SELECTING AND DEFINING A RESEARCH TOPIC

OBJECTIVES

After reading Chapter 2, you should be able to do the following:

1. Make a list of at least three educational topics for which you would be interested in conducting a research study.
2. Select one of the topics and identify 10 to 15 complete references that directly relate to the selected problem. The references should include multiple sources (e.g., books, periodicals, Internet reports, etc.).
3. Distinguish between quantitative and qualitative methods of starting a research study.
4. Read and abstract the references you have listed.
5. Formulate a testable or descriptive hypothesis for your problem.

Note: These objectives will form the basis for Task 2. Selection and definition of a research topic is the first stage in applying the scientific and disciplined inquiry method. The research topic (also called the research question, problem, or purpose) focuses and provides structure for the remaining steps in the scientific and disciplined inquiry method; it is the thread that binds everything else together. The basic function of the research topic is to focus the study to a defined, manageable size. One of the common difficulties that arises among researchers seeking to develop a research topic is selecting one that is so broad and complex that the researcher is unable to implement and complete it. Usually the first topic identified is too broad to be manageable for study, so the researcher must narrow its scope. Selecting and defining a topic is a very important component of the research process and should entail considerable thought.

The research topic that you ultimately select is the topic you will work with in succeeding stages of this text. Therefore, it is important that you select a problem relevant to your area of study and of particular interest to you. Given that you will be living with your study for a long time, it is especially important that you select a topic that will hold your interest through its completion.

The goal of Chapter 2 is for you to identify and define a meaningful topic, conduct an adequate review of related literature, and state a testable hypothesis. After you have read this chapter, you should be able to perform the following task.

TASK 2

Write an introduction for a quantitative research plan. Include a statement of the research topic, a statement concerning the importance or significance of the topic, a brief review of related literature, and a testable hypothesis regarding the outcome of your study. Include definitions of terms where appropriate (see Performance Criteria, p. 71).

IDENTIFYING A TOPIC OR QUESTION TO RESEARCH

For most of our school careers we are taught to solve problems of various kinds. Ask most people to list the 10 most important outcomes of education, and somewhere on the list will invariably be problem solving. Now, after many years of emphasis on solving problems, you
face a research task that asks you not to solve but to find a problem or topic to study. If you are like most people, you have had little experience in doing this. For this reason, beginning researchers often view the selection of a research topic as the most difficult step in the whole research process. Some graduate students spend many anxiety-ridden days and sleepless nights worrying about where they are going to find the problem they need for their thesis or dissertation.

**The Realities of Research and Topic Identification**

As you begin to work through the many aspects of educational research, you will be embarking on an important learning experience. We must highlight two initial realities of this experience. First, it is important for you to be clear about what educational research is and is not. Research is not haphazard data gathering. It is not a process in which the researcher knows the outcome before the study is completed. It is not the selective or biased interpretation of results. It is not verifiable by independent, unbiased researchers. Conversely, true research is guided by an identified topic or issue. It describes a plan to carry out the research. It collects pertinent data in a systematic and unbiased manner. It analyzes the data and makes it available to other researchers for examination.

Second, it is important to understand the human face of education research. Textbooks tend to present topics in a linear form: do this and then this and then this and ultimately you’ll get to where you want to be. While a linear format provides a necessary template for student learning, the reality of educational research is not solely linear. It is true that serendipity, good luck, or happenstance occasionally occurs in research, but not very often. In reality, educational research is truly a process of trial and error. As you work through your research topic, you will find things that “don’t fit” as expected, or topics that are not as clear on paper as they were in your head, or topics that require considerable rethinking and writing. That is the reality of research. However, working through these realities will be an important and satisfying measure of your understanding, more important and satisfying than having everything work perfectly the first time.

**Sources of Research Topics**

Where do research topics, questions, purposes, or problems come from? Where should you look to ferret out topics to study? Four main sources of research topics are theories, personal experiences, replications, and library searches.

