
Electronic Collections and Wired Faculty

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ABSTRACT

THIS ARTICLE EXPLORES THE RELEVANCE between electronic resources and faculty in their teaching and research. The role these resources play in faculty planning for their own research and their planning for their students' research, individual learning, and classroom activities are all explored. Additionally, issues pertaining to geographically dispersed students and faculty, copyright, and computer skills are included. The discussion uses The Pennsylvania State University as a model, and a spectrum of Penn State faculty were interviewed and provided information about their work and the impact of electronic resources.

INTRODUCTION

There is a natural relevance between academic faculty and research libraries. Without the wealth of resources available in the research library, faculty teaching and scholarship suffer. Without the primary constituency of the faculty, both direct and indirect use of library materials wanes. Each party relies upon the other. The characteristics and activities of an academic library are defined by this interdependent relationship with the faculty and by our desire to be relevant.

"The principal characteristic of a research library is an emphasis on primary resources for advanced study and research" (Mosher, 1994, p. 3). Library collections improve research and instruction by supplying faculty with the intellectual resources necessary to study and teach. Library collec-

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tions also correct individual inequities in access and economics and provide a context for scholarly investigation and communication. While some scholars indicate that increasing numbers of faculty are circumventing libraries for direct electronic access, by far a larger number of faculty continue to rely upon the library for well-rounded, representative, and pertinent information. "It is only a handful of scholars who are bypassing their libraries" (Abel, 1991, p. 273).

For all its desired relevance, the academic library does not exist in and of itself. It is not an inherently relevant organization. Academic faculty orchestrate exploration of library materials for their own research and assign library projects to their classes. As changes in the research and instructional environment favor digital materials, the library remains relevant by ensuring collections that meet changing classroom and desktop needs. Ultimately, the relevance of the collection lies within its use to the faculty and to the efforts of their students. A collection unused, whether due to irrelevance or inaccessibility, is not a library collection so much as a packing list. In short, scholars do not exist in a vacuum of resources to use. Libraries do not exist in a vacuum of use. The question of how electronic collections affect faculty is essentially one of utility.

Based on strong mutual self-interests, interdependence, and complementary activities, significant changes in library collections inevitably produce attendant changes in faculty activities. Electronic collections ultimately produce wired faculty. At the Pennsylvania State University Libraries, like many others, electronic resources have exploded in popularity and use. Generally desirable for reasons of accessibility and availability, electronic collections have specific utility and, thus, relevance for faculty. The application and integration of electronic resources into teaching and research form a matrix of inquiry. In this article, discussion and examples of faculty, libraries, and electronic resources will focus on examples at the Pennsylvania State University. Issues with regard to electronic collections and the effects of copyright and computer skills on faculty will also be explored.

The Pennsylvania State University is organized in a way that gives special significance to the access provided by electronic resources. Only half the students, faculty, and staff of the university are located at University Park, the "main campus." The remainder are located around the state at other locations. These other locations are not separate entities in the usual sense but function as a part of the whole or, in the local parlance, one university geographically dispersed. The libraries function as a single entity with all librarians reporting to a single dean regardless of location. Students and faculty, at least in theory, have equal access to resources from all campuses.

TEACHING

Electronic resources can and do enable innovations in teaching. The University Libraries pursues a two-pronged approach to the acquisition and selection of electronic materials. First, the Libraries often acquires and makes available broad and generally useful materials. While at one time collection relevance meant acquiring maximum materials for a "just-in-case" scenario, electronic materials are now routinely acquired when they are most heavily, regularly, and generally used by the faculty and students. Based philosophically on a radical shift in collection policy (Shamber, 1996; Smith & Johnson, 1993), the practical result of this strategy is an increased relevance to the classroom faculty.

As a fundamental part of student research, encyclopedias are an initial entry point into the library collection. The heavily used and popular, *Encyclopedia Britannica* was acquired electronically to increase collection relevance to the teaching faculty. In just six months, from January 1996 to June 1996, the *Encyclopedia Britannica* was searched over 140,000 times by Penn State users. Access was made available through an agreement between *Encyclopedia Britannica* and the consortia of Big Ten universities, the Committee on Institutional Cooperation (CIC). Collectively the users of the CIC university libraries searched the system almost 1 million times during the same six month period.

The kinds of uses have in many ways been as interesting and gratifying as the quantity of use. A Penn State art professor has designed a course which depends heavily on the student's ability to connect to the encyclopedia directly from web-based information screens that make up a primary aspect of the content of a course. Teaching students the many terms, names of art movements, and periods in history necessary to understand art history is always a challenge. This course depends on the student's ability to easily click from the content of the course to a description in the encyclopedia explaining such terms. Many students achieved the same goal over the years by sitting down in front of the paper volumes and pulling them off the shelf and looking up term after term. The students and the faculty member find this new capability far more efficient and helpful. A proposal to digitize and provide access to the classic edition of the *Encyclopedia Britannica*, the eleventh edition, should further enhance the ability of humanities faculty to use this resource as an electronic map to the content of their courses.

