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This paper examines the current state of practice and management of electronic course reserve systems. The results of a Fall 2003 survey of 89 faculty, graduate, and undergraduate users of the UNC-Chapel Hill E-Reserves system, which uses Docutek ERes, are presented. Complementary use of course management software, the influence of copyright, and need for copyright management features are discussed. Survey questions addressed attitudes of users toward customer service from Reserves Staff; legibility of materials; preferences for paper vs. the electronic; the user-initiated, navigability-related, and environmental limitations of access; information about points of access; printing services; and perceptions of usability.

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Automation of library processes—Reserve collections.

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ELECTRONIC RESERVE SERVICES AT UNC-CHAPEL HILL: FACULTY AND STUDENT PERCEPTIONS OF PERSONAL CONTROL, ACCESS, AND SERVICE QUALITY

by
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Introduction

Within the last five years, the use of electronic networked resources has increased dramatically on college campuses. The twenty-first century has brought with it access to enormous quantities of useful, portable and instant information. Speed and precision of access to this information is critical to the modern educational infrastructure. Electronic content is available in a variety of formats from a wide range of devices.

In this age of the remote user, improved access and availability of new technology have transformed the ideal academic library. Users now expect libraries to offer both local and remote patrons equal options in accessing high-quality information. Users may still speak of the library as a place, but the role of the library is also understood as one of an online content and service provider. This typically entails maintaining comparable, if not duplicate, collections of print and electronic materials.

One of the areas of library service that has changed considerably since the days of the high-use reserve collection of print items is the reserve department. Required reading assignments in print form have, during the last decade, been augmented with remote accessibility to their digital surrogates. The climate of reserve operations is much different than it was in the previous decade, and this requires new and different forms of management. Reserve collections today often consist of highly accessible materials, primarily networked resources, or e-reserves, which comprise an important service linking the library to its users in the campus community

Whereas provision of access was previously a focus, quality of access is now a theme in library e-reserve operations. Usability has therefore become a central concern for library managers, access services librarians, and reserves staff. User education and training have become more essential to maintaining equity in an online environment, in which users are likely to have differing levels of expertise in using Web interfaces and electronic resources. Ergonomics and the effects of pervasive access on library printing services have, too, become relevant factors in effective management of an e-reserve system.

To simplify and streamline management of e-reserves, many libraries have opted to implement dedicated electronic reserve management software (Kesten & Zivkovic, 1997). One of the most popular off-the-shelf packages is Docutek ERes, which gained widespread acceptance and was adopted on many campuses in the late 1990s. Docutek Information Systems, a company founded by Dr. Philip Kesten, a physics professor from Santa Clara University, and Slaven Zivkovic, that university's Library Webmaster, was founded in 1995. Docutek ERes was marketed as the first standalone e-reserve system, which produced a database-driven e-reserve Web site. This proved to be an inexpensive solution for many libraries, costing at most $999 for initial implementation, and an annual maintenance fee of 20% ($199.80) each year thereafter. (Docutek Information Systems, n.d.)

Rather than purchase an additional software package or library system module, some library systems instead took note of the increasing role of course-authoring software in providing access to electronic reserve materials. This course-authoring software (also often referred to as course management software, learning management software, courseware, or e-learning software) was beginning to find its place in the higher

education environment in the late 1990s as well, even as a substitute for a dedicated electronic reserves management package. The increased use of networked resources and shift of course content to the Web created a demand for the software. Students expected course information to be accessible online. There was a host of e-learning software companies, but among the most successful, because of their staff-friendly interfaces, were Web-based course authoring tools such as Blackboard and WebCT.

Blackboard, which was founded in 1995, incorporated the CourseInfo system from Cornell University into its flagship product, and introduced itself to the higher education market in 1998. As of 1998, Georgetown University and Yale University had both begun to use the Blackboard course-management system (Skale, 1998). WebCT originated at the University of British Columbia in 1998, which spun off the division and then sold it to private investors in the U.S. (Stueck, 2000) Today, some university libraries, such as American University Library (2004) have integrated their electronic reserve operation with course-management software completely. Matthew Pittinsky, CEO and founder of Blackboard, Inc., emphasizes the need to use middleware to unite pieces of technology infrastructure, continuing to "tie things together" in his book *Wired Tower*. He also recognizes that the "electronic library can be the foundation on which e-learning is built," which acknowledges that e-learning does not, and is very much unlikely to, replace the physical library (2003).

While the advent of e-learning and remote access to required course reading might not spell the death of the reserve reading stacks, migrations to new technologies are watched with concern by academic libraries. Librarians have become accustomed to planning their budgets in anticipation of technology changes and upgrades. A library's image and ability to fund regular migrations and remain technologically au courant highly depends

on the environment librarians are perceived as creating for users. Just as important, one could argue, is the degree of user loyalty to both the online resources an academic library provides and the extent to which the physical library represents a center of access and social activity. Assessment of user attitudes toward Web-oriented library-branded services, such as electronic reserves, inevitably influences decisions about outreach and instructional programming, library systems and middleware vendors, electronic collection management, and perhaps even interior design.

Awareness of and sensitivity to copyright prompted some libraries to more closely examine staffing and technical challenges in their reserve departments. To this day, copyright concerns remain top-of-mind for reserves staff, because keeping track of items on reserve in larger systems and managing the payment of permissions fees is a time-consuming and laborious undertaking. Few reserves users ultimately see or become familiar with this work that goes on in the back offices of libraries. Faculty members largely do not understand how copyright clearance is achieved, and do not know about the volume of communications exchanged between library and rightsholders. The cost of maintaining an electronic reserves system is potentially exorbitant, but approaches to electronic reserve cost control vary widely. However, regardless of institutional interpretations of copyright law and levels of staffing, maintaining an electronic reserves system has become a new and necessary expense for academic libraries in the last few years.

While electronic reserve systems were being implemented throughout the early 1990s, interpreters of copyright moved from the previous focus on illegal reproduction through photocopying to illegal reproduction through electronic means. The debate over how copyright laws applied to electronic reserves remained lively, but ultimately,

inconclusive. Libraries wanted to establish guidelines for e-reserves that would allow usage similar to that of print reserve collections of the past, while publishers saw library interpretations of fair use as too liberal and too broad (Gasaway, 1997). In 1994, the Conference on Fair Use (CONFU), intended as a forum for rightsholders and users to discuss how these interpretations would affect educational uses of scholarly information, turned hostile as both sides aired viewpoints, but did not arrive at an agreed-upon set of guidelines for e-reserve materials (Lehman, 1997). Eventually, guidelines were established, but the AAP (American Association of Publishers) ultimately found them unacceptable. Publishers were adamantly opposed to practices that would damage their business model; librarians argued that, with proper security and policies, use of the scholarly articles most often used by undergraduates would have little, if any, effect on publishers' businesses.

However, with the rejection of CONFU E-Reserves Guidelines and without an ALA policy specifically for e-reserve, many libraries were unsure as to how to proceed. Cases such as the *MAI Sys. Corp v. Peak Computer, Inc*. indicated that "simply reading the item on the screen makes a copy of the copyrighted item," although Gasaway also points out that many scholars disagree with this unusual interpretation and instead consider any such copy as incidental to the use (1997). Publishers also worried that on-screen display of materials in public areas increased use of reproductions rather than the original items. In spite of these confusing aspects of copyright law as it applies to electronic reserve, new procedures were developed at University of North Carolina at Chapel Hill and on other campuses, to seek permission for any use beyond the original CONFU E-Reserves Guidelines. Staff was increased accordingly to handle the increased workload. Many libraries chose a less stringent interpretation of E-Reserves Guidelines, asserting that

ownership of a print item entitled libraries to claim fair use in digitizing to make the copy available to local user populations. This interpretation adapts the copyright policies that govern the print reserve process and applies it to the electronic.

Faculty members have an investment in the decisions librarians make about electronic reserves software implementation and copyright policy, and are, along with students and reserves staff, one of the three main stakeholder groups of electronic reserves. Reserves staff provides what is intended to be a timesaving and valuable library service to faculty members with what seem like increasingly tight schedules and heavy teaching loads.

Difficulties arise in maintaining this service, when faculty members are faced with an array of options in authoring a Web-based home for their courses. The faculty has never had more options in presenting a course's structure and reading list to students than at the present time. Instructors can make use of the library's reserve services, or e-reserves, or use a course module created with learning management software such as Blackboard or WebCT. Another option is to continue to forego use of electronic resources in favor of producing photocopied "coursepacks," usually through cooperation with campus bookstores.

It is thought that a good share of faculty members would agree that e-reserves are an important point of service. However, there are many others who have created course-related Web sites independently for years. These instructors may happen to prefer resources they have designed personally over either library-managed services or learning how to use course management software. Whenever faculty members are mounting Web pages independently, a common concern is that they may unwittingly expose the institution to copyright infringement lawsuits through unauthorized reproduction or digitization of protected materials.

Use of electronic reserves by student users is equally as sensitive an issue for publishers. Publishers are relatively suspicious of making material available for use in library reserve operations, perhaps fearful that users, who have grown up in the era of Napster and KaZaA, would be similarly laissez-faire in their regard for copyright law as it applies to text content as they are with the latest MP3.

As with music downloads, electronic reserves comprise a critical content service for a student population on the go. There have been swift changes in user preferences for electronic material over the last five years. Access to a personal computer has become even more common, and policies such as that of UNC-Chapel Hill, which mandates laptop ownership for incoming students, have been instituted. The marketplace for high-speed Internet access has grown quickly. Users of all ages have eschewed television viewing for Internet browsing and online activities, such as e-mail, instant messaging, shopping, gaming, content creation, file sharing, and fact-finding (Horrigan & Rainie, 2002). The demand for educational products has also grown, as entrepreneurial online education companies like the University of Phoenix have become large and profitable operations.

Most undergraduates now are likely to expect to interact largely with electronic sources, as they have throughout their years in primary and secondary education. Undergraduates come to the academic library more computer literate than students of five or ten years ago, and they expect easy access to electronic information. They want and need their computers at home and in the residence halls to be fast. The emphasis is on the immediate. This kind of customer demand evokes a host of questions for the managers of electronic reserves. Are these students using electronic course materials differently than before? Is there a difference between the access to which they are

accustomed at home and the access they have from campus access points? What do these students like about electronic reserves, and what do they find dissatisfying?

According to the 2001 Pew Internet study on teenage life online, 71% of teens said they used "the Internet as the major source for their most recent big school project" (Lenhart, Rainie, & Lewis, 2001). Although most faculty members and librarians experienced the transition from print to electronic reserves just a few years ago, incoming freshmen are often not aware that reserve materials are available in print. This is all the more reason to evaluate anew student perceptions of service quality.

There have also been considerable changes on the electronic reserve front for reserves staff during the last five years. The introduction of commercial products, such as Docutek ERes, and e-reserves modules of integrated library systems (ILSs) occurred only 5-6 years ago. Today, some institutions are still adopting e-reserve solutions such as ERes to simplify processing workflow, whereas others are still exploring management of their homegrown systems. Reserves staff is always coping with the new developments in this ever-changing market, as software products and processes are refined, and employees become acquainted with revised procedures. Electronic reserves in academic libraries are clearly a service component very much in transition.

With commercial products such as Docutek ERes in use at the UNC-Chapel Hill at present time, the design and specific features of e-reserves remain in question, but in a different sense. Electronic reserves are widely accepted and here to stay, whether they are used exclusively or combined with course modules in learning management software, complementary print resources, and instructor-crafted, Web-based course guides. Some of the problems reserve operations face today may be identical to their predecessors from decades ago. The new question for academic libraries is one of improving service quality

and conquering the digital inequities within our user populations. To do this, it is necessary to understand more about user attitudes toward customer service, Web site usability, on-campus access points, the specific technologies remote users employ, and their online habits and behaviors.

The changes in attitudes toward reserve collections seen throughout the country are similarly reflected at UNC-Chapel Hill. At the time of the survey, the E-Reserves Web site was used by 986 courses at the UNC-Chapel Hill, and the system is expected to only grow. At present, the system includes 1003 accounts, and since Fall 2003, total documents in the database have increased by nearly 25% to 21,516. Total items on reserve have more than doubled in the last two years. Because of the increased use of electronic materials, the E-Reserves Unit must devote a substantially larger portion of its budget to paying copyright fees. In spite of these other approaches to course authoring, use of electronic reserve materials continues to spiral upward.

This sharp increase has taken the UNC-Chapel Hill Academic Affairs Libraries by surprise. The Academic Affairs Libraries have been using course reserves online for nearly five years, introducing the Docutek ERes system that is currently in use in September 2001. The content of E-Reserves help pages was revised in the fall of 2002.

Because of the substantial increase in use of the e-reserves system at UNC-Chapel Hill, Library Administration had expressed an interest in surveying users on their perceptions of the Web site and service quality. In Fall 2003, the R.B. House Undergraduate Library decided to investigate user attitudes toward e-reserves service further. The author of this paper and Leah McGinnis, Undergraduate Librarian, managed the study. For the study, a user satisfaction survey was designed, and implemented by the author of this paper. This paper reports the results of that study.

Literature Review

Academic libraries have long made high-use materials the most accessible in their collections. Developing collections, which focus on course offerings, providing access to materials, and supporting users with training and public service have remained important to academic libraries for decades. Since the 1800s, academic libraries have grouped course-related, high-use materials together as reserve collections, which are formed using materials from the core collection and maintained in physically separate locations for convenient access.

The idea of a separate room for course-related readings grew naturally from the idea of maintaining a separate reading and study space. The arrangement of library interiors with great halls for reading and study (*exedra*) dates from the dawn of Western civilization, deriving in part from rooms within the architectural complexes forming the *gymnasia* of ancient Greece (Makowiecka, 1978).

In 1878, the "reserved book room" at Harvard Library was discussed in 2-year old *Library Journal* ("Special Reserves," 1878). This is thought to be "the first mention of a reserve room in library literature." (Gasaway, 1997) In this system, books on reserve were arranged in an alcove and marked with a special "Reserved Book" label. The labels were colored, and each professor who kept books on reserve had "a distinctive color." As the practice and adoption of what was also known as the "assigned reading room" gained acceptance through the 1880s (Brown & Bousfield, 1933), Melvil Dewey (1887), using his characteristic phonetic spelling, commented on controls necessary in the reserve collection to thwart the acts of young, highly learned thieves: "Sum of the students in their zeal for lerning wanted it all; and, as these books wer on open shelves where each

helpt himself, we soon found that the books most wanted often disappeard [sic]."

