Chapter 3

Reviewing the Literature and Developing Research Questions

LEARNING OBJECTIVES

To be able to

- Identify research problems.
- Explain why it is necessary to conduct a literature search.
- Conduct a literature search.
- Explain the reason for stating the purpose of a research study and the research questions.
- Explain the difference between purpose statements and research questions in qualitative and quantitative studies.
- Explain the purpose and necessity of stating your research questions and hypotheses.
- Explain the difference between problem statements in qualitative and quantitative studies.
One of the stereotypes that many people seem to harbor privately but few openly express is that poor students who attend the nation’s worst public schools are a lost cause, regardless of how much money you throw at them or the innovative attempts that are made to teach them because they are inherently unteachable. This myth, however, is being exposed for exactly what it is in about two dozen schools statewide (Editorial, 2002). Bethune Elementary School in Vine City, Georgia, is one of the schools that has achieved success, in spite of its location in one of Atlanta’s most depressed in-town neighborhoods. About 86 percent of the fourth-graders scored at or above the state average in math and reading tests in 2001.

Bethune has clearly defied the odds against poverty and has proved that children from poverty-stricken inner-city areas can perform well academically. The test scores vividly verify that Bethune has accomplished something that has eluded numerous other schools across the country. An educational researcher, however, would want to go beyond applauding the success of these schools and learn why Bethune and other such schools were successful when most schools in depressed inner-city areas are not. An educational researcher would look at the overall program instituted at Bethune and search for the primary reason for the success of the program. It might be that all components are needed. However, it is also possible that one of the components, such as soliciting the help and cooperation of the parents, was more important than the additional discipline, encouragement, and accountability implemented by the school staff. It is important to identify the most vital components of a successful program such as the one at Bethune because this is the primary way to transport the success that was achieved to other programs.

This example illustrates how a real-life event can lead to a good research study, and it might suggest that research problems and questions are easy to generate. This is often true for the veteran researcher. However, beginning researchers frequently have difficulty identifying a research question that they can investigate. In this chapter, we try to minimize this difficulty by discussing the origin of most research questions and the way these research questions are converted to ones that can be investigated.
about the value of such alternatives and found that you could not change their opinions. Such an argument or disagreement is legitimate subject matter for a research study. All you have to do is convert the argument into a research question and ask, for example, “What benefits are derived from increasing academic testing?” or “What benefit is derived from reducing class size, and will this benefit be greater than doing more academic testing?”

Once you have converted the disagreement into a researchable question, you have taken the first step in developing a research study. Researchable questions are numerous in education. To identify them, all you have to do is develop an inquisitive attitude and ask questions.

**SOURCES OF RESEARCH IDEAS**

Where do ideas for research studies originate? Where should you look for a researchable idea? In all fields, research ideas can grow out of existing theories and prior research. In education, we are fortunate in that we have our own experiences and the experiences of others to draw from. Typically, research ideas originate from one of four sources: everyday life, practical issues, past research, or theory.

**Everyday Life**

One of the most fruitful sources of ideas for beginning researchers is their own experience as educators. In the course of conducting your job as an educator, you continuously have to make decisions about such things as the best method of teaching students, how to maintain discipline in the classroom, how best to use technology in the classroom, and how to motivate a bright but underachieving student. You might observe that some students aggressively pursue their studies, whereas others procrastinate and do anything but study. Some students might be very aggressive and constantly disrupt the classroom, and others are model students. Experiences such as these can be turned into research problems. For example, you could ask why some strategies of instruction work better with some students than with others or why some students use one method of study and others use another and whether there is any relationship between the method of study and the grades achieved.

