Library Research Strategies for Educators

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Library Research
Strategies for Educators

By Alexia M. Kartis
and
Annette Jones Watters

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Introduction

Conducting research should be a continuing part of an educator's professional life. However, retrieving pertinent information for one's research requires an awareness of and familiarity with library resources and tools. Without knowledge of information retrieval techniques, conducting library research can be tedious and frustrating; and many valuable sources of information may be overlooked.

The key to conducting thorough research is knowing how to locate and use the information resources at one's disposal. The purpose of this fastback is to inform educators about the most common library reference sources that can be used in educational research.

When searching the literature, the researcher will find that most sources can be classified into one of three types: primary, secondary, or tertiary. Primary sources are original reports of research representing either new knowledge or a new interpretation of old knowledge. Examples of these sources are reports from organizations, monographs, journal articles, conference proceedings, and dissertations. The researcher should consult primary sources whenever possible. Secondary and tertiary sources serve as identifiers of primary source material. Secondary sources organize the information of primary sources into one volume. They, in effect, repackage primary source information and guide the researcher to the original documents. Examples of secondary sources are review journals, indexing and abstracting services, most books, encyclopedias, and handbooks. Tertiary sources are especially useful in identifying primary and secondary sources. Examples of tertiary sources include directories, bibliographies, and guides to the literature.
Just as different sources of information can be classified by level, so can information sources be classified by function: Some information sources function to provide current awareness; others function to provide information needed for day-to-day living; still others function retrospectively. Many reference sources serve only one of these functions; some serve more than one. For example, the library card catalog is most useful for retrospective searching; a newspaper for current awareness; an index for both.

Whatever the purpose, the search for information should ultimately lead the researcher to the primary source. But it is often difficult to identify primary sources without the aid of reliable secondary sources. This fastback will aid the researcher in using references for both primary and secondary sources.
Developing a Library Search Strategy

Every researcher should devise a strategy to assure that all relevant information on a subject is retrieved in an efficient manner, without any duplication of effort. Several factors will determine the nature of the strategy:

1. The subject of inquiry
2. The researcher's background in the subject
3. The library's resources
4. The researcher's ability to access those resources
5. The availability of external sources of information
6. The time available for the literature search
7. The nature of the anticipated final product.

STEP 1: Become familiar with the library.

Become familiar with the physical layout of the library. Many larger libraries provide an orientation pamphlet or an instruction sheet. If the library is new to you, such guides can be very helpful for general orientation. Become acquainted with the reference librarians and with interlibrary loan office procedures. During this step, determine if the library's holdings can accommodate the research to be conducted. Time invested in performing these tasks will be time well spent.

STEP 2: Select a topic.

Topic selection is the most critical step in conducting a literature search. Failure to identify a precise subject of investigation may result in
considerable amounts of wasted time and energy. Several factors should be considered when selecting a topic:

1. It should be challenging and interesting.
2. It should be within the researcher's capabilities.
3. It should be appropriate for the assignment or research required.
4. There should be sufficient original data available to conduct a meaningful investigation and synthesis.

Literature summaries in encyclopedias or handbooks are excellent beginning points for selecting a topic. Biographical reference books may also be helpful for identifying a topic. These references can provide the researcher with a historical synopsis of a subject and a bibliography of sources. The Appendix provides a listing of encyclopedias, handbooks, and biographical references particularly suited for educational research.

**STEP 3: Delimit the selected topic.**

By answering the following questions, the researcher can limit the topic of investigation so that it is manageable:

1. What is the purpose of the research?
2. Who is the audience?
3. What is the perspective (e.g., current issue, historical overview, empirical research)?
4. What is the expected end product?
5. How much time and money can be allocated to this project?

The answers to these questions will help the researcher delimit the topic by clarifying the problem and by identifying, among other things, its scope, depth, and purpose.

Delimiting a topic should also include identifying search terms for locating sources through the card catalog and other references. Terms can be culled from literature summaries and subject dictionaries. The following dictionaries may be helpful:

*Dictionary of Education*, 3d ed., edited by Carter V. Good, (McGraw-Hill, 1973) contains clear, concise definitions of over 33,000 terms and concepts as they relate to the entire area of education and such allied fields as psychology, philosophy, sociology, and statistics.
International Dictionary of Education, by G. Terry Page and J. B. Thomas, (Nichols, 1977) is a comprehensive reference work and a practical guide to the language of education from preschool to post-doctoral levels. The 9,000 entries cover virtually every country in the world and range from specialized terms in computerized systems and legislation affecting education to entries about famous educators and their contributions to education.

STEP 4: Begin the literature search.

First try to locate subject bibliographies on the topic. A subject bibliography may reduce the amount of time needed to identify other sources such as books, monographs, and journal articles. Check the currency of the bibliography; otherwise, you might miss more recent sources on a particular subject. Bibliographies can also be used to verify references and other publication information.

STEP 5: Take complete bibliographic notes.

Record information about each pertinent source on index cards. The information should include:
1. Author
2. Title
3. Publisher
4. Date of publication
5. Call number and other information that help to locate the source
6. Content notes.

Prepare the index cards during the search through the card catalog. This step frequently is neglected because it is time-consuming. However, when a literature search extends over several weeks, you should not trust your memory. A card file with complete citations and accurate notes will save time in the long run. After finding sources in the card catalog or other indexes, retrieve them from the shelves or in the reference or periodicals sections of the library.

STEP 6: Evaluate books, monographs, and other sources.

Evaluate your sources as to their significance to the research you are conducting. You may wish to look up book reviews of the sources you have identified as another way of evaluating them.
**STEP 7: Identify periodical literature.**

Periodicals are the best source for current information but are also a major source for retrospective searches. Consult periodical indexes and abstracting services to locate pertinent information. Select the time period you wish to cover and conduct the search by author, title, or subject. A search by subject is likely to yield more sources. Remember to record the full citation on index cards, which should include the author, title, journal, volume and issue number, and the page numbers of the article.

At this step you may want to inquire about the availability of computerized searching and weigh the advantages and disadvantages of online computer searching of indexes and abstracts. Cost will be a primary consideration; but if the computer search will yield optimal identification of relevant sources, then it should be used if available. However, if the topic is extremely broad, a manual search would be more efficient.

**STEP 8: Evaluate periodical literature.**

Retrieve the periodical literature and evaluate it. The library may have a separate serials catalog with call numbers for each journal. Journals are usually arranged alphabetically in an area separate from the book stacks. Journal articles are also useful for the references they cite. Check each article's reference list carefully as an additional source of pertinent citations. Cards for sources that cannot be located locally should be placed aside for interlibrary loan requests.

**STEP 9: Identify other sources of information.**

The literature available on any subject is far more extensive than is available in any one library. Newspapers, statistical tables, government documents, and other associations' publications are all excellent sources of information. These sources are not likely to be uncovered through the use of a card catalog or serials indexes. A serious subject inquiry should not neglect these additional source materials.

**STEP 10: Construct a bibliography.**

The bibliography identifies those sources that the researcher has chosen to use when preparing a written report of the research con-
ducted. A comprehensive search will uncover numerous references. Of foremost importance in the bibliography are the primary source references. As you peruse the various references and source materials, you will reach a point of diminishing returns: the same source citations will continue to reappear in the literature. At this point you can assume that the most pertinent literature on the subject has been identified and you can begin the task of analyzing and synthesizing the information gathered.

The 10 steps outlined above can serve as a general guide to library research. In the sections to follow, you will learn about specific library reference tools to use in conducting education research.
The Card Catalog

Manual retrieval sources are frequently the first entry points into the search process. These sources include card catalogs, bibliographies, periodical and citation indexes, and abstracting services. Selection of an entry point will depend on the specificity of the topic as well as the amount of information the investigator has already acquired. Another factor affecting the entry point decision is how deeply the investigator wishes to delve into the subject matter. Usually more than one entry point source is needed to uncover the existing literature.