Early in the last century, reading rooms in academic libraries divided into undergraduate and graduate sections were common, as were departmental reading spaces, which sometimes were supervised by library staff. Some divisional or departmental reserve reading rooms even offered subject-specific reference services (Wilson & Tauber, 1956).

In the same vein as Dewey's complaints above, as long as reserve collections have existed, faculty and some librarians have espoused harsh criticisms of such service. Fifty years ago, there were calls to abolish reserve reading altogether, because it was perceived to interfere with the general public's access to library-held titles and connected works to course-related use only, while failing to teach students to appreciate content on its own merits. Wriston (1939) frames this failure in the context of individual student learning: "The individual with ideas and appreciation of problems, with resourcefulness and energy, can learn many of the technical things which were omitted in his training as he administers the library, but all the course in the world will not supply imagination or tact, industry or scholarly feeling."

Branscomb (1940), the former University Librarian at Duke University and Chancellor at Vanderbilt University, similarly, rails against reserve operations in *Teaching with Books*:

> The unsatisfactoriness of the reserved book arrangements in most colleges is agreed to by students, librarians and instructors alike. The brief periods for which the books may be used, the necessity for many duplicates, the waste involved when reading lists are changed, the large number of volumes tied up which are not used, the crowded, noisy and restless condition of the reserved book reading room, and the tendency of students never to go beyond the books given this special handling, are all causes of complaint.

Wilson & Tauber (1956) mention that library building experts recommended reserve reading rooms be located near the building entrance, "so that the heavy traffic [would] interfere least with the other uses of the library."

Lansberg, in 1953, writes of the overall dissatisfaction with reserve operations and what was perceived as their uninspired missions, and makes mention of the systems in place at this time. Some libraries maintained a closed stacks area of reserve items, whereas others had completely open stacks. Other libraries, such as Harvard's Widener and Lamont Libraries, employed a combination of the two systems. Librarians criticized reserve systems, but ultimately tolerated them, admitting that they were high-maintenance, but necessary. Lansberg quotes Eileen Thornton, librarian at Vassar College, who remarked that, although she viewed "the reserve system with a jaundiced eye," there would certainly be more risk that more cantankerous students would steal or hide in-demand materials in its absence.

There was clearly a need to improve and expedite reserve processing. At Brooklyn College in 1964, Weyhrauch discusses the introduction of automation in the reserve room. Automation at this time included only a Simplex machine to rubber-stamp dates and tracking numbers, an "IBM Alpha-Numeric key punch," a numerical sorter, and a collator. In this environment, reserves staff spent upwards of five hours daily manually sorting and matching up call slips and transaction cards. Understandably, Weyhrauch writes, the process "became an intolerable burden… It was never finished; it was never up to date; it was never accurate." Despite the striking resemblance of this statement to the feelings of present-day reserves staff, office technology we would classify as primitive today truly brought a new level of efficiency to reserve operations.

As of the late 1960s and early 1970s, reserve automation leaders such as Fasana (1969)

at Columbia University and Gallivan, Bamber, and Buckland (1972) at Lancaster University in the U.K. had put into place systems that would allow for improved inventory control, processing, and the production of computer-generated lists which staff could reference and which could also be printed out for public use at the reserve desk. This batch system at Columbia used a series of programs written in COBOL stored on a random access drive as well as a punch-card reader and a printer.

Storage devices became more common through the 1970s. Simple programs and floppy disks were used to maintain historical reserve collection information. Voth and Lipp (1976) at Kansas State University used floppies to weed the reserve section and produce annual renewal lists for instructors, resulting in "improved service" and "a better overall library image."

When personal computers began to be a common fixture in academic libraries, reserve operations aimed to replace systems such as the one Millar and Cochrane (1985) discuss, in which "long, narrow strips of card were fitted into a metal holder. The strips were interfiled alphabetically by author and title" and "constant typing and filing" was required. What's more, at the patron end, only one patron at a time could use the dog-eared printouts made available for student perusal. The solution: software and electronic access. Commercial software was beginning to make its entrée into the academic library. Millar and Cochrane mention setting up a reserves-dedicated PC that could run a dBaseII database on a Cifer 2684 microcomputer at their library at Paisley College in Scotland. Around the same time, the University of Virginia was also addressing "backlogs, disorder, and a reduction to service" by building a custom system that automated reserves processing and checkout (Self, 1985). Evidently, some librarians still did not feel any more loving-kindness toward reserve reading operations than they did 30 years previous.

Self writes about reserve reading service, “librarians keep hoping it will go away.”

Meanwhile, a general feeling was building that library maintenance of the reserve function was in fact subsiding. Fisher (1988) writes about the decline in reserve usage recorded at the University of Denver’s Penrose Library from 1980 to 1987. Since the mid-1970s commercial photocopying shops such as Kinko’s had sprung up around most college campuses to deliver “custom publishing materials,” (Hoover’s Company Information, 2004) and it was believed “students would commercially duplicate [course readings] rather than use the reserve copy.” (Fisher, 1988) According to Fisher, “some [students] were instructed to do so.” Also to blame were “decreased hours of service, reduction in seating, use of more paperbacks, library charges to departments for use of reserves, greater reliance on textbooks..., and lack of publicity regarding the availability” of the reserve service.

In 1988, the same year of Fisher’s survey, Gyeszly surveyed the reserve operations of ARL libraries. Of the 78 responding institutions, it was found that all ARL libraries maintained reserve reading collections. This proved that, despite Fisher’s reported decline in reserve usage, reserve services were still important enough to not have been abolished. Gyeszly reported that the majority of students retrieving reserve readings would access a printed list of all readings placed on reserve at the reserves desk, request an item, at which point reserves staff would retrieve hard copies of the materials for the patron. Fifty-two percent of libraries had entirely closed stacks, 3.9% had entirely open stacks, and the remainder responded that they had both closed and open stacks in their reserve operation. The same survey found that institutions with higher enrollments were moving the fastest toward automation of reserve processing. Perhaps a fair number of librarians were still holding out hope that reserve collections would wither away to the

point that they were no longer needed. Overall, 26.9% of libraries stated that they had not yet automated their reserve departments at all.

On the automation front, although an array of database options were available by the 1990s, it was still in many cases perceived as necessary to develop home-grown reserve automation solutions. At Moravian College in Pennsylvania, a database management system created by students was used for 2 years until the computer on which it was housed became outdated (Crawford, 1990). This is the first mention in reserve literature of automating the generation of letters to faculty for reserve list renewal. On some campuses, such as Northwestern, modifications were made to a NOTIS circulation system, but integrating reserve item records with the library's main database proved too complex and time-consuming (Aagard & Furlong, 1990). Crawford writes, the local system at Moravian College was superseded by the commercial Dynix reserve book room module.

Within a few years, librarians were taking a step beyond automating and organizing reserve collections through new technology. It was time to make full-text articles available. This leap forward was in response to a ruling in the 1991 case, *Basic Books v. Kinko's Graphics*, which effectively ended the age of "anthology service." In the suit, it was ruled that Kinko's was infringing copyright by reproducing coursepacks consisting of selected readings (Seaman, 1995). The result was a growing interest in electronic course reserve systems.

A system was developed at San Diego State University that was available locally in what was known as the Electronic Reserve Book Room (E-RBR). Bosseau (1993) described the system as a solution to students waiting in lines to photocopy reserve items. E-RBR operated using an optical storage device, a WORM-drive jukebox. It was

determined that students would also pay for an electronically delivered copy, as they would a photocopy, and that this would help "recover costs associated with maintenance and copyright fees."

This was not the case at Colorado State University or Duke University, two other electronic reserve pioneers. Colorado State University's Reserve-Online! system was well received by students (Enssle, 1994), but "relied primarily on professors to advertise the service." Enssle pointed out that, "this did not work." Banks (1996) notes similar problems at Southeast Missouri State University a couple of years later, when during a survey of faculty reserve use, a majority of faculty reported that they did not know reserve had been automated. Duke sought to create a "document-on-demand" service through which students could order coursepacks through electronic reserve space in the library. Former Duke Library Director Jerry Campbell (1995) described the initial electronic reserves system as "not user-friendly," but in spite of being difficult to use, students took well to the system. Instructions were provided at each terminal, although Campbell states that most students didn't read instructions and largely "didn't need instructions."

Electronic reserves systems began to appear either as homegrown solutions or through use of commercial software. As Austin (2001) writes, the move toward adoption of e-reserve services gained in momentum with the rise of World Wide Web and the "mainstreaming" of e-reserves as evidenced by development of commercial products. E-reserves were arguably a response to changing expectations and information behaviors among student populations who were requesting access to high-quality materials regardless of location. One such system was Contec's C3, introduced in 1996. While Brett Butler (1996) of Contec wrote of the new C3 product as a "low-cost virtual

warehouse," it was referred to as a "digital library system," a benefit of which was the "disintermediation" of services. In other words, libraries could, through the newly founded Copyright Clearance Center, now work directly with publishers to determine the future of information services online. However, McGinnis (1999) points out that the Contec C3 system required users to access reserve items locally, and users evolved more quickly than the C3 product.

The need to adhere to copyright law was stressed often by librarians, and eventually this was communicated to the software innovators turning out electronic reserve management products, such as Docutek Information Systems. The benefits associated with Docutek's ERes software was greatly improved when copyright management features were developed. Using this feature, reserves staff would be able to maintain a database of rightsholder information, generate permission request letters and basic MARC records for the main library catalog, and create reports on usage, fees paid, broken out by course, department, or publisher. The goal of ERes was to provide an "intuitive interface" and create a Web-based system which faculty could also use to "make entries directly." (Kesten & Zivkovic, 1997) Although the original intent was to "empower the faculty," a lot of libraries opted to manage the entries themselves in order to maintain a quality-controlled database with clean, consistent data that could be used for the copyright clearance communications and to gather reliable usage statistics.

One of the first student user surveys of electronic reserves was a study done at the Citadel in 1999 (Reichardt, 1999). This study reported differences between the preferences of full-time students who attend during the daytime compared with students who are part-time evening students. Seventy-three percent of the daytime students preferred the online reserves, whereas half of the evening students preferred using paper

reserves.

Recent research in the area of electronic reserves has mostly focused on organization rather than usability. Many researchers, such as Hiller and Hiller (1999), reviewed e-reserves processing workflow; he pointed out that processing time increased for staff compared with traditional reserves. Others, such as Bale (2001), discussed the option of library e-reserves processors using course management software instead of dedicated e-reserve packages, such as ERes, citing content security, existing tech support, cost, and positive response from students are reasons for this approach. Still, other researchers, such as Laskowski (2002) from the University of Illinois at Urbana-Champaign, discussed management of homegrown e-reserves systems. A large number of libraries are still using homegrown e-reserve solutions. This figure may be even higher in law libraries. In a 2002 survey of academic law libraries' e-reserve operations, Cochran notes that, "The majority of the respondents (65%) indicated that home-grown Web-based systems are being implemented in law libraries… Innovative Interfaces, Inc. was a distant second at 13%, followed by ERes at 6%."

These organizational and workflow descriptions were likely useful to libraries, especially those at smaller colleges, which had not yet explored the possibilities of electronic reserves and could not afford a commercial e-reserve solution. However, these authors, in describing their homegrown solutions, had likely not yet encountered or might not have been aware of some of the service questions that would arise because of the increased amount of time required to manage copyright permissions. Particularly onerous were submissions to e-reserves from faculty that arrived late, contained incomplete or incorrect information, or misunderstood copyright, as detailed by Cody (2001) at the UNC-Wilmington. Other library systems, such as the University of Illinois,

had to organize their service between several campus libraries and centralize their scanning operations (Weible, 2003).

In 2003, Lori Driscoll from the University of Florida produced a valuable guide for library staff members that addresses strategic planning, staffing, service assessment, workflow (including copyright permissions management), copyright law as it applies to e-reserves in its current interpretation, sample copyright policies, and forms.

There are some references to usability in the literature, although it is not the chief focus of any survey. Pilston and Hart (2002) discuss "user reaction to this transition [to digitized reserve collections]" and some of the negative aspects that drive users away from use of the service. They found that users appreciate the timesaving features and 24-hour access of electronic reserves. This kind of appreciation from millennial users of a system in transition, however, is apt to soon fade. In *Managing Electronic Reserves*, Hiller (2002) mentions that "for a first- or second-year student, electronic reserves may be all he or she has ever known, so naturally there will not be an onslaught of comparative comments along the lines of 'this is so much better than the old way.'"

Today, academic libraries are at a crossroads in offering these kinds of services to students and faculty. It is therefore curious that there have rarely been extensive user assessments previously publicized via library literature.

Four or five years have passed since studies were conducted at the Citadel (Reichardt, 1999), University of Missouri-Rolla (Peterson, 1999), Bucknell (Hiller & Hiller, 1999), and UNC-Chapel Hill (McGinnis, 1999), and there have been a lot of technical changes during this time, especially as a large number of libraries prepare themselves to migrate from a legacy system to a new ILS, and in the process find that they will need to make arrangements for a new electronic reserves system altogether (Kenney, 2003; Breeding &

Roddy, 2003).

The literature describing the electronic reserves system at UNC-Chapel Hill is not extensive. Barreau (1985) completed the first research on automation of a reserves system at UNC at the Health Sciences Library, recommending the implementation of a dBaseIII automated system. The most recent survey on user attitudes toward e-reserves at UNC-Chapel Hill was carried out by Colaric in 1998. Colaric studied students who did not read traditional reserve readings and their attitude toward electronic reserve. Her study followed up on the electronic reserves related research done the previous year. It was clear the user demand for access was increasing at a rapid pace.

In her 1997 master's thesis, Petersen provides an excellent summary of the history, goals, and perceptions of electronic reserve service. However, the survey she administered was during a time of rocky transition from the paper to the electronic. In Petersen's survey, 44.6% of users reported that they would find "access [to reserve materials] from outside the Library" desirable, whereas one year later, among Colaric's survey population, 78.3% reported that they wanted "access from outside the Library."

Just one year earlier, in 1996, Cai interviewed 83 library users in the Reserves Area of the R.B. House Undergraduate Library. Participants were asked about the details of known-item searches they had performed at the Reserves Desk in order to determine usability standards for the design of an electronic reserves system search interface. At the time of this study, many academic libraries were not yet aware of commercial electronic reserves systems, and expected to design homegrown systems.