**Practical Issues**

Many research ideas can arise from practical issues that require a solution. Educators are constantly faced with such problems as the instruction of our youth, disruptive behavior in the classroom, selection of textbooks, cheating, prejudice, and providing instruction for the culturally diverse, as well as issues such as salaries and burnout. One controversial issue that generated considerable discussion was the decision in the 1990s of the school board in Oakland, California, to teach ebonics (a term derived from the words *ebony* and *phonics* that refers to the African American speech pattern) as a second language. This decision was based on the apparently favorable results found by several teachers who taught English using a contrastive analysis technique, in which the teacher used books written in both ebonics and standard English to point out differences in syntax. This decision by the Oakland school board created a swell of rhetoric, particularly because it suggested that schools might use the ebonics issue to seek federal funds earmarked for bilingual programs. Most of the reaction, including that from the black
community, was negative and nonsupportive. A decision was also made that federal funds could not be used to support the instruction of ebonics. Reactions and decisions were made with very little research data, although the limited data that were available were supportive (Leland & Joseph, 1997). Clearly, this is a practical issue that deserves investigation and one that easily lends itself to the formulation of a research question such as “Is learning standard English enhanced among African American students if they are taught by using the contrastive analysis technique involving ebonics and standard English?”

**Past Research**

The research literature of previously conducted studies represents an excellent source of research ideas and might be the one that produces the most research ideas. This might sound like a contradiction because a research study is designed to answer a research question or questions. However, one of the interesting features of research is that it tends to generate more questions than it answers. Furthermore, as you know from reviewing and critiquing journal articles in college classes you have taken, you often will find issues in an article that you believe are problematic; the “problems” that you identify in your article critique can be an excellent starting point for proposing another closely related study that builds on the research literature.

Although each well-designed study does provide an advancement in knowledge, phenomena are multidetermined. Any study can investigate only a limited number of variables, and the investigation of the variables that are selected can lead to hypotheses about the effects of other variables. Table 3.1 lists a variety of ways in which past research can provide research ideas.

<table>
<thead>
<tr>
<th>Method</th>
<th>Rationale</th>
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<tr>
<td>Replication</td>
<td>You might decide that you want to repeat a study to see whether you can replicate the results because you think the author’s results have significant educational importance and you want to verify them.</td>
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<td>Test the external validity of a study</td>
<td>You might have read a laboratory-based study that has suggestions for important issues such as reading, control of aggression, or improving instruction. You want to find out whether the laboratory methods tested would work equally well in the classroom.</td>
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<td>Improve a study’s internal validity</td>
<td>In reading a study, you might realize that the study did not control one or more important variables and the lack of control of these variables led to an ambiguous interpretation of the results. For example, Gladue and Delaney (1990) thought that the Pennebaker et al. (1979) study that found that girls in bars got prettier at closing time did not answer the question of whether it was time or alcohol consumption that contributed to the perceptions of attractiveness.</td>
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<tr>
<td>Reconcile conflicting results</td>
<td>In reading the literature on a topic, you might find conflicting results. These conflicting results can lead to a study trying to resolve the conflict. This conflict might be due to different ways in which the studies were conducted, the use of different measurement instruments, or the use of different participant populations. When studies conflict, you need to look for any differences in the studies because these differences might represent the cause of the apparent conflict.</td>
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<tr>
<td>Suggestions for future research</td>
<td>One of the easiest ways to get ideas from past research is to look for the author’s suggestions for future research. Often, particularly in review articles, the author(s) of the article will make suggestions for the future direction of the research. These suggestions are frequently quite valid and represent good sources of research ideas.</td>
</tr>
<tr>
<td>Theses and dissertations</td>
<td>Theses and dissertations often have a section devoted to future research that will identify subsequent studies that need to be completed.</td>
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These suggestions are frequently quite valid and represent excellent sources of research ideas. Mining suggestions found in articles and coming up with your own suggestions through your article critiques are relatively easy ways to come up with a good research topic.

Theory

Theory, as defined in Chapter 1, is an explanation or explanatory system that discusses how a phenomenon operates and why it operates as it does. Theory serves the purpose of making sense out of current knowledge by integrating and summarizing this knowledge. This is referred to as the goal function of theory. Theory also guides research by making predictions. This is the tool function of theory. A good theory goes beyond the goal function of summarizing and integrating what is currently known to suggest new relationships and make new predictions. It is in this manner that theories guide research. Therefore, you should try to identify suggested relationships and new predictions based on theory that you can test in a new research study to confirm or disconfirm their authenticity.