**Theories**

One of the most meaningful sources of research topics is derived from theory. A theory is an organized body of concepts, generalizations, and principles that can be subjected to investigation. There are many educationally relevant theories and topics from which problems can be drawn, such as theories of learning and behavior. For example, Piaget posited a theory of cognitive development that had four stages of development: sensorimotor stage (birth to age 2), preoperational stage (ages 2 to 7), concrete operational stage (ages 7 to 11), and formal operational stage (ages 11 to adulthood). At each level Piaget indicated what children could or could not do. Examining whether aspects of Piaget’s theory operate as suggested could be the basis for many possible topics. For example, one could study whether children who receive a great deal of attention and verbal interaction reach the concrete operational stage earlier than those who received little attention and verbal interaction. If the high attention/verbal group did reach the concrete operational stage before the low attention/verbal group, it would suggest that entry into the stage varied not just on age, but also on children’s experiences. Think of two other theories that are popular in education and identify from them a few more topics.
CHAPTER 2 SELECTING AND DEFINING A RESEARCH TOPIC

LIST SERVES

Researchers frequently use e-mail to solicit advice and feedback and conduct dialogue with peers and experts in their fields. The most common way to do so is by subscribing to an electronic mailing list, commonly known as a listserve. These lists are designed by organizations or special interest groups to facilitate communication among their members. Through this list, you can expect to receive announcements and bulletins related to your area of interest. In addition, you can post comments or questions on the listserve. Your messages will be read by members of the listserve, who have the option of responding to you personally or to the mailing list as a whole. A well-known example is LISTSERV®, run by L-Soft International, Inc.

A listserve is a good resource to consult when you are devising a research question. You can ask listserve members what they think of a particular topic, if they know of other research pertaining to your topic, or for links (electronic or otherwise) to resources of interest. You can also bounce ideas off other listserve members at each stage of your research. You can even ask for volunteers to read your work in progress!

To subscribe to a listserve, you generally are required to send a short e-mail message to the listserve. Once subscribed, you will receive detailed information about how to post messages on the listserve, how to unsubscribe, etc. Examples of useful education listserves include the following:

- American Educational Research Association List
  (aera@lists.asu.edu)
  (aera@li.stex.asu.edu)
- AERA-K Division Teaching and Teacher Education Listserve
  (aera-k@lists.asu.edu)
  (aera-k@listex.asu.edu)
- Educational Administration Discussion List
  (edad-l@wwvm.vwinet.edu)
- Educational Resources on the Internet
  (edres-l@listserve.unr.ca)

A useful Web site to consult in your search for appropriate listerves is http://www.lsoft.com/lists/listref.html. This site, sponsored by L-Soft International, contains a catalogue of LISTSERV® lists. At this site, you can browse over 52,599 public lists on the Internet, search for mailing lists of interest, and get information about host sites. Recent searches for education lists yielded 732 LISTSERV® mailing lists.

to investigate. Topics focused on aspects of a theory are not only conceptually rich, they also provide information that confirms or disconfirms some aspect of the theory. They also suggest additional studies that would further test the theory.

Personal Educational Questions

A second common way to identify research topics is to examine some of the questions we commonly ask ourselves. It is hard to imagine an educator who has never had a hunch concerning a better way to do something (e.g., to increase learning or improve student behavior) or asked questions about a program or materials whose effectiveness was untested (for example, questioning why a writing program was successful or science materials were not). We observe schools, teachers, programs, and news articles about schooling, and we ask ourselves questions usually stated in the following ways: "Why does that happen?" "What causes that?" "What would happen if . . . ?" and "How would a different group respond to this?" Normally we think briefly about such questions and get back to our everyday business. But such questions are probably the most common source of research topics because they are of interest to us. How do teachers structure their classroom cultures in the first few days of school? Would achievement go up if students were given quizzes each day on the prior day's instruction? Would I get the same results with high- and low-achieving students if I emphasized peer review in my instruction? What would happen to teacher performance if we evaluated teachers three times a year at unannounced times instead of at single, preannounced time? Serendipity, also known
as happenstance or being in the right place at the right time, is all around us and is often the source of research topics. Sensitivity to what is happening around us is an important inquiry skill to cultivate.

A veritable gold mine of research topics arises out of the questions we ask ourselves every day about education, topics that arise in class discussion, articles in local newspapers and educational journals, and similar sources. Note, first, that this approach to finding research topics is appropriate for both qualitative (How do teachers structure their classroom culture?) and quantitative (Would achievement go up with more frequent use of quizzes?) topics. Note, also, that most of the initial topics need to be refined and clarified before they become suitable research topics.

**Replication**

A third source of research topics is replication, meaning “doing it again.” We noted in Chapter 1 that no single study, regardless of its focus or breadth, provides the certainty needed to assume that similar results will occur in all or most similar situations. We also noted that progress through research usually comes from accumulated understandings and explanations. Replication is a tool used to provide such accumulated information.

