Community College.

The DL team provides especially intensive support for new and experienced distance learners during the weeks leading up to and immediately following the start of each academic term. The secret of success is to help students with different learning styles to overcome any and all logistical, pedagogical, and technical uncertainties and anxieties that might impede those important first strides in the virtual classroom.

Looking toward the future, North is moving away from categories such as "online," "video-based," and "traditional" learning modalities toward a continuous spectrum of learning methodologies. In addition, student support services for distance learners continue to expand. Online users are able to receive complete information on course prerequisites, entrance testing, academic advising, degree audits, personal counseling, and financial aid. They can also receive information on textbook purchasing, transfer procedures, and options for contacting teachers. Online technologies move North toward a more efficient and paperless environment both inside and outside of the classroom.

Conclusion

North Seattle Community College's newly structured organizational model for instructional support brings together disparate units that share the common purpose of supporting teaching and learning campus-wide. The library, as one of the central elements, is thus well-positioned within the larger institution that highly values instruction. Specialized information literacy instruction is commonly sought by faculty from their librarian liaisons, and several for-credit library classes may be selected by students. In addition to traditional academic liaison roles, librarians create and maintain the library and media services Web sites, are actively engaged with new service development (for example, e-reserves), and participate in both college and district governance issues.

The campus technological infrastructure is robust, making possible the support of a wide variety of options for offering instruction both on campus and online. An unusual number of technology options are available to faculty for course design and delivery in keeping with the tenet that one size does not fit all, and experimentation is encouraged. To further facilitate incorporating technology in instruction, many professional development opportunities are available and collaboration and mentoring are supported. The environment is characterized by flexibility, collaboration, and relationship-building across units, with staff and faculty actively working together to foster student success.

References and Notes

1. North Seattle Community College home page. Accessed Feb. 25, 2003, www.northseattle.edu.
2. IISS division home page. Accessed Feb. 25, 2003, www.northseattle.edu/programs/iiss.
3. SSCTV home page. Accessed Feb. 25, 2003, www.scctv.net. Programs broadcast on cable channel SCCTV are also streamed over the Internet.
4. W. Lee Hisle, "Top Issues Facing Libraries: a Report of the Focus on the Future Task Force," *College and Research Libraries News* (Nov. 2002): 715.
5. TLC Workshops Web page. Accessed Feb. 25, 2003, http://northonline.sccd.ctc.edu/tlc/workshops.htm.
6. Summer Institute 2002 home page. Accessed Feb. 25, 2003, http://northonline.sccd.ctc.edu/SI2002. Last year's institute.
7. North's Virtual College Web site. Accessed Feb. 25, 2003, www.virtualcollege.org.
8. Western Cooperative for Educational Telecommunications and the Centre for Curriculum, Transfer & Technology, EduTools. Accessed Feb. 25, 2003, www.edutools.info/course/compare/byproduct/index.jsp. A one-on-one comparison of over thirty different courseware systems.

Building a New Infrastructure for Digital Media: Northwestern University Library

M. Claire Stewart and
H. Frank Cervone

The Northwestern University Library has been a pioneer in text and media digitization. From early efforts primarily focused on enhancing access to reserve material to current projects involving vast quantities of streaming media, in great part these projects have been the result of close collaboration between the library and other units on campus, particularly Academic Technologies. As the depth and breadth of digitization efforts have increased, so have the technological and organizational issues. This article examines the history of digitization efforts at Northwestern University as a context for exploring the emerging issues most libraries face as digitization enters a new era.

Northwestern University Library was an early pioneer in text electronic reserves, and has had a fully functioning service to digitize articles and book chapters for classroom use since 1995. The library also has an active digital library program, through which unique or rare pieces from the collection are digitized for delivery to the wide world of scholars. The Siege and Commune of Paris photograph digitization project, completed in 1995, is the earliest example, and the spectacular collection of Edward Curtis's early-1900s photographs, The North American Indian, is the latest.

Northwestern University was also a pioneering user of streaming media. Political Science professor Jerry Goldman, whose *Oyez Project* is now the authoritative site for Supreme Court oral argument audio materials, began using Real Audio when it was first introduced in the mid-1990s, and released the first all-streaming version of *Oyez* in January 1996. Other faculty projects soon followed, including fellow Political Science professor Ken Janda's *Videopaths Through U.S. Politics*. Janda's project was built around news archive footage from the *Video Encyclopedia of the Twentieth Century*, and was designed to give his American government class first-hand exposure to important historical events such as the Watergate scandal and Nixon resignation, struggles of the 1950s and 60s civil rights movement, and the Vietnam war. Building on the success of the Goldman and Janda projects, Northwestern secured permission in 1999 to digitize the entire *Video Encyclopedia*, and now serves all eighty-three hours of that important resource freely to the campus community as streamed MPEG-1.

Northwestern University Information Technology (NUIT) has been an active partner with the library on many technology projects and has been instrumental in assembling the systems and infrastructure to sustain their growth from experimental to production status. One of the most visible collaborations was the offering of a faculty boot camp, Technology in Learning and Teaching (TiLT), four times a year between 1993 and 2000. The four-day TiLT program introduced faculty to the technology to build instructional tools for their courses and provided a forum in which to discuss effective uses of technology in the classroom with their colleagues, campus library and technology specialists, and outside experts. As the years passed and the Internet became ubiquitous, Web-based instructional technologies became more prevalent. As a result, the focus of TiLT shifted to course Web-site development. Eventually, however, the need for this type of training decreased due to two factors: the increasing sophistication of the development tools, which made them easier to use, and the greater sophistication of new faculty in using information technologies. With the introduction of the Blackboard CourseInfo system, the focus of training shifted from being primarily technical to concentrating on the integration of course materials.

This shift from individually crafted course Web pages to a Web-based course management system allowed faculty, librarians, and information technologists to emphasize the content of these courses rather than the mechanics of building sites. This renewed the importance of Electronic Reserve, which expanded its services to include Blackboard delivery of scanned material and providing links to full-text articles in databases and journals that the library subscribes to electronically. Requests for digital selections of non-print media from the library's image and video collections and other campus collections, such as the Art History Slide Library, also began to increase. It became possible, for the first time, to begin to plan systems and services to deliver this rich media content around a secure mechanism. Once it was possible to restrict access to digitized material to particular students in a particular class, many concerns about copyright liability were alleviated.

The center of many of the new digitization services has been Digital Media Services (DMS), a unit of the Library's Marjorie I. Mitchell Multimedia Center (MIMMC), which has been operating as a do-it-yourself scanning and media digitization facility since 1995. This self-service approach, which paralleled the philosophy of do-it-yourself for Web page building before the introduction of Blackboard, artificially limited the number of faculty who were able to use digitized material in their classes. Those who had teaching or research assistants were in the best position because they were able to assign these students to digitize materials. Unfortunately, often the results of this activity were

M. Claire Stewart (claire-stewart@northwestern.edu) is Head of Digital Media Services and **H. Frank Cervone** (f-cervone@northwestern.edu) is Assistant University Librarian for Information Technology at Northwestern University, Evanston, Illinois.

uneven and unsatisfactory. Some faculty, truly passionate believers in the power of digital media, or with particularly media-rich courses, did invest their own time in digitization. For the most part, however, a lack of time and lack of access to digitization equipment prevented faculty from using many materials in digital form.

In addition, the library began to feel some concern about the stress repeated digitization was likely to place on library materials. Although the video collection housed in the MIMMC does not circulate, the tapes had begun to show signs of deterioration that would be exacerbated by regular recreation of digital media from these tapes. Similar fears were felt for other library collections.

Further issues requiring resolution related to a lack of consistency in applying digitization standards. Lacking expertise in media formats and standards, some faculty were saving images at incorrect resolutions or file formats. In many cases, needlessly high resolutions were used for image files. This burdened the course management system both during the media upload and download processes. In addition to being inconvenient because it forced students to wait an excessive amount of time for these large files to download, the misuse of media formats caused serious complications when many students tried to use these images concurrently which increased server utilization tremendously.

Creating a Synergy of Services

For these reasons, among others, the library expanded the role of DMS in January 2001 to offer drop-off digitization services, free of charge to all teaching faculty. This decision, however, was not made in a vacuum and was carefully considered. Adding this service coincided with the second phase of the library's renovation plan, a complete redesign of the second floor of the east tower of the main library building.

As a result of the redesign, the possibility of creating a new synergy between services provided by the various units to be housed in the area was possible. With the completion of the remodeling, a new entity, 2East, was born. Comprising 2East are the Academic Technologies (AT) unit of NUIT, DMS, and the collection management offices of the library.

For the two years prior to their move into 2East, AT had been renting office space off campus. Moving back to campus into the library was both a solution to a practical problem and a way to solidify a strong, effective campus partnership of the two largest pedagogical support units on campus.

Bringing AT into the physical library building increased cooperation, and as a result, joint work has been greatly enhanced. Staff members from AT frequently serve on committees, task forces, and ad-hoc work groups based in the library and vice versa. As an example, representatives from all three units in 2East are members of the library's Digital Library Committee. Through such joint activities, the opportunities to exploit the synergy between library-initiated and faculty-initiated digitization projects have increased exponentially.

Despite their physical and ideological proximity, the separate missions of the 2East units have been maintained. An example is the approach to providing services around the Blackboard Course Management System, which was tested in spring 1999 and moved into production the following fall. Once the new 2East facilities opened in January 2001, DMS began to accept the first drop-off projects destined for Blackboard delivery, while AT focused its attention on key areas such as accounts creation, training and support in using the course management system, project development, and providing live video Web casting services. This clear division of labor simplified the message to faculty, and the close physical partnership allowed the library and NUIT units to refer faculty and graduate students to each other and avoid some of the miscommunication that had plagued technology services in the past.

Once the initial issues related to occupying the new space were resolved, production schedules and procedures were established and demand for digitization services increased further. DMS began to produce significant numbers of digitized slides, photographs, and streamed audio and video for faculty. This was demonstrated by the fact that DMS made more than four thousand individual pieces of media available in streamed, digital format between January 2001 and December 2002. The proliferation of these media, which in most cases were partial or complete digital surrogates of materials in campus collections, highlighted some weaknesses in the campus infrastructure that urgently demand attention.

The Problems of a Wealth of Activity

For the most part, media files had been handled individually, and tracked using primitive tools, if at all. The shortcomings of such a system had long been apparent, but a server migration in mid-2002 demonstrated that, over time, the institutional memory had failed and many assets were orphaned, with no known owner, project, analog parent, or in some cases, any idea of the subject of the material. In another project, work with materials in the Music Library collection focused attention on the desire to build upon existing library catalog data to more fully describe digital surrogates. This was particularly

important for music materials, where uniform title issues are notoriously difficult.

Furthermore, security issues were becoming more complex and difficult to address. Streamed content is not housed on the course management server but rather on a separate streaming server. As such, Blackboard can serve as a secure gateway, but in order to safeguard the media, it is imperative that users be authorized on the streaming media server as well. This means that the user is forced to re-authenticate when leaving Blackboard upon requesting an actual streamed file.

An additional complexity is the problem of metafile creation and arbitrary rearrangement of digital media. Most streamed media platforms such as Real and QuickTime use a redirection process to deliver streaming media. When the user requests a streaming media file through the Web browser, the request made is not for the streaming media file, but for a metafile that redirects the request to the actual streamed resource. In addition, metafiles can be used in some cases to assemble multiple media in varying ways depending on the ultimate use of the media. Synchronized Media Integration Language (SMIL) will be a key technology in this area, and in order to make the best use of it an infrastructure must be in place to automate metafile creation and allow users to create and save custom groupings or arrangements of files.

Moreover, a more robust file storage system will be required to hold the increasing numbers of media files and to insure their integrity over the long term. Given the direction media use is taking, both AT and the library hope to abandon the practice of storing access files on a server, but storing the digital masters locally—often on optical media such as CD or DVD.[1] Ideally, spinning disks connected to the network will be large and secure enough to house both digital masters and the service files used for rapid access. Eliminating the barrier between digital archival materials and their surrogates will increase the likelihood that the masters will be well backed up, undergo periodic data validity checks, and be included in migrations, either from storage location to storage location or between formats or both. All of these will be essential in preserving these valuable digital assets indefinitely.

Preparing an Infrastructure for the Future

These and other artifacts of the overwhelming success of our collaboration have prompted the library and AT to investigate the issues related to media infrastructure planning. In the course of the investigation, five major areas of concern have emerged: federated searching, repository structures, still images, streaming media, and asset and rights management. However, in an investigation such as this, a major concern must be the vagaries of the future: we have to consider future trends and what the requirements of future students and faculty will be as they become more familiar with the possibilities of digital media and as the technology itself advances.

Within the issues identified, a noticeable trend is the expansion of the realm of the issues to more traditional areas within the library. Perhaps the most obvious of these is federated searching.

Although primarily a concern for the library, the issue of federated searching has a significant impact on the teaching function of faculty, particularly in the online environment. Federated searching is the ability to aggregate the contents of a search that is performed across databases. The reasons why this particular issue is of critical importance to the larger academic community are complex.

