TEACHING ELECTRONIC LITERACY

A Concepts-Based Approach for School Library Media Specialists

Kathleen W. Craver

Greenwood PUBLISHING GROUP

Teaching Electronic Literacy

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To Charlie

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Introduction: The Rationale for Instructional Change

TECHNOLOGICAL TRENDS

The instructional role of school library media specialists (SLMSs) is being influenced not only by advances in technology but also by economic, educational, and employment changes. Faced with expanded access and increased storage and retrieval capabilities in an electronic environment, we are fast discovering how obsolete our former methods of bibliographic instruction have become. Faculties, faced with a similar information explosion, are realizing how limiting their textbook-lecture-classroom method is in this new electronic age (Craver 1994, 148).

With improvements in telecommunications, cable and satellite resources, computer hardware and software, scanners, CD-ROM and hypertechnologies, SLMSs have the ability to provide information to students on a scale never before imagined. The major thrust of these electronic changes is being generated by the nationwide installation of fiber-optic cabling. This telecommunications backbone, which currently supplies access to the Internet, serves as the engine that drives every type of information to become digitized, whether book, recording, or video. Once digitized, information is no longer bound by time or place. It can be quickly and inexpensively transmitted through fiber-optic cabling to not only school library media centers (SLMCs) but also to other parts of the school and to students' homes. As this telepower revolution renders the walls of SLMCs superfluous, it is simultaneously providing students and faculty with a wealth of information never before thought possible. Even the smallest SLMC can provide its students and faculty with information that should satisfy most of their research needs. But this increased access in a timeless and wall-less environment will also have negative aspects if students and

faculty are not electronically literate. SLMSs may find that they have opened a Pandora's box by providing a bewildering array of electronic on-site and remote online databases, and access to Internet without sufficient instruction.

EMPLOYMENT TRENDS

It is imperative that SLMSs furnish electronic literacy instruction to satisfy both immediate student information demands and long-term information and employment needs. By 2010, 90 percent of all jobs will be computer dependent, a forecast confirmed daily by the proliferation of computers and modems in homes and businesses. In 1981, there were only 750,000 personal computers in U.S. homes. Today more than one-third of American homes have personal computers (Gates 1995, 71).

Employers are indicating that the level of employee electronic literacy is too low to satisfy workplace demands. A survey of business executives, for example, indicates that they expect more than routine production-services work that involves repetitive tasks usually performed by clerks and data processors. They also want workers to have analytic reasoning, logic, and communication skills to enable them to adjust to increased workplace demands. These are the same skills that characterize symbolic-analytic service workers. Their occupations entail problem identifying, problem solving, and strategic-brokering functions. Their products are not tangible; they deal with the manipulation of data, words, and graphic representations. Occupations representing symbolic-analytic information services comprise software designers, engineers, lawyers, tax consultants, management information specialists, systems analysts, writers, and musicians. Workers who are engaged in symbolic-analytic services account for only about 20 percent of American jobs, and this percentage is not predicted to grow appreciably (Reich 1991, 173–203).

The Education-Income Connection

Most employment specialists note that a much larger percentage of workers will need these same skills just to survive as more occupations become increasingly technologically advanced. Already there is a distressing connection between the education levels that workers attain and their respective incomes. Certainly the relationship between education and earnings has always been clear, but it will become even more important in the years ahead. More than 50 percent of new jobs will require some education beyond high school, and almost one-third of these jobs will be filled by college graduates. Only 22 percent of today's occupations require a college degree (Person 1993, 477).

Employment statistics show that the absence of a college degree may preclude a decent standard of living. In 1980, male college graduates earned

about 80 percent more than their high school counterparts. By 1990, the gap had nearly doubled (Murnane and Levy 1993, 1–19). The main reason given for this growing divergence between male high school graduates and college graduate earnings is lack of education.

During the 1980s, when employers could have replaced high school graduates with other high school graduates, they chose to replace them with college graduates. Economists believe that they were responding to increased competition and to changes in the way work was being performed. Some companies, for example, contracted high-school level work out to workers in lower-wage countries and hired college graduates for marketing and financing tasks. Other companies introduced advanced technologies that required better-educated workers to operate the machines.

Rising Skill Requirements

What are the skills that high school graduates need to increase their wages? Many studies suggest that reading and math skills and a facility to use these skills to solve problems matter more in today's workplaces than they did in the workplaces of the 1970s (Murnane and Levy 1993, 8). The correlation between reading, mathematics, and reasoning skills and the fastest-growing jobs is direct. Natural scientists and lawyers, for example, whose skill requirements in these areas were rated highest by the U.S. Department of Labor, are among the two fastest-growing occupations (Person 1993, 472). Yet many labor economists are not confident that improving literacy and mathematics skills in a standardized, back-to-basics fashion is the answer to diminished employment opportunities. Reich, for example, in *The Work of Nations* (1991), advocates that education should be centered around "a lifetime of symbolic-analytic work." A symbolic analyst combines four skills: "abstraction, system thinking, experimentation, and collaboration" (227). To think abstractly means to be able to discern patterns and meanings in information so that it can be equated, formulated, analyzed, or categorized. The abstract process of construing information into usable patterns is characteristic of occupations such as scientist, attorney, engineer, designer, and systems consultant. These are positions that, although susceptible to global competition, will be growth occupations accompanied by decent standards of living.

System thinking, a more advanced stage of abstraction, requires that individuals be able to recognize patterns and meanings and how they relate to something as a complete process or cycle. Problems are identified and then linked to other problems. The use of DDT as a pesticide and its deleterious concatenated connection to an entire ecosystem of animals and plants is illustrative of system thinking. Experimentation, rarely used as a teaching method in most disciplines with the exception of science, is needed to establish cause and effect, similarities and differences, and pos-

sibilities and outcomes. It provides opportunities for students to use tools to structure their own learning situations.

Last is the ability to collaborate, to work in teams, and to share information and solutions. The means to do this can be provided through oral reports, designs, scripts, discussion groups, debates, symposia, or focus groups. The emphasis on this form of learning—using reasoning skills instead of mere acquisition of unrelated facts—is to simulate the type of thinking that will be required to achieve success in a technologically advanced global marketplace (Craver 1994, 67–68).

SLMC INSTRUCTION IN AN ELECTRONIC ENVIRONMENT

Given these technological, economic, and employment trends, many SLMSs' concepts of bibliographic instruction are outmoded. The availability of the Internet and the fast-approaching presence of third-generation online public access catalogs (OPACs) necessitate a dramatic change in SLMSs' instructional methods. Advances in telecommunications and computer hardware and software have made the development of more sophisticated OPACs a reality in many SLMCs. Some SLMCs provide users with a selection of more than sixty different CD-ROM titles (Technically Speaking on Information Navigation 1993, 5–6).

This explosion of choices has both positive and negative instructional aspects. The fact that students can choose from a multitude of databases requires not only a tolerance for many alternatives but also the ability to choose correctly to fulfill their information needs. Studies of consumer tolerance for choosing products indicate that "more is less," not "more is more," and that consumers faced with an overwhelming supply of competing goods tend to suffer increased anxiety (Oberman 1991, 189).

There are similarities between the problems of choice that consumers encounter in a shopping mall and the problems of increased choice that are beginning to confront students in electronic library environments. As SLMCs acquire the latest CD-ROM databases or add additional Internet sites to their library home pages, access patterns to information change. Suddenly, students can access their local online catalog from a single workstation, switch to remote library collections, cruise the Internet, or tap the resources of perhaps fifty additional specialized CD-ROM online databases.

The instructional challenges in this electronic environment are daunting. School library media specialists must assist students in choosing correctly from a plethora of electronic resources and teach students how to search and retrieve the extraordinary amount of information available in this new online environment. To achieve these goals, SLMSs will have to make major changes in library education. Recent research conducted at the college level confirms this conclusion.

Student Information-Seeking Behavior

Initial studies of the presence of an online public access catalog show that it frequently creates a false sense of confidence regarding "the understanding of its content and the knowledge to use it effectively" (Baker 1986, 36). Yet frequent and even infrequent library users, whether they are successful in searching or not, characterize the OPAC as an improvement over the card catalog.

Further studies reveal that students are unable to match even basic subject needs with the appropriate information retrieval database. When eighty-two undergraduates at the University of Illinois (Champaign–Urbana) were given a subject and asked to choose a database from among sixteen, only 22 percent of the searchers selected appropriate ones. Furthermore, almost 20 percent of the students selected databases not even remotely connected to their topic. Nine percent of InfoTrac users interviewed at the University of North Carolina were attempting to use this business-oriented database to locate information on Graham Greene, the Spanish Civil War, and Kierkegaard (Oberman 1991, 191–92).

Studies indicate that information users do not fully comprehend the large array of available search options and rarely apply the correct ones even when they are cognizant of them. Moreover, students are often frustrated when confronted with too many search options and have difficulty deciding when to employ them. For example, choosing to use a Boolean search may yield more information than choosing to use a keyword search. Studies also reveal that many students do not know how to search a subject by employing controlled vocabulary terms. Set building by use of Boolean operators is performed only by skilled searchers. Finally, students frequently make errors in groups, thus building mistakes internally into the searches so that no information matches result (Baker, Huston, and Pastine 1991, 210–22). There is also a direct correlation between library use and remaining in college. Approximately 43 percent of the students at California State Polytechnic College who did not use the library dropped out, compared to 26 percent of library users (Brevik 1989, 105). In an age when every student will have to acquire more education beyond high school, it will be imperative that SLMSs prepare them adequately for an electronic educational environment. Future online instruction will be based on concepts that are universally transferable to a variety of information storage and retrieval systems.

Questions generated by the preceding findings naturally occur. What, for example, should be taught? Should electronic literacy instruction be integrated with course work or retained as a separate learning experience? What methods achieve the best results? Most library researchers no longer recommend a specific teaching method in the provision of electronic literacy instruction.

PURPOSE OF THIS BOOK

The purpose of this book is to identify the universal concepts of electronic literacy by teaching students to (1) find and evaluate needed information from a variety of listed electronic resources including remote online commercial databases, the Internet, and various CD-ROM databases; (2) understand standardized concepts of information retrieval systems; (3) formulate appropriate search strategies for information; (4) create electronic searches by selecting, entering, and manipulating search commands; and (5) interpret and evaluate search findings in relation to a specific topic.

Use of Symbolic-Analytic Skills

Information retrieval skills will demand a high degree of symbolic-analytic thinking by students. Skills such as abstraction, system thinking, experimentation, and collaboration will constantly be required if students are to cope successfully with an increasingly complex electronic environment. Students will have to be taught to find patterns and meaning in the information they acquire from diverse databases. They will have to discern and access the relationships among various pieces of information and problems or subjects. They will have to experiment in their searches for information by selecting different databases, creating several search strategies, and varying their search options. Finally, they will have to engage in several forms of collaboration by interacting with librarians, teachers, and their peers in different course-integrated electronic instruction units.

Although many sophisticated online databases and services are referred to in this book, my assumptions are that most SLMCs have only a small portion of them and perhaps Internet access via modem rather than other high-speed transmission forms. What is important is to stress the standardized features that are common to most electronic technologies. No library, academic, public school, or special, will ever contain all of the world's electronic resources. Once students are taught that electronic resources and searching techniques are more alike than different, they will be able to transfer what they have learned from one to another. After mastering these skills, they will be on the road to becoming life-long learners who can adapt to changing technologies independently and successfully.

A second assumption concerns whether to integrate specific concepts into resource-based learning units or to teach them in isolation. Although I favor the former method because students deem instruction more relevant when it relates to a course assignment, I do not reject the other method. If the only instructional opportunity is to introduce electronic literacy skills in isolation, do it. Most students find computers intrinsically more interesting to use than other information formats so that you will probably experience little difficulty in maintaining their interest.

User Population

I have written this book primarily for SLMSs with the presumption that most of their students will be pursuing education beyond high school. A cursory reading of the Introduction documents the absolute need for higher education. Therefore, students will encounter many of the databases cited in various chapters in either community college or university settings.

Students who have computers at home can be expected to access many sites and resources remotely via some form of dial-up or Internet access. Teaching them how to search electronically for information from their homes will prepare them for much broader and faster access from dormitories or off-campus sites in the future.

I have also written this book for faculty. Many of them are going to be electronically searching for information from their home computers or from classroom connections. Although the exercises provided in each chapter are not as relevant to this population, standardized searching techniques and other concepts should be just as useful to both groups.

REQUIRED EQUIPMENT

While it would be preferable to have more than one electronic station and electronic database to teach the concepts in this book, it requires only one Windows-compatible computer and the installation of either Netscape's Navigator or Microsoft's Internet Explorer as an Internet browser. SLMSs must also have a connection to the Internet from a network provider. The second piece of equipment should consist of either Internet or on-site access to an electronic database such as SIRS (Social Issues Resources Series), an electronic encyclopedia, or periodicals data base.

BOOK ARRANGEMENT

The book is arranged in eleven chapters, with each concept presented in a chapter building on the previous one. A suggested lesson plan and, where appropriate, a sample assignment are included at the close of each chapter.

Chapter 1, "The Structure of Electronic Information," describes how information in electronic format is designed for easy searching and retrieval. It gives an overview of electronic database structure, computer indexes, keyword and subject searching, and the use of thesauri to assist people in using a variety of electronic resources. Chapter 2, "The Common Vocabulary and Characteristics of Electronic Resources," defines the common structures, features, limitations, access points, and keyboard symbols of electronic databases. Chapter 3, "Formulating Electronic Search Strategies," includes information about selecting suitable search terms, expanding and

narrowing topics, and the employment of systematic search methods. Chapter 4, "The Physical Arrangement of Information," discusses how materials found in electronic resources can be physically located in different types of libraries. Although many students know how to search large library online catalogs remotely, they do not know how to access physically the materials they have identified because they lack information about shelf arrangement and the separate locations for materials such as microforms and government documents. This chapter also describes the Dewey Decimal and Library of Congress classification systems, subject-specific collections, electronic stack browsing, photocopying, and the availability of reference services.

Chapter 5, "Choosing Appropriate On-Site and Remote Electronic Libraries," outlines what different types of libraries offer in terms of reference services, collection size and subject matter, accessibility, degree of user friendliness, and hours. A list of guidelines to facilitate the selection of appropriate libraries is included. Chapter 6, "Choosing Appropriate Electronic Databases," focuses on various online, CD-ROM, and Internet databases available from commercial services such as EBSCO's Host, OCLC's FirstSearch, and Dialog. A chart listing the most important SLMC-related online and CD-ROM databases is provided along with guidelines for selecting the most appropriate ones. Chapter 7, "Internet Search Tools and Techniques," contains descriptions, site addresses, and examples of the most useful Internet search engines. It also furnishes information to teach students how to refine their Internet searches and a list of text file sites for employing the Internet to obtain library-related training and assistance.

Many electronic information resources contain a mixture of books, newspaper and periodical articles, microforms, and government documents. Frequently after they have printed or downloaded lists of items or citations, students are unable to understand exactly what they have retrieved. Are the items books, government reports, articles, or abstracts of articles? If an item is unavailable locally, they do not know which electronic sources they may use to obtain a copy through interlibrary loan or commercial access. Chapter 8, "Identifying Electronic Resources," contains information about analyzing the results of electronic searches, using the results to generate additional searches, recognizing relevant and irrelevant information, and discerning information availability. Chapter 9, "On-Site Electronic Records Access," describes fee-based information identification and delivery services that can provide students with access to full-text documents and the location of books for interlibrary loan.

Chapter 10, "Using Primary Electronic Resources," introduces students to the differences between primary and secondary electronic information sources, the advantages and disadvantages of working with them, and how to search electronically for them. Chapter 11, "Evaluating Electronic

Information Resources," discusses how to evaluate critically information sources for their relevance, validity, and objectivity. Criteria for evaluating electronic information sources and a suggested assignment for practicing this essential skill are included. The book concludes with an appendix of principal vendors, a glossary of relevant electronic literacy terms, a bibliography, and the index.

ELECTRONIC INFORMATION IDIOSYNCRASIES

Internet sites are listed in this book for reference and instructional purposes. The Internet, however, is not a stable electronic information resource. It is possible that some Internet addresses will be unresponsive for a variety of technical, personal, financial, or commercial reasons. I have endeavored to verify their availability as this book went to press. If an Internet address is inaccessible, refer to the site title and enter the keywords in a search engine such as Alta Vista. The site may still be retrieved even though it may have moved to a new address.

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1 The Structure of Electronic Information

Rationale for Change

The ubiquitous presence of electronic libraries and databases has made the use of card catalogs and most printed indexes obsolete. Students and teachers are just discovering that electronic searching is more complex than print searching, because each system possesses different types of search capabilities, commands, screen displays, and contents. Students need a basic understanding of the structure of electronic information, computer indexes, keyword and subject searching, and the use of thesauri to enable them to use a variety of electronic resources successfully.

HOW ELECTRONIC RESOURCES ARE STRUCTURED

Students and teachers constantly amaze SLMSs with their overall concept of the structure of electronic resources. I have witnessed a student trying to use the library's online public access catalog to order a watch from the Sears catalog and a teacher trying to search a periodical database to obtain a list of quotations about technology stocks. Students and teachers also attempt to use similar search commands in different databases and become easily frustrated when they receive no matches for their searches.

Time can be saved and the rejection of electronic resources avoided if students and teachers have a generic mental model of database construction, indexing files, searching parameters and various types of thesauri.

Database Construction

Select a course-related on-site electronic database (it can be the SLMC's OPAC [online public access catalog] or a CD-ROM periodicals database) and search for some necessary information by subject. Retrieve a list of items and keep them displayed on the screen. Tell students that all databases, including the one you have chosen to demonstrate, consist of records or units of information such as citations, abstracts (summaries), or the full text of articles. Explain that the computer can sort these units into smaller ones called *fields*. Point out that some fields consist of the author's name, title of a periodical, the year of publication, and the subject.

Indexing Files

The computer makes it possible for students to retrieve these information units by indexing them. An index is simply a list—for example, all the subjects contained in a particular database. Computers, unlike books, can locate and display information from multiple fields or different parts of the same index.

Demonstrate this feature by searching an on-site database and entering two subject search terms about a topic in which students are interested. If necessary, have a printed index on hand and show students how it is not possible to achieve this same search without the use of a computer.

Searching Parameters and Thesauri

Searching electronic resources by subject requires a systematic approach and the ability to know the difference between two forms of searching: subject versus keyword. Subject searching is based on some form of thesaurus. The standard thesaurus for many electronic databases is *The Library of Congress Subject-Headings (LCSH)*, in essence a large thesaurus that contains an alphabetical listing of subjects in all fields of knowledge. For thousands of subjects, *LCSH* lists broader, narrower, and related terms to use instead of other terms. In some cases, it even offers short definitions of a subject to indicate the scope of that topic. Ask a student to volunteer a subject of interest, and show students the various terms *LCSH* uses to provide them with functional subject headings.

Not all electronic databases rely on *LCSH* for subject headings. Some databases, such as ERIC, devise their own list of acceptable subject terms or thesauri for their respective databases. In that case, students must consult it if they wish to find correct terms to search about their topics.

Keyword Searching

Almost all databases offer an additional form of searching, by keyword. In addition to indexing the contents of a database by author, title of publication,

subject, date of publication, and other publishing information, computers also provide a keyword database index. A keyword search finds a word(s) that students specify in any part of the title, author's name, summary, subject heading, or sometimes full text of a document. Using an appropriate subject-specific on-site database, ask a student to volunteer keywords from topics in which they are interested. Show students that the computer retrieved items that contained those keywords in *any* part of the record.

Subject Searching Versus Keyword Searching Guidelines

When students observe the above two forms of unknown item database searching, a logical question is: "Which search method should I use?" This is not an easy question to answer, but following are guidelines about each method of searching.

Use keyword (K) searching when:

- You have not retrieved any records from a subject search.
- You want to search for more than one subject or concept at the same time (example: K = time travel and twins).
- Your subject is very precise or uses specific terms or jargon (example: K = computer music).
- You need the most recent materials on a topic.

Use subject searching when:

- You need to narrow or broaden your topic.
- You need to find other relevant subject headings.
- You need to identify some authorities on your subject.
- You need to identify sources within a specific library or database.

Database Parameters

Although you have explained some of the generic aspects of database construction, students still need to know database parameters so that they do not mistakenly think that eventually they will be accessing a database that contains everything. Limitations imposed by privacy, secrecy, the market value of information, and the expense of converting all print information into electronic form make it unlikely that there will ever be a computer containing all the information in the world.

Nevertheless, databases will proliferate as more information is converted into electronic format. The information contained in them will continue to be classified into broad subject categories (e.g., general reference, and life sciences). Users will need to have a broad term that characterizes their topic before selecting more appropriate ones to search.

SUGGESTED LESSON PLAN

Library concept
The structure of electronic information.

Time requirements
Fifty minutes (one class period) to explain and demonstrate general database construction, use of indexing, subject versus keyword searching, and construction of a database by groups of students.

Objectives
- To provide students with an overall model for the design of electronic resources.
- To understand the basic components of electronic database construction and searching.
- To comprehend the need for database parameters.
- To be able to generate appropriate search items for future assignments requiring electronic resources.

Prerequisites
Students should have some general knowledge that databases are created by people who select the content and indexes.

Equipment needed
- At least one computer with either on-site or remote access to a periodicals database such as *Ebsco's Magazines Article Summaries, Reader's Guide to Periodical Literature,* or *SIRS.*
- Copies of an article from a general interest news magazine no longer than 500 words in length that is appropriate and of interest to the students. This article should be retrievable from the database you have chosen to demonstrate.
- Chalkboard with chalk and an eraser or large poster board with markers.
- An overhead projector, and a transparency of the article.

Procedure
- Divide students into groups of four. They will be constructing their own database by assuming the role of indexers.

Choosing Terms

Have students read the selected article. Tell them to circle all the words that they think should be entered into the computer as indexing terms. Students should also be encouraged to write any additional terms that they deem appropriate to index the article.

Database Design

Ask students to volunteer some of the indexing terms that they circled and to categorize the terms as either keywords or subject terms or descriptors. Remind students that descriptors or subject terms tend to be broader in scope and are an attempt to describe what subject the entire article is about. Write the keyword and descriptor terms in separate labeled columns on the chalkboard or poster boards.

You should have too many terms to be accommodated in the database, especially for an article of fewer than 500 words in length. Point out the problems of size in an electronic database if you had thousands of these articles. Tell students that most electronic databases permit only between three and five terms as descriptors, so they must choose their four best terms.

At this point you may wish to ask them to consider the audience for their database: elementary school students, secondary school students, adults, or subject specialists. If it is for older students, how sophisticated do the terms need to be? (Do not have the students change their terms based on these considerations; your goal is simply to enlighten them regarding the decisions that indexers face when constructing a database.)

Constructing the Record

Have students take parts of the article and assign abbreviations to each field. (This will help them recognize that these letters are not mysterious librarian-created codes.) Start by telling them to give the first article in their database an accession number or record number Assign 000000000001 to be the individual number for their first database record.

Search the article with them and have them place abbreviations and information for the following fields:

1. AN (accession number)
2. DB (database)
3. TI (title)
4. AU (author)
5. SO (source or title of the periodical)
6. PD (publication date)
7. IL (if the article contains an illustration)
8. DE (descriptors or subject terms that describe the overall contents of the document or article)

Inform students that these are just some of the fields that database designers use to index documents, articles, or books. Others might be AB (abstract), KW (keyword), CA (call number), LOC (location of the record), and so forth.

Comparing the Student Record and the Actual Record

The remaining part of the lesson for students is to compare their sample database record with the actual record of the same article from the database that contains it. Students are sometimes surprised at the differences because the database may have used *LCSH* as its thesaurus. If the terms the

students chose were not *LCSH* terms, their terms may not appear in the database record at all.

Tips and Tricks

1. If the class is working on a specific assignment, select an article related to the subject area.
2. If the class is present for a library lesson, choose an article of interest to the grade level.

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The Common Vocabulary and Characteristics of Electronic Resources

2

Rationale for Change

Students are no longer confined to using electronic resources that are stored in their SLMCs. They are also accessing other online databases, online catalogs, CD-ROM databases, and the Internet to search for information. Most electronic resources have different contents, searching capabilities, and commands that sometimes make it difficult to search for and retrieve information. Almost all, however, have many aspects in common. It is important that students have a strong foundation in the standardized vocabulary and characteristics of electronic resources so that they can become confident users of information technologies.

SEEKING STANDARDS

As students encounter the vast array of electronic resources, many will feel justifiably overwhelmed by the numbers, the different search commands, and the features of each. Electronic resources also have a great deal in common, and once students learn some of the vocabulary and characteristics of various electronic resources, they will begin to discern patterns that are generic to most of them. What they learn from one database can usually be transferred to another. As students comprehend the standard aspects to various electronic resources, they will not be intimidated by new databases or new versions of the same resource.

DIVIDING, DESCRIBING, AND DEMONSTRATING

For organizational purposes, it is useful to divide electronic resources into three groups: electronic libraries, electronic databases, and the Internet. Describe and demonstrate the common vocabulary and characteristics of each type of electronic resource and also stress how the first two types of resources, electronic libraries and electronic databases, are available through the Internet.

ELECTRONIC LIBRARIES

Common Vocabulary

Electronic libraries are the most standardized of the three types of electronic resources. They all use some common vocabulary terms.

OPAC (online public access catalog). This is the printed card catalog of a library in electronic form. Usually it is referred to by an acronym or name associated with its parent institution, such as GEORGE (Georgetown University OPAC), CLS (Cathedral Libraries System), or CATS (Washington Libraries Research Consortium). Not all electronic libraries are open to the public, although they may use the term *public access* as part of their database description. Some are restricted by password. Others are open only to registered members of, for example, a university or corporation.

Bibliographic Record. Contains information about the author, title, subject, place of publication, publisher, date of publication, summary or annotation, and call number of a work.

Truncation. Symbols such as *, !, ?, and $ permit users to retrieve all words that begin with a root of a word or words that may appear within a word.

Boolean Searching. A series of operating terms—AND, OR, and NOT—that permit users to broaden or narrow searches.

Common Features

Before discussing specific access points in an OPAC, explain the terms *on-site* and *remote access. On-site access* means that students are physically present in the library where the OPAC resides. Although they are searching it electronically, it may respond differently than when they access it from a remote location. *Remote access* signifies that students are searching the OPAC through a modem and dial-up access protocols or through the Internet. The steps to acquire remote access may be different depending on the location and status of the user. Remote access may also decrease searching capabilities. Students may find that they cannot print or download citations as easily. Some of the keyboard commands on the screen, such as "Press F8 to move to the next screen," may be unresponsive. Students may have to

type the words FOR (forward) or PREV (previous) instead to achieve the same result.

Common access points include:

Author or Name. All OPACs permit a search by author. Some require entering a last name followed by a comma and the first name. Others allow entry by first name followed by last name.

Title. OPACs provide title searching. Students should know that "stop words" consist of "A," "An," and "The" if they are the first word in the title; the computer does not search under those words.

Subject. OPACs feature subject searching and almost always rely on *Library of Congress Subject Headings*, a thesaurus of thousands of words or terms for other words. Subject headings are displayed at the bottom of the bibliographic record.

Call Number. Many OPACs provide a way to browse their collections electronically in call number order or by a shelf or shelf position search command.

Keyword. OPACs allow users to search various parts of the bibliographic record such as author, title, or subject fields for any terms or word that a user wishes to enter.

Boolean Searching. Many OPACs permit users to combine keywords with the words AND, OR, and NOT to broaden and narrow their information searches.

Record Display. OPACs vary in the way users see the information on the screen. Some OPACs provide only a brief (BRI) bibliographic record consisting of the author, title, publisher, place of publication, and copyright date. Users may then press an additional command, sometimes called FULL or LONG, to retrieve notes, summaries, annotations, location of the item, subject headings, and so on.

Circulation Status. Most OPACs furnish information concerning whether the book is on or off the shelf, on reserve, lost or missing, or in remote storage. The terms they generally use are "date due," "on the shelf," "in circulation," or "in collection."

Help Screens. OPACs usually provide Help screens to guide users, for example, to enter a correct Library of Congress subject heading or a Boolean search.

Location Codes. OPACs use a variety of codes to tell users where materials are located. Use of the location Help screen will usually reveal what each code signifies. Students may encounter STX (stacks), RES (reserves section), PER RM (periodicals room), or MONT (a specific branch or departmental library within a larger system).

Printing. Many OPACs display a print command at the bottom or top of the computer screen. Others rely on the user to press the Control/P keys, Print screen key, or click on the print icon to print a list of citations.

Limitations

All electronic libraries are restricted by the type, quantity, or scope of information they contain. Students should be aware of the following limitations:

Coverage. Many OPACs contain bibliographic records from 1970 to the present. Students searching for materials written before 1970 need to search the card catalog (usually stored elsewhere) for those materials.

Type of Database. OPACs are strictly bibliographic and do not provide the full text of documents.

Materials Formats. OPACs usually contain a variety of differently formatted materials (books, government documents, reports, conference proceedings, and serials or periodicals). Maps, audiovisual items, or microfiche may be cataloged separately.

ELECTRONIC DATABASES

Common Vocabulary

Electronic databases also share a common vocabulary with which students need to be familiar:

Database. An electronic file of information about a particular subject or subjects.

Hits, Matches. Two terms that are used to describe the success that users experience when they have retrieved information relevant to their topic.

Online. A term used to describe the accession of a database through dial-up access or the Internet.

CD-ROM Databases. Databases that are contained within a certain number of CDs. These may be accessible on a LAN (local area network) or on-site in an SLMC or other library.

Keywords. Words that may be considered descriptive of a search topic. If a student were searching for the increase in violence as depicted in children's cartoons, the keywords would be *violence* and *children's cartoons.*

Records. Databases consist of units of information such as bibliographic citations, abstracts, or full-text documents.

Fields. Fields contain smaller amounts of information such as the author's name, title of a work, magazine title, and published language.

Descriptors. Acceptable subject headings and keywords for a bibliographic citation, abstract, or full-text document.

Common Features

Although databases are less standardized than OPACs, they do share many characteristics that help students to assess and use them more easily:

Subject Based. Databases usually cover a specific subject such as science, English literature, or education. General databases are the exception; they usually consist of periodical citations.

Types of Databases. All databases fall within six categories or combinations: (1) bibliographic, (2) abstracts, (3) numeric, (4) directory, (5) full text, and (6) multimedia.

Contents. Databases reflect a restricted contents approach. They contain a prescribed set of books, periodicals, or documents that the database owner or vendor can index or reproduce in online or CD-ROM format.

Span or Coverage. Databases are not retrospective. Most usually feature information that covers a range of dates or the most recent span of years (e.g., the previous three years of medical information about AIDS).

Searching Capabilities. Most databases permit some type of known item searching such as author and/or title, keyword, or Boolean searching. In addition, some databases permit proximity indicators so that certain search terms can be specified in a certain order such as *bird near nest.* Many databases also enable users to limit their searches by specific field designations within records, such as language, source, type of material, or location of an item.

Record Display. The terms used to designate various subject fields are synonymous in many electronic databases—for example: AN (accession number), DB (database title), PY (publication year), TI (title), AU (author), SO (source of document), PD (publication or copyright date), and DE (descriptors or subject heading).

Help Screens. Directions on how to perform a keyword and/or Boolean search and other functions of the database are usually provided on Help screens or in printed guides stored by a specific database.

Printing or Downloading. Almost all electronic databases provide downloading on-screen instructions for printing or transferring the information to a floppy diskette or hard drive. Some databases allow full-text downloading; others permit users to download only parts of a record, such as the abstract or citation. Many databases also provide marking options for the purposes of selecting an individual document for delivery or printing.

Screen and Displays. Databases are quite flexible in permitting users to move back and forth between a search strategy and the number of search results or hits, select record displays in a certain format (e.g., abstracts or citations only), move back and forth between the citation and full text of an article, and specify the order of display records by requesting, for example, chronological or alphabetical order.

