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Electronic Texts and Multimedia in the Academic Library: A View from the Front Line

ABSTRACT

Electronic texts and hypermedia databases can be invaluable resources for helping students engage and understand primary sources in the humanities. In addition, the ability not only to interact with existing electronic resources but also to manipulate and create information in digital forms contributes a unique dimension to the learning process. The Information Arcade at the University of Iowa Libraries provides a model for the role of the academic library in integrating electronic resources and interactive technologies into research and teaching.

ELECTRONIC PRIMARY SOURCES AND INTERACTIVE LEARNING

Primary sources in the humanities—whether the creative works of the human imagination or the documentary records of human affairs—do not yield their secrets readily. They do not come to students with their multiple layers of meaning pre-digested and transparent or their contradictions and paradoxes neatly rationalized; they may reflect a time or place far removed from the student's experience and learning or provide evidence of a world inaccessible to the student's senses. Teaching students about the nature and use of primary source materials and teaching them the special analytical skills that these sources demand are among the challenges that faculty face in both graduate and undergraduate courses. Just getting undergraduates interested in primary sources may be the first and greatest hurdle.

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While I would not argue that electronic resources are a panacea for teaching students to appreciate primary sources, I am convinced that they can be an invaluable tool for this purpose. Electronic texts with text analysis programs and hypermedia databases that link texts with other primary source materials as well as with commentary and reference sources—these present source materials to students in completely new ways. They make source materials both *more* accessible to students and, paradoxically, *less* accessible, and it is by virtue of *both* of these seemingly contradictory characteristics that they make such excellent teaching tools.

On the one hand, electronic databases can bring together materials from a great variety of sources, many of them obscure or difficult to locate, and put them literally at the fingertips of scholars and students. At Stanford University, in an undergraduate English course nicknamed "Electronic Chaucer," Professor Mary Wack and her students used a large collection of images in an online database, the *Stanford Humanities Image Archive*, to explore manuscripts, art works, maps, and other documents of medieval culture. In this database, each image can be accompanied by up to thirty-five pages of information, commentary, and bibliography, and the images and text may rapidly be retrieved, displayed, juxtaposed, and examined, inside or outside of the classroom. Here is how Professor Wack describes one of the ways her class has profited from this database in the classroom setting:

> When my class informed me that they really didn't understand the concept of "ordinatio" after our first session on it, I was able to show them a page from Ellesmere juxtaposed with pages from both the Kelmscott Chaucer and an Ovid MS. On the spur of the moment I could illustrate by comparison and contrast how the elements of page design contribute to a reader's interpretation of the text. . . . The quality and flexibility in the reproduction of images goes far toward reducing the logistical problems of access to the sorts of objects that medievalists often study (manuscripts, objects in European collections) . . . *it opens students to the many possibilities for concentrated engagement with medieval objects more typical heretofore of graduate work* [emphasis added]. (Wack 1993, 9)

In a very different sense, however, texts or other sources in electronic databases are *not* as immediately accessible as those in print, because they are not laid out neatly on a page for browsing or casual perusal. The text retrieval or analysis software that is used with a text database forces the student to formulate a question or series of questions in order to retrieve information from the source and organize it in a meaningful way; this makes explicit the close attention and questioning stance that must be brought to bear on primary source materials. And so, with

these electronic resources, an instructor can give students vivid and dynamic lessons in the interrogation and interpretation of primary source materials.

For example, students in Columbia University's renowned "Contemporary Civilization" course must come to grips with seminal works of the Western intellectual tradition from Plato to Freud—no mean feat for undergraduates. In his "Contemporary Civilization" class, Professor W. D. Van Horn used a full-text database containing key works by Jean-Jacques Rousseau (1990) to teach his students strategies for examining some of the difficult paradoxes in Rousseau's thought by searching through the database for pairs of opposing concepts, such as nature versus society or freedom versus obligation. On the one hand, this exercise with the electronic text enabled students quickly to locate relevant sections of the texts for closer study; at the same time, the interactive and iterative process of identifying concepts, of selecting the words and combinations of words to define them, and then of further refining those definitions as a result of searching the database helped students to focus closely on the words and structure of the texts and to re-create for themselves the terms of Rousseau's arguments (Van Horn 1991).

Reference librarians are all familiar with the undergraduate student who has to write a paper on a theme or motif in a literary work, let's say a play by Shakespeare, or is asked to compare and contrast some aspect of the writings of two authors. This student immediately heads to the library to try to find books and articles on the topic, hoping to find in the writings of others the answers to the riddles of the primary text. The *MLA Bibliography* on CD-ROM has been a godsend to these students and to the reference librarians who must help them try to locate, in the enormous haystacks of Shakespeare criticism, just the needle that will pierce their specific topics. But might these students not also discover that the *WordCruncher Disc* CD-ROM (*WordCruncher* 1990), which contains the complete full-text of the Riverside edition of Shakespeare's works, is an attractive tool for interrogating the text directly, thus helping them to seek answers in their own engagement with the words of the author?