Likewise, the recent acquisition of the full-text format of *Periodical Abstracts* promises to afford many professors a convenient and timely resource for general classroom use. In just one month, over 7,500 users accessed the system. The librarians at the various campuses are finding the full text of titles especially useful since the local collections are limited. As an additional benefit, the number of intralibrary loan requests is dropping. It is clear from this preliminary test that full-text articles im-

prove library relevance to geographically remote faculty.

For the teaching faculty, an electronic collection strategy that emphasizes broad and generally useful materials affords a commonality of baseline access and content—that is:

- students share access simultaneously and diminish contention,
- electronic materials may not be hoarded by one or more members of the class to the detriment of others,
- electronic materials may not be defaced or mutilated to the point that they are unusable, and
- electronic materials provide a more timely expression of current information pertinent to discussion and learning.

By sharing fundamental materials more widely, quickly, and consistently, teaching activities accelerate based on instructional goals rather than literary logistics. Desktop learning, with proper skills, enables students and teachers to liberate the learning window from the walls of the library or the classroom.

The University Libraries also acquires and makes available electronic resources to support smaller-scale classroom activities. While heavily used materials are the best candidate for electronic format, data-intensive or static historical materials are also considered prime candidates for the electronic collection. *The Pennsylvania Gazette* is a retrospectively converted newspaper available to Penn State history faculty and students. Currently, it is shared between two faculty on our multicampus system and provides an excellent example of the libraries' role in leveraging the maximum use of specialized information by using electronic formats to minimize physical damage and reduce the need for multiple copies.

In this case, two professors at two locations wanted students to look for information in the *Pennsylvania Gazette* during a one-week period in the semester. It was a fairly simple matter to ask them to coordinate their schedules so that the students in each location had access to the resource during the week of the assignment. We sent the compact disks to the requesting locations during the weeks of the assignments. However, as is often the case with electronic issues, the technical issues were a special challenge. The students experienced difficulties with the CD-ROM player at one campus that hampered their ability to complete their assignment but, even with those difficulties, the professor reports that he told the students that: "It's a whole new ball game. It isn't what you can get upstairs in the library anymore. It is what you find anywhere in the world." He tells us that: "It is now possible to have undergraduates do what used to be major research projects for graduate students. They can be assigned projects that would have taken months using indexes and microforms. It opens a whole new world for undergraduates."

He goes on to discuss the challenges the technology presents to him

as a teacher. He says, "I have to start to do things and think differently." As an example, he reports he used to have assignments due at noon but now students report they encounter contention for electronic resources in the morning, so he has made assignments due (electronically) by midnight. They are often date stamped at 11:55 P.M. Despite his enthusiasm for testing the use of electronic resources, he continues to express some skepticism about technology, especially in light of the equipment failures that provided challenges in his classes. However, he finds that the electronic resources and the technology "gets students excited" and anything that "gets students excited about history is well worth the effort [he must put forth] to learn it, help make it work and rethink [his] classes."

More and more frequently, customized electronic collections are assembled on request from existing electronic materials. In one example, recent collaborations between business professors and business librarians resulted in custom-designed web home pages for class use. In the business program, students learn in intensive short sessions. Again, the timely collocation of materials within an instructional context speeds learning and facilitates group discussion. The materials requested, while available on a myriad of Internet sites, were effectively identified and locally organized for convenience and timely use. The professor supplied the activities and assignments, the librarian supplied the resources and the page. Future directions and relevance may be found in the creation of these "micro-collections" that pre-coordinate pertinent materials electronically and include locally licensed materials as well as freely available Internet resources.

The professor clearly outlined the advantages:

Prepackaging the material for a major assignment probably had the most profound effect on my own organization. I really had to think through what I expected the students to be able to do, what resources would be required for them to do it, and how they could interact with me if they had questions about the material. These issues were more important this year because not only was I teaching material that we had normally covered in 15 weeks in 5 weeks, but I was responsible for delivering this material to 147 students instead of 40 students.

The other important outcome of using new technology is only by working with it could I begin to appreciate what else I might be able to do. As a professor who is committed to continuous improvement of instruction, I developed new skills and teaching techniques because I established new avenues for sharing and learning with students and my colleagues. The "structure for inquiry" that was built into the web page also became a common ground for sharing and adaptation. Students showed me new sites and techniques; I could pass these along to others who were interested and our overall knowledge and understanding grew.