For most individuals the card catalog is the primary entry point into the literature search. Two common types of card catalogs are the dictionary catalog and the divided catalog. The dictionary catalog files all types of entries together: authors, titles, and subjects. A divided catalog separates types of entries into different sections. A common form of separation is an author/title catalog and a separate subject catalog. A divided catalog makes searching easier in large libraries if the researcher knows the name of an author, a specific title, or a subject heading. Large libraries also may have specialized catalogs for separate collections; for example, a periodicals/serials catalog or a government documents catalog.

The card catalog is the library's main index to the contents of its collection. It enables a person to find a book of which the author, title, or subject is known and shows what the library holds by a given author or on a given subject. It also tells where the book is located in the library according to the classification system used.
Library of Congress Classification System

There are two classification systems commonly used in libraries. The older is the Dewey Decimal System, devised by Melvil Dewey in the latter part of the nineteenth century. Since the base for this system is narrow and since knowledge is being generated exponentially, most large research libraries use the Library of Congress (LC) classification system, which was originally designed in the latter part of the nineteenth century for use by the Library of Congress staff. This system uses letters of the alphabet as the primary classification and then adds Arabic numerals for subdivisions. The LC system has 21 different classes with numerous subdivisions under each class. Each primary class is designated by a single letter. Adding a second letter indicates a more specialized classification under a broader field. Following the first letter or group of letters is a whole number, which indicates a still smaller subdivision. This number is often followed by another letter/number combination called the author number. This number, known as the "Cutter number" (named for its inventor), is a numerical shorthand for the author’s name. Every book cataloged under the LC system has a unique call number not held by any other book. It is not necessary to learn all the classes in the LC system, but researchers should become familiar with the class letters and numbers in the particular field in which they are working. One limitation to both the Dewey and the LC classification systems is that a book, as indicated by its index, may have 100 or more subject areas but is classified and cataloged under only one or two. A second limitation is that subject headings are assigned by catalogers whose terms may not be the same as the users’. Thus, it may appear that there are no works in the library’s collection on a researcher’s particular topic. For example, does one search under the heading “Blacks,” or “Negroes,” or “Afro-American” when attempting to explore some facet of Black America? Even if all these subject headings are listed in the catalog, they might not be cross-referenced, so the researcher may be unaware of many pertinent materials housed in a particular library.

In most libraries the card catalog is augmented by such reference works as periodical indexes, bibliographies, and encyclopedias, which can provide useful information not classified under the subject headings.
in that catalog. While the card catalog does have limitations, it is a quick means of identifying those books in the library that may be pertinent and topical. In pursuing a topic through the card catalog, a researcher may want to consult Subject Headings Used in the Dictionary Catalogs of the Library of Congress. This reference source is complicated and laborious to use and may require the guidance of a reference librarian, but it is helpful in identifying related or more specific subject headings on a topic and can lead the researcher to other relevant books listed in the catalog.
Books as Sources of Information

Most people are comfortable with books and are likely to turn to them first when conducting scholarly research. Although most books are not primary sources, they usually provide a comprehensive discussion of a particular subject. Certain books are “classics” in their field and thus lay the foundation for further study of a particular subject. Therefore, perusing a book can lay the groundwork for researchers and prepare them to ask informed questions while conducting a search through other library references.

If a library has limited holdings, the card catalog will not identify significant works in the field that may be useful to the researcher. However, there are other sources, in addition to the card catalog, that list books that have been published on a specific area of study:

Cumulative Book Index (CBI) (The H. W. Wilson Company, 1898 to date) is published monthly, with three-month, annual, and five-year cumulations. The CBI is accurate and easy to use; however, no abstracts are given.

Books in Print (R. R. Bowker Company, 1948 to date) and Subject Guide to Books in Print (R. R. Bowker Company, 1957 to date) are reference volumes frequently consulted for identifying previously published titles. In-print books of all types are indexed by author and title in Books in Print. Each citation entry usually includes the author’s or editor’s name, price, publisher, year of publication, LC card number, and the International Standard Book Number (ISBN). Books in Print is issued each October; a supplement the following April includes newly published titles, out-of-print titles, and an updated list of publishers.
The Subject Guide to Books in Print is basically Books in Print rearranged under the 62,000 LC subject headings. This work is especially helpful in locating books about a given subject; however, the list is inclusive, not selective, so there is no indication of the quality of the titles listed.

The National Union Catalog: A Cumulative Author List (NUC) (Library of Congress, Card Division, 1956 to date) and Pre-1956 Imprints are two important references that help the researcher identify retrospective book titles. The NUC is published in nine monthly issues and three quarterly cumulations.

Book Reviews

Book reviews can often serve as abstracts of books, thereby helping the researcher determine if the book’s content is pertinent to the topic being investigated. Book reviews are also useful in developing bibliographies.

Book Review Index (Gale Research Company, 1965 to date) covers adult and juvenile fiction and nonfiction in the areas of humanities, social sciences, and library science. Review citations are listed alphabetically by author. Beginning in 1976, a separate title index section was included bimonthly. The April, August, and December issues cumulate their respective preceding issues. The Book Review Index has a 10-year cumulation volume that covers 960,000 entries from 1969 to 1979.

Current Book Review Citations: An Index to Book Reviews (CBRC) (The H. W. Wilson Company, 1976 to date) is a cumulation of reviews of books indexed in other Wilson indexes. Beginning in 1976, this index covers reviews published in more than 1,200 periodicals. Fiction and nonfiction foreign language titles and new editions are included. The author or main entry listing provides complete citations to reviews, and the title listing includes the authors’ names and serves as an index to the main entry listing. The CBRC is published monthly except August, with a bound cumulation each year.

Book Review Digest (The H. W. Wilson Company, 1905 to date) is an index that provides excerpts from and citations of reviews of current
fiction and nonfiction titles in the English language from fewer than 100 periodicals. It is organized into two sections. The first section is an alphabetical listing of book authors. Each entry includes the title of the book, bibliographic information, and publisher’s notes, followed by references to the reviews that have appeared in various periodicals. Some of these references include excerpts from the book reviewers. The second section is a subject and title index. A listing of the periodicals indexed is located at the front of each issue. The Digest is issued monthly except in February and July, with a bound annual cumulation.

Although books are excellent sources of information, it would be unwise to rely solely on them as source materials. It is impossible for books to be truly current. Even the most recently published book uses information that was gathered at least a year or more prior to publication. Furthermore, books are not usually primary sources of information. The authors usually survey or summarize a topic and interpret research findings from primary sources or other secondary sources.
Bibliographies and Dissertation Abstracts

When conducting research reviews, accuracy is best assured by using primary source materials. Bibliographies, abstracts, and periodical indexes can facilitate a scholar's search for primary source materials.

Bibliographies exist in many forms, but they usually fall into two types: descriptive and systematic. A descriptive bibliography is concerned with a book as a physical entity, i.e., the author(s), title, place of publication, publisher, date, size, number of pages, illustrations, series to which it belongs, etc. A systematic bibliography describes books categorized within a subject heading. When they are logically arranged and annotated, systematic bibliographies provide the most useful overview of the literature on a subject.

The researcher should keep in mind that most subject bibliographies are selective since the enormity of available materials precludes comprehensiveness; and, therefore, they reflect the bias and depth of subject matter knowledge of the compiler. Also, the researcher should remember that subject bibliographies quickly become dated and are not always accessible.

A ready reference guide to selective subject bibliographies is the Bibliographic Index: A Cumulative Bibliography of Bibliographies (The H. W. Wilson Company, 1937 to date). Published in April, August, and December (annual cumulation), it is a compilation of bibliographies found in books, periodicals (approximately 2,600), and pamphlets. This index leads the researcher to listings of references (bibliographies) that may be useful in a literature search. Arranged by subject headings, the
Bibliographic Index supplies a full citation but no abstract of each bibliography.