Limitations

Information Availability. Unlike OPACs, which indicate the circulation status of an item, most databases require users to find the materials in local libraries or use a document delivery service.

Updates. Most databases are characterized by updating in the form of a new release or version. A database may be updated daily, weekly, quarterly, or yearly. If users require recent information, a yearly updating schedule is a critical factor and sometimes a serious limitation.

Vendor Decisions. Most databases are commercial enterprises. The owners decide, sometimes arbitrarily or because of business or copyright provisions, what to include or exclude from their databases. Limits may be imposed based on the nature of a record, its format, potential for citing, and so forth.

Quality Control. Many databases are constructed by indexers and abstracters without professional subject or library degrees. Aside from possible technical errors, such as omitting information or entering incorrect information, indexers, who lack the appropriate subject expertise, may choose inappropriate subject headings or descriptors so that some information is difficult or even impossible to retrieve.

Cost. Many databases are commercial and charge for searching by one or more of the following means: connect time, per search, flat rate, or the number of matches printed or downloaded.

THE INTERNET

Common Vocabulary

Within the three groups of electronic resources, the Internet is the least standardized and probably the most difficult to search systematically. Its vocabulary is difficult to master because the Internet is such a protean electronic resource. Introduce only terms that students need to know to permit practice or course-related searching on the Internet. Then acquaint them with additional terminology as they advance to more refined searching.

Internet. The Internet is a worldwide network of computer networks that share a common means of communicating called TCP/IP (transmission control protocol/Internet protocol).

Telnet. An Internet command that students use to connect to another computer and search for information on it. Students must know the other computer's name or numeric address and once logged on must follow the host computer's instructions to navigate and exit from their system.

Gopher. An organized series of menus that leads to other menus and to files or a variety of other services.

FTP (File Transfer Protocol). A communications transfer system that allows students to connect to another computer and copy text files, programs, or graphics from that computer to theirs.

Archie. Archies, or archive servers, store and update databases of FTP archives. They are useful only if students know the name of the file they are looking for.

WAIS (Wide Area Information Server). A database searching tool that can search the full text of documents in a database and ranks the results according to a relevancy search term scale.

Word Wide Web (WWW, the Web). Uses hypertext to create documents that are linked together so that students may move easily from one document to another at the click of a mouse. With browser software such as Netscape's Navigator or Microsoft's Internet Explorer, the Web can display graphics, sound, and full-motion video.

Lynx. A Web browser that can be operated on a dial-up access shell account over a slow modem. Students will not be able to access graphics.

Page. Web documents are called pages, just like the ones in a book. A Web page can be any length and contain as many links (connections to other documents or sites), graphics, and full text as a Web page creator wants to include. The first or top page is called the home page.

HTTP (Hypertext Transfer Protocol). The specific means that people using the Web and other Web servers use to communicate with each other.

URL (Uniform Resource Locator). The most common way of referring to a specific Internet information source. It can refer to Web, Telnet, Gopher, and FTP services as well (examples: http://www.orcabay.com, ftp://ftp.quartz.rutgers.edu (directory pub/pets), telnet://telnet.library.brown.edu, and gopher://gopher.gate.net/11/marketplace).

Bookmark. A means provided by Web browser software, such as Netscape's Navigator, Microsoft's Internet Explorer, a Gopher, or a Lynx, to save a site's exact Internet address in a file on the computer. This feature saves time because users do not have to type a long Internet address every time they wish to access a site.

Common Features

Some of the following features are based on the flexibility in searching with Internet Web access. If students do not have direct access to the Internet, they will need to rely on Archie, Telnet, Gopher, and Lynx (a graphicless Internet browser) to locate and retrieve documents.

Known-Item Searching. The Internet does support known-item searching (e.g., name of a person, title of a work or periodical) but not to the specific degree that electronic libraries and databases do. Students may search for Henry James, for example, and retrieve information by or about the famous American author and simultaneously retrieve information by another Henry James who has recently authored a pamphlet about diseases in parakeets.

Subject Searching. Subject searching is supported by a variety of Internet search engines such as WebCrawler, Lycos, InfoSeek, and AltaVista. Students need to know that words and terms are not indexed by any official thesaurus such as *The Library of Congress Subject Headings.*

Keyword Searching. This form of searching is one of the best methods to search the Internet.

Boolean Searching. Various Internet search engines permit Boolean searching and through Help screens provide easy-to-follow examples of successful Boolean searches.

Proximity Searching. Several Internet search engines support the searching of terms together or near each other by using quotation marks or brackets around them.

Help Screens. Usually the second Web page of all search engines provides users with detailed examples and instructions for proximity, keyword, and Boolean-type searches. There are also instructions at various sites for how to use Gopher, Archie, Lynx, and Telnet commands.

Printing and Downloading. The Internet does not provide instructions for printing or downloading information. The browser software that enables Internet access, however, does give simple instructions for printing. A more advanced technique, FTP (file transfer protocol), enables users to download information but only if students have the host address, directory name, and the file name.

Screen and Displays. Moving back and forth between pages and to new page levels is easily accomplished on the Web by resting the cursor on any word or site that is highlighted (usually in blue) and clicking the mouse once. Moving to another listing of Web sites requires a simple click on the word *next* or on the next numbered page listed at the bottom of the screen. Students also need to know that once they are at a Web site, the printing instructions of their communications software apply.

Site Address Searching. In addition to a modified form of known-item searching, the Internet supports searching by URL. Students must have a specific Telnet, Gopher, Web, or FTP address and at a URL prompt enter the type of site—http://www, telnet://telnet, ftp://ftp or gopher://gopher—followed by the specific address.

Limitations

Information Availability. While users of databases and OPACs rely on libraries to fulfill most of their information needs after searching, the availability of Internet information is serendipitous. Students may encounter full-text documents or just the table of contents from a new electronic periodical. They may also encounter the "here today, gone tomorrow" phenomenon. Since no one owns or maintains the Internet, students may locate a useful information site one day, only to find that it has disappeared the following day. Sites that are under construction are another limitation. Students will see a site that looks particularly helpful, only to click on it and receive the message that it is under construction. If the site is particularly enticing, encourage them to try accessing it a day later. Perhaps the creator was adding something to the document and removed it from the Internet briefly.

Case Sensitivity. Unlike electronic libraries and databases that do not require capitalization, the Internet is a case-sensitive electronic resource. If a site address contains capital letters, carets, or other keyboard symbols, they must be used to access the site. Names, specific geographic locations, and so forth require capitalization for successful retrieval.

Response Time. Response time on the Internet is dependent on many factors, such as the speed of the students' connection (a T-1, for example, is faster than a modem connection), the number of people simultaneously attempting to access the same site, and the general volume of Internet traffic.

Cost. Assuming that equipment and software costs have been accounted for, there are additional costs for accessing some forms of Internet information. Many electronic database vendors sell Internet access by connect time, per search, a flat subscription rate, or the number of results that students print or download.

Quality Control. Although the Internet operates with some standard communication protocols, no one supervises its contents. Volunteers and computer designers have created various types of navigational tools to help users find Internet information. This means that there are no formal indexing, abstracting, record inputting, and retrieval standards as there are in OPACs and to a certain extent electronic databases. Students can never be certain that they have found everything on a subject on the Internet.

COMMON KEYBOARD COMMANDS

Although being keyboard literate is of great help when searching electronic databases, having knowledge of some generic commands and keystrokes can reduce frustration. Students and teachers can easily become defeated by a new electronic resource when they cannot access the information in a timely fashion.

Finding Help

Most electronic resources provide help screens that list searching commands and the contents of the database. Try typing "help" or "?" or pressing the F1 key to access a Help screen. Many databases provide printed guides that give the same information, and libraries sometimes create their own. Both types of printed materials are usually located by the specific database.

Correcting Mistakes

Although it may be more difficult to correct mistakes when remotely accessing electronic OPACs and databases, the following keys and keystrokes usually work:

- Backspace key
- Delete key
- Highlight and delete
- Type over
- Enter key and type over

Try the following keys if the ones above do not function, especially when on the Internet with modem access:

- Press the Control key and the Backspace key together.
- Press the Control key and the H key together.
- Press the Control key and the W key together.

Using the Function Keys

Often database commands can be performed by pressing function (F) keys, which reside on the top part of the keyboard. Help screens and commands at the bottom of the information screen indicate which function keys access the full text or citation of a document and permit printing or downloading or exiting from the database.

Starting Over

The majority of electronic resources permit the creation of new searches without exiting from the database. This can be accomplished by reading the instructions on the last search screen. Usually users have either the opportunity to type in a new search or they can press the ESC key or a function key that returns them to the original main menu screen. Once there, users are prompted to type in a new search.

Saving Time, Information, and Keystrokes

There are several generic commands that students can master that will save their time, their research, and unnecessary typing:

- Saving search strategies to a hard drive or floppy diskette so that they can perform the same search in the future.
- Saving a search in one database and transferring it to another database. This command is available with online services such as OCLC's FirstSearch or EPIC and multidisk CD-ROM databases.
- Saving search results in groups or sets by line numbers. Typing line numbers instead of search terms saves not only time but also reduces the chances for spelling errors.

Exiting

Electronic resources use a variety of commands to enable students to exit the database because they have completed their searches or wish to initiate a search in another database. The most generic command is to press the Escape key and then follow the additional prompts on the screen that ask you to type, "Yes, I wish to quit," followed by typing the letter "q" (for quit). If students are in a timed electronic resource, it may log them out if they do not press a key within a prescribed number of seconds. Having a written search strategy should prevent this occurrence.

The Internet does not recognize the Escape key command. In a Windows environment, closing each window and exiting Windows enables students to exit. In a non-Windows environment, the following commands may be employed:

Quit
Bye
Stop
Exit
End
Logoff
Logout
Q (for quit)
D (for disconnect)
F10
^]
^c
^q
Alt-X (This command will also disconnect the modem, and the user will have to log on again.)

SUGGESTED LESSON PLAN

Library concept Understanding the common vocabulary and characteristics of electronic resources.

Time requirements Fifty minutes to review and demonstrate the vocabulary and characteristics that are common to the three types of electronic resources and practice a class-related or librarian-designed assignment.

Objectives

- To have students understand the common vocabulary and characteristics of electronic libraries, databases, and the Internet.

- To provide students with a list of common keyboard commands.
- To give students the opportunity to practice searching with three types of electronic resources.

Prerequisites

Students should be familiar with the SLMC's OPAC or a remote electronic library's OPAC, an on-site or remote online database, and the Internet.

Equipment needed

At least one computer with either dial-up or direct access to the Internet through a commercial provider that uses Netscape's Navigator or Windows' Internet Explorer as a browsing tool.

Procedure

- Review and distribute a handout of the common vocabulary and characteristics of electronic resources as homework.
- Create a matching exercise of the most critical terms necessary for students to remember and distribute it the following day.
- Design a course-related or librarian-created search topic to be executed in an electronic library, on-site, or remote electronic database and the Internet.
- Depending on the number of computer stations available, assist students individually or in groups in executing their searches. Require them to complete questions at the bottom of the suggested assignment (following this lesson plan) after their searches.

Evaluation

Depending on the grade and ability levels, students can:

- Demonstrate knowledge of common vocabulary and characteristics of electronic resources by successfully identifying the correct terms and characteristics on a matching assignment.
- Successfully manipulate the command structure of electronic resources.
- Understand why search results differed among the three types of electronic resources.

SUGGESTED ASSIGNMENT

Project: Find information about a disease called anorexia.

Library OPAC Search

1. Examine the types of searches available: author, title, subject, keyword, and/or combinations of these.
2. Search by keyword for information. Note the results of your search in terms of number of records found.
3. Search by title or author for a book entitled *Reviving Ophelia* by Mary Pipher.

4. Print out the full bibliographic record. Circle the Library of Congress subject headings used to describe this book.
5. Search by subject by typing in the first circled subject heading from the *Reviving Ophelia* bibliographic record you just printed.
6. Note the differences in information from your keyword and subject searches.
7. Does this electronic resource consist of bibliographic citations, full text, or abstracts?

Electronic Database

Choose an electronic database such as SIRS or a periodicals database that will have information about anorexia.

1. What subjects does this database cover? _____
2. What years does the database span? _____
3. List the types of searches available. _____
4. Search for the topic "anorexia" by using the most effective search command.
5. How do you display the results of your search? _____
6. What print options are available? _____
7. Is this database bibliographic, full text, abstracts or multimedia? _____
8. How are the results of your search arranged? _____

The Internet

1. Experiment with the different search engines (e.g., AltaVista, Lycos, Infoseek, Web Crawler, and others) by using two of them to keyword search for your topic. Refer to Chapter 7 for an explanation and examples of search engines if necessary.
2. Compare your search results. Did you retrieve the same number of sites with both search engines? _____
3. Find a site with information about the symptoms of anorexia. Create a bookmark so that you can easily return to that document.
4. Print only the homepage of this relevant source.
5. Under file, open location and type in the following address:
   http://wellweb.com/index/QANOREX.HTM
6. Describe the contents of this site. Is it relevant to your research? _____

ADDITIONAL SOURCES

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3 Formulating Electronic Search Strategies

Rationale for Change

Electronic resources streamline the research process by providing students with the means to conduct complex, multiterm searches quickly, rapidly retrieve information from large databases equivalent to many years of printed indexes, and modify their searches quickly and easily. They also require that students be able to formulate successful search strategies by defining their topic, identifying key search terms, combining concepts in appropriate databases, and revising their strategy based on the retrieved results.

THE NEED FOR A SEARCH STRATEGY

To enter only one or two search terms in an electronic information resource is like playing information roulette: The chances are extremely slim that the user will hit the information jackpot. This type of search normally yields either too much or too little information and as a result tends to discourage users from entering future queries. This type of serendipitous approach to searching usually causes students to change their topic prematurely or reject a database that may actually contain all the sources they need. As database contents continue to grow, this type of search strategy becomes the most futile one to employ.

Unlike print resources, electronic information technologies are designed to support complex, multiterm searches. The best searchers of electronic databases are subject-heading experts who can create an appropriate list of

alternative search terms and combine them to broaden or narrow their search as necessary.

The time devoted to designing a search strategy is the best safeguard against zero or zillions of search matches. Students need to resist the temptation to search haphazardly in an electronic resource when they have a specific topic. Using a treasure hunt analogy may help them realize the foolishness of unplanned searching. Explain that searching for information is similar to a treasure hunt. Most people when searching for treasure would love to have a map to search with rather than wander aimlessly in the hopes of stumbling onto it. A search strategy in an information quest is equivalent to a map in a treasure hunt. It greatly improves one's chances of finding the treasure.

SELECTING SEARCH TERMS

Once students have been assigned or chosen a topic, they should identify the best keywords to search. This can be accomplished by describing the search topic in one sentence or phrasing it in the form of a question and writing down the keywords or concepts contained in it:

- Sample Topic Example: Is protecting endangered species worth the cost?
- Keywords: *protecting, endangered species, cost*

The next step is to increase the list of keywords by completing one or all of the following steps:

- Consult a topic-related article, textbook, or reference book for additional keywords.
- Solicit keyword suggestions from a subject expert (perhaps a teacher) or school library media specialist.
- Use a database thesaurus (ERIC, for example), *Roget's Thesaurus,* and/or *Library of Congress Subject Headings* to compile related and synonymous search terms.
- Consider variations in word endings for possible truncation (e.g., *woman, women*).

CATEGORIZING THE TERMS

Once they have a list of search terms, students may be tempted to begin entering them, usually one at a time, in a selected database. This action will produce the identical dismal results as their first type of search. Spending the time to sort their terms into narrower, related, and broader categories will greatly improve their rate.

Students can sort their newly identified search terms in the following way:

SAMPLE TOPIC EXAMPLE:
THE COST OF PROTECTING ENDANGERED SPECIES

Narrower Terms	*Related/Synonymous Terms*	*Broader Terms*
cost	expense	sacrifice
and	and	and
protecting	defending	conserving
and	and	and
endangered species	vanishing wildlife	species

DESIGNING A SEARCH STRATEGY

One of the best features of electronic resources is the support of multi-term searching. Entering combinations of multiple search terms is using the computer to its best advantage. This is the next step in formulating a search strategy. Ask students to select two or more narrower search terms that they wish to combine together using the Boolean operator AND. Then ask them to prepare a similar search based on broader terms.

- **Narrower search example:** *cost* AND *protecting* AND *endangered species*
- **Broader search example:** *sacrifice* AND *conserving* AND *species*

Choosing the narrower terms first permits students to retrieve specific topic information on the first try and save time. Students should use the suggested strategy form (in this chapter's Suggested Lesson Plan) to design and keep a log of the search terms and databases used.

Beginning with the narrower search terms, write these words in the space(s) provided on the form and *OR* them with a synonym or related term. Examine the help screens of intended databases to determine if they support truncation, proximity indicators, or limitors. Place the correct query syntax by the search term. For example, **protect$** would retrieve information containing the words *protect, protecting, protector(s), protection,* and so on.

Revising the Search Strategy

Although students should design a formal search strategy to begin their searches, they need to remain flexible during the search process and be prepared to modify their searches. Narrowing and broadening searches constitute the first steps to attempt to retrieve relevant documents.

Another method is to view preliminary search results and to revise the search strategy. Many times students feel that they have invested so much time in designing a search strategy that they are unwilling or unable to modify it even when they are not obtaining particularly beneficial matches.

Students need to know that viewing their search results may provide them with a set of new search terms that are likely to generate more relevant information.

SCANNING THE COMPUTER SCREEN

A brief scan of the screen results from their first search should furnish two important pieces of information: (1) the number of search matches and (2) additional keywords, and controlled vocabulary terms such as *Library of Congress Subject Headings*.

Number of Matches

Electronic information resources usually indicate the number of matches or sites a search has retrieved before students begin to examine them individually. If students retrieve thousands of matches to a search, they need to narrow their search. On the other hand, retrieving zero or five matches tells them that they should broaden their searches or select another electronic resource. For some students, retrieving five matches is an acceptable number. An acceptable information retrieval is dependent on the nature of the assignment.

Additional Search Terms

Viewing several search results can furnish students with some of the most relevant information about their topics. Most electronic resource records contain additional keywords, descriptors, or *Library of Congress Subject Headings*. Students should scan the screen display of several relevant items and determine what other search terms were employed to describe those items. At this point, they may wish to stop their first search and enter these key words, descriptors, or LC subject headings to retrieve more records that are exactly relevant to the topic.

RECORDING THE SEARCH PROCESS

While modifying the search is a necessary part of the strategy, keeping a brief log of terms searched in each database is also critical. Students have a tendency to follow a search term wherever it leads them. If they forget to print out or record some of these revised searches, they cannot execute them in similar electronic resources and have to try to reconstruct their searches from memory. As students begin to modify their search strategies, encourage them to print out one page of results and either circle the new keywords they are using or jot down their combination of search terms at the top of the page.

SEARCH STRATEGY IDIOSYNCRASIES

Many electronic information resources still require that students enter the Boolean operators AND, OR, NOT when executing a search. (Refer to Chapter 7 for further Boolean instruction if necessary.) As advances with front-end software and smart technologies progress, these words may be automatically and invisibly inserted between search terms. Some electronic resources search related terms by default rather than requiring the user to enter them. Usually when students enter an unnecessary search term, a sentence appears that instructs them to omit the unnecessary Boolean operator or search term. Students should be familiar with some of the vocabulary of electronic information databases that do not require a combined terms search strategy.

Natural language querying. Users may pose their information search as a natural question, such as "Where do I find information about the migratory habits of whales?"

Natural language searching. Users may search the database using any term that is employed in everyday language (e.g., *car* instead of *automobile*).

Boolean defaults and replacements. Users may encounter the word *with* being used instead of the word *and* to combine search terms. Examples include SIRS (Social Issues Resources Series, Inc.) and Ebsco's Magazine Article Summaries. They may also find that some electronic information resources use the Boolean operator AND as an automatic default between any search terms (e.g., dogs (AND) canines (AND) rabies).

Phrase searching. Users may search some electronic databases by entering a phrase such as *state-of-the-art computer*. The computer has automatically inserted a Boolean AND between each of the search terms. Many Internet search engines, for example, support phrase searching.

SUGGESTED LESSON PLAN

Library concept	Formulating successful search strategies by using search terms in combination with Boolean logic.
Time requirements	One fifty-minute period to emphasize the need for search strategies and to explain and demonstrate how to execute one and to provide practice searching and retrieving relevant results.
Objectives	• To teach students how to create a successful search strategy for a course-related or librarian-selected topic. • To make students aware of current and emerging search techniques. • To provide practice in the design of search strategies.
Prerequisites	Students should understand the structure of electronic resources and their common vocabulary and characteristics.

Equipment needed At least one computer equipped with an electronic database such as SIRS, InfoTrac, Reader's Guide to Periodical Literature, Ebsco's Magazine Article Summaries, or access to a general information database through Internet, FirstSearch, or EPIC.

Procedure

- Review and demonstrate, when appropriate, the information presented in this chapter about designing search strategies.
- Divide the class into groups of four and distribute copies of the Search Strategy Form to each group.
- Provide each group with a topic (see Suggested Group Topics) and have them design a search strategy by (1) thinking of related search terms, (2) consulting *Roget's Thesaurus* and *Library of Congress Subject Headings*, (3) listing variations in words, and (4) correctly combining relevant terms with the Boolean operator AND.
- Depending on the number of available computers, have each group execute its search in one of the recommended electronic databases and share search results in a class discussion.

Evaluation Depending on the grade and ability levels, students can successfully design and execute a search strategy in at least one appropriate electronic database.

Search Strategy Form

1. Write the search topic or question in the space provided and underline the keywords or search terms that you will use to formulate a strategy.

   Search question

   _____

   _____

2. Think of additional keywords or search terms that are narrower, related or synonymous, and broader than the ones listed in the search question. Write them in the spaces below:

SEARCH TERMS		
Narrower	*Related/Synonymous*	*Broader*
_____	_____	_____
and	and	and
_____	_____	_____
and	and	and
_____	_____	_____

3. Select the database(s) that contains the most appropriate information about the topic and write them in the spaces below.

   Database title: _____

Database title: _____

Database title: _____

4. Execute the search you designed in Step 2, and record the results in the space below. List three information sources that matched your search.

_____

_____

5. If these searches resulted in relevant information search matches, you may wish to revise your strategy. Identify several search terms from three relevant matches and combine them in one more strategy. List two retrieved matches from this revised search.

_____

_____

6. Be prepared to discuss which type of search yielded the best information on your topic. Summarize your findings in the space below.

_____

_____

Suggested Group Topics

1. To what extent are juveniles involved in violent crime?
2. Is there a need for campaign finance reform?
3. What is the political future of Russia?
4. Will cuts in welfare threaten the homeless?
5. Should specific drug testing be the primary focus of AIDS research?
6. Is marijuana a gateway drug that leads to use of more dangerous drugs?
7. Is the problem of Quebec sovereignty still an issue in Canada?
8. Do cigarette advertisements encourage teenagers to smoke?
9. Is the threat of a global water crisis real?
10. Is dieting bad for your health?

ADDITIONAL SOURCES

Basch, Reva. "Secrets of the Super Searchers: Planning Search Strategies." *Online* 17 (September 1993): 52–54.

"Computer Search Strategies." URL: http://www.nyu.edu/library/bobst/research/guides/ib6c.htm (August 9, 1996). Provides excellent keyword searching explanations and examples.

Dubin, David. "Search Strategies for Internet Resources." *School Library Media Quarterly* 24 (Fall 1995): 53–54.

Gilster, Paul. *Finding It On the Internet.* New York: Wiley, 1996.

Pappas, Marjorie L. "Hypertext Searching through Electronic Resources." *School Library Media Activities Monthly* 12 (February 1996): 38–39.

Terra Com Inc. "How to Conduct Research on the Internet." URL: http://www.terracom.net/research/strategy.html (August 9, 1996). A ten-page full-text document describing how to formulate a search strategy, which Internet search engines to choose and how to interpret the results.

Wells, John G. "Search Strategies for the World Wide Web." *The Technology Teacher* 55 (April 1996): 34–36.

The Physical Arrangement of Information

4

Rationale for Change

Remote searching of electronic libraries is becoming the first stage of library research for most students. Being able to access materials physically via remote searching in different libraries is a problem because students lack basic location skills and knowledge of the information programs and services of various libraries. It is important that librarians teach the Library of Congress and Dewey classification systems, collection material formats, electronic stack browsing, and the availability of reference and information services if students are to be successful at retrieving materials from remote locations.

PRESEARCHING ELECTRONIC LIBRARIES

Isaac Asimov's Book of Facts (1991) contains a wonderful description of the 117,000-volume caravan library of the tenth century Persian scholar Abdul Kassem Ismael. Books were arranged in alphabetical order and mounted on the backs of 400 camels trained to walk in alphabetical order. While students would probably be thrilled with this easily accessible library and its high potential for home delivery, albeit a bit slowly, it is no longer a working model for the Information Age.

Students and teachers need to physically access and retrieve materials from a variety of large libraries, which can be quite intimidating when first encountered. To reduce the intimidation factor and increase their chances for successfully locating materials, students and teachers should

be encouraged to presearch electronic libraries remotely and take their citation printouts to the shelves with them.

Before students travel to the physical site of their remote searches, briefly review the parts of an electronic bibliographic record. Although electronic libraries use a variety of vendor systems and there will be a lack of consistency in record displays, all library online systems share the following standard display features within this varying order: (1) author or contributor, (2) title of work, (3) place of publication, (4) publisher, (5) copyright date, (6) number of pages and size of book, in centimeters, (7) notes, (8) *LCSH* subject headings, (9) call number, and (10) location of material. The call number, location codes, and item status are usually the three fields that students need help interpreting.

Students should highlight the call number, location, and title of the work before they visit the library. If they have a particularly long list, they should rearrange the citations in call number order. Then they will be sure to search each library floor efficiently and ensure that they have not overlooked an item.

Call Number

The call number can be displayed horizontally or vertically. Here is an example of a sample citation with both types of call number displays:

Garrett, Laurie
The Coming Plague. / Laurie Garrett.
New York: Farrar, Straus and Giroux, 1994 xiii, 750 p.: ill., maps; 25 cm.
Includes bibliographic references (p. 623–727) and index.
1. Communicable Diseases — history — popular works.
2. Epidemiology — popular works.
{Call #: RA651.G37 1994 LOC: SSX
{Call #: RA651.G37 1994 Status: In collection

Location Codes

The location code in the sample citation is SSX, which stands for Social Sciences Stacks. Location codes are used to denote a variety of sites where the items reside: (1) departmental library within an academic library system, (2) branch library within a public library system, (3) separate room or section within a library (e.g., reference, reserve section, microform room), and (4) specific library within a group of libraries, such as a campus library.

Item Status

Electronic libraries use different words to indicate whether a book is on or off the shelf. Here are some typical ones: "In collection," "On the shelf," "not checked out," "checked out," or "date due."

TOURING BEFORE VISITING

Many libraries that students access remotely have homepages on the Internet that describe their collections and services and display maps of the library. Some even offer virtual library tours on the Internet. Students can download the maps and take a virtual library tour before they begin their search for materials on the shelves. This will save them time and reduce their anxiety when they come face to face with large library collections. They should mark the maps that indicate which floors, rooms, and sections contain materials that correspond with their call numbers. When they arrive at the library, they need only go to those particular areas and begin accessing the materials highlighted on their printout.

If there are no maps of the library on the Internet, briefly describe the following areas and designations that libraries may use to locate their materials.

Reference Section. Contains books and perhaps electronic resources designed to be consulted for authoritative information. It usually consists of guides to the literature about specific subjects, dictionaries, encyclopedias, directories, biographical resources, atlases, handbooks, and statistical sources.

Rare Book Room. Includes materials distinguished by their early printing dates, limited issue, special character of the editor or their binding, or their historical interest. Materials in this area do not circulate.

Archives. Houses documents or records relating to the activities, business dealings, history, and so forth of an individual family, corporation, association, community, or nation.

Media Services. Collects CDs, videocassettes, 16-mm films, and other nonprint items. Items in this area may or may not circulate. They may have to be consulted in a special viewing room.

Microfilm and Microfiche Area. Consists of newspapers, past issues of periodicals, and ERIC and other documents. Materials in this area may only be photocopied.

Government Documents. Contains a wealth of information published by the U.S. government on a variety of subjects. In many libraries, government documents are not listed in the online catalog. If the library is a Federal Depository Library, students may freely access these materials, which are available for interlibrary loan.

Stacks (STX). Designates the main collection of a library. This area may be small and stored on one floor or so large that various parts of it are housed on separate floors or in different buildings. The most important information for students is whether the stacks are browsable by users. Some libraries require students to identify materials in the online catalog and request the item(s) at the circulation desk; a library clerk finds the book in the collection and checks it out.

Reserve Area. Contains materials that have been placed in a designated section for a reduced or zero loan period because they are needed by many students who are taking particular courses.

Periodical Area. Storage of library periodicals (journals, magazines, and newspapers) depends on the size of the library's collection. Current issues may be stored separately from bound or past issues. Students should inquire about loan policies. Current issues do not circulate, but sometimes back issues do.

Photocopiers. Photocopy machines are invaluable when students lack borrowing privileges. They should inquire about the cost per page and where to purchase photocopy charge cards to use the machines.

Electronic Resources. Online catalogs are quicker and easier to search on site than they are remotely. Students may also be able to use various CD-ROM databases at a specific library. Students should check this area out for additional resources.

FINDING MATERIALS ON THE SHELVES

Students do not have to know the particulars of the Dewey Decimal and Library of Congress classification systems. They are different user-friendly systems that were created to help users find their way through long aisles of books and lists of materials in online catalogs. Materials in both systems are grouped by subject. Numbers, initially in the case of the Dewey Decimal system, or letters, initially in the Library of Congress system, are assigned to each book to keep similar subjects together. Most school and public libraries use the Dewey Decimal system, and academic and sometimes special libraries use the Library of Congress system.

A simple search for a nonfiction title and a glance at the call number in any electronic library will enable students to discern which system a library is using. Matching the call number on the citation to the call number on the book's spine is the key to finding any item in any type of library. Use the example below:

Dewey Decimal Classification Example

Author: Goleman, Daniel

Title: Emotional Intelligence / Daniel Goleman.
Publisher / Date: New York: Bantam, 1995.
LOC: STX
Call #: 152.4 Gol Status: In collection

The call number will look like this on the book's spine:

152.4
Gol

Libraries arranged according to the Dewey Decimal system are in order numerically with numbers in decimal order. For example: 398.02 comes before 398.1 which comes before 398.2, and 398.5 L34 1992 comes before 398.8 D82 1993 or:

398.5	*comes before*	398.8
L34		D82
1992		1993

Library of Congress Classification Example
Author: Goleman, Daniel
Title: Emotional Intelligence / Daniel Goleman
Publisher / Date: New York: Bantam Books, 1995
LOC: STX
Call #: BF561.G65 1995 Status: Checked out

The call number will look like this on the book's spine:

BF561
.G65
1995

Libraries arranged according to the Library of Congress system are in order alphabetically, with single letters of the alphabet preceding double letters. For example, B comes before BD, which comes before BF and:

BF632 H253 1991	*comes before*	BF637 P58 1991 or:
BF632	*comes before*	BF637
.H253		.P58
1991		1991

ELECTRONIC AND ON-SITE BROWSING

Once students have identified a call number representing an item directly relevant to their topic, they may wish to search that call number section for additional topic materials. In electronic terms, this command may be called a "shelf position search," "call number search," or "shelf search." This command allows students to browse the shelves electronically by searching as many as six titles to the left of the relevant title and six titles to the right of it. Since books corresponding to the same subject are shelved together, a shelf position search will lead students to additional sources.

Another means to browse electronically employs a call number search. After locating a relevant call number, students can use the call number search command to peruse numbers in the same range for additional sources.