And, last but not least, *hypermedia* text databases, which contain not only primary source texts but also a variety of other related source materials in different media, can help students to understand some of the relationships between the text and its broader literary, historical, and cultural context. It is the goal of the developers of the *Perseus* (*Perseus* 1992) hypermedia database to create an "electronic environment . . . [that will] allow individuals to use more varied kinds of evidence than they normally would . . . to ask more questions and pursue problems

to a deeper level than would otherwise be possible" (Crane 1990, 150). To that end, *Perseus* contains many original texts in Greek and in English translation, thousands of photographs of art objects and archeological artifacts, maps, site plans, photographs, and video images of the remains of sanctuaries and other sites, reference tools, and explanatory essays and annotations written especially for *Perseus;* subsequent editions will add new materials in each category. Because of the breadth and depth of its source collections and its wealth of hypermedia links, the *Perseus* database provides a rich and complex environment for the exploration of primary sources, including texts. In addition, the software allows faculty or students to write their own commentary and annotations into the database and to create and save their own links and pathways among its treasures; this ability to "customize" a database for individual or group study is an exciting feature of many hypermedia databases.

I have seen undergraduate students use electronic texts with enthusiasm and success. I share the conviction expressed by the creators of *Perseus* and the other faculty I have just quoted that electronic texts and hypermedia text databases hold great promise for undergraduates as well as for graduate students. But I also know that these innovative materials will not have a significant impact on undergraduate education unless there is adequate planning, commitment, and support from the library, the computer center, the university administration, and, last but certainly not least, the faculty. The infrastructure and support services that are sufficient to accommodate the use of electronic texts by faculty and graduate students may not suffice for use by undergraduates, if for no other reason than the sheer numbers of undergraduate students.

In order to integrate electronic primary source materials successfully into the undergraduate academic experience, access to these materials must be as transparent and hassle-free as possible and point-of-use assistance must be readily available. As Gregory Crane, the general editor of the Perseus Project, found when he used an early version of the database in a class that he taught:

> When asked to abandon a familiar type of written assignment for an electronically annotated pathway through the database, most students expressed doubts as to whether the pedagogical gains outweighed the anxiety, frustration, and inconvenience posed by first having to overcome the problems of limited access to the materials, which were only available in the computer laboratory, and then having to deal with an unfamiliar system to complete the assignment. (Mylonas et al. 1993, 152)

For librarians, acquiring and cataloging a hypermedia database on CD-ROM or subscribing to an online electronic text database constitutes merely the first step in the process of helping faculty and students realize the potential benefits of using electronic primary source materials.

Libraries must also address complex issues of access and service in order to lower the barriers to widespread and equitable use of electronic resources in research and teaching.

THE ROLE OF THE ACADEMIC LIBRARY

Several years ago at the University of Iowa, the Libraries decided to take on the challenges of providing access to electronic texts, hypermedia, and other electronic resources, with a special emphasis on the applications of interactive technologies to undergraduate education. The University Libraries, the Office of Information Technology, and the University of Iowa administration jointly submitted a proposal and received a three-year, $752,432 grant from the Roy J. Carver Charitable Trust to establish what was initially called the Interactive Information Learning Center and is now called the Information Arcade. While the Information Arcade was not established exclusively as a pedagogical facility, the planning and implementation of the Arcade has been strongly influenced by the desire to fully support and strongly encourage new applications of electronic resources for teaching and independent learning. I should make it clear that the scope of the Arcade includes but is not limited to electronic texts and that the Arcade seeks to serve teaching and research needs in all disciplines; however, to date, its collections are strongest in the humanities and social sciences (which are the disciplines served by the Main Library). Its classroom and lab area, however, are used by faculty and students in a wide range of disciplines, including the sciences.

Let me briefly describe the Information Arcade and then examine some of the assumptions and rationale for this particular model for integrating information technologies into the curriculum. And then let me venture some preliminary conclusions, or at least observations, about what we have learned since we opened our doors in August of 1992.