As we know, libraries spend large percentages of their budget for electronic commercial content and this is a trend that will continue.[2] For students, faculty, and staff, this has resulted in a proliferation both of electronic resources and interfaces to those resources, which must be learned in order to navigate and find appropriate content. In addition, because most commercial e-resources are found in aggregator sites (such as EBSCOhost), complexity is added because the same journal article may be available from multiple vendors. Moreover, navigation is made more complex by the fact that having located a citation, users still have to search to find out if the article or monograph is available through the library, and if not, know to make an interlibrary loan request (and how to make this request.) An additional issue is the need to manage who has rights to content and off-campus access.

Federated searching will be the next strategic system for libraries because it has the potential to resolve these problems and leverages the cost of local and commercial content by providing the architecture and tools to manage access.[3] As such, it may become a more important service the library provides to the academic community than the online card catalog.

Some of the critical issues a federated searching system must address include providing:

- a single interface that acts as a portal and helps end users discover which campus resources will provide the research and information needed;
- intellectual organization of categorizing electronic resources through a collection management function;
- multiprotocol searching to bring backretrieve content from these resources and to allow direct access to the native interface of another content provider or search engine;

- reference linking that allows lateral navigation from citations to full text, and from any content to other relevant services such as ILL;
- the capability of integrating and managing local content such as electronic reserves and institutional scholarly digital content (such as art slides, audio clips, or archival information); and
- hooks for integrating into systems that are pivotal to the educational mission of the institution, such as course reserve systems like Blackboard.

The second major issue that has been identified is related to repositories. A robust repository structure is needed because digital objects are more numerous, volatile, and mutable than "traditional" materials and digital objects depend on and are bound to a technical environment and infrastructure.[4]

A digital repository service provides for the storage and retrieval system of digital material within collections. These services and facilities include:

- an electronic storage facility within which the digital objects created or purchased reside;
- management of administrative and structural metadata associated with stored objects;
- preservation policies and procedures to insure the continued usability of stored objects, and delivery of an object to a registered or known software application (e.g., an online catalog, a Web browser); and
- a name resolution service, which is a comprehensive service for creating, maintaining, and resolving persistent identifiers which are location-independent names for network-accessible resources. Name resolution is the process of mapping from a given abstract name to a URL that represents a particular instantiation of the named resource.

There are also a handful of issues strictly pertaining to certain types of media. Still images present a challenge because they may represent several different kinds of information. This is often seen in digital library projects, where the digital facsimile of a text page must be retained along with the optical character recognition (OCR) recognized or rekeyed text. In many cases, the two modes—digital facsimile image and searchable text—must be presented to the user simultaneously. With other materials, however, the still image facsimiles represent other forms of data, including musical notation and traditional visual information, for which the technology to build a direct index of the contents does not yet exist or is not readily available. For projects dealing with images of this kind, the campus media infrastructure must be flexible enough so that when tools such as visual content mapping and automated music recognition technologies do become available, they can be integrated with a minimum of effort.

In addition to such specialized image indexing tools, an infrastructure designed to describe and store images must support tools for high-resolution browse. Many faculty, particularly those using images in lecture, wish to zoom in on details of paintings or oversize maps, making a zoom and pan tool a critical component. Some of these same users require tools that will allow them to save annotations about the images as a whole, or attach annotations to specific regions of an image. This is useful for maps and anatomical images, which are often highly complex, but is also useful for a host of other types of images.

The rapidly evolving nature of streaming media technologies makes careful planning absolutely essential. While compression algorithms and file types are changing constantly, users demand the highest visual quality that computing power and network connections can support. Much more so with digital audio and video than with digital text, the formats commonly used for desktop delivery today will almost certainly be obsolete in a short time frame, perhaps even within a few years. In addition, the library community has not yet agreed on a file format for long-term archival storage of digital video.[5] With this uncertainty at both the high and low end of the spectrum, planning both for long-term retention and short- and long-term delivery of video becomes a nearly impossible task.

To help resolve this dilemma, Northwestern has been investigating server-side transcoding technologies. These systems store a high-quality, high bit-rate audio or video file (mostly likely MPEG-2 or MPEG-4 in the case of video) but transcode it to a small, lower-quality version at the server for delivery to the client. Such a scenario will avoid conflicts between different versions of media players, and gives users with slower network connections a version of the content that they may reliably play without loss of data. This approach introduces a host of new questions. Once requested and created, should service files be retained permanently? What storage format for video will yield the best possible balance between high quality and storage efficiency? Of the many pieces of auxiliary data, such as edit decision lists and raw footage that may accompany a finished film or video work, which are worthy of long-term retention?[6]

The last major issue that has been identified is rights and asset management. A robust, scalable campus media infrastructure must allow media creators and managers to assign and change the right to access shared materials in both a fine and a coarse manner. Some materials might, for example, be freely accessible at low resolution to all music faculty for preview purposes, but the high-resolution versions only accessible once assigned to a specific course. Translating complex relationships such as these into clear rules for interoperating campus information systems is a significant challenge. Nevertheless, a robust

and complete access management system must be in place to safeguard the university's valuable media assets. This is important both to assure copyright compliance and to give faculty and other media producers on campus a guarantee that their unique materials will not be vulnerable to theft on the Web.[7]

Northwestern University Library is engaged in a process of reevaluating its entire media infrastructure. This study will have implications ranging from determining the amount and type of storage media needed to sustain growth, to bridging traditional divisions between database subscriptions and local digital materials, to expanding the scope and complexity of core library collection development activities.

But this reevaluation is just part of a larger process within the library. This is just a manifestation of our engagement in a continuous process of rethinking the library and its services. The importance of this was outlined by Wilson

> [For libraries] to be successful, we need to be essential to people and to stay ahead of client expectations. Library managers need to show vision and leadership on behalf of their clients, rather than simply respond to client feedback, when developing services and facilities. This means we need to continually rethink libraries themselves, rather than simply the services we provide.
>
> In order to remain a vital part of our academic community, we must continually question what we do, how we do it, and for whom we are doing it.[8]

AT and other NUIT units are key partners in evaluating and implementing components of the new campus media infrastructure. Large-scale systems support has traditionally been provided by NUIT; the several large servers that comprise the library's current library management system, for example, are maintained by NUIT's Computing Services unit. AT is responsible for management of the Blackboard Course Management system, and therefore is central to all decisions made about systems that allow faculty to more easily find and integrate digital information into their classroom teaching. Already, AT is working to develop tools and utilities to build learning modules around reusable, sharable digital objects.[9] The library selects and makes available a variety of materials in electronic formats: full-text articles, electronic books, and digitized media. Improving and extending intellectual access to these materials must be the result of close collaboration between the library and AT.

Conclusion

By working with faculty who were truly passionate believers in the power of digital media, the Northwestern University Library has developed a rich infrastructure to support text and media digitization. Combined with the opening of a new shared office space within the library, known as 2East, where the AT unit of NUIT is colocated with the DMS department and the collection management offices of the library, the possibilities of collaboration in providing media services have been greatly extended.

While early efforts primarily focused on enhancing access to reserve material, current projects extend across disciplines and media formats and include vast quantities of streaming media. For the most part, these projects have only been possible as a result of close collaboration between the library and other units on campus, in particular, AT.

As the depth and breadth of digitization efforts have increased, so have the technological and organizational issues. Furthermore, the rapidly evolving nature of streaming media technologies makes careful planning absolutely essential. As a result, the Northwestern University Library is engaged in a process of reevaluating its entire media infrastructure in partnership with AT and other NUIT units. By working together, we will be better able to evaluate and implement various components for a new campus media infrastructure that will support the primary purposes of our institution: teaching and research.

References and Notes

1. Franziska Frey, "File Formats for Digital Masters," *Guides to Quality in Visual Resource Imaging* no. 5, Jul. 2000, Council on Library and Information Resources. Accessed Mar. 3, 2003, www.rlg.org/visguides/visguide5.html.

2. T. H. Hogan, "Drexel University Moves Aggressively from Print to Electronic Access for Journals (interview with Carol Hansen Montgomery, Dean of Libraries) ," *Computers in Libraries* 21 no. 5 (May 2001): 22–27.

3. Brian E. C. Schottlaender, "The New Academic Platform: Beyond Resource Discovery," (paper presented at the ARL forum, "Collections & Access for the 21st-Century Scholar: A Forum to Explore the Roles of the Research Library," Washington, D.C., Oct. 20, 2001). Accessed Mar. 3, 2002, www.arl.org/forum/schottlaender.

4. R. Crow, *The Case for Institutional Repositories: A SPARC Position Paper*, (Washington, D.C.: ARL Scholarly Publishing and Academic Resources Coalition, 2002), 1–4. Available at www.arl.org/sparc/IR/ir.html.

5. "Video Technical Issues," *Audio Visual Prototyping Briefing Document*, in Digital Audio-Visual Preservation Prototyping Project, (Washington, D.C.: Library of Congress, 1999). Accessed Mar. 3, 2003, http://lcweb.loc.gov/rr/mopic/avprot/avbrief3.html.

6. Mary Ide, Dave MacCarn, Thom Shepard, and Leah Weisse, "Understanding the Preservation Challenge of Digital Television," *Building a National Strategy for Preservation: Issues in Digital Media Archiving*, (Washington, D.C.: Council on Library

and Information Resources and the Library of Congress, 2002). Accessed Mar. 3, 2003, www.clir.org/pubs/reports/pub106/television.html.

7. Kenneth D. Crews, *New Copyright Law for Distance Education: The Meaning and Importance of the TEACH Act*, (Washington, D.C.: ALA, 2002). Accessed Mar. 3, 2003, www.ala.org/washoff/teach.html.

8. M. Wilson, "Understanding the Needs of Tomorrow's Library User: Rethinking Library Services for the New Age," *Australasian Public Libraries and Information Services* 13 no. 2 (June 2000): 81–86.

9. Jonathan Smith, "Learning Technologies," *2East eNewsletter*, 4 no. 3 (Dec. 2002). Accessed Mar. 3, 2003, http://web.at.northwestern.edu/da/archives/12-10-02/article2.htm.

Collaborative Digitization Projects: Opportunities to Enhance Teaching and Learning

Adriene Lim

Many libraries assist faculty in the development of digital materials for instruction, with services ranging from scanning documents for electronic course reserves to providing digital production centers for faculty use. But what types of services are best offered by librarians when the development of instructional materials takes the form of formal, more complex digitization projects? This article describes one such collaborative project, the Dorothea June Grossbart Historic Costume Collection (HCC) at Wayne State University (WSU), and examines how building this digital resource has offered new opportunities for librarians to expand their partnerships with faculty and meet shared educational goals.

Digitization projects are now commonplace in much of the library world. A search of the library literature and the Web will show that local digital collections, both large and small, have proliferated and are well documented. But for the Wayne State University Library System (WSULS) in Detroit, and perhaps other research and academic libraries, the collection-development answers to the question, Why digitize? must be compelling enough to compete with other expensive library and information technology initiatives. Digitization—beyond a few demonstration projects and temporary online exhibitions—is hard pressed to win such a difficult competition in an era of stagnant or shrinking budgets.

Yet, there are many reasons to support the management of selected collaborative digitization projects as natural extensions of the library's existing instructional support alliances with faculty. Some libraries, including WSULS, are exploring the potential of digitization partnerships to improve teaching and learning and are providing digital imaging centers and digital media services for faculty. As Rockman asserts, digitization partnerships with faculty are opportunities "outside of the traditional teaching and learning arena," which can lead to improved library involvement and visibility.[1] Libraries that are relative newcomers to digitizing educational materials can look to the experience and expertise of a growing number of institutions and libraries that are developing digital repositories of instructional, cultural, and scholarly materials for educational purposes.

Digitizing local resources improves scholarly use by helping preserve fragile artifacts and increasing access to the materials, among other benefits, but it also represents a collaborative process that requires closer, more sustained relationships with faculty than some librarians may have experienced in the past. While working together on the Dorothea June Grossbart Historic Costume Collection (HCC), for example, WSULS librarians and faculty combined their strength to develop grant proposals, explore copyright issues, devise project goals, create databases and metadata, configure searches and interfaces, integrate the new digital images and related library materials into a course management system, and perform many other tasks over the period of one year. They are now designing evaluation tools and promotional programs together to ensure that the collection reaches its full research and educational-use potential.

Project Background

HCC is maintained by the Fashion Design and Merchandising Department of WSU's College of Fine, Performing, and Communication Arts (CFPCA). The collection consists of five hundred pieces of Western dress and accessories, ethnic garments, and historic textiles. Some highlights from the collection include nineteenth- and early-twentieth-century clothing previously owned by historic Detroit figures, unique beaded garments, and various examples of designer wear. The collection was begun by former CFPCA professor Dorothea June Grossbart in 1982 after she received several donated pieces from the Chicago Historical Society, but it is now under the care of Jane Hooper and Rayneld Rolak Johnson, retired and current CFPCA professors respectively, and CFPCA faculty member Susan Widawski. Considered by CFPCA to be a study resource, the collection is used for classroom lectures, exhibitions, and research by scholars, students, and people interested in period reenactments.

