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Student use of CD-ROM indexes at one academic institution

Suellen Cox
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Cox, Suellen, M.L.S.

San Jose State University, 1994

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Ann Arbor, MI 48106**

STUDENT USE OF CD-ROM INDEXES AT ONE ACADEMIC INSTITUTION

A Thesis

Presented to

**The Faculty of the School of
Library and Information Science
San Jose State University**

In Partial Fulfillment

**of the Requirements for the Degree
Master of Library Science**

By

Suellen Cox

May, 1994

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Suellen Cox

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APPROVED FOR THE SCHOOL OF
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A handwritten signature in cursive script, reading "William Fisher", written over a horizontal line.

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ABSTRACT

STUDENT USE OF CD-ROM INDEXES AT ONE ACADEMIC INSTITUTION

by Suellen Cox

This thesis addresses the issue of student use of CD-ROM indexes with limited chronological coverage. The study explores the fundamental question: Do students conducting research in CD-ROM indexes require retrospective information not available in most CD-ROM indexes? Student awareness of and direction to archival discs and printed indexes is also studied.

A survey was used to collect data from undergraduate and graduate students accessing the indexes in the LAN area of the library at California State University, Fullerton. An ACCESS program was used to analyze the data. Analysis of the results of this survey did not support the expectation that students conducting research do require retrospective information not available in current CD-ROM indexes. Further, the results did not support the expectation that the indexes were not meeting students' research needs. The results of the survey did confirm that students were given some direction to CD-ROM indexes, but not to printed indexes.

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CHAPTER 1

INTRODUCTION

In the United States, within the past 5 to 10 years, the creation and proliferation of a significant new information storage and retrieval technology has taken place. This technology, CD-ROM or Compact Disc Read-Only Memory, is having an impact with regard to the research being done at academic institutions.

The purpose of this study is to discover student use of and attitudes toward CD-ROM indexes within an academic environment. The investigation that follows specifically explores the fundamental question: Do students conducting research in CD-ROM indexes at an academic institution require retrospective information not available in most CD-ROMs? The instrument for data collection, a questionnaire, tests several hypotheses. The first hypothesis is that students do require retrospective information. The second is that CD-ROM indexes that lack retrospective information do not meet students needs. The third hypothesis is that many students are not aware of retrospective information in either disc or printed format. And finally, students are routinely directed to the CD-ROM indexes by both library staff and professors, but not to the printed indexes which would provide retrospective information.

CD-ROM, Compact Disc Read-Only Memory, is a variant of the audio compact disc. Information is stored on a 4.75-inch disc that fits into a floppy disk drive slot of a microcomputer and read on the computer screen. Approximately 1,500 floppy discs or 250,000 pages can be stored on one CD-ROM. This large storage capacity of CD-ROM

lends itself to many different uses within the academic library environment including: library catalogs; reference data; encyclopedia sets; and periodical indexes.¹

Prior to 1986 when periodical indexes on CD-ROM were introduced to libraries, card catalogs, journals, book reviews, library shelf browsing, informal channels of information, footnotes, and indexes and abstracts were all used to one degree or another by students conducting research. Fast, efficient, and found in most academic institutions, CD-ROM has become a favorite research tool among students, eclipsing traditional sources used in research. Many feel that it is a "boon to information seekers, saving them time in locating references and freeing them from the tedium of hand copying citations."² CD-ROM is heavily promoted and given wide exposure not only by information vendors but also by librarians and information professionals as well. Consequently, it is employed heavily by students conducting research.

Specifically, CD-ROM indexes list citations to articles appearing in newspapers, magazines, and academic journals. Examples of these indexes include the Wilson products: Art Index; Business Periodicals Index; Reader's Guide to Periodical Literature; Humanities Index; Library Literature; and General Science Index. SilverPlatter indexes include: Psychological Abstracts; MLA Bibliography; ERIC; and Sociofile. Student researchers search these databases to locate bibliographic citations, often including abstracts, to relevant articles needed for their particular research.

There are several advantages to CD-ROM indexes. CD-ROM is fast and easy to use, requiring little extensive user training. On-screen instructions tend to be clear and

¹Kristine Salomon, "The Impact of CD-ROM on Reference Departments," *RQ* 28 (Winter 1988): 203.

²Cynthia Hall, Harriet Talan and Barbara Pease, "InfoTrac in Academic Libraries: What's Missing In The New Technology," *Database* 10 (February 1987): 52.

easily understood. They are also less complex to search than online systems. According to Kristine Salomon, CD-ROM has a further advantage over online services in that "users can access information conveniently and cheaply without being concerned about the online connect charges associated with traditional online searching."³ For students, this cost factor is a significant one. Further, most CD-ROM terminals are equipped with attached printers, allowing the user to print out the accessed material. CD-ROM users frequently cite this convenience factor when expressing their preference for CD-ROM over the printed sources. In terms of CD-ROM versus its print equivalents, CD-ROM has a distinct advantage "because of the many different access points by which information can be retrieved."⁴ Users can combine a variety of terms or key words to limit or expand a search in either the title, abstract, index, thesaurus, or text. Other access points include author, language, publication, and date. There is one specific area, however, where CD-ROM indexes may be lacking.

Most currently manufactured CD-ROM indexes include only a limited number of years. The number of years covered varies from index to index, but most indexes indicate the mid 1980s to the present time. For example, Wilson indexes indicate the following coverages: Art Index (September 1984-present); Applied Science and Technology Index (October 1983-present); Business Periodicals Index (July 1982-present); General Science Index (1984-present); Humanities Index (February 1984-present); Library Literature (December 1984-present); Reader's Guide to Periodical Literature (January 1983-present); Social Sciences Index (February 1983-present). Wilson's Religion Index is somewhat more retrospective, covering January 1975-present.

³Salomon, 203.

⁴Salomon, 203.

SilverPlatter Information, Inc. offers both current and retrospective discs. Academic institutions can opt to hold one or both. For example, ERIC-Current Files include 1983-present. ERIC on SilverPlatter covers 1966-present. ERIC Retrospective Files covers 1976-1981. PSYCLIT (2 discs) covers 1974-present. MLA International Bibliography covers January 1981-present.

For some students conducting research, the most current information available is needed. For other students, however, a historical perspective is not only beneficial, but is required and essential for thorough scholarly research. This may be especially true for graduate-level students conducting in-depth research. The fact that most CD-ROM indexes only cover the mid 1980s to the present is likely to have some impact on the research being conducted by students in general, but especially at the graduate level.

Several questions arise with regard to this limited date coverage by CD-ROM indexes. Are students aware of this limited coverage? At both the undergraduate and graduate level, is it a significant factor inhibiting or influencing the research being conducted? Is the information accessed on CD-ROM indexes meeting students' information and research needs? If not, are students seeking out or consulting traditional sources such as the print equivalents in an effort to obtain retrospective information? Finally, are students made aware of or directed to the print equivalents by library professionals and professors in an effort to encourage and insure thorough research when necessary? These are critical questions and should be addressed.

User studies indicate that students are extremely enthusiastic about CD-ROMs. As noted earlier, students appreciate the speed, efficiency, and convenience of CD-ROM. As Ann Beltran has stated, "reaction continues to be overwhelmingly favorable."⁵

⁵Anne Bristow Beltran, "Infotrac at Indiana University: A Second Look," *Database* 10 (February 1987): 48.

Because of this favorable attitude, students may be casting a less-than-critical eye on CD-ROM technology. Students may not be focusing on or questioning the limited date coverage, and how this may or may not be impacting their research.

There appears to be another inherent and significant factor in searching periodical indexes via computers that impacts upon student use and the quality of research being conducted. In our society, computers have taken on a powerful and somewhat magical quality. There seems to be an illusion of not only absolute certainty, but also infallibility. Theodore Roszak suggests that there is a widely held belief by computer enthusiasts that "the information which gets processed through computers is unassailably correct."⁶ This belief is held by many others as well. Furthermore, with computers there is "an illusion of completeness that does not exist with printed works."⁷ Teresa Mensching makes the same point stating that "they [the students] seem to be convinced that the CD-ROMs--simply by virtue of their electronic format--are better or more complete sources of information than the print versions."⁸

This illusion of completeness is especially significant and worrisome. Students searching CD-ROM periodical indexes may fail to note the coverage dates of the specific index or indexes and consequently assume that the retrieved citations are all that is available. Also, students may not be aware of the existence of any retrospective discs or printed equivalents containing information which might enhance or add depth to their research. Another concern is that "users are likely to have false confidence in the results of their searches because they think they have employed the full capability of an electronic

⁶Theodore Roszak, *The Cult of Information* (New York: Random House, Pantheon Books, 1986): 131.

⁷Hall, Talan, and Pease, 54.

⁸Teresa Mensching, ed., "Dialogue and Debate: CD-ROM: The Aladdin's Lamp of Library Technology?" *Research Strategies* 7 (Spring 1989): 91.

retrieval system when they have actually used it at only the most superficial level."⁹ Lastly, a "user might be grateful for any information at all relating to an information problem and may not be unduly concerned about what relevant information is not located or whether something more on target or 'better' is being missed."¹⁰

The question of whether the overall quality of student research is being adversely affected by the use of electronic retrieval sources and, if yes, why, is very difficult, if not impossible to assess. Professors and instructors may be the only ones able to determine this, especially when retrospective information in research papers is required and found to be lacking. The lack of retrospective information in student research may be due to a number of factors including: 1) no information available in electronic sources; 2) students' limited or inadequate knowledge of electronic retrieval sources and searching skills; 3) students' lack of knowledge of other traditional sources such as printed indexes; 4) disinterest on the part of the student to conduct thorough research.

There has been concern expressed among some librarians and information professionals regarding this issue of the quality of information retrieved and used. Charles Bunge expresses such a concern:

Especially worrisome is the apparent tendency of patrons to define information needs in terms of what is easily available from an electronic source. "If I can get the citation (or even the full text) easily from a CD-ROM source, it is relevant to my project; otherwise, skip it," expresses an attitude that increases reference librarians' nagging concern about the quality of the information patrons are taking from the reference department.¹¹

⁹Stephen P. Harter and Susan M. Jackson, "Optical Disc Systems in Libraries: Problems and Issues," *RQ* 27, no. 4 (1988): 519.

¹⁰*Ibid.*

¹¹Charles Bunge, "CD-ROM Stress," *Library Journal*: 116 (April 15, 1991): 63-64.

The question of the overall quality of student research is well beyond the scope of this study. It is important to acknowledge, nevertheless, the possibility that CD-ROM technology may be having some negative impact.

Any understanding of student attitudes and use of CD-ROM technology must include an extensive review of the literature, what has been researched and reported within the field. Specifically, it is necessary to determine whether or not this issue of periodical indexes with limited date coverage has been addressed, and to what extent. Above all, it is necessary to determine if this issue is a significant factor for students themselves. What is needed, therefore, is an appraisal of current student attitudes and use with regard to the use of CD-ROM indexes.

In order to discover student attitudes and use of CD-ROM indexes containing limited date coverage, a survey was developed to determine the following: 1) which indexes were used; 2) did information found on CD-ROM indexes meet research needs; 3) was the index easy or difficult to use; 4) were students aware of the availability of indexes for earlier years on disc; 5) were students aware of the existence of paper indexes; 6) was there student use of paper indexes; 7) were paper indexes easy or difficult to use; 8) did information found in paper indexes meet current research needs; 9) was current (1986+) information important for research purposes; 10) was earlier (pre-1986) information important for research purposes; 11) were students directed to CD-ROM indexes by librarians or library staff; 12) were students directed to paper indexes by librarians or library staff; 13) were students directed to CD-ROM indexes by professors; and 14) were students directed to paper indexes by professors. The survey should reveal, then, not only student use patterns but also needs and attitudes regarding periodical indexes on CD-ROM.

Undergraduate and graduate students attending California State University, Fullerton, and using the CD-ROM indexes at the university library, provided the primary data for this quantitative study. Initial informal observation of and interaction with students using CD-ROM indexes by this author raised the fundamental question explored and analysed in the study: Do students conducting research at academic institutions require retrospective information not available on CD-ROM periodical indexes? If so, is it a significant factor, and in what ways are students compensating for this limitation? Once again, the working hypothesis is that students do require retrospective information, and that indexes with limited date coverage are not meeting the students' needs. Moreover, it is suggested that often students are not made aware of, or directed to, retrospective information in either disc or printed format.

A review of the literature, as well as complete results and analysis of the survey are expected to indicate a need for further research regarding this issue. This specific study is designed to add knowledge and facilitate discussion not only among information professionals, but especially librarians attempting to meet the information and research needs of students in the academic environment. Further, the study will provide guidelines for mitigating for the lack of retrospective coverage by way of more extensive user training and education in the way of bibliographic instruction. Above all, the study should underscore the need for more direct input and lobbying of information vendors by academic librarians on behalf of students. Vendors must be made aware of the full range of research needs of students.

The overall aim of this study, then, is to address the issue of students use of CD-ROM indexes, specifically with regard to the problem of limited date coverages, and suggest guidelines for implementing ways in which information professionals and academic librarians can help alleviate this problem.

CHAPTER 2

REVIEW OF THE LITERATURE

The creation and subsequent use of CD-ROMs during the past eight years has been accompanied by a considerable amount of literature on the subject. As early as 1986, "articles began appearing in library literature discussing the emerging technology of CD-ROMs and how libraries were beginning to use this technology."¹² Articles have examined a wide variety of CD-ROM issues. Some articles have dealt with general library users reactions to the new technology. While many other articles have specifically addressed student attitudes and use at academic institutions. Comparative use studies of CD-ROM and online systems, or CD-ROM and equivalent print sources at several universities have also been undertaken and reported. Some librarians and information professionals have expressed reservations with regard to certain aspects of CD-ROM searching and use. Lastly, a number of very good articles have appeared discussing the use and merit of bibliographic instruction to add to and enhance student searching techniques when using CD-ROM.

A thorough search performed in the following sources, Dialog's Dissertation Abstracts Online, Dialog's LISA (Library and Information Science Abstracts), Nexis's CD ROM Librarian, Wilson's Library Literature, ERIC, INFOTRAC's Magazine Index, CSUF's OPAC, and MELVYL, found many articles addressing the areas noted above.

¹²Cindy Faries, "Users' Reactions to CD-ROM: The Penn State Experience," *College and Research Libraries* 53 (March 1992): 139.

The search failed, however, to retrieve any articles specifically addressing the issue of student use of CD-ROM periodical indexes with limited date coverage.

The advent of periodical indexes on CD-ROM has made some student research easier, faster, and more convenient. Does it lend itself, however, to a thorough approach to research, meeting the needs of students at a variety of different experience and educational levels? If not, which sources have been commonly used, and are still an option?

As stated in the introduction, prior to CD-ROM there were several traditional sources used for research purposes. In an early article by Stephen Stoen examining the source of misunderstandings between librarians and teaching faculty over the concepts of library use and research, Stoen examines the use of these traditional sources. Stoen notes that:

"the Hernon, Steig, Wood, Styvendaele, Stenstrom and McBride, and Bath University studies together indicate that footnotes, personal recommendations from other scholars, serendipitous discovery, browsing, personal bibliographic files, and other such techniques that involve no formal use of access tools account for the great majority of citations obtained by scholars."¹³

It has been widely believed by librarians that the use and importance of two types of access tools---indexes and abstracts---are a significant element of research. The Stoen article questions this in light of the above mentioned studies.

In gathering citations, the practice of pursuing and following footnotes in research has been widespread. According to Stoen, "the INFROSS study at Bath University of Technology on the information-gathering habits of researchers in the social sciences revealed a clear-cut preference for following footnotes and bibliographies in the subject

¹³Stephen K. Stoen, "Research and Library Skills: An Analysis and Interpretation," *College and Research Libraries* 45 (March 1984): 101.

literature."¹⁴ The Stenstrom and McBride study found that 69.4 percent of researchers used footnotes in journals, and 51.3 percent of researchers used footnotes in books.¹⁵ Stoan also cites a study conducted by Steig on how historians gather information. "Historians reported using bibliographies or footnotes in books and articles as their principle source."¹⁶ Another study by Hernon assessing the ways in which political scientists and economists found information revealed that they used "citations in their subject literature."¹⁷

In addition to footnotes, Stoan elaborates on the special importance of several other traditional research practices. In citing Line, Stoan underscores the importance of serendipity. It "'plays an important role in research, and information that a researcher comes across merely by chance may cause him to channel his work along new lines."¹⁸ Stoan also mentions browsing as a valuable way to locate information on a particular research topic.

Stoan's examination of these studies, as well as his own opinions, indicate that traditional sources and techniques may not be outmoded methods for finding information. CD-ROMs may be fast, easy, and convenient, but other methods may add thoroughness and depth to student research. The current promotion and use of CD-ROMs without a

¹⁴Stoan, 100-101.

¹⁵Stoan, 101, citing Patricia Stenstrom and Ruth B. McBride, "Serial Use of Social Science Faculty: A Survey," *College & Research Libraries* 40 (September 1979): 429.

¹⁶Stoan, 101 citing Margaret F. Steig, The Information Needs of Historians,"*College & Research Libraries* 42 (November 1981): 554.

¹⁷Stoan, 101, citing Peter Hernon, "Use of Microformatted Government Publications," *Microform Review* 11 (Fall 1982): 241-42.

¹⁸Stoan, 102, citing Maurice Line, *Investigation Requirements of the Social Sciences*, Research Report No. 5 (Bath, England: Bath University of Technology, 1971), p.3.

basic working knowledge of other traditional sources and techniques might handicap students' abilities to conduct thorough research. They may not be utilizing all possible information gathering tools.

Another article "A Study of the Use of Information Sources by Social Science Researchers" by Mary B. Folster, also looks at how research has been conducted by scholars.