Library services have in the years since the research of Cai, Petersen, and Colaric undergone a great deal of change. It is no longer cost-effective to design e-reserves systems in-house. The focus of user studies of e-reserves systems has shifted from

comparisons of print and electronic to assessments of quality and equity of access. However, Petersen asks a question that remains highly relevant to e-reserve operations of today: "Given the different access and delivery options available to implement in electronic reserve systems, which design will be most successful?"

In 1999, McGinnis followed up the Petersen and Colaric studies, describing experiences at UNC-Chapel Hill with the local access-only Contec C3 system, and the implementation of Docutek ERes, which allowed authenticated access by remote users. In a later article, McGinnis (2000) describes the need to manage copyright permissions, which was developed by Docutek after significant feedback from library clients, who expressed a need for this feature.

Considering the previously mentioned alternatives to electronic reserves service—instructor Web pages and course management software such as Blackboard and WebCT, the Library must market and position itself to maintain its own institutional mission, to provide the services through which it has committed itself. Any lapse in service quality could potentially drive faculty, or students, to squander resources on competing information services and authoring technology.

With this in mind, in Spring 2002, researchers at UNC-Chapel Hill conducted the LibQUAL™ survey co-sponsored by the Association of Research Libraries (ARL) a large-scale general study that aimed to gather data on user perceptions and attitudes toward the Libraries. The LibQUAL™ survey was derived largely from SERVQUAL, a customer service assessment instrument. With the advent of e-business design, the current definition of personal control relates strongly to SERVQUAL and the customer-centric business service philosophy in accordance to which it was developed. Personal control is defined as encompassing customization, personalization, and general service-

oriented adaptation of both human and Web-based interfaces, whenever possible.

LibQUAL™ segmented the results into user groups including undergraduates, graduate students, and faculty. Survey results indicated that, among the all groups in the surveyed population, the largest concerns were issues of "personal control", or, the degree of independent or unmediated interaction with information resources irrespective of user location (Webster, D. et al., 2002). The LibQUAL/Library Assessment Task Force at UNC-Chapel Hill reported that, "The level of dissatisfaction should be of some concern, as electronic resources are heavily used." (Mohanty, Norberg, Owen, & Strauss, 2002) In the survey, the organization and link language of the Library Web site were singled out as sources of confusion. These concerns were later addressed with a new Libraries Web site design in 2002 and usability studies to follow up on effectiveness of new link language and navigability in Fall 2003.

Electronic reserves, as a regular component of most students' learning experiences, comprise a service that depends heavily on user preferences and time management. This also requires an easily accessible, highly usable Web presence. Personal control is highly relevant to users of electronic course reserves, whether they are students or faculty members. Allowing users the freedom to determine how, when, or where they access materials may contribute meaningfully to the perception that the library offers a wide range of services and is no longer building-based, but capable of serving a community's needs as an institutional repository of knowledge, encompassing both the print and the digital.

A survey was designed to attempt to shed light on these issues of "personal control" as they related to the UNC-Chapel Hill e-reserves system. It also sought to explore "affect of service," or feelings toward library service, which was explored in the survey under

the category "human service." Under "human service," survey participants were asked questions about speed of customer service, processing turnaround, preferences for paper over the electronic, and perceptions of staff attitude. Access to information, or service equity between the local and remote user, is another component of the survey. Lastly, the environment and ergonomics were treated briefly as well, in the interest of learning more about the effect of the point of access on user perceptions of service quality. These dimensions were in part based on the same dimensions of the LibQUAL+ survey, as they apply to the e-reserves service environment at UNC-Chapel Hill.

Methodology

In an attempt to gather more information about electronic reserves, the UNC-Chapel Hill Academic Affairs Libraries decided to carry out a survey to study user attitudes toward and perceptions of e-reserves at UNC-Chapel Hill. The Undergraduate Librarian asked the author of this paper to design and carry out the survey (see Appendix A). The study was advertised to students and instructors in the classroom through e-mail and print, through university publications, Library Web pages, and by encouraging students to participate at a laptop station in front of the Library. The survey author used all these promotional methods, because it was expected that difficulties in eliciting participation would arise, especially with faculty users, typically an over-surveyed population with time limitations.

Current users of the E-Reserves Web site were asked to participate in the study through their instructors. Instructors were contacted by e-mail and requested to distribute the URL to the online version of the survey. Our hope was to increase the amount of faculty participation, and in this way, both instructors and student e-reserve user groups were

able to be included in our sample. Two weeks after initial contact, the researcher followed up with a printed request.

The survey was marketed to campus media via press releases that explained the need for the survey in the context of course planning for instructors, rising costs, and state budget cuts. The University Gazette, a faculty/staff print and online newsletter, announced it in an October issue. The survey also received mention in another publication, CITations, which appears bimonthly and features technology-related news of interest to UNC-Chapel Hill faculty members, graduate instructors, and support staff. (http://www.unc.edu/cit/citations/citations105.html).

The survey took place over the course of the Fall 2003 semester, and subjects were recruited through the classroom in the earlier part of the semester. As the semester progressed, the researcher recruited survey participants in-person. A peer-student library employee and a graduate student recruited these later participants in a central area of campus with a high volume of foot traffic, outside the Library building in a well-used seating area with benches. They passed out slips of paper with the survey URL printed on them for students who expressed interest, but who were in a hurry. A laptop station with a wireless connection was also set up to allow students to take the survey on the spot. All potential participants were offered candy in return for their time and interest.

In addition, early in the semester, a text link announcing the survey appeared on the main UNC-Chapel Hill Libraries home page (http://www.lib.unc.edu). Responses were also encouraged with a hyperlinked announcement in rotation on the Undergraduate Library's home page (http://www.lib.unc.edu/house) and on the E-Reserves front page (http://eres.lib.unc.edu), both as a text link in the main menu and as a smaller news item link.

The results from the online survey were entered into and stored in a mySQL database that was built specifically for this survey by Library Systems Staff at UNC's Davis Library. For reporting and analysis, the final results were retrieved and moved into Excel spreadsheet format. The data was analyzed using a combination of Excel and the statistics software package, SPSS.

Aims of the Survey

The major goals of the survey were identified by the author of this paper as gathering more information about usability, computer and browser specifications, expectations for electronic reserves staff, and cultural factors that determine the user's point of access. Access in this sense would not be defined only access per se, but unimpeded access. Do users perceive obstacles to the user experience? Is there slow or efficient service that would discourage adoption of e-reserves by potential users? The survey was marketed heavily by the author of the survey and librarians in the Undergraduate Library to faculty users of electronic reserve services, fully aware that traditionally this is a group that is hard to survey, but to whom electronic reserve services are often mission-critical.

There is a notable absence of faculty opinion on e-reserve operations in the literature. Service assessment is especially important in terms of use among the faculty population. Even with a highly service-oriented and dedicated team of library staff to adhere to institutional policy on fair use of materials, and maintain an online home for their course materials, faculty may still have preferences or restraints that e-reserves processing workflow does not take into account. It was the goal of this survey to gain some new insight into these preferences.

Therefore, in summary, the survey was designed to address all factors below in the

interest of improving electronic reserves service quality at UNC-Chapel Hill from both a student and faculty perspective.

Demographic Preferences

The LibQUAL+™ survey broke out survey results according to user sub-populations, or "rank": faculty members, students, graduate students, and staff. The delineation among these different user groups was critical to the study. Each group was perceived to have a different perspective, because of their unique needs with regard to reserve reading lists.

In addition, the survey aimed to explore differences in attitude toward e-reserves between other demographic factors, such as age, sex, school, department, enrollment in courses using e-reserves, Internet connection speed from off-campus computers, and browser type and version preferences.

Customer Service from Reserves Staff

The survey attempted to gain information on perceptions of staff job performance, including attitudes and helpfulness. It was thought that faculty might express concerns about length of time necessary for reserve processing, as well as procedures for submission of materials to Reserves Staff.

Legibility of Scanned PDF Files

Based on previous research, it was thought that there would also be issues with the perceived clarity and legibility of the articles on e-reserve, which are scanned as images using a Fujitsu Duplex flatbed scanner. The survey included questions that addressed e-reserves clarity, including views of items from the screen and once printed.

Preferences for Paper vs. the Electronic

Another aim of the survey was to investigate printing behavior related to the reading

of articles on e-reserve. User preferences for paper would provide information useful in planning for any additional printing access and cost control.

User-initiated Limitations of Access
(including prevalence of multi-tasking and simultaneous use of other programs—in particular, music, games, and instant messaging)

Other user behaviors that take place at the same time e-reserve items are accessed were also considered. It was hypothesized that simultaneous users of P2P music downloading software and online games could possibly interfere with E-Reserves site functionality, because of the amount of bandwidth these online activities consume. We also wanted to consider how simultaneous use of instant messaging software or having more than three browser windows open and active at one time may affect user perceptions of the E-Reserves site, because we were interested whether the user experience may be affected adversely by on-screen distractions and multi-tasking/toggling behavior.

The survey attempted to address some of these issues by including questions pertaining to simultaneous user behavior. For example, the number of undergraduates using instant messaging technologies at the same time they used the E-Reserves System was thought to be dramatic. This was especially expected among on-campus-oriented students among the survey participants. A study from Hong Kong on the use of ICQ (an interpersonal communication tool that was a precursor to and has similarities to AOL Instant Messenger (IM), which remains popular in Asia and Europe), indicates that students who live in residence halls are highly likely to be users of the chat tool (Leung, 2001). Therefore, high use of IM is likely an important part of modern "dorm culture," due to high-bandwidth Internet connections and the highly social atmospheres that residence hall life encourages. On the other hand, the high percentage of simultaneous E-Reserves IM users may, as mentioned previously, be something of a generational trend. Are these

users different? Howe and Strauss (2000) contend in their interpretation of the "Millennial Generation," that so-called Millennials indeed are. They say these students are much more time-pressured, but also more team-oriented than previous generations.

A team orientation is already implicit in the use of IM and online chat technologies, sometimes referred to in communications literature generally as CMC (computer-mediated communication) (Riva, 2002). The buddy list feature of AOL Instant Messenger as well as other CMC tools such as ICQ, Yahoo! Messenger, and MSN Messenger reinforce the perception that the user is involved in collaborative communication and belongs to a self-defined social sphere. As users select their "buddies," to include in their "Buddy Lists" of virtual acquaintances, they create a reference of presences tied to groups or categories of individuals. This creates an environment in which there is constant waking-hours access to a team of users, who can offer empathy or advice in dialogue form, or checked in on, in times of boredom or stress. These types of CMC tools, some say, reinforce a mindset of instant gratification, while others may conclude the protocols of using IM include the understanding that lack of response is not necessarily meaningful. Whether these mindsets of the IM generation affect perceptions of online document retrieval or delivery is an interesting question, and more research could be devoted to this topic of study. The survey results did not aim to measure levels of IM use among the general university population.

Likewise, it could be presumed that the repercussions of this new and growing user base running CMC applications alongside on-screen e-reserves reading would result in less learning and nonlinear thought. Our survey, however, does not make the distinction between those engaged in "simultaneous activities" (IM, downloading music, game-playing, and using multiple browser windows) while accessing the E-Reserves site to

print out documents and those actively multi-tasking while reading from the screen.

Environmental Limitations of Access

Also included was a question about distractions in general: "There are too many distractions that keep me from working."

It was thought concerns about distractions and multi-tasking were legitimately founded. Psychology researchers at the University of Georgia have demonstrated that users get frustrated more easily in an environment, where they lack privacy, in a study of how the amount of privacy a worker has relates to job performance and satisfaction (Block & Stokes, 1989). The results of the study showed an increase in the need for privacy in proportion to task complexity in work settings. When users performing complicated tasks, such as research, confinement to environments in which they feel intrusions are less likely are more conducive to job satisfaction, because of "sensitivity to public evaluation." For this reason, it is easy to understand why modern offices routinely feature different kinds of office barriers, cubicle designs, and workstation layouts in various working environments. It was believed that it would not require that much of a stretch to apply this same performance/satisfaction framework to the researcher or student, who is also doing his/her job in a workstation environment similar to that of the present-day office worker. A more recent study explored generational differences in workplace attitudes toward privacy needs, and concluded age does not play a role, and that older workers are no different than younger workers in their needs for distraction-free work environments in the face of complex tasks (Kupritz, 2001).

Cyberinfrastructural Limitations of Access
(including connection speed, file download speed, and age of respondent's computer)

In this survey, it was thought that a fair definition of access as not only access in and of

itself, but unimpeded access, was a topic worthy of research. Do users perceive obstacles to the user experience? Is there slow or efficient service that would discourage adoption of e-reserves by potential users?

Information about Points of Access
(home, office, on-campus)

This survey sought to gather information about the campus locations from which students were accessing the E-Reserves site. There was an interest in what motivates student users as they choose an on-campus location from which to access e-reserves.

Web Site Usability and Attractiveness, Specifically As It Applies to Use of the PDF Format

The E-Reserves site makes use of the Docutek onCampus v.4.2.05 software, which does not offer much leeway for customers to alter a heavily text-based interface. The E-Reserves front page that the Docutek product can render uses a navy blue header, footer, and left-hand menu to frame links to search function, and help and informational pages (figure below). Even with aesthetic limitations, there are a number of improvements that could be made to the site for increased usability as per guidelines outlined by Nielsen and Tahir (2002). The right-hand sided navigation and announcement menu goes against results of Nielsen and Tahir's "Homepage Design Statistics," which state that only 6% of the sites they critiqued in their book, *Homepage Usability: 50 Websites Deconstructed*, had right-hand navigation schemes. Using their guidelines, the search the Web box at the top of the right-hand side of the page is not all that unusual, but its purpose on the E-Reserves site, a second-level UNC Libraries page with an intended audience of e-reserves users, is in fact questionable. The right-hand side navigation menu has been full of filler content, for over two years. Perhaps the wording of the links in the right-hand menus and the goals ought to be re-examined.

As Nielsen and Tahir review the front page of the Web version of the magazine *New Scientist*, they comment on how "well written and concise" the headlines and deck copy are in the former "Latest Online News" section of their site. The current *New Scientist* was changed based on their suggestions, and is now labeled "Latest News." Using a headline-and-deck model for the informational links is appropriate, but on the E-Reserves front page, the decks should avoid repeating the text of headline links (e.g. Headline: Information for Students, Deck: Information for students on getting standard with electronic reserves).

The E-Reserves front page also welcomes users to the site with the salutation "Welcome to ERes at University of North Carolina at Chapel Hill." According to Nielsen and Tahir, a salutation that says "Welcome!" is unnecessary, meaningless, and harkens back to the days of the Web in the early 1990s, when actually getting to a Web site was a feat worthy of congratulations. Today, many sites have dropped their welcomes in favor of tag lines.