On-site browsing, if permissible, may be even more effective if the library's OPAC contains records only from 1970 to the present. Strolling the stacks in a desired call number range may yield even more sources that were not even listed in the OPAC.

REFERENCE AND INFORMATION SERVICES

The use that students may make of reference and information services is dependent on the rights and privileges accorded to them by various libraries and their access to the Internet. Students should be aware of all types of information services regardless of their current status with a specific library.

Usually students who are not registered at an academic library are not permitted to avail themselves of the personal services of reference librarians. Most reference librarians are, however, too busy to validate students' enrollment status. If students act in a mature fashion, many librarians are happy to be of assistance. Reference librarians at public libraries provide assistance to students unless they have been requested not to by specific teachers and SLMSs with regard to a special assignment.

Some libraries dispense reference assistance on a first-come, first-served basis. If extended consultation is required, they will ask the student to complete a form and schedule an appointment. This procedure enables the reference librarian to analyze and perhaps presearch a student's information need.

Depending on the time of day, reference desks can be extremely busy places. To ensure that students receive assistance, they should adhere to the following guidelines:

1. Start research early so that you have time to gather the materials that a reference librarian may recommend.

2. Help yourself as much as you can. For example, rather than ask a reference librarian if the library owns a copy of *Don Quixote*, look for the title by searching the library's OPAC.
3. Feel free to ask simple questions. Sometimes simple questions are not so simple. Reference librarians are fonts of information. They can quickly point out the best source, for example, of U.S. immigration statistics during the 1800s that might take you hours to locate on your own.
4. Phrase your question in terms of what you need, not where you may find what you need. "I need articles about the incidence of blindness in AIDS patients" is more helpful than, "Where is a general periodicals database?" A reference librarian may know of a specific AIDS database or hotline concerning just that piece of information.
5. Use library terminology. When you know the difference between a periodical and a journal or a biography and bibliography, use it. Your knowledge will affect how well you may be treated and how serious your information needs are taken.
6. Questions are normal at a reference desk. Many times after students have asked questions, reference librarians will pose some in return. Don't interpret their inquiries as a sign of rudeness. They are trying to focus in on exactly which source(s) may satisfy your questions.
7. Keep a search log. Maintain a record of the databases, subject headings, keywords, authors, and titles you have searched. Reference librarians will use this record to suggest alternative terms or search strategies.
8. Don't be afraid to ask questions regarding any subject. All librarians, not just reference librarians, practice a code of ethics that guarantees your right to confidentiality and privacy to seek information about any subject. Some have even withstood jail threats rather than reveal user information concerning a borrower's library requests or circulating items. If necessary, make an appointment to speak to a reference librarian privately.
9. Wait your turn. Reference desks can be beehives of activity. Don't interrupt a reference librarian even if you have only one quick question. Wait until he or she is free to help you.
10. Choose appropriate times. Reference desks are staffed by reference librarians during posted hours. If you stagger up to a reference desk at 11:45 P.M., chances are that you will be greeted by a student-clerk who can offer only minimal assistance. Reference librarians also leave their desks to help students searching a database or a reference shelf. They will usually return shortly. Be patient and wait.

Pathfinders and Guides to the Literature

Whenever students enter a library, they should look in the areas surrounding the reference and information desk. There may be some helpful one- or two-page pathfinders or guides to the literature on various subjects located on a kiosk or on designated shelves. They are free and can be useful starting points for research on a variety of topics.

Term Paper Counseling

Academic and some public libraries offer term paper counseling to students at peak times during the year. Sometimes the service is highly specialized. Students may make an appointment for assistance with developing thesis statements, finding appropriate electronic resources, locating overview materials, or using specialized databases. Other times, they may receive a general overview of the sequential steps necessary for successful papers. Although students in secondary school are not eligible for such services, those who are college bound should be aware of them for future consultation.

Electronic Library and Database Instruction

Many libraries, especially academic ones, offer workshops about how to use their online catalogs and other electronic databases. At state educational institutions, these workshops may be open to high school students. Public libraries also offer workshops about the use of electronic resources. Students may use these services without application.

Dial-up Access Information

Although many libraries are searchable from the Internet, many students cannot afford the monthly charges associated with Internet access from home. Instead they may prefer to have dial-up access via a modem and some communications software. Most libraries offering this service provide a one-page handout with terminal protocol and baud settings instructions.

KidsConnect

KidsConnect (http://www.ala.org/ICONN/kidsconn.html) is an Internet reference and information assistance service free for students in grades K–12. Sponsored by the American Association of School Librarians (AASL), it relies on rotating monthly teams of volunteer SLMSs to answer students' questions. Although the goal of KidsConnect is to assist students in accessing and using Internet information, SLMSs also provide students with titles of books and other appropriate materials or contacts in addition to relevant Internet sites. Students may contact the KidsConnect by e-mail and receive assistance within forty-eight hours.

ELECTRONIC GATEWAYS

As more libraries create supercatalogs (containing the OPAC plus hundreds of CD-ROM databases searchable from one terminal), librarians are

designing user-friendly interfaces to guide users through this maze of electronically accessible information. Students can search these front-end software systems on site and sometimes remotely. Electronic gateways guide users to:

1. Enter a broad topic search.
2. Read an overview of the topic from a full-text electronic encyclopedia article.
3. Narrow their topic to obtain relevant results.
4. Identify and search various appropriate CD-ROM databases.
5. Search the OPAC.
6. Identify other relevant materials such as statistical sources.
7. Locate materials by printing out library maps and floor plans.

Students should inquire about electronic gateways whenever they need to use an academic library. They may be known by names such as "The Gateway to Information" (Ohio State University), "RAID" (Remote Access Interface Design—University of California, San Diego), or the "Index Expert" (University of Houston).

ELECTRONIC INTERLIBRARY LOAN

When students verify that surrounding libraries do not own a specific work, they may request it via interlibrary loan (ILL). Libraries are beginning to permit users to place their own interlibrary loan requests electronically. Students should check at their local public library to see if they are allowed to use this service. Otherwise they may complete a request form containing the call number, author, title, and date of request and submit it at their SLMC or other library where they have privileges.

Every library has rules and policies concerning interlibrary loans. Loan periods and waits for materials vary. There may be a charge for photocopying periodical articles or passages from noncirculating books. Some libraries even stipulate that the materials must be used in the borrowing library.

SUGGESTED LESSON PLAN

Library concept	Accessing information from various types of electronic libraries through dial-up or Internet access.
Time requirements	Fifty minutes to explain and presearch an electronic library, point out the parts of a bibliographic record, describe the location of different types of materials and classification systems, and practice searching for known and unknown items.

Objectives

- To teach students how systematically to presearch physically proximate electronic libraries.
- To make them aware of the programs and services that other libraries offer.
- To enable them to locate materials on the shelf by following either the Dewey Decimal or Library of Congress system.

Prerequisites

Students should be familiar with the basic structure of electronic information, main components of electronic databases, and basic searching methods.

Equipment needed

At least one Windows-level computer with a modem and either dial-up or Internet access to nearby academic and public libraries.

Procedure

- Demonstrate to students the advantages of presearching and browsing electronic libraries prior to visiting them.
- Using the example in the chapter, briefly describe the differences between the Dewey Decimal and Library of Congress systems and how the call number determines the location of an item on the shelf.
- Review the different types of materials that students may encounter and their possible separate locations(s) within a library.
- Describe the services offered by public and academic libraries and how to avail oneself of those services.
- Using either a course-related series of questions or the suggested librarian-created ones, assist students in presearching selected electronic libraries.

Evaluation

Depending on the grade and ability levels, students can:

- Presearch proximate electronic libraries and identify materials for either a class- or librarian-designed assignment.
- Place a list of identified citations in call number order in preparation for retrieving the materials from the shelves.
- Take the list and retrieve selected materials for a course or librarian-related assignment. (This technique is ideal but may not be feasible unless a field trip can be arranged.)

SAMPLE ASSIGNMENT

This practice sheet is to assist you in presearching electronic libraries remotely and locating materials on the shelves.

Known-Item Searching

Known-item searching means that you are certain about a main part of a bibliographic record—usually the author or title of a work. To find a known item, you need to use author or title search commands.

1. What is the call number of the book published by Salman Rushdie in 1996?____
2. Look at the call number and circle the type of classification system the library you are searching is using.

   Dewey Decimal Library of Congress
3. Where is the book located?_____
4. How many books about Jane Austen does the library own? _____
5. How many books by Stephen E. Ambrose does the library own? _____
6. What is the first subject heading for the book entitled *Grand Expectations: The United States 1945–1974*? _____

Unknown-Item Searching

Unknown-item searching means that you do not know the author, title, or call number of a work. You need to use keyword, subject searching, or shelf-searching commands.

1. How many books contain the word *accordion* in the title? _____
2. List two Library of Congress headings for books about the death penalty. ____

   _____
3. List the first six call numbers for books written about the subject of *abused children.*

   _____

   _____
4. Place the call numbers listed above in the order that you would find them arranged on the shelves by placing a number 1 by the first book to be retrieved, a 2 by the second book, and so forth. _____

   _____
5. How many books contain the keywords *snow cedars* in the title? _____
6. Note the call number for a book about anorexia. Use the shelf position search or call number search command to browse this area electronically for additional sources. List three additional titles of books about anorexia._____

   _____

   _____

ADDITIONAL SOURCES

Asimov, Isaac. *Isaac Asimov's Book of Facts.* New York: Random House, 1991.

Everhart, Nancy. *LION'S PALS Public Access LIAS for Students.* Williamsport, Penn.: Brodart Corporation, 1994.

Felknor, Bruce L. *How to Look Things Up and Find Things Out.* New York: William Morrow, 1988.

KidsConnect (http://www.ala.org/ICONN/kidsconn.html). Contains an Internet reference assistance service sponsored by the American Association of School

Librarians. Students in grades K–12 may submit questions to a volunteer SLMS, who will respond within forty-eight hours.

Mann, Thomas. *A Guide to Library Research Methods*. New York: Oxford University Press, 1986.

"News Notes." *School Library Journal* 42, no. 5 (July 1996): 14.

Walsh, Mary Jane. "Asking for HELP." In Linda Shirato, ed., *The Impact of Technology on Library Instruction*, 156. Ann Arbor, Mich.: Pierian Press, 1995.

5 Choosing Appropriate On-Site and Remote Electronic Libraries

Rationale for Change

Telecommunications systems now link the SLMC to the classroom; the Internet; public, academic, and government libraries; commercial online databases; and the home. Students and faculty may initiate their information search at any time from any one of these information resources. It is vitally important that users have knowledge of different types of libraries, what each offers, means of access, and the most appropriate library(ies) for their information needs.

TYPES OF LIBRARIES

Libraries can be sorted into seven general categories: (1) school, (2) public, (3) state, (4) academic, (5) Library of Congress (LC), (6) special, and (7) government. Usually the larger they are, the more they have to offer. That does not mean that the average student should go to the largest, the Library of Congress, to search for information about Thomas Jefferson, but it does mean that they should not start looking for information concerning the influence of pastoral poetry on the industrial revolution in their SLMC. On the other hand, if they need articles from last week's *Time* or *Newsweek* magazine, their local SLMC should be able to satisfy this information need.

ACCESSING SCHOOL LIBRARY MEDIA CENTERS

Describe the collection, programs and services of your own SLMC first. You may wish to use the precious jewel analogy and refer to most types of

school library media centers as semiprecious jewels within a library gemstone collection. Tell students that they need to look beyond the collection of books and consider the SLMC's Internet access, on-site or remotely accessible CD-ROM databases, other electronic libraries' accessible collections, linkage to a statewide library network or library consortium, and dial-up access to your own OPAC.

If students wish to search the OPACs of other school library media centers, they can find them on the Internet at the Inter-Links site (URL: http://www.nova.edu/Inter-Links/). Once there, they click on the hyperlink "Library Resources," followed by "Library Catalogs–Hytelnet." The list is not nearly as extensive as the ones for academic and public libraries, but inquisitive students may wish to see what services and collections these SLMCs offer. All of them require access by a Telnet address, and all supply appropriate log-in information.

Linkages to state library consortia or networks can also be found at this site by clicking on the hyperlink word "consortia."

Collections

Describe in general the collections of SLMCs. Students are already searching other SLMCs' collections from the Internet. They need to know, for example, that SLMCs collect materials—mainly books, videos, CDs, software, and magazines—in all subject areas. This means that the collection is broad, but the depth of the collection is often superficial. Depending on their assignment and its level of complexity, students may have to locate resources at other types of libraries.

School library media centers are somewhat restricted to collecting age-appropriate materials. An SLMC for high school students may well contain the latest legal thriller by John Grisham but probably not the recent bodice ripper by Judith Krantz. Elementary school libraries, on the other hand, are wonderful sources for current and many times out-of-print children's literature.

Borrowing

By describing your own SLMC borrowing policy, you have the opportunity to point out the convenient aspect of searching and borrowing materials from the nearest library. In most cases, it makes sense for students to begin searching their SLMC first and borrowing all of the materials they can from their SLMC before moving on to larger libraries.

ACCESSING PUBLIC LIBRARIES

Public libraries are tax-supported institutions that serve communities' information and recreational reading interests by providing books, videos, CDs, periodicals, indexes, CD-ROM databases, and much more. These li-

braries almost always have online catalogs and offer online bibliographic searching, interlibrary loan, and reference desk services. Depending on the collection size, students will be able to find a wider range of materials on a given subject at a higher reading level, sometimes even college-graduate levels. A few metropolitan public libraries, such as those in New York, Los Angeles, Boston, and San Francisco, contain collections equal or superior to those of large university libraries in specific subject areas.

An alphabetical listing of public library OPACs is available at the Internet site Inter-Links (URL: http://www.nova.edu/Inter-Links/). In some cases, students may click on the desired public library and begin searching. Other occasions may require using a specific supplied Telnet address and logging in as "guest," "user," or "visitor."

Public libraries usually have electronic access to related city or county branch library collections. They have access to the Internet and offer remote online database searching. Their on-site CD-ROM databases are likely to include many of the CD-ROMs featured in SLMCs, and they should also contain more sophisticated and subject-specific ones such as Art Index (a CD-ROM database containing twelve film journals, searchable by author and subject), Humanities Index (a CD-ROM index of 290 humanities periodicals), and Psych Abstracts (a social sciences–related database). Their fiction stock is sure to include the latest best seller, sufficient numbers of current nonfiction, and the classics. The nonfiction stock is most certain to provide some (perhaps more authoritative) works about Thomas Jefferson.

Magazines (always called *periodicals* in public libraries) include standard news ones as well as more subject-specific titles. Public libraries are more likely to subscribe to titles such as the *Public Interest*, the *Economist*, *Prevention*, and the *New England Journal of Medicine*.

Services

Public libraries provide information or reference services to students to help them find what they need or show them where to start. Students should be encouraged to request assistance at a public library when they experience difficulty finding what they need.

Searching public library catalogs can often be done from students' homes from either a modem or the Internet. Although students may not be able to search public libraries' non-networked CD-ROM databases remotely, they should be able to identify a sufficient number of resources to begin or satisfy their search, depending on its nature.

Borrowing

Borrowing, assuming students have their public library cards, is not a problem at public libraries. If students identify materials not in their public library's main or branch collection, they can request that the library borrow

it for them through interlibrary loan. Cooperative lending agreements with surrounding communities are usually in effect. A few states consider an individual borrowing card valid throughout the state's public library system, thus making every public library collection in the state available to card holders.

ACCESSING ACADEMIC LIBRARIES

Academic libraries are those associated with universities, colleges, and community colleges. While public libraries are considered information jewels, large academic libraries are the star sapphires. Academic libraries are the most computerized. Many of their vast catalogs are searchable on the Internet. Academic libraries have super-online catalogs. If students have searching privileges at an academic library, they can search that institution's online public access catalog, an assortment of CD-ROM databases, and sometimes intelligent front-end software such as Ohio State's The Gateway to Information, which guides students through a maze of electronic databases by assisting them with appropriate search term selection and strategy. One place to begin searching academic libraries is through Internet's Inter-Links site (http://www.nova.edu/Inter-Links/). Students click on the phrase "Academic, Research and General Libraries" and are instantly linked to an alphabetical list of hundreds of academic OPACs to search.

Collections

In addition to books, maps, indexes, videos, and microforms, academic libraries contain government reports and documents, statistical data, and frequently the diaries, letters and papers of famous people. Magazines in academic libraries are referred to as either periodicals or journals. Articles in journals, unlike magazines, are written by subject experts and are reviewed by a panel of subject experts before they are published.

Academic libraries, because of their storage capacity and collection policies, usually maintain back issues of journals longer than do school or public libraries. Students will also find books from the 1800s on their shelves, which are rarely found in public libraries outside major metropolitan areas.

Many electronic libraries do not have their entire collections online. Older materials, special collections, government documents, and microforms may not be cataloged and are not accessible via the Internet. Academic libraries with collections consisting of millions of volumes, for example, probably include materials cataloged from the mid-1970s to the present.

Services

Academic librarians provide instruction only to registered students. For registered college students, bibliographic instruction is one of the best educational investments colleges offer. It will reward them handsomely by facilitating the completion of research assignments.

Even to students not registered at a college, information and reference services are offered to a more specialized degree than they are in most public libraries. Academic librarians usually have subject specialties in such fields as the humanities, physical sciences, or performing arts, and they are often fluent in more than one language. They are trained to help users identify the most appropriate sources for their research, interpret the information in various sources, and locate materials in their library and in off-site libraries. At most academic libraries, they also offer term paper, thesis, and dissertation counseling, usually on an individual basis.

Borrowing

Academic libraries differ in the services they offer to the public. Some libraries have liberal walk-in policies; they permit on-site and remote use of their online catalogs, access to their bookstacks, and use of online databases. Some extend borrowing privileges to community residents. Others charge a semester or annual fee if a user has no affiliation. SLMSs should tell students which academic libraries are more accessible to them, post their telephone numbers, and note their operating hours. As long as students conduct themselves in a mature fashion, most librarians will help them with critical information queries.

USING THE LIBRARY OF CONGRESS

The Library of Congress (LC) is the de facto national library of the United States and contains more than 100 million items, 20 million of them books. It is the world's largest library and thus the greatest depository of our country's cultural and intellectual heritage.

Elementary and secondary school student access has been severely restricted at the Library of Congress. To access and borrow materials, users need to be eighteen years old. Students nevertheless may still search the collections, special exhibits, and collection projects remotely via the Internet.

Collections

Because the LC is a depository library, a copy of every published book must reside in its collection in adherence with U.S. copyright laws. LC maintains a huge collection of American print and nonprint materials and also collects and stocks materials from all over the world.

Demonstrate some of LC's collections by using the Internet to view one or more of the following Internet LC sites: American Memory Project, Vatican Library Exhibit, the Russian Archives, and the Dead Sea Scrolls. These sources are available on the Internet at URL: http://lcweb.loc.gov. Show students how they may use some of these materials by downloading or printing them offline for future research assignments.

Services

The best services of LC to students under the age of eighteen are accessible electronically. LC has agreed to put all future library exhibits on the Internet, so that students from anywhere in the world with Web access can see and read the works being displayed. LC is also continuing to develop the American Memory Project, a collection of photographs, audio records, and text designed to illustrate major events and individuals in the history of the United States. In addition to browsing LC's online catalog, students are able to print or download substantial full text materials for various assignments, especially in the humanities.

Borrowing

The collections of LC do not circulate. LC will loan books, however, if no other American library owns them. The primary assistance for students rests in the remote use of the library's online catalog. Students can use the online catalog to identify various works on a subject and then search other types of libraries to find and retrieve these items.

USING STATE LIBRARIES

State government libraries were established in all fifty states to serve state legislators in the same way the Library of Congress serves members of Congress. State libraries administer funding to public libraries within their states, the loaning of materials among various public libraries, and the design and development of statewide online public access catalogs.

Collections

For students who are doing state legislative or historical work, state library collections are of high quality and often open to the public. They usually contain a wealth of documents, personal papers, photographs, and other primary sources about state history and legislative decisions.

Services

State libraries provide searching assistance but usually assume a fair degree of subject expertise on the part of users. It is wise to contact state li-

brarians for assistance in locating and retrieving known items. State libraries are not likely to offer instructional programs to the public.

Borrowing

Borrowing from state libraries, with the exception of members of that particular state's legislature, is usually arranged through a public library via an interlibrary loan request. Many materials are noncirculating. In that case, students may request a photocopy of an item if it cannot be obtained at any other public institution.

USING GOVERNMENT LIBRARIES

Approximately 2,000 libraries serve the federal government. The National Agricultural Library and the National Library of Medicine are designated national libraries within this category. The Census Bureau Library and Bureau of Mines Library are also examples of government libraries. Most are open to the public without restrictions. Some require an appointment.

Collections

The collections of government libraries tend to be highly specialized. Because government libraries focus on one, usually narrow subject area, they can acquire many primary source documents in addition to regular books, videos, and other types of materials. Their collections are not always online. Many times, however, they have specialized CD-ROM databases that contain information, such as census data or labor statistics. Usually they are willing to search for known items. Students may obtain a list of searchable government library OPACs through the Internet Inter-Links site (http://www.nova.edu/Inter-Links/). When they receive an <Enter search keywords:> prompt, students should enter the words *government* and *libraries*. The listing will contain hyperlinks from various state Free-Nets (community-based computerized bulletin board systems) to government and state libraries. Each site will contain a Telnet address with specific log in instructions.

Services

Reference services in government libraries include searching assistance. Like state libraries, they usually require some knowledge of the subject matter on the part of users. Since they are open to the public, most contain self-service photocopiers. They also accept telephone and sometimes Internet requests for information.

Borrowing

Borrowing materials from government libraries is sometimes limited to a prescribed number of items. They accept interlibrary loan requests, but those requests must usually be made through OCLC. Many, however, accept requests for materials via fax if followed by an official interlibrary loan form.

USING SPECIAL LIBRARIES

Special libraries comprise medical, corporate, law, museum, art, and other specialized subjects. They are privately owned and permit access only to members of the firm, association, profession, or business. A listing of special library OPACs can be found at the Internet Inter-Links site (http://www.nova.edu/Inter-Links/). After clicking on the hyperlink "Library Resources" followed by the hyperlink "Library Catalogs," students may enter the search term "Special Libraries" in the Search box and retrieve a list of hyperlinked special libraries.

Collections

The collections of many special libraries are not always large, and they are extremely narrow in scope, but with great collection depth. The catalog may not be automated because the materials may be so old that they require original rather than copy cataloging. Other special libraries may be completely online because their subject specialty (e.g., genetic engineering research) requires almost instantaneous access to the latest study or book.

Services

Reference services in specialized libraries include searching assistance but usually require a subject expertise on the user's part. Special librarians are under no obligation to provide information or reference assistance to the public.

Borrowing

Borrowing materials from special libraries is difficult. If a user can prove that a special library is the only institution in possession of a particular item, it may agree to an interlibrary loan via a public library. It is more likely to agree to photocopy selected passages or pages for a fee in lieu of loaning the item.

CHOOSING THE MOST APPROPRIATE ELECTRONIC LIBRARIES

Once you have briefly explained and demonstrated Internet access to various types of libraries, students will naturally ask how they should engage in selecting the most appropriate ones. There is no exact answer to this question. Choosing the most appropriate electronic libraries is dependent on their responses to the following questions:

- What is the primary topic?
- What kinds of information are required?
- How much information do they need?
- When do they need the information?
- Where are they located, and what time is it there?

What Is the Primary Topic?

This is the hardest question. Before students rush off to their nearest library or hurry to log on to the Internet, they must do the following things:

1. Formulate a central search question.
2. Identify key words, concepts, and names.
3. Design general strategies to organize the search by combining keywords and concepts.

Sitting down for just a few minutes and writing out their central search question, then identifying keywords, concepts, and names and combining those terms using Boolean operators will probably save students hours of time. It will also save them from information overload when they begin searching an electronic library, either on site or remotely.

If this part of the assignment is difficult because students are not sufficiently knowledgeable about their question, they should make a list of keywords or synonyms and search a local electronic library catalog until they have retrieved an item that matches their central search question. They should then use this match to identify standardized subject headings for further searching. Students should stop searching electronically and return to a written system until they have compiled a series of acceptable keywords and subject headings to search more than one electronic library in a systematic fashion.

What Kinds of Information Are Required?

The kind of information required to complete an assignment is a determining factor for choosing a particular electronic library. Here are some guidelines for you to review with students. Ask them to carefully read the assignment to ascertain if it requires:

- General versus specific information.
- Primary and secondary sources.
- Subject-specialized periodicals or general interest magazines.
- Undergraduate-level secondary sources.
- Microform materials.
- Subject-specific lists and statistics.

Students need to know that the kind of material required to complete an assignment probably governs which electronic libraries they should search. If the assignment requires just an overview of a subject, searching a SLMC or local branch public library should suffice. If the subject is specific and narrow, it may be necessary to search the SLMC and perhaps the main branch of a public library.

Students should always search their SLMC first unless they are under time and location constraints. It is most efficient to obtain as many appropriate resources as conveniently as possible. Right now, the SLMC is their most convenient resource, and it has open stacks, unlimited borrowing procedures, and free instructional and reference assistance.

Students should next determine if the assignment requires primary sources and, if so, what kind (e.g., documents? historical accounts written hundreds of years ago?). Sometimes teachers consider a primary source document to be a periodical article written ten years ago by a reporter at the scene. In this case, the SLMC may have this type of primary source document in microform. On the other hand, if students need to retrieve original documents relevant to a historical event, person, or issue, an academic library may clearly be the most appropriate selection.

The type of periodical is a determining factor in the electronic library selection process. If students are required to cite articles about AIDS from journals such as *Lancet* and the *New England Journal of Medicine*, a large public, academic, or special library is necessary.

The reading level of secondary sources is another important criterion. If students are urged to seek out academic press books as secondary sources, they may need to use a large public or academic library.

Microform materials, if mandated in an assignment, almost certainly necessitate using public or academic libraries. Unless it is to retrieve back issues of general interest magazines, most SLMCs do not have a sufficient collection of microform materials.

Subject-specific lists and statistics also lend themselves to the use of electronic libraries other than SLMCs. Many public, academic, and government libraries contain specific databases that can fulfill a need for recent census or AIDS-related data.

How Much Information Do They Need?

This question is usually easy for students to answer because they are so task or assignment driven. After observing numerous assignment presentations by various teachers, I can almost predict that if they have not included the assignment length in their introduction, the first student question will be, "How long does this paper have to be?"

The quantity of information required to complete an assignment is relevant to choosing the appropriate electronic libraries. Here are some guidelines on length in relation to electronic library choice. Is the information needed for:

- Daily homework assignments?
- Unit assignments?
- Research or composition paper assignments?
- Term papers?
- Independent studies for credit?
- Senior honors theses?

Quantity, however, is only tangentially related to choosing appropriate electronic libraries. A question that is part of a daily homework assignment, for example, does not usually necessitate a trip to a large university library. Most teachers create daily homework assignments that require only a quick scan of a subject-specific reference book for the answer. A visit to the SLMC is usually all that is needed. The same visit should suffice for a unit assignment about earthquakes in earth science.

These criteria are no longer common sense to many students. Students are faced with such an assortment of electronic databases and libraries that it necessitates a tolerance for many alternatives and the ability to choose correctly to fulfill their information needs. Many may select electronic libraries based on the page length of their assignment. Some may automatically assume that when a term paper is assigned, it means that they must use an academic library even if it is inconvenient and their SLMC has many of the necessary resources.

In most cases, particularly in the junior and senior years of high school, term paper research requires the use of an academic library. The same library would also be appropriate for many independent studies and senior honors projects or theses. Yet length is not the sole determining factor. It is more important that students analyze their search question and the types of information required first rather than making a choice based on the length of an assignment.

When Do They Need the Information?

This is another question that students have no trouble answering—sometimes, unfortunately, breathlessly and tearfully. Nonetheless, it is an important variable that they should use in deciding which electronic libraries are most appropriate for their information needs.

Obviously students with an assignment due the next day should probably choose the nearest, largest library. A comprehensive library has a much better chance of satisfying their information needs in such a short time frame. For assignments with more extended deadlines, students should be encouraged to search their SLMC first, followed by public, academic, or government or state libraries. The sooner they begin their information search, the more electronic libraries are available. If they live, for example, in a rural area, they may quickly be able to identify relevant materials but then have to request them via interlibrary loan. Interlibrary loan requests can take a week or more before they receive the items. Materials that are identified as currently checked out on the computer need to be recalled, and this may extend the retrieval time.

Where Are They Located, and What Time Is It There?

Years ago, this question would never have been included as a criterion for the selection of a library. It is now, however, a critical factor, especially when it is combined with various imposed deadlines that students have for assignments. Students should be conscious of where they are located and what time it is when they begin searching electronic libraries.

Students are just beginning to initiate their searching from nonlibrary locations. Many begin searching for materials to satisfy an assignment by accessing the SLMC's online catalog from a classroom. Most assume that if they have printed out a list of appropriate citations, those materials will be available for retrieval within the next few days. Since many teachers issue similar assignments in several classes, more than one student is usually working on the identical assignment. They should realize that the early bird gets the worm. Although they have identified appropriate materials, it does not mean that the materials will remain on the shelves indefinitely. The same admonition holds true for students who are using dial-up access from home. They need to retrieve relevant materials as soon as possible from any libraries that they have searched. Students need to call and ascertain the hours that various libraries are open. If it is Friday and they have a Monday assignment deadline, it will not be beneficial to search the SLMC's online catalog if it is closed Saturday and Sunday.

Geographical proximity to a library is extremely important. It may be useful to search the University of Michigan Library to identify appropriate materials, but not for a user who lives in Pennsylvania and wishes to access

those materials physically. Students living in Pennsylvania would be wiser to search the online public access catalog of the Penn State University Library System. Once they have accessed that system, they should search the campus library nearest their home to minimize driving time.

Time-Saving Tips

Before searching, students should ask themselves:

- What must I find out?
- What kinds of information do I need?
- How much information do I need?
- When do I need it?
- Where am I located?
- What time is it?

Save time by searching large libraries from the comfort of your home or SLMC first to identify resources. After you've identified the sources you need, take a printout of citations so you can go directly to the library shelves.

SUGGESTED LESSON PLAN

Library concept	Choosing appropriate electronic libraries.
Time requirements	Fifty minutes to explain the different types of electronic libraries, the criteria for selecting appropriate ones, and selection practice based on a specific class-related or librarian-created assignment.
Objectives	• To have students apply a quick criterion-based checklist before selecting appropriate electronic libraries. • To give students an opportunity to search appropriate electronic libraries either on-site or remotely. • To tell students that they may initiate their search in places other than the SLMC.
Prerequisites	Students should be familiar with the SLMC's online catalog and collection, as well as various on-site CD-ROM databases.
Equipment needed	At least one Windows-level computer with a modem and dial-up access to the Internet through a commercial provider using either Netscape or Windows' Internet Explorer as a browser tool.
Procedure	• Inform students about the characteristics, programs, and services of various types of libraries. Using either a course-related assignment or librarian-created topics, search the

online catalogs of the local academic libraries, the state library, and the nearest public libraries.
- Assist students in searching these online catalogs remotely for their own topics or ones that you have assigned them.

Evaluation

Depending on the grade and ability levels, students can:
- Log in and search the nearest electronic public, state, and academic library online catalogs.
- Print out an appropriate list of citations from each type of electronic library.

ADDITIONAL SOURCES

Braun, Eric. *The Internet Directory*. New York: Fawcett, 1996. Contains the Internet addresses for more than 1,200 academic libraries.

Felknor, Bruce L. *How to Look Things Up and Find Things Out*. New York: William Morrow, 1988.

Garland, Kathleen. "The Information Search Process: A Study of Elements Associated with Meaningful Research Tasks." *School Libraries Worldwide* 1 (January 1995): 41–53.

Goodrum, Charles A., ed. *Treasures of the Library Congress*. 2d ed. New York: H. N. Abrams, 1991.