In most cases, a replication is not carried out identically with the original study. Rather, some feature or features of the original study are altered in an attempt to “stretch” the original findings. Thus, the researcher might select a different sample of participants for the replication in the hope of determining whether the results obtained are the same as those of the original study. Or, the replication might examine a different kind of community, a different kind of student, a different classroom climate, a different questionnaire, or a different method of data analysis. There are many interesting and useful ways to replicate studies in the many domains of education.

**Library Search**

Another commonly cited source of research topics is a library search. Many students are encouraged to immerse themselves in the library and read voraciously in their area of study until a research topic emerges. Although some research topics do emerge from library immersion, they are considerably fewer than those emerging from theory, personal experience, and replication. Trying to identify a topic amid the enormous possibilities in a library is akin to looking for a needle in a haystack; sometimes we find it, but not very often. Clearly libraries are essential sources of information in the research process. However, the library is most useful after a topic has been narrowed. Then library resources can help the researcher gather information to place the topic in perspective, find what has already been done on the topic, and suggest methods for carrying out examination of a topic.

The first step in selecting a topic is to identify a general topic or problem that is related to your area of expertise and is interesting to you. Examples of general topics are decision making in the schools, manipulatives for elementary mathematics, the effects of standardized testing, paraprofessionals in the elementary school, busing schoolchildren, and whole language reading. Note that these topic areas are broad and inclusive, containing many, many more specific potential research topics. Such general areas have to be narrowed to a more focused and manageable research topic or problem. Remember, you will be spending a great deal of time reading about, planning, and carrying out your ultimate research topic. Choosing a topic that is of interest to you will help maintain your focus during the months of conducting and writing your study.

**Narrowing the Topic**

For most quantitative researchers and some qualitative researchers, the next step is to narrow the general topic area to a more specific, researchable one. A topic that is too broad...
can lead to grief. First, a broad topic enlarges the scope of the review of related literature that one must inevitably conduct (discussed in the next section), likely resulting in many extra hours spent in the library. Second, broad topics complicate the organization of the review itself. Finally, and more importantly, a topic that is too broad tends to result in a study that is general, difficult to carry out, and difficult to interpret. Conversely, a well-defined, manageable problem results in a well-defined, manageable study.

Note the difference between a quantitative approach (based on deductive reasoning) and a qualitative approach (based on inductive reasoning). A quantitative research topic typically requires that the researcher spell out the topic studied, the hypotheses related to the topic, the strategies for conducting the research study, and the methods of collecting and analyzing the data prior to initiating the study. Thus, for quantitative research, narrowing the general topic area into a more specific and manageable research topic is essential. Without such a topic, hypotheses, instruments, strategies, and analyses cannot be specified. Conversely, for most qualitative research, it is desirable to enter the research setting with only a general topic area in mind. Based on what is observed in the research setting over a period of time, the qualitative researcher will formulate a narrowed research topic.

One way to narrow your topic is to talk to your advisors and to specialists in your area about specific suggestions for study. Another way is to read sources that provide overviews or summaries of the current status of research in your topic area. Search through handbooks that contain many chapters focused on research in a particular area (Handbook of Research in Educational Administration, The Handbook of Educational Psychology, Handbook of Research on Curriculum, Handbook of Research on Teacher Education, Handbook of Sport Psychology, International Handbook of Early Child Education, and many more). You could also check the Encyclopedia of Educational Research or journals such as the Review of Educational Research, which provide reviews of research in many areas. These sources often identify "next-step" studies that need to be conducted. The suggested next step might involve a logical extension of another study or a replication of the study in a different setting. For example, a study investigating the effectiveness of computer-assisted instruction in elementary arithmetic might suggest the need for similar studies in other curriculum areas. Bear in mind that at this stage in the research process you seek general research overviews that describe the nature of research in an area and that can suggest more specific topics in your chosen area.

In narrowing the problem area you should select an aspect of the general topic area that is related to your area of expertise. For example, the general problem area "the use of reviews to increase retention" could generate many specific problems, such as "the comparative effectiveness of immediate versus delayed review on the retention of geometric concepts" and "the effect of review games on the retention of vocabulary words by second graders." In your efforts to sufficiently delineate a problem, however, be careful not to get carried away; a problem that is too narrow is just as bad as a problem that is too broad. A study such as "the effectiveness of pre-class reminders in reducing instances of pencil sharpening during class time" would probably contribute little, if anything, to education knowledge.