Weiner’s (1974) attributional theory of success and failure is an example of a theory that suggests a way of thinking about and explaining test anxiety. Attribution theory has therefore been used to stimulate a number of research studies investigating test anxiety. From this theory, Bandalos, Yates, and Thorndike-Christ (1995) hypothesized and confirmed the prediction that test anxiety was related to the type of attribution a student made for his or her good or bad grade on a test. Individuals who attributed failure on a test to a lack of effort on their part reported lower levels of test anxiety than did those who cited a lack of ability or some external cause such as the difficulty of the test. Similarly, students who attributed successful performance on a test to some external factor such as the test being easy or to luck reported higher levels of test anxiety.

These four sources of research ideas—everyday life, practical issues, past research, and theory—represent the primary sources of research ideas. The important issue, however, is not the identification of sources of research ideas but the generation of researchable ideas from these sources. Generation of research ideas represents the initial stage of a research project, and development of these research ideas requires the development of a questioning and inquisitive way of thinking.

Identifying a research idea does not mean that this will be the exact focus of your research study, because the idea you have come up with might have already been investigated. The generation of a research idea really identifies the topic area that you intend to investigate. For example, assume you believe that teachers do a more effective job and the students learn more when they have a class size of 18 than when they have a class size of 28. You want to verify this belief in an empirical research study. However, this is a topic that others have likely thought of and investigated, so there is probably a considerable amount of past research on this issue. What you have done is to identify a research topic, or a broad subject matter area that you want to investigate. The research topic that you have identified is class size and its effect on academic performance. Identification of the research topic is the beginning of a sequential process that starts with the identification of the research topic and ends with the research question and research hypothesis, as illustrated in Figure 3.1.
IDEAS THAT CAN’T BE RESOLVED THROUGH EMPIRICAL RESEARCH

Some ideas are very important, are debated vigorously, and consume inordinate amounts of time and energy but cannot be resolved through empirical research study. These ideas typically involve making judgments of aesthetics, morality, and religion. Consider, for example, the issue of school prayer. It has been debated for years, has polarized segments of the U.S. population, and has even been debated in the courts, ultimately resulting in the ruling that prayer should not be a regular part of public school activities. This ruling was based on the legal opinion of members of the judicial system and did not arise as a result of an empirical research study because the issue of school prayer is a moral issue. As such, it implies notions of what is morally right and wrong or proper or improper. Empirical research cannot provide answers to such questions, although it can provide useful data on opinions, attitudes, and behaviors of individuals and groups. The key point is that empirical research cannot resolve the issue of which value position is morally best.
After you have identified a research idea, many investigators believe that your next step should be to conduct a full literature review to familiarize yourself with the available information on the topic selected. However, the use of the literature review varies depending on whether one is conducting a qualitative or a quantitative study. We will therefore discuss the purpose of the literature review separately for quantitative and qualitative research studies.

**Literature Review for Quantitative Research Studies**

In quantitative research, an extensive literature review is done before the actual conduct of the study. For example, assume that you want to conduct research on the effect of students’ self-concept on academic achievement. Before beginning to design this research project, you should first become familiar with the available information on the individual topics of self-concept and academic achievement.

The general purpose of the literature review is to gain an understanding of the current state of knowledge about your selected research topic. Specifically, a review of the literature

1. **Will tell you whether the problem you have identified has already been researched.** If it has, you should either revise the problem in light of the results of other studies or look for another problem, unless you think there is a need to replicate the study.

2. **Will assist you in forming your research questions.**

3. **Might give you ideas as to how to proceed with and design the study so that you can obtain an answer to your research question(s).**

4. **Can point out methodological problems specific to the research question(s) you are studying.** Are special groups or special pieces of equipment needed to conduct the research? If so, the literature can give clues as to where to find the equipment or how to identify the particular groups of participants needed.