Wayne State University (WSU) is an institution with an urban teaching and service mission that has, among its strategic goals, a focus on integrating "the new paradigms of learning and discovery created by technology in ways that enrich educational experiences."[2] There is an emphasis on serving remote users. With this in mind, the library system has been working diligently to forge partnerships with campus colleagues to achieve excellence in teaching, research, and community service. WSULS is adding more electronic library materials into its collections, offering a variety of electronic services on the Web, providing digital media production services and facilities, and helping faculty integrate digital objects and other library resources into their courses. Digitization

Adriene Lim (ab7155@wayne.edu) is a Librarian and the Digital Library Services Team Leader at Wayne State University, Detroit, Michigan.

projects are also being considered for several collections held by colleges and nonlibrary units. In the case of the HCC, a grant from the Detroit Area Library Network (DALNET), combined with WSULS support, allowed for the purchase of new equipment and software, completion of professional digital photography of selected garments and accessories, and the hiring of a graduate student assistant for metadata research and input.

Project Goals

Some project goals articulated by CFPCA faculty were to:

- Develop a digital collection for the purposes of historic record, descriptive information, observation, instruction, research, and analysis.
- Provide instructional support for specific classes offered in the Art and Art History Department, such as History of Costume, Clothing and Culture, and Senior Seminar.
- Offer greater access to the HCC for educators, students, collectors, designers, curators, and people involved in period reenactments.
- Develop metadata for historic items to provide as much accurate record, understanding, and background for the objects as possible.
- Facilitate preservation of the physical items by encouraging observation of digital images in lieu of physically handling pieces that are fragile or deteriorating.

All of these faculty goals are being met, benefitting students and researchers in concrete ways. Faculty have noted that students are already using the resource at home for study, design inspiration, and to complete research assignments. CFPCA instructors are finding the digitized collection to be an exciting extension of materials available to them as they develop courses and lectures.

Some of WSULS's goals were to:

- Build a technical environment that will allow creation, mounting, and manipulation of digital content of various types for curriculum support and research.
- Develop and support access mechanisms for digital collections, so that users are presented with easy-to-use search options and quick responses.
- Improve support for metadata creation and maintenance to increase integration and interoperability of digital content. This means moving beyond using the MARC format and the integrated library system as an access means, which was originally used in early experiments with digital collections, and moving toward XML and other standards.
- Provide collaborative leadership in the planning, implementation, operation, and evaluation of a central digitization service and repository for WSU's campus collections.
- Maintain and enhance the library system's role in WSU's educational efforts.

By helping the CFPCA meet its goals, WSULS is now in a better position to realize its own goals by seeking participation from other faculty members and colleges, applying for additional grants after having obtained experience and demonstrated results, and securing continued support from its administration and institution.

Roles and Responsibilities of Partners

As Barbara Dewey noted in a description of the University of Tennessee's collaborative digital media spaces, a "mutually agreeable memorandum of understanding" is an important element in collaboration processes.[3] To formalize the responsibilities and commitment of all digitization project participants, WSU uses a service-level agreement. In these agreements, the library system's role is to:

- Manage the project, including setting goals, objectives, budgets, and timelines; grant reporting and other communications; developing procedures and documentation; determining the technology that will be used; and purchasing equipment, software, and other project materials as required.
- Assisting with and executing the digitization process and the standards that will be used;
- Perform server- and database-related tasks, including software installation and configuration, database development, image and data loading; interface design and access methods;
- Managing rights issues, including copyright and patent considerations;
- Storing electronically, copying, and migrating the HCC images to ensure their future use and accessibility;
- Assist with and arrange for metadata input into database as necessary;
- Develop a Web site for the project;
- Integrate user access to collection;
- Provide technical testing, troubleshooting, and problem resolution;
- Train CFPCA staff as necessary;
- Assist with developing end-user tutorials and training programs for CFPCA instruction purposes;
- Incorporate the digital collection into educational settings; and
- Participate in publicity and promotional efforts, product evaluation and reporting, and exploring continued funding options for the project.

Faculty partners agree to:

- Assist with setting and meeting project goals and objectives;
- Curate selection of and preparation of items for digitization;
- Develop content for project's Web site;
- Create metadata and enrichment for selected objects;
- Participate in developing end-user tutorials and training programs, publicity and promotional efforts, and product evaluation and reporting; and
- Explore continued funding options for the project.

Digital Library Software

HCC data and images are accessed with the University of Michigan Digital Library eXtension Service (DLXS) suite of indexing and retrieval tools, developed by the University of Michigan Digital Library Production Service.[4] Membership in DLXS provides WSULS librarians with the use of XPAT, a powerful SGML/XML-aware search engine, and open-source middleware that supports encoded text collections, digital image collections, bibliographic data, and EAD-encoded finding aids. Images are encoded using LizardTech's MrSID Geo, which allows users to enlarge or shrink retrieved images on demand within the DLXS Web interface.

DLXS is also being used for several new digital library initiatives at WSU, including a poetry project partially funded by the Michigan Humanities Council; an Institute of Museum and Library Services (IMLS)-funded project called the Making of Modern Michigan in which WSU is participating along with Michigan State University and several other institutions; and an IMLS-funded project with WSU's Reuther Library to digitize and make Web-accessible a portion of the Detroit News Photo Archive.

Digitization Process

The HCC project allowed CFPCA faculty and graduate students to learn about the selection and preparation of garments and accessories for digitization, and to gain general curatorial experience. Selections of a total of fifty objects were made to represent a cross section of the collection, concentrating on pieces that would illustrate particular periods, materials, construction, embellishments (e.g., beading, embroidery, decorative elements), colors associated with various periods, and fabric design. The Digital Library Services (DLS) team contracted with the WSU Photography Department to conduct a number of four-hour sessions to digitally photograph the objects on site at CFPCA facilities. Because the project's budget was relatively small and only a limited number of sessions were available, some of the dollars were used to purchase an additional dress form, which maximized the number of garments that could be prepared and captured at any one session. A 5.3 megapixel camera was used to create four hundred uncompressed TIFF images, each at 3008 x 1960 pixels. For the Web interface, the images were downsized and encoded using MrSID Geo. The team also created thumbnail-sized versions of the images for easy browsing and fast retrieval. Additionally, a digital video of the selection, preparation, and photography stages of the digitization process was created by WSULS's Media Services Team. CFPCA and WSULS both plan to use the video as a teaching aid in future classes and for other digitization projects.

Metadata Decisions and Tasks

The HCC project presented an array of challenges related to metadata and how it would be designed, input, and stored. CFPCA faculty had already been using a collection management database system, called Collectorpro, to input basic descriptions of objects in the collection. This proprietary software, designed for cataloging and inventory of antiques and collectibles, did not meet some of the project's additional requirements, which included having single repeating fields for image file names and spontaneously creating custom database fields of various formats. After evaluating the pros and cons, project participants decided to migrate existing collection data into a FileMaker Pro database to gain the required flexibility. The FileMaker Pro database was designed by librarians to take into account faculty partners' needs, to incorporate a combination of Dublin Core and collection-specific metadata elements, and to work easily with the DLXS architecture chosen and managed by WSULS. With advice from Fran Krempasky, the Cataloging Team Leader at WSU, and an extensive document about metadata formats for fashion and traditional costumes at Kent State University, librarians worked with faculty to map existing collection data into new metadata fields and label them for use in DLXS.[5]

CFPCA faculty members are now enriching the metadata, which will be transferred as periodic data extracts to WSULS for updating of the online collection. Upon receipt of the data extracts, librarians use DLXS to programmatically mark up the data elements into SGML and index the data using XPAT.

Some Future Goals

To augment the HCC project, WSULS librarians are planning to license the digital rights for a set of 1,875 History of Costume digital images (the original set of slides was published by Slide Presentations in 1975 and is held by WSULS), and load them into DLXS as a separate collection.[6] DLXS will allow users to search HCC and the commercial images separately, or to search both together, as core data fields for each will be mapped to common metadata elements. At this time, simultaneous searching across WSU's DLXS collections and non-DLXS collections is not possible, but WSULS is actively pursuing solutions for broadcast searching across its heterogeneous types of digital resources. For now, records about HCC, to include URLs that perform predefined searches into specific segments of the online collection, will be added to the WSU library catalog.

Evaluation

Evaluation is ongoing and includes collecting and analyzing data about and from users of the digital resources by means of classroom- and Web-based surveys. A final evaluation will take place at the end of the grant period, and will include answers to questions such as, What issues were identified that require further consideration? and What processes were most successful and least successful?

Spreading the Word

Several other Detroit-metropolitan institutions and museums, such as the Detroit Historical Museum and Henry Ford Museum/Greenfield Village, are interested in expanding this project to include images from their own historic costume collections, and funding is actively being pursued toward this end. At WSU, in the meantime, the positive outcome of the demonstration project has lead to renewed awareness of WSULS's digital library expertise and services. Faculty and librarians who participated in the project are hoping to present details about their collaborative partnership and highlight the online collection at an upcoming WSU Teaching, Learning, and Technology Roundtable (TLTR) conference, where WSULS plans to actively seek new faculty partners for future projects. There are also plans to formally open the online collection to the campus community by holding an event in a WSU gallery space, with promotional cards similar to those for art show openings mailed out to CFPCA students.

Conclusion

Librarians involved in digital library services at WSU are encouraged by the impact of this relatively small digitization project. By interacting successfully with CFPCA faculty on the HCC project by meeting their needs, sharing ideas, and obtaining positive results, the library system has gained at least one more important ally in its efforts to expand its educational reach and solidify its reputation as an important information technology partner on campus.

References and Notes

1. Ilene F. Rockman, "Strategic Alliances: The Power of Collaborative Partnerships," *College & Research Libraries News* 62, no.6 (June 2001): 616–18.
2. Wayne State University home page (2003). Accessed Apr. 9, 2003, www.wayne.edu.
3. Barbara I. Dewey, "University of Tennessee's Collaborative Digital Media Spaces," *ARL Bimonthly Report* no. 222 (June 2002): 4–5. Accessed Nov. 29, 2002, www.arl.org/newsltr/222/collabtenn.html.
4. University of Michigan Digital Library Production Service, *Digital Library eXtension Service* (2002). Accessed Nov. 29, 2002, www.dlxs.org.
5. Marcia Lei Zeng, "Metadata Elements for Object Description and Representation: A Case Report from a Digitized Historical Fashion Collection Project," *Journal of American Society for Information Science* 50, no. 13 (Nov. 1999). Accessed Nov. 29, 2002, http://web.slis.kent.edu/~mzeng/OCLCreport/cover.html.
6. Jeanne Button, P. Stuart, and Stephen Sbarge, *History of Costume Slides* (New York: Slide Presentations, 1972).

Other Resources

Grossbart, Dorothea June. Historic Costume Collection (2002). Accessed Nov. 29, 2002, http://dlxs.lib.wayne.edu.

Deanna B. Marcum, ed., *Development of Digital Libraries: An American Perspective* (Westport, Conn.: Greenwood, 2001).

Hannelore B. Rader, "Managing Academic and Research Libraries Partnerships," *Library Management* 23, nos. 4/5 (2002): 187–91.

Arts Instruction in the Age of Technology: Providing Library Services to Support Studio and Survey Faculty Who Use Technology for Instruction

Bella Karr Gerlich and Amy Perrier

Where students once came into higher learning equipped with pencils and protractors, paintbrushes and easels, scores and record player, today's art student arrives armed with laptop, speakers, and wireless card. Just as academic institutions must adapt and restructure instruction modules around the twenty-first-century student, so must university libraries provide new services to support studio and survey faculty as they change teaching methodologies and pedagogies. At Carnegie Mellon University Libraries, services to support technology in education include digitization workstations, creating and maintaining digital image collections, and implementing audio e-reserves.

At Carnegie Mellon University, the libraries acknowledge that instructional methods are becoming increasingly technological. To that end, each of the three facilities that comprise the University Libraries (Hunt Library, Engineering and Science Library, and Mellon Institute Library) has been supplying electronic databases and online resources for the campus community for some time. For the College of Fine Arts studio and survey courses, however, it became clear that in order for faculty to be successful using technology in the classroom, additional library services were going to be needed beyond changing subscription formats from print to electronic resources. Providing these new services for the art faculty are the staff in the Arts and Special Collections department in Hunt Library, whose areas of specialization and collection responsibilities support the arts disciplines.

Canvas versus Computer Screen

Until recently, studio and survey faculty in the College of Fine Arts at Carnegie Mellon were satisfied to continue teaching using tried and true instruction methodologies that required little or no technological skill or knowledge: group lecture and critique sessions, analog slides and in-library audio listening assignments, library print collections, and term papers printed on good, old-fashioned twenty-pound white stock. It was obvious in isolated conversations that some faculty were proud of their luddite tendencies, but when informal polling by library staff began in earnest, another side of the story began to emerge: most studio and survey faculty were simply uncertain as to how the library could help them to begin using technology for teaching, and up until this juncture, it didn't really seem to matter. Students seemed content learning in the old, precomputer ways—but were they?