Selecting a good topic is well worth the time and effort. As mentioned previously, there is no shortage of significant educational problems that need to be researched; there is really no excuse for selecting a trite, overly narrow problem. Besides, it is generally to your advantage to select a worthwhile problem; you will certainly get a great deal more out of it professionally and academically. If the subsequent study is well conducted and reported, not only will you earn a good grade and make a contribution to knowledge, but you might find your work published in a professional journal. The potential personal benefits to be derived from publication include increased professional status and job opportunities, not to mention tremendous self-satisfaction.
CHARACTERISTICS OF GOOD TOPICS

By definition, a research topic involves an issue in need of investigation. It follows that a fundamental characteristic of any research topic is that it is researchable or doable. A researchable topic is one that can be investigated through collecting and analyzing data. Problems dealing with philosophical or ethical issues are not researchable. Research can assess how people “feel” about such issues but research cannot resolve them. In education there are a number of issues that make great topics for debates (e.g., “Should prayer be allowed in the schools?” “Should students be grouped homogeneously or heterogeneously?” “Should students be held back in grade if they fail to meet defined standards of achievement?”) but they are not researchable problems; there is no way to resolve these topics through collecting and analyzing data. Generally, topics or questions that contain the word should cannot be answered by research of any kind, because they ultimately are matters of opinion.

Note, however, that one could carry out research studies that examine the effects on teachers and students of school prayer, grouping practices, or being held back in grade. Do you see how a slight wording change creates researchable topics? Such studies, as worded, can tell us about the varied consequences of these practices, but the decision of what should be done in a school or classroom involves issues that go beyond the abilities of any research study. Issues of cost, educational philosophy, teacher and parental beliefs about the nature of schooling, and views about how students best learn are some of the other factors that would enter into the debate over what should be done. Research findings can inform decision making, but they cannot and should not be the sole or main determinant of what should or should not be done.

A second characteristic of a good research topic is that it has theoretical or practical significance. People’s definitions of significant vary, but a general rule of thumb is that a significant study is one that contributes in some way to improve or understand education or educational practice. A third major characteristic of a good topic is that it is a good topic for you. The fact that you have chosen a topic of interest to you, in an area in which you have expertise, is not sufficient. It must be a topic that you can adequately investigate given your current level of research skill, the available needed resources, and sufficient time to carry out the study. The availability of appropriate participants and measuring instruments, for example, is an important consideration. A fourth important characteristic is that the research is ethical. That is, the research must not potentially harm the research participants. Harm encompasses not only physical danger, but also affective and emotional danger. Fifth, and very important, is the interest in your topic. The characteristics of a good topic are summarized in Figure 2.1. Furthermore, as a beginning researcher, you likely have access to one or more faculty advisors. They can help you to assess the feasibility of your topic.

---

**Figure 2.1**  
Characteristics of a good research topic.

1. **The topic is interesting.** It will hold the researcher's interest through the entire research process.
2. **The topic is researchable.** It can be investigated through the collection and analysis of data and it is not stated as a topic seeking to determine what should be done.
3. **The topic is significant.** It contributes in some way to the improvement or understanding of education theory or practice.
4. **The topic is manageable.** It fits the researchers' level or research skill, needed resources, and time restrictions.
5. **The topic is ethical.** It does not contain practices or strategies that might embarrass or harm participants.
CHAPTER 2 SELECTING AND DEFINING A RESEARCH TOPIC

STATING THE RESEARCH TOPIC

Stating Quantitative Research Topics

The nature of a research topic varies in form and specificity according to the type of research undertaken and the preferences of the researcher. For a quantitative study, a well-written statement of the topic generally describes the variables of interest, the specific relationship between those variables, and, ideally, the nature of the participants involved (i.e., gifted students, learning-disabled fourth graders, teenage mothers). An example of a problem statement might be: "The topic to be investigated in this study is the effect of positive reinforcement on the quality of 10th graders' English compositions." In this statement, the variables to be examined are "positive reinforcement" and "quality of English compositions." The participants will consist of 10th graders.

Other possible topic statements:

- "The topic to be investigated in this study is secondary teachers' attitudes toward required after-school activities."
- "The purpose of this study is to investigate the relationship between school entrance age and reading comprehension skills of primary-level students."
- "The problem to be studied is the effect of wearing required school uniforms on the self-esteem of socioeconomically disadvantaged sixth-grade students."
- "Does the effect of periodic home visits diminish the recidivism rate of middle school juvenile offenders?"