5. **Can identify appropriate data-collection instruments.**

Familiarity with the literature will also help you after you have collected your data and analyzed your results. One of the last stages of a research project is to prepare a research report in which you communicate the results of the study to others. In doing so, you not only have to describe the study and the results you found but also have to explain or interpret the results of your study. In trying to make sense of data collected from a study, it is often valuable to be aware of the literature, because it can frequently provide clues as to why the effects occurred. If you are familiar with the literature, you can also discuss your results in terms of whether they...
support or contradict prior studies. If your study is at odds with other studies, you can speculate as to why this difference occurs, and this speculation then forms the basis for another study to attempt to resolve the contradictory findings.

Literature Review for Qualitative Research Studies

The literature review in qualitative research can be used in several ways. It can be used to explain the theoretical underpinnings of the research study, to assist in formulation of the research question and selection of the study population, or to stimulate new insights and concepts throughout the study. Qualitative researchers often integrate the literature review throughout their study, working back and forth between the literature and the completion of the research study (LeCompte, Preissle, & Tesch, 1993). Still, there are two schools of thought about the use of literature reviews in qualitative research.

According to one school of thought it is important to conduct a thorough literature review on your research topic before collecting data. The second school of thought advocates an “ignorance is bliss” approach (Shank, 2002) and believes that the researcher must set aside any preconceived notions (including published literature) and use a fully exploratory approach in which additional research questions, hypotheses, and theory emerge from the data collected. From this perspective, you should familiarize yourself with the literature only enough to make sure that the study you are planning to conduct has not been done. Only after you have collected much of your data, or at the completion of data collection, do you conduct a thorough literature review to try to integrate what you have found with the prevailing literature.

For example, in Chapter 2 we introduced you briefly to grounded theory (a qualitative method where the researcher attempts to develop a theory or explanation from qualitative data such as interviews and observations). One camp of grounded theorists led by Glaser (1978) recommends postponing the literature review until after data collection (the “ignorance is bliss” approach) because of its potential “biasing” effects on the researcher. Glaser wants researchers to use the grounded theory approach to discover or generate a set of constructs, relationships, and theory that are uncontaminated by any knowledge of prior research or theory. This does not mean that the literature does not have a place in Glaser’s approach to grounded theory. Glaser (1978) recommends that the literature be reviewed after the theory is sufficiently “grounded in the data” so that it fits the particular people in the study. Then the researcher can examine how the theory relates to the prior literature, checking to see if the grounded theory is similar to other studies in the literature or if it suggests a different process operating for a particular kind of people in a particular context.

Although Glaser (1978) recommended postponing review of the literature until the theory was sufficiently grounded and developed, other grounded theorists believe that a literature review should be done earlier. Strauss and Corbin (1990) specify several different ways in which a literature review conducted before data collection can be of value:

1. The literature review can be used to stimulate theoretical sensitivity of concepts and relationships that prior literature has repeatedly identified and that therefore appear to be meaningful and significant. Because of their apparent significance, you might want to bring these concepts into the situation you are studying to identify the role they might play. For example, if the concept of isolation is repeatedly identified in the literature as being significantly related to creative achievement and you are studying creative achievement in underprivileged children, you might want to look for evidence of how isolation relates to creative achievement in your study.
2. The literature can stimulate questions. In conducting a grounded theory study, you will be collecting data by asking the research participants a variety of questions and/or observing them. The literature can assist you in deriving an initial list of pertinent questions to ask or of behaviors that you might want to observe.

3. Finally, the literature can provide some information about the situations and populations that you need to study so that you can uncover phenomena that are important to the development of your theory. For example, in a study of creativity, the literature might indicate that you should look at individuals who are experiencing various emotional states because this might represent an important variable in the development of your theory of creativity.

In sum, the current position among qualitative researchers seems to be that a literature review can be of value, but the researcher must make sure that it does not constrain and stifle the discovery of new constructs, relationships, and theories.

**Sources of Information**

The two primary sources for tracking down information relevant to any research topic are books and journals, although information can also be found in technical reports and academic theses and dissertations.

**Books**

Books are a good place to start your literature search because they will provide a general overview of the research topic and a summary of the literature published up to the time the book was written. Most books focus on a specific topic, such as team teaching or Head Start. If you have selected a research topic that focuses on one of these issues, then a book written about that topic will give you a good overview of the subject matter, as well as a bibliography of other works that might be of use to you. Remember, however, that the literature that is cited in books is generally several years old, so books do not provide the most current information. Even books that have just been published do not contain the most recent information because there is a delay between the time when the book was written and the time when it is available for consumers to buy.