In the article, Folster briefly relates the findings of early studies such as INFROSS, and Stenstrom and McBride. As indicated in the Stoen article above, scholars rely heavily on "following up references in books and journals, and heavy use was also made of informal channels."¹⁹ Folster then describes a 1987 survey conducted at the University of Wisconsin-Madison which examined the different sources used by researchers at varying levels of academic status. Of importance here are the findings that, as in previously cited studies, "Journals are the most important source of information in the research process and tracking citations is also an essential factor in the acquisition of information."²⁰ Moreover, Folster found that computerized literature searching by faculty and student researchers ranked as one of the least important avenues for research.²¹ It must be noted here, that in the studies conducted and examined, researchers have been defined as scholars---faculty, and for the most part graduate students. It must be assumed that their research needs, and above all their knowledge of research techniques and methods, differ from novice searchers or undergraduate students. Thus, their research ability is significantly more sophisticated. CD-ROM indexes may provide some information for these more

¹⁹Mary B. Folster, "A Study of the Use of Information Sources by Social Science Researchers," *Journal of Academic Librarianship* 15 (March 1989): 7.

²⁰*Ibid.*, 10.

²¹*Ibid.*

sophisticated researchers, but according to the studies cited, electronic sources, at least in the recent past, have not occupied a major place in advanced research. This current study should generate additional findings to determine if research techniques and needs differ among graduate and undergraduate students. The limitations of electronic sources, specifically CD-ROM indexes with limited date coverage, may be apparent to advanced researchers, as it is to this author, and thus impact on their use patterns.

Many articles have reported on studies conducted at academic institutions measuring student attitudes and use of CD-ROM technology. Only a few mention user's desire for more retrospective information.

An early and often-cited article by Beltran discusses the CD-ROM InfoTrac system and student interaction at Indiana University Library. In 1986 Beltran surveyed 200 users over a three-day period and discovered that students found the system easy to use. When asked if they found information on their topic, 68.4 percent of undergraduates strongly agreed. Only 51.5 percent of graduate students strongly agreed with the statement. Beltran suggests that this is "not a surprising result given the popular nature of the database."²² More significant was the fact that several users asked for "more scholarly journals" and "more retrospective information."²³ Clearly for some, the need for a broader coverage of dates was present and the InfoTrac system did not meet those needs. Unfortunately, Beltran does not indicate whether the students asking for more journal and retrospective information were undergraduate or graduate students.

In a follow-up study done one year later at the Indiana University Library, Beltran found that user reaction to the CD-ROM product "continued to be overwhelmingly

²²Ann Bristow Beltran, "Use of InfoTrac In A University Library," *Database* 9 (June 1986): 66.

²³*Ibid.*

favorable."²⁴ Beltran further noted that "undergraduates are the heaviest users of InfoTrac, and its most enthusiastic supporters."²⁵ This seems to indicate that more sophisticated users--graduate students--are using more traditional sources and other avenues of research, such as footnotes and bibliographies. No mention was made in this article of the need for and inclusion of more retrospective information.

Another article that reported on positive user response to CD-ROM featured a two week test performed at the UCLA Biomedical Library. A portion of the MEDLINE database on CD-ROM was used to test patron response to the system and previous search experience.

Results of the two week test showed that out of the sixty-three evaluation forms that were completed and returned, 57 percent of the respondents were satisfied with their searches; 30 percent said they were not satisfied. Interestingly, "One respondent who . . . said she was satisfied with her search had actually received 826 citations, while another 'satisfied user' found nothing on his topic."²⁶ Of those responding that they were not satisfied, 85 percent said they would use the system again, and 63 percent said the library should buy the system.²⁷ These responses seem indicative of users' overall acceptance of and appreciation for electronic sources regardless of either the quality or amount of information retrieved. Of real significance was the complaint of a few respondents that "the system did not cover a long enough period of time."²⁸ In the article, Glitz fails to

²⁴Beltran, "InfoTrac: A Second Look," 49.

²⁵Ibid.

²⁶Beryl Glitz, "Testing the New Technology: MEDLINE on CD-ROM in an Academic Health Sciences Library," *Special Libraries* 79 (Winter 1988): 31.

²⁷Ibid.

²⁸Ibid., 32.

address this as a fundamental problem with CD-ROM indexes, stating only that patrons were informed that "the disc was only a small demonstration."²⁹

A survey conducted at the University of Delaware Library, Newark, measured user satisfaction of MLA on CD-ROM. Closed- and open-ended questions were used to determine user likes and dislikes of the product, as well as measuring the success of their searches.³⁰ Further, several hypotheses were tested. One hypothesis was that the CD-ROM version of MLA is a very difficult tool, not easily understood by novices or mastered by more advanced users. The second hypothesis was that users would find the lack of documentation, printed or on-screen, frustrating. The third hypothesis was that despite the limitations of the index, users would nonetheless feel positive about using it. Surprisingly, the survey found that users did not find MLA on CD-ROM difficult to use. Further, users were concerned about the lack of documentation. Finally, users (85 percent) were overwhelmingly satisfied with the system, and 100 percent responded that they would use it again.³¹ Significantly, this article was one of the few citing user dissatisfaction with the lack of retrospective information. In the survey, respondents were allowed space for written comments. Sixty-two percent wrote some negative comments, and more than one-fourth of these "concerned the lack of coverage before 1981."³² The authors expressed surprise that this criticism far outranked any other criticism.

A 1990 *Library Journal* article by Schultz and Salomon reports on a survey conducted at Oakland University's Kresge Library to not only identify users' attitudes

²⁹Ibid.

³⁰Jo McClamroch, Linda Lawrence Stein, and Edgar Williamson, "MLA on CD-ROM: End - Users Respond," *Reference Services Review* 19 (Spring 1991): 82.

³¹Ibid., 81-84.

³²Ibid., 84.

toward CD-ROMs but also to evaluate their use of these systems. The survey posed four questions: 1) were you satisfied with the results of the search? 2) did the search produce useful references? 3) was CD-ROM difficult to use? 4) did CD-ROM use save research time? The results indicated that students found CD-ROM very useful and accessible. Sixty percent of the respondents were satisfied with the results obtained. Sixty-two percent of the respondents felt the CD-ROM search produced useful references. Sixty-four percent felt it was easy to use. A substantial 83 percent felt that it saved time. In terms of the CD-ROM system versus the print equivalent, 85 percent chose the CD-ROM. Two-thirds of the respondents indicated that if the CD-ROMs were busy they would wait until available rather than use the print source.³³ There was no breakdown of use by educational level, ie. graduate or undergraduate. Further, no mention is made with regard to the need for retrospective information, or the limited date coverage in CD-ROM indexes.

A study conducted at Pennsylvania State University did address the issue of CD-ROM use and educational level. The goal was to determine not only the characteristics of CD-ROM users, but also how they were interacting with the system. Results indicated that 55.7 percent of the users of the CD-ROM systems were undergraduates. This heavy use by undergraduates has been reported in previous studies and is therefore not surprising. Twenty percent of the users were master's students, 9.6 percent doctoral students, and 9.6 percent freshmen and sophomores. In terms of user satisfaction, 56 percent of all users were satisfied with their search results, and over 86 percent found the systems easy to use. The most heavily used CD-ROM indexes were: Readers Guide, Social Sciences Index, and Business Periodicals Index.³⁴ Apparently, there were no comments from users requesting

³³Kim Schultz and Kristine Salomon, "End Users Respond to CD-ROM," *Library Journal* 115 (February 1, 1990): 56-57.

³⁴Faries, 42-43.

expanded coverage of the CD-ROM indexes, and Faries makes no suggestion that limited date coverage was a problem.

The entire question of CD-ROM indexes versus the printed equivalents has been explored and reported on in a number of articles. Most articles focus on user preference for the CD-ROM systems. The question of limited date coverage on CD-ROM products and the retrospective and comprehensive quality of print sources would, it is assumed, be discussed. However, this has not been the case.

In a 1988 article, Stewart and Olsen report on an experiment conducted in 1987 at the Albert R. Mann Library of Cornell University. One hundred students using ERIC on SilverPlatter assisted in the experiment to test the following hypotheses: 1) Students using ERIC on CD-ROM will outperform students searching the same topics in the printed ERIC indexes; 2) Students instructed in the use of ERIC on CD-ROM will outperform students not instructed and who must use their own initiative to consult the SilverPlatter manual or reference staff; 3) Students will express a preference for CD-ROM after comparing results obtained in printed indexes; 4) Students with prior experience, either in performing or observing searches, will outperform other students.³⁵

The data collected supported both hypotheses one and two. The third hypothesis was overwhelmingly supported. Results for hypothesis four were inconclusive. Interestingly, "the student's subjective responses to the CD-ROM database support the objective data: they recognize its potential, find it reasonably easy to use and would prefer it to printed indexes."³⁶ Neither the students, nor Stewart and Olsen, expressed concern regarding limited date coverage or the possible need for retrospective information.

³⁵Linda Stewart and Jan Olsen, "Compact Disk Databases: Are They Good For Users?" *Online* 12 (May 1988): 48-52.

³⁶*Ibid.*, 52.

In an *RQ* article appearing in 1989, Allen reports on user response to and success in using six Wilsondisc bibliographic databases and InfoTrac Periodicals Index at the Undergraduate Library at the University of Illinois at Urbana-Champaign. The results indicated an overwhelming preference for CD-ROM over the print indexes. In citing their preference for CD-ROM, 53 percent strongly agreed, 16 percent agreed somewhat, 9 percent were unsure, 2 percent disagreed, and 2 percent strongly disagreed.³⁷ No mention, once again, was made of the possible need for retrospective information or CD-ROM indexes with limited date coverage.

Another study conducted at the Purdy/Kresge Library at Wayne State University in Detroit also shows user preference for CD-ROM indexes over the equivalent print sources. This study is significant in that it indicates some users are not aware of printed equivalents. The four databases used in the study were: PsycLIT, ERIC, Compact Disclosure, and Social Sciences Index.

Lynn and Bacsanyi report that of the thirty-one users of the PsycLIT database, fourteen were undergraduates, eleven were graduate students, three were faculty members, two were staff members, and three were non-WSU graduate students. When asked if they had used the print version, fifteen responded yes, five responded no, and ten did not know that one existed.³⁸ Unfortunately, the article does not indicate the educational level of the respondents who were not aware of the print versions. It would have been beneficial to see the percentage of graduate students and faculty that had used the print version. Lynn and Bacsanyi also report that of the nineteen respondents who

³⁷Gillian Allen, "Patron Response to Bibliographic Databases on CD-ROM," *RQ* 29 (Fall 1989): 102-10.

³⁸Patricia Lynn and Karen Bacsanyi, "CD-ROMs: Instructional Methods and User Reactions," *Reference Services Review* 17 (Summer 1989): 17-25.

used the ERIC database, seven were undergraduates, six were graduate students, one was a faculty member, two were staff members, and three were individuals not attending WSU. When questioned if they had used the print version of ERIC, five answered yes, seven answered no, and six did not know that one existed.³⁹ Once again, the article does not indicate the educational level of the respondents with regards to the print version question.

Of the eleven respondents who used the Compact Disclosure database, seven were undergraduates, two were graduate students, and two were graduate students not affiliated with WSU.⁴⁰ The print version question was not applicable here. Curiously, there was no mention of the grade level of the eight respondents using the Social Sciences Index. Of the eight, three had used the printed version, two had not, and two did not know that a printed index existed.⁴¹ Interestingly, this study replicates what has been seen in other studies: undergraduates are the heaviest users of CD-ROM indexes.

Crawley and Adams report on a comparative study done with the assistance of twenty-two undergraduate psychology students at the University of Saskatchewan to determine their preference for searching Psychological Abstracts in three available formats. The formats included: print, CD-ROM, and InfoAccess. Results show a clear preference for the automated indexes. "Users preferred to search with CD-ROM, but found InfoAccess to be an acceptable alternative."⁴² The print version was consistently ranked second or third. Students indicated that they found using print indexes to be time consuming, and a fewer number of references were located. It was noted that searchers

³⁹Ibid., 20.

⁴⁰Ibid., 21.

⁴¹Ibid., 21.

⁴²Jill Crawley and C. Adams, "InfoAccess Project: Comparing Print, CD-ROM, and In-house Indexes," *The Canadian Journal of Information Science* 16 (April 1991): 29.

limited by date in the printed indexes by selecting the volume corresponding to the year required and for the automated version by selecting a publication year in a command. No mention was made, however, of the possible problem with CD-ROM indexes with limited date coverage or how this might influence or inhibit the research process.

Although CD-ROMs are widely accepted and in many instances preferred over more traditional sources by users, librarians and information professionals have expressed some reservations and raised some important questions. A number of articles have appeared expressing these reservations and addressing certain questions.

In a 1987 article, Hall, Talan and Pease discuss InfoTrac use in academic libraries. Although InfoTrac, once again, is not the focus of this thesis, the authors raise some important questions that are germane, indeed fundamental, to the issue of CD-ROM technology in general. Of special concern is the quality of information students may be obtaining. Discussed in the article is the issue of students using CD-ROM systems "in place of more appropriate subject indexes or abstracts, that many students are unaware of --or ignore the subject limitations of-- the database, and that students often use inappropriate or inadequate search strategies."⁴³ There is another fundamental question that they raise with regard to InfoTrac specifically, but which is applicable to all CD-ROM indexes. "Did the students search further in other indexes or did they give up without finding anything, or stop with a few marginally relevant citations, thinking 'This is all there is?'"⁴⁴

Students' awareness and selection of appropriate CD-ROM databases seems to be an ongoing concern and was surveyed in 1991 at Montana State University, Bozeman,

⁴³Hall, Talan, and Pease, 54.

⁴⁴Ibid.

Montana. Dyson and Cary report that their survey showed that while 83 percent of the searches were conducted in the appropriate database, 17 percent were not. Of further concern, the survey revealed a heavy reliance on computerized sources. In the survey response, 65 percent used only computerized sources or nothing else at the time of the survey. Only 24 percent used a combination of print and computerized sources.⁴⁵ Dyson and Cary express the concern that "patrons may be wasting their time for limited results. While some users may be satisfied, others may not realize that they could do much better."⁴⁶

Somporn Puttapithakporn, in his article "Interface Design and User Problems and Errors: A Case Study of Novice Searchers," identifies and analyzes the various problems students encounter when searching CD-ROM products within an academic environment. Data was gathered on thirty-three students enrolled in an Introduction to Information Science course in 1989 at Indiana University-Bloomington. The students who took part in the study used ERIC on SilverPlatter. The author used direct observation, self administered questionnaire, and selective interviews to gather the information. Some of the problems encountered by students included syntactic errors, menu selection problems, problems when interacting with systems through abbreviated codes, semantic errors, and system functionality problems. Once again, however, in the procedures involved to gather the information--direct observation, self-administered questionnaire, and selective interviews--no mention is made of the possible problem of limited date coverage and how this might impact the outcome of a student's research.⁴⁷

⁴⁵Rick Dyson and Kjestine Carey, "User Preference For CD-ROMs: Implications for Library Planners," *CD-ROM Professional* 6 (May 1993): 87-88.

⁴⁶*Ibid.*, 88.

⁴⁷Somporn Puttapithakporn, "Interface Design and User Problems and Errors: A Case Study of Novice Searchers," *RQ* 30 (Winter 1990): 195-203.

Harter and Jackson also discuss some of the characteristics of CD-ROMs, and various problems and issues related to their use are identified. Harter and Jackson are especially concerned with regard to the quality of information retrieved as users gravitate toward sources that are quick and easy to use. The article by Harter and Jackson is also significant in that it is one of very few that, however briefly, addresses the issue of limited date coverage:

Size of a database can also be crucial, since with the present technology one CD-ROM disc cannot hold the largest databases. This has serious implications for the handling of multiple discs, . . . and user misunderstanding about what was searched. The complete run of ERIC for example, requires three CD-ROM discs. Without instruction, many users will believe that a complete retrospective search on ERIC was conducted, when in fact only the last few years were searched.⁴⁸

Throughout the article, Harter and Jackson stress the necessity for further study and discussion of user needs.

Users of CD-ROM systems often experience the various problems discussed above when utilizing the systems. Many users, however, are unaware of the limitations attendant with CD-ROM technology. Several articles examine the issue of CD-ROMs and attendant user education or bibliographic instruction (BI). Repeatedly throughout much of the literature, bibliographic instruction is suggested as a useful way to alleviate many of the problems encountered with CD-ROM use.

In an article entitled "CD-ROM: The Aladdin's Lamp of Library Technology?" Teresa Mensching provides an interesting forum for several academic librarians to suggest ways to manage some of these CD-ROM issues. Among these, Gibson recommends telling students in BI sessions and reference interviews about the limitations of CD-ROM indexes, such as the depth and quality of coverage and the time limitations. Gibson also

⁴⁸Harter and Jackson, 518.

suggests teaching students to use a mix of traditional print and CD-ROM indexes, so students will realize the full range of information sources available.⁴⁹ Penhale and Taylor recommend BI sessions that describe "the variety of bibliographic sources that are available and include an explanation of the formats in which the sources may appear (print, CD-ROM, online)."⁵⁰

In "CD-ROM's: Instructional Methods and User Reactions," Lynn and Bacsanyi describe and analyze the development, practice, and success of five instructional methods used to familiarize and instruct students with regard to CD-ROM at the Purdy/Kresge Library at Wayne State University. These methods include developing instructional leaflets, offering individual instruction on demand, offering instruction by appointment, arranging scheduled group sessions, and designing course-integrated training sessions. The study found that the following models were the most effective: computer-assisted instruction, individual instruction on demand, training sessions on an announced basis, and instruction within subject classes.⁵¹ The article does not specifically address problems with searching CD-ROMs, and nowhere is there any discussion of the limited date coverage on most CD-ROM indexes and how this might impact user searching. A question arises, does library staff compensate for this in any way, and is discussion of this factor a significant part of the bibliographic instruction process?

Nash and Wilson report on a study conducted at the Alexander Library, Rutgers University, concerning the large number of irrelevant or inappropriate citations retrieved by undergraduate students when searching on CD-ROM. The authors suggest that

⁴⁹Mensching, 91.

⁵⁰Ibid.

⁵¹Lynn and Bacsanyi, 17-25.

students have a difficult time navigating the large amount of information available and critically analyzing the citations retrieved for usability.