Bibliographic Guide to Education (G. K. Hall, 1979 to date) is an annual, comprehensive subject bibliography dealing with almost every aspect of education. It contains entries cataloged by Teachers College, Columbia University, and supplemented by information provided by the New York Public Library. Entries cover all forms of publications except serials. Sources are listed alphabetically by main entry, added entries, titles, series titles, and subject headings. Full bibliographic information is provided in the main entry. These entries include foreign as well as English language titles.

Doctoral dissertations are assumed to be original contributions to knowledge and may have important reference and research value. Dissertations are listed in special bibliographies.

The main abstracting service for dissertations is the Dissertations Abstracts International (DAI). However, the title of this reference source has varied several times since its inception by University Microfilms of Ann Arbor, Michigan. The first 11 volumes of the current DAI are titled Microfilm Abstracts: A Collection of Abstracts of Doctoral Dissertations Which are Available in Complete Form on Microfilm. These volumes provide summaries of selected dissertations written at selected U.S. colleges and universities. Beginning with Volume 12 (1952) the series is titled Dissertation Abstracts: A Guide to Dissertations and Monographs Available in Microform. In 1967 (Volume 27) Dissertation Abstracts was divided into two sections: Humanities and Social Sciences (A) and Sciences (B). Each section is published separately.

In 1969, beginning with Volume 30, Dissertation Abstracts became Dissertation Abstracts International. The change in title reflects the addition of dissertation citations and abstracts from European countries. The DAI is issued 12 times per year and contains approximately 18,000 abstracts per year, each of which is 400 to 600 words in length. Doctoral dissertations submitted by more than 210 cooperating institutions are indexed. Author, subject, and keyword title indexes are included. DATRIX (Direct Access to Reference Information) is the computer database of DAI.
Comprehensive Dissertation Index, 1861-1972 (CDI) (Xerox University Microfilms, 1973) is a 37-volume, computer-generated index that attempts to list all dissertations (417,000) accepted at universities in the U.S. during the period indicated. Volumes are published by subject category (e.g., volumes 20 through 24 are the indexes of education dissertations). The listings are entered by author and by keywords and include full bibliographic information as well as a reference to the DAI entry. This index supercedes all previous listings of dissertations.

Comprehensive Dissertation Index 1973-1977 (Xerox University Microfilms, 1978) is a five-year, 19-volume cumulation that has the same format as the previous CDI. Volumes 8 through 10 index education dissertations exclusively. Coverage of dissertations is extended through annual supplements of CDI. Each supplement is issued in five volumes: Part I Sciences (2 volumes); Part II Social Sciences and Humanities (2 volumes); and Author Index (1 volume).

A Guide to Theses and Dissertations: An Annotated, International Bibliography of Bibliographies, Michael M. Reynolds, editor, (Gale Research Company, 1975) is a retrospective international listing of bibliographies of theses and dissertations produced through 1973. Entries are arranged by subject. Institutions, names, titles, and specific subject indexes are provided.
Periodical Indexes

The card catalog is the major index to a library’s collection, but it cannot be used to locate specific articles in periodicals and other serials, which are important sources for current information. Three types of references are available to help the researcher locate periodical literature: directories, union lists, and indexes. But most researchers will first consult a periodical index to locate pertinent articles in a great variety of periodicals. The information in periodicals is virtually inaccessible without an index to their contents. William Frederick Poole realized this fact when he compiled the first periodical index covering the years 1802-1907. Since Poole’s Index to Periodical Literature, 1802-1907 (Houghton Mifflin Company, 1881-1908), numerous indexing (and abstracting) services have been established. Some are general in character, but the majority relate to special subjects, such as education.

The information within a periodical index is arranged alphabetically by subject and is usually cross-referenced by author and/or title. Each citation will include the article title, the author’s name, the title of the journal in which the article appears, the volume and issue numbers, the date of publication, and page numbers. The title of the journal is usually abbreviated in the citation. An explanation of abbreviations is commonly found in the preliminary pages of most indexes. The following indexes may be useful for educational researchers:

Education Index (The H. W. Wilson Company, 1929 to date) is published monthly except for July and August and is cumulated annually. Citations are indexed by author and subject categories in one alphabetical index. It indexes over 325 journals plus conference pro-
ceedings, bulletins, monographs, yearbooks, and U.S. government publications in education and related fields. This index is somewhat less inclusive, extensive, and comprehensive than other available sources, but it is popular because of its frequent publication and its availability.

*State Education Journal Index (Westminster, Colorado, 1963 to date)* is published semiannually in February and July and references articles from approximately 80 state and association publications, most of which are not indexed in the *Education Index*. Entries are arranged by subject. There is no title or author index.

*A User's Guide to the Phi Delta Kappan, 1970-81* (Phi Delta Kappa, 1982) is a subject index of a single journal. It is included because the *Phi Delta Kappan* is one of the most widely read and frequently cited of all education journals. The *Guide* contains citations and brief abstracts of 1,738 articles arranged alphabetically by author. The subject index of more than 2,400 items uses ERIC descriptors and identifiers.

*Social Sciences Index* (The H. W. Wilson Company, 1974 to date) cites articles in the social sciences and may be helpful in identifying articles on education or education-related topics written from the perspective of any one of several disciplines.

*Index to Legal Periodicals* (The H. W. Wilson Company, 1908 to date) is published monthly except September, with a bound cumulation each year. Legal periodicals published in the U.S., Canada, Great Britain, Ireland, Australia, and New Zealand are indexed if they regularly publish legal articles of high quality and permanent reference value. Entries are indexed by subject category and author.

To determine if the library carries those journals (and specific volumes) that contain the articles the researcher needs, he or she should consult the library's serial catalog. This catalog may be no more than a list in a notebook kept at the reference desk, or it may be housed in several drawers of a card cabinet. Periodical titles are arranged alphabetically by each word in the title, not by the abbreviations within the citations listed in the index. For future reference, the researcher should remember to cite each article properly with the title, volume, issue, date, and page numbers. Journal articles are useful not only for the information they report but also for the references the authors cite.
The "References" section of each article should be checked carefully as a source of additional pertinent literature. This is explored more fully in the "Citation Indexes" chapter of this fastback.

Periodical indexes are important tools for the researcher but they do have limitations if used exclusively:

1. Although they are excellent guides to relatively current information, they are still one to three months out of date.
2. They provide the researcher access only to normally referenced materials, not elusive materials.
3. The researcher still has to sift through a large number of citations listed under the subject headings to find those relevant to a specific area of study.
4. They provide no controlled thesauri to locate subject headings; thus researchers depend on their own knowledge of appropriate keywords and descriptors to find relevant information.
5. In general, they do not provide abstracts to help researchers determine which materials fall within the purview of the topic under investigation. An article title alone could be misleading.
Abstracting Services

It is impossible for one person to review all the published literature on a topic; therefore, abstracts provide a rapid means of reviewing that literature. They not only include the bibliographic information necessary to retrieve the original article but they also summarize the contents, so that a researcher can determine whether reading the complete article is warranted. Abstracts may range from a few words to several hundred words. They usually describe the original work factually, although some provide critical comments as well.

Following is a listing of abstracting services frequently used by researchers in education. This list is not intended to be comprehensive.

*Child Development Abstracts and Bibliography* (Society for Research in Child Development, Inc., University of Chicago Press, 1927 to date) is issued three times per year and publishes approximately 800 abstracts annually, each about 250 words in length. It abstracts articles from more than 100 domestic and 60 foreign periodicals, books, pamphlets, etc. Entries are arranged by subject and author indexes. A "Book Notices" section includes evaluative reviews and lists of new books, pamphlets, and periodicals in the field.

*College Student Personnel Abstracts* (Claremont Graduate School, 1965 to date) is a quarterly publication that contains abstracts from approximately 125 journals, conference proceedings, and research reports pertaining to college students and faculty and student services personnel. Abstracts are arranged by subject. A subject index and an author index are included in each issue.