In another class-specific example, the Libraries Electronic Reserves

service allows teaching faculty to collaborate with librarians to disseminate instructional materials electronically. At Penn State, the Electronic Reserve system increases the relevance of the library by allowing faculty to literally add to the electronic collections as needed—directly—easily. While the Electronic Reserve system is not a typical electronic resource, it is an example of how faculty and libraries work together to improve relevance. It is also a good example of how a library's collection can be locally created, customized, and "converted to digital form to make it more useable" (Butler, 1996, p. 493).

The Electronic Reserve system will be particularly important to the work of students in a program called Project Vision. These students are scattered around the Commonwealth and are enrolled in a package of first year classes. Although there are some face-to-face meetings between students and faculty, much of the work of the course is done by computer. Students communicate with their professors via e-mail and with their fellow students in chat rooms and via e-mail. They conduct most of their library research through the computer and submit their papers and receive comments from their instructor online. This year they will use the electronic reserves system to read course-related articles and materials. Although not distance education in the usual sense, this project is an example of the relevance of electronic collections to an increasingly digital faculty and student population.

RESEARCH

Technological innovations comprise, increasingly, a greater role in the research milieu of the university community. Penn State is no exception. Generally, the significant characteristics of this environment include rapidly compressed timelines of research and increased discovery and creation of new fields of inquiry (Brown, 1990).

Timelines of research increase rapidly when electronic formats facilitate baseline data gathering and analysis, identification and retrieval of secondary materials, and publication and dissemination of results. With the availability of electronic formats, data gathering and analysis is accelerated by the phenomenal counting and sorting speed of computers. Beyond the generic advantages of computer-based research are the clear benefits of computer-based extraction for subject researchers. Our membership in ICPSR and our acquisition of databases like COMPUSTAT and CRISP supply faculty researchers with a wealth of information on demand in business, political science, social science, and public policy. By extracting relevant materials, large databases can serve multiple purposes and increase the libraries' relevance to all researchers. These statistical databases can be combined with the capabilities of our Geographic Information Service lab to provide faculty with the ability to customize their statistical research.

Providing electronic resources for humanities faculty presents special challenges. In our experience, and according to the research of Adams and Bonk (1995), faculty access to electronic technology and information resources is often significantly lower for humanities scholars. Recent innovations like the Electronic Text Center aim to supply both the content and means to analyze humanities texts. Like many, the Pennsylvania State University Libraries sees great advantage in acquiring primary research materials electronically in order to support these faculty in their timelines of research. For the humanities scholars with electronic capabilities, full-text humanities resources are being provided through the network as well as in the Center whenever possible. One English professor tells us:

The real advantage of having primary materials available electronically is that the materials can be accessed as easily from home or office as in the library itself. It's like having unlimited shelf space in your own office. Just as important, these electronic materials can be manipulated by tools that scholars already know how to use—tools like word processors or database packages. The result, I think, is a huge increase in speed and convenience.

One of the most popular research tools made available to faculty at Penn State is *MathSciNet*. Each Penn State location includes several mathematics professors trying to earn tenure and keep up with their discipline. This group of faculty posed a special challenge and were very vocal in their request for access to electronic information about their discipline. Mathematics departments are often well wired and the faculty very knowledgeable about computers and electronic resources. Once *MathSciNet* was available, the Libraries immediately subscribed and was rewarded with comments like this one:

I have used *MathSciNet* extensively.... It is terrific! Speaking for myself, I would happily give up all access to the printed and CD-ROM version for reasonable access to *MathSciNet*. I currently use the online version from the University of Michigan, but I don't find that anywhere near as convenient as the *MathSciNet* interface....I [will] use it on the average more than once a day. By contrast I used the printed version more like once a month.

Other activities to support faculty research include online interlibrary loan requests. The timely acquisition of secondary research materials is greatly enhanced when the request can be made more quickly and the delivery expedited, in many cases, by electronic services like UnCover and Ariel. The Libraries' new e-mail request service facilitates online requests and, like many other libraries, directly harnesses the power of electronic communication. Already nearly 25 percent of all ILL requests are being sent by e-mail. Since implementing these electronic enhancements, the turnaround time had been reduced by five days.

Finally, the emergence of electronic journals as alternatives to scholarly communication contributes significantly to rapid research progress. The Libraries collections include access to a consortia collection of electronic journals. These electronic journals represent a first tangible glimpse into the future effect of electronic resources. As computers enable new fields of research between hitherto distant faculty and as results can be shared instantly, electronic journals accommodate the immediacy of a new research milieu and diminish the financial concerns of print communications. The Libraries no longer collect these materials individually but relies, instead, on the consortia partners to "collect" electronic journals through a project called the CIC Electronic Journals Collection (EJC).