Kabacoff, Rob. "Inter-Links: A Resource Guide to a Wide Range of Internet Services Including All Types of Libraries Online Public Access Catalogs." http://www.nova.edu/Inter-Links/help/scope.html (August 9, 1996).

Pappas, Marjorie L. "Presearch With Electronic Sources." *School Library Media Activities Monthly* 11 (June 1995): 35–37.

Washington Area Library Directory. Washington, D.C.: District of Columbia Library Association, 1992.

Whitely, Sandy, ed. *Guide to Information Access*. New York: Random House, 1994.

6 Choosing Appropriate Electronic Databases

Rationale for Change

Electronic linkage via the Internet or through a modem and specific communications protocols to various electronic libraries gives students and teachers the opportunity to begin their research by searching a multitude of electronic databases not available in SLMCs. It is vitally important that users have knowledge of various electronic databases and be capable of selecting the most appropriate ones for their information needs.

DEFINING ELECTRONIC DATABASES

Electronic databases store vast quantities of digital data in text, audio, or image format. An electronic database may be in the form of a CD-ROM, online via the Internet, or from a commercial vendor. Many electronic databases can be selected when students access an electronic library such as Washington Library Research Consortium or MELVYL, the University of California's Library System. In addition to searching a particular library's online catalog, users are given the option to select from a multitude of subject-specific databases.

Electronic databases are not interactive; it is not yet possible to write anything on them. Text, however, can be copied from electronic databases onto computers or printers, where students may do further work with it.

USING ELECTRONIC DATABASES

You will not have to tell students and teachers how much more useful, fun, and interesting electronic databases are compared to their printed counterparts if you begin with a demonstration. Use either an on-site CD-ROM database or access an electronic database through the Internet or dial-up access. Show students and teachers how you can search not only by author and subject but also by keyword, phrases, title, and abstract (if available). (See Chapter 3.)

Explain that electronic databases permit users to research the relationship between two or more concepts or variables. If you are using a general periodical database, pose the question, "How are baboons being used to prolong the life of AIDS patients?" Students can see how easily the computer is able to link these concepts or terms and display only those records where the concepts appear together. Also mention how fast the results appeared on the screen. Not one student could have searched a printed index for those terms as quickly as the computer did.

Stress the quality of the information you retrieved. Usually the most current articles are listed first, making it even easier for students to find up-to-date information about a topic. Explain that a printed index or database takes more time to update because of printing, packaging, and delivery time lags.

Electronic databases sometimes contain information only in computer-readable form; they have no print equivalents. Other times the electronic version may be enhanced and may contain more information than its printed counterpart. Many electronic databases are full text. Students and teachers do not have to locate and physically retrieve an article; they can either download it to their own computers or print it by pressing a print command key.

Since many first-time users think they can access the entire contents of the Library of Congress at the push of a button, it is time to tell them about the limitations of electronic databases. Most electronic databases, particularly periodical databases, do not contain materials published before 1970. Students who are doing historical research have to use printed indexes and other materials.

The next limitation they will probably discover on their own, but you can always demonstrate it. Choose a broad subject term that will yield thousands of records. Enter the search term *computer*, for example, and let them observe how many results you retrieved. Students will quickly see that electronic databases do not tolerate broad search terms.

Finally, you have to mention money. If you are demonstrating FirstSearch (described later in this chapter), students should know that each query costs money. Other electronic databases are also fee-based, so students need to search them efficiently.

ELECTRONIC DATABASE TYPES

Students do not have to be able to classify all databases by type. They should, however, be aware that certain categories of databases may yield only a list of citations and that they have to find the articles themselves in their SLMC or another library. The ability to understand quickly the type of database they are searching is important if they need full-text information as opposed to abstracts or lists of books or articles.

Electronic databases can be classified into six types:

1. Full text. The entire article, story, or document is contained in the electronic database. Examples of full-text electronic databases are SIRS (Social Issues Resources Series), DISCLIT (American, British and World Authors), and most electronic encyclopedias.
2. Bibliographic. Bibliographic databases provide citations to bibliographic records such as magazine articles, books, government reports, and conference proceedings. Examples of bibliographic electronic databases are SciSearch, Arts & Humanities Search, and Legal Resource Index.
3. Abstract. Abstract databases usually furnish citations to articles or documents together with a summary of the item's content. Examples of abstract-type electronic databases comprise EBSCO's Magazine Article Summaries, ERIC, and PsycINFO.
4. Directory. Directory-type electronic databases contain information and descriptions of items other than published documents. Examples of directory electronic databases are DIALOGS's U.S. Copyrights, Softbase (directory of software products), and the Thomas Register online.
5. Numeric. Numeric electronic databases supply quantitative data, such as stock market quotes, demographic figures, and weather information. Examples of numeric electronic databases are CENDATA (U.S. Bureau of Census data) and Worldscope (financial and stock information about leading companies worldwide).
6. Multimedia. Multimedia databases furnish selections of video clips, film footage, maps, paintings, audio clips, and text—for example, National Geographic's *Mammals* and Microsoft's *National Art Gallery*.

SUBJECT-RELATED ELECTRONIC DATABASES

Once students have learned to classify databases by type, talk to them about categorizing them by general subject matter. Make them aware that you are just introducing them to some of the most frequently used databases. There are, for example, more than 4,000 CD-ROM titles on the market and 5,000 online databases available. Chances are excellent that they will encounter ones that you have not mentioned on the Internet or by way of another electronic library's menu system. By all means, encourage students to explore them and let you know if they found them helpful.

DATABASES ON THE INTERNET

The availability of electronic databases on the Internet is in a transition period as many CD-ROM publishers begin to use it as a full access vehicle for their products. Here are some versions of Internet access that are available.

Internet Database Subscription Access. An online service maintains an Internet site/address for subscribers to the database. The Internet itself is simply used as a telecommunications channel. Subscribers pay a yearly or per-search fee and receive a password and sometimes special Internet protocols to access the database. Some subscriptions, for example, permit only five simultaneous log ins and prevent access at the sixth user. Examples of Internet subscription databases are SIRS (Social Issues Resources Series) at http:\\www.sirs.com and the Electric Library at URL: http:\\www.elibrary.com

Internet Database Homepage Access. An online service or database producer maintains a home page, which describes the contents, searching methods, and subscription costs of a database. Some companies provide a thirty-day free trial of the database. Others offer a sample noninteractive search on the Internet to interested customers. An example of an Internet database Homepage access is Ebscohost at URL: http:\\www.ebsco.com

Internet Database Full Access. Internet full access means that the database is available to Internet users at no charge. Many of these databases are accessible once users have logged into large university online catalogs. In addition to being able to search a university's online catalog, it may also be permissible to search other databases from the same menu system. Examples of searchable electronic databases accessible from academic electronic libraries are ERIC and PSYCHLIT. In other cases, government-sponsored databases such as CENDATA are available (sometimes in abbreviated form) via the Internet.

ELECTRONIC DATABASE OVERVIEW

The charts on pages 60–102 outline electronic databases available for a variety of subjects (e.g., General Reference, Consumer Information, Environment, etc.). Each database entry is identified by type, Internet accessibility, format, the principal vendors, and a brief description of the database.

While many electronic databases are listed as having no Internet access, they actually do by subscription or electronic library access. When students are searching various electronic libraries, they should make note of those offering free access to specific subject electronic databases. SLMSs should maintain a list of which electronic libraries, especially local ones, give database access at no charge.

A list containing the addresses and telephone numbers of principal vendors cited in the charts that follow can be found in the appendix at the end

of the book. A description of the types of services offered by Wilsonline, FirstSearch, and EPIC can be found in the Glossary.

Several of the databases, such as Humanities Abstracts, Academic Index, SIRS, Social SciSearch, and PsycINFO, are multidisciplinary. Students and faculty will be successful searching anyone of these databases for a variety of related subjects.

The omission, with the exception of Britannica Online, of electronic encyclopedias from the General Reference chart is deliberate. By all means encourage student to use these excellent sources for a topic overview and list of keywords. Examples include *Academic American Encyclopedia, New Grolier Multimedia Encyclopedia, Collier's Encyclopedia,* and *Encarta Multimedia Encyclopedia.* Most students are already familiar with these sources and can easily access one from home or in the SLMC. *Britannica Online* is included in the chart because of its prototype features.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Books-In-Print Plus	Bibliographic, full text	No	CD-ROM	CDP Online Dialog (File 470) BRS (BBIP) Knowledge Index/Compu Serve	An identifying and locating tool for books available for purchase in the United States. Available in many libraries and bookstores. The enhanced version contains full-text book reviews.
WorldCat (OCLC Online) Union Catalog Coverage: 2000 B.C.–	Bibliographic	Yes (subscription)	Internet, CD-ROM	Silver Platter EPIC FirstSearch	A union library catalog that lists more than 28 million books, serials, and nonprint materials held by thousands of participating libraries worldwide. Provides complete bibliographic information and the names of holding libraries. One of the best sources for assisting users in identifying, locating, and borrowing items.
NetFirst-OCLC	Bibliographic	Yes (subscription)	Online, Internet	OCLC	Bibliographic citations—complete with summary descriptions and subject

					headings—describing Internet-accessible resources, including Web pages, interest groups, listservs, library catalogs, FTP sites, Internet services, Gopher services, electronic journals, and newsletters. Records contain location information so that users can connect to cited resources.
Microsoft Bookshelf	Full text	No	CD-ROM	Microsoft	Searches full text of *American Heritage Dictionary, Bartlett's Familiar Quotations, Concise Columbia Dictionary of Quotations, Concise Columbia Encyclopedia, Hammond Atlas of the World, Roget's II Thesaurus,* and the *World Almanac.*
Britannica Online	Full text	Yes (subscription only)	CD-ROM and/or Internet	Encyclopedia Britannica	One of the first electronic encyclopedias to offer continuous updating with its Internet online format. Includes recent Internet Web sites that are relevant to specific articles.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Languages of the World	Full text	No	CD-ROM	NTC Publishing Co.	Definitions, translations, and synonyms of words in the following languages: Chinese, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Norwegian, Spanish, and Swedish.
Biography Index Coverage: 1984–	Bibliographic	No	CD-ROM	Wilsonline FirstSearch	Citations from more than 2,700 periodicals and books, as well as juvenile literature about notable people. Indexed by occupation and profession.
Biography and Genealogy Master Index Coverage: 1984–	Bibliographic	No	CD-ROM	Gale DIALOG (File 654)	Approximately 8.25 million citations to biographical data published in 700 sources.
Complete Marquis Who's Who Plus	Abstract	No	CD-ROM	Reed Publishing Co.	Biographical sketches of more than 400,000 living people from *Who's Who in America*, regional *Who's Who*, *Who's Who in the World*, and the *Directory of Medical Specialists*.

	PC Globe	Full text, numeric	No	Floppy DOS-based disk	Broderbund Software	Maps of the world, regions, and 177 individual countries. The program can compile statistics in text or graphic format concerning predefined user groups. Contains the audio for 175 national anthems. Broderbund also produces PC USA, which covers the United States and furnishes a screen of historical facts and climate information regarding major cities.
	Software Toolworks World Atlas	Full text, numeric	No	CD-ROM or diskette	Software Toolworks	Three hundred color road and relief maps plus a great deal of demographic and geographical data. Tourist information, area codes, and weather maps are included for major cities. Program prints reports with maps and text and allows the exporting of maps to graphics programs.
	Encyclopedia of Associations	Directory	No	CD-ROM	Silver Platter DIALOG (File 114)	Supplies access to the address, founding data, CEO, size of membership, pur-

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
					pose, and publications of thousands of national associations and other nonprofit groups. Searchable by keyword, association name, CEO, etc.
Statistical Abstract of the United States Coverage: Annual edition	Numeric	No	CD-ROM	Government Printing Office	Major source for statistics on every facet of American life—crime, alcoholism, household income, etc.
World Factbook	Numeric	Yes	CD-ROM, Internet	Central Intelligence Agency	Excellent statistical information about each country in the world. Topics cover land use, population density, type of government, economic health, etc.
CENDATA Coverage: 1990– . Also contains historical data	Numeric, full text	Yes (http://www.census.gov)	CD-ROM, Internet	DIALOG CompuServe	Current and past census data for population, housing, business, trade, manufacturing, and agriculture. Contains a wealth of information from the 1990 census.

Quotations Database	Full text	No	Online	DIALOG (File 175) Knowledge Index (REFR1)	Features the third edition of the *Oxford Dictionary of Quotations*. Searchable by author, keyword, and subject.
Academic Index Coverage: 1985–	Bibliographic, abstract, full text	No	CD-ROM	Data-Star DIALOG Knowledge Index / CompuServ	Indexing and abstracts and selected full text of 1,500 periodicals. Focuses on the leading academic journals in the humanities, social sciences, science, technology and general business, and current events.
Article First—OCLC Coverage: 1990–	Bibliographic	Yes (subscription via FirstSearch)	Online and / or Internet	EPIC FirstSearch	Bibliographic citations from 11,000 periodicals on virtually almost every subject. Range of articles spans refereed academic journals to popular magazines.
FactSearch Coverage: 1984–	Numeric, full text	Yes (subscription)	Internet CD-ROM	EPIC FirstSearch	Key statistics culled from 300 government documents and prominent periodicals, combined into 150–200-word essays. Topics include public policy debates, crime, medical care, youth and family issues, and the environment.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Poll (Public Opinion Location Library) Coverage: 1940–	Full text	No	Online	DIALOG Knowledge Index/CompuServ LEXIS-NEXIS Roper Center for Public Opinion Research	Full text coverage of thousands of public opinion survey results concerning politics and government, public institutions, business, social issues and attitudes, market research and consumer preferences, and personal opinions and attitudes. Survey results are compiled from organizations such as Gallup, Roper, the National Opinion Research Center, CBS/NY Times, ABC/Washington Post, and NBC/Wall Street Journal.

Periodical Indexes

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Magazine Article Summaries	Full-text, bibliographic	Yes (subscription)	CD-ROM, Internet	EBSCO	Indexing of more than 500 general interest periodicals, including book reviews for current literature and approximately 500 classics. About 30 percent of the periodicals are available in full-text format. EBSCO HOST provides full-text access to more than 3,000 journals from nearly 11,000 journals and 1,200 pamphlets and brochures.
EBSCO HOST Coverage: 1984–	Full-text, bibliographic	Yes	Online, Internet	EBSCO	
The Electric Library	Bibliographic, full text	Yes (subscription)	Internet	Infonautics Corporation	Provides access to not only periodicals but also reference books, works of literature, newspapers, pictures, maps, and radio and television transcripts. Its search engine uses a natural language query approach.
InfoTrac Series	Bibliographic, full text	No	CD-ROM, online	Information Access DIALOG	Information Access owns a variety of periodical data-

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Magazine Index Plus Magazine Index Select Magazine ASAP Plus General Periodicals Index TOM (Text-on Microfiche) Coverage: 1959–				(File 47) BRS	bases in its InfoTrac series. Versions offer a combination bibliographic/full-text version of general interest periodicals and major newspapers such as *New York Times*, *Wall Street Journal*, and *Christian Science Monitor*. The number of periodicals indexed ranges from 140 for TOM to 1,000 periodicals for General Periodicals Index.
Readers' Guide to Periodical Literature Coverage: 1984– Readers' Guide Abstracts Select Edition Coverage: 1988–	Abstract	No	CD-ROM, Internet	H. W. Wilson Wilsonline FirstSearch	The first version provides abstracts of 60,000 articles from more than 230 general interest periodicals and *New York Times* since 1984. The Select Edition contains 25,000 articles selected since 1988.

ProQuest Series Resource/One Ondisc Coverage: 1986– Magazine Express Coverage: 1988– Periodical Abstracts Ondisc Coverage: 1988– General Periodicals Ondisc Coverage: 1988–	Bibliographic, full text	Yes (subscription)	CD-ROM, Online	University Microfilms DIALOG (File 484) FirstSearch RLIN's CitaDel	University Microfilms produces several periodical indexes in its PROQUEST series. Resource/One indexes 140 general periodicals plus *USA Today* and *New York Times Current Events Edition*. Magazine Express indexes 85 popular periodicals. Periodical Abstracts Ondisc contains three different editions, which index 500, 950, and 1,500 periodicals, respectively, plus several major newspapers. General Periodicals Ondisc indexes the full text of 350 periodicals.
Newspaper Abstracts Coverage: Jan. 1, 1990–	Abstracts	Yes (subscription)	Online, Internet, CD-ROM	University Microfilms DIALOG (File 484) RLIN's CitaDel FirstSearch	Indexes more than 25 U.S. and urban and regional newspapers including *New York Times, Los Angeles Times, Washington Post, USA Today*, and *Wall Street Journal*; business journals, academic journals, general periodicials, and broadcast

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
					programs. Searchable by subject, company name, and personal name descriptors.
National Newspaper Index Coverage: 1983–	Full text, bibliographic	No	CD-ROM, Online, Internet	Information Access DIALOG (File 111) Knowledge Index (NEWS2)	Full-text coverage and bibliographic citations for the last four years of *New York Times, Wall Street Journal, Christian Science Monitor, Los Angeles Times,* and *Washington Post.*
NewsBank Coverage: 1980–	Bibliographic, full text on microfiche	No	CD-ROM, microfiche	Newsbank	Indexes articles from 450 U.S. newspapers and provides copies of all indexed articles in microfiche.
NEXIS Coverage: Varies early 1980s to current only	Full text, abstract	No	Online	Reed Elsevier	Full-text coverage of 2,300 newspapers, news wires, magazines, newsletters, and broadcasts. Features general and business news worldwide.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Art Abstracts Coverage: 1984– for citations; 1993– for abstracts	Abstract, bibliographic	No	CD-ROM, Online	CDP Online EPIC FirstSearch Wilsonline	Abstracts from more than 200 journals, yearbooks, and museum bulletins concerning every aspect of art. Abstracts average 100 words and are meant to summarize the salient points in the original journal.
A-V Online Coverage: 1964–	Bibliographic	No	Online, CD-ROM	SilverPlatter DIALOG (File 46) Knowledge Index	Consists of the Database of the National Information Center for Educational Media and provides a directory / citation guide to commercially produced educational 16-mm films and videotapes.
Cinemania for Windows Coverage: N.A.	Multimedia	No	CD-ROM	Microsoft	Full-text reviews, biographies, and actual footage from hundreds of film scenes.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Footage '91 North American Film and Video Sources Coverage: N.A.	Directory	No	CD-ROM	Prelinger Associates	A directory of 1,600 collections that furnish film and taped images plus stock footage libraries, nonprofit film and television archives, and television news libraries. Searchable by topic, issues, personalities, and locations.
Magill's Survey of Cinema Coverage: 1902–	Abstracts	No	CD-ROM	EBSCO DIALOG Knowledge Index/CompuServ	Reviews and plot summaries for more than 3,500 films and short descriptions for 30,000 additional films. Searchable by title, genre, star, director, or year.
Microsoft National Gallery of Art	Multimedia	No	CD-ROM	Microsoft	Displays of 2,000 pieces of art and summaries of stories behind the art from the London's National Gallery of Art collections.

Consumer Information

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Consumers Reference Disc Coverage: 1985–	Bibliographic	No	Online	FirstSearch	A subject index to the contents of more than 100 periodicals categorized from general (the home) to more specific (automobile) or by specific brand.
Computer Database Coverage: 1983–	Abstracts, bibliographic	No	Online	Information Access	Reviews of various hardware and software in computer magazines.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
College Handbook	Full text	No	CD-ROM, online	Macmillan	Statistics and facts about 2,700 undergraduate schools. Students may search more than 600 fields regarding majors, tuition, geographic setting, and qualifications. Can be searched via America Online by university name or keyword.
Peterson's College Database	Full text	No	CD-ROM, online	SilverPlatter DIALOG (File 214) BRS Knowledge Index (EDUC2) Dow Jones News/ Retrieval	Fact-filled profiles of thousands of colleges and universities. Can be searched by more than twelve fields.
ERIC Coverage: 1966–	Abstract	Ask ERIC at **http://ericir.syr.edu**	Internet, CD-ROM, online	U.S. Dept. Education SilverPlatter DIALOG (Ondisc) EPIC FirstSearch CompuServ/	Abstracts of hundreds of thousands of articles, research reports, documents, curriculum materials, and conference papers relating to education.

				Knowledge Index DataStar EBSCO	
Education Index Coverage: 1983–	Bibliographic	No	Online, CD-ROM	FirstSearch Wilsonline	Bibliographic citations to approximately 400 major periodicals encompassing administration, teaching methods, and curriculum topics.
PsycINFO Coverage: 1967–	Abstract	No	CD-ROM, online	American Psychological Association SilverPlatter CDP Online Data-Star DIALOG (File 11)	Abstracts of articles selected from more than 1,300 scholarly journals published in fifty countries and twenty-eight languages. Subjects pertain to experimental psychology (human, animal, and comparative), psychosexual behavior, educational psychology, applied psychology, and sports psychology.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Applied Science & Technology Index Coverage: 1983–	Bibliographic	No	Online, CD-ROM	Wilsonline FirstSearch	Citations to 391 journals in disciplines such as environmental engineering and waste management.
Biological and Agricultural Index Coverage: 1983–	Bibliographic	No	Online, CD-ROM	Wilsonline FirstSearch	Citations to 391 journals covering topics ranging from groundwater pollution to other areas of environmental science. Also includes current book reviews.
Environmental Periodicals Bibliography Coverage: 1972–	Bibliographic plus table of contents	No	CD-ROM, online	Environmental Studies Inst. DIALOG (EPB Online)	Tables of contents to more than 300 periodicals dedicated to environmental topics.
Environmental Sciences & Pollution Management—Cambridge Scientific Abstracts Coverage: Last 5 years	Bibliographic	No	Online	FirstSearch Cambridge Scientific Abstracts	A bibliographic database of journals covering topics such as toxic hazards of chemicals, pharmaceuticals, and air, marine, and freshwater pollution. Biochemical applications in water treatment and pollution are also included.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Health Periodicals Database Coverage: 1976–	Bibliographic, abstract, full text	No	CD-ROM, online	Information Access CDP Online CompuServe Data-Star DIALOG	Indexing, abstracts, and selected full text for 100 health and medical periodicals appropriate for lay users, 130 professional medical journals such as *New England Journal of Medicine, Lancet,* and *JAMA,* plus 3,500 general interest magazines from which articles relevant to health have been selected.
MDX Health Digest (Medical Data Exchange) Coverage: 1988–	Abstracts, bibliographic	No	CD-ROM, online	SilverPlatter FirstSearch	Citations with abstracts for 12,000 health articles suitable for reading by the general public. Formats include newsletters, magazines, bulletins, newspapers, medical journals, and hospital publications.
MEDLINE Coverage: 1966–	Bibliographic, abstract	Yes, with password	CD-ROM, online, Internet	National Library of Medicine CDP Online CDP Colleague	A hybrid database for use by health professionals and the general public, MEDLINE indexes more than

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
				Data-Star DIALOG EPIC Knowledge Index Quester Orbit NEXIS STN	3,600 medical journals published in the United States and seventy foreign countries. Considered the premiere database in a group of more than forty National Library of Medicine databases.
PDQ (Physician Data Query)	Abstracts	No	CD-ROM, online	BRS CompuServ MEDIS MEDLARS National Cancer Institute	Description, symptoms, and diagnostic and prognostic information for common forms of cancer. Includes a physician reference section of specific cancer specialists.
SIRS Coverage: 1989–	Full text	Yes (subscription)	CD-ROM, Internet, online	SIRS, Inc.	A full-text multidisciplinary database with coverage from selected magazines and newspapers concerning topics related to psychology, alcohol use and abuse, mental health, drug information, and others. Easily searchable by keyword and suitable for the layperson.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
America: History and Life Coverage: 1982–	Bibliographic, abstract	No	CD-ROM	ABC-CLIO DIALOG (File 38) Knowledge Index CompuServ (File HIST1)	An index to over 2,100 journals in history and related disciplines, including many local, state, and special interest journals. The definition of history is broad and encompasses traditional topics as well as social, ethnic, and gender issues. Abstracts average seventy-five words and summarize main issues of the document.
European Monarchs	Directory	No	CD-ROM	Quanta Press	The genealogic history of past and present European kings and queens.
GEOBASE Coverage: 1980–	Bibliographic, abstract	No	Online	Elsevier Science Publishers	Citations and abstracts of worldwide literature covering cartography, geography, climatology, volcanology, and other more science-related disciplines such as geophysics and geology.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Historical Abstracts Coverage: 1954–	Abstract, bibliographic	No	CD-ROM, online	ABC-CLIO DIALOG Knowledge Index/ CompuServ	Indexes and abstracts the research literature of modern world history (with the exception of the United States and Canada) from 1450 to the present. Materials are selected from 2,100 journals in history and related disciplines.
History Source Coverage: July 1990–	Abstract, bibliographic, partial full text	No	CD-ROM	EBSCO	Abstracts and indexing for fifty nonacademic historical journals plus full-text coverage of *American Heritage, History Today,* and *Smithsonian.*
Humanities Abstracts Coverage: 1984–1994 for abstracts	Abstract	No	CD-ROM, online	CDP Online EPIC FirstSearch Wilsonline	Detailed abstracts from more than 350 scholarly journals in the humanities. Within this broad index history, archaeology and classical studies are included.
History of the World	Full text	No	CD-ROM	Bureau of Electronic Publishing	The full text of many history books, plus 1,000 maps, photographs and tables. Especially suitable for secondary school students.

Landmark Documents in American History Coverage: 1492–1995	Full text	No	CD-ROM	Facts on File	The full text of 1,200 primary source documents in American history from 1492 to Newt Gingrich's *Contract with America.*
Social Sciences Abstracts	Abstracts	No	CD-ROM, online	Wilsonline FirstSearch	Abstracts and indexes of 350 core periodicals from the fields of anthropology, economics, geography, law and criminology, political science, social work, sociology, and international relations.
U.S. War Series	Full text	No	CD-ROM	Quanta Press	Chronologies, biographies, and military campaigns of the Civil War, World War II, Korean War, and Vietnam War.

Law

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Index to Legal Periodicals Coverage: 1981–	Bibliographic	No	CD-ROM, online	Wilsonline BRS FirstSearch LEXIS WESTLAW	Indexes to approximately 600 legal periodicals including law review journals, state bar publications, and periodicals from Australia, Canada, and Great Britain.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Arts & Humanities SEARCH Coverage: 1990–	Bibliographic	No	CD-ROM, online	Institute for Scientific Information Data-Star DIALOG EPIC FirstSearch	Indexes to 1,100 leading journals and reviews in all fields of the arts (art, architecture, music, dance, theater, film, radio and television) and the humanities (literature, literary reviews, language, classics, history, religion, and philosophy).
The English Poetry Full-Text Database	Full text	No	CD-ROM, magnetic tape	Chadwyck-Healey	The full text of poetry by 1,350 poets, A.D. 1600–1900.
Poetry Finder on Disk	Bibliographic	No	CD-ROM	Roth Publishing	Searchable by first line, author, and title, this database searches poetry from more than 700 anthologies.
Contemporary Authors on CD	Full text	No	CD-ROM	Gale	Biographical information about 100,000 authors, playwrights, screenwriters, journalists, and notable nonfiction writers. Searchable by the author's na-

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
					tionality, place of birth, college attended, political affiliation, and other descriptive fields. The database also provides bibliographies by and about the author.
DISCLIT: American Authors	Full text	No	CD-ROM	G. K. Hall, OCLC	Full-text coverage of the Twayne Authors series volumes. American Authors include 143 authors ranging from Nathaniel Hawthorne to Langston Hughes. Also included is a bibliography of more than 100,000 citations to books by or about the authors from OCLC's online catalog.
DISCLIT: British Authors	Full text	No	CD-ROM	G. K. Hall, OCLC	Full-text searching for 145 authors from the fifteenth century to the present. Also includes a bibliography of 100,000 citations by or about the author culled from the OCLC catalog.

DISCovering Authors: Biographies & Criticism on 300 Most Studied Authors	Full text	No	CD-ROM	Gale	Biographic and critical information about 300 authors studied most frequently by high school and college students. Searchable by author, title, theme, time period, characters, or genre. Authors cross all time periods and nationalities.
The Columbia Granger's World of Poetry	Bibliographic, partial full text	No	CD-ROM	Columbia University	First line, author, title, and subject indexes to poetry found in 550 anthologies. Also includes the full text of 8,500 poems no longer covered by copyright.
Essay and General Literature Index Coverage: 1985–	Bibliographic	No	CD-ROM	Wilsonline	Citations for 250,000 essays published in 15,000 collections. Searchable by author and subject. Features literary criticism but is not solely devoted to it.
Humanities Abstracts Coverage: 1984– , citations; 1994– , abstracts	Abstracts	No	CD-ROM, online	CDP Online EPIC FirstSearch Wilsonline	Indexes many journals related to literature such as *American Scholar* and *Hudson Review.*

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
MLS International Bibliography	Bibliographic	No	CD-ROM, online	EPIC FirstSearch Wilsonline Silver Platter	Easily the most comprehensive database on language and its expression in culture and literature; searchable by genres, author, subjects, themes, time periods, and role relationships. Also provides bibliographic citations to more than 4,000 periodicals, books, and dissertations on literature in all major languages.
Masterplots II on CD-ROM	Full text	No	CD-ROM	EBSCO	Full-text coverage for 2,500 works of literature, including plot summaries and brief critical analyses.
Monarch Notes	Full text	No	CD-ROM	Bureau of Electronic Publishing	The entire Simon & Schuster Monarch Notes on more than 200 authors ranging from Austen to Zola. Monarch Notes include plot summaries, character analyses, criticism, author biographical sketches, and additional reading lists.

Scribner Writers Series on CD-ROM	Full text	No	CD-ROM	Scribner	The full text of essays about 510 authors selected from Scribner's writers series. Authors range from Cicero to Gabriel García-Marquez. Searchable by genre, language, period, nationality, or combination of these descriptors.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Afro-American Insight	Directory	No	Diskette	AfroLink Software	Lists of African-American associations, business and national organizations. Also provides lists of African Americans elected to state and national office and/or appointed to federal offices.
ETHNIC NewsWatch	Full text	No	CD-ROM	Softline Information	Full-text version of more than eighty periodicals and newspapers relating to various ethnic groups. Searchable in English or Spanish.
The American Indian: A Multimedia Encyclopedia Coverage: N.A.	Full text/ graphic, multimedia	No	CD-ROM	Facts on File	Full text of the following Native American reference sources: *Atlas of the North American Indian, Who Was Who in American History,* the *Encyclopedia of Native American Tribes, Voices of the Winds,* National Archives documents, and approximately 1,000 images and audio excerpts from Native American songs.

Chicano Database on CD-ROM Coverage: Ranges from 1965–present depending on the selected index	Bibliographic	No	CD-ROM	Chicano Studies Library	Bibliographic citations from selected segments of *Chicano Periodical Index* (1967–1988), *The Chicano Index* (1989–), *Arte Chicano: An Annotated Bibliography of Chicano Art* (1965–1981), and *The Chicano Anthology Index*.
Hispanic-American Periodicals Index Coverage: 1970–	Bibliographic	No	Online	RLIN	Bibliographic citations from more than 250 academic social science and humanities journals published in Latin America. Topics pertain to Latin America and/or the U.S. Hispanic population.
North American Indians	Full text, graphic multimedia	No	CD-ROM	Quanta Press	Selected images and text about various Indian tribes and chieftains listed in the U.S. Bureau of Ethnology.

Music

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
MUSE (MUsic SEarch): International Bibliography of Writings about Music: RILM Abstracts (Répetoire International de Litérature Musicale) Coverage: 1970–	Abstracts, bibliographic	No	CD-ROM, online	National Information Service Corp. DIALOG (File 97)	The most inclusive music database. Contains abstracts of literature concerning music, periodical articles, books, essays, dissertations, catalogs, and other printed publications. Searchable by author, reviewer, title, keyword, subject, and journal title.
Music Index on CD-ROM Coverage: 1981–	Bibliographic	No	CD-ROM	Chadwyck-Healey	Bibliographic citations to approximately 350 music periodicals published in North America, Europe, and other countries. Searchable by name, event, musical category, instrument, musical group, historical period, and specific subject.