In addition to books on a single topic, there are reference books that provide integrative reviews and summaries of studies on specific educational topics. Specialized encyclopedias and dictionaries provide background information, frequently used words or concepts, names of the important people who have had major influence, dates, legal cases of consequence, and usually a bibliography of other sources that are considered important. For example, the *Encyclopedia of Educational Research* provides a review of the research literature on several hundred topics in education. Check your library’s reference collection for a copy of this encyclopedia to see whether your research topic is included. If it is, you might be able to obtain valuable information for your research project. Use your library’s catalog or ask at the reference desk for help finding reference books, as well as books you can check out and take home. Once you identify a call number area for your topic, you should spend some time browsing for other relevant items in this area.

Although books provide a good introduction to and overview of the issues of importance in your chosen research area, they do not give a comprehensive review of all the research conducted on any specific topic. Any book author has to be selective and present only a small portion of the literature. To be sure that you have not read a biased orientation, you should select and examine several books on your chosen research topic.
Journals

After you have examined several books and have become familiar with your research topic, your next step is to identify relevant articles contained in any of the numerous journals that publish educational research. Most of the current information about a research topic is usually found in educational journals. If you already have some familiarity with your chosen research topic, you might forgo examining books and go directly to educational journals.

There are numerous journals that publish educational research or research that is highly relevant for educational research. It would be impossible to go through each journal looking for relevant information. This is where periodical indexes, abstract journals, and citation indexes become valuable. The indexes that are of most value and importance to educational researchers are the Current Index to Journals in Education (CIJE) and Resources in Education (RIE), which are produced by the Educational Resources Information Center (ERIC); Psychological Abstracts, which is produced by the American Psychological Association; and Sociological Abstracts. These indexes include a mixture of annotations or abstracts of published articles and abstracts from sources other than journal articles such as instructional materials, speeches, information analyses, statistical data, and research, feasibility, and evaluation reports. In the past, literature reviews were conducted by manually searching through indexes such as these to identify relevant journal articles and research reports.

Computer Databases

With advances in computer technology and particularly the Internet, it has become possible to electronically store and access large data sets. Several comprehensive computerized information storage and retrieval systems, such as OVID, SilverPlatter, FirstSearch, and EBSCO, have been developed for this purpose. Information retrieval systems like these have access to many databases. The information that is of primary interest to educational researchers is available in EBSCO. When you use EBSCO we strongly recommend that you search multiple databases, including, at a minimum, the following: ERIC (which includes all the entries for CIJE and RIE), PsycINFO (which includes the entries for Psychological Abstracts), and SocINDEX (which includes the entries for Sociological Abstracts). Educational researchers also will be interested, depending on their research topics, in other databases such as those listed in Table 3.2.

Most universities give students access to many databases through use of an Internet connection in a dorm room, computer lab, or office. Check your library’s home page or ask your reference librarian to tell you which databases your library subscribes to. The information stored in these databases cannot be found by using typical Internet search engines that search only the public part of the Internet. These electronic tools are paid for through the library and are usually restricted by login and password to the students, faculty, and staff of your university. Reference librarians often develop guides and web page aids that will help you to use these databases. In addition, they often have class sessions that are specifically designed to teach you efficient search strategy and database search techniques. Become familiar with your library’s home page and the numerous information sources that are available to you through the library.
Most literature searches are conducted by making use of the Internet. The Internet is a “network of networks” consisting of millions of computers and tens of millions of users all over the world, all of which are interconnected to promote communication. All colleges and universities provide access to the Internet.