Thus, another key question concerned whether users perceived the site as attractive. Although there are limitations to what can be accomplished with the site using the Docutek software, such results were thought valuable in informing future e-reserve site design projects.

Among the important considerations that this survey aimed to address implicitly were issues of personal control and attitudes toward the PDF. The PDF file format is used extensively in presentation of e-reserve items.

Web usability expert Jakob Nielsen (2003, July 14) lambastes PDF for the format's lack of usability in his online newsletter, Alertbox, calling it "unfit for human consumption" and "for online reading… the monster from the Black Lagoon,"

responsible for a great deal of "user misery." (2003, July 28) The PDF's only benefit for users is that it provides a print-ready format, Nielsen argues. Users have been duped into using PDFs for on-screen reading, when it was not designed for such use. When readers force themselves to read documents intended for print reading rather than on-screen reading, it is not surprising that they complain not only about legibility, as they did in our survey, but also about slow loading times, having to scroll, unwanted graphics, and limited navigation and searchability. Danish researchers (Hertzum and Frøkjær, 1996) have even concluded that users, in addition, don't reap as much benefit from on-screen reading as they do from reading of print materials, because lower reading speed contributes to "learning of lower quality."

Fortunately, the PDF format in itself is attractive and well accepted by the online user, not to mention, appropriate and well suited to printing. This is one of its main advantages. The relatively high number of users who print out documents rather than read from the screen is particularly marked. Sellen and Harper (2002), in *The Myth of the Paperless Office*, discuss three categories of "problems that paper presents: symbolic problems, cost problems, and interactional problems." E-reserves users at UNC experience all of these problems.

Printing Behavior Related to the Use of E-Reserves

There was a concern that printing out items from the e-reserves database in the campus IT-managed lab (where free printing was allowed) delayed other users and presented a service problem. This is representative of the symbolic problem of paper, as defined by Seller and Harper (2002), namely that the volume of printed documents produced on paper reveals personal disorganization. However, the word disorganization cannot begin to describe the chaos that ensues in an environment where unchecked, free printing is

available to a large lab of students. One can estimate that the crowded printing stations in a lab of 65 computers are surrounded by up to 10 students waiting for print jobs at times of highest traffic. Often, when the printed item is not found at the station, the print job is sent repeatedly. Admittedly, only a fraction of these print jobs consist of items on e-reserve. Students are frenetically printing assignments, papers, Web pages, and full-text articles they locate in databases as well.

One problem for certain e-reserves users in printing is perhaps cost. Charging library users to print may discourage them from printing at all and instead force them to read from the screen. However, it is noteworthy that more undergraduate users print than faculty members or graduate students. The pay-for-printing policy, therefore, could possibly be seen as infusing documents with value in the mind of the user. Users, in a practical way described as typical of the new "Millennial Generation," can consider the usefulness or relevance of their readings and determine whether it is worth having a portable, annotation-friendly paper version. They can then pay to print, should they feel a need to assign a higher value to one node of learning over another. Rather than see library policy of charging for print jobs as prohibitive and annoying, it is possible to see requiring users to pay to print course e-reserve documents as beneficial. During interactions with the reference desk, some student users, although perhaps a minority, have mentioned their reluctance to use the lab where free printing has been allowed, to do their printing. Reasons cited for the avoidance of the lab include the frequent "mob scene" and confusion that occurs due to the nearly non-stop output of paper around the lab's printing stations.

Lastly, there are interactional problems with paper. To make use of terminology from David Levy and his writings on electronic documents and digital preservation, items

viewable through the ERes database are more "fixed" in a sense, and in other ways, with regards to their accessibility by the UNC community, they are more "fluid." (Levy, 1998) By copyright law, namely fair use, they are available to students for the semester that they are enrolled in courses, but then the access to these items disappears. If students did not invest the time in creating print paper copies of their readings, the items placed on e-reserve by their instructor are no longer as accessible. However, there were no complaints from students regarding the function of the e-reserves system at UNC-Chapel Hill as a type of digital archive. Comments of this kind have previously been passed on to E-Reserves staff from faculty members, however. The E-Reserves database may wish to include policies stating that its aim is not to serve as a personal electronic document organization system for faculty members who renew course documents year after year.

Overall, as Sellen and Harper argue, paper is a viable technology that will be around for a long time to come. Furthermore, it is a technology that complements the e-reserve databases of today and tomorrow. If the results of Sellen and Harper's studies can be applied to e-reserves, perhaps it would show that user satisfaction very much correlates to the convenience of obtaining a print copy of an item.

In summary, this survey aimed to take into consideration the findings of previous surveys of electronic reserves systems, changes in information behavior as perceived to affect the new generation of Millennial users, Web usability studies, and comparisons of reading from the screen to reading from the printed page. It also sought to shed new light on access limitations and access preferences as they apply to e-reserves use. While the results of the survey might confirm the conclusions of previous research, it is the hope of the author that survey results provide more granular information than prior studies. It is thought that these findings could be used to identify the differences in attitudes and

behavior between segments of the UNC-Chapel Hill user population, which could inform future changes to e-reserves systems and policy at UNC-Chapel Hill and in other academic libraries.

Fellow graduate student research assistants in the Undergraduate Library tested the survey to determine how much time was necessary for its completion prior to the construction and posting of a Web-based survey. They found that a paper version of the survey questions took approximately 10-15 minutes to fill out.

The survey received a total of 104 responses. Responses from 15 survey participants who neglected to supply their rank were discarded, resulting in a survey population of 89.

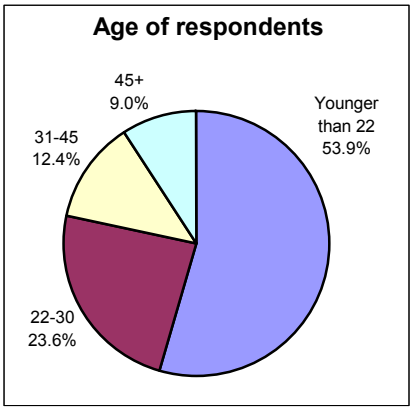
Results

The results from the survey are reported below. The survey can be seen in its entirety in Appendix A.

Demographics

The first question asked for participant age. As can be seen in Figure 1, more than three quarters of the survey population were under 30 (77.5%), and a little over a half were 22 and under. Other age groups specified by survey participants include "31-45" (12.4%) and "Older than 45" (9.0%). Five respondents did not give their age.

Figure 1. **Age of respondents**.

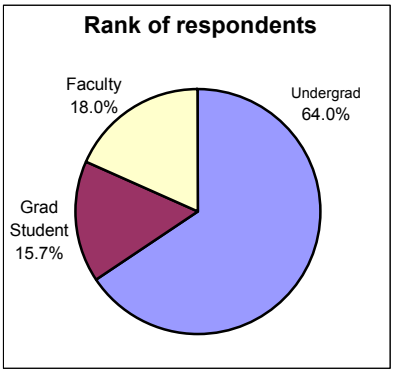


Question 2 asked for the participant's sex. Answers to Question 2 indicate survey respondents were much more likely to be female than male, which is similar to UNC's demographic profile. During the semester the survey was administered, enrolled students

at UNC were 58% female and 42% male ("Enrollment Statistics," n.d.). Females were more highly represented than in the student population as a whole. Survey respondents were 73% female and 26% male. Three percent of respondents did not provide gender information.

Question 3 concerned the prime demographic variable examined in this survey, rank (undergraduate, graduate student, faculty, staff). This variable was important, because it was felt that certain information behaviors would be related to generational culture. This study also placed an emphasis on this variable, because rank of respondents was also a main focus in the LibQUAL+™ study conducted in Spring 2002. The rank of respondents was distributed as follows: 57 undergraduates (64.0%), 14 graduate students (15.7%), and 16 faculty members (18.0%).

***Figure 2*. Rank of respondents.**



No staff members responded to the survey, although the Web survey included "staff" as a possible choice for Question 3. Staff members, apart from Reserves Staff in the Undergraduate Library, generally do not use the E-Reserves Web site. This choice was included in the survey in the event a staff member would have elected to take the survey.

In Question 4, users selected their school from a pull-down menu. Table 1 (appears on the following page) shows the breakdown between different UNC schools. As can be seen in Table 1, almost ninety percent of faculty participants were from the College of Arts and Sciences. The majority of instructors who use E-Reserves at UNC

Table 1.

Participants by School.

School	UG	Grad	Faculty	Total	Percentage
College of Arts and Sciences	49	2	16	67	75.30%
School of Information and Library Science	2	5	2	8	9.00%
Graduate School	-	3	-	3	3.40%
General College	2	-	-	2	2.20%
School of Education	1	1	-	2	2.20%
School of Journalism and Mass Communication	2	-	-	2	2.20%
School of Social Work	-	2	-	2	2.20%
Kenan-Flagler Business School	1	-	-	1	1.10%
School of Dentistry	1	-	-	1	1.10%
School of Nursing	-	1	-	1	1.10%

tend to be from the arts and humanities. The remaining 11.1% of faculty were from the School of Information and Library Science.

Graduate student survey takers identified themselves as being affiliated with the School of Information and Library Science (35.7%), the Graduate School (21.4%), College of Arts and Sciences (21.4%), School of Social Work (14.3%), School of Education (7.1%), and School of Nursing (7.1%).

As above in Table 1, the vast majority of undergraduate participants associated themselves with the College of Arts and Sciences, with others from the School of Information and Library Science, School of Journalism and Mass Communication, General College, Kenan-Flagler Business School, School of Education, and School of Dentistry.

Question 5 asked about the user's department. Response to this question, unfortunately, reflected that users possibly did not have enough choices from which to

Table 2.

Participants by Department.

Department					
Top response:	Other	16	18.00%		
DEPARTMENT	**NO. OF RESPONSES**	**%**	**DEPARTMENT**	**NO. OF RESPONSES**	**%**
Psychology	12	13.50%	Computer Science	2	2.20%
Political Science	7	7.90%	Dramatic Art	2	2.20%
African/African American Studies	6	6.70%	Public Policy	2	2.20%
Anthropology	5	5.60%	Environmental Sciences/Engineering	1	1.10%
English	5	5.60%	Folklore	1	1.10%
History	5	5.60%	Geological Sciences	1	1.10%
Exercise and Sports Science	4	4.50%	Germanic Languages	1	1.10%
Biology	3	3.40%	Linguistics	1	1.10%
International Studies	3	3.40%	Mathematics	1	1.10%
No response	3	3.40%	Romance Languages	1	1.10%
Economics	3	3.40%	Slavic Languages	1	1.10%
Art	2	2.20%	Sociology	1	1.10%

select, with "Other" the most commonly selected department (18.0%). The large number of "Other" responses indicates perhaps that not enough choices were available. "Other" refers to disciplines mainly outside the College of Arts and Sciences, such as Business, Journalism, Communications, Public Administration, Library Science, Information Science, Social Work, and Dental Hygiene. Perhaps if a field in which the participant could have typed the department name were used in place of the pull-down menu, this might have produced more consequential results. The results do indicate, however, that the survey population was heavily concentrated in the humanities. As can be seen in Table 2, respondents came from a wide variety of departments.

Question 6 instructed users to indicate the number of on-campus courses, exclusively online courses, and distance education courses they were taking or teaching, with separate sections for students and instructors, but allowing for responses to both, for those cases in which the respondent was a graduate-student instructor.

This question received few responses indicating survey takers were enrolled in or instructed exclusively online courses. Only three students were enrolled in online courses. No respondents were enrolled distance education courses (for students outside the Chapel Hill or Carrboro area). Similarly, none of the faculty members who were surveyed are teaching courses that are solely online or categorized as distance education courses.

Responses to Question 6 indicate that students who took the survey are likely to be full-time students who attend classes on campus. Undergraduates who responded are taking between 3 to 5+ classes, while graduate students report they are taking anywhere from 2 to 5 classes. Eleven undergraduates report taking 5 or more classes (18.33%).

Faculty members who responded to the survey are most often teaching 2 courses, with a mean of 2.47 and a median of 2.00. All surveyed faculty were teaching courses during the semester the survey was administered.

Questions 7 and 8 follow up the question of course enrollment, asking how many courses the respondent is taking or teaching, respectively, which make use of e-reserves.

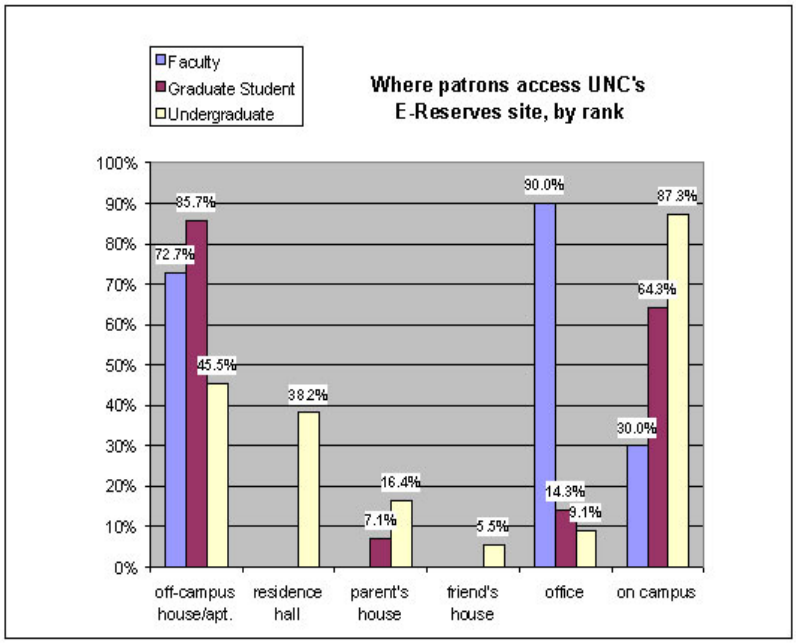
Students who took the survey are highly likely to be taking a course, which utilizes the Library's e-reserves service. Graduate student respondents take, on average, more courses that require use of e-reserve materials (mean 2.33, median 2.00), which is slightly less likely for undergraduates (mean 1.77, median 2.00). One third of surveyed instructors report they use e-reserves for more than one of their courses (mean 1.41, median 1.00).

The survey included questions about technical specifications, such as Question 9, which asked about off-campus access of e-reserves. As Figure 3 demonstrates, access varies considerably among faculty, graduate student, and undergraduate users.