Educational Administration Abstracts (University Council for Educational Administration, 1966 to date) is published three times a year and includes abstracts arranged by broad subject categories from approximately 125 journals. It includes author and journal indexes as well as a section of recently completed dissertations on educational administration from universities belonging to the Council.

Exceptional Child Education Resources (formerly Exceptional Child Education Abstracts) (The Council for Exceptional Children, 1969 to date) is a quarterly publication that provides comprehensive abstract coverage of journal articles, research reports, curriculum guides, administrative surveys and guidelines, and many ERIC documents in the field of special education. The abstracts are arranged in a numerical sequence and are indexed by author, title, and subject.

Master's Theses in Education in the United States and Canada (Research Publications, 1951-52 to date) is an annual publication that provides a listing of theses reported by those institutions in the U.S. and Canada offering the Master's degree in the field of education. Titles are listed numerically and alphabetically by author's name under each subject heading. Entries are cross-referenced with an institutional index. An author index is included.

Psychological Abstracts (American Psychological Association Inc., 1927 to date) is published 12 times a year and annually provides more than 20,000 nonevaluative summaries and citations of relevant dissertations, books, documents, and articles extracted from more than 850 journals covering psychology and related areas. Entries are grouped under 16 major categories. A brief subject index and an author index are included.

Sociological Abstracts (Sociological Abstracts, Inc., 1952 to date) is published five times a year with an annual, cumulative index and annually provides nearly 6,200 abstracts, each approximately 500 words in
length. Entries are classified in 31 sections and are alphabetized by author in each section. Subject, author, and source indexes are included in each issue. Complementary services include supplements of abstracts of papers presented at national and regional sociological conventions and a computerized retrieval system of indexed categories.

*Sociology of Education Abstracts* (Oxford University, Pergamon Press, Ltd., 1965 to date) is published six times a year and contains approximately 1,100 abstracts, each 200 to 400 words in length. It contains abstracts from 56 British and 160 foreign journals and books. Entries are alphabetized by author. An annual author index and source index are also published.
Educational Resources Information Center (ERIC)

The major abstracting service in the field of education is provided by the Educational Resources Information Center (ERIC), a federally funded national information storage and retrieval network designed for educators and others interested in education issues. The current ERIC database is a collection of more than 170,000 published and unpublished educational documents. These documents are categorized in one of the two components of the ERIC system: Resources in Education (RIE) (U.S. Government Printing Office, 1966 to date) or Current Index to Journals in Education (CIJE) (Oryx Press, 1969 to date). Documents in these massive systems are selected for inclusion from those written materials submitted for abstracting and/or publication consideration to one of the 16 clearinghouses in the nationwide ERIC network. Each clearinghouse specializes in a different, multidisciplinary educational area. The exact number of clearinghouses has changed over time in response to the shifting needs of the educational community. A listing of the clearinghouses and their addresses can be found in any issue of the CIJE or RIE publications.

Each document, when entered into the ERIC system, receives a clearinghouse accession number (a prefix, which identifies one of the 16 clearinghouses, followed by six digits) and an ERIC system number (an ED prefix plus six digits for an RIE document or an EJ prefix plus six digits for a CIJE document). The clearinghouse number and the system number are cross-referenced. Once entered into the system, a document will never go out of print since it is stored on microfiche at over 700 de-
repositories in libraries and education institutions nationwide. Each document is also on record at the ERIC Document Reproduction Service (EDRS). Copies of a document can be obtained from the EDRS for a nominal fee.

Even if a research library is not an ERIC repository, it should have the ERIC indexes. The RIE (formerly named Research in Education, pre-1975) is a monthly index to the ERIC document holdings. Semianual and annual compilations are published. The RIE includes resumes (abstracts) of articles, books, monographs, and other materials selected by one of the 16 clearinghouses for inclusion in the system. Some of these materials are ephemeral or of limited distribution in their original issue. The ERIC system deliberately includes quality research works that might not otherwise come to the attention of the research community.

The indexes of the RIE are divided into 1) the Subject Index, which lists each document title and its ERIC accession number; 2) the Author Index, which lists each document by title and accession number according to author; and 3) the Institution Index, which is organized by agency affiliation of authors. Each document is listed consecutively by its accession number in the Document Resume section. A full citation, a resume, and the availability of each document is given. If the researcher decides to read a document, it can be located by accession number in a special collection of the library's holdings.

The second part of the ERIC system is the Current Index to Journals in Education (CIJE). Published monthly, semiannually, and annually, the CIJE, established in 1969, supplements the RIE by abstracting journal articles. Over 65,000 articles are cited annually in the CIJE from over 700 education and education-related journals (over twice as many as Education Index). Coverage is intended to be comprehensive rather than selective. The CIJE is divided into three indexes and a Main Entry section. The Subject Index is categorized according to those descriptors found in the ERIC Thesaurus and provides full citations of articles under those headings. The Author Index is alphabetical and identifies articles by article accession numbers. The Journal Contents Index contains the table of contents for each journal indexed. The Main Entry section includes a complete citation plus descriptors and a brief annotation (50 words or less).
The ERIC Thesaurus (Oryx Press) assists the researcher in identifying key descriptors (subject headings) relevant to the search. The Thesaurus is the indexing vocabulary used to describe all documents entered into the ERIC system. Key descriptors are supplemented with the following information:

1. The month and year of its initial inclusion in the Thesaurus.
2. The number of CIJE documents and RIE documents that use the term as a key descriptor.
3. A scope note (SN) to denote the term's usage in the ERIC system. It is, in a sense, a definition of the term.
4. The UF (used for) acronym to identify those words that are cross-referenced with the key descriptor. These words should not be used when searching because they will not provide any additional information.
5. Other acronyms to redefine or to clarify the topic by broadening or by narrowing the search through more general or more specific terms. The following acronyms are used, followed by self-explanatory definitions: NT—narrower term, BT—broader term, and RT—related term.

Familiarity with the ERIC Thesaurus is necessary to conduct a successful literature search through the ERIC system. The terms in the Thesaurus must be used to identify relevant sources of information from the system. The researcher should follow the steps below when conducting a literature search of the ERIC system.

1. All applicable descriptors should be searched in the subject index of the most recent monthly issue of the RIE, and then one should work backward from the most recent month/year.
2. Each title under the descriptors searched will have an ED accession number. This number should be used to locate the full citation, abstract, and other pertinent information about the document in the Document Resume section of the RIE.
3. If the abstract suggests that the text of an RIE document would be pertinent to the research topic, it may be retrieved from the special RIE document microfiche holdings. If the library does not hold the microfiche, information on the document's availability is provided in
the resume section. EDRS ordering information is located on the back of any recent RIE issue.

4. To extend the search to the periodical literature, the same descriptors should be located when consulting the subject indexes of the monthly issues and annual compilation of the CIJE. The subject index provides a full citation and an EJ accession number.

5. To locate an abstract of the article and to determine its availability the researcher should look up the title located in the Main Entry section using the EJ accession number.

6. To access an article the researcher should first determine if the journal in which the article has been published is held by the library. If the journal required is not available, reprint ordering information can be found in the CIJE introduction. Another way to access articles is through the interlibrary loan office.
Citation Indexes

The plethora of literature currently published has given rise to a new form of indexing that serves a different purpose from the periodical index or the abstracting service. It is known as citation indexing—the indexing of references cited in journal articles. A cited reference becomes a main entry in the citation index. Identified under this main entry is an alphabetical list of those authors (and a brief reference to their published work) who have cited the entry in their works. A companion source index provides a full bibliographic citation for these references.

Citation indexes are based on the premise that references (from a published article) to previously published materials indicate subject relationships between current articles and older publications. The citation index shows, for the specific time period considered, which previously published items are being cited in the current literature, who is doing the citing, and in what journals they are being cited. The main question that can be answered by a citation search is “Where and by whom is this research being cited?”