The Electronic Journals Collection project is being developed based on information gathered from an early project, the CICNet E-Serials Archive. The EJC will be a fully managed collection of selected electronic journals shared by all libraries in the CIC. The collection will be actively managed, cataloged, and maintained. The member libraries will be freed of individual responsibility for acquiring, cataloging, maintaining, and preserving the titles. Six libraries will provide cataloging that will be available to all thirteen members through a special OCLC symbol. This project has several goals. First, it should provide an efficient and cost effective method for the libraries to provide these resources to their users. Second, it should provide a testbed for these sorts of resources that will make it possible to expand the project to include fee-based journals and other kinds of electronic resources. And third, it provides a test of the technology and our abilities as librarians and technologists to collaborate to maximize the benefits and capabilities of electronic resources.

The creation of new fields of inquiry is also facilitated, in great part, by the academic libraries' focus on electronic resources. Electronic resources allow for a simpler mixing and matching of previously disparate information. Desktop researchers can "switch" between literally dozens of large research-oriented databases and freely combine the results to create and discover new ideas, results, and observations. The facility and flexibility of electronic formats acquired by the library results in new uses both unforeseen and unpredicted when ordered.

ISSUES

The rapid and pervasive introduction of electronic materials to the university community has not come without a price. Two distinct issues, among many, stand apart as particularly problematic. First, the library's electronic collections have precipitated issues of copyright among the faculty. While we have made materials widely available, we have assumed the role of "enforcer" as a condition of acquiring licensed electronic resources. In addition, our electronic materials have also revealed a gap

between faculty computer skills and their abilities to effectively use electronic resources. As many materials are discontinued in print, faculty without training or facility in computer skills increasingly find themselves disadvantaged by our "new" collections.

Electronic copyright issues are unfathomably complicated, tenuously defined, and almost certainly unpredictable for the near future. Yet, in the library, we continue to purchase electronic formats and, subsequently, sign the licensing requirements for these materials. It is maddening to faculty to have such a wealth of resources that are so constrained. Two of the faculty members interviewed reported encountering these frustrations. One describes his greatest frustration as becoming aware of resources which he can't access either because of costs or access restrictions. He goes on to talk about resources that are restricted by licensing, copyright, or agreement with a donor to a single location even though they are available electronically. At the Penn State Libraries, the Copyright Committee plans to organize and bring together scholars and faculty from across the university community to better explain and detail the licensing and copyright requirements of our electronic resources. Additionally, the Faculty Senate Committee on Libraries has presented an informational report to the Senate and plans to follow that report with an action item outlining faculty concerns around copyright.

Closely related to the issues of copyright are those of pricing and licensing. Increasingly vendors are not selling electronic products but rather licensing them to libraries with a long list of restrictions and requirements. Often the annual fee is coupled to the size of the faculty or the student body or even based on whether or not the library is housed in a single building. Universities organized like Penn State are charged far more than comparably sized universities with all students located on a geographically contiguous campus.

Rapidly looming on the horizon of our electronic future are issues involving faculty computing skills. As many resources become available only in electronic form or, alternatively, are more effectively and efficiently provided in electronic form, faculty computing skills in using these materials will become critical. If, as some have suggested, faculty are especially resistant to the technical and pedagogical implications of electronic resources (DeSieno, 1995; Hardesty, 1991), then it will be a significant challenge to the academic library to develop information literacy skills among the faculty. In an example of an effort to ease this problem, the Libraries, in conjunction with the Center for Academic Computing, embarked on a systematic training program for Internet skills aimed at faculty and graduate students. Met with praise, the Internexus program successfully reached out to researchers and teachers and provided them with a practical and useful orientation. In addition, the Libraries offers many

opportunities for faculty training each semester based on generic or subject specific goals.

CONCLUSION

The relevance of electronic resources to faculty is measured in its utility to both teaching and research. In teaching, the widespread availability of general use or heavily used materials facilitates individual learning and promotes classroom activities. On a class by class basis, electronic materials allow for customizable content, scheduling, and access. For a geographically dispersed university, electronic materials often level the learning field across all locations. In research, electronic collections encourage rapid research advances, instantaneous scholarly communication, and the creation of new discoveries. For a geographically dispersed university, electronic resources level the tenure field across all locations as well. In all cases, however, electronic resources present significant challenges in everything from simple use to intellectual property to faculty computing skills.

In closing, it is worth noting that, like the chicken and the egg, the electronic collection and the wired faculty enjoy a which-came-first relationship. It is unclear whether our electronic collections truly create wired faculty or whether faculty requirements drive our collection formats and philosophy. However, they are not mutually exclusive. In reality, and true to the premise of interdependence, both parties alternate in driving an electronic agenda. It is in our naturally relevant nature to do so.

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