The Information Arcade is located in the Main Library, just inside the building's north door and next to the Information and Instructional Services Department (formerly known as the Reference Department), with which it shares a common door. I am quite glad that this space on the first floor was chosen, because it is both prominent and directly adjacent to the Information and Instructional Services Department, whose collections and services it both complements and extends. The Arcade occupies approximately 6,000 square feet of renovated space that includes a large electronic classroom, a lab area with clusters of microcomputers that we call information stations and multimedia stations (I'll get to the distinction between them in a moment), a large service

desk, a semiprivate faculty cluster, and staff offices and workroom. All microcomputers in the Information Arcade are on a local area network, whose file server is located across the street at the Weeg Computing Center; network management services constitute one of the primary contributions of the Office of Information Technology to this joint project.

What are some of the basic assumptions that went into the design of the Information Arcade? We first assumed that the classroom is still a central locus for undergraduate learning. So electronic source materials must be available in an electronic classroom, where the instructor can use them to enhance lecture and discussion and where students can use them on individual stations for guided and collaborative in-class explorations. For these very same reasons, the electronic classroom is an invaluable resource for library instructional programs that involve information technologies. From the day it opened, the Information Arcade's electronic classroom has been heavily booked for undergraduate and graduate courses that meet there either regularly or occasionally and for library instruction.

Outside the classroom, there are clusters of what we call information stations and, in another part of the room, what we call multimedia stations. These two names reflect a crucial distinction and commitment. The purpose of the information stations is to enable faculty and students to use existing information resources: electronic texts, hypermedia databases, courseware, software, and the Internet. The purpose of the multimedia stations is to enable them actually to create and manipulate source materials in digital formats; accordingly, the multimedia stations have powerful microcomputers and large screens, with a variety of peripherals like scanners, CD-ROM and laserdisc players, VCRs, tape deck, and removable storage media. At the multimedia stations, students have access to special software for digitizing, editing, and manipulating text, images, sounds, and moving images, as well as a variety of presentation and authoring programs. The multimedia stations reflect a fundamental conviction that in the electronic age students will learn not only by interacting with existing resources but also by creating their own multimedia documents.

One of the primary exponents of this active approach to learning is Professor Brooks Landon of the English Department. Professor Landon teaches a course titled "Literature and Culture of Twentieth Century America," which focuses on the impact of technology on literary culture in the twentieth century. A central concern of this course is the meaning and implications of the 1893 World's Columbian Exposition in Chicago, a great cultural event that exposed millions of Americans to large-scale applications of outdoor electric lighting and other new

technologies for the first time and served as a kind of official introduction to the twentieth century (Landon 1993). Professor Landon is creating an ambitious hypermedia database about the Columbian Exposition called *The White City;* his class meets in the electronic classroom of the Information Arcade, where he can use his database to guide his students hypertextually through the White City that he has re-created with primary source text documents, images and photographs, old moving picture clips, and contemporary accounts and modern interpretations of the fair. The students read classic and popular literature of the late nineteenth and early twentieth centuries. But instead of writing term papers, the students in the class research, write, and prepare their own hypermedia mini-databases on topics relating to the exposition. They locate and digitize selections from a variety of source documents, including articles in the press of the time, publications from the fair, and other writings on the fair or on the topics they've chosen. These documents, along with the hypertext essays the students write, may even be incorporated into the ongoing development of *The White City* database.

Professor Landon has been teaching this course for several years, but the spring term of 1993 was the first time that he taught it in this fashion, because of the facilities newly made available in the Information Arcade. Discussing the course with a colleague, Professor Landon expressed particular pleasure with the quality of the students' work that semester. And what did he consider to be one of the most impressive indicators of the success of this new "electronic" course and its unorthodox assignment? It was the fact that the students in this class had done a great deal more bibliographic and historical research and made greater use of primary source materials than undergraduate students are usually inclined to do. Motivated by the technology and the possibilities it opened up for them, they had sought out a wide range of contemporary source materials on turn-of-the-century America from the library's stacks and special collections in order to analyze, digitize, and synthesize them into their hypermedia projects in a meaningful way.

The development of Professor Landon's *White City* database has been made possible by Second Look Computing, the multimedia development studio at the Weeg Computing Center. At Second Look, the latest in multimedia equipment and software and an expert staff of multimedia specialists are available to assist faculty with multimedia projects for a variety of research, educational, and information applications around campus. Complementing the mission of Second Look, the Information Arcade provides a place for faculty to integrate

these projects into the classroom or into course assignments, as well as a place for students to work on smaller scale projects of their own.

Other courses that not only use the Arcade electronic classroom but that also require the students to create multimedia documents include courses in political communication and cognition, music and multimedia, interactive media in libraries, women in film, design and management of civil engineering projects, and computer applications for clinical practice in nursing.