This method of indexing also reveals the interrelationships between disciplines, something that is not always obvious to the researcher who usually searches discipline-specific indexes and abstracts.

There are two strategies for using a citation index. The first is to generate additional citations by searching the index itself to determine who cited the reference listed in the original (starting point) bibliography. Any citing author’s reference may be searched as a main entry in the citation index, allowing the researcher to identify those research studies and scholars prominent in a field of study. The second strategy is to generate citations by looking in the bibliographies of articles that are cited by the main entry (the reference taken from the original bibliography).
The type of search to be conducted will determine the amount and kinds of information the researcher can cull from the citation index. There are four specific searches: 1) a citation search, briefly described above; 2) a permuterm search, which uses keywords to locate articles; 3) an author search; and 4) a geographic or organization search. Search methodology will be determined by the kind of information the researcher has; for example, knowing the full citation of an article of significant research value, being familiar with keywords related to a specific topic, or knowing an author's name or a geographic location.

A citation search can be conducted retrospectively or it can be used to identify recent publications, depending upon the method the investigator chooses to use when initiating a search.

The citation index that is most useful to education researchers is the *Social Sciences Citation Index (SSCI)* (Institute for Scientific Information, 1970 to date). The *SSCI* covers over 1,000 journals in 26 disciplines and selectively reviews 2,000 others. It lists all items cited in the year covered by the service. The *SSCI* cites approximately 130 education journals. It consists of six separate volumes that are issued annually: 1) Citation Index, 2) Corporate Index, 3) Source Index, 4) Permuterm Subject Index, 5) Journal Citation Reports, and 6) Guide. The *SSCI* does not use a keyword or specialized thesaurus. Cumulative indexes of the *SSCI* are also published.

Detailed information on how to conduct a literature search using the *SSCI* is found in the Citation Index volume. It describes the four types of literature searches that can be performed, either separately or in conjunction. The following is a brief description of a *SSCI* Citation Index search process:

1. Begin with a reference previously identified.
2. Locate the author's name in the Citation Index.
3. Determine if the main entry is the previously identified reference.
4. Note the citing authors listed.
5. Use the Source Index to obtain a complete bibliographic citation.
6. Acquire the Source Index article and its reference list.
7. Identify a pertinent "new" reference.
8. Return to the Citation Index and begin the process again. This process is known as "cycling."
Government Documents

Government documents can provide a wealth of information to a researcher, but gaining access to a pertinent document can be impeded by three factors: the physical form of the document, the location of the document, and the complexity of the bibliographic tools available.

Form

Government publications are often thought to exist solely as paper-bound documents or pamphlets, but as printing and shipping costs rise, libraries are receiving more materials in microfiche rather than in paper form. Microfiche can be read on special machines available in the library, but a hard copy of any page can be made, usually for a fee. Reading microfiche does not appeal to many people, but its use is becoming more and more prevalent because of the spiraling costs of printing, processing, and storing printed documents.

Depository Libraries

Research that requires the use of government documents can be conducted more easily in a depository library. Depositories are located in all the states and most of the U.S. territories. The Superintendent of Documents provides these libraries with certain government publications as long as they continue to abide by the laws governing the depository program. There are two classes of depositories: regional and selective. Regional depositories automatically receive every document the government provides to the depository program, but not every document the government prints is included in the depository system. Selec-
tive depositories acquire only those documents that they request. Therefore, regional depositories will contain a greater number of government documents than selective depositories. A state may have as many as two regional depositories and any number of selective depositories. The nearest regional depository will provide interlibrary loan service for those researchers who are working in a nondepository library or a selective depository library.

The depository system does not provide every type of federal government document. For example, the ERIC system is not included in the depository system. Neither is the National Technical Information Service (NTIS) system, which will be discussed later. Documents emanating from the executive branch and from independent government agencies and field offices and produced by these agencies’ own printing offices or under contract are not necessarily available in a depository library. That is, government documents not printed by the Government Printing Office are not automatically available in a depository library, although many libraries make a concerted effort to acquire them. However, department and agency publications, documents of independent and regulatory agencies, and reports of advisory committees and commissions can be highly useful, even though elusive to retrieve. A documents librarian in a research library can help the investigator gain access not only to depository items but also to other useful government publications.

Bibliographic Tools

To make effective use of government documents requires knowledge of certain bibliographic tools. All government agencies issue catalogs, lists, or indexes of their published documents. These can be useful; however, their frequency varies, as does their coverage. Commercial firms also publish guides and indexes to government documents.

The Government Printing Office (GPO) publishes bibliographic works that index government documents. The most useful of these is the *Monthly Catalog of United States Government Publications* (U.S. Government Printing Office, 1895 to date). This catalog offers a current listing of government publications, arranged by departments, which are
published by the Government Printing Office. Entries are arranged alphanumerically by Superintendent of Documents (SuDoc) classification notation. The September issue lists those libraries that serve as depositories. Each monthly issue contains a subject index as do the semiannual and the annual cumulation. There is always a significant time lapse between the end of the year and the availability of the annual cumulation. The Monthly Catalog is used mainly to identify pertinent government documents printed by the Government Printing Office and to identify whether such documents are depository items.

To eliminate the need to search through each monthly and every annual index of the Monthly Catalog, the Cumulative Subject Index to the Monthly Catalog . . . 1900-1971 (Carrollton Press, 1973-1976) is useful. This index was originally published in a 15-volume set and has annual supplements. Use of this index involves a two-step process: 1) the year and the page number of the citing Monthly Catalog are provided under each entry (arranged by subject category); and with that information, 2) the user must turn to the Monthly Catalog to find the SuDoc number in order to locate a document on the shelves.

If a document title is known, the researcher can use the Cumulative Title Index of U.S. Public Documents 1789-1976 (U.S. Historical Documents Institute, 1979). This index is published in a 15-volume set and offers the title, date of publication, and SuDoc number for each entry. Document citations are arranged alphabetically by title.

Another bibliographic tool published by the Government Printing Office is Subject Bibliographies (Government Printing Office, 1975 to date). These bibliographies are compilations of documents by subject and are published irregularly. The arrangement, length, and quality of each bibliography varies.

Two government agencies providing bibliographic services merit mention. The ERIC system, described earlier, has an extensive bibliographic network. It often proves to be the single most useful system for the individual conducting educational research. The National Technical Information Service (NTIS) is equally well organized and is as intricate as the ERIC system. Documents indexed by the NTIS are government-supported research and development projects. The Government Reports Announcements and Government Reports Index are the principal tools
used for identifying citations to the literature available through the NTIS system. Although the NTIS service is separate from the depository system, some NTIS-indexed documents are government document depository items.

**Guides to Congressional Documents**

Congressional hearings and committee, commission, and task force reports are published and distributed to depository libraries as well as to other libraries. Researchers working on topics of current interest may need to access some of these documents.

The *Congressional Information Service Index to Publications of the United States Congress (CIS)* (Congressional Information Service, 1970 to date) is a valuable source for identifying and analyzing all the documents of the U.S. Congress. Usually called the *CIS/Index*, it is published monthly in looseleaf form and is between 100 and 200 pages in length. It is arranged in two sections: Index and Summary. The Index section is cumulated quarterly and annually; documents citations may be accessed by subject, author, and title. The Summary section provides a full bibliographic citation for each document and includes an abstract of a majority of those documents indexed. All documents that are indexed by the *CIS/Index* are available on microfiche; however, few libraries can afford to purchase this service. Hard copies of indexed documents are accessible in depository libraries.

For documents issued prior to 1970, the *CIS/Index* has a companion publication called *CIS U.S. Serial Set Index 1789-1969* (Congressional Information Service, 1978). This index is published in parts, with each part covering a particular period. A title-derived subject, name, and keyword index is included. *Serial Set* indexes congressional documents and reports that date back to 1789 and still continue to be published.