SilverPlatter Music Library Coverage: 1991–	Bibliographic	No	CD-ROM	SilverPlatter	A selected OCLC database catalog of more than 400,000 recordings on LPs, 45- and 78-rpm records, tape cassettes, and CDs. Music in all categories and from all over the world is cited.

Physical Sciences and Technology

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Applied Science & Technology Index Coverage: 1983–	Bibliographic	No	CD-ROM, online	Wilsonline FirstSearch	Citations to 391 journals in biology, chemistry, computer technology, all types of engineering, geology, and other related technology fields.
Biological & Agricultural Index	Bibliographic	No	CD-ROM, online	Wilsonline FirstSearch	The entire range of sciences associated with biology and agriculture from 226 core periodicals plus book reviews.
Computer Database Coverage: 1983–	Abstract, full text	No	CD-ROM	Information Access Company Data-Star DIALOG Knowledge Index/CompuServ LEXIS/NEXIS	Detailed abstracts from 150 core computer journals, consumer magazines, trade papers, and newsletters and the full text from seventy of these journals. Topics span computer platforms, products, companies, computer applications, and information regarding electronics, robotics, and data communications.

General Science Abstracts Coverage: 1984– , citations; 1993– , abstracts	Bibliographic, abstracts	No	CD-ROM, online	Wilsonline FirstSearch EPIC CDP Online	Citations to approximately 140 periodicals in astronomy, biology, botany, chemistry, earth science, environmental issues, mathematics, medicine, physics, and zoology. Easily searchable by the layperson. Also provides abstracts for "Science Times" from *New York Times*.
Mammals: A Multimedia Encyclopedia Coverage: N.A.	Multimedia	No	CD-ROM	National Geographic	A single CD-ROM database featuring 700 color images of mammals plus full-text descriptions of their features, habitat, range, and vital statistics.
McGraw-Hill Science & Technical Reference Set	Full text	No	CD-ROM	McGraw-Hill	The full text of the second edition of *McGraw-Hill Concise Encyclopedia of Science and Technology* and the fourth edition of the *McGraw-Hill Dictionary of Scientific and Technical Terms*. Searchable by keyword.
SciTech Reference Plus	Full text	No	CD-ROM	Bowker	The full text of *American Men and Women of Science, Directory of American Research and Technical,*

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
					Corporate Technology Directory, plus the science and technology books and periodicals from *Books in Print* and *Ulrich's International Periodicals Directory*.
SciSearch Coverage: 1974–	Bibliographic	No	CD-ROM, online	Institute for Scientific Information Data-Star DIALOG (File 434) STN	Comprehensive subject searching of 4,500 key technical journals ranging from astronomy, biology, chemistry, and physics to engineering and applied sciences. Citation indexing traces the number of times an article was referenced in other scientific articles. Useful for initial searching followed by specific subject database research.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
CQ Washington Alert Coverage: Most parts span from the beginning of the present congressional session; some refer back to the 98th session	Full text	Yes (information from several Washington Alert departments is on the Internet)	Online, Internet	Congressional Quarterly	Online versions of *Weekly Report, Congressional Monitor, Congressional Insight,* and *Governing* plus the full text of congressional documents, including *U.S. Code, Congressional Record, Federal Register Code of Federal Regulations,* and committee and hearings transcripts. Searchable at various skill levels by use of a simple menu or a full command system.
LEXIS/NEXIS Coverage: Varies—historical and current spans	Full text	No	Online	Reed Elsevier	One of the most comprehensive collections of full-text information of U.S. federal and state statutory, case and administrative law, plus supporting legal and general information. Includes many separate databases such as bill text (the full text of all bills

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
					initiated during the current congressional session) and The Capitol service, which furnishes biographical data on more than 7,000 persons and organizations related to government work. Searchable by three search interfaces: (1) full-text search commands, (2) simplified menu system, and (3) FREESTYLE, a method that permits users to modify their searches in progress.
Library of Congress Bill Tracking	Full text	Yes **(telnet.locis.loc.gov.)**	Internet	Library of Congress	A forty-eight-hour delay bill tracking system accessible via Internet.
PAIS International Coverage: 1972–	Abstract	No	CD-ROM, online, Knowledge Index/ CompuServ FirstSearch	SilverPlatter Public Affairs Information Service Data-Star DIALOG (File 49) EPIC	Abbreviated abstracts to about 1,600 journal articles on other publications on public affairs. Includes government, public administration, business, law, international relations, finance, education, politics, and the social sciences. An excellent

					crossover database, useful to history and other social science topics.
Political Risk Services Coverage: Current information	Full text, numeric	No	CD-ROM	Political Risk Services Data-Star LEXIS-NEXIS NewsNet	Analyses and forecasts about the economic, political, and business conditions for more than 100 countries. The following publications are produced by 250 research area specialists and consultants: country reports (analyses of sixty-four countries with a predicted outlook of political transition and economic uncertainty); executive reports (shorter analyses for thirty-six more stable countries); country forecasts (summary and numeric analyses for all 100 countries); international country risk guide (risk analyses and assessments for 130 countries); and a political risk letter for 100 countries.
Social Sciences Index	Bibliographic, abstracts	No	CD-ROM, online	H. W. Wilson Wilsonline	Bibliographic citations to more than 350 core period-

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Coverage: 1984–				FirstSearch BRS	icals in political science, law and criminology, anthropology, social work, sociology, geography, and international relations.
Social Science Source Coverage: 1984–	Abstracts, bibliographic, partial full text	No	CD-ROM	EBSCO	Abstracts and bibliographic citations for 353 periodicals and full text for fifteen most useful sources, such as *Congressional Quarterly Weekly Report, Foreign Policy, Nation, National Review,* and *New Republic.*

Religion

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Arts and Humanities SEARCH Coverage: 1990–	Bibliographic	No	CD-ROM, online	Institute for Scientific Information Data-Star DIALOG EPIC FirstSearch	Articles from 1,100 leading journals and reviews in all fields of the arts and humanities, including religion.
Humanities Index Coverage: 1984– , citations; 1994– , abstracts	Abstracts	No	CD-ROM, online	CDP Online EPIC FirstSearch Wilsonline	Indexes of approximately 290 periodicals related to the humanities including religious titles such as *Biblical Archaeologist, Catholic Biblical Quarterly, Church History, Harvard Theological Review, History of Religions, Muslim World,* and *Religious Studies.*
Religion Indexes Coverage: 1975–	Abstracts, bibliographic	No	CD-ROM, online	H. W. Wilson Wilsonline DIALOG (File 190) Knowledge Index CompuServ	Citations and abstracts for articles from more than 200 religious journals plus books. Provides coverage from all theological perspectives.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
REX (Religious Index) Coverage: 1959–	Abstracts, bibliographic	No	CD-ROM	FABS International	More than 60,000 citations and abstracts to religious articles from 200 periodicals. All religious and theological perspectives are represented.

Social Sciences

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
Social Sciences Index Coverage: 1984–	Bibliographic, abstracts	No	CD-ROM, online	H. W. Wilson Wilsonline FirstSearch BRS	A multidisciplinary database with bibliographic citations to journals from psychology, psychiatry, social work, and other related subjects.
Social Science Source Coverage: 1984–	Abstracts	No	CD-ROM	EBSCO	Abstracts of articles from 353 journals and periodicals in psychology, anthropology, psychiatry, sociology, and related fields.
SIRS (Social Issues Resources Series) Coverage: 1989–	Full text	Yes (subscription)	CD-ROM, Internet	SIRS, Inc.	A full-text multidisciplinary database with coverage from selected magazines and newspapers concerning topics related to psychology, alcohol use and abuse, mental health, drug information, and others. Easily searchable by keyword and suitable for students.

Database	Type	Internet Access	Format	Principal Vendor(s)	Database Description
PsycINFO Coverage: 1967–	Abstract	No	CD-ROM, online	American Psychological Association SilverPlatter CDP Online Data-Star DIALOG (File 11)	Abstracts of articles selected from 1,300 scholarly journals published in fifty countries and twenty-eight languages. Subjects include all types of psychology ranging from abnormal to experimental.
SocioFile Coverage: 1992–	Abstracts	No	CD-ROM, online	SilverPlatter BRS DIALOG (File 37) Knowledge Index CompuServ FirstSearch	Detailed abstracts from more than 1,900 journals covering all aspects of sociology and related disciplines, including anthropology, criminology, demography, education, law, race relations, and urban studies.

DATABASE SELECTION

After you have demonstrated and explained the types of on-site and remote electronic databases, it is time to provide students with criteria to help them select appropriate ones. Students should realize that more of something may be actually less when they are confronted with as many as sixty CD-ROM and online databases. When choosing the most appropriate database(s), students should answer the following questions:

1. What is my topic?
2. What kinds of information should I be searching for?
3. What level of research is needed?
4. How much information is needed?
5. Do I need to access physically all of my search results?

What Is My Topic?

This question is somewhat similar to asking students what information they must find—with one exception: They need to broaden that specific information need into a subject category. For example, is their topic about literature, political science, history, biology, or psychology? Once they have placed their topic into a broad subject category, they should be ready to answer question 2.

What Kinds of Information Should I Be Searching For?

After learning about the various types of databases—full text, bibliographic, abstracts, numeric, directory, and multimedia—students should be able to identify the kinds of materials they need and the types of databases most likely to fulfill those needs. If the assignment requires only books and periodicals, a numeric database packed with statistics and lists is not an appropriate choice. If the assignment requires an annotated list of proposed assignment resources, a database containing abstracts of articles and books would be very suitable.

What Level of Research Is Needed?

Students may have to consult their teacher on this question. If students are asked to cite periodicals, may the articles be from general interest periodicals such as *Newsweek* or *Time*? Or are they required to cite subject-specific periodicals such as *Scientific American* or *Discover*? If the course is an advanced placement or an independent project, students may have to use academic journals and cite books published by academic rather than popular presses.

How Much Information Is Needed?

Students almost always have the answer to this question in the form of the number of pages to be written or the number of sources to be cited. Years ago the quantity of information was not as relevant a question as it is today. Many electronic databases may be searched without cost to students, but document delivery is fee based. If students need to find only two demographic statistical sources for an assignment, it may well be worth accessing CENDATA (a Census Bureau database) to locate and retrieve two relevant documents and pay to have them faxed or mailed to their home or school. On the other hand, if the assignment is a term paper, students may wish to select databases that provide abstracts or the full text of an article and save their funds for pieces of information that are absolutely necessary to the paper and accessible only via a document delivery service.

Do I Need to Access Physically All of My Search Results?

The answer to this question is critical to student database choice. Accessing a remote electronic database about alcohol and drug abuse is an excellent selection for the topic of teenage alcoholism. It is not, however, when a student has printed a list of bibliographic citations and has no access to a library that contains those sources. In some cases, a specialized database cites a sufficient number of physically accessible articles to satisfy information needs. In other instances, the materials retrieved will be so esoteric that they will necessitate a trip to a large academic or public library. Depending on student responses to the previous questions, students may wish to select a more general subject treatment database.

THE NEXT STEP

After responding to these questions, students should examine possible on-site electronic databases followed by remote ones. To examine an electronic database, they should consider the following factors:

- Database title
- Database description
- Type of database
- Content level
- Coverage
- Contents availability

Database Title

When searching for appropriate databases, students should first focus on the different database titles. For an assignment concerning campaign

finance reform, PsycINFO would not seem remotely connected to their topic. Title scanning is not the only way to rule out a particular database, but it is useful for screening out a sufficient number to help narrow choices.

Database Description

There is usually a brief description of each database posted by the computer terminals. It may consist of only one sentence, but there may be sufficient clues in the description to help students with their selection. If a database is described as "covering scholarly journals in psychology and other related fields," students should realize that the periodicals indexed are at a high academic level and that subjects associated with psychology are also covered in the database. If the database description reads "contains magazine articles and book reviews about psychology and related fields," then they have most likely located a database at a lower academic level.

Type of Database

The type of database (full text, multimedia, numeric, directory, bibliographic, or abstract) is more important to secondary school students than it is to college students. The former do not have as flexible schedules or the transportation to avail themselves of many materials cited in various electronic databases. Many of their assignments are due within a few days compared to college assignments, which may extend over a period of weeks. Students should examine a database quickly to determine its type. If students need the full text of an item, a database comprising bibliographic citations will not suffice.

Content Level

Even a one-sentence database description provides a clue to the content level of a database. Students should look for the following words:

More Appropriate	*Less Appropriate*
periodicals or magazines	journals or academic reviews
layperson or nonspecialist	specialist or scholar
articles	bibliographic citations
general interest	subject related
nonacademic	academic
selected	comprehensive
information or data	research findings or results
multidisciplinary	subject specific

The use of one of the listed terms in a database description is not always an indicator of the content level, but many times it reveals whether the database is designed for younger students or subject specialists such as biologists, physicians, or attorneys.

Coverage

The time period encompassed by particular databases is sometimes confusing to students. They may wisely note that a periodical database contains bibliographic citations from 1984 to the present. Unfortunately, their next step is to conclude that the database does not have any articles about the U.S. Civil War—even though it does contain several articles on that conflict written since 1984. Explain that the coverage of a database is critical only when students are required to access materials written *during* a specific time period. If they are required to cite materials about the Civil War that were written during the 1800s, the database America: History and Life, which covers 1982 to the present, is not appropriate. Landmark Documents in American History, which contains actual documents from 1492 to the present, is an appropriate choice.

Contents Availability

At this stage in their educational careers, students may have to choose a particular database because its contents are more readily available. A general versus specialized periodicals database will usually index periodicals that can be found more easily in SLMCs or local public libraries. Students who begin their searches at home need to be especially knowledgeable in this area. They may arrive at the SLMC the following morning with a list of suitable citations, only to find that the SLMC collection contains none of the books or periodicals they are seeking.

SUGGESTED LESSON PLAN

Library concept Choosing appropriate electronic databases.

Time requirements One hundred minutes (or two class periods) to explain and demonstrate different types of electronic databases and the criteria for selecting appropriate ones and to provide selection practice based on a specific class-related or librarian-created assignment.

Objectives

- To inform students about the vast numbers of online and CD-ROM databases.
- To enable students to classify databases by type in preparation for appropriate database selection.
- To have students use a criteria-based approach to database selection.
- To have students practice appropriate database selection with written and online assignments.

- To show students how to initiate their database selection from outside the SLMC.

Prerequisites Students should be familiar with the basic components of electronic databases and their standard features, limitations, potential fees, and searching capabilities.

Equipment needed At least one Windows-level computer with a modem and dial-up access to an electronic library that permits the searching of several electronic databases. At least one on-site electronic database, such as SIRS, EBSCO's Magazine Article Summaries, Readers' Guide to Periodical Literature, or National Geographic's Mammals.

Procedure

- Inform students about the benefits and drawbacks to searching electronic databases and demonstrate the six different types of databases by using on-site and dial-up access or Internet-accessible databases.
- Explain the different levels of database availability.
- Distribute the following written assignment and refer students to the database charts in this chapter so that they may make appropriate selections.
- Orally review their completed assignments to ascertain the suitability of their selections.
- Provide on-site, online, or CD-ROM-based practice by using either a course-related assignment or the suggested assignment.

Evaluation Depending on the grade level and ability levels, students can:

- Correctly classify databases according to type.
- Apply a criteria-based approach to database selection.
- Choose an appropriate database(s) based on their assignment.

SUGGESTED ASSIGNMENT

If time is limited, this lesson can be completed as homework. If a class is in the library for a specific course-related assignment, create topics that are related to the assignment. If time permits, create more questions of a similar type or reproduce these and assign one question to each student.

This sheet is to assist you in selecting the appropriate electronic database(s) for the following assignment. Refer to the database selection charts to aid you in making correct database choices. You may assume that an assignment such as a term paper is due in six weeks, a five-page assignment in one week, and anything less within three days.

1. A term paper about the benefits of campaign finance reform.
2. A five-page report about the potential abuses of drug testing in schools.
3. A three-page defense of mercy killing.
4. A term paper about the effects of tobacco advertising targeted at teenagers.

5. A five-page report about the character Heathcliff from Emily Brontë's *Wuthering Heights*.
6. A three-page report about the current status of global warming.
7. A term paper about the impact of the polio epidemic on children during the 1950s.
8. A five-page report about Rosa Parks and her contribution to the civil rights movement in the United States.
9. A three-page report about potential hazards when using the Internet.

Answer the following questions:

1. What is my topic?_____
2. What kinds of information am I searching for?_____
3. What level of research is needed? _____
4. How much information is needed? _____
5. Refer to your chart of database choices and select several databases to examine based on: (1) database title, (2) database description, (3) type of database, (4) content level, (5) coverage, and (6) contents availability. Write your selections in the spaces provided: _____

   _____
6. Rank the database(s) you chose by placing a 1 by your first choice, a 2 by your second choice, and so forth. _____

   _____
7. List at least three reasons for your first two database selections:

   _____

   _____

   _____

ADDITIONAL SOURCES

Diller, Karen R. "How to Choose the Best Index, or Where to Take Your Date for Dinner?" In Linda Shirato, ed., *Judging the Validity of Information Sources: Teaching Critical Analysis in Bibliographic Instruction*. Ann Arbor, Mich.: Pierian Press, 1991.

"FIRSTSEARCH SERVICE DATABASES." Dublin, Ohio: OCLC, January 1996.

"Help Sheets for Electronic Databases." http: www.lib.utah.edu/instruction/handouts.html (June 5, 1997). Contains a general guide of basic database search strategies and stresses their standard features.

Johnson, Margaret Ann. "Desperately Seeking Sources: Selecting Online Resources." *Technicalities* 15 (August 1995): 1.

O'Leary, Mick. *The ONLINE 100*. Wilton, Conn.: Pemberton Press Books, 1995.

Owen, Dolores, ed. *Abstracts and Indexes in Science and Technology: A Descriptive Guide*. 2d ed. Metuchen, N.J.: Scarecrow Press, 1985.

Whiteley, Sandy, ed. *Guide to Information Access*. New York: Random House, 1994.

Internet Search Tools and Techniques

7

Rationale for Change

The Internet has become one of the main reference tools that students use to find information. As the amount of information on the Internet increases exponentially, students need to be able to execute simple and advanced queries by using a variety of Internet search tools. Librarians need to teach Boolean logic, proximity indicators, and limited operators as a means of successfully enabling students to broaden or narrow Internet searches.

INTRODUCING SEARCH TOOLS

"Why do I need a search tool to navigate the Internet?" is a frequently asked question by beginning searchers. When they hear that the number of Web sites is increasing by approximately 3,000 percent a year, they begin to grasp that Internet sites are expanding faster than anyone could possibly visit. The Internet contains more than ten thousand Web servers, hundreds of thousands of hypermedia documents, images, sounds and video files, and millions of subjects.

Search tools are computer programs that search the Internet on a periodic basis ranging from hourly to yearly, collecting information about new Internet documents and servers. Many also provide a form on the Internet for people who have created Internet documents to send in specific details for possible inclusion in a search engine's database. Depending on the search tools criteria, the information collected may contain either part or all of the following information: names and addresses of home pages, information about page contents, or the full text of a document or multimedia file.

Students connect to a search engine by entering the URL address into the browser they are using. They can also connect to search engines by way of other Internet users' home pages. Many Internet users have placed a list of accessible search engines on their own homepages for others to use without charge. The search tool's homepage will appear, providing an opportunity for students to enter keywords or phrases in a fill-in box. After typing the term(s) in the box, students press the Enter key or click on the word(s) *find* or *submit,* and the search engine looks for resources that match their search terms.

The result of a search is a list of Internet sites or locations that may or may not contain the requested information. Students need to scan the site titles, which sometimes have a brief description attached, to determine which ones seem appropriate. If a site appears promising, they click on it and begin to skim and burrow through the various hyperlinks to find additional information.

The Internet is in the larval stage of development. As designers of search tools learn more about indexing and abstracting principles, these tools will become more sophisticated. Students should expect frequent changes in the offerings and formats of various search tools. Because so many sites are being added to the Internet, one search tool can never contain all of them in its database, so students must employ several when searching for information.

There are about twenty-three frequently used Internet search tools that students may access. Some of the most popular are WebCrawler, Alta Vista, Lycos, InfoSeek, Inktomi Web Service, Excite, Yahoo!, Magellan, and World-Wide-Web Worm. The popularity of these search tools sometimes affects their response time. Depending on the time of day and the level of Internet activity on a search tool, response time may vary greatly—another reason that students should either bookmark several search engines or mount them as additional Internet sites on their own or SLMC homepage.

TYPES OF SEARCHING TOOLS

There are two types of search tools for locating Internet resources: subject directories and search engines. Knowing the difference between them can save students time and direct them to appropriate information sources quickly. Almost all of them, with the exception of Library Corporation's NlightN Universal Index and InfoSeek, are free of charge. InfoSeek still supports free trial searches of 100 per subject. After 100 transactions, users are asked to subscribe to InfoSeek and pay for their searches.

Search Engines

Search engines, often referred to as spiders, worms, and crawlers, are software programs that roam all over the hypertext structure of the Internet,

scanning for new sites by following hypertext links from page to page in a document. These software programs sort newly found data links into keyword-searchable indexes.

Search engines accumulate vast numbers of data links and corresponding numbers of keywords to enter as search terms. Because search engines are using free text versus controlled vocabulary indexing, they are most likely to retrieve a large number of sites, only some of which may be relevant. Most search engines provide a series of search options to help users broaden or narrow their search. They also furnish display options that rank search results by the frequency that search terms appear in each document.

Subject Directories

Since search engines retrieve vast amounts of information, software designers realized that programs were needed to organize and categorize information even further to facilitate access to it. Subject directories were subsequently designed that attempted to classify complete Internet sites, not just individual Internet pages, by broad subject categories such as business, entertainment, law, medicine, and so forth. Some subject directories are supported by advertising to enable users to have free access. Examples of subject directories are Yahoo!, Magellan, and Lycos.

Search Engines Versus Subject Directories

A second frequently asked question concerns the decision to use a search engine or a subject directory. This problem seems to have a solution as search tools become more sophisticated and offer both options. Some search tools such as InfoSeek are supporting a search engine vehicle that also provides a directory of related search terms in an adjacent column to the sites retrieved from a keyword search. In the near future, users will have the opportunity to search by either keyword or by a subject category within the same search tool. A merging of the two functions is definitely on the electronic horizon. In the meantime, students should try a subject directory tool if they have a specific topic and wish to browse. If their search results are sparse, they can switch to a search engine because it will search a wider number of sites and may retrieve something very helpful.

SEARCH TOOLS

The following list of search tools was excerpted from a set provided by ICONnect (http://www.ala.org/ICONN), an Internet site sponsored by the American Association of School Librarians. In addition to a list of search engines, it contains information about courses on the Internet, library curriculum materials, listservs (electronic subject-specific discussion

groups), library policies, and an overview of annotated Internet sites related to reference sources and school library science matters. It is an excellent reference point for locating Internet tutorials about various aspects of the Net. Search engines and subject directories are listed together because of their potential to merge functions in the future. A separate listing for search tools that query multiple search engines simultaneously is also included for the convenience they offer searchers.

Megasearch Engines

All-in-One Page: http:/ /www.albany.net/allinone/ A convenient compilation of various form-based search tools such as Alta Vista, Lycos, Yahoo!, WebCrawler, and fourteen additional search tools. Users can specify sources and types of information to be searched, including Web resources, people, commercial sites, technical reports, news, software, reference, images, and entertainment.

The Mother Load: http:/ /www.cosmix.com/motherload/ A searchable directory of search engines and directories to help narrow search results to a relevant, retrievable level. It also supports a fast search of five to nine search engines that can collate hits, eliminate redundancies, and display them in a relevant ranked order. Includes an "Insane Search," which permits searching of newspapers, periodicals, government documents, mailing lists, news groups, and more.

Query Interface to the WWW Home Page Broker: http:/ /www.aii.net/search.html A quick route to various Internet search engines, including Archie, Jughead, Veronica, and Deja News-Usenet. Contains a variety of search forms for more than fifty search engines, including those that search multiple sites concurrently.

Savy Search: http:/ /www.cs.colostate.edu/~dreiling/smartform.html A search engine selector that accepts a search phrase and transparently submits it to several search engines. Users can then be searching several search engines concurrently. It also includes e-mail addresses, Usenet, FTP sites, Gopher, and Web space.

SuperSearch: http:/ /www.robtex.com/search/search.htm A compendium of search engines that contains a query box and list of twelve search tools that the user may choose. After selecting a specific number of search tools, users enter a query and click on Go. The program searches each engine and provides a list of relevant sites.

Search Engines and Directories

Alta Vista: http:/ /www.altavista.digital.com The favorite of many users because of its hit rate and response time. It offers simple and advanced queries of approximately 8 billion words in 16 million pages and claims to

be the largest Web index. It also furnishes users with the full-text index of more than 14,000 news groups.

C/Net Search.Com: http:/ /www.search.com/ A directory of 250 search tools combined with a directory of search subjects. Search engines are organized alphabetically and by category.

EINet Galaxy: http:/ /www.einet.net/galaxy.html A search engine and subject directory that supports all words or any word in a phrase and looks for those terms in the full text, titles, and hyperlinked parts of all its indexed documents. Galaxy's searches may be executed in the directory mode by selected topic or in a general search mode.

Excite: http:/ /www.excite.com/ A search engine that includes more than 1 million Web documents and the past two weeks of Usenet news and classified ads. Excite supplies NetReviews, a service that evaluates Internet sources for content quality and an up-to-the-minute news base.

The Harvest Information Discovery and Access System: http:/ /harvest.cs.colorado.edu/ This searching tool indexes documents from Web, FTP, and netNews servers. It supports queries using keywords, Boolean, limiting, and proximity operators and uses a series of search engines called brokers, gatherers, and caches to locate information. Searching appears more complicated with this search tool than with the others listed here.

HotBot: http:/ /www.hotbot.com/ This search engine, a product of HotWired and Inktomi, claims to have indexed every word in the WWW and to possess a more flexible and powerful system than Alta Vista or Yahoo!

InfoSeek: http:/ /www2.infoseek.com A commercial Internet searching tool that charges users per query after the first one hundred matches. It browses Web pages, Usenet news groups, FTP, and Gopher sites. It is also a directory and can search for information within categories such as arts and entertainment, business and finance, computers and internet, education, and so forth. Each site, when available, has a hyperlink to similar pages about the queried subject.

Inktomi Web Services: http:/ /www2.daa.de/~sr/inktomi.html/ A member of the NOW (Network of Workstations) project at the University of California at Berkeley, Inktomi is considered the first fast search engine with a large database. It counts only the number of documents actually retrieved from the Web, for a total of 1.3 million URL documents, as opposed to 1.18 million for Lycos, 200,000 for InfoSeek, and 150,000 for Webcrawler.

Lycos: http:/ /www.lycos.com/ Supported by Carnegie Mellon University, Lycos is a search engine that claims millions of link descriptors and documents retrieved by a Web crawler that searches daily. It searches titles, headings, hyperlinks, and keywords.

Magellan: http:/ /www.mckinley.com A subject directory that enables users who know their topics to select a subject category first and then begin their search. Magellan tries to help users narrow searches and retrieve only relevant items.

Metacrawler: http:/ /metacrawler.cs.washington.edu Combining a search engine with a subject directory, Metacrawler supports either a fast or comprehensive search and allows the user to indicate the type of site desired by specifying an organization category.

Open Text Web Index: http:/ /www.opentext.com A combination search engine–directory tool that claims to have indexed every word of every Internet page that their search engine has found. This index currently totals 21 billion words and phrases. It supports queries of any length or searching by title or hyperlinks.

RBSE's URL Database: http:/ /rbse.jsc.nasa.gov/eichmann/urlsearch.html A subject directory consisting of millions of URLs, it is useful as a last effort to open a location when other search engines have failed.

WebCrawler: http:/ /www.webcrawler.com This search engine–subject directory was the prototype Internet search engine. It builds indexes for documents it finds on the Web. It supports all words or any word-in-a-phrase searching, and users may employ limitors to refine their search queries.

World-Wide-Web Worm: http:/ /www.cs.colorado.edu/wwww Named Best of the Web in 1994, this search engine navigates through 3 million URLs and 2 million people each month. Includes a "hot issues" and a VOTELINKS VOTE page that provides users an opportunity to electronically vote for their favorite Internet sites. Supports a variety of search parameters, including a URL search option.

Yahoo!: http:/ /www.yahoo.com/search.html One of the oldest subject directories on the Internet, Yahoo! lists sites, classifies them into subject categories, and provides the linkage to these sites.

Subject-Specific Search Tools

The following search tools are engines or directories that students can use for a specific searching purpose. They are listed on the I-Connect home page: http:/ /www.ala.org/ICONN/ (click on Curriculum Connections).

E-Mail Search Engines

- Four11 Internet White Page Directory: http:/ /www.Four11.com
- OKRA: net.citizen Directory Service: http:/ /okra.ucr.edu/okra/
- The White NetPages: http:/ /www.aldea.com/whitepages/white.html
- InterNIC Directory Services "White Pages": http:/ /www.mercy.com/depart/is/internet/internic.htm
- Netfind: http:/ /www.cob.asu.edu/misc/netfind.html

Telephone Number Searching

- Database America's People Finder: http:/ /www.databaseamerica.com
- Switchboard: http:/ /www.switchboard.com/

Listserv and Usenet News Groups Searching

- Directory of Scholarly Electronic Conferences: http://n2h2.com/KOVACS/
- Tile.Net/Listserv: http://www.tile.net/listserv/
- Inter-Links: http://www.nova.edu/Inter-Links/listserv.html
- DejaNews Research Service: http://www.dejanews.com/forms/dnq.html

Specific Academic Subjects and Specialized Lists Searching

- Academic Institutions—Christina DeMello's List of Colleges and Universities: http://www.mit.edu:8001/people/cdemello/univ-full.html
- Agriculture and Related Sciences: gopher://ukoln.bath.ac.uk:7070/11/Link/Tree/Agriculture/Agriculture
- Art History Information: http://www.gii.getty.edu/gii/index1.html
- Biodiversity and Biological Collections: http://muse.bio.cornell.edu/
- Chorus—Arts and Humanities: http://www.chorus.cycor.ca/chorus.html
- Engineering—Engineering Library at the University of Michigan: http://www.engin.umich.edu/library/NET/Electronics.html
- Humanities Resources: http://www.csun.edu/~jhartzog/chrec.html
- Law Resources: http://www.lawmall.com/lm_resou.html
- Nonprofit Organizations on the Internet: http://philanthropy-journal.org/plhome/plmeta.htm
- Planet Earth Virtual Library: http://www.nosc.mil/planet_earth/info.html
- Scott Yanoff's Special Internet Connections List: http://www.spectracom.com/islist/
- Educational Technology Page of the Virtual Library: http://agora.unige.ch/tecfa/edutech/welcome_frame.html
- Argus Clearinghouse (Clearinghouse for Subject-Oriented Internet Resource Guides): http://www.clearinghouse.net/
- University of Toronto Library Subjects Index: http://library.utoronto.ca/www/subjects.html

TYPES OF INTERNET SEARCHES

As the Internet expands, software programs are being designed to provide users with a series of search options to facilitate access. The first option is usually termed a simple, first, quick search, or query. Sometimes it is the default option and the first fill-in box that the user sees on the screen. A *simple query* prompts the user to enter a keyword(s) or a phrase (sometimes enclosed in either double quotations or brackets) and click on the Submit or Find box on the screen or press the Enter key on the keyboard.

The second type of search is called an *advanced search.* (It also may be called a power, expert, or comprehensive search.) Advanced searches are sometimes listed as an option along with simple searches. Users select which one they wish to employ. Many search tools, however, require users

to click on Help, Search Language Help, Search Tips, screens, and advanced search icons embedded in the search tool's home page to initiate this type of Internet search. When students select an advanced search, they will encounter a series of fill-in box options or a page of written instructions and examples for deploying Boolean logic, proximity, and limiting operators.