Undergraduates surveyed say they most commonly access e-reserves on campus, while graduate students say they are more likely to be off-campus, remotely accessing items on e-reserve. Faculty members overwhelmingly access e-reserves from their offices as well as from home.

The survey inquired about connection speed with Question 10, asking users to describe their off-campus connection speed. Most often the faculty have a high-speed connection as their primary off-campus Internet connection (70.59%).

***Figure 3*. Access location by rank.**



More than half of graduate student respondents have high-speed off-campus connections (57.14%), but this is less than undergraduates, of whom 65% have high-speed connections from off-campus locations. Almost six percent of faculty and 5% of undergraduates surveyed indicated that they do not have off-campus Internet access.

Question 11 asks whether the user is a PC or Mac user. Overwhelmingly, if patrons access from a non-campus computer, they seem to be likely to access e-reserves using PCs. There were no Mac owners among graduate student respondents, while 17.65% of

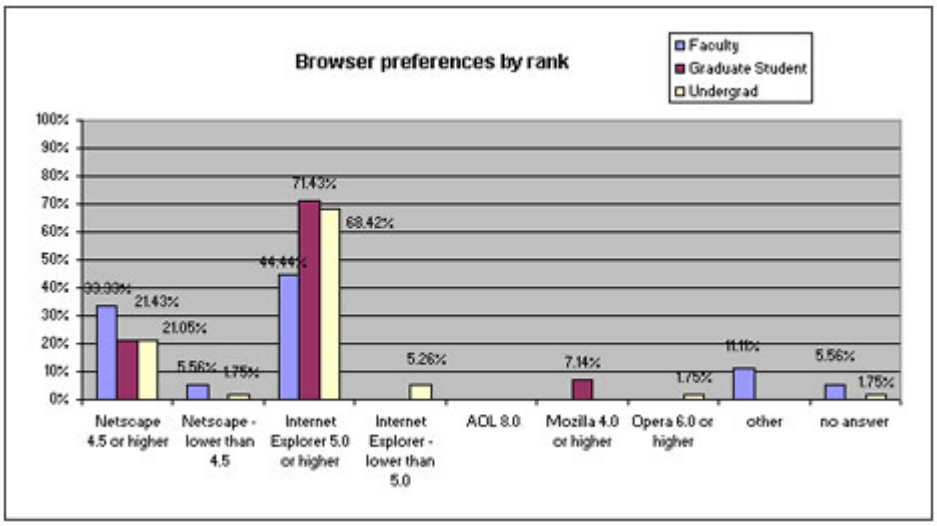
the faculty own Macs. Only 3.33% of the UNC undergraduates who took the survey are Mac owners.

Age of computer was seen as a factor that was potentially related to student attitudes via computer performance and speed of document retrieval. Question 12 addresses this. Results show that, among graduate student computer owners, 50% of those surveyed had purchased their current machine within the last year. Predictably, this was true for only 25% of the undergraduates, but a larger percent of them were owners of computers less than two years old (61.67%). As for the faculty respondents, the survey results indicate their home computers are often new, with 35.29% who say their computer is a year or less old. Some survey respondents also told us that they own older computers. Among the faculty, 11.76% own computers more than 4 years old.

More undergraduate respondents in our survey population own computers more than 4 years old (29.41%). Undergraduates in their junior and senior years at the time of the survey, however, are likely to have purchased their computers before UNC instituted its current policy, which requires all incoming students to own a laptop computer. Similarly, some graduate schools, such as the School of Information and Library Science and Kenan-Flagler Business School, also have requirements that students should own laptop computers, and include the cost of purchasing a new laptop computer among estimated cost figures for prospective students.

In Question 13, respondents were next asked about browser preferences, which differed substantially by rank among the survey population. As seen in Figure 4, among faculty members, nearly half use Internet Explorer, while a little over 40% use Netscape. The remaining 11.11% use another browser ("Other"). Graduate students also highly prefer Internet Explorer to Netscape or Mozilla. Undergraduate responses

***Figure 4*. Browser preferences by rank.**



similarly indicated a strong preference for Internet Explorer over Netscape. The version of the browser was also indicated, as survey takers were asked to specify if the browser they used most often was "Internet Explorer 5.0 or higher" or "Internet Explorer – lower than 5.0," "Netscape 4.5 or higher" or "Netscape – lower than 4.5." If we consider Internet Explorer before version 5.0 and Netscape before version 4.5 "old" browsers, there was not much use of these out-of-date browsers in the survey sample. A little over 5% of the faculty uses these older browser versions, whereas no graduate students claimed to use them, and only around 7% of undergraduate users say they use "old" versions most often.

Question 14 asked about frequency of computer crashes that require re-booting during access of e-reserve items. Most users report that this never happens (47.2%), but others indicate it does happen rarely (29.2%) or sometimes (10.1%). Only 2.2% of respondents say that it happens frequently. Ten respondents did not answer this question (11.2%).

Core Questions

Questions 15-38 were considered the "core" of the survey. These questions were labeled with headings that suggested five aspects of e-reserves service: access, human service, identification of resources, clarity, and user behavior. Users were asked to use a Likert scale, with 1 being strongly disagree and 5 strongly agree, to rate a sequence of statements.

User assessment of e-reserves service. Questions 15-21 were considered questions of "access", because they concerned page and PDF loading speeds, link reliability, and navigation. Generally, responses differed little among undergraduates, graduate students, and faculty. Excluding question 19, which concerned link reliability, the mean across the category was 3.85 on a scale of 1 (strongly disagree) to 5 (strongly agree). This suggests users rarely take issue with loading speeds and navigation of the E-Reserves site.

With Question 15, "The E-Reserves site loads quickly," respondents strongly agreed. As can be seen in Table 3, there was agreement across different ranks, with faculty agreeing strongest, followed by undergraduates and then, graduate students.

Question 16 stated "Articles on e-reserve load quickly." There was less agreement about this statement. Undergraduates generally agreed, as did graduate students. Faculty, however, rated this lower and closer to neutral.

Question 17 tested the comment "The last time I accessed an article on e-reserve, it loaded within a minute or two." Undergraduates strongly agreed, but graduate students and faculty, although they still agree, ranked this statement lower.

Question 18 consisted of the statement "Articles on e-reserve are easy to find." Undergraduates strongly agreed. Graduate students also agreed fairly strongly, as do faculty, albeit somewhat less.

Table 3.

Core Questions: Access.

User assessments of E-Reserves service		Faculty	Grad Students	UG
	Statement	M	M	M
Q15.	The E-Reserves site loads quickly.	4.17	3.86	3.89
Q16.	Articles on e-reserve load quickly.	3.33	3.43	3.47
Q17.	The last time I accessed an article on e-reserve, it loaded within a minute or two.	3.42	3.57	4.00
Q18.	Articles on e-reserve are easy to find.	3.58	3.86	3.91
Q19.	Links to articles on e-reserve are often broken or incorrect.	2.55	1.95	2.21
Q20.	The E-Reserves site is easy to locate from the Library's home page.	4.08	4.14	3.72
Q21.	I can find information I am looking for on the E-Reserves Web site.	4.00	3.86	3.69

Question 19, which was negative in its phrasing, concerns link reliability ("Links to articles on e-reserve are often broken or incorrect."). Response to this question indicated that users do not think erroneous or malfunctioning links are commonplace. There was only a small difference in between perceptions of link reliability between faculty and students. Faculty members are slightly more likely to agree that links are often not working than graduate students or undergraduates.

As shown in Table 3, respondents from all ranks largely agreed with Question 20, "The E-Reserves site is easy to locate from the Library's home page," and responses were nearly as positive for Question 21, "I can find information I am looking for on the E-Reserves Web site."

Human service. "Human service" was the umbrella label for questions focused on

perceptions of speed of customer service, E-Reserves turnaround, preferences for paper over the electronic, and staff attitude. Again, the responses were on the whole quite positive. In response to Question 22, the faculty and graduate student respondents indicate that they more often believe that articles are posted on time than undergraduates (means 3.69 and 3.70, respectively, vs. 3.46).

Question 23 tackled the issue of preferences for paper over the electronic. The statement used was "I prefer using paper reserves at the Library to E-Reserves." The phrasing "using" paper reserves indicates both reading from the original paper hard copy, as well as preference for checking out the hard copy in-person at the Reserves Desk, then making a personal photocopy of the item. All groups of respondents indicated they prefer electronic to paper, but a small difference remains between faculty (mean 1.92) and undergraduates (mean 1.56).

Seven survey takers said they agree with the statement in Question 23, "I prefer using paper reserves at the Library to E-Reserves," rating it either a 4 or 5 on a Likert scale. There were 2 faculty (11.76%), 2 graduate students (14.28%) and 3 undergraduates (5.00%) who claim to prefer using paper. A closer inspection of these individual cases reveals that both faculty members believe the print on the screen is too small and the scanned page too "speckly and scratched." One graduate student was from the Art Department. In Art and Art History courses, there is more of a need for high-quality color images, not yet a feature of UNC's E-Reserves system. Another graduate student respondent remarked on commonly accessing e-reserves from a wireless connection, and complained of files that were "too large." It is worth noting that users who access e-reserves from laptops in wireless zones on campus do often face lengthier download times. This is especially true during certain times of day when students are "on the go"

on campus, and networks are busy re-configuring as laptop users who use wireless connections are identified by virtual LANs.

Additional analysis was performed to explore the issues raised by the suggestion that a user prefers the print reserve to the electronic. Among those who prefer paper, it was found there were also 2 responses from users (faculty and undergraduate, respectively) who do not have an Internet connection at home. This may imply that there is a connection between a preference for paper and users who actively management their time and "compartmentalize" academic tasks, and therefore restrict research and use of e-reserves to the campus. Instead of only reflecting attitudes toward human service, the question of preference for paper may hinge upon user strategies and personal relationships to time, in addition to the unavailability of remote access.

Question 24 concerned staff response time: "When I call or e-mail E-Reserves, staff respond quickly to my requests." There was agreement on this question, although not strong agreement. Faculty rated the statement highest (mean 3.50), followed by more tepid rankings from undergraduates (mean 3.29) and graduate students (3.20). It was noted that low ratings came from faculty in Political Science and Sociology, fields in which assigned reading lists are often lengthier than in other disciplines.

To the statement in Question 25, "Staff at the Reserves Desk are friendly and helpful," faculty reacted positively (mean 4.08), and to a lesser extent, so did undergraduates (mean 3.69) and graduate students (mean 3.30).

Identification of resources. Question 26, "I seek help if I have problems with articles on e-reserve," received enthusiastic responses from both faculty (mean 3.78) and graduate students (mean 3.77). While faculty and graduate students were likely to seek help with e-reserves problems, undergraduate responses were closer to neutral (mean

3.14). Undergraduates have long been less reluctant to seek help when they need it, instead choosing to consult their peers, friends, and classmates, rather than instructors or librarians. This question was followed at a later point in the survey with the question, "Who do you contact regarding problems with the E-Reserves site?"

Responses show that 47.4% of faculty members contact the Library, as do 44.4% of graduate students. Only 36.1% of undergraduates, however, would notify the Library of problems. Similarly, undergraduates said they would contact their instructors in 37.7% of cases. The biggest discrepancy between user groups occurs with regard to the perception that users should turn to campus IT support (under the direction of the Academic Technology & Networks department, in UNC parlance, IT support is called the "ATN help desk") for help with e-reserves. At UNC, the help desk is not involved in the support of the E-Reserves system. No faculty respondents identified the ATN help desk as a potential problem solver, and undergraduates understood this as well, with only 1.6% saying they would contact the help desk for help. Surprisingly, 11.1% of graduate students said that they, however, would call the ATN help desk. These respondents also indicated that they only used e-reserves a few times over the course of a semester.

Question 27, "I understand what is meant by the term 'E-Reserves'" received high rankings. Survey participants were unanimous in their strong agreement to this statement, with affirming responses from faculty (mean 4.62), undergraduates (mean 4.58), and graduate students (mean 4.38) alike.

Clarity and legibility. The survey included a section of questions labeled "Clarity," which contained questions that were felt to address e-reserves clarity, both on-screen and once printed.

The first of these questions, Question 28, stated, "Articles on e-reserve are clear and

legible on the screen." Undergraduates and faculty tend to agree slightly (mean 3.17, 3.24, respectively), but are nearly neutral on this issue. Graduate student responses were more positive (mean 3.54).

Question 29 concerned legibility of material once printed: "Articles on e-reserve are clear and legible when printed." Responses were similar to those from Question 28. Faculty ratings were closest to being neutral (mean 3.10) and lower than those of undergraduates (mean 3.20) and graduate students (mean 3.62).

In this section, questions also addressed specific complaints with clarity. Question 30 addressed problems of poor photocopy quality of the hard-copy original. It consisted of the statement "Articles on e-reserve often contain type that is speckly, scratched and hard to read." By and large, responses were neutral, with responses from undergraduates (mean 3.09) and faculty members (mean 3.09) only a few hundredths from complete neutrality. Graduate students, who responded similarly, disagreed somewhat (mean 2.77).

Question 31, "Articles on e-reserve often have print that is too small," received interesting responses. Faculty members, all of whom were in the "31-45" or "Older than 45" age groups agreed (mean 3.27), whereas undergraduates (mean 2.93) and graduate students (mean 2.77) voiced slight disagreement. One concern the responses to this question indicated was that some users are unaware of how to manipulate PDF documents in Adobe Acrobat, especially how to use the software's zoom-in feature.

A similar question, which addressed another aspect of document manipulation in Acrobat, namely the rotation feature, was Question 32, which stated, "A lot of articles on e-reserve seem to be scanned upside-down." Slight disagreement was expressed by all ranks, with graduate students (mean 2.23) and faculty (mean 2.36) disagreeing somewhat

more than undergraduate respondents (mean 2.63).

Question 33 contained the statement, "Articles on e-reserve often consist of files that are too large." Although graduate students only marginally agreed (mean 3.08), faculty (mean 2.67) and undergraduates (2.46) slightly disagreed.

Question 34, "I usually print out articles on e-reserve before I read them" introduced the topic of printing behavior into the survey. Responses received show that undergraduates are most likely to print out their readings (mean 3.93), with faculty (mean 3.82) and graduate students (mean 3.54) not far behind.