Sometimes the articles are in languages the student cannot read. At times, the list may contain items that are not, in fact, journal articles (book reviews, conference proceedings, even dissertations) but the student is unable to recognize this fact. And, in a few instances, the student may simply be using the "wrong" database.⁵²

The findings and in-depth interviews with students confirmed previously conducted studies. Most of the students--80 percent--were satisfied with the results of CD-ROM searches, despite the fact that only one-third found only 5 to 20 percent of their citations useful. Also revealed was the fact that 20 percent of the students used the wrong database. Moreover, 30 percent would have had better results with the print equivalents in the subject specialty.⁵³

The authors propose to remedy this situation by means of a bibliographic instructional model which would teach students "critical skills necessary to effectively use indexes and abstracts in any format."⁵⁴ These skills would include the ability to critically evaluate, select, and acquire citations in terms of publication year, language, type of periodical, article length, and subject. Further, they stress the need to inform students of the relationship between print indexes and CD-ROMs. This article is extremely significant in two respects. Not only do the authors realize and articulate the important relationship between CD-ROM and print indexes, but they also emphasize the importance of teaching students, through bibliographic instruction, to understand the scope and nature of

⁵²Stan Nash and Myoung Chung Wilson, "Value-Added Bibliographic Instruction: Teaching Students To Find the Right Citations," *Reference Services Review* 19 (Spring 1991): 88.

⁵³*Ibid.*

⁵⁴*Ibid.*, 90.

databases. This would incorporate not only the dates of coverage but also the type and amount of information supplied.⁵⁵

Several other articles discuss the importance of fully incorporating CD-ROMs in bibliographic instruction. In "Back to Basics: Integrating CD-ROM Instruction with Standard User Education," Nipp stresses the importance of developing instructional programs to assist students in the effective use of CD-ROMs. She discusses not only the goals of bibliographic instruction in general but also how these goals need to be integrated into goals specific to CD-ROM use.⁵⁶ In contrast, Blumenthal, Howard, and Kinyon, while examining the effects of CD-ROMs on students conducting research, focus primarily on how bibliographic instruction programs must be modified to incorporate CD-ROM technology.

Blumenthal, Howard, and Kinyon report that library professionals at Georgia State University's William Russell Pullen Library found that student response to CD-ROM technology was extremely enthusiastic. "Researchers who had formally used the print indexes found the CD-ROMs efficient and fascinating."⁵⁷ Librarians were concerned, however, because students often reveal a tendency to "think one-dimensionally and focus on one database or index as the answer to all their questions and research needs."⁵⁸ In order to instruct students in the effective use of the technology, library staff fully incorporated CD-ROM instruction into their bibliographic instruction. CD-ROM players

⁵⁵Ibid., 87-92.

⁵⁶Deanna Nipp, "Back to Basics: Integrating CD-ROM Instruction with Standard User Education," *Research Strategies* 9 (Winter 1991): 41-47.

⁵⁷Caroline Blumenthal, Mary Jo Howard, and William R. Kinyon, "The Impact off CD-ROM Technology on a Bibliographic Instruction Program," *College and Research Libraries* 54 (January 1993): 12.

⁵⁸Ibid., 14.

with the software of several CD-ROM databases were added to the BI classroom. Further, in addition to hands-on demonstration and instruction, discussion of basic searching concepts and techniques such as boolean logic, the appropriate use of connectors, and the use of thesauri is also taught. Above all, the librarians stress the importance of accessing both traditional as well as high technology sources to adequately address information needs.⁵⁹

The review of the literature has focused on several significant elements of CD-ROM technology in the academic environment including: student attitudes and use patterns; comparative use of CD-ROM systems and print sources; concerns and reservations of librarians and information professionals; and the inclusion of CD-ROM technology in bibliographic instruction programs. The available literature reveals that undergraduates are the heaviest users of CD-ROM indexes. Undergraduate students are, however, generally the least sophisticated in terms of research methods and procedures. Often the citations they access and use are inappropriate or unusable. Research has shown that many times students are found to be searching in entirely the wrong index for their subject. In addition, many students seldom utilize all available resources, such as, the print versions of indexes. The question of student use of CD-ROM indexes with limited date coverage is a significant one. Although there is brief mention of limited date coverage on CD-ROM indexes in some of the articles, none were found that addressed this issue in a full and complete manner. Moreover, none discussed what impact this may be having with regard to a possible lack of historical perspective in student research. To address this issue fully, chief reliance will be placed on the findings and discussion of a questionnaire

⁵⁹Ibid., 11-16.

distributed to students conducting research in the LAN, or Local Area Network, area of the reference section, at the library of California State University, Fullerton.

CHAPTER 3

METHODOLOGY

In order to determine the use of CD-ROM indexes with limited date coverage in an academic environment, a survey method was employed. Permission was sought and granted to distribute a questionnaire to a random sample of CD-ROM users at an academic library. As was discovered in a review of the literature, similar questionnaires have been employed to solicit opinions from users (Crawley and Adams 1991; Allen 1989; Folster 1989; Faries 1992). The questionnaire for this current study was distributed to users conducting research on CD-ROM indexes mounted on workstations in the LAN area of the reference section at the library of California State University, Fullerton.

Setting

The library involved in this study is on the campus of the California State University, Fullerton (CSUF). It is a medium-sized university with an enrollment in 1992 of approximately 25,486. The student body make-up is varied: 9 percent are first time freshmen; 18 percent are lower division students; 56 percent are upper division students; 17 percent are graduate-level students. A significant proportion of those enrolled are commuter and returning students. Over 70 percent of the students work 20 or more hours per week. Fifty-six percent of all students take 12 or more hours of course work each semester.

CSUF offers 45 bachelors degrees, 44 masters degrees, 47 minors, 3 resident certificates, and 13 teaching credential programs. In 1991-92, 4,188 undergraduates

received Bachelor of Arts degrees, and 762 graduate students received Master of Arts degrees. The two largest programs are the School of Business and Management and the School of Communications. Computer literacy is heavily stressed on campus, and some programs require a computer element.

Faculty on campus are actively involved in research. There are 738 full-time faculty members and administrators, and 507 part time faculty members.

The six-story library, located in the center of the campus, was founded in 1959. It houses a collection of over 700,000 books and bound periodicals. There are over one and a half million other items including government documents (federal, state, local, and international); maps; over 920,742 titles on microform; and over 15,530 nonprint materials (kits, videotapes, CDs, audiotapes, and film strips).⁶⁰ Reference services are located on the first floor, in direct view of the entrance. There are no separate research facilities for graduates or undergraduates. The CSUF library serves many other Orange County residents including students from other local colleges and schools, as well as non-academic users such as business people.

Background

Beginning in 1984, reference librarians at the CSUF library recognized a need to acquire and integrate many of the newly developed and manufactured electronic information retrieval systems into the library collection. For several years an active mediated online information retrieval service was offered. An InfoTrac system with four workstations was acquired, but was found to be unsatisfactory due to the simplicity of its search capabilities. The reference section then applied for lottery funds in hopes of financing a CD-ROM master plan. By 1989 the reference section had in place a very

⁶⁰*American Library Directory*, 1990-91 Vol. 1, 43rd ed., s.v. "California, Fullerton."

successful CD-ROM program. The CD-ROM system included over seventeen products. More changes were introduced in 1990. The EBSCO Company selected the CSUF library as a field test site for the installation of their new LAN system. In addition, the reference section secured an additional lottery grant of \$55,000. Part of this grant money purchased the EBSCO CD-ROM Network, which uses the LANtastic system along with OPTI-NET software.⁶¹

The LAN is located on the first floor, adjacent to the reference desk in the reference section. The LAN area serves faculty, staff, graduate and undergraduate students. Twenty workstations with attached printers are located in this area. At the time of this survey, sixteen databases produced by five vendors were mounted on the network. Wilson indexes include Applied Science and Technology Index, Art Index, Business Periodicals Index, Reader's Guide to Periodical Literature, Humanities Index, Library Literature, Literary Index, Social Sciences Index, Religion Index, and General Science Index. SilverPlatter indexes include Psychological Abstracts, MLA Bibliography, and ERIC. Other databases include UMI's ABI/INFORM, Dataware's Music Index, and The Chicano Database. There are four stand alone workstations which accommodate the following indexes: Eighteenth Century Short Title Catalog; UMI's Dissertation Abstracts; Science Citation Index; Social Sciences Citation Index; and SilverPlatter's Sociofile. Also available in the LAN area are two LEXIS/NEXIS workstations, and two other workstations which include the following systems: CarlUncover; Interlib; Firstsearch; and LEXIS/ NEXIS Tutorials. Students have the option of printing out the accessed material by means of a copy card, or downloading to a floppy disk.

⁶¹Mary Ellen Bobp, Mona Kratzert, and Debora Richey, "The Emergence of Systemwide Electronic Access to Information Sources: The Experience of Two California State University Libraries." *Reference Librarian* 39 (1993):111-30.

A LAN desk was established in the Spring of 1993 to guarantee CSUF students access to the LAN, answer CD-ROM questions, and relieve demand at the reference desk. The desk stands at the entrance to the LAN area and is staffed by student assistants. The hours are: 9 A.M.-8 P.M. Monday through Thursday, 9 A.M.-3 P.M. Friday; and 12 Noon-5 P.M. Saturday and Sunday. Faculty, staff, and students of the university must show their ID to gain access to the LAN area. Student assistants answer many of the CD-ROM questions, and reference staff are also available at the nearby reference desk to answer questions. Further, there are printed guides for most of the CD-ROM indexes, as well as thesauri for PsycLit and ERIC. Also available are notebooks which list the periodicals and journals indexed in the databases and held by CSUF.

Outside the LAN area, and adjacent to the reference desk are four other workstations with the networked indexes. There are no printers attached, but downloading to floppy disks is permitted. These workstations are available to CSUF students, students from other local colleges and schools, business people, and nonacademic users. Two other workstations are also available, offering Disclosure's Compact D/Sec and SilverPlatter's CIRR. Printed indexes and abstracts are located adjacent to the reference desk, opposite the LAN area.

The reference desk is staffed 10a.m.-10p.m. Monday through Thursday, 10a.m.-3p.m. on Fridays, and 12p.m.-5p.m. Saturdays and Sundays. Nine reference librarians staff the reference desk. Two graduate students from the School of Library and Information Science, San Jose State University, also work the desk and are scheduled for ten hours a week each. Eleven student assistants also work at varying times during a weeks period, answering directional questions.

The reference section offers library tours and bibliographic instruction. CD-ROMs are increasingly included in course-related instruction and are mentioned in library tours.

There is no specific library course offering instruction in CD-ROM use. Some reference staff have held CD-ROM workshops. Student participation is voluntary and few students take advantage of the service. Many students new to CD-ROM receive little or no formal instruction in either CD-ROM use or searching techniques.

Data Collection

A survey was created to ascertain student use of CD-ROM indexes with limited date coverage. The instrument for data collection was a one-page questionnaire consisting of eleven questions. The questionnaire was not pretested. The questionnaire was distributed to a random sample of undergraduate and graduate students and faculty entering the LAN area (restricted to CSUF users) during a one-month period from April 20 to May 20, 1993. This is a peak period of activity during the spring semester in which CD-ROM indexes are heavily used. Both the LAN desk and reference desk were staffed when distribution of the questionnaire took place. CD-ROM users were asked to complete the questionnaire at the conclusion of their search session. Directions for completing the questionnaire were clearly printed at the top of the questionnaire. No specific instructions were given in searching techniques, and no personal interviews regarding the search session were conducted. Questionnaires were returned to the LAN desk upon leaving the LAN area, and placed in a collection box. Responses to the questionnaire were voluntary and anonymous. A total of 411 questionnaires were returned.

The questionnaire included spaces for respondents to indicate their major, the research topic, and their status (undergraduate, graduate, faculty, or other). The questionnaire employed a combination of multiple choice, Likert Scale, and yes-no questions. Respondents were asked to indicate which CD-ROM indexes were used for their current research assignment. The results are graphically represented to produce a

faculty/student use profile. The results should reveal the education level of the user; if the user was employing the correct database for the given research topic; which CD-ROM indexes were used; whether information found on CD-ROM indexes met users research needs; ease or difficulty of use; user awareness of availability of indexes for earlier years on disc; user awareness of paper indexes; use of paper indexes; ease of use of paper indexes; whether information found in paper indexes met research needs; whether current (1986+) information was important for research purposes; whether earlier (pre 1986) information was important for research purposes; whether users were directed to CD-ROM indexes by library staff; whether users were directed to paper indexes and abstracts by library staff; whether users were directed to CD-ROM indexes by professors; whether users were directed to paper indexes and abstracts by professors.

Data Preparation

A total of 411 questionnaires were collected and data preparation was begun. Questionnaires were checked for completeness and legibility. Four hundred and six questionnaires were found to be complete and useable. The questionnaires were then numbered and arranged in a binder.

Analysis of the data was conducted using a Microsoft Access program. This program is a relational database management system. It includes a graphical design environment for creating and modifying tables, forms, reports, queries, and macros. Access does not offer built-in statistical tests but is quite powerful with its referential integrity, self-joins, complex expressions, and validation features.

CHAPTER 4

RESULTS

This survey focusing on the use of CD-ROM indexes located in the LAN area of a library at one academic institution, California State University Fullerton, yielded some interesting results.

Results from the 406 complete and useable surveys showed that in terms of status, 321 or 79 percent of the respondents were undergraduate students. Eighty or 20 percent of the respondents were graduate students. Faculty and "other" comprised the remainder of the respondents at one or 0.25 percent, and four or 0.99 percent respectively (see table 1). Since only five questionnaires were completed and returned by those identifying themselves as other and faculty, few conclusions can be drawn from this group. In order to make the results of the survey more valid, these five identified as other and faculty are subtracted from the total number (N=406), leaving a total of 401 undergraduate and graduate students. It is interesting and perhaps valuable to note, however, that so few faculty and staff entered the LAN area and used the system.

Table 1.--Status of CD-Rom Users

Status	N	(%)
Undergraduates	321	79
Graduates	80	20
Other	4	.99
Faculty	1	.25
Total	406	100%

According to the CSUF Statistical Handbook Tables for Spring 1993, the total number of students enrolled at CSUF was 22,778. Eighteen thousand nine hundred and four or 83 percent of the enrolled students were undergraduates. Three thousand eight hundred and seventy four or 17 percent were graduate students.⁶² A 3 percent gap shows that proportionately, graduate students entered the LAN area and completed more questionnaires than undergraduate students. The survey, therefore, should be valid statistically.

Although graduate students in proportion to the total number of students enrolled filled out more questionnaires than undergraduate students, undergraduates on average used more CD-ROM indexes than graduate students.

During the one-month period in which the survey was conducted, undergraduate students entering the LAN area and completing the questionnaire indicated that they used a total of 474 CD-ROM indexes. Three hundred and fourteen or 68 percent of the undergraduates used at least one CD-ROM index. Ninety five or 20 percent used at least two CD-ROM indexes. Fifty-five or 12 percent used three or more CD-ROM indexes. Of the 321 undergraduate students completing the questionnaire, only ten indicated that they used more than four of the CD-ROM indexes.

In comparison, graduate students responding to the questionnaire used a total of 118 CD-ROM indexes. Seventy-seven or 65 percent of the graduate students used at least one CD-ROM index. Twenty-five or 21 percent of the graduate students used at least two CD-ROM indexes. Sixteen or 14 percent of the graduate students used three or more of the CD-ROM indexes. Of the eighty graduate students responding to the questionnaire, none indicated using more than four of the CD-ROM indexes (see table 2).

⁶²Spring 1993 Statistical Handbook Tables

Table 2.--CD-ROM Usage at CSUF

Usage	Undergraduate	(%)	Graduate	(%)
Used at least 1 CD-ROM	314	66	77	65
Used at least 2 CD-ROMs	95	20	25	21
Used at least 3 CD-ROMs	55	12	16	14
Used 4 or more	10	2	0	0
Total	474	100%	118	100%

The data from this survey indicates that undergraduate students do indeed use more CD-ROM indexes than graduate students on a ratio of almost 4:1. This data further supports previous literature by Beltran, Lynn and Bacsanyi, and Faries, indicating that undergraduate students are by far the heaviest users of CD-ROM indexes. This pattern of heavy use by undergraduates indicates that perhaps they are favoring CD-ROM indexes over the more traditional methods of research such as footnotes, bibliographies, and the print versions of indexes and abstracts. While graduate students also used CD-ROM indexes, proportionately they used far less than the undergraduate students. This pattern of heavy use by undergraduate students, and less use by graduate students, may be a result of advanced research knowledge and experience. Undergraduate students, in general, are far less likely to be knowledgeable about and experienced in search techniques and traditional research methods. Graduate students, on the other hand, are much more likely to be aware of not only advanced searching techniques but also traditional research methods, and are more experienced in using them as well.

Bibliographic indexes on CD-ROM were used by all majors. However, the use by some majors was heavier than by others. The majors most heavily using the CD-ROM indexes were business, psychology, communications, child development and biology.

According to the survey results, business majors from the School of Business Administration and Economics were the heaviest users of the CD-ROM indexes. Of the the 401 questionnaire respondents, 113 or 28 percent indicated they were business majors. Of the 113 business majors, 103 or 91 percent were undergraduates, and 10 or 9 percent were graduate students. That there was heavy use by business majors is not surprising, as the school has the highest enrollment figures for the university. The business school, comprised of the departments of Accounting, Advertising, Business, Business Administration, Economics, Finance, International Business, Management, and Marketing, had a total undergraduate and graduate enrollment for spring 1993 of 6,483.⁶³ Twenty-nine percent of all students enrolled at the university were business students.

Business students primarily used the two business indexes, Wilson Business Abstracts, and ABI Inform. Wilson Business Abstracts was used a total of seventy-four times, accounting for 13 percent of all use. ABI Inform was used a total of fifty-seven times, accounting for 10 percent of all CD-ROM Index use. The use of these two indexes accounted for 23 percent of the total CD-ROM use. Seventy business majors used only Wilson Business Abstracts and/or ABI Inform.

Students from the Psychology Department of the School of Humanities and Social Sciences were the next heaviest users of the CD-ROM indexes. Of the total number of CD-ROM users (N=401), forty-six or 11.5 percent were psychology students. Of these forty-six psychology students, thirty-six or 8 percent were undergraduates, and ten or 2.5 percent were graduates. The psychology department with 1,104 undergraduates and sixty graduate students, has the third largest enrollment of students at the university. That they were the second highest users of the CD-ROM indexes is not surprising. All forty-one

⁶³Ibid.

psychology students used the bibliographic index PsychLit, as well as additional indexes. PsychLit was used a total of eighty-three times or accounted for 15 percent of all CD-ROM use.