Advanced Internet search options are similar to the fields in electronic databases. Depending on the search tool, students can:

- Search for a single word or a group of words.
- Search for phrases of either any or determinate length.
- Search for combinations of words and phrases.
- Employ Boolean operators AND, OR, and NOT.
- Employ proximity operators such as NEAR or ADJACENT.
- Employ limiting operators such as NOT.
- Employ truncation.
- Search for URLs only.
- Search only titles and headings of pages.
- Search by geographic region.
- Search by subject.
- Search by site type (commercial versus academic).

SEARCHING TECHNIQUES

All search tools provide a Help or Searching Tips screen to explain their advanced search options. The directions are usually accompanied by excellent examples. Because search tools are still evolving, students should be prepared for changes in formats, command structures, and display options. Instead of teaching them the query syntax for various search tools, introduce them to the standard features and strategies. Once they have the ability to expand or narrow their searches by using Boolean, limiting and proximity operators, phrases, and the correct sequence of keywords, they can easily master the idiosyncrasies of individual search tools.

Boolean Logic

The three Boolean operators AND, OR, and NOT are supported by almost all Internet search tools. Students must understand the correct use of these operators if they are to be successful searchers. There are two ways to introduce Boolean logic concepts. One is to use Venn diagrams that show adjacent individual circles to illustrate the concept of OR and overlapping circles to demonstrate the concept of AND. Another way is to use

a simple analogy, introduced by Donald A. Barclay in *Teaching Electronic Information Literacy* (1995).

In this analogy, Boolean cafe logic is considered the reverse of cafe logic. In a real cafe, an order of "soup and salad" means you receive *more*: soup *and* salad. In the Boolean Cafe, an order of "soup AND salad" means you receive *less*. If dining at a Boolean Cafe, students would be eating something that was both soup *and* salad—say, minestrone salad or tomato salad soup. Yet in a regular cafe, an order of "soup OR salad" means that you receive less—soup *or* salad but not both. If you were in the Boolean Cafe, an order of "soup OR salad" would result in a delivery of every soup and every salad being brought to your table. In both cafes, the word NOT is the same. Placing an order for "soup NOT salad" means that you would receive soup but no salad. Barclay recommends demonstrating this analogy with bowls and plates to help students visualize the concepts. After a demonstration and explanation of this important concept, students should also know that some Internet search tools are employing AND and OR as default operators when keywords are entered in a sequence.

One of the most important skills students need to master is when and how to expand or narrow their searches to improve their match results. Many times they do not realize that they have the option, and they abandon searching because they think that there is nothing on the subject or they change their topic because they have found too much information.

Expanding Searches

Searches should be expanded when students realize that they do not have a sufficient number of resources to complete the assignment or when they receive no match results. Rather than changing their topic, encourage them to consult the following tools:

- Thesauri such as Roget's *The New Thesaurus* (Berkley 1966) or *The Synonym Finder* by J. I. Rodale (Warner Books 1986)
- *Library of Congress Subject Headings*
- Online catalog for related subject terms
- Encyclopedia for an overview of the subject

They should also reenter their search terms and employ the following operators:

- Boolean OR, to combine the new synonyms that they have found in the previous sources or thought of themselves.
- Truncation, which involves placing a symbol (*, !, ?, or $) at the end of a root word (e.g., "ring*"). It commands the database to retrieve all words that begin with that root. Students may notice that some search tools are using truncation as a default operator for all forms of keyword searching.

Narrowing Searches

Searches should be narrowed when students have more than enough resources to complete their assignment or receive more than one hundred search match results. If they remain interested in their topic, encourage them to narrow it by:

- Restricting the topic to a problem or question.
- Narrowing the subject topically (e.g., automobile industry to Ford Motor Company).
- Narrowing chronologically (e.g., century to decade).
- Narrowing geographically (e.g., volcanoes to volcanoes in the Cascades Range).
- Narrowing spatially (something in relation to someone or something else).
- Narrowing it by dividing and subdividing it.

They should also reenter their search terms and employ the following operators:

- Boolean AND. This operator is used to couple two or more search terms to increase search results. Students can also use the Boolean AND to link separate groups of synonyms that have been combined by a Boolean OR. For example, the command "bread OR rolls AND chocolate" will search for all Internet sources containing the words *bread or rolls with* the word *chocolate.*
- Boolean NOT. The use of Boolean NOT will narrow a search by excluding documents containing keywords that might muddle search results. For example, the command "peanut AND butter NOT jelly" will search for all Internet documents containing the words *peanut and butter* but *not jelly.*

Proximity Operators

Many Internet search tools support proximity indicators to help narrow searches. They can be used to retrieve documents that appear within a specified number of words from each other or next to each other (in the same sentence or perhaps paragraph). They use command words, such as NEAR, ADJ (for adjacent), or keyboard symbols or punctuation such as double quotation marks, hyphens, parentheses, brackets, and commas, to increase search precision.

Limitors

Internet search tools are just beginning to provide commands that help limit searches. The use of a period at the end of a word limits expansion. Users may also specify how many results they wish to retrieve at one time. Searching by only URL (Uniform Resource Locator) or site title is also a form of limiting.

The use of a pathfinder or search tool command guide to help students recall the purpose of each command is especially useful. If they are using the same search engines and directories to look for information, they may wish to note which commands are employed by that search tool in the pathfinder below:

Search Tool Commands

Purpose	Command	Example	Finds All Documents Containing . . .
Increase precision	Capitalize names	Charles Boycott	"Charles Boycott" but not "boycott" or "Boycott"
Increase precision	Use commas between different names	Martin Sheen, Charlie	"Martin Sheen" or "Charlie" but not "Martin Sheen Charlie"
Increase precision	Use FOLLOWED BY in which words appear within 80 words of the first keyword	gender FOLLOWED BY bias	"gender" within 80 words of "bias"
Increase precision	Use NEAR in which both words appear within 25 words of each other	Brazil NEAR rainforest	"Brazil" within 25 words of "rainforest"
Increase precision	Use parentheses to simplify complex queries	Alice NOT (Australia or Waters)	"Alice" but NOT "Alice, Australia," or "Alice Waters"
Increase precision	Use brackets around words appearing within 100 words of each other	[Olympic games]	"Olympic" and "games" within 100 words of each other
Increase precision	Use NOT in front of a word that must not appear in the search results	pie and NOT apple	"pie" but not "apple"

Purpose	Command	Example	Finds All Documents Containing . . .
Increase precision	Use a plus sign in front of a word that must appear	chip + chocolate	"chocolate" and possibly "chip"
Narrows search	Use quotation marks around words appearing next to each other	"information literacy"	"information" and "literacy" next to each other
Narrows search	Use ADJ in which two words should appear next to each other	electronic ADJ literacy	"electronic" and "literacy" next to each other
Narrows search	Use hyphens between words appearing within one word of each other	super-computer	"super" and "computer" within one word of each other
Narrows search	Use a minus sign in front of a word that must not appear in the search results	newt -Gingrich newt-Gingrich	"newt" but not "Gingrich"
Narrows search	Use a period ("dot") at the end of a word to limit expansion	tank.	only the word "tank," not "tankers"
Narrows search	Use AND between words you wish together	bread and chocolate	"bread" and "chocolate"
Expands search	Use an asterisk (*) after a keyword to expand a search	fly*	"flying" and "fliers"
Expands search	Use $ after a keyword to expand a search	plumb$	"plumber," "plumbers," and "plumbing"
Expands search	Use OR between words to expand search results	International Business Machines OR IBM	either International Business Machines or IBM

BROWSING CRITERIA

Despite the deployment of commands to increase precision in searching, the Internet still contains a vast amount of useless information that may match student search terms. The following criteria will help students evaluate as they browse.

Source. Who authored the Internet document? What is the person's subject expertise? The contributor's name and credentials should be visible. If the information is critical, verify it in another source.

Site Level. If students have hyperlinked three levels into the site and are still seeking content, they should exit and search another site. Content, if it is there, should be readily available by the first or second hyperlink.

Site Objectivity. Examine every site as if it contained propaganda. Tell students to determine if the information appears biased, limited, or written from a specific perspective. Be especially alert for documents that may have been written for commercial purposes.

Timeliness. The date for entry or revision of an Internet site is extremely relevant if students need recent statistics, lists, or information. Make sure that this type of information is dated and sourced. Current census data, for example, should be from the most recent census.

Site Suitability. Students need to determine if the site is appropriate for their assignments. Are the language, graphics, and content relevant and valid for what they have been assigned to do?

Site Organization. This element should not be the sole determining factor for rejecting a site, but it is relevant to an overall evaluation. Are there, for example, appropriate hyperlinks to the homepage from lower-level pages? Is the material structured in a linear fashion, or do students lose their way in a maze of hyperlinks? Do the contents reflect the menu description?

Site Relevance. Are the links relevant to the subject? Do they appear to be logically connected?

Site Images. Does the site use graphics, icons, and images in gimmicky fashion rather than to illustrate a principle or increase understanding of an idea or concept?

RETRIEVAL OPTIONS

Just as search options and techniques are evolving on the Internet, so are retrieval options. The search tool that students select determines the choices they have to display or print Internet documents. As more information expands the size of search databases, software programs will be designed to help users retrieve only necessary documents. Currently search tools offer a variety of the following retrieval options:

- *Term matching.* Some search tools provide the opportunity for users to select how many of their keywords need to match in various Internet documents.

- *Relevance ranking.* Depending on the search tool, users may select whether their keywords should appear in the first few words of the documents or the title of a Web page, header, or text of the document. Other search engines perform this task by default and list the retrieved sites according to the same ranking system.
- *Timed response.* This option provides users with the means to limit how long they wait for document retrieval. If they respond "quick" or specify a short period of time, the search tool will allow a specified number of minutes for each remote search engine to produce data. This option is important if students are downloading sites with many graphics that require extra time to retrieve.
- *Display style.* Search tools offer users choices in the styles they wish data to be displayed. Framed Style furnishes navigation and Web site descriptions next to one another. Fast Style displays documents in the same format but retrieves fewer graphics to speed download time. Basic Style supports a traditional Web site listing followed by annotations to accommodate Internet machines that do not support graphics.
- *Query modes.* Some search engines give users a mode choice. One option displays the results immediately after retrieval from remote search tools. The other, sometimes referred to as the verification mode, loads and verifies each document to ensure its relevance to the search terms.

Number of Hits

Because of the potential for thousands of documents to result from one search, software designers are furnishing options to users to select a precise number of hits or matches that they will peruse. Others display a prescribed number of hits and require the user to request additional ones by exercising a command option.

File Transfer Protocol (FTP)

The last retrieval option is the most precise. It allows users to transfer files from another computer to their own. If, for example, a student discovers a relevant fifty-page document listed as an FTP file, he or she may download it onto his or her own hard drive or floppy disk. To do so, the user must have the following data: (1) the name of the other computer (the "ftp host"), (2) the name of the directory in which the desired file resides, and (3) the name of the file the student wishes to transfer to his or her computer.

This form of Internet retrieval is sometimes the only means to obtain the full text of a document. Students should always check the size of the file(s) to be transferred, since many are large enough to take up considerable space on computer hard drives.

IMPROVING SEARCH RESULTS

After students have been introduced to Internet search tools, search techniques, and retrieval options, they still need some commonsense guidelines for improving their search results. They can consult the Help page of the InfoSeek search engine (http://guide.infoseek.com) for detailed assistance with each point below:

- When time permits, use a variety of search engines and subject directories.
- Try using synonyms or variations of words.
- Use phrase searching whenever possible.
- Check syntax and spelling.
- Search for additional sites similar to ones you found helpful.
- Refine your search by the use of Boolean and proximity operators.
- Try again if you are unsuccessful the first time.

INTERNET IDIOSYNCRASIES

Despite all the search options, the Internet is idiosyncratic, because it does not use controlled vocabulary and has definite serendipitous responses to some precise queries. When students seem to have done everything right and still get no results, here are some possible reasons:

- The document is new, and the search tool has not added it to its database.
- The document is protected and is not available to the public.
- The document may have been renamed or removed by the owner.
- The server containing the document may be down at the moment.
- Access restrictions may have been imposed since the last retrieval time.
- The server containing the document may be so busy that attempts to connect to it time out.
- The search terms may not exist in the searchable parts of the document.
- The connection at the client end may be down or broken.

INTERNET TUTORIALS

One of the best ways to learn about the Internet is to use a tutorial while connected to it. The following sites offer tutorials that may be useful for reinforcement or to introduce students to other aspects of the Internet such as listservs or e-mail. Remember to bookmark them or add them to your SLMC's home page.

Monster FTP Sites List: URL: http://wc2.webcrawler.com/select/netinfo.74.html Contains a huge collection of annotated file transfer protocol

sites. It also includes an excellent "Frequently Asked Questions" (FAQ) section about what, when, and how to do file transfer protocols.

Netscape Tutorial Caroline County Public Schools: URL: http:/ /cl.k12.md.us/nstutor/netscapetutorial.html Features an excellent online tutorial for using Netscape's Navigator. The easy-to-follow instructions guide users through the fundamentals of searching on the Internet.

Internet Explorer Tutorial: URL: http:/ /jrbnt.vuse.vanderbilt.edu/workshops/iexplore.htm Contains a two-part online tutorial about how to use the main menu of Microsoft's Internet Explorer.

"Junior Surf Session:" URL: http://www.ncs.cathedral.org/library/upper/search.htm A valuable Internet site that provides tutorials for both Internet browsers: Netscape's Navigator and Microsoft's Internet Explorer. In addition, it contains the basic Internet functions and concepts from a Netscape online handbook.

"A Guide to Getting Started on the Internet": URL: http:/ /www.imagescape.com/helpweb/ Provides a user-friendly instructional guide for all basic Internet functions ranging from bookmarking and e-mail protocols to file transfer protocols (FTP).

SUGGESTED LESSON PLAN

Library concept

Using various Internet search tools and techniques to find information.

Time requirements

Two fifty-minute periods to introduce and demonstrate various Internet search engines and subject directories; explain and show the difference between simple and advanced searches; teach and demonstrate Boolean logic, proximity operators, and limitors; and practice searching for course-related or librarian-created information on the Internet.

Objectives

- To teach students how to use search engines and subject directories.
- To demonstrate and practice simple and advanced Internet searches.

Prerequisites

Students should have a working definition of the Internet and a vocabulary of common Internet terms, such as *matches, hits, sites, URLs,* and *hyperlinks.*

Equipment needed

At least one Windows-level computer equipped with Netscape's Navigator or Microsoft's Internet Explorer and access to the Internet.

Procedures

- Explain and demonstrate the differences among some of the search engines and subject directories on the list provided.
- Explain and show the difference between a simple and an advanced Internet search.
- Review the Boolean cafe analogy, and show students how to expand and narrow searches.

- Post a copy of the chart that shows the different search tool commands.
- Review browsing criteria, retrieval options, improving search results, Internet idiosyncrasies, and Internet tutorials.
- Use either a course-related topic or the suggested assignment that follows, and provide opportunities for students to practice the objectives.

Evaluation

Depending on the grade and ability levels, students can:

- Successfully perform a simple and advanced search on at least two search engines and one subject directory.
- Retrieve three documents that match their search terms.

SUGGESTED ASSIGNMENT

This assignment is to acquaint you with Internet search engines and search directories.

Part I: Simple Search

Select two search engines and one subject directory from the list provided in this chapter and perform a simple search in each one. Answer the following questions about your search.

Assignment: Find information about terrorism.

1. Title of Search Engine Number 1 _____

   How many matches did you retrieve? _____

   Using the Internet Evaluative Criteria as a guide, list the titles of three sites that provided appropriate overview information about terrorism:

   http:// _____

   http:// _____

   http:// _____

2. Title of Search Engine Number 2 _____

   From the sites listed above, narrow the topic terrorism geographically, chronologically, or by specific event or type. List three subtopics under terrorism:

   A. _____

   B. _____

   C. _____

   Select an Internet subject directory from the list and enter the subject terrorism.

3. Title of Subject Directory _____

   From your search of various Internet sites, list two synonyms for the topic terrorism.

   A. _____

   B. _____

Part II: Advanced Search

Select two new search engines and one new subject directory, and perform an advanced search in each one. Answer the following questions about your search.

Assignment: Find information about children in the Oklahoma City bombing.

1. Title of Search Engine Number 1 _____

   How many matches did you retrieve? _____

   What was the difference in the number of sites retrieved from the simple search and this advanced one? _____

2. Title of Search Engine Number 2 _____

   Give the titles of three sites that provided information about this topic:

   http:// _____

   http:// _____

   http:// _____

   Were these three titles retrieved when you used the first search engine?

   Yes _____ No _____

3. Search Directory Name: _____

   Search for the same topic. Did you find anything that was helpful in this directory that was not cited in the previous two engine-type searches? _____

   _____

ADDITIONAL SOURCES

Barclay, Donald A. *Teaching Electronic Information Literacy*. New York: Neal-Schuman, 1995.

Eager, Bill. *Using the World Wide Web*. Indianapolis, Ind.: Que Corporation, 1994.

Harmon, Charles, ed. *Using the Internet Online Services & CD-ROMs for Writing Research and Term Papers*. New York: Neal-Schuman, 1996.

Harris, Judi. "Electronic Packaging: File Types for File Transfer." *Computing Teacher* 20 (October 1993): 14–16. Also available at URL: http://www.ed.uiuc.edu/Mining/October93-TCT/October93-TCT.html

Hawn, Matthew. "Seek and Ye Shall Find: Searching the Web." *MACWORLD* 13 (May 1996): 123–27.

Notess, Gregg R. "Searching the World Wide Web: Lycos, Webcrawlers and More." *Online* 19 (July–August 1995): 48–53.

Stripling, Barbara K., and Judy M. Pitts. *Brainstorms and Blueprints Teaching Library Research as a Thinking Process*. Englewood, Colo.: Libraries Unlimited, 1988.

Tiefel, Virginia. "Innovative Applications of Technology." In Linda Shirato, ed., *Working with Faculty in the New Electronic Library*. Ann Arbor, Mich.: Pierian Press, 1992.

Identifying Electronic Resources

8

Rationale for Change

Computers make it possible for users to search for information in a variety of formats. Students need to be able to identify electronic record formats so they can choose the most appropriate library to retrieve those records, request them from the appropriate holding library or commercial vendor, and make decisions concerning their relevancy.

VIEWING ELECTRONIC RECORDS

As more materials are entered into electronic databases, their format becomes increasingly confusing to students. This problem is compounded by the different online and CD-ROM screen display formats. Some CD-ROM databases provide the words *journal title* on the screen to show users that they have located an article from a specific periodical. Others simply assume that the title of the journal is sufficient information to alert users that they have accessed an article from a periodical.

Most online catalogs provide title information about periodicals but require users to search other screens for holdings and location information. Large online catalogs do not search for materials by format. If users enter a subject search, they are likely to receive a list of records containing items from the reference, book, microform, government document, and perhaps media collections. Being able to identify the type of material shown on the screen and deciding its relevance and availability are two major electronic

information skills that students need to perform to conclude information searches successfully.

PRESEARCHING CLUES

Before searching an electronic information resource, students need to determine the type of database that they are searching. The title may contain a brief description of the database contents. Students should be looking not only for the subjects that the database covers but also whether it contains citations or full text from books, periodicals, microforms, or government documents. The word *citation* is important because it indicates only the identifying information of a record, such as author, title, publisher, and copyright date. The contents of that item must be located elsewhere—either in a library or through a document delivery service.

RESOURCE FORMAT

Trying to establish whether a particular electronic resource is single or multiformatted can be difficult for students. Online catalogs are multiformatted and contain citations of books, media (videocassettes, recordings, films, etc.), government documents, microforms, and periodical titles. The Internet is also multiformatted. Students may find video clips, full-text documents, government reports, bibliographies, audio clips, graphics, maps, and so forth when they search the Internet.

Searching other electronic databases requires a closer examination of the database contents description. In general, periodical databases provide citations or full text to magazines and newspapers. Subject-specific databases, such as ERIC, provide citations and abstracts to books, periodicals, and documents. The latter are in microform or may be purchased in hard copy from ERIC.

CLASSIFYING BEFORE RETRIEVING

Students should learn to identify the format that materials are in from the screen results. If they visit a library with a citation for an item they believe is a book, only to find that it is a videocassette, they will become increasingly frustrated and discouraged with searching. Most electronic databases contain one or more of the following information formats: reference books; books or monographs; periodicals; newspapers; government documents and reports; media such as videocassettes, recordings, and films; and microforms. Once students have placed a record into one of these seven categories, they need to examine the record, if they are still interested, for further clues, such as location, availability, length, and relevance.

PRINT ELECTRONIC RECORDS

Book

The search request for the following books was performed by entering K <keyword> = Morrison Toni. Note that this search request retrieved materials *by* Toni Morrison and *about* Toni Morrison's fiction. Many times, students do not discern the difference between the two types of works until they actually retrieve the items from the shelves.

By the Author

Title: Beloved: a novel / **by** Toni Morrison.

Author/Contributor: Morrison, Toni.

Edition: 1st ed.

Publisher/Date: New York: Knopf: Distributed by Random House, 1987.

Description: 275 p. ; 25 cm.

ISBN: 0394535979

Location: GA: UNIV General Stacks

Call Number: 813.54 M67b, 1987

Status: Not checked out

About the Author's Works

Title: Toni Morrison's fiction / Jan Furman.

Author/Contributor: Furman, Jan.

Publisher/Date: Columbia, S.C.: University of South Carolina Press, c1996.

Description: 123 p. ; 24 cm.

Subjects: (Searching using s=)
Morrison, Toni—Criticism and Interpretation.
Women and literature—United States—History—20th century.
Afro-American women in literature.
Afro-Americans in literature.

Note(s): Includes bibliographical references (p. [115]–120) and index.

Contents: Understanding Toni Morrison—Black girlhood and Black womanhood: the Bluest eye and Sula—Male consciousness: Song of Solomon—Community and cultural identity: Tar baby—Remembering the "disremembered": Beloved—City blues: Jazz—Literary and social criticism: Playing in the dark.

Series: (Searchable t= or k=)
Understanding contemporary American literature

ISBN: 1570030677

Location: GM: JOHNSON CTR Stacks

Call Number: PS3563.08749 Z65 1996

Status: Not checked out
Location: GM: FENWICK Main Stacks
Call Number: PS3563.08749 Z65 1996
Status: Returned on 7/24/96

Chapter in a Book

A chapter or essay in a book is one of the most difficult types of electronic records to identify, because the citation may be accessed from an electronic database that also contains citations of books and periodicals. Here is an example:

Title: Eating disorders
Author(s): Hendren, Robert L.
Berenson, Claudia K.
Institutional Affiliation: U New Mexico, Div of Child & Adolescent Psychiatry, Health Sciences Ctr, Albuquerque, NM, US
Source: Diagnosis and psychopharmacology of childhood and adolescent disorders (2nd ed) (Jerry M. Wiener, Ed.), pp. 449–469
Publisher: John Wiley & Sons, New York, 1996 NY, US

For this work, the search was for information regarding eating disorders. The search retrieved a book chapter titled "Eating Disorders," written by Robert L. Hendren and Claudia K. Berenson. The chapter was published in a book titled *Diagnosis and Psychopharmacology of Childhood and Adolescent Disorders*. The primary identifying characteristic of the book (compared with a periodical article) is the citing of a publisher. Book display records show the total number of pages. Chapter in a Book displays indicate the pages containing the chapter rather than the length of the book. Students who have retrieved a chapter in a book must now search an OPAC to ascertain the book's call number, location, and availability.

Reference Work

Here is an example of a citation from a reference work:

Title: Encyclopedia of government and politics / edited by Mary Hawkesworth and Maurice Kogan
Other Authors/Contributors: Hawkesworth, M. E., 1952–
Kogan, Maurice.
Publisher/Date: London; New York: Routledge, 1992.
Location: GM: FENWICK Reference (**Non-Circulating**)

Call Number: JA61 .C66 1991
Status: **Enter HOL 1 for holdings**

Noting the call number, location, and circulation status of an item is important if students are to become proficient searchers. In this case, neither the call number nor the circulation status alerts users that the book has been classified as a reference work. The location, however, does indicate that this is a reference work and *may not* be borrowed.

Students should also understand that additional screen record displays will supply them with information that can aid them in deciding whether to search further for an item. In the reference work example, note how users can find more information about the number of volumes this encyclopedia contains. By entering the command HOL 1, the screen will display the following record, which shows that the library has volumes 1 and 2 of *The Encyclopedia of Government and Politics.*

Title: Encyclopedia of government and politics
Location: GM: FENWICK Reference (Non-Circulating)
Call Number: JA61 .C66 1991
Status: Check Shelf
Library Has: v.1–2

This information is critical if the student has a citation from volume 2 and that volume is not held by the library

Government Documents

Recognizing government documents is probably the most confusing of all types of electronic records because of their varying formats. Government documents consist of those items published by any governmental agency—local, regional, national, or international. They may be published in the form of pamphlets, serials, books, reports, or nonprint materials. The U.S. government makes its documents available to the public through designated depository libraries and indexes them in *The Monthly Catalog.*

When searching electronically, students may access government publications through a search of an online catalog or by a subject-related electronic database. Following are two examples:

Online Catalog Government Document Retrieval Example

Title: A nation at risk: the imperative for educational reform: a report to the Nation and the Secretary of Education, United States Department of Education / by the National Commission on Excellence in Education.

Author/Contributor: United States. National Commission on Excellence in Education.

Publisher/Date: Washington, D.C.: The Commission: [Supt. of Docs., U.S. G.P.O. distributor], 1983.

Location: MU: MARYMOUNT Main

Call Number: LA217 .U58n 1983

Status: Not checked out

This record contains the call number, location, and status of the government document. A careful reading of the title also informs students that this government document is in report form, but it does not indicate its length.

Electronic Database Government Document Retrieval

Title: The effects of minimum wages on teenage employment and enrollment: evidence from matched CPS surveys.

Author(s): Neumark, -David; Wascher, -William; Nat. -Bur.-of-Econ.-Research

Source: Nat Bur Econ Research U.S. $5; elsewhere $5 plus $10 per order postage and handling; payment with order

Pagination: 34+[15]p

Publication Type: M; Monograph

Language: E; English

This government document is more difficult to access. Students need to enter the title of this document into an OPAC, preferably one that has been designated as a Federal Depository Library, and confirm library holding, call number, location, and circulation status. An alternative approach would be to pay the amount indicated and order the document from the National Bureau of Economic Research or from a document delivery service.

Periodicals

A similar approach is necessary to access periodical articles. Students usually have to search the library OPAC for the periodical title and specific holdings to see if the pertinent issue is physically available or to determine whether the full text is available in the database they are searching or another database from which they can download or print the article.

Students have trouble discerning the difference between periodical citations and book citations. Some of this confusion stems from their lack of knowledge concerning titles of well-known journals, periodicals, or magazines. Much of the bewilderment, however, is that students ignore vital clues in an electronic record, such as volume number, date, and title—all prime indicators that they have retrieved an article from a periodical rather than a book, monograph, or government document.

Review the examples below with students and stress the distinguishing features of periodical records.

Book Review from a Periodicals Database

Title: Computers: The Road Ahead by Bill Gates

Author(s): St. Lifer, Evan.

Source: Library Journal **Jan 1996**, v121n1, p. 130

Subject Descriptors: Nonfiction
Computer industry
Personal computers

Company Names As Subjects: Microsoft Corp

This type of periodical citation is frequently misidentified by students. A quick scan of the title confirms that they may have retrieved an article about computers written by Bill Gates. Instead, they have retrieved an approximately 250-word review of Bill Gates's book, *The Road Ahead*. Most students are unaware that many journals publish brief, or sometimes lengthy, reviews of books. They need help scanning the electronic record for the periodical title, the date, and the page length. The last item is extremely important for making a decision to access the citation physically. Most students when they realize that they have retrieved only a short (one page or less) book review are not interested in downloading it or searching for it elsewhere.

Periodical Articles

Title: Are the "most advantaged" children truly disadvantaged by early maternal employment? Effects of child cognitive outcomes.

Author(s): Greenstein, Theodore N.

Source: Journal of Family Issues Mar 1995, v16n2, p. 149–169

Title: Counselors-in-training: Creating leadership opportunities.

Author(s): Felix, Garrett D.; Ambler, Holly P.

Source: Camping Magazine Mar 1996, v68n4, p. 31–32 (2 pages)

The two examples shown above are more typical of the types of citations that students will encounter. Monthly, quarterly, or weekly dates and volume and number are important clues that these are citations from periodicals. In addition, stress that the word *magazine* as opposed to *journal* is sometimes an indicator of the subject-level treatment and the type of subscribing library. The word *magazine* usually signifies that its articles are written for nonsubject specialists and are subscribed to by school and public libraries. The word *journal* in a periodical title sometimes indicates that the articles require some degree of subject expertise on the part of the

reader and may be subscribed to by large public, academic, and special libraries.

Newspapers

Although students recognize the names of large urban newspapers such as the *Washington Post*, the *New York Times*, and the *Los Angeles Times*, they sometimes mistake regional newspapers for magazines. They also forget that newspaper articles tend to be short. Sometimes they spend an inordinate amount of time physically accessing a one-column article from the *Des Moines Register*, only to be disappointed in its lack of content.

Students need to be aware of citation clues that will aid them greatly in deciding whether to access physically newspaper citations retrieved from an electronic database. Refer to the examples below, and point out distinguishing citation features of newspaper articles such as section letters and numbers and dateline information that indicate the length of an article.

Title: Deadly play.

Author(s): Wallace, Wendy

Source: Times Educational Supplement May 20, 1994, n4064, p. SS1–SS2

Subject Descriptors: Suicides & suicide attempts
Teenagers
Statistics
Mental depression

Geographic Names as Subject: United Kingdom UK

Title: Keep safety in mind during storms.

Author(s): Ilka, Douglas.

Source: Detroit News Mar 25, 1996, C, 5:1

Subjects: Tornadoes
Weather

Places: Michigan

Special Features: C, 5:1 Availability: UMIACH\60496.00. Article Length: Medium (6–18 col inches). Article Type: News (NFW)03991357

Abstract: Michigan's weather is heading for prime storm time in 1996. April, May and June are the primary months when the state experiences severe weather, ranging from thunderstorms to tornadoes. Several tornado myths are discussed.

Nonprint Electronic Records

Nonprint electronic records consist of citations from materials in microform, on disk, or audiovisual form such as films, compact disks, and videocassettes. They are an important materials format for students to identify

before traveling to access them, because they are frequently noncirculating. Students typically must view them at the library by using library-owned equipment such as microform reader and printers, 16-mm film projectors, computers, or videocassette recorders.

Microforms

Most electronic records contain clues that alert students to materials formats, yet when students print a list of citations, they sometimes assume that everything they have just printed is in printed form and readily available. One of the most troublesome databases is ERIC. Students need to know that records bearing the prefix ED are stored on microfiche cards in large public or academic libraries. Users may use a microform reader-printer to view the entire record or pay the sum indicated on the citation and have the article printed offline and mailed to them. If the electronic record has the prefix EJ, the document is an article from a journal and may be retrieved by finding the correct periodical issue and reading or photocopying it.

Shown below are examples of EJ and ED ERIC citations, respectively.

ERIC Journal Citation

Accession No.: **EJ428854**

Title: Telecommunications for School Library Media Centers.

Author(s): Swisher, Robert.; and others.

Source: School Library Media Quarterly v19 n3 p153–60 Spr 1991

Clearinghouse No.: IR523090

Document Type: Journal Articles. Reports—Research.

Major Subjects: Learning Recourses Centers; Library Automation; Telecommunications.