Students Want Digital

In 2000 and 2001, Carnegie Mellon University was ranked number one by Yahoo! Internet Life magazine in its annual survey of the one hundred "most wired" colleges and universities in the United States.[1] It's no surprise then that within the College of Fine Arts, we found students have their feet planted in both old and new learning environments. Not a day goes by when you won't find students sitting cross-legged on the floor in front of some section of the library stacks, leafing through page after page of books old and new, searching for inspirations for their own work. When it comes to classroom presentations and learning styles, however, most students we talked to preferred the digital world as opposed to analog presentation. Library staff soon began to notice that students were often converting print images or sound files to digital for projects. Immediate access to resources also seemed a primary concern when it came to writing a paper or presenting supporting materials: time is clearly a critical factor in preparation and often the students turned first to online resources. From our observations it is clear that these students are well-equipped to use technology for gathering information and representing points of view. Over the past couple of years, faculty have begun to notice an increase in the number of students requesting the use of classroom facilities equipped with computer projection to present materials. As a result of seeing this new technology in action, studio and survey faculty began to investigate the utilization of technology in their own instruction and information-gathering methods.

New Library Services

Today's educators are asking themselves not whether to use technology, but how to use technology.[2] Library staff in the Arts and Special Collections department became aware that the art faculty, more and more often,

Bella Karr Gerlich (bg2r@andrew.cmu.edu), Head, Arts and Special Collections, and **Amy Perrier** (aperrier@andrew.cmu.edu), Arts Resource Specialist, Carnegie Mellon University Libraries, Pittsburgh.

were seeking or even preparing materials that could be adapted for use with computer projection and online delivery systems. For example, not only was it easier to request to have a .PDF created once (and only once) for an electronic reserve item, the document was instantly accessible to all students, anytime and from almost anywhere. Faculty were also taking another cue from their more technologically adept pupils and started to digitize images at home on consumer-grade scanners, creating personal image libraries for use in class and sometimes their research. The faculty we spoke to found that these new educational tools were an excellent fit with the learning style and resource-seeking behavior of the Carnegie Mellon University student: one who is used to finding, storing, and employing data via the personal computer and network systems for their project needs. Most students seem to prefer finding information online—it's fast and usually gratifying—and assignments can be easily accepted via e-mail, electronic dropbox, or handed in on disk. With this new emerging pedagogy came the necessity for instructional support designed to sustain the requirements of those faculty who wanted to use technology in their studio and survey courses. In response to this need, the Arts and Special Collections staff implemented new services to facilitate this emerging education trend. These new services include providing workstations for digitization of materials, creating and maintaining digital images online, and providing access to digital audio files through an e-reserves module.

Providing Digitization Workstations

The Arts and Special Collections department installed two large, twelve-inch by seventeen-inch flatbed scanners for faculty, staff, and students to digitize library materials as needed. Larger-than-average-size scanners were selected because they could best accommodate the oversize art books in the collection that typically have better illustrations and reproductions. Because the university supports both Macintosh and Microsoft Windows platforms, the services of the libraries must likewise reflect two operating systems. One workstation is equipped with a Macintosh OSX operating system with a 100 MB Iomega Zip drive and a CD-ROM drive. The other is equipped with Microsoft Windows 98 with a 100/250 MB Iomega Zip drive, CD-ROM drive, and floppy drive. Instructions, tips, and FAQs are available online from the library's Web site and in print format located at both stations. For the faculty, the installation and maintenance of the digitization workstations was important because it provided support for teaching on two levels: one, the faculty could digitize their own materials for class without having to leave the library with the items and two, faculty could likewise instruct students to use the workstations for presentations or homework assignments. The primary focus of this service is to address a need for speed and convenience when faculty and students are researching and saving materials for instruction both off and online. In addition to a selection of hardware and different operating platforms, a variety of software is available to accommodate faculty needs or students homework assignments including Adobe Photoshop, PageMaker, and Illustrator 9.0; Microsoft Word, Excel, PowerPoint, and Access 2000; Netscape; and Internet Explorer.

Being able to save images with ease is an important component of the scanning workstations. Carnegie Mellon University is generous with virtual space for student and faculty accounts, and so the first choice for saving and transporting images is uploading to one's personal space using Netscape 4.7. A Fetch program was also installed to allow direct access to personal computers or servers connected to the campus network to give maximum flexibility for the user. This gives faculty the ability to download and open images onsite in class, at home, or the office when preparing lecture notes and other materials. If they choose, faculty can also add digitized materials directly to their Blackboard course Web sites on the fly as they use the scanning stations. Most recently, a pay for color print option was added to the Windows digitization workstation to enable users to print images and files as needed for class or project preparations.

Creating and Maintaining Digital Collections for Instruction

This movement to use technology more prevalently in teaching is most evident at Carnegie Mellon in the growth of courses using Blackboard Web technology. In just two years, the number of classes taught using Blackboard rose from 150 in 2000 to 567 courses in 2002. In the beginning, those who used this technology were faculty who primarily taught in the Humanities, Social Sciences, and Engineering disciplines. Now, the arts faculty are getting in on the action and utilizing this electronic teaching tool for their studio and survey courses, and the library instructional support must likewise follow suit. When considering the edge that even the most basic software programs like Microsoft's PowerPoint have over slide carousels in terms of reliability and flexibility for image organization, and the compatibility to various deliverable services such as Blackboard, it's not hard to understand why some arts faculty are making the transition from analog to digital when it comes to requesting imaging services from the library (see figure 1).

In order to support these studio and survey faculty who want to teach using technology and need quality images for lectures, the Libraries implemented a high quality digital image creation service with a digital image database component to maintain and distribute materials online. For the library staff, creating a digital image service to support instruction is, overall, a less expensive service to maintain and operate than the traditional slide library. Computer storage and memory is more efficient and less expensive, images don't fade or turn pink, replacements are free and work can be more easily distributed among staff. It also means the ability to provide better service to faculty: quality control of the image and metadata is assured in the library setting; utilization of database fields means the pertinent information is available about the image; contention for the same images is essentially eliminated; digital images, unlike their slide counter parts are less likely to be misplaced or critical information lost; and there's no need to purchase additional detail images for the collection, as copies or image enhancements can be easily duplicated or created from the original. These combined factors save time and energy for both the faculty member preparing course materials and the library staff member creating the image.

One drama professor has, in the span of just one year, gone completely digital with his image requests. Once a prolific slide user who proclaimed computer illiteracy, this faculty member, with the help of library staff, now uses digital images exclusively to teach art history survey courses. Before, hours would be spent pulling slides in preparation for a lecture every semester. With the introduction of our digital imaging services at the library, images need only be requested once. The images are then put into an electronic slide show that the faculty member creates and can deliver online through the Blackboard course Web site. Once all of the requested lecture

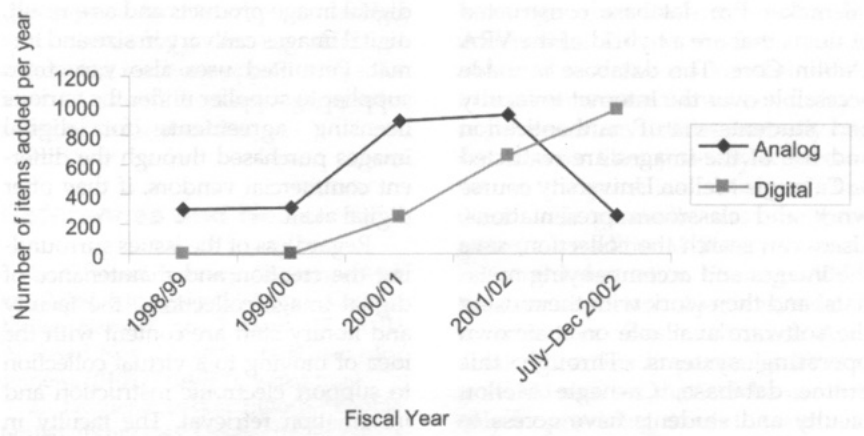


Figure 1. Analog and Digital Images Acquired into Collection, Based on Requests

images are digitized, this drama professor can more effectively utilize the time and energy that used to be spent on preparation for class on teaching instead. Because turnaround time is faster with the new in-house library process developed for creating digital images as opposed to outsourcing analog, the arts faculty can be more creative with their image selection and provide more variety in their slide repertoire. There are also supplementary benefits for the students whose instructors use Blackboard as their primary medium for teaching. Web-related communication technologies make it easier for students to communicate with the course instructor as well as with other students enrolled in the same course.[3] These interactions between and among students and instructors can occur either synchronously or asynchronously.[4] Less time for preparing means more time communicating with students.

Due to variations in hardware and software capabilities from instructor to instructor, library staff delivers digital image service via Zip disk, via CD-ROM, and through online modes. Format needs vary as well and can dictate deliverables. An image for a Blackboard course or one to be inserted into a syllabus would be lower resolution, while master images created for archiving purposes would be the highest resolution. These digital images created in-house follow the standards and best practices laid out in imaging initiatives such as the Digital Library Federation's Academic Image Exchange (http://memory.loc.gov/ammem/formats.html) and the Library of Congress' American Memory Project (www.diglib.org/collections/aic/appepv.htm). Prints and slides are scanned at either 24-bit color, or 8-bit grayscale, 3,000 pixels at the longest side of the scanned image on either the horizontal or vertical plane and then saved as an uncompressed TIFF file, roughly 18 MB in size. This image becomes the master archival copy, and all other images for purpose of delivery are derived from it. For a service image, those most often used and requested by faculty for purposes of instruction, a full screen JPEG image of 640 pixels on the longest side of the image is typically supplied. Instructors with digital imaging expertise can resize and present the image as they choose, or they can make specific requests from the library for file sizes as needed.

The digital images created by request for the faculty are added to the online collection and stored in a

Filemaker Pro database constructed of fields that are a hybrid of the VRA Dublin Core. The database is made accessible over the Internet to faculty and students via IP authentication and use of the images are restricted to Carnegie Mellon University course work and classroom presentations. Users can search the collection, save the images and accompanying metadata, and then work with them using the software available on their own operating systems. Through this online database, Carnegie Mellon faculty and students have access to three JPEG images of different sizes ranging from a thumbnail (150 pixels), a medium (600 pixels) to the largest screen size image available (1024 pixels). In addition to the Libraries' homegrown database, we also subscribe to the Art Museum Image Consortium (AMICO) digital image collection, have a growing collection of images on CD-ROM and continually seek out access to new image collections, as they are made available, to supplement our unique collected works. Any of the libraries' online collections and services can be bookmarked on faculty Web pages and on Blackboard course sites.

As accommodating as it is, creating and maintaining a digital image collection is not without its own unique set of problems. The technology available seems to advance almost daily and as a result library staff often spend a considerable amount of time researching new image-capturing technologies that could be faster and better while continuing to maintain and upgrade existing equipment and software. The online database itself was created from scratch, and work on the database requires collaboration with individuals both inside and outside the Libraries' Arts and Special Collections. Besides the problems associated with equipment and software, the acquisition of digital images can also prove to be a challenge, particularly when purchasing digital images through commercial vendors. There is little to no standardization in digital image products and as a result, digital images can vary in size and format. Permitted uses also vary from supplier to supplier under the various licensing agreements for digital images purchased through the different commercial vendors, if they offer digital at all.

Regardless of the issues surrounding the creation and maintenance of digital image collections, the faculty and library staff are content with the idea of moving to a virtual collection to support electronic instruction and information retrieval. The faculty in the College of Fine Arts at Carnegie Mellon University are beginning to appreciate the numerous benefits of computer projection technology over analog slide-projection systems. With their image needs stored and cataloged on a library server, there is improved access for both faculty and students, followed by the convenience of being able to save presentations and eliminate the need to pull the same slides year after year. There is also the ability to create side-by-side comparisons of images without the need for additional equipment, and the bells and whistles afforded by new technologies (such as adding sound or embedding hyperlinks) also make this teaching method more attractive to those technologically savvy students who cut their computer teeth on gaming systems. In the end, it all boils down to maintaining relevance in an age where information including images can be accessed via the Internet in a matter of seconds. If librarians and faculty fail to keep in step with the times, we may very well fall into obsolescence, along with the soon to be outmoded analog format.

Sound: The Final Frontier

As instruction shifts further away from person-to-person contact to an environment of online instruction delivery, issues related to student learning approaches become all the more important to the design of these new environments.[5] Images delivered over the Web address the visual component of the new electronic classroom environment—but the use of sound and audio to teach can also be a vital element of the arts teaching/learning environment, and the library needed to provide a service that enables faculty to use technology to teach using this medium.

Faculty who teach with audio want to utilize technology to deliver listening assignments via the Web. After consulting with instructors, some collegial research, and a field trip or two, the Arts and Special Collections staff embarked on creating an audio e-reserves service that supports faculty who want to use electronic sound delivery methods for instruction. At Carnegie Mellon University, an e-reserves service for text resources has been in use for some time, so adding a sound component to the existing e-reserves model seemed the logical next step in the evolution of the media teaching environments.

The Arts and Special Collections department devised, along with the Research and Development department, a method of sound file delivery that follows the e-reserves model that utilizes the online catalog reserves system and delivers sound from within the item's record. The decision to use the online catalog for delivery of sound files was made because (1) faculty were familiar with the process of requesting e-reserves and assignments could be made with confidence that students would find the item; (2) students are taught to search in the catalog for e-reserves and connect to full text as provided in the system; and (3) the e-reserves service uses the same Carnegie Mellon University user authentication system as Blackboard and therefore security was of less concern.