Communications majors were the next heaviest users of the CD-ROM indexes. Of the total number of respondents (N=401), forty-one or 10.2 percent were communications majors. Of these forty-one, thirty-one or 76 percent were undergraduates, and ten or 24 percent were graduate students. Child development majors were the next heaviest users of the CD-ROM indexes, at thirty-one or 7.65 percent of the total number of respondents (N=401). Of these thirty-one, thirty were undergraduates, and only one was a graduate student. Both communications and child development majors used a variety of CD-ROM indexes including ERIC, PsychLit, Social Sciences Index, General Science Index, and Reader's Guide to Periodical Literature. Twenty-four biology students accounted for 6 percent of all CD-ROM users. All twenty-four were undergraduate students (see table 3). One hundred and forty-six undergraduate and graduate students from various other majors accounted for 36.5 percent of the remaining CD-ROM use. These remaining majors are included in Appendix 3. The total number of times each CD-Rom was accessed is shown in Appendix 4.

Table 3.--Heaviest use of CD-ROMs by Major

Status	N	(%)
Business	113	28
Psychology	46	11.5
Communications	41	10.3
Child Development	31	7.7
Biology	24	6
Other	146	36.5
Total	401	100%

On the questionnaire, respondents were asked to indicate their current research topic. This question was followed by a listing of the CD-ROM indexes available, and respondents were directed to check which indexes were used for the research topic. In examining the completed questionnaires and evaluating the responses, it was determined that most of the respondents were using the appropriate CD-ROM index for their research topic. However, since there were no questions on the questionnaire relating to the length, quality of the searches, or the number or nature of citations retrieved, no evaluation can be made in this area. Moreover, these issues are beyond the scope of this study.

In order to explore the fundamental question "Do students conducting research in the CD-ROM environment require retrospective information not available in most CD-ROM indexes?" a number of hypotheses were tested. The first hypothesis, that students do require retrospective information, was tested by asking two questions relating to the type of information needed by the students' for their current research topic. The first question was "Is current (1986+) information important for your research purposes?" Of the total number of undergraduates responding (N=321), 282 or 88 percent answered "yes." Twenty-two or 7 percent answered "no." Seventeen or 5.3 percent answered "don't know." Of the graduate students responding (N=80), seventy-seven or 96 percent answered "yes." Two or 2.5 percent answered "no." One or 1.2 percent answered "don't know." The combined undergraduate/graduate response was, 359 or 90 percent indicated current information was important for research purposes, twenty-four or 6 percent indicated it was not, and eighteen or 4 percent responded "don't know" (see table 4). As indicated by a low "don't know" response, graduate students apparently seemed to have a better understanding of current needs with regard to their research topic.

Table 4.--Current Information Important?

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	88	7	5.3
Graduates	80	96	2.5	1.2
Total	401	90%	6%	4%

To determine if earlier or retrospective information was important, a second question was asked. The question posed was, "Is earlier (pre-1986) information important for your research purposes?" Of the undergraduates responding (N=321), 113 or 40 percent responded "yes." One hundred and seventy-one or 60 percent of the undergraduates responded "no." Thirty-seven or 12 percent responded "don't know." Of the graduate students responding (N=80) to the question, thirty-seven or 46 percent responded "yes." Thirty-five or 44 percent responded "no." Eight or 10 percent responded "don't know." The 6 percent difference between the undergraduate and graduate affirmative response may indicate that graduate students are possibly more aware of or concerned about the importance of retrospective information for their research. The combined undergraduate/graduate response was 150 or 37 percent indicating that earlier information was important for their research purposes, 206 or 52 percent responded it was not, and forty-five or 11 percent responded "don't know." Although a reasonable percentage of students (37 percent) indicated that retrospective information was important, a larger overall percentage (52 percent) indicated that it was not (see table 5). In evaluating the overall results then, the survey seems to indicate that for a majority of students, retrospective information was not important for their research purposes. It would appear that the first hypothesis was not supported. However, possibly a significant

factor was discovered with respect to the influence of a majority of business students entering the LAN area and completing the questionnaire.

Table 5.--Earlier Information Important?

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	40	60	12
Graduates	80	46	44	10
Total	401	37%	52%	11%

In discussions with business students at the time the survey was conducted and in reviewing the completed questionnaires, the observation was made that business students seemed primarily interested in the most current information available and did not want retrospective information. Did the findings of the survey confirm this? Moreover, would confirmation of this fact, then, significantly influence the findings?

In analyzing only the data for the 113 business students, it was found that an overwhelming percentage of these students did indeed want only up-to-date information. Of the 103 undergraduate business students responding to the question "Is current (1986+) information important for your research purposes?" ninety-three or 90 percent responded "yes," six or 6 percent responded "no," and four or 4 percent responded "don't know." Of the ten graduate business students responding to the same question, nine responded "yes," none responded "no," and one responded "don't know." The combined total of undergraduates and graduates responding "yes" to this question was 102 or 90 percent, six or 6 percent responded "no," and five or 4 percent "responded don't know." Of the 103 undergraduates responding to the question "Is earlier (pre-1986) information

important for your research purposes?" twenty-nine or 28 percent responded "yes," sixty-six or 64 percent responded "no," and eight or 8 percent responded "don't know." Of the ten graduate students responding, one responded "yes," six responded "no," and three responded "don't know." The combined total of undergraduate and graduate business students responding "yes" to this question was thirty or 26 percent, seventy-two or 64 percent responded "no," and eleven or 10 percent responded "don't know." These results clearly indicate a preference by business students for current up-to-date information (see table 6). And again, the fewer "don't know" and "zero" responses by graduate students seem to indicate that graduate students have a better understanding of their research needs. Moreover, it is felt that the significantly higher percentage of business students wanting only current information may be strongly influencing the overall results. When the business students, both undergraduate and graduate, are separated out from all other students, does a somewhat different picture emerge regarding the need for retrospective information?

Table 6.--Responses by Business Majors

Status	N	Current			Earlier		
		Yes (%)	No (%)	Don't Know (%)	Yes (%)	No (%)	Don't Know (%)
Undergraduates	103	90	6	4	28	66	8
Graduates	10	90	0	10	10	60	30
Total	113	90%	6%	4%	90%	6%	4%

The total number of non-business students was 288. Of the 218 undergraduates responding to the question "Is earlier (pre-1986) information important for your research purposes?" eighty-four or 38 percent responded "yes," 106 or 49 percent responded "no"

and twenty-eight or 13 percent responded "don't know." Of the total number of graduate students responding to the same question (N=70), thirty-six or 51.5 percent responded "yes," 29 or 41.5 percent responded "no," and 5 or 7 percent responded "don't know." The combined total of non-business students responding "yes" was 120 or 42 percent. The total number of students responding "no" was 135 or 47 percent. The total number responding "don't know" was thirty-three or 11 percent (see table 7). As with business students, the slightly higher percentage of non-business students responding "no" indicates that a majority of these students also did not consider earlier information important for their research purposes. Once again, the first hypothesis was not supported. It is significant, however, that a fairly large percentage of non-business students--42 percent--did consider retrospective information important for their research purposes. That more graduate students indicated retrospective information was important, as opposed to those who did not, is not surprising. It is surprising, however, that the percentage was not higher. The relatively high percentage of undergraduates responding "don't know" seems to indicate, once again, that the undergraduates were perhaps uncertain with regard to their specific research needs.

Table 7.--Responses by Non-Business Majors. . .Earlier Information Important?

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	218	38	49	13
Graduates	70	51.5	41.5	7
Total	288	42%	47%	11%

The second hypothesis was that CD-ROM indexes with limited date coverages and lacking retrospective information, do not meet students' needs. In order to test this hypothesis another question was presented. "Did the information found on the CD-ROM index(es) meet your current research needs?"

An overwhelming majority of students indicated that the CD-ROM index(es) used did indeed meet their current research needs. Of the undergraduates responding (N=321), 219 or 68 percent answered "yes." Fifty or 15.5 percent responded "no." Fifty-two or 16.5 percent responded "don't know." Of the graduate students responding (N=80), fifty-six or 70 percent responded "yes." Nine or 11 percent responded "no." Fifteen or 19 percent responded "don't know." The combined total of all students responding "yes" was 275 or 69 percent. The total number of all students responding "no" was fifty-nine or 14.5 percent. The total number of students responding "don't know" was 67 or 16.5 percent. In essence, then, the responses did not confirm the second hypothesis. In addition, the high percentage of "don't know" responses from both undergraduates (16.5 %), and graduates (19%) is not surprising and would be expected. It is often difficult to determine whether or not specific citations are appropriate or applicable without looking at an entire cited article. The 2.5 percent difference between undergraduate and graduate response would seem to indicate that perhaps graduate students are more aware of this fact (see table 8). Did any pattern emerge indicating that some majors were more satisfied than others with regard to the information found in the CD-ROM indexes meeting their research needs?

Table 8.--Did Information on CD-ROM Meet Research Needs?

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	68	15.5	16.5
Graduates	80	70	11	19
Total	401	69%	14.5%	16.5%

In analyzing the data for the four heaviest users by major, business, psychology, communications, child development, and biology, the results showed the following. Business majors, the largest percentage of CD-ROM users at 28 percent, indicated that the information found on the CD-ROM indexes did meet their research needs. Of the total number of business students (N=113), eighty or 71 percent responded "yes," seventeen or 15 percent responded "no," and sixteen or 14 percent responded "don't know." Of the total number of psychology students (N=46), a majority, twenty-eight or 61 percent, also indicated that the CD-ROMs met their research needs. Nine or 19.5 percent responded "no." Nine or 19.5 percent responded "don't know." Twenty-seven or 66 percent of the communications majors (N=41) responded "yes." Five or 12 percent responded "no." Nine or 22 percent responded "don't know." Of the child development majors responding (N=31), twenty-three or 74 percent answered "yes," three or 10 percent responded "no," and five or 16 percent responded "don't know." All twenty-four biology students were undergraduates. Fifteen or 62 percent responded "yes." Five or 21 percent responded "no." Four or 17 percent responded "don't know." The results clearly show that well over 50 percent of the students in all four majors were satisfied with the information found in the CD-ROM indexes. Child development majors were, proportionately, the most satisfied at 74 percent. Child development majors also gave the lowest number of negative responses at three or 10 percent (see table 9).

Table 9.--Satisfaction of Information Found by Major Users

Status	N	Yes (%)	No (%)	Don't Know (%)
Business	113	71	15	14
Psychology	46	61	19.5	19.5
Communications	41	66	12	22
Child Development	31	74	10	16
Biology	24	62	21	17
Total	401	37%	52%	11%

Located in the library reference area are a number of newspaper, magazine, and journal citation sources other than CD-ROMs that provide retrospective information. These print or paper sources include both general indexes such as Reader's Guide to Periodical Literature, and many specialized subject indexes and abstracts such as Business Periodicals Index, Humanities Index, Social Sciences Citation Index, Chemical Abstracts, and America: History and Life. In addition to the print versions of indexes and abstracts, the reference department also retains several archival indexes in CD-ROM disc format. These include PsycLIT (1974-1976), ABI/Inform (1987-1989), Science Citation Index (1986, 1987), ERIC (1966-1982), Business Periodicals Index (1981-1985), and Dissertation Abstracts (1861-1988). These archival discs are kept at the LAN desk.

In order to test the third hypothesis that many students are not aware of retrospective information in either disc or printed format, it was necessary to pose several questions regarding student knowledge of these sources held by the library. The first question dealing with archival discs was, "Are you aware that some indexes for earlier years exist on disc, and are available at the LAN desk?" Of the total number of undergraduate students responding (N=321), only fifty-one or 16 percent responded "yes." An overwhelming majority of undergraduates, 242 or 75 percent, responded "no."

Twenty-eight or 9 percent responded "don't know." As might be expected, more graduate students were aware of the archival discs than undergraduate students. Of the total number of graduate students responding (N=80), eighteen or 22.5 percent responded "yes," 6.5 percent more than undergraduate students. Forty-eight or 60 percent responded "no." Fourteen or 17.5 percent responded "don't know." The combined total of undergraduate and graduate students responding "yes" was sixty-nine or 17 percent. The total number of students responding "no" was 290 or 72 percent. The total number of students responding "don't know" was forty-two or 11 percent. It would be expected that graduate students would be knowledgeable about this resource, and such a high cumulative response of 77.5 percent "no/don't know" response by graduate students is therefore quite surprising (see table 10). As some of the archival discs are primarily business and psychology related, did the survey results show that those majors were more aware of the discs?

Table10.--User Awareness of Archival Discs

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	16	75	9
Graduates	80	22.5	60	17.5
Total	401	17%	72%	11%

The results indicate that, comparatively, students in those majors, business and psychology, were not more aware of the archival discs than students in other majors. For example, of the 113 business students, only eighteen or 16 percent were aware of the discs. Of the forty-six psychology students, only nine or 20 percent were aware of the

discs. In comparison, nine or 29 percent of the child development majors were aware of the discs.

The second question used to test the hypothesis that many students are not aware of retrospective sources dealt with student knowledge of paper indexes. The question was "Are you aware that paper indexes exist?" Of the total number of undergraduates responding (N=321), 108 or 34 percent responded "yes." One hundred and eighty-seven or 58 percent responded "no." Twenty-six or 8 percent responded "don't know." Of the total number of graduate students responding (N=80), forty-four or 55 percent responded "yes." Thirty-one or 39 percent responded "no." Five or 6 percent responded "don't know." The combined total responding "yes" was 152 or 40 percent. Responding "no" were 218 or 53 percent. Responding "don't know" were 31 or 7 percent. Comparatively, 21 percent more graduate students were aware of paper indexes than undergraduate students (see table 11). This higher percentage is not surprising due to the fact that graduate students should be more advanced in research methods and aware of additional sources of retrospective information. What is surprising, however, is that the percentage of graduate student awareness of paper indexes was not significantly higher. It should be noted that both undergraduate students and graduate students are more aware of the existence of the paper indexes than the archival discs held at the LAN desk. Both the undergraduate and graduate responses confirmed the third hypothesis. A majority of students were not aware of either archival discs held at the LAN desk or paper indexes housed in the reference section of the library.

Table 11.--User Awareness of Paper Indexes

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	34	58	8
Graduates	80	55	39	6
Total	401	40%	53%	7%

Related to the question of student knowledge of paper indexes is the issue of their use. The question was posed, "Did you use paper indexes for your current research purposes?" A second question was also asked, "If yes, did the information found meet your research needs?" The respondents were then directed to rate the degree of ease or difficulty on a scale of one to five, one being easy and five being difficult.

On the question of use, of the total number of undergraduate students responding (N=321), thirty-four or 11 percent indicated that they did use paper indexes. Two-hundred and sixty-five or 83 percent indicated they did not. Twenty-two or 7 percent responded "don't know." Of the total number of graduate students responding (N=80), sixteen or 20 percent responded "yes." Sixty or 75 percent responded "no." Four or 5 percent responded "don't know." The combined total of all students responding "yes" paper indexes were used, was fifty or 12 percent. The total number indicating paper indexes were not used was 325 or 81 percent. The total number responding "don't know" was twenty-six or 7 percent (see table 12). Proportionately more graduate students than undergraduates used paper indexes on a ratio of approximately 2:1. That only 20 percent of the graduate students used paper indexes is quite surprising considering that 55 percent were aware of paper indexes and 51.5 percent indicated that earlier (pre-1986) information was important for their research purposes. The high percentage of "don't know" responses by undergraduates (7 percent), and graduates (5 percent) is puzzling.

The question was worded in a straightforward manner and should have elicited a "yes" or "no" response. One possible explanation for the high percentage could be that respondents were not familiar with, or confused about the term "paper indexes."

Table 12.--Use of Paper Indexes

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	10	83	7
Graduates	80	20	75	5
Total	401	12%	81%	7%

Respondents indicating that paper indexes were used were asked further if the information found in the paper indexes met their research needs. Of the thirty-four undergraduate students responding, nineteen or 56 percent responded "yes." Four or 12 percent responded "no." Eleven or 32 percent responded "don't know." Of the sixteen graduate students indicating they used paper indexes, twelve or 75 percent indicated that "yes" the paper indexes did meet their research needs. Two or 12.5 percent responded "no," and two or 12.5 percent responded "don't know" (see table 13). Once again, the high percentage of "don't know" responses may be attributed to the uncertainty over whether or not the information found is useful without first examining the full article.

Table 13.--Paper Indexes Met Needs?

Status	N	Yes (%)	No (%)	Don't Know (%)
Undergraduates	34	56	12	32
Graduates	16	7.5	12.5	12.5
Total	50	62%	12%	26%

To test the fourth hypothesis that students are routinely directed to CD-ROM indexes by library staff and professors but not to the printed indexes, several questions were presented. The first question was "Did librarians or library staff direct you to 1) CD-ROM indexes; or 2) paper indexes/abstracts?" Of the total number of undergraduate students responding (N=321), 157 or 49 percent indicated that "yes" they were directed to CD-ROM indexes. One hundred and forty or 44 percent responded "no." Twenty-four or 7 percent responded "don't know." Of the total graduate response (N=80), thirty-seven or 46 percent indicated that "yes" they were directed to CD-ROM indexes. Thirty-six or 45 percent responded "no." Seven or 9 percent responded "don't know." Slightly more undergraduates and graduates were directed to CD-ROMs than were not. The total number of students indicating they were directed to CD-ROM indexes was 194 or 48 percent. The total number of students indicating they were not directed to CD-ROMs was 176 or 44 percent. Thirty-one or 8 percent answered "don't know" (see table 14).