*CQ Weekly Report* (Congressional Quarterly, 1945 to date) is not an index but a summary of the week’s past events, including congressional and federal government activity. Included is a table that shows the progress of legislation in Congress.

The *Congressional Record* is the daily record of the proceedings of Congress. It is a verbatim report of activities; however, members of
Congress reserve the right to delete or add text. The two basic indexes of the Congressional Record are Congressional Record Abstracts—Master Edition (Capitol Services, 1976 to date) and the Federal Index (Capitol Services, 1976 to date). The Abstracts is published daily and provides citations to and abstracts of the Congressional Record text. The online database is known as CRECORD in System Development Corporation’s ORBIT and as Congressional Record Abstracts in Lockheed’s DIALOG. The Federal Index is published weekly.

Guides to Government Periodicals

The U.S. government probably produces more periodicals, series, serials, and continuing reports than it produces monographs. Tapping these sources can be highly rewarding. A special serials supplement to the Monthly Catalog contains a list of government periodicals, but the most comprehensive indexing of government periodicals is the Index to U.S. Government Periodicals (Infodata International, 1974 to date). This index provides access to periodicals produced by more than 100 U.S. government agencies. The intent of the publishers is to provide access to every U.S. government periodical that offers substantive articles of lasting research and reference value. This index is issued quarterly and cumulated annually. It is arranged by subject and is easy to use.

The Documents Librarian

To access the prodigious number of government documents requires the use of numerous bibliographies, indexes, guides, and catalogs, of which just a few have been described here. However, the most important “tool” that a researcher can use when attempting to access these publications is the government documents librarian. Documents librarians are trained in the cataloging and identification of these publications and can provide invaluable assistance in locating and using these documents. Researchers can save much time and effort if they will discuss their research topic with a documents librarian prior to initiating a search of the literature.
Statistical Sources

The U.S. Bureau of the Census is a major collector of statistical information. The Bureau conducts several censuses in addition to the decennial censuses that provide demographic information (e.g., age, gender, race, marital status, educational attainment, occupation, income, housing) on the U.S. population. A helpful source to the Bureau's census publications is the Bureau of the Census Catalog (U.S. Government Printing Office, 1967 to date), which is issued monthly, with quarterly and annual cumulations. For historical research, a useful source is the Bureau of the Census Catalog of Publications: 1790-1972 (U.S. Government Printing Office, 1974). This cumulative edition is based primarily on the annual issues published from 1946 to 1972 and reprints from the original catalog from 1790 to 1945.

The Bureau also publishes the Statistical Abstract of the United States (U.S. Government Printing Office, 1879 to date). This reference work is an annual summary of statistics collected by the federal government, but also includes some statistics from other sources. The book includes a detailed table of contents (for over 30 chapters) and a detailed index. A source citation for each table is provided in case the researcher wishes to look up the originating documents.

Another Bureau of the Census publication is Historical Statistics of the United States: Colonial Times to 1970 (U.S. Government Printing Office, 1976). This compilation is the third in a historical series that complements the annual Statistical Abstract of the United States and supercedes the first two editions.
The Congressional Information Service indexes and abstracts statistical publications of the federal government and of private organizations and state government sources. *American Statistics Index... A Comprehensive Guide to the Statistical Publications of the U.S. Government (ASI)* (Congressional Information Service, 1973 to date) is published annually in two volumes with monthly and quarterly supplements. The first volume indexes data sources on specific subjects with bibliographic citations for the originating sources (e.g., National Center for Education Statistics, Bureau of the Census, Bureau of Labor Statistics, and regulatory agencies that generate statistical studies, including congressional committees and special commissions). *ASI* indexes all types of publications by subject, author, category, title, and agency report number. The second volume (Abstracts) contains full descriptions of the content and format of each publication and is organized by *ASI* accession number. *ASI* is accessible online through System Development Corporation and Lockheed Information Systems (see the section on “Computer Databases”).

*Statistical Reference Index... A Selective Guide to American Statistical Publications from Private Organizations and State Government Sources (SRI)* (Congressional Information Service, 1980 to date) is published annually, with monthly and quarterly supplements. It indexes and abstracts statistical publications of private organizations and state governments by subject, author, category, issuing sources, and title. The format of this index is very similar to that of *ASI*; however, there are some differences so the researcher should consult the “User Guide” for instructions on using this work.

There are several statistical publications devoted exclusively to education statistics. Some of the more useful sources are identified below.

*Digest of Education Statistics* (U.S. Government Printing Office, 1962 to date) annually abstracts statistical information for all levels of education, federal programs, and research and development in the field of education. It provides the source for each statistical table and includes a subject index. A companion volume, published annually, *Projections of Educational Statistics*, shows trends for the past 10 years and projects trends for the upcoming 10 years.
The Condition of Education (U.S. Government Printing Office, 1975 to date) is an annual statistical report that examines educational opportunities and outcomes for population subgroups and trends and developments in educational institutions.

Standard Education Almanac (Marquis Academic Media, 1968 to date) addresses issues of contemporary relevance to educators by reprinting articles, charts, statistical tables, and graphs from several hundred sources for all educational levels.

Educational Statistics in OECD Countries (formerly Educational Statistics Yearbook) (Organization for Economic Cooperation and Development, 1974 to date) is divided into two parts: 1) international comparative data, and 2) data for individual countries. It includes tables on the scope and duration of formal education, enrollments, teachers, educational finance, and educational attainments of pupils.

Directory of Educational Statistics: A Guide to Sources (Pierian Press, 1974) offers 99 bibliographic sources grouped by subject into 10 categories. The entry for each source gives a brief description and publication history. Title and subject indexes are provided. As a guide to sources, this directory includes references to educational statistics, both current and historical, on a wide range of topics of interest to educators and educational planners and researchers, in some cases as far back as 1870. Source tables provide year-by-year information about the publication history of each series cited.
Other Sources of Current Information

Pamphlets, leaflets, and booklets are published by the thousands each year by federal and state agencies, colleges and universities, corporations, and associations. Some provide objective information, while others plead special causes. Since pamphlets are published and distributed quickly, they are excellent sources of topical information of current interest.

*Vertical File Index: Subject and Title Index to Selected Pamphlets* (The H. W. Wilson Company, 1932 to date) is an ideal source for locating ephemeral materials. Issued monthly except August since 1932, the *Vertical File Index* lists booklets, leaflets, pamphlets, folders, etc., currently available at no cost or for a nominal fee. These materials often contain information not found in books and periodicals and are excellent sources of current information on a particular subject. The publications listed in this index are of varying sizes and length, but they may be more substantial than a journal article and more current. Each entry includes a standard bibliographic citation, a note about content, the publisher’s address, and cost. A title index follows the subject listings.

*Associations’ Publications in Print* (R. R. Bowker Company, 1981) is an annual publication (1st edition, 1981) containing a compendium of titles published by associations. A main subject index lists titles under more than 420 subjects. The title index offers complete bibliographic information and references to other publications on the same subject. The association index lists alphabetically the names, acronyms, and addresses of approximately 13,000 associations. An acronym index and a publisher/distributor index are included.
Indexes to Current Events

_Facts on File, World News Digest with Index_ (Facts on File, Inc., 1940 to date) is a weekly 8- to 10-page news digest of world events, including education. It reviews U.S. and foreign newspapers and magazines and then publishes a weekly summary of events covering politics and government, sports, the arts, people, etc. Indexes are published twice a month; five-year cumulative indexes have been published since 1946. The cumulative indexes make possible rapid identification of current events.

_Current Contents_ (Institute for Scientific Information, 1957 to date) is a weekly publication that reprints the tables of contents of selected journals. It is currently available in seven editions, each of which is published separately as a small booklet in the following areas: 1) Life Sciences, 2) Clinical Practice, 3) Agriculture, Biology, and Environmental Sciences, 4) Physical, Chemical, and Earth Sciences, 5) Social and Behavioral Sciences, 6) Engineering Technology and Applied Sciences, and 7) Arts and Humanities. The Social and Behavioral Sciences edition reprints tables of contents of selected education journals.