Currently in a testing phase, the service utilizes a Java applet to deliver the audio electronically. After the sound files are requested by faculty for

use in their class and are ripped using CDex (www.cdex.n3.net), library staff dump the audio files on a secure server where the automated e-reserves script takes over and generates a URL that library staff add to the item record. When the record is accessed in the catalog, the student can launch the sound files by clicking on the live URL. The Java applet for this process was developed in-house and is unique in that it requires that a client run on the user's machine, which allows the streaming program to run locally, as opposed to other methods of streaming where a server streams the sound files, which creates a risk that the stream can be captured from an outside source. To enable the client, the first-time user is prompted to download the applet from a hyperlink in the reserve item's online record. Once the applet is loaded, the student is able to listen to assignments on the Carnegie Mellon University campus at any time in their dorm space and at their own pace. This new service is an important component for a school that is performance-based and where recordings are in high demand because sound files are part of the art curricula. And, because the sound files are available via the Internet, faculty are assured that students can, in fact, listen to their assignments at times that don't interfere with other activities such as master classes or studio time, and they can be accessed in the classroom for demonstrations and teaching.

Conclusion

More studio and survey faculty in the arts are taking advantage of electronic technologies to teach electronically savvy students. As a result, academic libraries like that of Carnegie Mellon must provide services to support these new methods of instruction and delivery of resources to ensure that materials are available for use as needed, on demand, and in formats that complement the faculty and student needs. By providing services that support faculty who are teaching with technology, library staff are enhancing teaching opportunities for instructors and the learning opportunities of students alike.

References and Notes

1. Edmund Delaney, "Carnegie Mellon Rated 'Most Wired,' Again" *Carnegie Mellon News* 9, no. 2 (Sept. 27, 2001). Accessed Nov. 12, 2002, www.cmu.edu/cmnews/010927/010927_wired.html.
2. Jacquelyn Barker Tulloch, "Sophisticated Technology Offers Higher Education Options" *T.H.E. Journal* 28, no. 4 (2000): 58–60.
3. M. O. Thirunarayanan and Aixa Perez-Prado, "Comparing Web-based and Classroom-based Learning: A Quantitative Study" *Journal of Research on Technology in Education* 34, no. 2 (2001/2002): 131–37.
4. Ibid.
5. Ibid.

Improving Art History Education: Library and Faculty Partnerships in Instructional Technology Development

Tara L. Dirst

This article discusses the provenance of a partnership between the Digital Projects Department (DPD) at Northern Illinois University (NIU) Libraries and NIU's Art History Department that seeks to improve art education at NIU. Academic librarians and other library personnel have unique skills, which along with providing traditional library services, should be utilized to meet instructional and educational challenges. Since DPD has a history of providing access to multimedia content via the Internet, it seemed natural to partner with the art history department to create a tool for accessing slides of artwork via the Web.

In an age when students and faculty underutilize library services, librarians need to better market their skills in order to remain relevant on today's campuses. Many articles routinely cite the need for library-faculty collaboration in the pursuit of this goal, but these calls generally describe programs of traditional library instruction and information literacy.[1] While these are important objectives, today's librarian can offer much more. Academic librarians in particular have a technical skill set that can be use not only for providing access to materials, but also for developing tools for instructors to be used in the classroom.[2] As an example, the Digital Projects department (DPD) at Northern Illinois University (NIU) Libraries is currently working with the Art History department to offer image slides via the Web that can be searched and integrated into classes. This paper reviews how this library-faculty collaboration emerged, and how all parties are working together to make this a reality.

DPD Experience

The DPD at Northern Illinois University Libraries (NIUL) has produced a series of multimedia Web sites dedicated to Illinois history.[3] The sites provide searchable databases of primary documents and images, historians' video and textual evaluations of important events, interactive maps that show demographic and voting information for the United States and Illinois from the years 1820–1860, and lesson plans that integrate these materials for use in the classroom. The success of the DPD comes from its collaboration with other departments

Tara L. Dirst (tdirst@niu.edu), Technology Coordinator, Digital Projects, Northern Illinois University Libraries, DeKalb.

on campus and with other institutions throughout the state of Illinois.

DPD staff works with partner institutions to provide the technology and primary sources that make up the Web sites. The database and search scripts come from a partnership with the University of Chicago. Other partner institutions provide content, including the Newberry Library, the Illinois State Archives, and Illinois State University.

In addition to working with other institutions, DPD has worked with departments on campus to develop digital resources that incorporate their unique skills and knowledge. the Communication department, with its experience in film production, assisted DPD in creating original video and sound files. The Faculty Development Office trained project staff in Adobe Premiere and Real Producer to offer these files on project Web sites. The response of these departments showed that the university community is a supportive, collaborative environment.

Within the library, many people and departments contributed to make projects successful. The systems department offered technical support. Much of the material came from Rare Books and Special Collections. Art librarian Charles Larry created graphics and assisted in the design and layout of the Web site. The diverse skill set and material resources found within the library illustrated how all library departments can contribute to the success of the whole. The experience suggested that this type of technological collaboration with the rest of the university might be successful as well.

Problem and Possible Options

The opportunity for testing the hypothesis came about when a new art history professor told the art librarian about an e-reserves collection of images at her former institution, and how she would like to see that offered at NIU. The art librarian looked to the DPD for assistance. The professor brought the thumbnails, full-size images, and captions from her former institution and DPD quickly made a new static Web site for her upcoming course. The site was placed on the library's electronic reserve site so that it would be password-protected and available only to students registered in her course (see figures 1 and 2).

Discussions with the professor made clear that providing Web access to slide images is of utmost importance for providing art history education. NIU has a slide library, but access is rudimentary at best in that students are restricted by the library's hours of operation and by limited access to a standalone database for image searching. Currently, students must squint and peer at rapidly disintegrating slides on a light box, which does not provide projection for enlarging the image. Slides have a tendency to get lost, are in great demand, and may even be in use at a course lecture at the time a student requires them. It seems unthinkable that students need to resort to such inefficient means to examine their subject in the digital age. The professor returned to her department and discussed the possibility of working with the library to offer similar pages for all art history faculty members. Not surprisingly, they were enthusiastic about the prospect of having digital access to the slide collection, so the professor coordinated meetings between the director and technical coordinator of the DPD and the art history faculty.

At the first meeting with the art history faculty, the group examined a number of different issues including faculty wants and needs, short-term and long-term goals of digitizing slides, initial technical considerations, and how to begin the process of developing such a project. Most art history professors had seen the original site, illustrated in figures 1 and 2, and agreed on a similar design that included thumbnail and full-size images and captions. Since each professor emphasizes different characteristics of the images for their students, all agreed that they needed to be able to control the content of the image captions for their individual courses. Professors also wanted to be able to search, browse, and select images for each course with the ability to edit, update, and change the image set each semester. Professors also wanted the ability to add their own personal slides to an online collection.

At the outset, the art history faculty realized that there should be short-term and long-term goals for this plan. With tens of thousands of images in the slide library, it seemed improbable that we would be able to obtain funding and be able to digitize all of the slides in a reasonable length of time. The faculty determined that a small set of images could be easily selected for an initial digitization plan, with the long-term goal of digitizing the majority of images within the slide library.

There was more concern and discussion about technical decisions. The group raised concerns about slide quality, size and space concerns for the server, who would do the scanning, how updates would be made, and the ease of database entry and editing. Due to copyright considerations, password protection for images was also necessary.

At the conclusion of the first meeting, it was decided that financing and grant availability and software options for the image database held first priority. While funding would impact the success of the project, the technical considerations were immediately pertinent to library and faculty collaboration in the development of instructional tools. Selecting database software was the first technical issue that needed resolution.

Students, faculty, and library personnel had used the slide library's standalone FileMaker Pro 3.0 database to locate images within the phys-

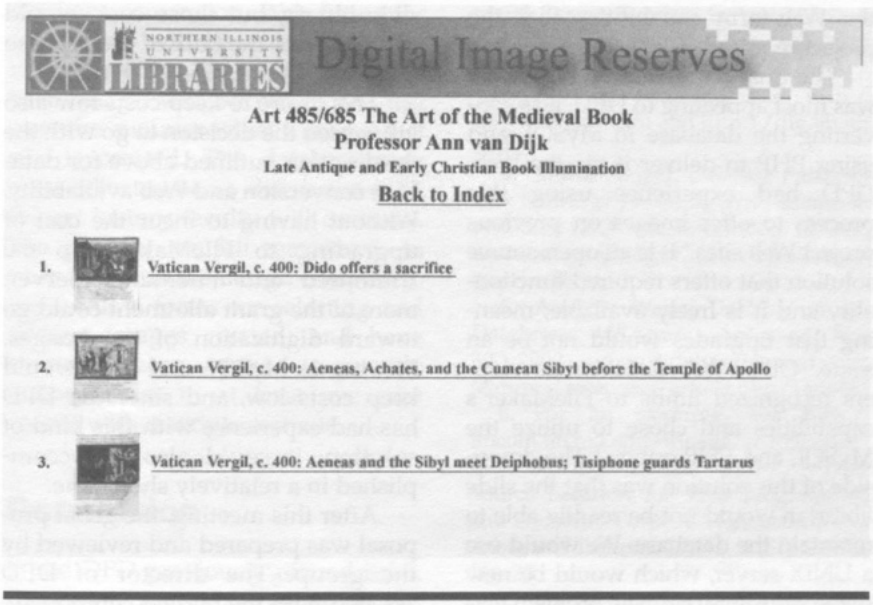


Figure 1. Course Image List with Thumbnails

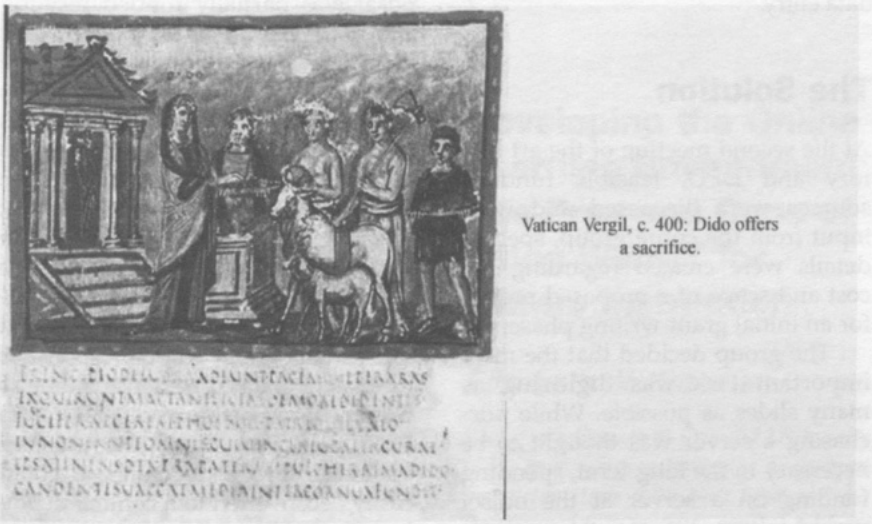


Figure 2. Full-size Image with Caption

ical slide library and the slide librarian used it to create slide labels. Utilizing the existing database seemed the best use of existing resources. It would also be beneficial to allow Web access to this database, but Web access proved problematic. One issue was that field-size limitations for label printing resulted in content being appended to incorrect fields. Enabling Web accessibility would eliminate the ability to label slides. Another issue involved the nonlibrary slides that faculty needs for their individual class slide collections. Built-in authority controls on the data-entry metadata language to enable the search functionality would be necessary for the professors to make their own additions. Because the online database would be the access point for slides within the library, it would also be necessary to distinguish the library's slides from slides in an individual professor's collection.

DPD had no experience working with FileMaker Pro, so research was necessary to find the easiest way for the department to provide Web accessibility for the database and be able to add information regarding images, captions, and courses. It was important to balance a number of different issues, including ease of and time commitment in designing and creating the online slide library, Web access to the existing slide library database, a method for database correction, ability of professors to select images online and perform data entry, and the implementation of course-specific selections and captions. The FileMaker Pro database application and its capabilities were examined along with other options for database development, conversion, and Web accessibility. Three possible options were reviewed: (1) maintaining the FileMaker Pro database; (2) converting the FileMaker Pro database to Microsoft Access and using its Web-publishing capabilities; and (3) converting the FileMaker Pro database to MySQL and using PHP to make it available on the Web.

The first option, maintaining the database in FileMaker Pro, would have required an upgrade because FileMaker Pro 3.0 does not have Web-publishing capability. Newer versions of FileMaker Pro have built-in Web-publishing capabilities (Instant Web Publishing). The advantage of this option would have been that the slide librarian could have easily continued working with a familiar database format. Drawbacks to this option were DPD's unfamiliarity with the program and its capabilities for Web

accessibility. DPD could not evaluate the newer FileMaker Pro edition except through purchase, and online comments indicated that it was difficult to make Web forms that were not based upon the built-in templates. Based on this information, upgrading to a newer edition of FileMaker Pro seemed an untenable solution.[4] Another perceived problem with FileMaker Pro was its operating system limitations. In the past, FileMaker Pro has only worked on the Windows and MacIntosh platforms, although FileMaker Pro 6.0 Unlimited Web server capability extends to Red Hat Linux. In addition to the purchase of FileMaker Pro 6.0 Unlimited, it would have been best to also invest in FileMaker Server for Red Hat Linux. Although UNIX, Linux, and Windows 2000 servers were available, DPD was most familiar with UNIX/Linux and open-source solutions. As a general rule, DPD is reluctant to utilize proprietary software and prefers to use open-source solutions. Given that the slide library was still using the version of FileMaker Pro from 1995, it seemed unlikely that funds would be available for upgrades.