Table 14.--Directed to Indexes by Library Staff

Status	N	CD-ROM			Paper		
		Yes (%)	No (%)	Don't Know (%)	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	49	44	7	12	67	21
Graduates	80	46	45	9	10	75	15
Total	401	48%	44%	8%	12%	68%	20%

The second part of the question dealt with the issue of paper indexes. Of the total number of undergraduate students (N=321) responding with regards to being directed to paper indexes and abstracts by library staff, forty or 12 percent responded "yes." Two hundred and fourteen or 67 percent responded "no." Sixty-seven or 21 percent responded "don't know." Of the total number of graduate students responding (N=80) to the same question, eight or 10 percent responded "yes." Sixty or 75 percent responded "no." Twelve or 15 percent responded "don't know." The combined total of undergraduates and graduates indicating they were directed to paper indexes by library staff was only forty-eight or 12 percent. In contrast, 274 or 68 percent indicated that they were not directed to paper indexes by library staff. Seventy-nine or 20 percent, mainly consisting of undergraduates, responded "don't know" (see table 14). The high percentage of don't know responses by undergraduates could be due, once again, to their lack of knowledge with regard to the term "paper indexes and abstracts."

The second question presented was "Did your professor(s) suggest that you use 1) CD-ROM indexes; or 2) paper indexes/abstracts?" One hundred and fifty-four or 48 percent of the undergraduates responding indicated that "yes" their professor(s) suggested the use of CD-ROM indexes. One hundred and fifty-two or 47 percent responded "no." Fifteen or 5 percent responded "don't know." Of the graduate students responding to the same question, forty-four or 55 percent responded "yes." Thirty-three or 41 percent

responded "no." Three or 4 percent responded "don't know." The combined total of undergraduates and graduates indicating that professors suggest they use CD-ROM indexes was 198 or 49 percent. A total of 185 or 46 percent responded "no." And eighteen or 5 percent responded "don't know" (see table 15).

Table 15.--Directed to Indexes by Professors

Status	N	CD-ROM			Paper		
		Yes (%)	No (%)	Don't Know (%)	Yes (%)	No (%)	Don't Know (%)
Undergraduates	321	48	47	5	13	67	20
Graduates	80	55	41	4	21	64	15
Total	401	49%	46%	5%	15%	66%	19%

Of the undergraduate students responding with regard to being directed to paper indexes and abstracts by their professor(s), only forty-two or 13 percent responded "yes." Two hundred and sixteen or 67 percent responded "no." Sixty-three or 20 percent responded "don't know." Of the graduate students responding to the question, seventeen or 21 percent responded "yes." Fifty-one or 64 percent responded "no." Twelve or 15 percent responded "don't know." The combined total of undergraduates and graduates indicating that their professors suggest they use paper indexes was only fifty-nine or 15 percent. Two hundred and sixty-seven or 66 percent indicated it was not suggested. Seventy-five or 19 percent indicated that they did not know (see table 15). These responses were similar to the responses given with regard to being directed by library staff.

The results of the survey showed that students were, by a slight majority, being directed to CD-ROM indexes by both library staff and professors. Forty-eight percent of

all students responded that they were directed by library staff. Forty-four percent responded they were not. Forty-nine percent of all students responded that they were directed to the CD-ROM indexes by professors. Forty-six percent responded they were not. As indicated by the results, a large majority of students are not being directed to paper indexes by either library staff or professors. Sixty-eight percent of all students responded that they were not directed to paper indexes by library staff, and only 12 percent responded that they were. Sixty-six percent of all students responded that they were not directed to paper indexes by their professors, and 15 percent responded that they were. Thus, the results of the survey confirmed the fourth hypothesis.

CHAPTER 5

CONCLUSION

Librarians and library users, especially students, have come to depend on many electronic information resources that make research convenient, faster, and easier. But for students conducting research, is the convenience, speed, and ease of use gained at the expense of thoroughness? Moreover, is the illusion that computers and other electronic resources such as CD-ROMs are better and more complete sources of information having a detrimental effect on student research? The assumption that students conducting research at academic institutions need retrospective information is a valid one. Further, to question student use of CD-ROM indexes covering only a limited time period, thus lacking retrospective information, is also valid. The use of these CD-ROM indexes may be seriously impacting student research in terms of thoroughness, and in other perhaps unforeseen ways. In reviewing the literature, it was found that no extensive studies have been conducted measuring the use and effects of CD-ROM indexes with limited date coverage on student research. Further, although there are a few exceptions (Glitz 1988, Harter and Jackson 1988, McClamroch, Stein, and Williamson 1991), most articles fail to mention limited date coverage. This study is an attempt address this issue.

It must be stated at the outset of this conclusion that in examining the survey responses and analyzing the data it was discovered that an essential question was not asked on the survey. That question should have been, "Are you aware of the limited date coverage of the CD-ROM index you are currently using?" This oversight may have

become apparent in pretesting the survey. Moreover, including this question in a subsequent survey might have provided a much clearer picture of the issue.

The first hypothesis presented in this study, that students do require retrospective information was not confirmed by the overall results of the survey. A majority of survey respondents, 52 percent as opposed to 37 percent, indicated that pre-1986 information was not important for their research purposes. This was true even after business majors, a majority of survey respondents who wanted primarily current information, were separated out from all other non-business majors. Forty-nine percent of non-business majors indicated that retrospective information was not important, as opposed to 42 percent who indicated it was important. Moreover, the data showing that 40 percent of the undergraduate students and 46 percent of the graduate students did consider retrospective information important should not be ignored. The overall results of the survey do seem to be influenced by the high percentage of business majors (66 percent) and undergraduate non-business majors (49 percent) who filled out the survey and indicated that earlier or retrospective information was not important for their research purposes. Another factor which must be considered is the strong possibility that many of the undergraduate students may not have been involved in lengthy in-depth research, but involved instead in assignments designed only to increase their writing and basic research skills. It was expected that graduate students, typically involved in more advanced or scholarly research, would consider earlier or retrospective information important. They did by a ten percentage point difference, 51.5 percent as opposed to 41.5 percent. That 51.5 percent of the graduate students indicated that retrospective information was important is not surprising. Although the results of this study did not confirm the first hypothesis that students do require retrospective information, it should not be concluded that this is the case for all students conducting research at academic institutions. The results of this study

were influenced by several significant factors. First, the large percentage of business students wanting primarily current information. Second, a majority of undergraduate students responding to the survey. Additionally, another factor must be considered. CSUF as a state university, offers only credentials, undergraduate degrees, and graduate degrees at the masters level, no doctoral degrees. As such, the school's focus is teaching rather than research. The assumption that students do require retrospective information may have greater validity in a large doctoral-granting university heavily involved in research. Therefore, although not confirmed by this study, the issue of the importance of retrospective information is still valid.

The second hypothesis, that CD-ROM indexes with limited date coverage and lacking retrospective information do not meet student needs, was also not confirmed. An overwhelming majority, 69 percent of all students responding to the survey, indicated that the CD-ROM indexes did indeed meet their research needs. The high percentage of user satisfaction with CD-ROM shown in this study is fairly consistent with the findings in many other studies (68 percent/Beltran 1986; 57 percent/Glitz 1988; 60 percent/Schultz and Solomon 1990; 85 percent/McClamroch, Stein, Williamson 1991; and 56 percent/Faries 1992). The overall satisfaction with CD-ROMs seen in this study and other studies seems to reflect users' uncritical acceptance of, and enthusiasm for, not only electronic sources such as CD-ROM indexes but also computer technology in general. Most studies routinely reporting on the widespread acceptance of and favorable attitudes toward CD-ROM technology occasionally include some negative responses which have been reported. In these studies, Beltran, Glitz, McClamroch, Stein, and Williamson, specifically mention surveys in which written comments are made by students regarding the lack of retrospective information in some CD-ROM systems. Although no space was provided for written comments on the questionnaire created for this study, a total of 9

students did add brief written comments. Of the nine, two of these were graduate students, and both requested that the library obtain CD-ROM systems with earlier information. A communications major requested information prior to 1983, and a history major requested that the library obtain America History and Life on CD-ROM. The assumption that CD-ROM indexes lacking retrospective information do not meet students needs may still be valid. This may be especially true, once again, at highly competitive, advanced-degree granting institutions heavily involved in research. Further, that there is widespread acceptance of, and enthusiasm for electronic sources of information should be acknowledged and not entirely discounted.

Alternative sources containing retrospective information are located in the reference area of the library at CSUF. As previously mentioned, these sources include archival indexes in CD-ROM disc format and many specialized subject indexes and abstracts. It was hypothesized that students are not aware of these sources, and the results of the survey confirmed this third hypothesis. Seventy-two percent of all students responded that they were not aware of archival discs held at the LAN desk. This percentage includes business and psychology students who should have special awareness of the discs as several of these discs are specifically business and psychology related. These archival discs seem to be somewhat of a hidden resource. The discs are kept in a drawer of the LAN desk, and there is no signage informing students of their existence. The discs are, however, mentioned on the "CD-ROM Databases In the University Library, CSUF" information guide. On the question of paper indexes, 53 percent of all students indicated that they were not aware of these sources. This high percentage of students who are not aware of either the archival discs or printed indexes suggests several possible conditions. First, that many students may not have attended a bibliographic instruction session where information regarding these sources are routinely covered. Second, students

are not being made aware of these sources in reference interviews with librarians, or by other library staff such as student assistants. Third, many students may not have been made aware of these sources by their professors. A real problem may exist in staffing the LAN desk with student assistants. These student assistants are fairly well trained in the use of the CD-ROM indexes and provide a great deal of assistance to students working in the LAN area. However, they may not be adequately trained to direct students to retrospective sources such as indexes and abstracts. Staffing a high-use area such as the LAN with student assistants may be cost effective, but could be a questionable practice in terms of adequately and thoroughly assisting students involved in research projects. The reasons for students' lack of awareness regarding retrospective sources could be varied and deserves further research and study.

Based on seven months of informal observations in the reference area and at the reference desk at the CSUF library, it was determined that students entering the reference area seeking magazine and journal articles were routinely directed to the CD-ROMs in the LAN area, but not necessarily to the printed indexes and abstracts. Was this observation accurate? On the question of the CD-ROMs, the results were somewhat mixed. Only a slight majority (48 percent) indicated they were directed by library staff. Forty-nine percent indicated that they were directed by their professors. A relatively high percentage of students indicated that they were not directed to CD-ROM indexes by either library staff (44 percent) or professors (46 percent). This high percentage may be due to the fact that students may have had prior knowledge and experience in using the CD-ROM indexes. Nonetheless, results of the survey confirmed the first part the hypothesis that students are directed to CD-ROM indexes by library staff and/or their professors. On the question of paper indexes, the results were clear and conclusive. An overwhelming majority of students, 68 percent, indicated that they were not directed to the paper indexes

by library staff. Sixty-six percent indicated that their professors did not suggest they use paper indexes and abstracts. Thus the findings confirmed the fourth hypothesis.

The results of the survey conducted for this study give only an indication of CD-ROM use by undergraduate and graduate students at one academic institution, California State University, Fullerton. That the first and second hypothesis were not confirmed by the results of the survey should not be taken as an indication that both hypotheses are invalid. Specific factors such as the high percentage of business majors wanting primarily current information and a high percentage of undergraduate students using the CD-ROM indexes must be taken into consideration. Surveys and studies conducted at other institutions, especially those more heavily involved in research, may yield significantly different findings.

It should be a given that many students conducting research may require retrospective information not available in current CD-ROM indexes. Retrospective information in the form of archival discs and printed indexes are widely available. However, as the results of this study confirmed, a majority of students may not be aware that these alternative sources to CD-ROMs exist. What is especially worrisome is the fact that a majority of students responding in this survey indicated that they were not directed to these sources by either library staff or their professors. What steps can be taken to insure that students have knowledge of and access to retrospective information?

One method would be a more comprehensive approach to bibliographic instruction (BI). Much of the recent literature details specific methods for improving and refining students' searching skills in the CD-ROM environment in an effort to enhance and increase the amount of relevant citations retrieved. When conducting BI, care must be taken to include information and instruction in the traditional sources such as indexes and abstracts and archival discs as well. Moreover, as an extensive review of the literature revealed,

little attention is paid to, or mention made of the problem relating to the limited date coverage and lack of retrospective information on most CD-ROM systems. In a more comprehensive approach to bibliographic instruction, the limitations of the CD-ROM indexes should be covered and emphasized. In BI, where hands on demonstrations are involved, students should be made aware of the date coverages of the CD-ROM indexes they are using. In one-on-one reference interviews and casual CD-ROM assistance, the limited date coverage as well as the depth and quality of information available should be stressed. A note regarding the limited date coverage of CD-ROM indexes should also be included in any CD-ROM guides routinely distributed or made available to students. Lastly, increased signage around CD-ROM workstations alerting students to the limited date coverage in the indexes and suggesting alternative retrospective sources is recommended. Above all, students should be made aware of and trained in the use of alternative print sources, and any available archival discs, as well as being alerted to the importance of bibliographic information obtained from primary literature, especially footnotes. Teaching research concepts can be time consuming and labor intensive. However, as more CD-ROM systems become available and in greater use, it is the educational obligation of librarians to foster an attitude with regards to research that is not merely mechanical, that is, having the computer print pages of usable and possibly unusable information; but instead, to foster an attitude in which students are encouraged to critically evaluate the appropriateness and usefulness of the retrieved information. This includes the process and "practice of planning search strategy, in analyzing and evaluating sources, and in defining areas for further study."⁶⁴ As Timothy Weiskel states, "there is considerable room here to plan new kinds of strategies to combine training and teaching

⁶⁴Hall, Talan, and Pease, 55.

functions. . . Librarians may have to take the initiative in this realm, as they have in so many domains related to the information revolution."⁶⁵

Another area where librarians can take the initiative is with CD-ROM manufacturers and vendors. Librarians need to be proactive and make these enterprises aware of students' research needs. This would include urging them to develop and manufacture more extensive backfiles in a variety of subject areas.

There is a great need for further research to be done regarding the various effects of CD-ROMs on students conducting research in academic institutions. For example, to what extent would students use extensive backfiles? With the widespread acceptance and use of CD-ROMs, are certain formats being discounted or canceled to the detriment of research? Finally, is the fast-changing CD-ROM technology vulnerable to advances which would seriously impact on future student research? This study was exploratory in nature and certainly not comprehensive. It is hoped that the information and results of the survey will generate further questions, and additional research.

⁶⁵Timothy C. Weiskel, "The Electronic Library: Changing the Character of Research," *Change* (November/December 1988): 44.

APPENDIX 1
CD-ROM SURVEY

CD-ROM SURVEY

The purpose of this survey is to assess the use of CD-ROM and paper indexes. Please check (/) the appropriate spaces. Thank you for your cooperation.

1. Major: _____ Research Topic: _____
2. Status: Undergraduate___ Graduate___ Faculty___ Other___
3. Which CD-ROM index(es) did you use for your current research assignment?

ABI/INFORM___	Humanities Index___	Music Index___
Applied Science & Tech___	Library Literature___	Chicano Database___
Art Index___	MLA___	Religion Indexes___
Wilson Business Abstracts___	PsycLit___	Literary Index___
Eric___	Readers' Guide___	Sociofile___
General Science___	Social Sciences Index___	Science Citation Index___
Don't know___		
4. Did the information found on the CD-ROM index(es) meet your current research needs?
Yes___ No___ Don't know___
Did you find the use of CD-ROM indexes easy or difficult? Please rate on a scale of 1 to 5
(1 = easy: 5=difficult)___
5. Are you aware that some indexes for earlier years exist on disc, and are available at the Lan desk (the desk where you show your ID)? Yes___ No___ Don't know___
6. Are you aware that paper indexes exist? Yes___ No___ Don't know___
7. Did you use paper indexes for your current research purposes? Yes___ No___ Don't know___
If yes, did you find the use of paper indexes easy or difficult? Please rate on a scale of 1 to 5
(1= easy: 5= difficult)___
If yes, did the information found meet your research needs? Yes___ No___ Don't know___
8. Is current (1986+) information important for your research purposes? Yes___ No___
Don't know___
9. Is earlier (pre-1986) information important for your research purposes?
Yes___ No___ Don't know___
10. Did librarians or library staff direct you to CD-ROM Indexes? Yes___ No___ Don't know___
Paper indexes/abstracts? Yes___ No___ Don't know___
11. Did your professor(s) suggest that you use: CD-ROM indexes? Yes___ No___ Don't know___
Paper indexes/abstracts? Yes___ No___ Don't know___