Try to identify the variable or variables in each of these examples and suggest what type of quantitative research method would likely be employed to carry out the study.

Stating Qualitative Research Topics

Qualitative research topics often are stated later in a written study and stated more generally than quantitative ones, because in many cases, the qualitative researcher needs to spend time in the research context for the focus of the study to emerge. Remember, the qualitative researcher usually is much more attuned to the specifics of the context in which the study takes place than is the quantitative researcher. Qualitative topic statements initially tend to be general, eventually becoming narrowed as the researcher learns more about the research context and its inhabitants. Qualitative research topics are typically stated as in the following examples:

- "The purpose of this study is to describe the nature of children's engagement with mathematics. The intention is to gather details about children's ways of entering into and sustaining their involvement with mathematics."
- "This qualitative study examines how members of an organization identify, evaluate, and respond to organizational change. The study examines what events members of an organization identify as significant change events and whether different events are seen as significant subgroups in the organization."
- "The purpose of this research is to study the social integration of disabled children in an integrated third-grade class."

Placement and Nature of the Topic Statement in a Study

A statement of the topic is the first component of the introductory sections of both a research plan (see Chapter 3) and the completed research report. The topic statement gives direction to the remaining aspects of the research plan and report. The statement should be accompanied by a presentation of the topic's background, a justification for the study in terms of its significance, and, often, a list of limitations of the study. The background includes information needed by readers to understand the nature of the topic. The topic should be justified in terms of its
PART 1 INTRODUCTION

correlation to educational theory or practice. For example, an introduction might begin with a topic statement such as, "The purpose of this study is to compare the effectiveness of salaried paraprofessionals and nonsalaried parent volunteers with respect to the reading achievement of first-grade children." This statement might be followed by a discussion concerning (1) the role of paraprofessionals, (2) increased utilization of paraprofessionals by schools, (3) the expense involved, and (4) the search for alternatives, such as parent volunteers. The significance of the problem would be that if parent volunteers and paid paraprofessionals are equally effective, volunteers can be substituted for salaried paraprofessionals at great savings. Any educational practice that might increase achievement at no additional cost is certainly worthy of investigation. Qualitative researchers would likely want to examine pertinent research, so they may first draw their own perspectives on the topic and settings. They would want to form their own perspective before being influenced by the literature. Once a qualitative researcher has a sense of the topic and issues, she might turn to the literature for further information.

After a topic has been carefully selected, delineated, and stated, the researcher is ready to attack the review of related literature. The researcher typically has a tentative hunch or hypothesis that guides the review. In the previous example, the tentative hypothesis would be that parent volunteers are equally effective as salaried paraprofessionals. It is likely that the tentative hypothesis will be modified, even changed radically, as a result of a more extensive review of the literature related to the topic. It does, however, give direction to the literature search and narrows its scope to include only relevant topics.

REVIEW OF RELATED LITERATURE

Having happily found a suitable topic, the beginning researcher is usually "raring to go." Too often the review of related literature is seen as a necessary evil to be completed as fast as possible so that one can get on with the "real research." This perspective is due to a lack of understanding of the purpose and importance of the review, and to a feeling of uneasiness on the part of students who are not sure exactly how to go about writing the review. The lack of practice that makes finding a topic difficult for many beginning researchers is revisited when they are faced with the need to write a literature review, as they have had little or no prior experience. Nonetheless, the review of related literature is as important as any other component of the research, and it can be conducted quite painlessly if it is approached in an orderly manner. Some researchers even find the process quite enjoyable!

DEFINITION, PURPOSE, AND SCOPE

The review of related literature involves systematically identifying, locating, and analyzing documents containing information related to the research problem. These documents can include articles, abstracts, reviews, monographs, dissertations, books, other research reports, and electronic media. The literature review has several important functions that make it well worth the time and effort. Its major purpose is to determine what has already been done that relates to your topic. It provides the understandings and insights necessary to develop a logical framework into which your topic fits. The review tells you what has been done and, in doing so, also suggests what needs to be done. Studies can provide the rationale for your research hypothesis, while indications of what needs to be done often form the basis for justifying the significance of your study.