Converting to Microsoft Access, the second option, was another possible solution, but while it had some benefits compared with FileMaker Pro it also had some of the same problems. DPD maintains Access databases for metadata, so the comfort level with Access was high and the slide librarian would not have had much trouble adapting to it. Microsoft Access is a product that the university will continue to use in the future, so upgrades would happen through university licensing agreements. Thus the Art History department would not be responsible for the costs of upgrading. Accessing the database information through Perl instead of using other proprietary solutions made it a cost-effective solution.[5] The shortcomings of Access were similar to those of FileMaker Pro. It only runs on Windows operating systems and it would be difficult for DPD to create the Web-form capabilities that the project requires.

The final option, and the one that was most appealing to DPD, was converting the database to MySQL and using PHP to deliver it via the Web. DPD had experience using this process to offer images on previous project Web sites.[6] It is an open-source solution that offers required functionality and it is freely available, meaning that upgrades would not be an issue.[7] Other Web database developers recognized limits to FileMaker's capabilities and chose to utilize the MySQL and PHP option.[8] The downside of this solution was that the slide librarian would not be readily able to maintain the database. We would use a UNIX server, which would be new to the slide librarian. The problem was solved by DPD's commitment to maintain the database and use PHP to provide easy-to-use online forms for data entry.

The Solution

At the second meeting of the art history and DPD, feasible funding sources were discussed and with input from the entire group, specific details were created regarding the cost and scope of a proposed project for an initial grant-writing phase.

The group decided that the most important task was digitizing as many slides as possible. While purchasing a server was thought to be necessary in the long-term, spending funding on a server at the outset would achieve little for the students and faculty and seemed like the wrong way to go. The DPD had a number of servers with adequate space to house the database, slide thumbnails, and full-size images. To accomplish the goal of digitizing slides for the core art history courses, the majority of the grant funds could go for labor to perform the scanning and image editing. A portion of the funds would go to purchase a slide scanner and new workstation for the slide library, but those costs would still allow for the bulk of the grant to go for the digitization of the slides.

This desire to keep costs low also influenced the decision to go with the third option outlined above for database conversion and Web availability. Without having to incur the cost of upgrading to FileMaker Pro 6.0 Unlimited and FileMaker Server, more of the grant allotment could go toward digitization of the images. Moving to MySQL and PHP would keep costs low, and since the DPD has had experience with this kind of solution, it could also be accomplished in a relatively short time.

After this meeting, the grant proposal was prepared and reviewed by the group. The director of DPD assisted with the budget component, the technical coordinator outlined the technical considerations, and the grant was submitted. The grant proposal was partially funded recently and implementation has begun.

Because the slide library and the DPD are not close to each other, the new slide scanning equipment was placed at the slide library. The slides cannot be removed from the slide library for significant periods of time, so doing production within the slide library makes logistical sense. The slide librarian will oversee the daily digitization of the images and the data entry. The slide librarian will be responsible for making data corrections relating to the label printing errors left over from FileMaker Pro. Since the existing FileMaker Pro slide database could easily beconverted to a comma-delimited file and be imported into MySQL, the slide librarian could maintain the FileMaker Pro database for the purpose of label creation, and simply send DPD the database updates.

Project Status

DPD has begun the FileMaker Pro database conversion to MySQL and the design of the subsequent relational database. Upon completion of

database conversion, Web forms for data entry will be created for the slide librarian. The relational database design will be put to the test over the summer when a course test site is created. The database may need adjustment, so discussion with the art history faculty will continue. The goal for the fall semester is to have the database design completed, have online forms for selecting and adding images created, and have enough images scanned to provide online access to at least one core course with multiple sections.

Conclusion

While DPD previously offered brief, short-term assistance to professors when they needed documents or images digitized, this was the first opportunity to work with an entire department to develop a solution to a pedagogical challenge. It is encouraging that the Art History department recognized the skills that library personnel could offer them in the classroom. Library-faculty collaboration makes the library a more integral part of campus, facilitates communication between the library and departments, and works as a marketing tool by providing more visibility to departments. Providing access to information is the goal of DPD, so it is only logical that technical expertise is used to assist professors in the quest to offer access to digital images.

References and Notes

1. Beatrice O. Agingu and Cathi Mack Cooper, "Collaborating with Faculty through Technology: Faculty As Users and Partners," *Journal of Educational Media & Library Sciences* 39, no. 1 (Sept. 2001): 1–7; Hannelore B. Rader, "A New Academic Library Model: Partnerships for Learning and Teaching," *College and Research Libraries News* 62, no. 4 (Apr. 2001): 393–96.

2. C. Michael Sturgeon, "Reaching Students and Faculty: Offering Instructional Design Services in Your Library," *The Christian Librarian* 45, no. 3 (2002): 102–103.

3. For an example, see http://lincoln.lib.niu.edu and http://dig.lib.niu.edu.

4. Maria Langer, *Database Publishing with FileMaker Pro on the Web. Companion Web Site, FAQs*. Accessed Dec. 12, 2002, www.marialanger.com/booksites/fmproweb.html.

5. Andrew Weiss, *Dabbling in Live Databases: MSAccess*. Accessed Nov. 20, 2002, www.databasejournal.com/features/msaccess/article.php/1408481.

6. For an example, see http://lincoln.lib.niu.edu/fimage/search.php.

7. Kevin F. Cullen, "PHP: An Open Source Solution for Web Programming and Dynamic Content," *Information Technology and Libraries* 21, no. 3 (Sept. 2002): 116–20.

8. Thomas Kehoe, "Website Basics with PHP and MySQL," Developer Shed. Accessed Nov. 3, 2002, www.devshed.com/Server_Side/PHP/DB_Basics/page1.html.

Developing the Online Learning Environment: The Pros and Cons of Using WebCT for Library Instruction

Elizabeth W. Kraemer

Rising enrollments at Oakland University (OU) have required librarians to decrease instruction time with each basic writing class in order to preserve contact with all sections. As a result, the faculty at Kresge Library developed an online instruction module to familiarize students with library research. Using WebCT course management software, the librarians are able to introduce students to basic library skills so that in-class time can be used to teach more advanced research techniques. This article focuses on the benefits and drawbacks of using WebCT for such a library instruction program, and the support provided to the instructors of the courses using the module.

Oakland University (OU), a public institution located in Rochester, Michigan, about thirty miles north of Detroit, has experienced steady growth for the past six years, bringing fall 2001 enrollment to 15,875 students.[1] Oakland's administration, faculty, and staff are dedicated to continually strengthening the educational experience of students. With this goal in mind, a two-day "Teaching with Technology" seminar for faculty members was held on campus in the winter 2001 semester, in great part to embolden instructors to reach beyond traditional teaching methods in the classroom. The OU administration also began promoting the use of WebCT course management software that semester, even offering financial bonuses to faculty members who developed WebCT-based instructional programs and courses over the summer of 2001.

Coinciding with this push from the administration was an effort within the library to reorganize the information literacy instruction program offered to the university's freshman writing course, Rhetoric 160 (RHT-160). The library faculty at OU typically provided multiday instruction to each section of RHT160, but rising enrollments had increased the number of sections of this class, making it difficult for a small library faculty to maintain that standard. In order to preserve contact with all sections, the librarians had to reduce face-to-face teaching time for each class from three hours to two hours. WebCT provided a platform for organizing the decreased amount of face-to-face time efficiently and effectively. To develop an online instruction module using WebCT, a three-person design team was created: a senior member of the library faculty

Elizabeth W. Kraemer (kraemer@oakland.edu), is an Assistant Professor at Kresge Library, Oakland University, Rochester, Michigan.

would assist with content and course design; this author, then the most-junior faculty member, would manage the technical aspects, including any hand-coding, file uploading, and actual construction of the course; and the then-interim associate dean of the library would advise on the project.

Academic libraries of all types have begun to implement similar online instruction programs in order to reach large-scale student populations, and some have determined that an online instruction project positions them strategically on campus.[2] The goal of the OU library design team was to create an instructional module that would both familiarize students with library services and also teach them the basics of library research before ever coming into the building for in-class instruction. This would allow the librarians time to present other types of material face-to-face in the subsequent class sessions, and also place Kresge Library among the leaders in instructional technology on campus.

The WebCT module ultimately was divided into three tutorials, each of which was followed by a short quiz. The online course also included a pretest, to be taken at the outset of the course, and an identical posttest which followed the last tutorial to measure the students' improvement. The first of the three modules was entitled Library Basics, where students learned about the library's layout, building and reference desk hours, interlibrary loans, and one-on-one research consultations. The second tutorial introduced Kresge Library's online catalog and showed students how to perform title, author, and keyword searches. Information on constructing effective Boolean keyword searches was also given. In the final tutorial the students were presented with OCLC FirstSearch, in which they were shown similar introductory search concepts.

The designers had a steep learning curve on this project, not the least of which was simply determining how best to shape WebCT to meet the program's needs. This article focuses on the benefits and drawbacks of using this course management software for a supplemental library instruction program. It also details the support provided by the library design team to the instructors of the Rhetoric 160 courses using the WebCT module.

Pros of Using WebCT

There is no question that WebCT is a powerful tool for course design. Many beneficial features are included in the package for instructor use.

Grade Book

At OU, the WebCT grade book is compiled for each section once the registrar enters a class list into the system. This online list is updated periodically throughout the semester to reflect student drops and adds. The grade book allows both classroom instructors and library instructors to determine who has completed quizzes and to review students' scores. The grade book is customizable, allowing instructors to add additional grading columns, rearrange the order of the columns, and allow or deny individual students' access to the course. Instructors can sort grade book entries alphabetically or according to grades received on an exercise. Additionally, one can search grade book fields, which would be helpful in listing every student who earned higher than a specific score on a quiz.

Analysis

The built-in tracking software in WebCT allows instructors to perform powerful analysis functions such as determining grade distribution on quizzes, checking how much time each student spends in each tutorial, and examining the number of pages of content each student has visited. Course designers can examine student performance on specific questions as well, to determine whether those questions are effective additions to a quiz. Many of these options are quite advanced for the library's needs, and the faculty have found that the analysis tools are rarely used to their full capacity for the library instruction course.

Glossary

The built-in glossary feature allows course designers to write or import definitions for potentially unfamiliar terms. In addition, WebCT allows instructors to create cross-reference links, relating one term to another in the glossary. For library instruction purposes, the design team included terms with which the average first-year student might not be familiar, like call number, record, and OPAC. The glossary is also searchable by keyword.

Selective Release

For each quiz or exercise, WebCT allows the course designer to set criteria for release to students. For example, the library design team held the release of each quiz until students earned a sufficient grade on the preceding tutorial's quiz. This feature helps to keep students focused so they do not complete the tutorials in a jumble, but rather in the intended order. Instructors could also make a quiz available only between specific dates, or even by password.

When editing the quiz settings, the designer can also indicate the number of times a student will be allowed to take each quiz, and which of multiple scores should be recorded. Release criteria can then be set that will regulate the span of time that must pass between attempts at taking the quiz. For instance, in the library module at OU, the settings

allowed students to take the three tutorial quizzes an unlimited number of times to achieve the highest score possible, but the pre- and posttests could each only be taken once.

Customizable

WebCT is highly customizable, both in the design stages and during use. For instance, when developing the course, an instructor can create a unique appearance for the environment by uploading a background image or selecting the color palette to be used throughout the course. Designers can also upload their own icons to be used in their modules to unify pages or suggest a theme for the class.

Customization has been very useful for the library instruction course because class instructors have the option of integrating their own components into the library template. For example, some rhetoric instructors at Oakland have uploaded their class syllabi or additional assignments, while others have activated WebCT tools like the chat room and discussion boards for use with their classes. Other optional tools include a course calendar, group e-mail, and a hit counter that displays the number of visits made to each page.

Student Contact with Technology

The intrinsic value of such an interactive online experience cannot be overemphasized. Every encounter students have with online technology will help them gain the comfort and skills they likely will need in nearly any professional arena they enter after college.

Cons of Using WebCT

Since WebCT is designed for use with a semester-long course, and because such technology is always improving, the library team encountered several problems during design and implementation.

Access

A WebCT course is available only to students registered for that specific class with the university, and the system requires a username and password in order to gain access. The drawback of this model is that password access prevents any members of the general public who may need assistance with library tools from using the content in the online library course. At this point, transfer students or other members of the university community are likewise excluded, as currently only the rhetoric department uses the online library course.

A simple solution used in the library's current WebCT incarnation is to house the lesson content on the local server, merely linking to it from within WebCT. This allows the wider academic community to view the tutorials, though without the option of taking the related quizzes. Using this method, professors from other departments on campus are also free to link to the content from their own WebCT courses.