APPENDIX 2
RESPONSE DATA

Q#	1-Major	1-a Research Topic	2-Status	3-CD Rom	q-3a	q-3b	4-CD	4a CD	5-	6-	7-	7a	7b	8-	8a	10-	10a	11-D	11-a
1	BUSINESS	EXERCISE	U	GSI			Y		2 D	D	N	0 D	0 D	n	n	Y	N	D	D
2	PSYCHOLOGY	LEARNING	U	PLT			N		1 N	N	N	0 N	0 N	n	n	Y	N	N	N
3	MARKETING	JAPANESE MANAGEMENT	U	WBA			Y		2 N	N	N	0 D	0 D	Y	Y	N	D	Y	D
4	PSYCHOLOGY	SELF ACTUALIZATION	U	PLT			D		0 D	D	D	0 D	0 D	n	Y	Y	D	N	N
5	PSYCHOLOGY	PREJUDICE	U	PLT	SSI		N		3 N	Y	N	0 D	0 D	Y	Y	Y	N	N	N
6	BIOLOGY	SALMONELLA	U	GSI			Y		1 N	Y	N	0 D	0 D	Y	Y	N	N	N	N
7	LIBERAL STUDIES	COMMUNICATION	U	SSI			Y		1 N	N	N	0 D	0 D	Y	Y	N	N	N	N
8	SOCIOLOGY	HOME SCHOOLING	U	ERC			Y		2 Y	N	N	0 D	0 D	Y	Y	N	N	Y	N
9	BIOLOGY	NUTRIENT EFFECTS	U	GSI			Y		2 N	N	N	0 D	0 D	Y	Y	Y	N	Y	N
10	COMMUNICATIONS	DRUNK DRIVING	U	ERC			Y		0 N	N	N	0 D	0 D	Y	Y	N	N	Y	Y
11	BUSINESS	PRODUCTS	U				N		2 N	N	N	0 N	0 N	Y	Y	N	N	N	N
12	COMMUNICATIONS	DRUG ADDICTED BABIES	U	PLT			N		3 Y	D	N	0 D	0 D	Y	Y	N	N	Y	D
13	BIOLOGY	ESTUARIES	U	GSI	SCI		Y		2 N	Y	N	0 D	0 D	Y	Y	D	Y	N	N
14	BIOLOGY	BOTANY	U	GSI			D		4 N	Y	N	0 D	0 D	Y	Y	N	N	N	N
15	PSYCHOLOGY	HOUSE TRUE PERSON	U	PLT			Y		1 N	Y	N	0 D	0 D	Y	Y	N	D	Y	D
16	COMMUNICATIONS	ENDOMETRIOSIS	U	GSI			Y		4 N	N	N	0 D	0 D	Y	Y	N	Y	Y	Y
17	BUSINESS	HEALTH CARE	U	ABI	PLT	RGD	Y		0 Y	Y	D	0 D	0 D	Y	Y	Y	Y	Y	D
18	PSYCHOLOGY	PARKINSONISM	U	AST	GSI		Y		1 N	N	N	0 D	0 D	n	Y	Y	Y	Y	Y
19	COMMUNICATIONS	COGNITIVE	U	PLT			D		3 N	N	N	0 D	0 D	n	Y	Y	N	N	N
20	INTERNATIONAL BUSINESS	VIETNAM	U	WBA			Y		1 N	Y	N	0 D	0 D	Y	Y	N	N	Y	N
21	HISTORY	CHICANO HISTORY	U	CDB	SSI		D		3 N	N	N	0 D	0 D	n	Y	Y	N	N	N
22	ENGLISH	JOHN OSBORNE	G	HUM			Y		0 N	N	N	0 D	0 D	Y	Y	Y	D	Y	D
23	PSYCHOLOGY	PSYCHOLOGY	U	HUM			D		1 Y	Y	Y	2 Y	Y	Y	Y	Y	Y	N	D
24	BIOLOGY	MICROBIOLOGY	U	GSI			Y		1 N	N	N	0 D	0 D	n	N	N	N	N	N
25	PHYSICAL EDUCATION	NAIL BITING	U	AST	PLT	SSI	D		1 N	N	N	0 D	0 D	Y	Y	N	N	N	N
26	MARKETING	PEPSI	U	WBA	ABI		Y		4 N	N	N	0 D	0 D	Y	Y	N	N	Y	N
27	CIVIL ENGINEERING	TRACY CHAPMAN	U				Y		1 N	N	N	0 D	0 D	Y	Y	N	N	Y	N
28	CHILD DEVELOPMENT	PRESCHOOL PLAY	U	ERC	PLT		Y		2 Y	D	N	0 D	0 D	Y	Y	N	N	Y	N
29	PHYSICAL EDUCATION	SPORTS LAW	G	ERC			N		2 N	N	N	0 D	0 D	Y	Y	N	N	Y	Y
30	CHILD DEVELOPMENT	ELEMENTARY MATH	U	ERC	PLT		Y		2 N	N	N	0 D	0 D	Y	Y	N	Y	N	N

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HUM=Humanities Index PLT=PsychLit
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Qu	1-Major	1-a Research Topic	2 Status	3-CD Rom	q-3a	q-3b	4-CD	4a CD	6-CD	6-7	7a	7b	8-10	10a-11-D	11-a
31	PSYCHOLOGY	COCAINE	U	SSI			Y	1	D	D	N	0	Y	D	Y
32	BUSINESS	MUTUAL FUNDS	U	ABI	WBA		Y	1	Y	Y	N	0	Y	N	N
33	EDUCATION	SELF MONITORING	G	ERC			Y	1	D	Y	N	0	Y	D	Y
34	ACCOUNTING	LIABILITY INSURANCE	U	ABI	WBA		D	1	N	N	N	0	Y	N	N
35	POLITICAL SCIENCE	FEDERAL SENTENCES	U	SSI	HUM		Y	1	N	N	N	0	Y	N	N
36	ECONOMICS	EMISSIONS CREDITS	U	ABI			Y	3	N	N	N	0	Y	N	N
38	ACCOUNTING	AUTOMOBILE INDUSTRY	U	WBA			Y	1	N	N	N	0	Y	N	N
39	ART HISTORY	RAPHAEL	U	ART			D	1	N	N	N	0	Y	N	N
40	COMMUNICATIONS	SPEECH COMPETENCE	U	SSI	HUM		Y	3	N	N	N	0	Y	N	N
41	CHILD DEVELOPMENT		U	PLT			Y	0	Y	Y	N	0	Y	N	D
42	LIBERAL STUDIES	MEDICAL ETHICS	U	SSI			Y	3	N	N	N	0	Y	N	N
43	COUNSELING	FAMILY THERAPY	G	PLT			Y	1	Y	N	N	0	Y	N	N
44	PSYCHOLOGY	BRIGHTNESS CONSTANCY	U	PLT			Y	2	N	N	N	0	Y	N	N
45	PSYCHOLOGY	PSYCHOBIOGRAPHY	U	PLT			Y	1	N	N	N	0	Y	N	N
46	ACCOUNTING	CHILD CARE	U	WBA			Y	1	N	N	N	0	Y	N	N
47	ART	MAGDALENA ABAKANOWICZ	U	ART			Y	1	N	N	N	0	Y	N	N
48	HISTORY	MILITARY HISTORY	U	AST	SSI		N	2	N	Y	Y	2	N	N	N
49	PSYCHOLOGY	AGING AND MEMORY	U	PLT			N	3	N	N	N	0	Y	N	N
50	ADVERTISING	CROSS CULTURAL COMPARI	G	ABI	SSI		Y	1	Y	N	N	0	Y	N	D
51	CHILD DEVELOPMENT	ART EDUCATION	U	PLT			Y	3	N	N	N	0	Y	N	N
52	HISTORY	NINETY-TWO ELECTION	U	RGD			Y	1	N	Y	Y	0	Y	N	D
53	COMMUNICATIONS	SMOKING AND AD BAN	U	RGD			Y	1	N	N	N	0	Y	N	Y
54	INTERNATIONAL BUSINESS	MEXICO ATTITUDE NAFTA	U	ABI			Y	2	N	Y	N	0	Y	N	Y
55	ACCOUNTING	AUDITING	G	ABI	WBA		Y	1	Y	Y	N	0	Y	N	N
56	BUSINESS	ILLEGAL IMMIGRANTS	U	ERC			Y	2	D	N	N	0	Y	N	D
57	COMMUNICATIONS	GENDER ENCULTURATION	U	ERC			Y	1	N	Y	N	0	Y	N	N
58	SOCIOLOGY	SEX OFFENDERS	U	SSI			D	1	N	Y	Y	4	D	Y	N
59	LIBERAL STUDIES	MULTICULTURAL EDUCATIO	U	ERC			Y	3	D	D	D	0	Y	N	N
60	PSYCHOLOGY	LISREL PROGRAMS	G	PLT			N	2	Y	Y	Y	2	N	Y	Y
61	COMMUNICATIONS	WATER	G	GSI			D	2	N	Y	N	0	Y	N	N

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Qu	1-Major	1-a Research Topic	2-Status	3-CD Rom	q-3a	q-3b	4-CD	4a CD	5-	6-	7-	7a	7b-	8-19-110-	10a-	11-DH11-a
62	ANTHROPOLOGY	LACTATIONAL AMENORRHO	U	GSI	HUM		N	0	N	N	N	0	0	Y	D	D
63	MARKETING	NFTA	U	WBA			Y	2	N	N	N	0	0	Y	N	N
64	CHILD DEVELOPMENT	PRE NATAL COCAINE EFFEC	U	GSI	PLT	SSI	Y	1	Y	Y	N	0	0	Y	N	Y
65	ENGLISH	RESTORATION DRAMA	U	MLA			N	1	N	N	N	0	0	Y	N	N
66	SOCIOLOGY	ANTICIPATORY GRIEF	U	SOC			Y	0	D	Y	N	0	0	Y	Y	N
67	ACCOUNTING	AMERICAN FILM COMPANY	G	WBA			N	1	N	N	N	0	0	Y	N	N
68	ENVIRONMENTAL STUDIES	WATER QUALITY	U	AST			Y	1	N	N	N	0	0	Y	N	N
69	CHILD DEVELOPMENT	BIRTH ORDER	U	PLT			Y	1	Y	N	N	0	0	Y	N	Y
70	MARKETING	CIVIL RIGHTS	U	ABI			Y	1	N	N	D	0	0	Y	N	N
71	BUSINESS	LINGUISTICS	U	ERC	SSI	ABI	Y	0	N	N	N	0	0	Y	Y	N
72	BUSINESS	CHINESE ECONOMY	U	WBA			Y	0	Y	Y	Y	3	Y	Y	Y	Y
73	HISTORY		U	HUM			Y	1	N	Y	N	0	0	Y	Y	N
74	INTERNATIONAL BUSINESS	WILLY BRANDT	U	RGD			Y	2	N	N	N	0	0	Y	Y	N
75	ENGLISH	HAWTHORNE	U	HUM	MLA		Y	1	Y	N	N	0	0	Y	N	N
76	BUSINESS	JAPANESE	U	WBA			Y	3	Y	Y	Y	3	Y	Y	N	N
77	PSYCHOLOGY	LESBIANISM	U	PLT	ERC	HUM	N	3	N	N	N	0	0	Y	N	N
78	FINANCE	PRINTING COMPANIES	U	ABI			Y	3	N	N	N	0	0	Y	N	N
79	PSYCHOLOGY	INFANT DEVELOPMENT SIBLI	U	PLT	HUM		Y	2	Y	Y	N	0	0	Y	N	N
80	LINGUISTICS	NFTA	U	ABI	WBA		Y	1	N	N	N	0	0	Y	N	Y
81	COMMUNICATIONS	ORGANIZATIONAL COMMUNI	U	WBA			Y	1	N	N	Y	2	Y	Y	N	N
82	BUSINESS	SMOKELESS TOBACCO	U	GSI			Y	2	N	N	N	0	0	Y	Y	N
83	ENGLISH	MEDIAVAL LITERATURE	U	MLA			N	6	N	N	N	0	0	Y	N	N
84	LIBRARY SCIENCE	WOMEN	G	PLT	SSI		Y	2	Y	Y	N	0	0	Y	N	Y
85	ENGINEERING	SPREAD SPECTRUM COMMUG	U	AST			Y	2	N	Y	Y	1	Y	Y	Y	Y
86	PSYCHOLOGY	CONCEPT FORMATION	U	PLT			D	3	N	Y	Y	2	Y	Y	N	N
87	LIBERAL STUDIES	EDUCATION, SELF ESTEEM	U	PLT			Y	1	N	N	N	0	0	Y	Y	N
88	PSYCHOLOGY	CPI & TAT	U	PLT			Y	1	N	N	N	0	0	Y	N	N
89	CHILD DEVELOPMENT	DEAFNESS	U	PLT	ERC		D	3	Y	N	N	0	0	Y	Y	N
90	COMMUNICATIONS	NON VERBAL PEER	U	SSI	GSI	PLT	D	3	N	N	D	0	0	Y	D	N
91	HUMAN SERVICES	CASE MANAGEMENT	U	SSI			Y	1	Y	N	N	0	0	Y	N	N

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 MDX=Music Index
 SOC=Sociology

N=No

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92	FINANCE	PRIVATE FOUNDATIONS	U	ABI	WBA		Y			1	N	N	N	0	D	Y	N	N	N	N
93	COMPUTER SCIENCE	CRYPTOGRAPHY	U	GSI			Y			3	N	N	N	0	D	Y	Y	Y	Y	Y
94	ELEMENTARY EDUCATION	SCIENCE TEACHER EFFICACY	F	ERC			Y			0	Y	Y	N	0	D	Y	Y	N	N	N
95	COMMUNICATIONS	MARRIOTT CORP	U	RGD			Y			0	N	N	N	0	D	Y	Y	N	N	N
96	LIBERAL STUDIES	EDUCATION	U	ERC			N			0	N	N	D	0	D	D	D	D	D	D
97	MARKETING	PHARMACEUTICAL INDUSTRIES	U	ABI			Y			1	Y	N	N	0	D	Y	N	Y	N	N
98	BUSINESS	MANAGEMENT	U	ABI	WBA		Y			2	D	D	D	0	D	Y	Y	D	Y	D
99	SOCIOLOGY	FAMILY POLICY	G	SSI			N			1	N	N	N	0	D	Y	Y	N	N	N
100	LIBRARY SCIENCE	REFERENCE ACCURACY	G	LLT	ERC		Y			1	Y	Y	N	0	D	Y	N	N	N	N
101	MANAGEMENT	CORPORATE POLICIES ON AI	U	ABI	RGD		Y			2	Y	Y	N	0	D	Y	N	N	N	N
102	ACCOUNTING	AUDITING	G	WBA			Y			1	N	N	N	0	D	Y	Y	Y	N	N
103	COUNSELING	POSTRAMATIC STRESS SYN	G	PLT			Y			1	Y	Y	N	0	D	Y	N	N	Y	N
104	PSYCHOLOGY	THEMATIC APPERCEPTION T	U	PLT			Y			1	N	N	N	0	D	Y	Y	N	N	N
105	BUSINESS	MORALE DEVELOPMENT	G	WBA			Y			4	N	N	N	0	D	Y	Y	N	Y	N
106	MARKETING	CONSERVATIVE SUPREMACY	U	SSI			D			3	N	Y	N	0	D	Y	Y	N	N	Y
107	COMPUTER SCIENCE	MUSIC	U	MDX			Y			1	N	N	N	0	D	Y	Y	N	Y	N
108	BUSINESS	SPEECH	U	ERC	HUM SSI		N			0	N	Y	N	0	D	Y	N	N	N	N
109	FINANCE	NAFTA	U	WBA			Y			2	N	N	N	0	D	Y	N	Y	N	N
110	BUSINESS	ARRANGED MARRIAGE	U	SSI			Y			4	D	D	N	0	D	Y	D	N	N	N
111	COMMUNICATIONS	DOMESTIC VIOLENCE	U	SSI	ERC PLT		Y			1	Y	Y	N	0	D	Y	Y	N	N	N
112	COMPUTER SCIENCE	COMPUTER VIRUSES	U	AST			D			1	Y	Y	N	0	D	Y	Y	N	D	Y
113	UNDECLARED	ABORTION	U	SSI			Y			1	N	N	N	0	D	Y	Y	N	N	N
114	ACCOUNTING	HOSTILE TAKEOVERS	U	ABI			Y			1	N	N	N	0	D	Y	N	N	N	N
115	PSYCHOLOGY	INTEREST IN READING	G	PLT			D			3	N	N	N	0	D	Y	Y	N	N	N
116	CHILD DEVELOPMENT	DIAPERS	G	RGD	GSI SSI		Y			3	N	N	N	0	D	Y	Y	N	Y	N
117	LIBERAL STUDIES	ART/WOMEN/EDUCATION	U	ERC	ART HUM		Y			2	N	Y	N	0	D	Y	N	N	Y	N
118	COMPARATIVE LITERATURE	DANTE	U	MLA			N			0	N	N	N	0	D	Y	Y	N	Y	N
119	ENGLISH	CANTERBURY TALES	U	MLA			Y			4	Y	Y	N	0	D	Y	D	Y	N	N
120	COMMUNICATIONS	BREAST CANCER	U	GSI			Y			1	N	Y	N	0	D	Y	N	Y	N	N
121	CHILD DEVELOPMENT	ESL	U	PLT	SSI		Y			3	Y	Y	N	0	D	Y	N	Y	Y	D

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122	MANAGEMENT	CHAPTER 11 BANKRUPTCY	G	WBA			Y	2	N	N	N	0	0	Y	D	N	N	N	N
123	PSYCHOLOGY	SLE	U	PLT			Y	1	N	Y	N	0	0	Y	D	Y	N	Y	Y
124	BUSINESS	CHINA'S ECONOMIC CLIMAT	G	WBA			Y	0	N	N	N	0	0	Y	N	N	N	Y	N
125	BUSINESS	CHICANO DRUG USE	U	CDB			N	3	N	N	N	0	0	Y	N	Y	N	Y	N
126	LIBERAL STUDIES	EDUCATION	U	ERC			Y	2	N	N	D	0	0	D	D	Y	N	N	N
127	COMMUNICATIONS	EMPLOYEE MAGAZINES	G	WBA			Y	1	N	Y	N	0	0	Y	Y	Y	Y	Y	N
128	POLITICAL SCIENCE	DRUG WAR	G	ABI	HUM		Y	2	N	N	Y	2	Y	Y	Y	Y	Y	Y	Y
129	BUSINESS	SOFTWARE COPYRIGHT INF	U	WBA			Y	1	N	N	N	0	0	Y	N	Y	N	Y	N
130	COMPUTER SCIENCE	STAFFING OF SERVICE DES	O	LLT			Y	1	N	Y	N	0	0	Y	N	Y	N	Y	D
131	COMMUNICATIONS	LEGAL COMMUNICATION	U	HUM			D	3	N	N	N	0	0	Y	D	N	N	N	N
132	ANTHROPOLOGY	POLITICAL & GOVERNMENT	U	SSI			Y	1	N	Y	Y	3	N	Y	N	N	N	N	N
133	ECONOMICS	ENVIRONMENT OF EAST EU	U	ABI	AST	SSI	D	4	N	Y	Y	0	D	Y	N	N	N	N	N
134	LIBERAL STUDIES	POLICE COMMUNICATION	U	SSI			D	0	D	Y	N	0	0	Y	D	Y	N	N	N
135	ELEMENTARY EDUCATION	BOOKMAKING	G	ERC			N	2	N	N	N	0	0	Y	Y	D	N	Y	D
136	COMMUNICATIONS	FRIENDSHIP CHOICES/BI-RA	G	SSI			Y	2	N	Y	Y	1	D	Y	N	Y	N	N	N
137	COMMUNICATIONS	RECEPTION IN COMMUNICAT	U	SOC			Y	2	N	Y	Y	2	Y	Y	N	N	N	N	N
138	PSYCHOLOGY	LEARNING & MEMORY	U	PLT			Y	5	N	N	N	0	0	Y	N	N	N	N	N
139	BUSINESS	SEXUAL HARASSMENT	U	ABI			Y	1	N	N	N	0	0	Y	N	Y	D	Y	N
140	CHILD DEVELOPMENT	IMPACT OF SKIN COLOR ON	U	ERC	PLT		N	2	N	N	N	0	0	Y	N	N	N	Y	N
141	HUMAN SERVICES	MEXICAN AMERICAN EDUCA	U	ERC			Y	3	N	N	D	0	0	Y	N	Y	N	Y	D
142	FINANCE	BANKRUPTCY	U	ABI	WBA		Y	1	N	N	N	0	0	Y	N	Y	D	N	D
143	ACCOUNTING	IBM	U	WBA	SSI		N	3	N	Y	N	0	0	Y	Y	Y	Y	Y	Y
144	BUSINESS	DRUG TESTING	U	ABI			Y	1	D	Y	Y	4	D	Y	N	Y	N	Y	Y
145	MANAGEMENT	TRAINING	U	WBA	ERC		Y	3	N	Y	N	0	0	Y	N	N	N	Y	Y
146	BUSINESS	MARKETING	U	ABI			D	1	N	N	N	0	0	Y	N	N	N	N	N
147	PSYCHOLOGY	SOCIAL INTERACTION	G	PLT			N	2	D	D	N	0	0	Y	Y	N	N	N	N
148	BUSINESS	POLITICAL SCIENCE	U	SSI			Y	2	Y	Y	N	0	0	Y	N	Y	N	Y	N
149	PUBLIC ADMINISTRATION	DECISION MAKING	G	SSI			D	3	N	N	N	0	0	Y	N	Y	N	Y	N
150	COMMUNICATIONS	INDONESIA	U	SSI	HUM	ERC	N	3	Y	N	D	0	0	Y	N	Y	D	Y	D
151	BUSINESS	ILLNESS RELATED TO VDT	U	RGD			N	5	N	N	N	0	0	D	D	D	D	D	D