Newspaper Indexes

The number of newspaper indexes is increasing because there is a demand for facts that are current; and with advances in computer technology enormous amounts of information can be rapidly processed to generate these indexes. The newspaper indexes listed below are available in printed form and by online computer.

_New York Times Index_ (The New York Times, 1851 to date) is published semimonthly and quarterly (beginning in 1978), with an annual cumulation. Since the annual cumulation is not published until six to seven months after the end of each year, a search of the previous year’s events would involve three separate quarterly issues plus the remaining semimonthly issues. However, this index offers wide coverage and is relatively complete. The index is arranged in dictionary form and each entry includes a brief abstract of the news story. Events are arranged chronologically under each of the main subject headings.
National Newspaper Index (NNI) (Information Access Corporation, 1979 to date) is published monthly and is available on microfilm as well as online. The database for this index is called NEWSSEARCH, which is updated daily. The NNI provides indexing of the New York Times, the Christian Science Monitor, and the Wall Street Journal. All three newspapers have their own published indexes; however, the advantage of this system is that all three may be searched at one time.

Newspaper Index (Bell & Howell, 1972 to date) is issued monthly and quarterly, with annual cumulations. It is available online through System Development Corporation’s ORBIT database service. (For more information on this service and others, see the section of this fastback on “Computer Databases.”) Nine of the country’s largest newspapers are indexed: Chicago Sun-Times, Chicago Tribune, Denver Post, Detroit News, Houston Post, Los Angeles Times, New Orleans Times-Picayune, San Francisco Chronicle, and Washington Post. The index is actually nine separate computer printouts—one for each newspaper. Each printout index is in two parts: a keyword subject index and a personal name index. International, national, state, regional, and local news, photographs, cartoons, editorials, syndicated columns, and some ads are indexed. Each entry includes a short, descriptive sentence.

Newsbank (Newsbank, 1970 to date) indexes by subject headings articles from approximately 190 major newspapers published in 130 major cities. It is the most comprehensive newspaper indexing service available. This service provides a monthly, printed index that directs the user to microfiche copies of the indexed articles.
Computer Databases

Through recent advances in computer technology, there are now reliable, long-distance communications networks linked to computers with powerful data storage and retrieval capabilities. It is now possible to have access to millions of pieces of bibliographic information via computer technology. The only hardware requirements are a computer terminal, a telephone, and an acoustic coupler. A user dials a telephone number that is answered by a main frame computer. When the tone sounds, indicating that the computer is ready to respond, the telephone receiver is placed in the acoustic coupler. The user can then communicate with the main frame computer by typing on the terminal messages that are sent through the telephone system.

Retrieving information through a computer terminal is known as online searching. Online searching services are available from organizations, companies, societies, etc., that compile and collate great numbers of citations in the form of computer-generated bibliographies and indexes. Such services are funded by subscribers from the business and academic communities who pay for access to databases that data vending companies lease from producing (publishing) companies. The three vendors the educational researcher should be familiar with are the Lockheed Corporation, whose system is called DIALOG; System Development Corporation (SDC), whose system is called ORBIT; and Bibliographic Retrieval Services, whose system is called BRS.

Bibliographic Online Databases

The major commercial vendors of bibliographic online retrieval services provide access to more than one database. They purchase or
license databases from producers (publishers) and convert the data to a uniform format so that the same basic commands and search techniques apply across all databases. Generally, all these vendors offer the same kinds of service. All provide access to online files, which are usually bibliographic, although some are numeric.

DIALOG Information Retrieval Service is a division of the Lockheed Missiles and Space Company of Palo Alto, California. It was created in 1963 when Lockheed established its Information Science Laboratory to investigate automated methods for handling the explosion of scientific and technical information. DIALOG began commercial operation in 1972 and in 1982 offered more than 130 databases available for searching. Its capabilities make it an extremely powerful online system. The databases in DIALOG contain over 35 million records. The following is a list of some databases that might be useful to the education researcher: Encyclopedia of Associations, GPO Monthly Catalog, Comprehensive Dissertation Index, National Newspaper Index, ERIC, PSYCHINFO (Psychological Abstracts), and Sociological Abstracts.

System Development Corporation (SDC) Search Service is a division of the System Development Corporation, a major systems software company located in Santa Monica, California. The SDC ORBIT (Online Retrieval of Bibliographic Information and Text) system contains 68 databases; SDC is the exclusive vendor for 32 of them. ORBIT's emphasis is on scientific, technical, business, and research databases; however, there are several files that might be of use to the education researcher. ORBIT's Newspaper Index provides coverage from 1976 of several newspapers that are unavailable through other vendors. SDC also offers online access to several databases of U.S. government information including the American Statistics Index and the CIS Index. Other databases available on the SDC ORBIT system and of possible interest to educators are PSYCHABS (Psychological Abstracts), SOCIAL SCISEARCH (Social Sciences Citation Index), SPORT (Sport and Recreation Index), ERIC, CIS Index, and CRECORD (Congressional Record).

Bibliographic Retrieval Services (BRS) entered the online market in the summer of 1976 and offers approximately 30 databases; however,
pre-1976 files of their larger databases may not be searched online, which is a definite disadvantage in retrospective searching. BRS acquires those databases that are most frequently demanded by users either through licensing or purchasing agreements. BRS offers several files in science and technology, but its files in either the social sciences or multidisciplinary categories are probably more appropriate for educators. They include, for example, Dissertation Abstracts, ERIC, Psychological Abstracts, and Social Science Citation Index. BRS also offers numerous databases for searching in the health sciences.

**Computer Database Bibliographies**

There are some standard reference works to help the researcher determine which vendor(s) and which databases to access. They describe computer databases, their availability (by producer or vendor), and at what prices. One such directory is the *Computer-Readable Data Bases: A Directory and Data Sourcebook*, 2d ed., (American Society for Information Science, 1979) which lists 528 online, publicly available databases. Information about each database is indexed by name, subject, and producer.

Another directory is the *Directory of On-Line Information Resources*, 8th ed., (CSG Press, September 1981) which provides an alphabetical and a subject list of bibliographic and nonbibliographic online databases. The databases listed are those publicly available from the user's own terminal or from a terminal in a library. It does not list databases for which searches have to be ordered through the generating agency or for which the actual tapes have to be purchased by the end user. The directory includes a subject index and an address list of database suppliers and producers.

**Database Producers**

In some cases, it is possible to order a computer search of a database directly from its publisher rather than through a vendor such as Lockheed or BRS. Not every publisher has provisions for accepting mail or telephone requests for computer searches, but three databases that are accessible for personal orders are described below.
The American Psychological Association has computerized files of *Psychological Abstracts*, which include all abstracts from the inception of the abstracting service in 1927 to date. Nonevaluative summaries of world literature in psychology and related disciplines are available through custom searches using descriptors and keywords from a controlled thesaurus. Abstracts are classified according to the traditional divisions of psychology. To use this service, a researcher must fill out a Psychological Abstracts Search and Retrieval (PASAR) request form available from the American Psychological Association, 1200 17th Street, NW, Washington, DC 20036. The researcher receives a computer printout of bibliographic citations, which include the full text of abstracts. Information regarding PASAR search requests and costs is published in any issue of *Psychological Abstracts*.

Direct Access to Reference Information (DATR IX) is a Xerox Company service, which offers a computerized bibliography of doctoral dissertations from several hundred American, Canadian, and foreign universities. DATR IX is the computer database of *Dissertation Abstracts International (DAI)*. Users are provided with full bibliographic citations, including the volume and page number of DAI in which abstracts of dissertations are printed. The files are divided into Humanities and Social Sciences, and Sciences. Keywords to describe the subject matter of the dissertation are derived from the titles as well as the subject headings chosen by the author of the study. To initiate a search, the user must complete a DATR IX search form, which is designed to accommodate various levels and types of search requests. DATR IX search analysts will tailor the request to fit the system's keyword list. For more information on this system, the researcher can contact the offices of DATR IX at Xerox University Microfilms, Ann Arbor, Michigan 48106, or consult the latest volume of the DAI.