Quiz Bank

The course designer must enter all potential quiz and test questions in the Quiz Bank before being able to use them in an exercise. This system is ideal, as an example, for importing questions from textbook publishers where available, but it is bulky for short exercises in a supplemental course. Upon entering a question into the database and indicating the correct answer, the instructor has the option of including feedback on each answer to help students. Before the question can be used in a quiz, it must be assigned to one of the designer's categories, which can be organized in any way. Our questions, for instance, are categorized under the quiz in which they are used, such as Pretest or Library Locations Quiz.

Complex Changes

Many changes to a WebCT course that seem straightforward (such as altering a quiz question) actually can take as many as six steps. Normally one would maintain a template of the course on the university's WebCT design server where all the changes would be made, and at the beginning of each semester the template would be copied—or cloned—once and transferred to the live WebCT server for student use. If an unexpected change needed to be made after the clone had been transferred to the live server, the instructor would just go into the live course and make the correction.

The library course is unique, however, in that the template on the design server is actually cloned multiple times, one copy for each of the RHT160 sections. Therefore, when even the smallest change needs to be made to the library course after the cloning has been completed and the semester has begun, the complexities of making alterations in WebCT are especially inefficient and frustrating to the designer. To illustrate, the library course was cloned twenty-one times for fall 2001 RHT 160 sections, and for the winter 2002 semester there were nearly ninety clones made.

Auto Grading

One of the major benefits of utilizing course management software is that students are able to complete assignments on their own timetable, at any time of day or night, without an instructor hand-grading their work after every exercise or quiz. Taking advantage of this feature, the designers of the library course planned to

make each quiz available only after successful completion of the preceding quiz; however, version 3.1.3 of WebCT, used for the initial course design in the summer of 2001, did not have this feature. The library's team was fortunate to find JavaScript code on a WebCT designer bulletin board that automatically grades quizzes upon submission, and the Information Technology Institute (ITI) training staff assisted in identifying a solution that would allow us to incorporate auto grading into the library module. This script was pasted into the submission message portion of each quiz settings page, which then directed the software to run the students' answers through an auto-grading tool so the next quiz could be released to the students accordingly. When using auto grading, however, it is vital for designers to remember that the course management software will only be able to handle multiple choice or true-false questions, as short answer or fill-in-the-blank questions require the interpretation of the grader. Later versions of WebCT include an auto-grading feature, so the JavaScript is no longer required.

Training Students and Faculty

As one might expect, due to the complexity and power of this course management software, faculty must go through training in order to begin constructing a class using WebCT. At OU there are a number of WebCT instructional courses offered through ITI. Classes include Faculty Orientation to WebCT, which is the prerequisite for other WebCT courses; WebCT Evaluation Tools, which introduce faculty to the various methods for testing students online using WebCT; and WebCT Content Resources, which describes how to create lesson pages and explains the basics of some of the other tools available with the course management software.

In addition, because navigation of completed WebCT courses is not highly intuitive, many students may need basic training just to feel comfortable using the software on their own. There is an extensive online tutorial available through ITI's Web site which covers the log-in procedure, minimum computer requirements, technical tips, FAQs, and expectations of learners in an online course. Upon completion of this online program, students needing additional help can enroll in a live, on-campus WebCT training session.

Technical Issues

As is to be expected with the first run of an online course, the designers of the library course encountered several technical problems with WebCT. First, the auto-grading JavaScript seemed not to work for certain IP address, both on- and off-campus. Because a pattern to the errors could not be determined, the precise glitch with the auto-grading script was never isolated. Another important issue to point out is that in version 3.1.3, students could not resize WebCT's small pop-up quiz window, as this seemed to disable the various submission buttons on the quiz screen. When the library design team reported the problem to ITI, it became clear that this was a documented glitch with WebCT. This fault has been fixed on newer versions of the software.

Finally, problems that students and faculty may encounter when simply trying to log in to the course cause frustration. While the library instruction team referred several RHT160 students to ITI for detailed guidance, some rhetoric instructors actually discovered that their technophilic students were happy to assist less-confident classmates through the log-in process. Special care was also taken to ensure that those faculty members not comfortable with WebCT were still able to track their students' progress through the library modules, as the library design team members would download grade books whenever requested, to be e-mailed to a professor ahead of time or printed out the day of the in-library session.

Instructional Support

The library design team knew that the instructors of each RHT160 section would be the best source of marketing for the new tool, as they would be able to promote the use of this tutorial to students most effectively. Therefore, as the team implemented WebCT for library instruction at OU, they also planned hands-on training opportunities for the rhetoric instructors. Additionally, technological support was offered to rhetoric instructors either through the library or through ITI.

As with any new tool, be it electronic or traditional print, it is vital that instructors feel confident using it and comfortable promoting its use to their students. For many people, confidence grows through experience and to this end, numerous WebCT training sessions were offered to faculty members in the rhetoric department. In preparation for the fall 2001 and winter 2002 semesters, twelve training sessions were held in library computer labs where instructors were given the chance to explore WebCT's features and uses under the guidance of this author, the tutorial's technical developer. In addition to the group times, individual appointments were scheduled and held for rhetoric faculty who had been unable to attend a session. A number of rhetoric faculty reported informally that the training sessions were very useful in helping them to feel more comfortable with the WebCT library instruction module.

Beyond training, support was offered to rhetoric faculty whose students experienced problems with the WebCT tutorial, either content-related or technical in nature. Every instructor was given a guide to the

tutorial to assist students with log-in and use. This guide listed the details for each quiz (including number of questions and required score to advance to the next quiz), along with contacts at ITI for technical issues (such as log-in glitches) and the library design team for content issues (such as concerns about quiz questions or grading).

During use of the online module, the librarians at Oakland University discovered that the sections with the highest completion rates were those in which the instructor required the students to go through the module for a grade. Conversely, sections in which instructors simply asked their students to complete the WebCT tutorial before the first face-to-face library instruction session had fairly dismal completion rates. This finding is consistent with that of other online library programs, in which student testers often indicate that unless incorporated into a course grade, the majority of them would probably not use the tutorial.[3]

Because the majority of the faculty members in the rhetoric department are employed only part-time, it often is difficult to get information to those individuals in a timely manner. The librarians discovered that many part-time instructors seem not to check their business e-mail regularly, nor are they likely to look in their campus mailboxes more than the few times each week that they are on campus for a class. Due to this communication gap, some of the rhetoric faculty members indicated that not only were they not aware that training was being offered, but that they had actually never heard of the library's WebCT module and had no idea that the instruction program and schedule had been altered as a result of this new tool. The library faculty are still determining the best ways to keep part-time faculty members fully informed. Often the librarian assigned to teach a RHT160 section will simply call the instructor at home to remind him or her that it is imperative for all students to complete WebCT before arriving in the library for instruction.

Instructional support for the WebCT module continues even now, in the fifth semester of use, and will remain in place for the duration. Changes are made to the module each semester as the library's tool is improved, and rhetoric faculty are always invited to contact the library's Instruction Coordinator for a walk-through of the WebCT course. In many instances, questions from faculty or students about the online module can be addressed either by the librarian assigned to teach their

section of RHT160 or by any librarian at the reference desk; for highly technical questions or concerns, either the library's Instruction Coordinator or this author generally handles WebCT issues. As the rhetoric instructors become more comfortable with the tool, fewer questions seem to come in each semester from the faculty.

Conclusion

Many college students matriculating today seem to have a high level of confidence in their technology skills. Because of this, library instruction is more important than ever as these techies look with blind faith to the Internet for all their research needs. To this end, the Kresge Library WebCT tutorial is valuable not only because it allows librarians to reach a greater number of students, but also because online tools such as this allow class instructors to integrate information literacy competencies more smoothly into their instruction.[4] Additionally, the assessment tools included within WebCT can be used to track student skills, allowing librarians to determine topics on which to focus during face-to-face time. This seamlessly integrates the lessons learned in the classroom with those learned online.

As libraries everywhere move more and more into an online information environment, many faculty and students may raise their expectations of library technology and seek to call on that ubiquitous information in the classroom. Kresge Library has already gotten positive feedback from the rhetoric department and has received some notoriety from the university administration due to the creation of the WebCT module, but the overall perception of the library as a technology leader on campus has yet to change as a result of the work with WebCT. However, should the librarians at OU decide to expand online bibliographic instruction offerings to other departments using WebCT, it is likely that the position of library resources as classroom mainstays would rise rapidly.

While it is clear that there are both pros and cons to using WebCT course management software to develop a supplemental online library instruction module, in our case, the benefits returned from the investment in the project ultimately outweighed the drawbacks.

References and Notes

1. *Spotlight on OU*, Accessed Oct. 19, 2002, http://www3.oakland.edu/oakland/aboutou/spotlight.htm.

2. Jerilyn Veldof and Karen Beavers, "Going Mental: Tackling Mental Models for the Online Library Tutorial," *Research Strategies*, 18 no. 2 (2001): 4; Laura J. Bender and Jeffrey M. Rosen, "Working Toward Scalable Instruction: Creating the RIO Tutorial at the University of Arizona Library," *Research Strategies* 16, no. 4 (2000): 316.

3. For articles supporting this statement, see Veldof and Beavers, "Going Mental," 15; Anna Marie Johnson and Phil Sager, "Too Many Students, Too Little Time: Creating and Implementing a Self-Paced, Interactive Computer Tutorial for the Libraries' Online Catalog," *Research Strategies* 16, no. 4 (2000): 279; and Nancy K. Getty et al., "Using Courseware to Deliver Library Instruction via the Web: Four Examples," *Reference Services Review* 28, no. 4 (2000): 351.

4. Veldof and Beavers, "Going Mental," 4.

Book Review

Tom Zillner, Editor

Eric Meyer on CSS

Mastering the Language of Web Design

by Eric A. Meyer. Indianapolis, Ind.: New Riders, 2002. 322p. $45 (ISBN 0-73571-245-X).

Most of us have seen visually dazzling Web sites—with out-of-date content. Often this happens because the site was designed by an outside graphic designer who used complex tools and techniques that made it difficult for the organization to maintain the site in-house.

Much of the early growth of the Internet was fueled by the ease of creating HTML pages. Learn a few simple tags like <html>, <p>, and <a href=". . ."> and you, too, could create your very own Web page. Since those early days, the Web has grown not only in size, but in complexity. Pages created with a few simple HTML tags have given way to pages filled with code of sometimes impenetrable complexity. To achieve visual effects, many pages are filled with complex table structures and images meant to control positioning rather than convey content. The result is that pages grow larger and take longer to load. They become difficult to update. A decision to change the look of a site might require hundreds or thousands of individual changes.

A key concept that has been floating around for a long time is that the look of a Web page—its presentation—should be separated from its content. Separating content from presentation holds out the promise of making it possible to maintain Web sites much more easily, as well as making it possible to repurpose the content e.g., to make it possible to access it from PDAs and other devices as well as from browsers.

The tool that makes it possible to separate content from presentation in the Internet environment is Cascading Style Sheets (CSS). First released as a recommendation in 1996 by the World Wide Web Consortium (W3C), an organization comprising Web stakeholders and experts whose purpose is to promote and enhance the Web, CSS is not yet widely implemented.

By separating content from presentation, CSS greatly simplifies the process of updating sites. Changing a font or color throughout a site can be done with a few keystrokes in the style sheet that controls the appearance of the site. Through the use of multiple style sheets, pages can be formatted differently for different uses, such as viewing in a browser or printing. Separating the formatting from the content makes the code of the page easier to understand.

A style sheet can be in the page it controls or it can be in a separate file that controls any number of pages linked to it. In short, CSS is a simple, elegant, effective, standards-based way to do Web pages.

Why then isn't CSS used more widely than it is at present? In a word, browsers. The (in)famous Netscape/Explorer wars of the 1990s led to inconsistencies in how different browsers displayed HTML code, and the off-putting "Best viewed in . . . . " messages. Anyone who has tried to code pages for multiple browsers knows the frustration and difficulty of getting anything more than the simplest pages to display consistently across the gamut of the most popular browsers.

This is about to change. Browsers that render CSS more competently are finally appearing. According to Charlie Morris, 96 percent of online users have browsers with at least partial CSS1 support, and 80 percent are using browsers with good CSS2 support.[1] To quote John Allsopp, "CSS offers Web developers a powerful tool that helps simplify the complex task of maintaining Web sites, and provides sophisticated layout and design features for Web pages without the need for plugins, long download times, and expensive tools."[2]

All of this makes the appearance of *Eric Meyer on CSS* particularly timely. Meyer is an acknowledged expert on CSS. He has been called a CSS guru, "the acknowledged master of CSS."[3] His job title at Netscape is Standards Evangelist. The significant improvement in the ability of the newer Netscape browsers to render CSS properly has been attributed to his influence.

This is Meyer's third book on CSS. His previous two books are: *Cascading Style Sheets: The Definitive Guide* (O'Reilly, 2000), which covers the theory behind CSS, and *Cascading Style Sheets 2.0 Programmer's Reference* (Osborne-McGraw-Hill, 2001), a CSS reference for Web authors. *Meyer on CSS* differs from the earlier books in that it is a practical, hands-on guide. The focus is on learning by doing. The book is divided into thirteen chapters, each of which presents a project creating a Web page using CSS techniques.

The companion Web site to the book (http://ericmeyeroncss.com) contains project files that readers can download. Starting with the bare-bones code consisting of just content marked up with structural HTML, one can follow Meyer as he builds up the style sheet, line-by-line, refreshing the browser after each addition to see the effect of the latest change. The code is presented in bite-size chunks, making it easy to follow along.