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162	CHILD DEVELOPMENT	GIFTED CHILDREN	U	PLT			Y	2	Y	Y	Y	Y	4	D	Y	Y	N	N	N	N
163	MARKETING	SLEEPING DISORDERS	U	RGD	LLT		Y	2	N	N	N	N	0	D	Y	Y	N	N	N	N
164	PSYCHOLOGY	YOUTH SHELTERS	U	PLT			Y	0	Y	Y	Y	Y	0	D	Y	Y	Y	D	Y	N
165	ANTHROPOLOGY	CULTURAL PROPERTY	U	SSI	ART		Y	3	N	N	N	N	0	D	Y	N	N	N	N	N
166	COMMUNICATIONS	AUTISM THERAPY	G	PLT			D	0	N	Y	N	N	0	D	Y	Y	N	N	N	N
167	ART	WALLINGFORD RIEGGEN	U				Y	1	N	Y	Y	Y	0	D	Y	Y	D	Y	Y	Y
168	COMMUNICATIONS	RUSSIAN MEDIA	U	SSI			D	2	N	N	N	N	0	D	Y	N	N	Y	Y	N
169	FINANCE	INCA AGRICULTURE	U	SSI	GSI		Y	2	N	N	N	N	0	D	Y	N	D	D	Y	N
160	ENGLISH	CHASITY IN 14TH CENTURY	U	HUM	MLA		Y	2	N	N	N	N	0	D	Y	Y	Y	D	Y	N
161	ENGLISH	COOPER'S THE DEERSLAYE	U	HUM			Y	3	Y	Y	N	N	0	D	Y	Y	Y	N	N	N
162	HUMAN SERVICES	INCEST TABOO	U	SSI			D	6	N	N	N	N	0	D	Y	Y	D	D	D	D
163	CHILD DEVELOPMENT	CHILD NEGLECT	U	ERC			Y	3	Y	N	N	N	0	D	Y	N	Y	D	Y	N
164	BIOLOGY	SEED GERMINATION	U	SCI			D	1	N	N	N	N	0	D	Y	Y	Y	Y	N	N
165	EDUCATION	RESTRUCTURING EDUCATIO	G	ERC			Y	0	Y	Y	N	N	0	D	Y	N	N	N	N	N
166	PSYCHOLOGY	SOCIAL COGNITION	U	PLT			D	1	N	Y	N	N	0	D	Y	Y	N	N	N	N
167	HUMAN SERVICES	EDUCATION	G	SSI			Y	2	N	N	N	N	0	D	Y	Y	N	N	N	N
168	COMPUTER SCIENCE	ELECTRONIC DATA INTERCH	U	AST	WBA		Y	4	N	Y	N	N	0	D	Y	N	N	N	N	N
169	CHILD DEVELOPMENT	ADOPTION	U	PLT			Y	1	Y	Y	N	N	0	D	Y	N	N	N	Y	N
170	POLITICAL SCIENCE	DEPENDENCY THEORY	G	SSI			Y	1	D	Y	N	N	0	D	Y	Y	N	N	N	N
171	ACCOUNTING		U	ABI			D	3	D	D	N	N	0	D	Y	Y	Y	D	Y	D
172	MARKETING	MARKETING	U	WBA	ABI		N	1	N	N	N	N	0	D	Y	N	N	N	N	N
173	SOCIAL SCIENCE	CAMBODIAN REFUGEES	G				D	0	D	D	D	D	0	D	Y	Y	Y	D	Y	D
174	COMMUNICATIONS	NESTLE COMPANY	U	WBA			Y	3	N	N	N	N	0	D	Y	N	Y	N	N	D
175	LIBRARY SCIENCE	IRVING GILL HOME	G	ART	HUM SSI		Y	2	N	Y	Y	Y	2	Y	N	Y	N	Y	Y	Y
176	BUSINESS	MARKETING	G				D	0	D	D	D	D	0	D	Y	N	D	D	D	D
177	COMMUNICATIONS	CONSUMER BEHAVIOR	G	WBA			Y	3	D	D	Y	Y	8	Y	Y	D	D	Y	Y	Y
178	PSYCHOLOGY	PSYCHOLOGY TESTING	U	PLT			Y	1	D	N	N	N	0	D	Y	Y	N	N	Y	N
179	ANTHROPOLOGY	GROWTH IN HIGH ALTITUDE	U	SSI	GSI HUM		Y	4	N	N	N	N	0	D	Y	Y	N	N	Y	N
180	BUSINESS	CIRCLE K	U	WBA			Y	2	Y	Y	N	N	0	D	Y	N	Y	N	N	N
181	POLITICAL SCIENCE	ECONOMIC DEVELOPMENT	G	SSI			Y	1	N	Y	Y	Y	4	Y	Y	N	N	N	N	N

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182	COMPUTER SCIENCE	MATHEMATICS	U	GSI			N	1	N	N	N	0	0	D	Y	Y	D
183	BIOLOGY	NUTRIENT REDUCTION IN CO	U	SCI			Y	0	N	Y	N	0	0	Y	Y	Y	Y
184	BUSINESS	MARKETING RESEARCH	G	ABI	WBA	RGD	Y	1	N	N	N	0	0	Y	Y	Y	N
185	COMMUNICATIONS	DISCLOSURE	U	ERC			Y	3	N	Y	N	0	0	Y	Y	N	N
186	HUMAN SERVICES	SEXUAL ASSAULT & EATING	U	SSI			N	2	N	N	D	0	0	Y	Y	N	N
187	CHILD DEVELOPMENT	EDUCATION	U	ERC			Y	2	N	N	N	0	0	Y	Y	Y	D
188	PSYCHOLOGY	LEARNED HELPLESSNESS/B	U	PLT			Y	2	N	Y	Y	0	0	Y	N	Y	N
189	PHYSICAL EDUCATION	SPORTS AND CHILDREN	U	RGD			D	3	N	N	N	0	0	Y	Y	D	N
190	MUSIC	ENGLISH MASQUE	U	HUM			Y	1	N	Y	Y	1	N	Y	Y	Y	Y
191	MARKETING	COMPETITIVE ENVIRONMEN	U	ABI			N	3	N	Y	N	0	0	Y	Y	N	N
192	BUSINESS	LOCAL AREA NETWORK	U	WBA			Y	1	N	Y	N	0	0	Y	N	Y	N
193	ECONOMICS	NAFTA	U	WBA			Y	1	N	N	N	0	0	Y	N	Y	N
194	CHILD DEVELOPMENT	CHILDREN AT RISK	U	PLT			Y	4	N	N	N	0	0	Y	Y	Y	D
195	UNDECLARED	LEGALIZATION OF MARAJUA	U	SOC			N	2	D	D	D	0	0	D	D	D	D
196	FINANCE	AUTOMOBILES	U	WBA			N	2	N	Y	Y	3	Y	Y	N	N	N
197	COMMUNICATIONS	INTERCULTURAL TRAINING	U	ERC			Y	2	N	N	N	0	0	Y	N	N	N
198	PSYCHOLOGY	PTSD & SEXUAL ABUSE	G	PLT	SSI	SCI	Y	3	Y	Y	N	0	0	Y	N	Y	Y
199	CHILD DEVELOPMENT	CHILD ABUSE	U	ERC			D	2	N	N	N	0	0	Y	N	N	N
200	CHILD DEVELOPMENT	EFFECTS OF DAYCARE	U	SSI	PLT	RGD	N	2	N	N	N	0	0	Y	N	N	N
201	SOCIOLOGY	KIDS AND GUNS	U	SSI	HUM	SOC	Y	3	N	N	Y	3	Y	Y	Y	Y	N
202	FINANCE	MALAWI	U	HUM			Y	1	N	Y	N	0	0	Y	Y	N	D
203	SOCIAL SCIENCE	WAR ON DRUGS	G	SSI	WBA	HUM	D	2	N	N	N	0	0	Y	D	N	N
204	LIBRARY SCIENCE	WORD PROJECT	G	ABI	ART	MLA	Y	3	N	Y	Y	3	Y	Y	N	Y	Y
205	BUSINESS		U	ABI			N	3	N	Y	N	0	0	Y	N	N	N
206	CHILD DEVELOPMENT	LABELING EFFECTS OF DISA	U	PLT	ERC		Y	3	N	Y	N	0	0	Y	D	N	Y
207	HUMAN SERVICES	DUAL RELATIONSHIPS	U	PLT			Y	3	N	N	N	0	0	Y	N	Y	N
208	ANTHROPOLOGY	HUMAN VARIATION	U	SSI	GSI	AST	Y	2	Y	Y	N	0	0	Y	Y	N	Y
209	MUSIC	HEALTH CARE REFORM	U	RGD			Y	3	N	N	N	0	0	Y	N	Y	N
210	CHILD DEVELOPMENT	DOWN SYNDROME	U	PLT			Y	3	N	N	N	0	0	Y	N	Y	N
211	PSYCHOLOGY	MUSIC	U				N	3	Y	Y	N	0	0	Y	Y	Y	Y

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212	BUSINESS	ILLEGAL ALIENS	U	SOC			Y	1	N	N	N	0	D	Y	Y	N	N
213	MARKETING	RECESSION	G	ABI			Y	2	D	N	N	0	D	Y	Y	N	N
214	LIBERAL STUDIES	GABRIEL GARCIA MARQUEZ	U	MLA			Y	3	Y	N	N	0	D	Y	Y	N	N
215	UNDECLARED	SPEED LIMITS	U	RGD			D	3	N	N	N	0	D	Y	Y	N	N
216	LIBRARY SCIENCE	AUTOMATED LIBRARY SYST	G	LLT	ERC		Y	2	D	Y	N	0	D	Y	N	N	N
217	COMMUNICATIONS	COMPUTER VIRUSES	U	AST	WBA ABI		Y	2	N	Y	N	0	D	Y	Y	N	D
218	SOCIAL SCIENCE	PHILOSOPHY/EXISTENTIAL	G	HUM			D	2	D	N	N	0	D	Y	D	Y	D
219	COMMERCIAL ARTS	LATIN AMERICA	U	HUM	RGD		D	3	N	N	N	0	D	Y	N	N	N
220	CHEMISTRY	GENE THERAPY FACTOR	U	GSI			Y	1	D	Y	Y	1	Y	Y	N	N	N
221	BUSINESS	GENERAL MOTORS	U	ABI	WBA		Y	3	Y	N	N	0	D	Y	N	N	N
222	LIBERAL STUDIES	CALIFORNIA DESERT PROTE	U	AST	WBA GSI		N	2	Y	Y	N	0	D	Y	N	Y	N
223	SOCIOLOGY		U	SOC			Y	2	Y	N	N	0	D	Y	N	Y	N
224	COMMUNICATIONS	ASIAN JOURNALISTS	G	HUM			Y	1	N	N	N	0	D	Y	Y	N	N
225	BIOLOGY	ELIMINATIONS DISEASE	U	GSI			N	2	N	Y	N	0	D	Y	Y	N	N
226	PSYCHOLOGY	HYPNOSIS OUTCOME STUDI	G	PLT			D	0	D	Y	N	0	D	Y	Y	D	Y
227	BUSINESS	AIRLINE DEREGULATION	U	WBA			Y	3	N	N	N	0	D	Y	Y	N	N
228	HUMAN SERVICES	STERIODS	U	GSI	SSI	PLT	Y	2	N	N	N	0	D	Y	Y	N	N
229	LIBERAL STUDIES	WOMEN'S WORKPLACE	U	HUM			Y	4	N	Y	N	0	D	Y	Y	Y	D
230	PSYCHOLOGY	COGNITIVE PROCESSES	G	PLT			Y	2	N	N	N	0	D	Y	Y	N	N
231	BIOLOGY	MICROBIOLOGY	U	GSI			Y	2	N	Y	Y	3	D	Y	D	N	N
232	CHILD DEVELOPMENT	SLOW LEARNER MAINSTREA	U	ERC			D	3	N	N	N	0	D	N	Y	N	D
233	BUSINESS	LOCATION IN BUSINESS	U	WBA			Y	0	Y	Y	Y	3	D	D	Y	Y	Y
234	EDUCATION	SCHOOL SITE COUNCIL	G	ERC			Y	0	N	Y	N	0	D	Y	N	N	N
235	COMPUTER SCIENCE	COMPUTER APPLICATION/M	G	RGD			Y	2	Y	Y	N	0	D	Y	Y	D	Y
236	PSYCHOLOGY		U				N	3	N	N	N	0	D	Y	N	N	N
237	HISTORY	YUGOSLAVIA CIVIL WAR	U	SSI			Y	3	N	Y	N	0	D	Y	Y	N	N
238	BUSINESS	RED LION HOTEL	G	ABI	WBA HUM		Y	3	N	N	N	0	D	Y	Y	N	N
239	MARKETING	MOTEL POSITIONING	U	ABI			Y	1	D	N	N	0	D	Y	Y	N	N
240	CHEMISTRY	VOLATILE ORGANIC COMPO	G	AST	GSI		Y	2	N	N	N	0	D	Y	N	D	N
241	LIBERAL STUDIES		U	ERC	WBA SOC		Y	2	Y	Y	N	0	D	Y	Y	D	Y

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242	BUSINESS	NAFTA	U	ABI			D	1	D	D	N	0	D	Y	D	N	N
243	EDUCATION	ELEMENTARY EDUCATION	G	ERC			Y	0	Y	Y	N	0	D	Y	Y	Y	Y
244	PSYCHOLOGY	EMOTIONS	U	PLT			Y	1	N	Y	N	0	D	Y	Y	N	N
245	BUSINESS	USER RISKS INFORMATION	U	WBA			Y	1	N	Y	N	0	D	Y	N	N	N
246	PSYCHOLOGY	DISCIPLINE IN CHILDREN	U	PLT			Y	2	N	N	N	0	D	Y	D	N	D
247	BIOCHEMISTRY	HMC PROTEIN	U	AST			D	1	N	Y	N	0	D	Y	D	N	Y
248	COMMUNICATIONS	RULES THEORY	U	ERC			N	1	N	N	N	0	D	Y	N	N	N
249	SOCIOLOGY	CHILDREN IN AMERICAN SO	G	RGD			Y	2	N	N	N	0	D	Y	N	Y	D
250	FINANCE	ESTATE PLANNING	U	ABI	WBA		D	1	N	N	N	0	D	Y	N	Y	N
251	AMERICAN LANGUAGE PR	AUTOMOBILE MARKETS IN UO	U	WBA			Y	3	D	D	D	0	D	D	N	D	D
252	COMMUNICATIONS	PARTICIPATIVE MANAGEM	U	ABI	WBA SSI		Y	1	N	Y	Y	1	D	Y	N	N	N
253	NURSING	ADULT CHILDREN/AGING PA	U	PLT			Y	3	N	Y	N	0	D	Y	N	N	N
254	HISTORY	EATING DISORDERS	U	AST	PLT SSI		D	4	N	N	N	0	D	Y	N	Y	N
255	AMERICAN STUDIES	TECHNOLOGY	G	SSI	HUM		D	1	N	Y	Y	1	Y	Y	N	N	Y
256	PSYCHOLOGY	MEMORY	U	PLT			Y	3	N	N	N	0	D	D	D	N	Y
257	COMMUNICATIONS	MOVEMENT TRAITS	U	GSI			Y	1	D	Y	D	0	D	D	Y	D	N
258	ADVERTISING	VARIOUS	U	RGD			Y	3	N	N	N	0	D	Y	N	N	N
259	CHILD DEVELOPMENT	CHOSES AND CHILDREN	U	ERC	PLT		Y	2	N	Y	N	0	D	Y	N	Y	N
260	PSYCHOLOGY	IMPRESSION	U	PLT			Y	1	N	N	N	0	D	Y	N	Y	D
261	BIOLOGY	WAVELENGTH	U	GSI			N	6	N	Y	Y	0	D	Y	N	N	Y
262	BIOLOGY	BIRDS/CHAPARREL	U	GSI			N	1	Y	Y	Y	3	Y	Y	Y	N	Y
263	COMMUNICATIONS	US HUMANITARIAN AID	U	GSI	HUM SSI		N	6	N	Y	N	0	D	Y	N	N	N
264	FINANCE	AMWAY INTERNATIONAL	U	WBA	ABI RGD		N	1	Y	Y	N	0	D	Y	N	N	N
265	HUMAN SERVICES	HISPANIC STUDENTS	U	ERC	CDB		N	6	N	Y	N	0	D	Y	D	Y	D
266	CHILD DEVELOPMENT		U	PLT			N	3	N	Y	N	0	D	Y	N	N	Y
267	BUSINESS	FLORIDA EVERGLADES	U	GSI	SOC SSI		Y	1	N	Y	Y	3	Y	Y	N	N	Y
268	COMMUNICATIONS	MESSAGES & CONTRACEPTI	U	SSI	ERC GSI		Y	3	D	N	D	0	D	Y	N	Y	Y
269	EDUCATION	SPECIAL EDUCATION RELATIG	G	ERC			Y	1	N	Y	N	0	D	Y	Y	Y	Y
270	ENGINEERING	REINFORCED CONCRETE DE	U	AST			Y	2	N	N	N	0	D	Y	Y	N	N
271	FINANCE	CORPORATIONS	U	ABI			N	1	N	N	N	0	D	Y	Y	N	N