Educational Resources Information Center (ERIC) has two databases, RIE and CIJE, which are accessible through any ERIC clearinghouse or through one of the organizations listed in the ERIC publication, *Directory of ERIC Search Services*. The researcher will have to supply a search subject that answers the question, "On what topic (subject, area, etc.,) do you desire information?" The search subject will then be translated into thesaurus terms by a search analyst, who then
develops a strategy for the information retrieval. More information on conducting an ERIC computerized search can be found in any recent issue of the *RIE* or *CIJE*.

Factors to Consider in a Computer Search

Conducting a computer search requires that a person be familiar with computer terminology and a particular vendor's computer syntax or have access to a librarian trained in database searching. Unfortunately, libraries with online computer database searching capabilities are not available everywhere. When requesting a search by mail or telephone, the researcher needs to plan carefully; otherwise money and time will be wasted.

Computer searching can be somewhat expensive: the investigator must pay a service and user fee to conduct a search. Individuals conducting research without outside funding may find that the cost of a computer search is prohibitive and will outweigh its benefits.

There are numerous advantages that online services have over manual methods of retrieving information in libraries. Computer searching is much faster than manual searching and in terms of hours involved is definitely cost-effective. The online searcher has access to many more information sources than even the largest libraries can support in printed form. Online information sources are often updated before their published counterparts are printed and distributed. The interactive nature of online searching permits many more access points than manual searching allows. The online searcher has immediate feedback on the relevance of a search and may alter the strategy at any point to increase that relevance. There are also many additional entry points for an online search.
Interlibrary Loaning

Almost no library will contain every source needed: budget restrictions and space limitations curtail the size of each library's collection. However, there are other means to obtain needed materials. The interlibrary loan process is a system that American libraries have evolved to enable them to borrow books and to acquire photocopied journal articles from each other. Usually most circulating books are loaned at no charge. Entire journals are rarely loaned, but articles needed are photocopied, frequently for a reproduction fee. This charge is set by the lending library; it will differ from one library to another.

Each library has its own rules and policies regarding interlibrary loans. Loan periods vary; some libraries ask that material lent be used only in the borrowing library; photoduplicating restrictions on copyrighted materials exist. Most larger academic libraries have an interlibrary loan office where the staff will assist the researcher in making a request for a loan.

The American Library Association has an Interlibrary Loan Code that establishes certain rules to govern this service and has developed a standard "Interlibrary Loan Request" form, which many libraries use.

Another piece of information usually required by the interlibrary loan office is a verification of the existence of that work which the investigator is requesting. The references listed below represent some of the legitimate sources of verification accepted by the loan office.

The National Union Catalog of the Library of Congress is a reference that not only verifies the existence of a book but may also provide, in some cases, more information about the book than the source from which the researcher first learned of it. The catalog lists those
libraries that include that entry in their holdings. The interlibrary loan office uses this information to make its requests for books held by specific libraries.

*Books in Print*, any major abstracting or indexing publication (e.g., *Education Index*, *Psychological Abstracts*, *RIE* or *CIJE*), and the *Cumulative Book Index* are all legitimate sources of verification.

To verify the existence of a journal (for requesting photocopied materials) the *Union List of Serials of the U.S. and Canada* and *New Serials Titles* are useful. The *Union List* is worldwide in its scope and lists more than 156,000 titles in existence as of December 1949 with holdings in 956 American and Canadian libraries. It includes periodicals, proceedings, and annual reports of associations. The *Union List*, indispensable for interlibrary loaning, is updated by the *New Serials Titles* which is broader in scope than the *Union List*. 
Appendix

Encyclopedias, Handbooks, and Biographies

Encyclopedias

The Encyclopedia of Education (Macmillan and Free Press, 1971) is a 10-volume work that includes well-balanced, competent articles on approximately 1,000 topics in such areas as history, theory, research, philosophy, and the structure of education. The articles are signed and many include bibliographies. The index volume contains a detailed subject index and a "Guide to Articles" that lists each article alphabetically, followed by a list of see and see also references to related articles.

The International Encyclopedia of Higher Education (Jossey-Bass, 1977) is a 10-volume work that covers essential information on postsecondary education in all countries, in all academic disciplines and fields of study, and on major problems confronting colleges and universities throughout the world. The approximately 1,300 entries fit into the following major categories: 1) national systems of higher education, 2) topical essays, 3) fields of study, 4) educational associations, 5) research centers and institutes, 6) reports on higher education, 7) documentation centers, 8) a listing of acronyms, and 9) a glossary of terminology. Most of the articles are followed by an extensive guide to other information sources.

Cyclopedia of Education (1911-1913) (Gale Research Company, 1968) is a five-volume work that is an excellent source for retrospective biographical, historical, and philosophical research in education. Other areas covered include institutions, elementary and secondary education, curriculum, administration, U.S. and foreign school systems, methodology, educational psychology, hygiene, and school architecture. Every subject taught in school in the early 1900s is considered in detail. Topics are cross-referenced. Many of the articles include bibliographies.

Education in the United States: A Documentary History (Greenwood Press, 1974) is a five-volume work that brings together significant documents in the field of American education, extending from the sixteenth- and seventeenth-century English and European backgrounds and the early Colonial times to the present. Documents are organized chronologically within chapters.

Encyclopedia of Educational Research, 5th ed., (Macmillan Company, 1982) contains well-researched articles on educational topics by subject specialists. The concise summaries of research are arranged by broad subject categories and include long bibliographies. Since this work is almost completely rewritten each decade, older editions (1941, 1950, 1960, and 1969) should be consulted for educational research conducted during a particular decade.

Review of Research in Education (F. E. Peacock, 1973-1978 and American Educational Research Association, 1979 to date) is an annual publication that provides a critical synthesis of educational research. The emphasis is on current research but the literature covered is not limited to any definite time period.
Handbooks

*Handbook on Contemporary Education* (R. R. Bowker Company, 1976) provides state-of-the-art information on education topics in the form of 118 articles written by authorities. The articles are grouped into eight sections: 1) educational change and planning, 2) administration and management of education, 3) teacher/faculty issues, 4) education and training of teachers and administrators, 5) students and parents, 6) special interest groups, 7) teaching and learning strategies, and 8) some alternatives and options in education. Bibliographies and information on specific programs, projects, and activities are provided.

*Handbook of Research on Teaching* (Rand McNally, 1963) is a scholarly work designed especially for the advanced student preparing to do research on teaching. Lengthy articles on methods, variables, areas, grade levels, and subject fields provide summaries and critical analyses of research in education. Extensive bibliographies accompany each chapter, and name and subject indexes appear at the end of the work.

*Second Handbook of Research on Teaching* (Rand McNally, 1973) has the same format as the 1963 edition. The lengthy review articles are accompanied by extensive bibliographies. Increasing specialization of researchers in the field of education is reflected by chapter coverage of much narrower topics than those presented in the earlier handbook.

Biographies

*Leaders in Education*, 5th ed., (R. R. Bowker Company, 1974) includes 17,000 biographical sketches of key persons in education. This edition includes a specialty index by educational interest and a geographic index.

*Biographical Dictionary of American Educators* (Greenwood Press, 1978) is a three-volume dictionary that provides biographical sketches of 1,665 major American educators from Colonial times to 1976. Information provided includes the subject’s education, employment, and contributions to education. Appendices list the subjects by place of birth, state of major service, and field of work.


*Who's Who in American College and University Administration* (Crowell-Collier Educational Corporation, 1971) provides biographical information on 11,000 administrators of higher education. Entries are arranged alphabetically.
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