Another important function of the literature review is to point out research strategies and specific data collection approaches that have and have not been found to be productive in investigating topics such as yours. This information will help you to avoid other researchers' mistakes and to profit from their experiences. It may suggest approaches and procedures that you previously had not considered. For example, suppose your topic involved the comparative
effects of a brand-new experimental method versus the traditional method on the achievement of eighth-grade science students. The review of literature might reveal 10 related studies already conducted that have found no differences in achievement between the two methods. Several of the studies, however, might suggest that the brand-new method may be more effective for certain kinds of students than for others. Thus, you might reformulate your topic to involve the comparative effectiveness of the brand-new method versus the traditional method on the achievement of low-aptitude eighth-grade science students.

Being familiar with previous research also facilitates interpretation of your study results. The results can be discussed in terms of whether and how they agree with previous findings. If the results contradict previous findings, you can describe differences between your study and the others, providing a rationale for the discrepancy. If your results are consistent with other findings, your report should include suggestions for the next step; if they are not consistent, your report should include suggestions for studies that might resolve the conflict.

Beginning researchers often have difficulty in determining how broad their literature review should be. They understand that all literature directly related to their topic should be reviewed; they just don't know when to quit. They have trouble determining which articles are "related enough" to their topic to be included. Unfortunately, there is no formula that can be applied to solve the problem; you must base your decisions on judgment and the advice of your teachers or advisor. Happily, there are some general guidelines that can assist you. First, avoid the temptation to include everything you find; bigger does not mean better. A smaller, well-organized review is definitely preferred to a review containing many studies that are peripherally related to the problem. Second, heavily researched areas usually provide enough references directly related to a specific problem to eliminate the need for relying on less related studies. For example, the role of feedback in learning has been extensively researched for both animals and human beings, for verbal learning and nonverbal learning, and for a variety of different learning tasks. If you were concerned with the relationship between feedback and chemistry achievement, you would probably not have to review feedback studies related to animal learning. Third, and conversely, new or little-researched problem areas usually require review of any study related in some meaningful way to the problem in order to develop a logical framework for the study and a sound rationale for the research hypothesis. For example, a study of the effects on GPA of an exam for non-English speaking students who are required to pass it to graduate would probably include in its literature search studies involving English as a Second Language (ESL) classes and the effects of culture-specific grading practices; and studies identifying strategies to improve the learning of ESL students. A few years from now there will probably be enough research on the academic consequences of such an exam on non-English speaking students to permit a much more narrowly focused literature review.

A common misconception is that the worth of a topic is a function of the amount of literature available on it. This is not the case. There are many new, important areas of research for which there is comparatively little available literature; the effects of high-stakes testing is one such area. The very lack of such research often increases the worth of its study. On the other hand, the fact that 1,000 studies have already been done in a given problem area does not mean there is no further need for research in that area. Such an area will generally be very well developed with additional needed research readily identifiable.

**Getting Started**

Because it will be a second home to you, at least for a while, you should become familiar with the library before beginning your review. Most libraries, especially university libraries, provide help and education in the use of their resources. It is very important that you familiarize yourself with these many resources. Time spent initially will save more in the long run.
find out what references are available and where they are located. You should also be familiar with services offered by the library, as well as the rules and regulations regarding the use of library materials. It also might be useful to identify three or so people who are actively conducting research in your topic area. Once identified, you could contact them to request copies of their recent articles on your topic and suggestions for useful references in the area. They might even make suggestions.

A common question asked about a literature review is, “How should I start?” Eventually you will have to examine a range of sources that are pertinent to your topic. However, to start, it is better to narrow the initial search to pertinent educational encyclopedias, handbooks, and annual reviews. These and similar resources provide broad overviews of issues in one or many subject areas, as well as initial references to examine. They allow you to get a picture of your topic in the broader context and help you understand where it fits in the field. Significant library-related technological advances have been made and libraries vary greatly in their ability to capitalize on increasingly available options. Note, however, while librarians are usually very willing to help individuals, you should learn to use the library; the librarian might not be as cheerful the ninth time you approach as he was the first time!

**IDENTIFYING KEYWORDS**

Having formulated your problem and acquainted yourself with the library, there is one more thing you need to do before you go marching merrily off into the book stacks—make a list of keywords to guide your literature search. Most of the sources you consult will have alphabetical subject indexes to help you locate specific references. You will look in these indexes under the keywords you have selected. For example, if your problem concerns the effect of interactive multimedia on the achievement of 10th-grade biology students, the logical keywords would be *interactive multimedia* and *biology*. You will also need to think of alternative words under which your topic might be listed. For example, references related to this problem might be found using the keywords *multimedia* or *interactive videodiscs* rather than just *interactive*. Usually, the keywords will be obvious; sometimes you may have to play detective.