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272	HUMAN SERVICES	DYSFUNCTIONAL FAMILIES	U	SOC			Y	3	N	N	N	0	0	Y	Y	Y	D	Y	D
273	BUSINESS	WELLNESS PROGRAMS	U	ABI			D	4	N	N	Y	3	0	Y	Y	Y	Y	Y	Y
274	ACCOUNTING	NAFTA	U	ABI	WBA	RGD	Y	1	Y	Y	N	0	0	Y	Y	Y	Y	Y	N
275	BIOLOGY	VIRUSES	U	GSI			Y	1	N	N	N	0	0	Y	Y	Y	D	Y	D
276	ENGLISH	POETRY	U	LIT			N	4	N	N	N	0	0	Y	Y	Y	D	N	N
277	ART	FAULKNER	U	ART	LLT		Y	4	N	N	N	0	0	Y	Y	Y	N	N	N
278	BUSINESS	AEROSPACE INDUSTRY	U	AST	ABI		D	1	D	N	N	0	0	Y	Y	N	N	N	N
279	ANTHROPOLOGY	FEMALE CIRCUMCISION	U	SSI			Y	2	N	N	N	0	0	Y	Y	N	N	Y	D
280	BUSINESS	MACROECONOMICS OF A C	U	WBA	ABI		Y	2	N	N	N	0	0	Y	Y	N	N	N	N
281	COMMUNICATIONS	MEDIA RELATIONS	G	ABI	RGD		Y	3	N	N	N	0	0	Y	Y	Y	Y	Y	Y
282	EDUCATION	PORTFOLIO ASSESSMENT	U				Y	2	N	N	N	0	0	Y	Y	Y	D	D	D
283	CHEMISTRY	MICROBIOLOGY	U	GSI			Y	1	D	N	N	0	0	Y	Y	N	N	Y	N
284	ACCOUNTING	AFFIRMATIVE ACTION	U	WBA			Y	3	N	N	D	0	0	D	D	D	D	D	D
285	POLITICAL SCIENCE	LAOS	U	SSI			Y	1	N	N	N	0	0	Y	Y	N	N	Y	N
286	BUSINESS	SWITZERLAND & EC	U	WBA	ABI		D	2	N	N	N	0	0	Y	Y	N	N	Y	N
287	BUSINESS	DEATH & DYING	U	SSI			Y	3	D	Y	Y	1	Y	Y	Y	Y	Y	N	N
288	BUSINESS	DRUG TESTING	U	ABI	WBA	SSI	Y	2	D	Y	Y	3	Y	Y	N	Y	D	Y	Y
289	BUSINESS	WOMEN IN MANAGEMENT	U	WBA			N	1	D	N	N	0	0	N	Y	Y	Y	Y	Y
290	POLITICAL SCIENCE	LITHUANIA/AMERICAN FOREIGN	U	HUM			D	6	N	N	N	0	0	D	D	D	D	N	D
291	BUSINESS	MINIMUM WAGE	U	ABI	AST	RGD	Y	1	N	Y	Y	2	Y	Y	Y	N	Y	Y	Y
292	COMMUNICATIONS	LANGUAGE LEARNING DISA	G	PLT			D	3	N	N	D	0	0	Y	Y	N	N	N	N
293	SOCIAL SCIENCE	AFRICAN AMERICAN ATTITU	G	SSI			Y	1	N	N	N	0	0	Y	Y	N	N	N	N
294	CRIMINAL JUSTICE	RAPE	U				Y	2	Y	Y	N	0	0	Y	Y	D	N	D	D
295	PSYCHOLOGY	MEANING IN LIFE	U	PLT			Y	0	N	N	N	0	0	Y	Y	D	N	N	N
296	PSYCHOLOGY	NORPLANT & WELFARE MOT	U	RGD			Y	1	N	Y	N	0	0	Y	Y	N	Y	Y	Y
297	ANTHROPOLOGY	DIABETES AND NATIVE AME	U	AST	ERC	GSI	Y	1	N	Y	N	0	0	Y	Y	N	N	N	N
298	ACCOUNTING	BUSINESS	U	WBA			Y	1	N	N	N	0	0	Y	Y	Y	Y	N	N
299	UNDECLARED	FUNERALS & GRIEF	O	SOC			N	2	N	N	N	0	0	Y	N	N	N	N	N
300	PSYCHOLOGY	BRIGHTNESS CONSTANCY	U	PLT			D	2	Y	D	D	0	0	Y	Y	D	D	D	D
301	COMMUNICATIONS		U	RGD			Y	5	N	Y	N	0	0	Y	Y	N	Y	N	N

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Q#	1- Major	1-a Research Topic	2-Status	3-CD Rom	q-3a	q-3b	4-CD	4a	CD	5-	6-	7-	7a	7b	8-	8a	10-	10a	11-D	11-a
332	ENVIRONMENTAL STUDIES	ELECTRIC CARS	G	AST	WBA	SSI	Y	0	Y	Y	Y	Y	0	Y	Y	Y	Y	Y	N	N
333	ADVERTISING	NESTLE CO	U	ABI			Y	3	N	Y	N	0	0	Y	Y	Y	Y	D	N	N
334	EDUCATION	WOMEN IN LEADERSHIP	G	PLT			Y	2	Y	N	N	0	0	Y	Y	Y	D	N	Y	N
335	BUSINESS	FOREIGN AID TO RUSSIA	U	SSI			D	0	D	N	N	0	0	Y	Y	N	N	N	N	N
336	PSYCHOLOGY	TWIN STUDIES	G	PLT	HUM	SSI	Y	2	N	Y	Y	2	Y	Y	Y	Y	N	N	N	N
337	POLITICAL SCIENCE	PORNOGRAPHY	U	SSI	HUM		Y	2	N	D	N	0	0	Y	Y	Y	N	N	N	N
338	PRE MED	AFRO ETHNICS	U				D	6	D	D	D	0	0	Y	Y	N	N	N	D	D
339	CHILD DEVELOPMENT	FAMILIES/ CHILDREN/DISABI	U	PLT	ERC		Y	1	N	N	N	0	0	Y	Y	Y	N	N	Y	N
340	BIOLOGY	ESSENTIAL MICROORGANIS	U				D	2	N	N	N	0	0	Y	Y	Y	Y	N	N	N
341	LIBERAL STUDIES	GABRIEL GARCIA MARQUEZ	U	MLA			Y	3	N	Y	N	0	0	Y	Y	Y	D	Y	Y	Y
342	BIOCHEMISTRY	BIOMEDICATION	U	GSI			Y	1	Y	Y	N	0	0	Y	Y	N	N	N	Y	Y
343	CHILD DEVELOPMENT	CHILDHOOD OBESITY	U	PLT	ERC		Y	3	N	N	N	0	0	Y	Y	Y	N	Y	Y	N
344	BUSINESS	UNITED AIRLINE	U	WBA			Y	3	N	N	N	0	0	Y	Y	Y	Y	Y	N	N
345	MARKETING	CLOTHING INDUSTRY/MARK	U	WBA			Y	1	N	N	N	0	0	Y	Y	Y	N	N	N	N
346	ENGLISH	CHAUCER	U	MLA			D	4	N	N	N	0	0	Y	Y	Y	Y	D	Y	D
347	ACCOUNTING	HERSHEY INC.	U	WBA			D	1	N	N	N	0	0	Y	Y	Y	N	N	N	N
348	SOCIOLOGY	ADULT ILLITERACY	U	ERC	HUM	SSI	Y	2	N	Y	N	0	0	Y	Y	Y	Y	Y	Y	Y
349	LIBERAL STUDIES	HUMAN GENOME PROJECT	U	GSI	SCI		Y	2	N	N	N	0	0	Y	Y	Y	Y	Y	Y	Y
350	SOCIOLOGY	ATTITUDES TOWARD PORNO	G	SOC			Y	0	Y	Y	N	0	0	Y	Y	Y	N	N	Y	Y
351	BIOLOGY	MICRO BIOLOGY	U	GSI			Y	1	N	D	N	0	0	Y	Y	Y	D	N	N	N
352	ART	EDUCATION GLAZES	U	ART	ERC		Y	4	N	N	N	0	0	Y	Y	Y	Y	Y	Y	Y
353	COMMUNICATIONS	KNOWLEDGE GAP THEORY	G	SSI			Y	2	N	Y	N	0	0	Y	Y	Y	Y	Y	N	Y
354	BIOLOGY	LIGHT INTENSITY	U	SCI			D	4	N	N	N	0	0	Y	Y	Y	Y	Y	Y	N
355	COMMUNICATIONS	SPANISH LITERATURE	U	MLA			Y	2	N	Y	N	0	0	Y	Y	N	N	Y	Y	D
356	BIOLOGY	WAVELENGTHS OF RADISHE	U	SCI			Y	2	N	Y	N	0	0	Y	Y	Y	N	N	N	D
357	AMERICAN STUDIES	BUMPER STICKERS	G	SSI	ERC	PLT	D	1	Y	Y	N	0	0	Y	Y	Y	N	Y	N	Y
358	PSYCHOLOGY	SUDDEN INFANT DEATH SYN	G	PLT			Y	2	Y	Y	N	0	0	Y	Y	Y	N	Y	Y	Y
359	BUSINESS	ABORTION	U	RGD			Y	3	Y	N	N	0	0	Y	Y	Y	Y	Y	Y	Y
360	COMMUNICATIONS	FILM	U	RGD			N	1	N	Y	N	0	0	Y	Y	Y	Y	N	N	N
361	BUSINESS	OUTPLACEMENT	U	ABI			Y	0	D	D	N	0	0	Y	Y	Y	N	N	N	N

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Q#	1-Major	1-a Research Topic	2-Status	3-CD Rom	q-3a	q-3b	4-CD	4a	5-CD	6-	7-	7a	7b	8-10	10a	11-D	11-a
362	SOCIOLOGY	SEXUAL ABUSE	U	SSI		Y			3N	Y	Y	0D	Y	Y	N	N	N
363	BUSINESS	HOME HEALTH CARE MARK	U	WBA		Y			0Y	Y	N	0D	Y	Y	N	D	N
364	PSYCHOLOGY	STIGMA AGAINST MENTAL	G	PLT					4N	N	D	0D	Y	Y	N	N	N
365	ANTHROPOLOGY	POTASSIUM ARGON DATING	U	AST	GSI	SSI			3N	Y	Y	4Y	Y	Y	Y	N	N
366	PSYCHOLOGY	RORSCHAK	U	PLT	SSI				2N	N	N	0D	Y	Y	Y	N	D
367	EDUCATION	PIAGET	G	ERC					1Y	Y	Y	1N	Y	Y	Y	N	N
368	BIOLOGY	AUSTRALIAN RABBIT BIOLO	U	SCI					4N	Y	Y	3Y	Y	Y	N	Y	Y
369	BUSINESS	JAPANESE PRODUCTION MA	U	WBA					0Y	N	N	0D	Y	Y	N	Y	N
370	BIOLOGY	MADONNA	U						4N	N	D	0D	Y	Y	N	N	N
371	CHILD DEVELOPMENT		U	ERC	GSI	PLT			0N	N	N	0D	Y	Y	N	Y	N
372	ANTHROPOLOGY	AIDS	U	GSI	SSI				2N	N	N	0D	Y	Y	N	Y	N
373	COMPUTER SCIENCE	OBJECT ORIENTED DESIGN	G	AST					2N	N	N	0D	Y	N	D	N	N
374	COMPUTER SCIENCE	AMUSEMENT PARKS IN USA	U	WBA					2N	N	N	0D	Y	D	Y	D	Y
375	LIBRARY SCIENCE	COOPERATION/PRESERVATI	G	LLT					1N	Y	N	0D	Y	N	N	N	N
376	ENGLISH	UNITED NATIONS	U	WBA					4N	N	N	0D	Y	Y	N	N	N
377	PSYCHOLOGY	THEMATIC APPERCEPTION T	U	PLT					1N	N	N	0D	Y	Y	N	Y	N
378	ACCOUNTING	IBM PERSONAL COMPUTER	U	WBA					4N	N	N	0D	Y	Y	Y	N	N
379	BIOCHEMISTRY		U	SCI					0N	N	Y	6D	Y	N	Y	D	Y
380	FINANCE	BENEFIT OF TRAINING	G	RGD					3D	D	D	0D	Y	Y	N	Y	D
381	ACCOUNTING	CAM	U	WBA					1N	N	N	0D	Y	Y	Y	Y	N
382	LIBRARY SCIENCE	KOREAN AMERICANS	G	RGD	SSI				1N	Y	N	0D	Y	Y	N	N	N
383	BUSINESS	WORKERS COMPENSATION	U	ABI	WBA				2N	N	N	0D	Y	Y	Y	D	Y
384	HUMAN SERVICES	SMALL BUSINESS MANAGE	U	ABI					2N	D	N	0D	Y	Y	D	D	D
385	BIOLOGY	MICROBIOLOGY	U	SCI					2Y	Y	N	0D	Y	Y	N	N	N
386	PSYCHOLOGY	BRIGHTNESS CONSTANCY	U	PLT					3N	Y	N	0D	Y	Y	Y	N	Y
387	FINANCE	NAFTA	U	WBA					1N	N	N	0D	Y	Y	Y	D	Y
388	BIOLOGY	MICROBIOLOGY	U	GSI					2N	N	N	0D	Y	Y	D	N	N
389	EDUCATION	SCHOOL CHOICE	G	ERC					2D	N	N	0D	Y	N	N	N	N
390	CHILD DEVELOPMENT	DIVORCE AND CHILDREN	U	PLT	ERC				2N	N	N	0D	Y	N	N	Y	N
391	BIOLOGY	CYANOBACTERIA	U	GSI	SCI				2N	N	N	0D	Y	Y	N	Y	N

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392	FINANCE	MARKETING COMPARISONS	U	ABI	WBA		N	3	N	N	N	0	0	Y	N	N
393	COMMUNICATIONS	CULTURE AND COMMUNICA	G	SSI	ABI		Y	2	D	Y	N	0	0	Y	N	Y
394	HUMAN SERVICES	LEARNING DISABILITIES	U	PLT			Y	2	N	N	N	0	0	Y	N	N
395	CRIMINAL JUSTICE	INSANITY DEFENSE	U	PLT			Y	3	D	D	N	0	0	Y	Y	N
396	BUSINESS	DISEASES	U	AST			D	3	D	D	N	0	0	Y	Y	Y
397	BUSINESS	HEALTH/DIET & LOW FAT	U	GSI			D	1	N	N	N	0	0	Y	N	D
398	CHILD DEVELOPMENT	MUSIC	U				Y	1	N	Y	N	0	0	Y	N	Y
399	BIOLOGY	MUSSELS	U	GSI	AST		Y	2	N	N	N	0	0	Y	N	N
400	BUSINESS	SLOGANS	U	ABI			Y	2	N	N	N	0	0	Y	N	N
401	MARKETING	MANAGEMENT	U	ABI	WBA		Y	2	N	Y	Y	3	Y	Y	N	Y
402	LIBERAL STUDIES	WILLIAM GRANT STILL	U				Y	1	N	N	N	0	0	Y	N	Y
403	PSYCHOLOGY	TUBERCULOSIS	U	GSI			Y	1	N	N	N	0	0	Y	N	N
404	CHILD DEVELOPMENT	PARENTAL DISCIPLINE/SPAN	U	PLT			Y	1	Y	Y	N	0	0	Y	N	Y
405	LIBRARY SCIENCE	GENEALOGY/REFERENCE S	G	LLT			Y	1	Y	Y	N	0	0	Y	N	D
406	COMMUNICATIONS	CARDIOVASCULAR SYSTEM	U	AST			D	3	N	N	D	0	0	Y	Y	N

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APPENDIX 3
MAJOR AND CD-ROM USE

Number of Times CD-ROM Used by Major

<u>Major</u>	<u>Count</u>	<u>Percent</u>
American Language Program	1	0.25
American Studies	4	0.99
Anthropology	9	2.22
Art	4	0.99
Art History	1	0.25
Biochemistry	4	0.99
Biology	24	5.93
Business	115	28.39
Chemistry	3	0.74
Chicano Studies	1	0.25
Child Development	31	7.65
Civil Engineering	1	0.25
Commercial Arts	1	0.25
Communications	41	10.12
Comparative Literature	1	0.25
Computer Science	10	2.47
Counseling	2	0.49
Criminal Justice	2	0.49
Education	10	2.47
Elementary Education	2	0.49

Engineering	2	0.49
English	10	2.47
Environmental Studies	2	0.49
History	6	1.48
Human Services	11	2.72
Liberal Studies	18	4.44
Library Science	8	1.98
Linguistics	1	0.25
Music	3	0.74
Nursing	1	0.25
Physical Education	3	0.74
Political Science	8	1.98
Pre Med	1	0.25
Psychology	46	11.36
Social Science	4	0.99
Sociology	10	2.47
Undeclared	4	0.99
<hr/>		
Total	405	100%

APPENDIX 4
CD-ROM INDEXES USED

CD-ROM Indexes Used

<u>CD-ROM</u>	<u>Count</u>	<u>Percent</u>
ABI/Inform	57	10
Art Index	9	2
Applied Science and Technology Index	26	5
Chicano Database	5	1
ERIC	53	10
General Science Index	51	9
Humanities Index	38	6
Literary Index	1	0
Library Literature	6	1
Music Index	9	2
MLA Bibliography	12	2
PsychLIT	83	15
Religion Index	2	0
Readers Guide Index	35	6
Science Index	11	2
Sociofile	10	2
Social Sciences Index	77	14
Wilson Business Abstracts	74	13
<hr/>		
Total	559	100%

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