A couple of questions were included to shed light on how the aesthetic and arrangement of the Docutek ERes front page contributed to perceptions of the E-Reserves site's clarity. Question 35 stated, "The E-Reserves is attractive." Ratings of this statement speak to users' agreement that the presentation of the site is adequate. Both graduate student (mean 3.45) and faculty member users (mean 3.31) agree the site is attractive. Undergraduates also agree, but only slightly, that the site is adequately attractive, with a near-neutral mean rating of 3.19.

Ratings of Question 36, the statement, "The E-Reserves site is logical," suggest that undergraduates believe that the site is logical (mean 3.81), as do graduate students (mean 3.50). Faculty members are also likely to agree with this statement, with a mean rating of 3.36, which most approaches being neutral of all user ranks.

User-initiated behavior. The next section of Likert-scale questions was labeled "User Behavior," beginning with Question 37, "I prefer accessing E-Reserves on my computer on campus rather than at home." Faculty ranked this statement highest (mean 4.00), followed by graduate students (mean 3.54) and undergraduates (mean 3.50). Perhaps this

Table 4.

Core Questions: User Behavior.

		Faculty		Graduate Students		Undergrads	
	Statement	**M**		**M**		**M**	
Q37.	The E-Reserves site loads quickly.	4.00		3.54		3.50	
Q38.	While I access e-reserves…	**ON CAMPUS**	**HOME**	**ON CAMPUS**	**HOME**	**ON CAMPUS**	**HOME**
Q38a.	I often simultaneously download MP3s.	1.50	1.58	1.31	1.15	1.56	1.85
Q38b.	I often simultaneously play online games.	1.33	1.33	1.17	1.15	1.67	1.75
Q38c.	I often have more than 3 browser sessions open at any given time.	2.42	1.33	3.25	1.15	2.96	1.75
Q38d.	I often simultaneously use instant messaging.	1.50	1.50	1.83	2.23	3.12	3.98
Q38e.	There are too many distractions that keep me from working.	1.92	2.08	2.00	2.23	2.08	2.56

indicates that instructors are more likely to engage in e-reserve planning and course authoring from their on-campus offices. This was thought to relate to personal preferences, because of all faculty survey respondents, nearly 22.22% did not have high-speed Internet access at home. In fact, 5.56% of faculty had no home Web access at all.

The category "User Behavior" also contained Question 38, shown above in Table 4, which included a series of several questions beginning with the phrase "While I access e-reserves…" The question concerned the degree of multi-tasking users engage in, while using the E-Reserves site. In addition, this series of Likert-scale questions asked users to specify the frequency of certain online activities performed at the same time, both at home and on campus. The online activities included downloading MP3s, playing online games, having more than three browser sessions open at any given time, and using instant messaging. Question 38 also asked whether users felt there were "too many distractions

that keep me from working."

In response to the statement, "While I access e-reserves [on campus], I often simultaneously download MP3s," overall, most users said they did not. Approximately the same number of undergraduates simultaneously uses e-reserves and downloads music as faculty members. Graduate students rated this item lower still. The question, slightly changed to focus on home usage, "While I access e-reserves [at home], I often simultaneously download MP3s," elicited similar responses. Undergraduates were most likely to download music at home, followed by faculty and graduate students. All graduate students but one strongly disagreed with this statement.

The second statement, "While I access e-reserves [on campus], I often simultaneously play online games," produced similar responses from all ranks, generally from the same users who download music. Simultaneous gaming was certainly not a majority behavior among survey participants. Undergraduates were most likely to play games, followed by faculty and graduate students. The at-home version of the question, "While I access e-reserves [at home], I often simultaneously play online games," resulted in responses from undergraduates, faculty and graduate students, who indicate it is not common to engage in multi-task behavior, as they play an online game.

"While I access e-reserves [on campus], I often have more than 3 browser sessions open at any given time," the third statement prompted higher response rates that suggest a population of active, if not sophisticated, users of online information services. Graduate students agreed slightly with this statement. Differentiating themselves some, undergraduates were closest to neutral on this question, just mildly disagreeing. Faculty slightly disagreed. Responses to the question as it applied to the home environment, "While I access e-reserves [at home], I often have more than 3 browser sessions open at

any given time," indicated more disagreement than the on-campus version of the question. Graduate students disagreed the most strongly, followed by faculty, then undergraduates.

The most striking results in this series of questions derived from reactions to the fourth statement of Question 38. Answers to "While I access e-reserves, I often simultaneously use instant messaging [on campus]" included slight agreement by undergraduates, and disagreement by graduate students and faculty. Answers to "While I access e-reserves, I often simultaneously use instant messaging [at home]," were even stronger. Undergraduates strongly agreed, while graduate students slightly disagreed, and faculty strongly disagreed. In total, 55.00% of undergraduate users rated the statement "While I access e-reserves, I often simultaneously use instant messaging" with a 4 or higher. The differences between responses among the user groups could indicate that undergraduates and the classes of students entering college during this next decade may have developed communication habits different from preceding generations by the time they are exposed to e-reserves or course reading lists online. However, results showed there was no relationship between IM use at home and questions of access such as "Articles on e-reserve load quickly" or "The last time I accessed an article on e-reserve, it loaded within a minute or two."

Although it was thought that running CMC applications alongside on-screen e-reserves reading would result in less learning and nonlinear thought, survey results indicate that the majority of undergraduate users would not encounter such problems as would older generations. Moreover, the study found no relationship between users operating IM and working with the E-Reserves site simultaneously and those who exhibit less satisfaction with e-reserve services in general. By and large, undergraduates state that they prefer to

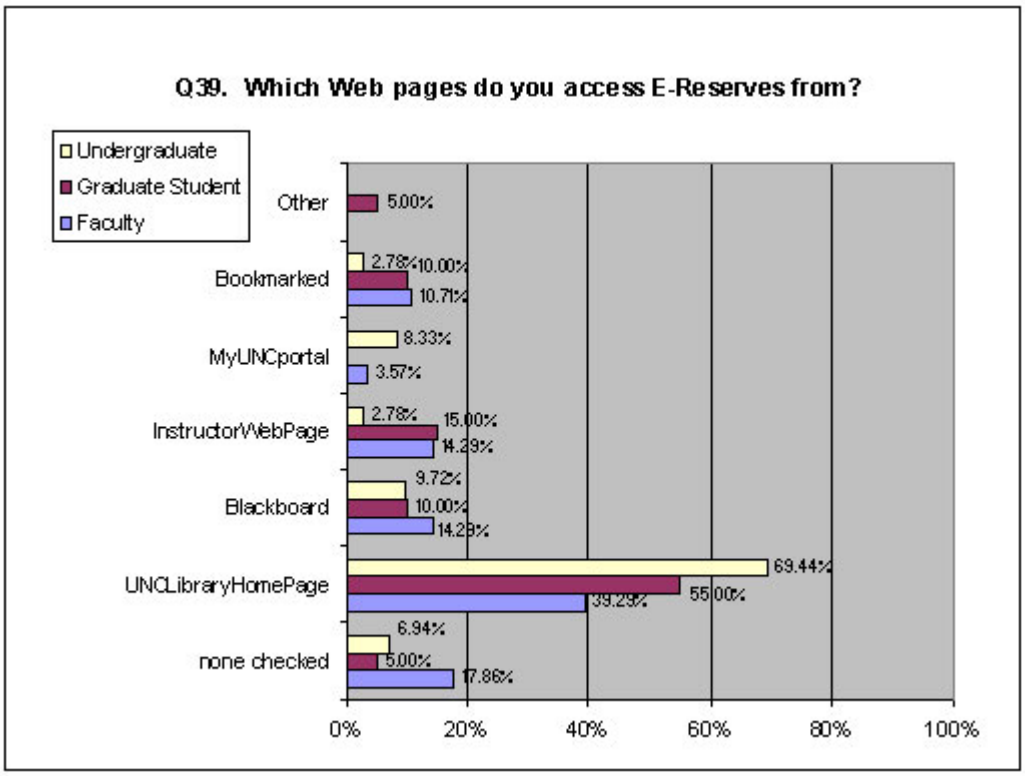
print their course readings—not read them from the screen. A minority of users may be using CMC applications or involved in other activities, while online reading e-reserves materials from the screen, but this is a behavior in which a minority of undergraduate survey takers reportedly engage.

In response to the last item under Question 38, "While I access e-reserves, there are too many distractions that keep me from working [on campus]," there were similar levels of disagreement among undergraduates, graduate students, and faculty. In the home setting, there is not much of a difference between reactions to the statement among the user ranks studied. Overall, graduate students and faculty disagree somewhat, whereas undergraduates are closer to neutral on this question.

Question 39 concerned Web pages that refer users to the E-Reserves front page. The E-Reserves front page is accessible from the MyUNC university portal, instructors' Web pages, links in Blackboard course management software and the UNC Libraries home page. Users were asked to check all responses that apply. As can be seen in Figure 5, the most common response for all groups was the UNC Libraries home page.

Sixty-nine percent of undergraduates say that they access the E-Reserves Web site from the Libraries home page. Undergraduates report that they are brought to the E-Reserves site via links in Blackboard, and on the MyUNC portal, instructor Web pages, or from browser bookmarks. Graduate student responses show that they are also likely to come to the E-Reserves front page via the UNC Libraries home page, but they report they are much more likely to be referred by an instructor's home page than undergraduates. Although the UNC Libraries home page is still the top referrer for faculty at 39.29%, faculty members also access the E-Reserves site through Blackboard and their own Web pages. Some graduate students and faculty respondents also said that they make use of

***Figure 5*. Web page referrals to E-Reserves Web site.**

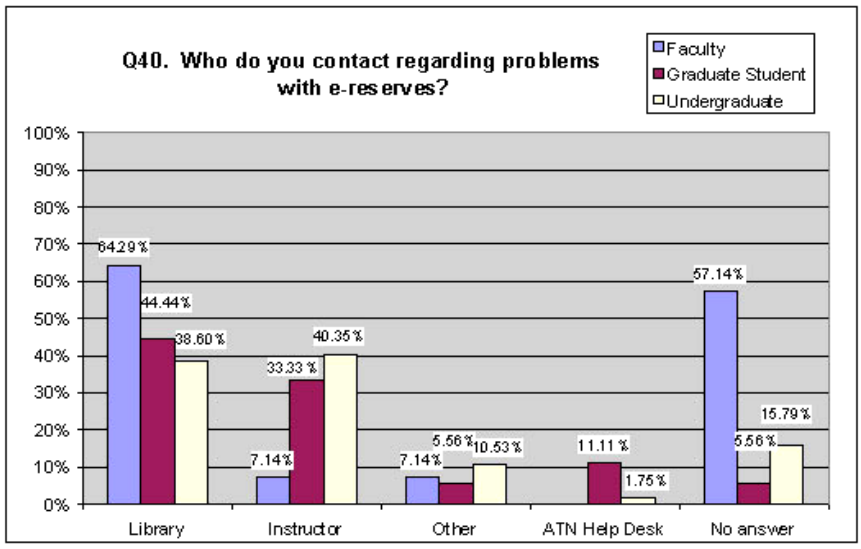


browser bookmark features to access the E-Reserves front page.

Question 40 asked respondents, "Whom do you contact regarding problems with the E-Reserves site?" Half of faculty said they contact the Library, but a large percentage of faculty did not answer this question. Other faculty responses included "other" and "instructor," which may be taken to mean *another* instructor. Graduate students correctly identified the Library as the party to contact, but also chose instructor, ATN Help Desk, and other. Around 5% of graduate students did not answer this question.

It was surprising to see that ATN Help Desk received graduate student responses in the double digits. This could indicate that some graduate students are unfamiliar with e-reserves, especially if they are returning to school after time in the workforce, and have not used an e-reserve system previously. It may also indicate that a portion of these students do not clearly understand who maintains e-reserves or the technology that makes

Figure 6. Help contacts as perceived by users, by rank.



electronic delivery possible.

Among undergraduates, a majority said they would go to their instructor for help or the Library. Other undergraduates selected "other," which likely refers to classmates or peers, given the complete saturation of the teen market by instant-messaging clients. In addition, 1.75% identified the ATN Help Desk as a potential contact for E-Reserves help. A little over 15% of undergraduates did not answer this question.

Question 41 examined frequency of e-reserve access from home (or residence hall) and was phrased, "Approximately how often do you use the E-Reserves site from home?" Most undergraduates (40.45%) indicate that they access the E-Reserves Web site "a few times a semester," and nearly a quarter of them (24.56%) access it on a weekly basis. 8.77% access the site about "once a semester," while 12.28% point out that they never access e-reserves from home. On the other hand, 7.02% claim to access the E-Reserves site daily. Seven percent did not answer this question.

Graduate students, the majority of whom are not housed on campus, indicated that they access the site from home on a "weekly" basis (42.86%) or "a few times a semester"

(35.71%). Other responses included "once a semester" (7.14%) or "never" (7.14%). Seven percent of graduate students did not answer Question 41.

As for faculty members, nearly one third reported that they access the site from home "weekly" (33.33%), and others access it only "a few times a semester" using their home connection (22.22%). Other responses consisted of "once a semester" (5.56%) and "never" (5.56%). One third of faculty surveyed did not respond to this item.

Although the option "daily" appeared as a possible answer to this question, no faculty or graduate student respondents reported being daily e-reserves users.

In total, when considering all user groups combined, the majority of all users access the E-Reserves site "a few times a semester" (35.96%) or weekly (29.21%).

Question 42 asked survey participants "The last time you accessed an article on e-reserve, how long did it take to load?" On the whole, undergraduates reported the quickest load times. Forty-seven percent said that it took "30 seconds or less" for an article on e-reserve to load. 24.56% reported it took "1 minute." Others said that articles loaded within two minutes (8.77%), five minutes (5.26%), or that they do not know, because they "gave up" (3.51%). About 10% of undergraduate respondents did not submit a response to this question.

Graduate student responses were more mixed in response to Question 42. 22.22% report that it took "30 seconds or less," while 16.67% report "1 minute" and another 16.67% report "2 minutes." Other respondents reported "5 minutes" (5.56%). More than 5% of graduate students did not respond to this question.

Unfortunately, the overwhelming majority of faculty did not respond to this item (44.44%). However, those responding indicated that articles they accessed on e-reserve loaded within "30 seconds or less" (33.33%). Other responses included "2 minutes"

(16.67%) and "5 minutes" (5.56%).