Minor Subjects: Annotated Bibliographies; Case Studies; Computer Networks; Elementary Secondary Education; Futures (of Society); Library Administration; Library Collection Development; Library Services; School Libraries.

Identifiers: Oklahoma.

ERIC Document Citation

Accession No.: **ED358371**

Title: Open Forum on Children and Youth Services: Redefining the Federal Role for Libraries (Boston, Massachusetts, May 4–5, 1993)

Publication Date: 1993

Clearinghouse No.: IR054938

Document Type: Collected Works—Proceedings. Opinion Papers.

Major Subjects: Government Role; Library Role; Library Services; Literacy Education.

Minor Subjects: Adolescents; Children; Childrens Libraries; Elementary Secondary Education; Federal Aid; Federal Government; Financial Support; Information Literacy; Latchkey Children; Learning Resources Centers; Public Libraries; School Libraries; National Commission Libraries Information Science; National Education Goals 1990; White House Conference Library Info Services.

Language: English

Institution: National Commission on Libraries and Information Science, Washington, D.C. Federal

Country of Origin: U.S. Massachusetts.

Availability: EDRS Price—MF01 / PC10 Plus Postage. 1 U.S. National Commission on Libraries and Information Science, 1110 Open Forum on Children and Youth Services: Redefining the Federal Role for Libraries (Boston, Massachusetts, May 4–5, 1993) Vermont Avenue, Suite 820, Washington, DC 20005-3522.

With the exception of the MF abbreviation buried in the availability segment of ED368371, students would have no way of knowing that all ERIC documents are available on microfiche. Fortunately, this is not the case with most other microforms. When students enter additional commands such as HOL for holdings, LON for long view, or FUL for full bibliographic record, they will usually receive information concerning materials format.

Many times back issues of periodicals and newspapers are in microform because of its space-saving features. Following is a more common citation that readily indicates it is in microform.

Microform Newspaper Article

Title: A nation at risk: Diplomacy.

Author(s): Baker, James A. III.

Source: Los Angeles Times Mar 10, 1996, M, 1:3

Subjects: Terrorism
Peace negotiations
Bombings

Organizations: Hamas

Places: Israel

Special Features: M, 1:3: Illustration Availability: Los Angeles Times, Times Mirror Sq, Los Angeles CA 90053. Article Length: Long (18+ col inches). Article Type: Commentary. (NEW)03940683

Abstract: James A. Baker III states that the terrorist bombings against Israel by the extremist group Hamas will not stop the peace process with the Palestinians. Baker says it is critical not to allow terrorism to undermine the process.

Location: AU: LIB Microforms Collection (Non-Circulating)
Call Number: MICROFILM
Status: Check Shelf
Other Info: Current issues in periodicals until microform copy received.

ON-DISK RECORDS

Microforms are rapidly being replaced by computerized storage formats such as CD-ROMs and diskettes. These types of materials can usually be accessed only by on-site or remote access. After students print a list of citations, they should immediately check a library's Internet home page or OPAC menu page to determine if on-disk materials may be searched remotely. This will save them a significant amount of time.

Below is a sample citation for the *New York Times*, which is on disk in the George Washington University Library, Washington, D.C.

Newspaper On Disk
Search Request: T=NEW YORK TIMES
Computer File—Record 1 of 721 Entries Found
Title: The New York Times **ondisc [computer file]**.
Publisher/Date: Ann Arbor, MI: UMI, c1992–
Location: GW: GELMAN Periodicals (Non-Circulating)
Call Number: No call number
Status: Enter HOL 1 for holdings
Location: GW: GELMAN Periodicals (Non-Circulating)
Call Number: No call number
Status: Enter HOL 2 for holdings

The emphasized language in the Title line indicates that this newspaper is available in an on-disk format.

As production prices decline for compact disks, many citations will indicate mixed formats. Students will be able to borrow a book about a topic that contains primarily the text and an enclosed compact disk of the text with accompanying graphics, audio, and video clips. The example below illustrates the citation features indicating that this record contains two formats.

Book On Disk
Title: The road ahead / Bill Gates with Nathan Myhrvold, and Peter Rinearson.
Author/Contributor: Gates, Bill, 1956–
Publisher/Date: New York: Viking, 1995
Description: xiv, 286 p.: ill.; 24 cm. + 1 **computer laser optical disc**; 4 3/4 in.

AUDIOVISUAL RECORDS

Audiovisual record citations usually contain materials in compact disk, recording, 16-mm film, or videocassette formats. They are important records to identify before traveling to a library because they often do not circulate or have limited loan periods.

The clues to this type of material format lie in the first screen record display. If the item is a film or movie, video, CD, or recording, that information will be indicated in the title field. Students tend to overlook these distinguishing words when they are busily searching. Shown below are citations of the videorecording and book format for the same item. Although the citation format is similar, *videorecording* in the title, *MCA Universal Home Video*, and *videocassettes* are the important descriptive words to note.

Videorecording Citation

Title: Schindler's list [**videorecording**] / an Amblin Entertainment production.

Publisher/Date: Universal City, Calif.: **MCA Universal Home Video**, 1994, c1993.

Description: 2 **videocassettes** (197 min.): 1/2

Note(s): "81629."

Location: AU: LIB Media Services (Non-Circulating)

Call Number: VHS 3116

Status: Enter HOL 1 for holdings

Book Citation

Title: Schindler's list/Thomas Keneally.

Author/Contributor: Keneally, Thomas

Publisher/Date: New York: Simon and Schuster, 1993.

Location: GM: FENWICK Main Stacks

Call Number: PR9619.3.K46 S3 1993

Status: Not checked out

INTERNET RECORDS

Many print and nonprint sources provide citations to specific Internet sites. Students are beginning to encounter them at the close of electronic encyclopedia articles and in the bibliographies of textbooks and research books. Some are easy for students to evaluate because they contain brief annotations of the Internet sites. Other consist merely of a URL address and are listed under a general subject heading such as AIDS and ADOLESCENTS.

The only problem they may encounter concerns accessibility. Certain forms of Internet access necessitate a more powerful type of computer. Users seeking to access Web documents, for example, require a Windows-

tolerant computer containing browser and communications software. Recognizing the word following the URL is the first step in confirming Internet-level capability. If the URL address is followed by "telnet," "ftp," or "Gopher," the site may be accessed by a Windows-intolerant computer. If the URL is succeeded by "http" or "http://www," then it requires a Windows-tolerant computer with all of the accompanying software. Following are examples of the two types of Internet citations that students will see when researching a topic.

Full Internet Citations

URL: **telnet://telnet.downwind.sprl.umich.edu.3000** Contains the University of Michigan Weather Underground application that provides information on current weather conditions, as well as forecasts for all portions of the United States.

URL: **gopher://gopher.marvel.loc.gov** LC Marvel is the acronym for Library of Congress Machine Assisted Realization of the Virtual Electronic Library. It contains directories and menu access to a wealth of government resources, including the Library of Congress online catalog.

URL: **ftp://ftp.metrics.com/** Files consist of news group archives about various types of Formula One racing cars.

URL: **http://http.www.lib.virginia.edu/etext/ETC.html** Created by the University of Virginia, this Web site is a gateway to thousands of electronic hypertext documents and works of literature, including works from eighteenth-century British literature and poetry.

Abbreviated Internet Citations

Abbreviated Internet citations are usually found under a general subject heading or in Internet Yellow Page directories.

URL: **telnet://:telnet.spacemet.phas.umass.edu**

URL: **gopher://:gopher.sunsite.unc.edu**

URL: **ftp://:ftp.metronet.com**

URL: **http://www.bess.tcd.ie/Ireland.html**

SUGGESTED LESSON PLAN

Library concept	Identifying various types of electronic records
Time requirements	Fifty minutes to teach and provide distinguishing features of reference works, books, government documents, periodicals, newspapers, nonprint materials, and Internet citations.
Objectives	• To teach students how to identify different electronic record formats. • To provide students with examples of distinguishing features of various electronic records to aid them in making retrieval decisions.

Prerequisite Students should be superficially acquainted with the definitions of books versus periodicals and other types of materials formats.

Equipment needed At least one Windows-level computer with a modem and either dial-up or Internet access to nearby academic and public libraries' OPACs.

Procedure

- Demonstrate to students the distinguishing features of different materials formats. Emphasize how presearching citations lists and marking items by type and availability can save valuable time and needless trips to other libraries.
- Using either course-related or librarian-created sample format citations, have students correctly identify the following types of sources: (1) books, (2) government documents, (3) periodicals, (4) newspapers, (5) microfiche or microfilm, (6) on-disk materials, and (7) Internet citations. Also require students to indicate status (availability) and location.

Evaluation Depending on the grade and ability levels, students can:

- Correctly identify seven types of material formats for a course-related or librarian-designed assignment.
- Correctly decide which types of materials are relevant to the assignment.
- Correctly determine how accessible various types of materials are given the time frame of the assignment.

ADDITIONAL SOURCES

Bolvin, Boyd, and Sharon West. *Information Identification and Organization Student Study Guide*. 1984. (ERIC Document Reproduction Service No. ED261704).

Descy, Don E. "Locating Online Resource." *TechTrends* 40 (April–May 1996): 10–11.

Kelly, Melody S. *Using Government Documents: A How-to-Do-It Manual for School and Public Librarians*. New York: Neal-Schuman, 1992.

Moore, Penelope A., and Alison St. George. "Children as Information Seekers: The Cognitive Demands of Books and Library Systems." *School Library Media Quarterly* 19 (spring 1991): 161–68.

Pappas, Marjorie L. "Information Skills for Electronic Resources." *School Library Media Activities Monthly* 11 (April 1995): 39–40.

Turrell, Linda. "How to Get the Most from Online Public Access Catalogs." *Media & Methods* 32 (January–February 1996): 10.

9 On-Site Electronic Records Access

Rationale for Change

The development of full image electronic technologies means that documents can be scanned for immediate transmission by fax or the Internet. Materials availability has changed dramatically. Students must be knowledgeable about fee-based information identification and delivery services, so they may choose to use them either at school or from home for assignments. If funding permits, SLMSs need to provide students with electronic services that access full-text documents and identify the location of books for interlibrary loan purposes.

ACCESSING ELECTRONIC RECORDS ON SITE

Improvements in the electronic delivery of information by fax or the Internet have greatly altered the concept of a library collection. Users are no longer edifice bound in their searches for information. All libraries have begun to change from collection-based to access-based ones. With the arrival of several low-cost document search-and-delivery services, SLMSs can offer students increased availability of information and more options for searching and retrieving it.

VENDOR SEARCHING CATEGORIES

Users are being deluged with advertisements and enticements to subscribe to a variety of electronic services by online or Internet access. It is

important that they understand the categories of service and what each can provide so that they make wise investments of their time and money.

In general, there are three categories of service offered by various information vendors. They differ according to cost, searching capability, search command complexity, and level of information retrieved. Students contemplating a subscription to an electronic search service should determine the desired vendor searching level before paying for the service.

Category 1 requires a high degree of subject expertise by the user. Users may even need to rely on a skilled searcher or librarian to assist them with search commands. LEXIS/NEXIS and Dialog are examples of this category.

Category 2 needs less user subject expertise. Searching commands are easier to execute, and database contents contain more information for laypersons. Vendors include Dialog's Classmate service, Knowledge Index, BRS/AfterDark, Wilsonline, and FirstSearch.

Category 3 does not require instruction before use. It consists of popular consumer services that provide e-mail, electronic bulletin boards, selected database access to popular magazines and newspapers, and monitoring of Internet information sources that match users' interests.

ACCESSING BOOKS AND NONPRINT MATERIALS

Physically accessing books and nonprint materials within twenty-four hours is still a challenge even with the latest electronic wonders of fax machines, scanners, and the Internet. The cost of scanning an entire book and transmitting the contents electronically is also interwoven with problems concerning copyright. Students, however, do not view these glitches as genuine problems and seem perplexed when the entire contents of a book cannot be retrieved whereas the full text of an article can easily be downloaded or printed on site.

While these technical and legal problems are studied, SLMS can offer several book identification services that can make books available faster. Nevertheless, time is a factor; most of them take more than twenty-four hours, and students should account for this time lag when using these services.

Using OCLC's FirstSearch

FirstSearch, a vendor service provided by OCLC, supports searching of more than forty electronic databases by a similar command system. It is menu driven and requires minimal instruction to use. Schools subscribe to FirstSearch by purchasing search queries in blocks ranging from 275 to 500 or by paying a database subscription fee for each database they choose to access. FirstSearch interfaces are available for modem and Internet Web access. Subscribers may customize their subscription by purchasing open

presearch subscription packages under a single authorization. The other option provides per-search and subscription access under separate authorizations or on a per-card basis. The latter option gives SLMCs without the funding capability the means to make the service student fee based.

One of the databases available in FirstSearch is WorldCat, the OCLC Union Catalog. It contains more than 34 million books, serials, government documents and reports, videos, and other nonprint materials. Students may search WorldCat by keyword, bound and/or adjacent phrasing, known item (author, title, LC subject heading), and Boolean operators. Since FirstSearch requires purchase through the nearest OCLC-affiliated regional network, materials retrieved are linked to nearby OCLC member libraries.

Once students have identified the library owning a copy of the book, they can pursue the following options: (1) confirm its availability by searching the holding library's OPAC, (2) retrieve the item from the shelves, (3) use the material at the holding library, or (4) request the item through interlibrary loan. There are other databases in FirstSearch that also provide book citations, but WorldCat is the only one that supplies with its citations a list of area libraries that own the item.

Using State Library Networks

A second alternative is to use a state library network or consortium to identify, locate, and access books and other nonprint items. Almost every state has a hierarchical network of libraries that share resources and provide interlibrary loans. In many state library networks, interlibrary loans are handled electronically, which greatly speeds the delivery process. Being a member of this type of network also helps to streamline and overcome barriers of using materials on site and borrowing them.

Using CARL (Colorado Alliance of Research Libraries)

If funds do not permit subscribing to FirstSearch or membership in a state library network, there is a less expensive way to provide somewhat similar access. One of these is to use the Internet to search the CARL System's Library Catalogs (URL: **telnet.database.carl.org**) or dial-up access (303/756-3600). CARL, a commercial document delivery service, provides free access to OPACs belonging to various Colorado public and academic libraries. Although students have to search each catalog, they can select ones nearest them, and the command structure is the same for each. After identifying appropriate materials, students may omit the first step in the FirstSearch options and proceed to request the items through interlibrary loan. Another free guide to different types of libraries is the Internet site Inter-Links at **http://www.nova.edu/Inter-Links/help/scope.**

html. A large selection of different types of libraries is available for searching and identifying materials.

ACCESSING ARTICLES

It is this materials format where the biggest changes have occurred regarding document delivery. The first change concerns a trend on the part of vendors to become a one-stop type of service. Companies owning articles databases are either providing document delivery or contracting with another vendor to deliver documents. Users no longer have to locate the article and contact a separate document delivery service to obtain a copy. Most of these databases include only articles published after the mid-1980s.

The second change concerns improved format modes and delivery options. Although there are sometimes increased costs, document delivery services can provide full-text articles that contain graphics, charts and pictures. They can also supply documents in ASCII format and download them through the Internet or onto a diskette.

There are a number of document delivery services that SLMSs and even students may subscribe to. All of them provide the following general services and adhere to similar fee and delivery arrangements (using the first two delivery options usually costs between $8.50 and $13.00 per article plus copyright costs, which can vary widely depending on the publisher):

- Twenty-four hour document delivery (usually accomplished within three hours).
- Article delivery onscreen in ASCII format, by fax, e-mail, or regular or overnight mail.
- Reduced cost for outsourcing documents to other libraries that charge less to photocopy and deliver.
- Prioritized access depending on the account level. Users with high-level gateway connections, for example, are provided with dedicated terminal ports so that they do not experience busy signals.

Using CARL System's Uncover

Although there are a number of fine document delivery services to contract with, CARL System's Uncover is the most dynamic and largest. It contains more than 16,000 periodical titles and claims to be adding 4,000 current citations every day. The database contains well over 6 million articles.

Uncover is searchable by subject, name, word, and journal title. Students may also browse the table of contents for specific periodical issues. Prices are reasonable, and faxed articles contain all graphics, charts, and images. Delivery options can be through a deposit account or a credit card. Students may access CARL's Uncover through the Internet at **http://www.carl.org/uncover/** or **telnet.database.carl.org**.

Using FirstSearch's ArticleFirst

ArticleFirst is an article-title database available through OCLC's FirstSearch. It offers document delivery from 13,000 journals and periodicals starting from 1990. This database follows the same command structure of other FirstSearch databases. If students have access to FirstSearch, they will be familiar and at ease with the search commands.

Students have the same delivery options as they do with Uncover. Prices are included with the articles and cover copyright costs. Since a password is required to use FirstSearch, students usually cannot have documents transmitted to their home computers unless they have authorization to bill a specific account. ArticleFirst uses independent document delivery services to provide the articles. The telephone number is 800/848-5878, ext. 6251.

Using Faxon Finder

Faxon Finder is a database consisting of more than 11,000 periodical and journal articles from 1990. A deposit or separate account is required to search it. Students need to set up their own accounts if they wish to use this service at home.

The telephone number is 800/999-3594.

Using EBSCODOC

EBSCODOC, from Ebsco Publishing Company, offers articles from more than 30,000 journals and periodicals. It charges an extra fee for articles obtained from outside of North America. Users may access it by establishing a separate account.

The telephone number is 800/554-7149.

Using NewsBank/Readex Quick Doc

NewsBank delivers articles from newspapers back to 1971, U.S. and United Nations documents, and selected periodicals. Its fees are based on the number of pages requested.

The telephone number is 800/762-8182.

Using the UMI Article Clearinghouse

This database contains approximately 16,000 titles from 1990 onward. UMI offers reduced prices for quantity searching and permission to outsource requests to other less expensive interlibrary loan facilities. Unlike several other document delivery services, UMI does not require a deposit

account. Users may order by fax, DIALOG, BRS, OCLC, or telephone (800/521-0600, ext. 2786, or 800/248-0360).

ACCESSING INTERNET INFORMATION DELIVERY SYSTEMS

Document delivery is still evolving on the Internet, but there are several information delivery systems that are serving Internet users. They differ somewhat from traditional document delivery systems, which require users to pre-identify specific items for fax transmission or offline mailing. Instead they will monitor the Internet for specific types of information resources (wire services, journals, stock listservs, etc.) that match users' interests. Students periodically receive either a summary or a full-text version of the matching articles. Most of the information delivery systems listed below are fee based, but some offer limited access for free.

- The Daily Brief: http://www.incinc.net
- Freeloader: http://www.freeloader.net
- IBM infoSage: http://www.infosage.ibm.com/news/23ce.html
- Individual Inc. (HeadsUp, First!, etc.): http://www.individual.com
- Pointcast Ex1, Ex2: http://www.pointcast.com

Document Delivery Criteria

If document delivery is free or subsidized by the SLMC, many students will be undeterred by the idea of fee-based searching. If they are under a deadline or have found *the* article that fulfills an assignment, they may be delighted to pay for all or part of document delivery service. They will, however, be disappointed if they pay for information that is not helpful or may already be part of their SLMC or nearby public or academic library collections.

Articles in many general interest periodicals, such as *Time, Newsweek,* and *U.S. News & World Report,* are almost interchangeable in terms of factual coverage of events. Information in this type of source should not be considered unique and essential to the assignment. Students are sometimes misled by a title that may match all of their assignment search terms or even the title of their assignment. It is at this point that they may avoid looking at the article's length, an important factor in making a decision for document delivery. Depending on the assignment, an article of fewer than three pages will probably not cover a topic adequately.

Document delivery is an expensive service when compared to obtaining the same article by using a photocopier at ten or fifteen cents per page. Students should balance these costs against assignment deadlines. With proper planning, document delivery should be reserved for essential articles that are unobtainable in SLMCs and local academic and public libraries.

Students should ask themselves the following questions before requesting document delivery:

- Is the article unique and essential to the assignment?
- Is there sufficient time to locate and photocopy the article at the SLMC or a nearby library?
- Is the article of sufficient length to cover or contribute significantly to a specific aspect of an assignment?

Document Delivery and Security

If students decide to use a document delivery service, they should have the following items ready:

- A credit card or account number
- Password if required
- Fax machine number, including area code
- Fax machine turned on and loaded with paper
- Telephone number where they can be reached in case of transmission difficulties

Students may be asked if they wish to store payment information for future transactions. If they are using a credit card rather than a deposit account as a form of payment, advise them to respond "no" to this question. It is safer not to have this information in any database.

SUGGESTED LESSON PLAN

Library concept	Using document delivery and electronic databases to access books, articles, and nonprint materials.
Time requirements	One fifty-minute period to introduce and demonstrate the appropriate use of document delivery services and to teach students the criteria for appropriate use of them.
Objectives	• To teach students to use document delivery services to access physically essential articles for a librarian-prepared or course-related assignment. • To instruct students how to use CARL's Library Catalogs and/or OCLC's FirstSearch to identify books and nonprint materials.
Prerequisites	A cursory knowledge of electronic databases and the Internet.
Equipment needed	At least one Windows-level computer equipped with Netscape's Navigator or Microsoft's Explorer and access to the Internet or a computer equipped with a modem and communications software.

Procedure

- Review information about document delivery services in this chapter and demonstrate by using Uncover at URL: telnet.database.carl.org or the dial-up access number (303/756-3600).
- Use topics related to either student assignments or librarian-designed ones.
- Perform several searches using the following commands: W for a word search, N for a name search, T for a title browse.
- Locate several articles that are relevant to the topic and mark them.
- Require students to examine the articles closely and apply the ordering criteria mentioned in the chapter, stopping at this point if they do not wish to order any.
- If the library subscribes to OCLC's FirstSearch, show students how to search the database WorldCat for books and nonprint materials. Remember to request the screen display that shows "which libraries may own this item" by typing LIB at the Record Number (or Action) prompt.
- If the library does not subscribe to FirstSearch, use the Internet Inter-Links site or dial-up access number to CARL's list of "Other Library Catalogs," and search for books in these databases.
- After searching for books, tell students about interlibrary loan and the need to budget time for receipt of these materials.
- Using a course-related or librarian-designed assignment, provide opportunities for students to practice searching. At this point, students do not need to order articles to understand how document delivery works.

Evaluation

Depending on the grade and ability levels, students can:

- Successfully search either FirstSearch's WorldCat or CARL's Other Library Catalogs for books and nonprint materials.
- Use Uncover to identify articles that match document delivery criteria and mark them for delivery.

ADDITIONAL SOURCES

Coffman, Steve, comp. *FISCAL Directory of Fee-Based Research and Document Supply Services*. 4th Ed. Chicago: American Library Association and County of Los Angeles Public Library, 1993.

Eiblum, Paula. "The Coming of Age of Document Delivery." *Bulletin of the American Society for Information Science* 21 (February/March 1995): 21–22.

Kohl, David F. "Revealing UnCover Simple Easy Article Delivery." *Online* 19 (May–June 1995): 52–60.

TerraCom, Inc. "Internet Research-Specific Resources & Tools." http://www.terracom.net/research/ Briefly discusses Internet information delivery systems.

Using Primary Electronic Resources

10

Rationale for Change

Most information is now being stored in digital form to make it machine readable, inexpensive, and highly transmittable. This process supports the creation of electronic databases and the Internet that contain millions of primary and secondary sources of information. Students no longer need to confine themselves to citing secondary sources solely because SLMCs do not have sufficient primary sources. Now they can easily search specific primary source databases and the Internet to locate primary materials for many assignments. Using primary rather than secondary sources requires critical thinking skills that are considered mandatory for future academic and employment success. To use primary sources appropriately, students must know the difference between primary and secondary sources, understand the advantages and disadvantages of working with them, and know how to search for them electronically.

CHARACTERISTICS OF AN ELECTRONIC PRIMARY SOURCE

Primary sources are databases of fact; secondary sources are databases of authority. The distinction between these two types of sources depends on their context. It is the context part of the primary source definition that is so troublesome to most students. Many think of primary sources as old, yellowed letters or documents that were found in someone's attic and even-

tually placed in a building or library called the archives. If their assignment requires the citing or use of primary sources, most of them believe the older, the better. Disabusing them of associating age with primary sources is easier if they have a list of electronic primary source examples:

- Government documents such as the Declaration of Independence, the Constitution, and the Bill of Rights.
- Scriptures and sacred books related to a particular faith or creed.
- Videotapes and audiotapes of actual events.
- Interviews.
- Photographs and paintings (created as a response to the event around the time it happened or of a person during his or her lifetime).
- Original editions and facsimiles.
- Speeches, position papers, diaries, and editorials.
- Law books such as state codes.
- Electronic mail.
- Raw data from research studies.
- Period articles (what was said about an event around the time it happened).
- Books that created change (*Common Sense, Uncle Tom's Cabin, Wealth of Nations, Das Kapital, The Prince*).

Review the potential primary materials and supply students with specific, course-related examples of each type. With the exception of electronic mail, videotapes, and audiotapes, many of these primary source examples can be found either in their entirety or excerpted and integrated into books and periodicals. They can also be located in electronic databases and the Internet.

Some electronic databases, such as Landmark Documents in American History (Facts on File), have simplified the process of locating primary sources. They may be accessed by entering a general subject from any period, event, or historical name from 1492 to 1995. The computer retrieves appropriate primary sources relating to the event, period, or person and supplies some information on their context.

Most electronic information resources, especially the Internet, have not created such primary source at-your-fingertips type of retrieval. Students cannot enter a subject into most electronic databases on the Internet and retrieve items that are labeled primary resources. They must be able to discern that a source may be primary only in relation to its connection to their topic or assignment. Its use in the correct context is what determines its designation as a primary or secondary source.

The best way to teach this concept is by providing students with a set of contextual examples that are course related, if possible, and illustrate different types of primary sources. Refer to the following examples for further ideas.

Contextual Electronic Primary Source Examples

I am writing a biographical sketch about the Nobel Prize–winning author Wole Soyinka (URL: http://www.mg.co.za/mg/news/wolesoyinka.html) and have found an interview on the Internet of him discussing his political views. Is this a primary source?

Yes. The interview directly relates to an important aspect of Wole Soyinka's life.

I am researching Charles Lindbergh's flight across the Atlantic Ocean and have found a microfiche article from the New York Times *dated May 22, 1927, that describes his trip. Is this a primary source?*

Yes. Since Charles Lindbergh and many witnesses to this event are no longer living, this article describing his flight right after it happened would constitute a primary source.

I am writing a report about medieval illuminated manuscripts and have found some examples of them at the Internet Vatican Library exhibit site. If I print them on a color printer and discuss them in my report, are these primary sources?

Yes. The Vatican Library exhibit on the Internet features pages and examples of illuminated manuscripts that were physically on display at the Library of Congress several years ago (http://lcweb.loc.gov/).

I am researching the latest treatments for breast cancer and have found a citation in Ebsco's Magazine Article Summaries to an article about the discovery of a gene linked to breast cancer in a 1995 issue of Science News. *Is this a primary source?*

No. *Science News* publishes summaries of original studies. You would need to find the source that published the entire study with the original research findings.

I am researching the slave population by gender of several Maryland counties in the year 1800 and have found census data on the Internet that give the slave population but no gender breakdown. Is this a primary source?

Yes; you have found a primary source, but it does not provide a breakdown of Maryland counties containing slaves by gender. You must look elsewhere for the information (http://umbc7.umbc.edu/~curnoles/marycens.html).

I am writing a report about the harmful legacies of slavery in the United States. I have found diaries and letters written by slaves in an Internet database called Valley of the Shadow (http://jefferson.village.virginia.edu/vshadow2/personal/weevils.html). Are these primary sources?

Yes; these are primary resources, but you may have a context problem. You must read the entries carefully to see if these particular slaves related the harm of slavery in their writings.

I am writing a paper about the discoverer of the planet Jupiter. I have just found a database on the Internet called Project Galileo (http://www.jpl.nasa.gov:80/galileo/). Is this a primary source?

Not for the paper you are writing. Project Galileo is an excellent primary source for anyone needing raw research data about the structure and composition of the planet Jupiter. It does not contain any primary sources about Galileo, the discoverer of Jupiter.

I have been asked to trace the legislative history of the Personal Responsibility and Work Opportunity Act and have found an Internet database called Thomas (URL: http:/ / thomas.loc.gov) that contains the full text of all House and Senate bills and the Congressional Record. *Is this a primary source?*

Yes, as long as the bill you have been assigned is listed. You can use all three sources to trace the bill from start to passage.

THE PROS AND CONS OF ELECTRONIC PRIMARY RESOURCES

Most students do not begin their information searches by combing electronic and print resources for primary materials. The search for primary sources, and usually only the required quantity of one, is frequently done as an afterthought. As such, it contributes little information to the assignment because it is simply inserted somewhere in the report and in the bibliography to satisfy an instructor's minimal source rules.

Part of primary source avoidance can be attributed to SLMC resources. Almost no SLMC has the shelf space, budget, or user population to justify significant collections of primary sources. Students and SLMSs have often had to struggle to find primary sources that even tangentially correspond to topics because of the meagerness of the SLMC collections.

With the increase in electronic databases and the availability of the Internet, all that has changed. Students now have the opportunity to do the reverse: design their assignments and structure their thesis statements based on easily found primary resources. To achieve this goal, students need to be convinced of the advantages of primary sources and the ease with which they can be located and retrieved by computers. The concept of contextual primary sources also needs to be constantly reinforced.

Advantages of Electronic Primary Sources

In general, primary sources have the following advantages over secondary sources.

They provide an instantaneous representation of events. Primary sources possess a wonderful "you are there" quality that make reading them exciting even after the fact. They represent the words of the first on the scene and are usually devoid of omnipresent criticism and analysis.

Neil Armstrong's conversation back to earth about his first walk on the moon riveted millions of people to televisions and radio stations to see and hear his first impressions.

Looking at the original research of Alexander Fleming regarding his discovery of the life-saving drug penicillin and following his laboratory findings step by step to their correct conclusion is not only a thrill but an absolute necessary if future scientists are to learn more from his research.

They furnish information not found in other sources. Primary sources are the best documents to aid in the search for the truth. When America was embroiled in the Vietnam War, the issuance of the *Pentagon Papers* by Daniel Ellsberg revealed the extent to which the U.S. government had been less than candid with the American public regarding the extent of casualties and bombings. Its publication had a significant impact on government policy toward Southeast Asia and the presidency of Lyndon B. Johnson.

They do not interpret the evidence after the fact. Although primary sources may have been written, created, or designed from a certain perspective, they are generally devoid of hindsight. As such, they have not been colored by the critic's palette or editor's pencil. They are alive with their own interpretations of specific celebrations or tragedies. They remain the closest record of what really happened before others had the chance to analyze, critique, or put their spin on it.

Pliny the Younger's vivid description of the eruption of the volcano Vesuvius in A.D. 79, which buried the cities of Herculaneum and Pompeii and many of its inhabitants in molten ash, provides a much more accurate account than one by archaeologists who reconstructed the same event from excavated ruins.

They assist in the discovery of truth about persons, events, and issues. Primary sources are the basic tools to help discover the truth about persons, events, and issues. The saying that "the truth is the first casualty of war" is somewhat analogous to secondary sources. Primary sources are the first casualty of secondary sources. Each time another person writes about a person, event, or issue, he or she can, wittingly or unwittingly, add another layer of personal bias to it that can prevent the discovery of the truth.

Primary documents may be the only sources we can rely on to discover the causes of war, the decisions by government officials, or the nature and implications of new discoveries in science. *The Diary of a Young Girl* by Anne Frank sheds enormous light on the nature and extent of the Nazi Holocaust, which the Germans tried to cover up during and after World War II. The testimony of Japanese Americans concerning their unjust internment in concentration camps provides a record of the shameful climate of fear that was generated as a result of Japan's bombing of Pearl Harbor.

Disadvantages of Electronic Primary Sources

Although students may be totally enthused by the thought of designing a topic based on primary resources, they need to acquire patience in working with some types of primary sources. Prepare them by reviewing some of the negative aspects so that they do not become frustrated and return to using safe secondary sources. Primary sources can have the following disadvantages.