Our experience has been that the more people know about multimedia, the more they want to do with it. A commitment to multimedia production in the library brings with it substantial costs for equipment, software, and, most of all, staff support. The kinds of expertise that are required to help students manage the multiple steps and the decisions that must be made at each step simply for scanning alone are formidable. Whether we are dealing with texts, still or moving images, numeric data, or other electronic primary source materials, the difference between supporting faculty and students in the use and limited manipulation of existing resources and supporting them in the creation of their own resources is enormous.

So how has the Information Arcade approached the issue of staff support? Our "front line" staff consists of lab monitors, who handle basic informational questions, dispense printouts from the networked laser printer, check out manuals and other materials from behind the desk, and perform a variety of clerical and simple technical tasks throughout the Arcade. In addition, six graduate assistants, who hold half-time year-long appointments analogous to a university research or teaching assistantship, provide the majority of the public services in the Information Arcade. Competition for these positions is keen, and graduate assistants are chosen for their interpersonal and communication skills, subject expertise in areas other than computers, broad experience with and interest in academic computing applications and electronic information sources, and their ability quickly to learn things that they don't already know. A lab monitor and at least one graduate assistant are on duty at all times the Arcade is open, and during busy times, we schedule two graduate assistants—even then, the graduate assistants and lab monitors can be pretty harried during the week before a major multimedia assignment is due.

So far, the participation of reference librarians and bibliographers in the public service activities of the Information Arcade has consisted primarily of teaching workshops on the online catalog, the Internet, and on electronic resources in various fields; this spring, we have had presentations for faculty and graduate students on such topics as electronic texts, primary sources in the social sciences, and electronic sources

in classics. In each of these sessions, we have made a point of including electronic primary source materials that are especially appropriate for undergraduate teaching. I am strongly convinced of the importance of these kinds of programs for faculty and graduate students and feel that they should be focused by discipline and targeted at specific departments or at a group of individuals from various departments who are likely to have an interest in a particular electronic text or other resource. I also think that there are other significant opportunities yet to be realized for librarians to be involved in supporting the creation and use of electronic primary source materials in research and teaching—opportunities that draw on their specialized subject and language knowledge and their expertise in information retrieval and management.

What have been some of our biggest challenges to date? First of all—access. With some exceptions, electronic primary source publishing in the humanities is currently split between two computer platforms: DOS or Windows for electronic texts and text analysis software, and Macintosh for hypermedia text databases like *Perseus*. And CD-ROMs that tie their texts to nonstandard markup systems and proprietary software are still the distribution medium of choice for most publishers. I think that this will begin to change under the influence of projects like the Center for Electronic Texts in the Humanities and the Text Encoding Initiative. But I am sure that multiple platforms and CD-ROMs will be with us for quite awhile. So if there is a technical wizard in the crowd who can guarantee me that you can successfully network *all* of our diverse DOS, Windows, and Macintosh CD-ROMs, including our multimedia titles, there is a job in Iowa waiting for you. And if you can successfully negotiate reasonably priced network licenses for each and every one of them, then you can name your price! Because until we can successfully deliver electronic texts and software to workstations throughout the Information Arcade, the Libraries, and the campus, we cannot really meet the needs of students or scholars for access to these resources and cannot promote widespread integration of them into the undergraduate curriculum.

The second challenge on my list? Staff—having enough of it and making sure that staff members can keep up with burgeoning collections of electronic information sources housed locally, available over the Internet, and being created by faculty and students on campus. This is a topic that deserves a paper in itself and cannot be considered in isolation from the fundamental rethinking of the roles of professional and nonprofessional staff that is taking place throughout academic librarianship. But, as I said before, we must recognize that supporting the *creation* of electronic source materials rather than just their *usage* makes unprecedented demands on library staff and has significant

ramifications for the kinds of staff expertise and the numbers of staff that are needed.

In conclusion, I think that in the first year and a half of its existence the Information Arcade has begun to make a difference in the ways that undergraduates confront primary source materials, including electronic and hypermedia texts in the humanities. But the facilities and services of the Arcade constitute only part of the solution to the issue of interactive resources and methods in undergraduate education— which, nevertheless, is better than being part of the problem! Ultimately, the solution requires a campus-wide strategy to address issues relating to the campus network infrastructure, the design and equipping of classrooms, facilities for individual and group access to electronic resources beyond word processing and electronic mail, incentives for experimental pedagogical efforts by faculty, copyright and licensing, personnel in the libraries and computing facilities, and the allocation and reallocation of scarce resources within the framework of university priorities. We are already grappling with many of these issues at the University of Iowa, and I hope and believe that the Libraries can be a catalyst for the development of a campus-wide strategy and will play a central role in its formulation and implementation.

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