Student use on campus. Question 43 asked (only) undergraduates and graduate students about preferred points of access on campus. It was phrased, "When on campus, I prefer to access e-reserves from… (Please check all that apply)," followed by a list of campus computing locations. Undergraduate e-reserves users report that they prefer to access the site from the Undergraduate Library (66.67%), Davis Library, UNC's main library (36.84%), followed by the Student Union (24.56%),"My laptop via a wired port or an Ethernet connection" (24.56%), or a residence hall lab (15.79%). Only 10.53% of undergraduates say that they prefer to access the E-Reserves site via their laptop using a wireless connection, and 5.26% access e-reserves from a departmental library.

Graduate students prefer accessing the E-Reserves site from different locations on campus. Their top responses included "My laptop via a wireless connection" (42.86%) and "other" (35.71%), followed by the equally preferred Undergraduate Library (28.57%), Davis Library (28.57%), and "a departmental library" (28.57%). Only 14.23% of graduate students say they prefer to access e-reserves via their laptops using a wired port or an Ethernet connection.

Question 44 asked (only) students to finish the statement "When on campus, I most often choose where to access online resources based on:" by checking all answers that apply. The most popular response for both undergraduate and graduate survey respondents was "Number of computers available for immediate use". Over 72% of undergraduates selected this answer, as did half (50.00%) of graduate students. The next most common responses were "Speed of computers," which was identified by 45.83% of undergraduates and 42.86% of graduate students, and "Proximity to classes," mentioned by 43.06% of undergraduates and 35.71% of graduate students. Other answers included

"Physical comfort," which 29.17% of undergraduates identified (but only 14.29% of graduate students did so), "Newness of computers" (15.78% of undergraduates and 7.14% of graduate students), and "Availability of certain software" (9.72% of undergraduates and 7.14% of graduate students). Similarly, few respondents identified "Where my friends are likely to be working" as a motive for choosing a site from which to access e-reserves; it was mentioned by 7.14% of graduate students and even less undergraduates (5.56%).

Additional comments from users. At the end of the survey, respondents were asked to provide any further comments about the E-Reserves site or suggestions for its improvement. The majority of comments were negative, and many comments mentioned library services or networking issues that were outside the control of the E-Reserves Unit. Most of the negative comments seemed to concern legibility of items on e-reserve:

- "Many of the articles are difficult to read…"
- "Print is too small sometimes."
- "The biggest problem I have with it [the E-Reserves site] as an instructor is poor legibility of scanned e-reserve articles."

There were also comments that addressed off-campus accessibility issues such as proxy server configuration ("Setting up the proxy configuration to access e-reserves from out-of-campus is a little cumbersome"), in-home wireless network usage ("At present, I'm having problems accessing e-reserve from my new wireless laptop at home. It would be easier if I could have more direct access."), and what one user perceived to be a Mac compatibility issue ("It is very difficult to access e-reserves off campus if you have a Mac…").

The survey received one very striking criticism from a faculty member: "I no longer

use E-reserves [sic]—it is much simpler to password protect a site and load PDF files for student use at that location. I have much more control over the system, and there is no lag time."

Other comments conveyed both faculty and student disappointment that archives of PDF files from previous semesters' classes were not accessible via the E-Reserves site.

There were also a number of comments from student respondents concerning the printing of articles on e-reserve. Confirming the survey results that indicate that the majority of users print e-reserves before reading, one student commented, "I always print my e-reserves, so if the idea was to cut down on paper, that doesn't work."

UNC Libraries has not offered free printing, since the fall of 1998. At the time the survey was conducted, the policy of the campus IT department, which oversaw printing services in the one of the labs housed in the Undergraduate Library, allowed for free printing. Student comments to the survey indicated that they were attracted to this location expressly for its free printing services.

Some of the comments:

- "I also choose where to access E-reserves [sic] on the basis of where there is free printing."
- "I print in the free labs, so I do like getting my course packets for free, rather than buying them."
- "I usually access and print out my Ereserves [sic] from the Undergrad Library… Maybe for Ereserves [sic], there could be a separate site, in the library or on the campus, where it is… convenient and not so disruptive to print them [articles] out [for free]."

Another survey respondent expressed concern about the language used in links to the E-Reserves site from the Libraries front page: "My only suggestion is putting a direct link to e-reserves on the www.lib.unc.edu page, so you don't have to go through reserves to

get to the e-reserves." Currently, the UNC Libraries front page requires the user to click on a "Reserves" link to access the E-Reserves front page.

There were also a number of positive comments and praise for the E-Reserves site, saying "I really appreciate the accessibility and convenience of e-reserves," "I would like every class to have e-reserve," "I think that the e-reserves system is a wonderful resource," and "Keep up the great work."

Discussion

Because the E-Reserves Unit at the UNC-Chapel Hill is located within the R.B. House Undergraduate Library, recruitment of survey participants in the immediate area outside the library building resulted in a survey population that was composed largely of undergraduates. Undergraduates who participated in the survey are thought more likely to live in residence halls on campus. This perhaps explains the on-campus orientation of undergraduate responses to the survey, which indicated that the UNC-Chapel Hill Libraries home page was the most common referral-link source and the Undergraduate Library was the most popular on-campus point of access for e-reserves

The results of this study show that although users claim to be largely satisfied with electronic reserves service quality, the attitudes of e-reserves users can differ with academic standing and rank. There are varying kinds of expectations that faculty members, graduate students, and undergraduates bring to the e-reserves user experience.

Faculty

Faculty members access the E-Reserves site both at home and in their office. Fortunately, survey results indicate they were aware of the appropriate contacts for help with e-reserves. However, there are many other concerns with faculty perceptions of e-

reserves service. One major concern is that faculty now have begun to rely on e-reserves as course pack replacements. Textbooks for many basic, large, undergraduate survey courses can be prohibitively expensive, and students are sometimes reluctant to buy them. In a 2000 study of 1178 students at two universities, 30% students from one campus reported not buying a textbook to their Introductory Psychology class, as did 18% of student respondents from another university (Sikorski et al., 2002). More faculty are designing their courses using material available from electronic sources, because it is inexpensive, readily available, and all students will have access to it via library reserves operations from on- or off-campus. Use of e-reserves as a substitute for coursepacks is expected to increase.

Another concern is that faculty would not make use of the library service, and instead independently post materials to unrestricted Web space or Blackboard course module in violation of copyright law, making the libraries or university vulnerable to potential infringement suits from publishers. Even with password-protected Web sites, although use may be acceptable under "fair use," uses that constitute a substantial portion of a work, an unpublished work, or subsequent uses of a work (a renewal) could constitute copyright infringement.

The faculty member who commented that he no longer uses e-reserve services and instead prefers to have control of his own password-protected Web site may be one of a growing number of faculty members who has adapted to seeking out course readings in electronic format. While the response did not portray the problem as a result of staff performance, the issue of turnaround is pertinent here. Whether an article is available electronically is not only a distinction that students tend to make in selecting which sources to use. During the course planning process, instructors are also susceptible to

ignoring print sources when compiling reading lists. This respondent, it is noted, is from the sciences, in which electronic sources play a larger role because of currency issues. The self-service that electronic journals provide faculty in the sciences will increase as the move toward Open Access, with resources such as the Public Library of Science (PLoS), gains ground.

Database-savvy instructors accustomed to taking advantage of the wide availability of e-journal articles are expected to increasingly supplant their former print sources with the electronic. This may in part be a result of older, seminal literature, especially in the humanities and social sciences, becoming available in electronic form through databases such as JSTOR. More likely, though, it is a question of the sheer convenience of the electronic journals offered.

Graduate Students

Graduate students who took the survey tend to be very mobile on campus. They told us they often use their laptops to access e-reserves from on-campus wireless zones. Graduate student responses also ranked "other" locations often, which could also possibly be interpreted as a substitute response for "on-campus office space." This response was not included in the range of survey choices in the question about preferred e-reserves access points on campus. Nearly all the graduate students surveyed indicated that they access the E-Reserves site from home. Although they may face lags more often than undergraduates or faculty, because they do not have high-speed connections, on the average, compared with undergraduates and faculty, they are still nearly as satisfied with the level of access. Perhaps it is then reassuring that, overall, satisfaction rates among the graduate students appeared to be similar.

The E-Reserves site instructs users to contact the E-Reserves Unit by phone or e-mail

with questions or complaints. However, nearly eleven percent (11.11%) of surveyed graduate students incorrectly identified the campus IT help desk as a source for help with technical problems with e-reserves, such as broken links or missing readings. Then again, previous longitudinal studies of compliance with assigned reading assignments in psychology classes (Burchfield & Sappington, 2000) revealed that less than a third of students complete their reading assignments in preparation for class. If students do not attempt to access the required reading for their courses, it then follows that they would have fewer complaints of a system they use erratically or not at all. However, the interpretation of this result is not necessarily this dire. This result may, on the other hand, be an indication that graduate students do not encounter many broken links or technical problems that they feel worthy of human assistance or intervention.

Undergraduates

Anecdotally, undergraduate students in the Undergraduate Library have expressed that they are often reluctant to bring their laptops with them around campus, because they recognize the added responsibility that a portable access point demands of them and are afraid of theft. This could very well explain the noticeable difference between graduate and undergraduate students' use of wireless networks for accessing e-reserves on laptops. The higher amount of undergraduates who informed us in the survey that they connect their laptops via wired ports indicates that they are likely to be accessing e-reserves on their laptops in the Undergraduate Library. This library is a new facility and offers a wired port from nearly all seating locations. The Undergraduate Library at UNC is also centrally located on campus, with the main quad, main dining hall, student union building, and student stores nearby. For this reason, we believe undergraduates may get their readings on e-reserve while "on the go" or on their way to class. With most

departments that teach large, undergraduate survey courses just a few steps away from the Library's doors, this seems likely.

The large number of undergraduates who reported that they use instant messaging is also of note. These students may have entirely new outlooks toward user interfaces and the transferability of content. They may come to expect stable URLs to course readings, and possibly even links to content that remain in place after the end of the semester. Whether students download PDF files or engage in archiving materials related to coursework for personal use would be an interesting question for future research.

Reserves Staff Response to Survey Results

On July 1, 2004, the author held a meeting with the Reserves Staff and the Undergraduate Librarian to discuss the survey results. Reserves Staff at the Undergraduate Library consists of the Reserves Processing Supervisor, who reports to the Undergraduate Librarian. In addition, the Reserves Processing Supervisor oversees two full-time Reserves Processors.

Reserves Staff was pleased to see that, most of the responses received were, on the whole, quite positive, and that faculty responses were not more critical. Overall, Reserves Staff's reactions tended toward surprise and amusement. The Reserves Supervisor speculated about additional causes for end-user dissatisfaction with customer service, including unpreventable server failures and the possibility that the use of "dummy files" in the E-Reserves database would be mistaken by Web site users for live links to full-text articles. She also mentioned PC performance failures and simultaneous operation of other programs as a factor influencing the loading of articles in PDF format.

The Undergraduate Librarian suggested that there was likely some confusion between the e-reserves managed by the E-Reserves Unit and housed in the UNC Undergraduate

Library, and those managed for Nursing, Dentistry, and Medicine courses by the UNC Health Sciences Library. The UNC Health Sciences Library uses a homegrown e-reserves management system instead of the Docutek ERes product.

This discussion of customer service also addressed perceptions of customer service by users who approach the Reserves Desk at the Undergraduate Library. There is a computer terminal available to users who wish to look up course reserves using telnet. The Undergraduate Librarian pointed out that the station is not used as often as one might expect, and instead undergraduate student workers at the Reserves Desk encourage users to look up course readings using a printout, which is perceived to be faster.

Reserves Staff mentioned another procedural issue, which is seen to contribute to faculty dissatisfaction. Sometimes, Reserves Desk student workers, in responding to an in-person faculty request, need to retrieve the Reserves Supervisor from the back office area to deal directly with service issues. However, student workers rarely ask the faculty's name and the course to which their questions pertain. The Reserves Processing Supervisor pointed out that this results in the need to move back and forth between the Reserves Desk and the back office area to address issues associated with a specific course. To overcome issues of physical layout, she proposed that student workers gather more information about the inquiry before retrieving Reserves Staff, which would result in less waiting for faculty members.

Future Issues for E-Reserves

For faculty who choose to maintain their own Web pages, E-Reserves teams may wish to play a part, in cooperation with reference or instructional services librarians, in marketing all library services to this population. Possible outreach could include efforts such as offers to host faculty informational sessions on copyright in the Library and

provide outreach services to students in courses less likely to require use of the physical library. It is imperative that libraries take steps to educate users about new subject-specific resources, and especially faculty. One step toward building faculty skills with these resources would be to arrange opportunities for discussions with faculty and staff about Digital Object Identifiers (DOIs). DOIs are one of the standards developed for online content identification that allows for redirection in the face changing, or less permanent, URLs (International DOI Foundation, n.d.). Registration agencies such as CrossRef or Content Directions, Inc. work with online content businesses, like academic publishers, to assign pieces of content with a numeric and alpha character-string identifier for a fee. The International DOI Foundation (IDF) is the maintenance agency for DOIs. The IDF works with registration agencies, which pay the IDF a franchise fee and then allocate numbers and work with academic publishers, content aggregators, and those interested in registering digital objects. Faculty members, once they become familiar with these identifiers, could take advantage the deeplinking potential of DOIs.

As DOIs continue to be assigned to new collections of digital materials, deeplinking will become more common. Many databases and publishers are beginning to use DOIs, and they are more prevalent with UK or Europe-based content vendors. Content aggregators and publishers such as Wiley, Kluwer, Emerald, Science-Direct, and Synergy all use DOIs, and the list of those who are adopting use of the DOI is constantly expanding.

Libraries should make the effort to advertise the usefulness of the DOI to faculty and staff members. Possible media for conveying the need for faculty-library discussions about content identifiers include messages posted to the E-Reserves site, and e-mails and announcements from the E-Reserves Unit. These are already established channels of

communication the Library uses with faculty. Response to faculty members who assert independence from library services needs to include emphasis on missed service opportunities and the added timesaving value of faculty-library collaboration.

Some faculty members, much like John Moore, a professor of Chemistry at the University of Wisconsin-Madison, have begun to question even our need for textbooks, when such extensive electronic teaching tools and holdings are now accessible online (2003). However, whether faculty needs introductory textbooks is not the same as asking whether faculty need to seek out the most relevant and suitable readings and teaching aids. Moore argues that, "technology-based materials can be non-linear" and "modularized," which "allows much more flexibility in curriculum and accommodating learning styles." This is fine for a stop-gap course planning solution, but when an entire course revolves around modules that originate from electronic information, it is important to remind instructors what they should be reminding their students: convenience is not the same as relevance or quality.