They can be difficult to read. Choose a JackDaw kit (Golden Owl Publishing Co.), if you have one, to illustrate this point. The kit contains a facsimile of the original document and a translated facsimile when the language is archaic or the print hard to read. The kits are excellent subject packets of primary source documents and especially helpful for students in grades 7–10. If you do not have a JackDaw kit, illustrate this point with a short reading from a Bible. Many of the words will be unfamiliar to the majority of students. Advise them to read background or secondary sources if the material is very difficult and to slow their reading speed. Have them keep a dictionary handy so that it is not a labor to consult it frequently.

They may be illustrative of one opinion and unaccompanied by background or contextual material. This characteristic of primary sources is one of the most troubling aspects to students. Often they overlook a gold mine of information because they lack the subject knowledge or background to realize the significance of their discovery. Encountering a list of household and plantation expenses by the governor of the colony of Georgia in the 1700s may appear to be an irrelevant piece of information, but as evidence of what Georgian colonists were planting and having to import from England, it is priceless primary source information. To avoid this understandable practice, encourage students to develop an overview of their topics and do some background reading.

They may be subjective, polemical, and of a limited perspective. Information in print tends to be imbued with an aura of verisimilitude. Students often reinforce their certainty of information with the statement, "But I read it in the paper." If a document is considered old, its continued existence is sufficient justification to them to consider it a valuable primary source. Providing students with examples of primary sources that are espousing particular points of view is necessary if they are to become objective evaluators of information. Depending on the age and ability level of the class, begin with examples from obvious sources, such as the National Rifle Association, the National Right to Life Group, or the Hemlock Society.

After examining literature from groups like these, tell the students how those documents could be found five hundred years from now. Ask them how they might be viewed by someone who did not know the historical background underlying gun control, abortion, and euthanasia. What clues do these documents contain that might lead students to conclude that they are biased and written from a limited perspective?

SEARCHING FOR ELECTRONIC PRIMARY SOURCES

A number of electronic databases already contain primary sources in the manner described by Landmark Documents in American History (Facts on File). They tend, however, to be historical and reflect traditional ideas

of what constitutes a primary source. It is the Internet that is really overflowing with potential primary sources not only for the humanities but also the sciences. Data from the Plant Genome server (URL: http://probe.nalusda.gov:8300) are robust with information about individual botanical specimens. There are several sites that maintain data banks and provide background information about the AIDS epidemic (URL: http://www.aegis.com/). Weather data are abundant on the Internet at sites such as Current Weather Maps and Movies (URL: http://rs560.cl.msu.edu/weather) and MIT Radar Lab (URL: http://www-cmpo.mit.edu/Radar_Lab.html). MIT RadarLab maintains an archive that contains twenty years of storm system observations.

Some sites even contain compilations of primary sources. A Gopher site maintained by the University of Tennessee (URL: gopher://gopher.tntech.edu:70/11gopher-root%3a%5bcampus.as.hist%5d) features a vast warehouse of historical documents that are international in scope. Examples include President Lincoln's first inaugural address, President Clinton's 1993 State of the Union address, and the Communist Manifesto.

While the Internet is indeed teeming with primary sources, it is important that students be able to develop successful search strategies to retrieve them, recognize various types of primary sources, and critically evaluate them. Searching for primary electronic sources should be integrated into all course-related assignments and should also be part of a general search involving print sources as well.

SUGGESTED LESSON PLAN

Library concept	Understanding what constitutes a primary source, how to use it in the context of an assignment, and the benefits and possible disadvantages from using primary sources.
Time requirements	Fifty minutes to define and provide examples of primary sources and to stress the importance of their use in context with specific topics and to practice searching for them for class-related or librarian-designed assignments.
Objectives	• To have students recognize the types of materials that are potential primary sources. • To enable students to use primary sources in the correct context of particular topics. • To provide students with the advantages and disadvantages of primary sources. • To give students the opportunity to practice electronic searching for primary sources.
Prerequisites	Students will need some Internet experience with searching tools such as AltaVista or Webcrawler and/or specific on-site electronic databases that contain primary sources.

Equipment needed At least one Windows-level computer equipped with either Netscape Navigator or Microsoft Internet Explorer and access to the Internet.

Procedure

- Review the information in the chapter that defines various types of primary sources and give examples of various types in context with an assignment.
- Refer to the questions in the Contextual Electronic Primary Source Examples.
- Demonstrate these examples by entering a selected Internet site and showing students how this primary source would relate to the described topic.
- Divide the class into groups of five, and have each group practice searching for primary sources with the suggested assignment provided or a course-related topic.

Evaluation Depending on the grade and ability levels, students can:

- Successfully define the kinds of information that constitute primary sources and use one appropriately for an assignment.
- Retrieve one primary source that can be appropriately integrated into an assignment.

PRIMARY SOURCES SEARCH FORM

This assignment is to acquaint you with Internet primary sources and to show you how to integrate primary sources into future class assignments.

Group No. _____

Assignment:

_____

_____

List at least one type of primary source that would be helpful to your research.

1. _____
2. _____
3. _____

In the space provided, write your Internet search strategy for finding a primary source and perform the search on the Internet.

_____

_____

List the Internet site address for the primary source you found, and briefly describe the source below.

URL address: _____

Site Description: _____

Note: If you are experiencing difficulty at this point, ask your school library media special for a hint.

Briefly describe how your group intends to incorporate the primary source into the assignment.

SUGGESTED ASSIGNMENTS

The sites below can be found using a standard search engine and keywords.

Group 1 assignment	You are a military historian who has been asked to write an article about the assault on the Alamo (Texas) from the viewpoint of General Santa Anna.
Librarian hint	General Santa Anna's battle map for the assault on the Alamo can be found at http://www.lib.utexas.edu/Libs/CAH/texas/cah_texas1.html
Group 2 assignment	You are an environmental lobbyist who needs to know the past environmental voting records of U.S. senators and representatives.
Librarian hint	The environmental voting records of U.S. senators and representatives can be found at http://www.econet.apc.org/lcv/scorecard.html
Group 3 assignment	You are writing a paper about human rights and have been told that there is a database of information about the death penalty compiled by Amnesty International.
Librarian hint	A list of Amnesty International facts and figures about the death penalty can be found at http://www.derechos.org/amnesty/info/
Group 4 assignment	You are writing a biographical sketch about the Nobel prize–winning author Seamus Heaney for a popular teen magazine.
Librarian hint	An interview with Seamus Heaney can be found at http://www.irishamerica.com/irishamerica/heaney.htm
Group 5 assignment	You are a meteorologist who has been asked to monitor weather conditions on the sun. You are looking for sun surface and solar radiation patterns.
Librarian hint	Images of the weather conditions in space and on the sun can be found at http://www.sel.bldrdoc.gov/today.html

ADDITIONAL SOURCES

Brooks, Philip Coolidge. *Research in Archives: The Use of Unpublished Primary Sources.* Chicago, Ill.: University of Chicago Press, 1969.

Dobyns, Sally McClure. "Using Primary Sources: Getting from Here & Now to There and Then." *The Gifted Child Today* 15 (September/October 1992): 52–55.

"Learning History Through Primary Sources." *The School Librarian's Workshop* 15 (October 1994): 14–15.

Teaching with Documents: Using Primary Sources from the National Archives. Washington, D.C.: National Archives and Records Administration, 1989.

Wilson, Don W. "Just Say KNOW: Not So Buried Treasures: Primary Sources from the National Archives and Presidential Libraries." *Journal of Youth Services in Libraries* 4 (Summer 1991): 377–82.

11 Evaluating Electronic Information Resources

Rationale for Change

In the past, many print information sources were prevalidated by publishing companies, peer review panels, and government agencies. Today students have access to information by electronic means that may be of doubtful origin, deliberately biased, or commercially motivated. It is important that students learn to evaluate electronic sources for relevancy, validity, and objectivity in a systematic fashion so they can distinguish among fact, opinion, and propaganda.

THE NEED FOR EVALUATION OF ELECTRONIC SOURCES

Students have always been taught to evaluate their sources, but the imperative was not as strong in the past because many print and even nonprint materials had been vetted by publishing companies, periodical review editors, and government publishing protocols. Electronic databases such as SIRS (Social Resources Issues Series) and Grolier's Electronic Encyclopedia were also somewhat prevalidated because of the editorial and contributor review process and the citing of their information sources.

With many sites on the Internet, information exists with no prior editorial review, no citation sources, no publication date, no fact checking, and no subject authority or even authorship. Electronic source information is also more ephemeral. Articles in a subscription electronic periodical database can disappear when the newest update is downloaded. On the Internet,

information can be almost vaporous, with a URL address accessible one second and inaccessible the next.

The Internet also contains subjective and commercial elements that students did not have to concern themselves with when consulting SLMC print and nonprint materials. Information, especially on the Internet, must be scanned for deliberate bias or commercial motivation, both of which can be cleverly concealed from novice users. Despite these information pitfalls, the Internet provides uncensored access to ideas and information that may not be as readily available in print sources. It is a cornucopia of information, but it demands intelligent searching and critical evaluation.

RELEVANCY OF ELECTRONIC SOURCES

Just a casual observance of students searching an electronic database or the Internet is a lesson in its power to distract users from an assigned task. Overhearing excited commands to a peer, "Come here; look at this!" and seeing the cartoon features of Pluto the dog scroll down the screen when students were asked to focus on Pluto the planet is sufficient justification to start teaching them to evaluate an electronic source for its relevancy to the assignment. Searching for information, however, is not a linear process. Students may start collecting background material and then serendipitously discover a more esoteric source. In giving students relevancy guidelines, remember that some students may only need a few facts to answer a brief homework assignment, while others may be in the initial stages of term paper research. The questions they should ask themselves may not be in this order or strongly relate to a specific type of assignment.

- Does this information help answer a question?
- Does this information provide needed background, overview, or specific textual information related to the topic?
- Are the language and approach appropriate to my level?
- Does the information add new material or a new approach to the assignment?
- Will I need to locate the full text somewhere else, and if so how many pages is it? (If it is fewer than three pages, balance the time spent retrieving it against finding a similar but more accessible source.)
- Does the source contain adequate amounts of textual information, or is it all icon based with little information?

VALIDATING ELECTRONIC SOURCES

Establishing the validity of an electronic source is one of the most important aspects of the evaluation process. Electronic database sources are easier to validate than are those found on the Internet. Electronic data-

bases usually comprise citations that contain the author's name, periodical or book title, place of publication, and so on. The Internet may lack all these validation components.

Students need to pose the following questions to assist in validating an electronic source. If the content seems valid but is unsourced, they should verify the information, if possible, in a print source or check with a teacher who has subject expertise.

- Who is the author(s), editor, compiler, and publisher(s) or contributors of the information?
- What is the author's subject expertise? (Authors should supply their credentials, and if the information is essential, the credentials should be verified in another source.)
- What is the date of the publication? (If the data are current weather information, for example, the date of the last page revision is critical.)
- What are the sources of data? (If someone has compiled demographic data, for example, are they relying upon the official 1990 census figures?)
- How is the information presented? (Is there a pattern of logical connections, consistency, and conclusions to the work?)
- Does the information appear to be accurate? (Can factual information, for example, be corroborated in another source?)
- Why was this document written? (How reliable and trustworthy is it?)
- What is the nature of the presented information? (Is it a primary or secondary source?)

OBJECTIVITY

Information is never totally objective. Consciously and unconsciously it is infused with an author's or contributor's emotional biases, needs, values, and interests. It is also always composed within a social context that reflects the attitudes and values of the time in which it was written. Students need to bring skepticism to everything they read. The format of words on a page or a computer screen cloaks words with an unjustifiable validity. Students may swallow them whole without questioning their viewpoint, truth, or logic.

The Internet, more than electronic databases, is the freest forum for the exchange of information and ideas, but it is also one of the most dangerous for unedited propaganda and bias. Students need to bring a critic's mind to all information they find on the Internet. The following guidelines and questions concerning objectivity may help them accomplish this daily task.

- Does the author, compiler, editor, contributor, or sponsoring organization or agency have a bias toward one particular viewpoint?

- Does the publisher of the information have an established reputation for conservative or liberal presentation of ideas?
- Are the facts relevant to the article?
- Do the facts, as presented, support the conclusions?
- Does the information exude a strong emotional appeal?
- Does the article seek to indoctrinate by deliberately negating opposing viewpoints?
- Is the information interpreted in only one way when there are clearly other perspectives?
- What is the nature of the language used? (Is it emotionally charged, obfuscative, or subjective?)
- What is the purpose of the information? (Is it to educate, entertain, or indoctrinate?)

EVALUATIVE RESPONSES

If SLMSs succeed in teaching students to become more skeptical, we usually stop at this point and justifiably celebrate. Students have been successfully taught to gaze at any source with a critical eye. The ultimate goal has been achieved—or has it? Students within our user population tend to be literal; they may automatically reject information because it clearly violated one of the relevancy, validity, or objectivity guidelines. Subsequently they may decide to change their topic or pursue another aspect of it.

Use a medical analogy to teach them to get a second opinion. Most health plans require second opinions before treatment, because they realize that there may be several options (e.g., drug therapy, change in diet or lifestyle or surgery). They also realize that there is a chance for misdiagnosis. Encourage students to do the following if they encounter suspect electronic information.

- Consult a librarian as an expert source analyst.
- Consult an instructor in the capacity of subject expert.
- Consult a second print or electronic source to verify questionable information.
- Obtain an opposing viewpoint for material that is clearly biased.

SUGGESTED LESSON PLAN

Library concept Evaluating electronic information sources.

Time requirements One hundred minutes (or two class periods) to review the criteria for evaluating electronic information sources; provide examples relating to the relevancy, validity, and objectivity guidelines; and to evaluate selected Internet information sources critically. You could shorten this time by printing the information ahead of time and assigning it

as homework. Then only one class period would be necessary for class discussion.

Objectives

To enable students to evaluate electronic information sources critically, especially those on the Internet.

Prerequisites

Students should be able to search the Internet by using search engines and directories.

Equipment needed

At least one Windows-level computer containing either Netscape's Navigator or Microsoft's Internet Explorer and access to the Internet.

Procedure

- Prepare students by telling them that their assignment is to evaluate two electronic sources critically: (1) "Valley of the Shadow," a project that has woven the history of two communities on either side of the Mason-Dixon line during the American Civil War, and (2) a paper that used primary sources from "Valley of the Shadow" written by Kelly McCollum when she was a junior at the Peddie School in Hightstown, New Jersey.
- Review the definitions, guidelines, and questions concerning relevancy, validity, and objectivity of electronic sources.
- At this point, the lesson may be approached from a totally electronic perspective if there are a sufficient number of Internet stations available. The other alternative is to print and photocopy the information at each Internet site and demonstrate the search on one terminal while the class follows the search paths with print copies.
- Have students search and locate the Internet site "Valley of the Shadow" by either entering it as a double-quoted phrase in a search engine such as AltaVista or opening the location at http://jefferson.village.virginia.edu/vshadow2/background.html
- Have them answer the questions in Part I of the sample assignment that follows about the "Valley of the Shadow" database.
- After completing the first part of the assignment, have students enter the site containing the paper "Slavery, Expansion, Politics: Causes of the Civil War" by Kelly McCollum at http://www.peddie.k12.nj.us/princip/vs2-kam.htm and answer the questions in Part II of the sample assignment.
- If time permits, conduct a class discussion that elicits students' critical judgment regarding both types of electronic sources.

Evaluation

- Students should be able to distinguish between primary and secondary sources.
- Students should be able to evaluate both types of sources for relevancy, validity, and objectivity.

SAMPLE ASSIGNMENT

Project: You are an editor for a historical periodical, *American History Revisited,* and have received a manuscript titled "Slavery, Expansion, Politics: Causes of the Civil War" at http://www.peddie.k12.nj.us/princip/vs2-kam.htm by Kelly McCollum for possible publication. In checking the sources cited, you find an Internet reference to "Valley of the Shadow" at http://jefferson.village.virginia.edu/vshadow2/background.html and an Internet reference to "(N.Y. Tribune 11/29/1860)" at http://jefferson.village.virginia.edu/vshadow2/articles/nyt.nd60.html You need to examine both sources for relevancy, validity, and objectivity before you decide whether to publish the manuscript. Answer the following questions to help you evaluate these electronic information sources.

Part I: "Valley of the Shadow"

Relevancy

1. Does "Valley of the Shadow" provide relevant background, overview, or textual information about the American Civil War? _____

   _____

2. Are the language and approach appropriate to secondary school students?

   _____

   _____

3. Does "Valley of the Shadow" contain sufficient amounts of textual information? _____

   _____

4. Does "Valley of the Shadow" add new materials and/or a new perspective to researching the Civil War? _____

   _____

Validity

5. Who are the authors/publishers of "Valley of the Shadow"? _____

   _____

6. Describe their backgrounds and their subject expertise. _____

   _____

7. What are the sources of data that comprise the database? _____

   _____

8. Is this a primary or secondary source database? _____

   _____

9. Does the information appear to be accurate? Could you corroborate some of these sources in another print source? Explain your answer briefly. _____

   _____

Objectivity

10. Do the publishers have a bias toward the North or the South in this database?

_____

11. What is the purpose of the database?_____

_____

12. Does the database appear to expose you to opposing viewpoints concerning the issues involving the Civil War? _____

_____

Part II: "Slavery, Expansion, Politics: Causes of the Civil War"

Relevancy

1. Does the paper provide background, overview, and textual information that is relevant to determining the reasons behind the war and its inevitability?

_____

2. Are the language and approach suitable for secondary school students?

_____

3. Does the paper contain a sufficient amount of information to support the conclusions? _____

_____

Validity

4. What is the author's background? _____

_____

5. What level of subject expertise does she or he have?_____

_____

6. What are the sources that the author relied on? Do they appear to be valid ones?_____

_____

7. Is this a primary or secondary source document? Explain your answer. _____

_____

8. Does the information appear to be accurate? _____

_____

9. Is there a pattern of logical connections, consistency, and conclusions to the work? _____

_____

Objectivity

10. Does the author have a bias toward one particular viewpoint? (If you believe the author does, provide an example(s).) _____

_____

11. Look at the citation from the *New York Tribune*, November 29, 1860, at http://jefferson.village.virginia.edu/vshadow2/articles/nyt.nd60.html Read the *New York Tribune* article. Do the facts from the article support the author's conclusions? Explain. _____

_____

12. Are all of the facts presented relevant to the article? _____

_____

13. What is the nature of the language used? _____

_____

14. What is the purpose of the paper? Is it to educate, entertain, or indoctrinate? Explain your answer briefly. _____

_____

15. As editor of *American History Revisited*, would you publish this manuscript? Explain your answer briefly. _____

_____

ADDITIONAL SOURCES

Dickinson, Gail K. *Selection and Evaluation of Electronic Resources*. Englewood, Colo.: Libraries Unlimited, 1994.

"How to Evaluate Internet Sources." http://www.jmu.edu/libliaison/gold/evalint.htm (August 9, 1996). Contains outstanding evaluative criteria for books, periodicals, movies, and databases, as well as Internet sources.

Santa Vicca, Edmund F., Carolyn S. Elliott, and Susan S. Starr. "Evaluating Internet Sources." *Reference Librarian*, nos. 41–42 (1994): 225–73.

Shirato, Linda, ed. *Judging the Validity of Information Sources: Teaching Critical Analysis in Bibliographic Instruction*. Ann Arbor, Mich.: Pierian Press, 1991.

Appendix: Principal Vendors

Note: In response to the need for Internet delivery mode, most of the vendors are well under way to becoming multi-format publishers. They deal in print, Internet host delivery, and online services.

ABC-CLIO
130 Cremona Dr.
Santa Barbara, CA 93117
805/968-1911

Afro-Link Software
P.O. Box 59145
Renton, WA 98058
206/277-6497

R. R. Bowker
Reed Elsevier Div.
121 Chanlon Rd.
New Providence, NJ 07974
800/521-8110, 908/464-6800

Broderbund Software Inc.
500 Redwood Blvd.
Novato, CA 94948-6121
415/382-4400

BRS InfoPro Technologies
BRS Online
8000 Westpark Dr.
McLean, VA 22102
703/442-0900

Bureau of Electronic Publishing
U.S. History on CD-ROM
141 New Road
Parsippany, NJ 07054
201/808-2700

CD Plus Technologies
333 7th Street
New York, NY 10001
800/950-2035, 212/563-3006

Chadwyck-Healey
1101 King St., Suite 380
Alexandria, VA 22314
800/752-0515

Chicano Studies Library
University of California, Berkeley
Publications Unit

3404 Dwinelle Hall
Berkeley, CA 94729
510/642-3859

CompuServe Information Service
5000 Arlington Centre Blvd.
Columbus, OH 43220
800/848-8990, 614/457-8600

Congressional Quarterly
1414 22d St., N.W.
Washington, D.C. 20037
800/432-2250

Data-Star
Knight-Ridder Information, Inc.
One Commerce Square
2005 Market Square, Suite 1010
Philadelphia, PA 19103
800/221-7754, 215/587-4400

DIALOG
Knight-Ridder Information, Inc.
2440 El Camino Real
Mountain View, CA 94040
800/334-2564, 415/254-7000

EBSCO Publishing
83 Pine Street
P.O. Box 2250
Peabody, MA 01960-7250
508/535-8500

EPIC
OCLC Online Computer Library
Center, Inc.
6565 Frantz Rd.
Dublin, OH 43017-3395
800/848-5878, 614/764-4000

FABS International, Inc.
120 Parkwood Dr.
Niceville, FL 32598
904/897-1430

Facts On File, Inc.
11 Penn Plaza
New York, NY 10001
212/967-9800

FirstSearch
OCLC Online Computer Library
Center, Inc.
6565 Frantz Rd.
Dublin, OH 43017-3395
800/848-5878, 614/764-4000

Gale Research, Inc.
P.O. Box 33477
Detroit, MI 48232-5477
800/877-GALE

Golden Owl Publishing Co.
P.O. Box 503
Amawalk, NY 10501
914/962-6911

Infonautics Corporation
900 West Valley Rd., Suite 1000
Wayne, PA 19087-1830
610/971-8840

Information Access Co.
362 Lakeside Dr.
Foster City, CA 94404
800/227-8431

Knowledge Index
CompuServe Information Service
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, OH 43220
800/848-8199, 614/457-8600

Macmillan Digital U.S.A.
1633 Broadway
New York, NY 10019-6785
800/261-8783, 212/654-8588

Microsoft Corporation
One Microsoft Way
Redmond, WA 98057-6399
206/882-8080

National Geographic Society
Educational Services
17th & M St., N.W.
Washington, DC 20036-2222
800/368-2728

National Information Service Corp.
Wyman Towers, Suite 6
3100 St. Paul Street
Baltimore, MD 21218
410/243-0797

Newsbank, Inc.
58 Pine St.
New Canaan, CT 06840
800/762-8181, 203/243-7694

Netscape Communications Corp.
501 East Middlefield Rd.
Mountain View, CA 94043
800/638-7483, 415/937-4467

OCLC
Online Computer Library Center, Inc.
6565 Frantz Rd.
Dublin, OH 43017-3395
800/848-5878, 614/764-4000

Political Risk Services
222 Teall Ave., Suite 200
P.O. Box 6482
Syracuse, NY 13217-6482
315/472-1224

Prelinger Associates, Inc.
Footage 1991: North American Film and Video Sources
430 West 14th St., Room 206
New York, NY 10014
212/633-2134

Quanta Press, Inc.
Roger Ebert's Movie Home Companion
1313 Fifth St., S.E., Suite 208C
Minneapolis, MN 55414
612/379-3956

Reed Elsevier
Metlife Bldg.
200 Park Ave.
New York, NY 10166
212/309-8136

RLIN
Research Libraries Information Network
1200 Villa St.
Mountain View, CA 94041-1100
415/962-9951

Roth Publishing, Inc.
185 Great Neck Rd.
Great Neck, NY 11021
516/466-3676

Scribner
Division of Simon & Schuster
200 Old Tappan Rd.
Old Tappan, NJ 07675
800/223-2336

SilverPlatter Information, Inc.
100 River Ridge Rd.
Norwood, MA 02062
800/343-0064, 617/769-2599

SIRS
P.O. Box 2348
Boca Raton, FL 33427
800/232-SIRS

Softline Information, Inc.
Ethnic NewsWatch
65 Broad St.
Stamford, CT 06901
203/975-8292

Software Toolworks, Inc.
60 Leveroni Ct.
Novato, CA 94949
415/883-3000

University Microfilms, Inc.
300 North Zeeb Rd.
Ann Arbor, MI 48106-1346
800/521-0600, 313/761-4700

Wilsonline
H. W. Wilson
950 University Ave.
Bronx, NY 10452
800/367-6770

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Glossary

Abstract Databases Databases that contain brief summaries of an article, book, document, or report.

ARCHIE An Internet service that allows users to discover which anonymous file transfer protocol sites contain particular files of interest.

Bibliographic Databases Databases in which the information is presented as citations that include the author, title, publisher, publication date, and other publication facts of a work.

Bibliographic Record A unit of information received from an electronic database. It can be brief (author, title, publisher, etc.) or full (abstract, summary, holdings information, and location).

Bookmark A means provided by Web browser software such as Netscape's Navigator and Microsoft's Internet Explorer, a Gopher, or a Lynx to save a site's Internet address in a file on a client computer. The feature saves time because users do not have to enter an Internet address every time they wish to access a site.

Boolean Logic A computer logic that employs the words AND, OR and NOT to increase search precision. The use of the word OR expands a search. The use of the words AND and NOT narrows a search.

Browser An Internet software program that allows users to skim, read, or scan information on the Internet. The two largest browsers are Netscape's Navigator and Microsoft's Internet Explorer.

CD-ROM (Compact Disk–Read-Only Memory) Digital compact disks used to deliver large collections of software or documents.

Click To position the computer pointer on a hyperlink portion of an Internet document and quickly release the mouse button.

Controlled Vocabulary The creation of a standardized list of words and terms to describe similar words or variants of words. The use of the *Library of Congress Subject Headings* is an example of controlled vocabulary.

Crawler A form of Internet software that burrows into Internet sites and hyperlinks and retrieves search terms.

Database A machine-readable collection of information including back files or categories necessary for convenient online access.

Descriptor A synonym for a subject heading or keyword.

Digital Information Data that has been transformed into a machine-readable format.

Directory Databases An electronic resource that arranges information in a format similar to a telephone book.

Electronic Gateway A piece of software that connects networks or computer programs that use different protocols or command structures and translates between protocols so that the programs can exchange data.

Electronic Literacy The ability to search, retrieve, organize, employ, and evaluate information derived from electronic information resources.

Electronic Stack Browsing A command available in second-generation online public access catalogs that permit users to access materials remotely to the left and right of a particular library item.

EPIC A product of OCLC, Inc. that sells access to more than sixty online databases. It features a similar command structure so that users can search or transfer searches to different databases easily.

Field A MARC (machine-readable-catalog) record term for a specific area of a bibliographic record containing identifying characteristics of an item (e.g., author, title of work).

FirstSearch An OCLC, Inc., product suitable for school libraries that permits users to search more than forty online databases by using a similar command structure.

Front-End Software Software that users see first before entering a second program or database (e.g., an electronic menu consisting of a listing of a library's online public access catalog and various networked CD-ROM databases).

FTP (File Transfer Protocol) A software program that transfers files using a specific command structure or the act of transferring files from a host computer to one's own terminal.

Full-Text Databases An electronic information resource that contains the entire document.

Gateway to Information Designed at Ohio State University, a front-end system linked to the online catalog and various CD-ROM databases. It guides users through a step-by-step process of searching a subject, moving from the general to the specific, considering all relevant areas of the library, and, through continuous evaluation, selecting the most appropriate information sources.

Gopher A menu-based means (and set of governing protocols) of exploring Internet information resources.

Hits, Matches Terms used to describe the finding of relevant information that corresponds to specific search terms.

Home page The first page on a World Wide Web hypertext transport protocol server or the root document describing an organization or individual on the Web.

HTML (Hypertext Markup Language) The computer languages used to create Internet Web documents.

HTTP (Hypertext Transport Protocol) The means by which people using the Web and Web servers communicate with each other.

Hyperlinks Reference points in documents for linking information. These words are usually highlighted in blue or underlined within an Internet document.

Hypermedia A multimedia document that includes links to text, audio, and video.

Internet The worldwide "network of networks" that are connected to each other using Internet and other software protocols. The Internet provides file transfers, remote access, e-mail, listservs, information, and other services.

Internet Explorer One of the two main browser software systems used to search the Internet.

Keyword Searching Using significant words that express a subject under which entries for all publications on the subject are filed in a catalog, bibliography, or electronic resource.

Known-Item Searching A form of searching where the user has knowledge of the author or title of a document.

Limitors Search tools or words that can be employed in a search strategy to increase precision by narrowing a search to specific terms, uniform resource locator addresses, or number of items retrieved.

LOCIS Online Catalog An acronym for the online public access catalog at the Library of Congress.

Lynx A World Wide Web browser that bridges the gap between graphicless mode browsers and multimedia databases. Lynx only allows the use of keyword cursors to display information.

Multimedia Databases An electronic information resource that contains audio, video, and graphic images in addition to text.

Netscape Navigator One of the two main browser software systems used to search the Internet.

Numeric Databases An electronic information resource that consists primarily of numbers, statistics, or numeric lists of information.

On-Site Browsing Using an electronic information resource at the place where it resides.

OPAC (Online Public Access Catalog) An electronic version of the catalog card that supports known-item, keyword, subject, and multiterm searching for information.

Phrase Searching Searching an electronic database by entering a phrase, usually within brackets or double quotations, to increase search precision.

Proximity Operators Indicators that use words or special punctuation to narrow searches. The words *near* and *adjacent* are proximity operators.

Record Display The manner in which online public access catalogs present information on the computer screen. Some OPACs provide only a brief bibliographic record consisting of author, title, publisher, place of publication, and so forth. Users may press an additional command (sometimes called "Full" or "Long") to retrieve notes and holdings.

Remote Access The searching of an online public access catalog or other electronic resource through a modem and dial-up access protocols or through the Internet.

Remote Searching Using an electronic information resource geographically distant from its place of residence. Users may access electronic information resources via modem and dial-up access or the Internet.

Response Time The time it takes for an electronic information resource to search for terms and display the results or indicate that there are zero information matches.

Search Engine A form of software that permits users to enter search terms and finds information in relevant Internet sites that match those search terms.

Search Strategy The organized plan by which a user conducts a search of an electronic information resource; usually involves the use of Boolean operators to increase search precision.

Shelf Position Search A type of online public access catalog command that searches a specified number of call numbers to the left and right of a previously identified bibliographic item.

Spiders Term used to describe software programs that travel the Internet looking for Internet sites and hyperlinks relevant to a specific set of search terms.

Subject Directories Internet searching tools that group Internet sites within broad subject categories such as arts and entertainment, business, law, or medicine.

Supercatalog An advanced or third-generation OPAC that usually features a gateway that assists users in the selection of appropriate search terms and electronic databases.

Telnet The protocol used by the Internet for remote-terminal sessions. Telnet access is address specific and is one of the fastest ways to access information on the Internet.

Truncation The use of keyboard symbols such as $, !, ?, and * that permits users to retrieve all words that begin with a root of a word or words that may appear within a word (e.g., *sing?* would retrieve *sing, singing, singers,* and so forth).

URL (Uniform Resource Locator) An address that identifies and locates multimedia information on the World Wide Web.

USENET A distributed discussion list system whose information is carried over the Internet. Usenets usually contain general or specific news about various subjects ranging from endangered species to education.

WAIS (wide area information server) A search engine commonly used by Gopher servers.

World Wide Web (W3), WWW, or The Web A network-based hypertext document delivery system that supports links to other documents within a given document.

Worms A software program designed to search the Internet for relevant documents that match a user's search terms.

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