The first project, Converting an Existing Page, takes a page that uses complex tables to control positioning and that is filled with font and size attributes, strips it down to the bare essentials, then recreates the look of the page using CSS. The final result is an almost pixel-perfect reproduction, based on HTML code that is far simpler to understand and maintain. A technique I found particularly helpful in this project was the use of temporary styles to outline tables and table cells as a way of visualizing the structure of a page being converted to CSS:

```
<style type="text/css?>
/* temporary styles */
table { border: 2px solid red;
        margin: 3px; }
td { border: 1px dotted purple;
     padding: 2px; }
</style>
```

Other CSS features covered include:

- using background images;
- changing the appearance of hyperlinks, including using the CSS command "a: hover," rather than JavaScript, to change the appearance of a hyperlink when the mouse is positioned over it;
- using a second style sheet with the setting "media='print'" to control the appearance of the printed version of a document;
- styling online input forms;
- setting the position of an element using both the float and position commands; and
- creating multicolumn layouts without using tables.

Chapter 12, Fixing Your Backgrounds, is a tour de force, demonstrating how CSS can achieve effects not possible with HTML alone. Using three images and a few CSS commands, the author creates a stunning effect—a page with a background that remains fixed while the text scrolls. While few browsers currently incorporate the level of support for CSS to display the resulting page properly, it does illustrate the kinds of advanced effects that can be achieved using CSS.

Meyer is an engaging guide, leading readers through complex issues effortlessly, with clarity and humor. The light tone is deceptive; at first one is tempted to think the book is covering its topic superficially. Only after several chapters does one begin to realize the depth of Meyer's mastery of CSS, and how much one has learned.

Meyer's common sense, practical approach will be appreciated. One project whittles away at tables, another leaves them in. "Just do whatever makes sense" is the message. In addition to containing the project files, the Web site has additional information supplementing the book that is well worth reading, including sections on Picking a Rendering Mode, and Hiding Styles from Browsers. Meyer's own Web site (www.meyerweb.com) includes additional CSS resources, including several cutting-edge CSS projects not covered in the book, among them a demonstration of how to create fly-out menus using only CSS.

To summarize, *Eric Meyer on CSS* presents the concepts of CSS in a practical, project-based approach. Those who learn best by doing will benefit particularly from this method. The book presents CSS functions in a carefully planned sequence so the reader can thoroughly assimilate one concept before moving on to the next. The book includes a Branching Out section at the end of each chapter that encourages the reader to solidify her mastery of the topic by varying the design for the chapter's project. This book is a must-read for anyone who creates or maintains Web pages.—*Thomas E. Lehman, University Libraries, Notre Dame University*

References and Notes

1. Charlie Morris, "Toss Out Your Tables! CSS Is the Scene!" Web Developer's Virtual Library. Accessed Apr. 21, 2003, http://wdvl.internet.com/Authoring/Style/Sheets/Positioning/Toss/index.html.

2. John Allsopp, "Introduction to CSS," The Complete CSS Guide. Accessed Apr. 21, 2003, www.westciv.com/style_master/academy/css_tutorial/introduction.

3. WebReference.com, WebReference Update Newsletter, July 25, 2002. Accessed Apr. 21, 2003, www.webreference.com/new/020725.html

Index to Advertisers

LITA

National Forum Preconferences

The Library As a Place in the Digital Age

Thursday afternoon and Friday morning, October 2 & 3, 2003
$149 with Forum registration; $199 without Forum registration

"Everything" is on the Web nowadays, yet it is an indisputable fact that libraries continue to exist as real places that people return to again and again. This preconference brings together a panel of speakers, including an academic librarian, a public librarian, an architect, and a space planner, to gaze into the future of the library as a place.

Speakers: Cate McNeely, Deputy Chief Librarian, Richmond (BC) Public Library; **Sue Stroyan,** Ph.D. University Librarian, Illinois Wesleyan University; **Carol Ross Barney,** President of Ross Barney+Jankowski; **Andrea Michaels,** founder of Michaels Associates Design Consultants, Inc.

Handhelds for Library Programs: Providing New Levels of Service

Thursday afternoon, October 2, 2003
$69 with Forum registration; $99 without Forum registration

This LITA preconference covers the practicalities and possibilities for the use of Personal Digital Assistants (PDAs) to deliver library services, through an examination of case studies. These examples represent new levels of library service for PDA users that focus on infrastructure for handheld use, creating original content and resources, and building collaborative programs.

Speakers: Joe Williams, Education Services Librarian for the Medical Sciences Library, Texas A&M University; **Plato L. Smith II,** North Carolina State University Libraries Fellow for the College of Veterinary Medicine

Creating, Maintaining, and Using Open Source Software in Libraries

Friday morning, October 3, 2003
$149 with Forum registration; $199 without Forum registration

In this half-day, hands-on workshop, participants will learn skills enabling them to download and install GNU software as well as Perl modules, create and download software from a CVS repository for sharing code, evaluate open source software for usefulness and applicability, create and foster a community of developers and users, conduct usability studies to verify a computer program's functionality. *Please note:* registration for this off-site, hands-on preconference is limited to 30. Registrations will be accepted on a first-paid, first-served basis.

Speaker: Eric Lease Morgan, lead developer of MyLibrary

Register now at http://www.lita.org/forum03

Instructions to Authors

Subject Content

Information Technology and Libraries (ITAL) publishes material related to all aspects of libraries and information technology, including digital libraries, metadata, authorization and authentication, electronic journals and electronic publishing, telecommunications, distributed systems and networks, computer security and intellectual property rights, technical standards, geographic information systems, desktop applications, online catalogs and bibliographic systems, optical information systems, software engineering, universal access to technology, futuristic forecasting, library consortia, vendor relations, and technology and the arts.

Types of Contributions

ITAL includes feature articles, communications, tutorials, reviews, and letters to the editor:

Feature articles consist of original research or comprehensive and in-depth analyses. Although longer works may be considered, manuscripts of 3,000 to 5,000 words are most common.

Communications consist of brief research reports, technical findings, and application notes. Generally communications are 1,000 to 3,000 words in length.

Tutorials are brief, instructional pieces on topics or issues of relevance.

Book reviews and **software reviews** are assigned by the respective editors.

Letters to the editor may be submitted to the editor for possible inclusion in the journal.

Instruction for Submissions

1. Submit original, unpublished manuscripts only. Do not submit a manuscript being considered for publication elsewhere. Authors are responsible for the accuracy of the information in the manuscript, including references and statistics.
2. Manuscripts should be machine-printed and double-spaced. Two copies should be provided. It is not necessary to provide the manuscript in electronic format until it has been accepted for publication. Author name, title, and affiliation should appear on a separate cover page only. This information should not be repeated in the text of the manuscript, including the abstract. Pages should be numbered. An abstract of 100 words or less should be provided on a separate sheet.
3. *ITAL* follows *The Chicago Manual of Style, 14th edition* for capitalization, punctuation, quotations, tables, captions, and elements of bibliographic style, including references. Spelling adheres to *Webster's Collegiate Dictionary*, 10th edition.
4. Information on submission of electronic copy, tables and illustrations, copyright forms, and other aspects of final copy will be provided when a manuscript has been accepted for publication.

Review of Manuscripts

ITAL is a refereed journal using double-blind reviewing. The editor assigns manuscripts to reviewers who receive the manuscript with no direct information on the author or author's affiliation. Reviewers examine the manuscript considering the following questions:

- Is the topic within the scope of *ITAL?*
- Is it meaningful and relevant to *ITAL* readers?
- Does it offer a valuable addition to the literature?
- Is it timely?
- Is the presentation that of an article or merely the text of an oral presentation?
- Is it organized well, and does it have a point?
- Are the citations complete and accurate?

Upon completing the review, a recommendation is presented to the editor as to the suitability of the manuscript for publication in *ITAL*. Recommendations fall into one of the following categories:

- Publishable in its current condition
- Significant and sound and should be published with only minor editorial revisions
- Basically significant and sound but requires some rewriting to make it a solid, publishable contribution
- Requires major rewriting, and it should be reviewed again after a revised draft has been received
- Does not warrant publication as a full article but might be published as a Communication
- Does not warrant further consideration by *ITAL*

The author is informed of the recommendation and any comments made by the reviewers. The review process takes four to six weeks.

Submissions

Manuscripts for consideration should be sent to:

Dan Marmion
ITAL Editor
University of Notre Dame Libraries
221 Hesburgh Library
Notre Dame, IN 46556-5629

I count on LITA's programs, publications, and working groups to give me a measure of what's important to library automation.
–Karen Coyle, University of California Digital Library

LITA is the association that **educates, serves, & reaches out** to the library and information technology community.

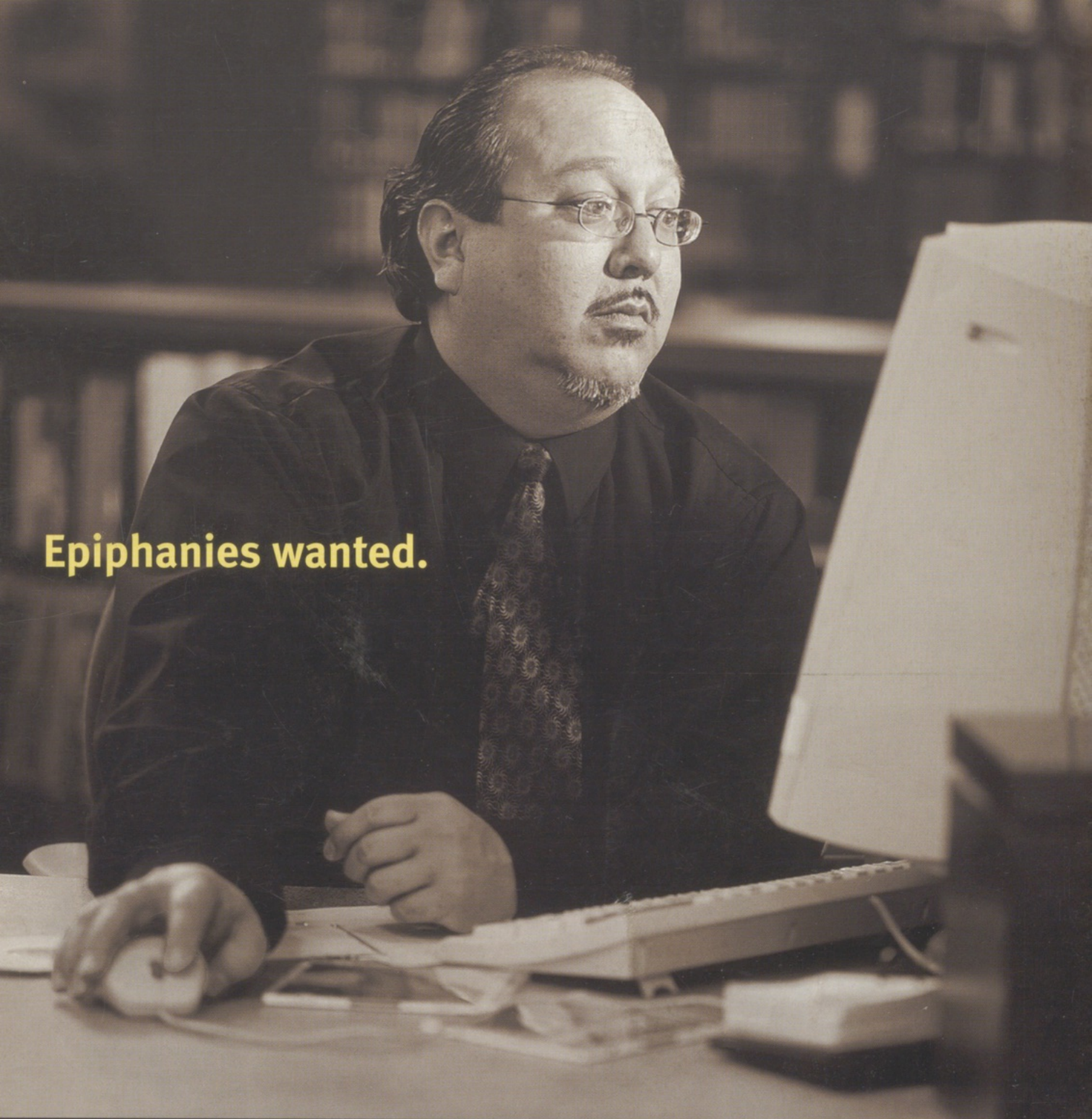
Find out more about the benefits of LITA membership today at

www.lita.org!

Library & Information Technology Association **LITA**

lita@ala.org • 800.545.2433, ext. 4270

a division of the American Library Association



As Joyce called them. Wordsworth called them "moments in time." It's that incredible moment when knowledge and intuition crystallize into a new depth of understanding. And OCLC Digital Collection and Preservation Services helps your library make more of these moments happen for your users—through your digital collections. We have the infrastructure, technology, resources and services you need to build and manage your digital library.

Find your inspiration with OCLC at **www.oclc.org/digitalpreservation/**.

Librarians make the difference.

OCLC

www.oclc.org