Nevertheless, the benefits of what Warren (2004) refers to as "deeplinking" will have an impact on electronic reserve operations, as more libraries see fit to deeplink, or provide a reliable stable URL, to content, rather than scan and upload PDFs to their e-reserve databases. This should not only alleviate some of the current issues involving processing speed, but also help to ensure permanence and quality from a digital preservation standpoint.

It is hoped that up-and-coming e-book products will also regularly incorporate DOI for stable linking to content nodes. The e-book market, unfortunately, is only beginning to show signs of accommodating needs of reserve departments in terms of overall design, and deeplinking functionality may be a long time coming.

E-book products with similar interfaces consistent with studies of e-book functionality are just now becoming available from vendors such as Gale, ABC Clio, and eBooks Corporation. In particular, eBooks Corporation looks especially promising with their "eBook Library" product, launching in July 2004, which will allow libraries to use individual book chapters, make use of a "flexible, multiple-concurrent-user lending model called 'Non-Linear Lending.'" (eBooks.com, 2004a)

Despite this news, the current state of the e-book marketplace is still highly targeted toward personal consumption and high-tech, multiple-device-owning, early-adaptor individuals. EBooks.com's top selling list of titles, as it appears on their Web site, for example, shows that the adult title *Letters to Penthouse XX* is their third most popular. This is quite representative of the consumer e-book market, with its emphasis on popular titles, such as Bill Clinton's *My Life* (currently #1), *The Ten-Day MBA* (#11), and *The Complete Idiot's Guide to Amazing Sex* (#12) (eBooks.com, 2004b). Clearly, this may not speak well to librarians who are interested in scholarly content, but if the value of the service can eclipse the original orientation toward the consumer market, this could prove an indispensable service to academic libraries.

An additional problem is that, generally, academic publishers are currently still quite resistant to the idea of segmenting or granularizing their texts and assigning DOIs to content "chunks" for deeplinking, because the effort and cost to produce this kind of linkable electronic text environment is still seen as prohibitive. Authors who are copyright holders must also give their consent, which is unlikely, given that writers are likely to see segmentation of their works in chapters or smaller "chunks" as making unlawful and widespread unauthorized distribution possible (Potash, Horner, Orr, & Pace, 2004). Perhaps, only when libraries, on behalf of their faculty and students, begin

to demand this kind of functionality will it become commonplace, and this may not happen until faculty and student users are sufficiently familiar with the new e-book interfaces to start to make suggestions for added functionality.

Kartus and Clarke (2004) at Australia's Deakin University describe one future scenario. Their practice is to make use of OCR scanning, which enables increased accessibility through use of HTML, rather than PDF, files. Although they recognize that HTML "is not a faithful representation of the original document," future conversion to XML "could be done without further cleanup of the text." From the vantage point of a digital preservationist, this could be useful, if e-reserves systems in the future are to be maintained as repositories of digital content that will provide very detailed insight into an institution's history and curricula. However, backlash from rightsholders to approaches of this kind, which optimize the transferability of content, is a formidable obstacle to academic libraries in the United States.

It is important for libraries to work in accordance with copyright guidelines, but it is impossible to control users' copyright infringement. While the library can never ensure adequate controls over users who freely disseminate content or plagiarize, by making use of library e-reserve services, instructors reduce the likelihood of copyright infringement allegations from publishers. As it is, in the era of the DMCA (Digital Millennium Copyright Act), publishers already look with suspicion toward institutions of higher education, imagining them as hotbeds of illegal copyright activities and libraries as the nuclei from which such activities emanate. It remains to be seen whether the Librarian of Congress, in 2006, will take advantage of the opportunity to address whether current access controls are disrupting fair uses of material, as part of a triennial rule-making proceeding required by the Act's anticircumvention provision (Gasaway, 2004). As has

been the case with other library automation technologies, however, customer demand may show itself to be the catalyst in this arena, rather than the legal challenges long imagined and feared by those working to improve electronic reserves service quality.

Conclusions

This study shows that there remains a number of issues relating to e-reserves service that require continued attention as e-reserves service expands or is reconfigured to adapt to new and changing technology and staff roles.

The Web interface for the e-reserve operation is an important representation of service quality to both faculty and student users. Some of the quality issues that student users of e-reserves face may be alleviated in the future by the introduction of an improved Docutek ERes interface, but the survey results show that there are still some concerns with legibility of scanned PDFs, knowledge of Adobe Acrobat software, and broken or unreliable links.

Another interface of the e-reserve operation at UNC, which is perhaps a stronger service point for faculty than for student users, is the actual Reserves Desk. Survey results point toward a need for a concise but active dialogue with faculty members about copyright, e-reserves processing, and how to improve service quality. It is the belief of the librarians in the Undergraduate Library that, through a partnership between Reserves and Instructional Services, the library can offer workshops to show instructors how to scan, process, and link their own reserve materials that will have a positive effect on beginning-of-semester backlogs. This also will allow instructors the kind of "personal control" that the Spring 2002 LibQUAL+ results revealed as somewhat lacking in the UNC Libraries.

The results of the study prompt more questions about the changing nature of e-reserves service within the academic library, the effects of an increasingly technically sophisticated user base on interface design, e-reserves copyright literacy, processing workflow, the extent of faculty involvement in processing, and staff training. Further research could be conducted to illuminate such topics and whatever effects they may have on e-reserves service quality. As always, there will be challenges for reserves operations in academic libraries, as technology products and user expectations change. Encouraging an ongoing conversation with stakeholders on the state of e-reserves service quality and performing regular assessments that involve user feedback is crucial to academic libraries, which choose to actively support Web-facilitated teaching and learning.

APPENDIX

USABILITY STUDY:
USER SATISFACTION WITH ELECTRONIC RESERVES

Welcome to the E-Reserves User Satisfaction Survey. We appreciate your interest!

Your responses will only be used for aggregate survey analysis, and we will treat them with the strictest confidentiality. We do not require you to give us your name, and individual responses will not be shared with anyone for any purpose.

For each item please select the value that most closely describes you.

---

1. Age:

□ Younger than 22
□ 22-30
□ 31-45
□ Older than 45

2. Sex:

□ Male
□ Female

3. I am (a/an)

□ Undergraduate
□ Graduate Student
□ Faculty
□ Staff

4. School:

□ College of Arts & Sciences
□ Friday Center for Continuing Ed.
□ General College
□ Graduate School
□ Kenan-Flagler Business School
□ Summer School
□ School of Dentistry
□ School of Education
□ School of Government
□ School of Library and Info. Science
□ School of Journalism and Mass. Comm.
□ School of Law
□ School of Medicine
□ School of Nursing
□ School of Pharmacy
□ School of Public Health
□ School of Social Work

5. Department:

□ African/African American Studies
□ Air Force ROTC
□ Allied Health
□ American Studies
□ Anthropology
□ Archaeology
□ Army ROTC
□ Art
□ Asian Studies
□ Biochemistry
□ Biology
□ Biomedical Engineering
□ Biostatistics
□ Cell and Developmental Bio

□ Cell and Molecular Physiology
□ Chemistry
□ City and Regional Planning
□ Classics
□ Cognitive Science
□ Communication Studies
□ Comparative Literature
□ Computer Science
□ Creative Writing
□ Cultural Studies
□ Dramatic Art
□ Economics
□ English
□ Environmental Sciences/Engineering
□ Epidemiology
□ Exercise and Sports Science
□ Folklore
□ Genetics
□ Geography
□ Geological Sciences
□ Germanic Languages
□ Health Behavior/Health Ed.
□ Health Policy/Admin.
□ History
□ International Studies
□ Latin American Studies
□ Linguistics
□ Marine Sciences
□ Maternal and Child Health
□ Mathematics
□ Medieval Studies
□ Microbiology and Immunology
□ Military Science
□ Music
□ Navy ROTC
□ Nutrition
□ Operations Research
□ Otolaryngology/Head and Neck Surgery
□ Pathology
□ Peace, War and Defense
□ Pharmacology
□ Philosophy
□ Physics/Astronomy
□ Political Science
□ Psychology
□ Public Administration
□ Public Policy
□ Recreation and Leisure Studies
□ Religious Studies
□ Romance Languages
□ Slavic Languages
□ Sociology
□ Statistics
□ Study Abroad
□ Surgery
□ Toxicology
□ Women's Studies

□ Other _____

6. Please check the total number of courses in table below.

I am a/an:	**on-campus courses**	**exclusively online courses**	**distance education courses (for students outside the Chapel Hill or Carrboro area)**
student enrolled in	0 1 2 3 4 5 more	0 1 2 3 4 5 more	0 1 2 3 4 5 more
instructor of	0 1 2 3 4 5 more	0 1 2 3 4 5 more	0 1 2 3 4 5 more

7. How many courses are you taking which make use of e-reserves?

□ 0
□ 1
□ 2
□ 3
□ 4 or more

8. How many courses are you teaching which make use of e-reserves? (if undergraduate, please mark "0")

□ 0
□ 1
□ 2
□ 3
□ 4 or more

9. Where do you access e-reserves? Check all that apply.

□ off-campus house or apt.
□ parents' house
□ friend's house
□ on-campus
□ residence hall
□ office

10. The following describes my off-campus Internet connection speed:

□ dial-up (up to 56K bps)
□ high-speed (e.g. cable modem, DSL, ISDN)
□ I do not have an Internet connection.

11. What kind of computer do you have?

□ PC
□ Mac

12. How old is your computer?

□ Less than 6 mos.
□ 1 year
□ 1½ years
□ 2 years
□ 3 years
□ 4 years
□ don't know

13. Which browser do you use most often?

□ Internet Explorer 5.0 or higher
□ Internet Explorer – lower than 5.0
□ Netscape 4.5 or higher
□ Netscape – lower than 4.5
□ AOL 8.0
□ Mozilla 4.0 or higher
□ Opera 6.0 or higher
□ other

14. How often does your computer crash and require rebooting, while you are using e-reserves?

□ Frequently
□ Sometimes
□ Rarely
□ Never

CORE QUESTIONS

With 1 being strongly disagree and 5 strongly agree, please rate the following statements:

Access

15. The E-Reserves site loads quickly.
    1 2 3 4 5

16. Articles on e-reserve load quickly.
    1 2 3 4 5

17. The last time I accessed an article on e-reserve, it loaded within a minute or two.
    1 2 3 4 5

18. Articles on e-reserve are easy to find.
    1 2 3 4 5

19. Links to articles on e-reserve are often broken or incorrect.
    1 2 3 4 5

20. The E-Reserves site is easy to locate from the Library's home page.
    1 2 3 4 5

21. I can find information I am looking for on the E-Reserves Web site.
    1 2 3 4 5

Human service

22. Articles on e-reserve are posted to the Web on time.
    1 2 3 4 5

23. I prefer using paper reserves at the library to e-reserves.
    1 2 3 4 5

24. When I call or e-mail E-Reserves, staff responds quickly to my requests.
    1 2 3 4 5

25. Staff at the Reserves Desk is friendly and helpful.
    1 2 3 4 5

26. I seek help if I have problems with articles on e-reserve.
    1 2 3 4 5

27. I understand what is meant by the term "e-reserves."
    1 2 3 4 5

Clarity

28. Articles on e-reserve are clear and legible on the screen.
    1 2 3 4 5

29. Articles on e-reserve are clear and legible when printed.
    1 2 3 4 5

30. Articles on e-reserve often contain type that is speckly, scratched out and hard to read.
    1 2 3 4 5

31. Articles on e-reserve often have print that is too small.
    1 2 3 4 5

32. A lot of articles on e-reserve seem to be scanned upside-down.
    1 2 3 4 5

33. Articles on e-reserve often consist of files that are too large.
    1 2 3 4 5

34. I usually print out articles on e-reserve before I read them.
    1 2 3 4 5

35. The E-Reserves site is attractive.
    1 2 3 4 5

36. The E-Reserves site is logical.
    1 2 3 4 5

User Behavior

37. I prefer accessing e-reserves on my computer on campus rather than at home.
    1 2 3 4 5

38. Please tell us about how your use on campus compares with your use at home.

    On a scale of 1-10, with 1 representing strongly disagree, and 10 representing strongly agree, please evaluate the following statements about use both on campus and at home.

While I access e-reserves,…

	ON CAMPUS	AT HOME
I often simultaneously download MP3s.	1 2 3 4 5	1 2 3 4 5
I often simultaneously play online games.	1 2 3 4 5	1 2 3 4 5
I often have more than 3 browser sessions open at any given time.	1 2 3 4 5	1 2 3 4 5
I often simultaneously use instant messaging.	1 2 3 4 5	1 2 3 4 5
There are too many distractions that keep me from working.	1 2 3 4 5	1 2 3 4 5

E-Reserves Access

39. From which Web pages do you access e-reserves?
Please check all that apply.
□ MyUNC portal
□ Instructor's Web page
□ Blackboard
□ UNC Library home page
□ I have bookmarked the ERes home page
□ other _____

40. Who do you contact regarding problems with the E-Reserves site?
Please check all that apply.
□ Library
□ ATN help desk
□ Instructor
□ other _____

41. Approximately how often do you use the E-Reserves site from home?
□ Once a day
□ Once a week
□ A few times a semester
□ Once a semester
□ Never

42. The last time I accessed an article on e-reserve, how long did it take to load?
□ 30 seconds or less
□ 1 minute
□ 2 minutes
□ 5 minutes

□ 10 minutes or more
□ Don't know – I gave up

43. For students only, when on campus, I prefer to access to e-reserves from: (Please check all that apply.)
□ Undergraduate Library
□ Davis Library
□ A departmental library
□ A residence hall lab
□ My laptop via a wireless connection
□ My laptop via a wired port or an Ethernet connection
□ Venable Hall
□ Greenlaw Hall
□ Law Library
□ Student Union
□ Johnston Center for Undergraduate Excellence
□ other _____

44. For students only, when on campus, I most often choose where to access online resources based on: (Please check all that apply.)
□ Number of computers available for immediate use
□ Physical comfort of the environment
□ Speed of the computers
□ Newness of the computers
□ Availability of certain kinds of software
□ Proximity to my classes
□ Where my friends are likely to be working

Suggestions or comments on the E-Reserves System you would like to share with us:

We appreciate the time you have taken to complete this survey. On behalf of the E-Reserves Unit in the Undergraduate Library, we offer our most sincere gratitude.

Your responses will help us to improve overall quality of the services we provide you and the rest of the UNC community. Thank you so much for your input!

We welcome individual questions or comments you may have about the survey. Please feel free to e-mail them to E-Reserves at ereserves@unc.edu.

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