Some years ago a student was interested in the effect of artificial turf on knee injuries in football. He looked under every keyword he could think of, such as *surface*, *playing surface*, *turf*, and *artificial turf*. He could find nothing. Since he knew that studies had been done, he kept trying. When he finally did find a reference, it was listed under, of all things, *lawns!* Identifying keywords is usually not such a big deal. In looking in initial sources you might identify additional keywords that will help you in succeeding sources. However, if you give some thought initially to possible keywords, it will facilitate an efficient beginning to a task that requires organization. After you have identified your keywords, you will finally be ready to begin to consult appropriate sources.

**IDENTIFYING YOUR SOURCES**

Many sources of literature may relate to a given problem. In general, however, educational researchers commonly use a number of specific major sources. Some are primary sources and some are secondary. Primary sources are definitely preferable because they describe a study written by the person who conducted it. Secondary sources are generally a much briefer, abstracted description of a study written by someone other than the original author. (An abstract is a summary of a study that describes its most important hypotheses, procedures, results, and conclusions.) The *Review of Educational Research*, for example, summarizes many research studies conducted on a given topic. Since secondary sources usually give complete bibliographic information on the references cited, they can direct you to relevant primary sources.
You should not be satisfied with the information contained in secondary sources; the corresponding primary sources will be considerably more detailed and will give you information "straight from the horse's mouth," as they say.

The number of individual references that you could consult for most problems is staggering. Fortunately, there are indexes, abstracts, and other retrieval mechanisms, such as computer searches, that facilitate identifying relevant references. In this section we will discuss the ones most often used in educational research; you should check your library for sources in your area of specialization. Following the discussion of the various sources, we describe computer-assisted literature searches and Internet searches.

Examples of handbooks, encyclopedias, and reviews relevant to educational research are *Encyclopedia of Educational Research, National Society for the Study of Education Yearbooks, Review of Educational Research, The Encyclopedia of Human Development and Education: Theory, Research, and Studies, The Handbook of Research on Teaching, The International Encyclopedia of Education: Research and Studies, Handbook on Social Studies Teaching and Learning, Handbook of Research in Curriculum, and Review of Research in Education*. These and other similar works contain summaries of important topics in various education, reviews of research on selected topics, and complete bibliographic information on the references cited. It is useful to photocopy the bibliographic references in the summaries that you consult, to use in your further research.

At this point, you may be asking, "How can I find such sources in my library?" If you know the title or author of the reference you are seeking, you will need to conduct a title or author search. If your reference is held in your library, you will probably be required to enter the number corresponding to the title you have selected to find out what the call number is (if your library owns it). At that point, you will need to find the call number of your book in the stacks.

If you do not know the titles of handbooks, encyclopedias, and research guides in your area of interest, you will need to conduct a keyword search. To do this, you will need to think of keywords or phrases that are pertinent to the type of volume you seek. For example, if you would like to find summaries of research previously conducted in an area of psychology, you might choose keywords such as handbook and psychology.

After reading a few secondary sources to get a more informed overview, you should have a clearer idea of your topic. You may want to revise your initial topic to reflect a narrower focus. After restating your topic, you should move beyond secondary sources to primary sources, including publications in which researchers report their own findings.

To sum up, you may find sources related to your topic in a variety of ways:

1. Search for books in the library.
2. Consult computer databases to locate journal articles, reports, and other publications.
3. Obtain the references listed in the bibliographies in the secondary sources you previously located.
4. Search the Internet and the World Wide Web for up-to-date information.

In the following pages we discuss these procedures in more detail.

**Searching for Books on Your Topic in the Library**

To locate primary sources, you need to conduct a library search much the same as those already illustrated. For example, you can conduct a title, author, or subject search on your library's computer. If you are at the beginning of your search for primary sources you should conduct a keyword search.

A keyword search may be narrow or broad; how narrow or broad depends on factors such as the purpose of the search and the amount of material available on your topic. If you need a relatively small number of references and if much has been published about your topic, a narrow search will likely be appropriate. If you need a relatively large number of references and very little has been published about your topic, a broad search will be better. If you do