**Using Databases**

There are several ways to use the Internet to assist in your literature review. The most effective use of the Internet is to gain access to the databases to which your library subscribes. The one database that will definitely be available to you is the ERIC database because this is a federally funded, nationwide information network that is designed to give you access to educational literature. Because ERIC is federally funded, it is available to anyone and can be accessed either through an information retrieval system to which your college or university subscribes or through the public Internet. Accessing ERIC through the public Internet will give you access to the literature contained in its database and enable you to identify relevant literature. However, if you use the Internet to access ERIC through a retrieval system to which your college or university subscribes, you will have the added advantage of getting access to a full text version of some of the literature. Therefore, we suggest that you access ERIC through your library so that you can make full use of the resources provided by your university library.

Because ERIC is such an important database for educational researchers, we want to provide some detailed instruction on its use. Table 3.3 identifies the steps to follow in conducting
a literature search using the ERIC database. If you follow these steps, you should be able to identify many articles pertaining to your research topic.

**TABLE 3.3  Steps in Searching the ERIC Database**

To illustrate the steps involved in searching the ERIC database, let’s assume that you want to search the literature on the phenomenon of being raped while on a date.

**Step 1.** Connect to the ERIC website either through your library home page or using the Internet address in Table 3.2, the one we will use. Using this address, open the ERIC home page. You want to search the ERIC database, so you would click on the ERIC Search link in the upper left hand corner of the ERIC home page. This brings you to the “basic search” web page.

**Step 2.** Identify descriptor or search terms. These are terms or descriptors that will direct your search. Because you are interested in the topic of being raped while on a date, the terms you would logically use as your descriptors or search terms are date and rape. However, there might be other descriptors that would also be valuable to use. If you want help in identifying additional descriptors, click on the Thesaurus link, and you will be able to find other important descriptors.

**Step 3.** Enter your “descriptors” or “search term(s)” in the “search term” box on the left. Just below is a box that says “search in” with the word “Keyword” in that box. If you click on this box you can limit your search to one of a number of items such as the title of the article. You can get help in searching ERIC by clicking on the “search help” link.

**Step 4.** Click the search button. This will bring up another screen that provides a list of journal articles about date rape.

**Step 5.** Examine the titles and abstracts of each of the articles located to identify those that seem relevant to your research topic. Read the abstract to further determine whether the article is one you wish to get and possibly use. Use this procedure when reviewing all the articles located by your search. ERIC provides the full text of some of the articles; there will be an “ERIC full text” link below the abstract.

**Personal Communication**

Many groups, organizations, and corporations have developed web pages that they make available over the Internet. These pages have information about conferences, debates, journals, and lists of references, as well as the results of research studies. Educational researchers have formed computer networks that enable them to carry on electronic discussions and inform each other of upcoming events as well as results of their research projects. For example, the American Educational Research Association provides electronic information about meetings, conferences, membership, and publications on their website, which can be accessed at www.aera.net. Other specialized discussion lists have been developed on topics ranging from curriculum studies to postsecondary education. Accessing one or more of these links can provide valuable information about your research topic.

**Using the Public Internet**

There is a vast amount of information available on the public Internet in addition to the databases we have covered. To access the information on the public Internet, you can make use of any of a number of general search tools, such as those listed in Table 3.4. Realize, however, that this list does not exhaust the available search engines, but it does represent some of the top choices.
From Table 3.4, you can see that there are at least three ways to search the public Internet: subject directories, search engines, and meta-search engines. Which one should you use? This is a good question because the information that you get will differ depending on the search service you use. Also, some of these services are labeled directories and others search engines, which means that the databases they develop to search are created in different ways. However, most of the services offer both search engine and directory information, though they predominantly feature one type of result over another.

The databases that are searched by the search services listed in Table 3.4 consist of web pages and not necessarily scholarly products, such as books and journal articles. So the information that you will receive will differ greatly from that received from a search of ERIC or PsycINFO. Additional information about these search services can be obtained from the following two Internet sites:

1. Search Engine Showdown: www.notess.com. This site provides information on subject directories, search engines, and meta-search engines, including reviews, tips for conducting an Internet search, and statistics on the various search engines.

2. Search Engine Watch: www.searchenginewatch.com. This site list provides a comprehensive list of search tools as well as a brief description of each, search tips, and ratings of the major search engines.

### TABLE 3.4: Internet Search Tools

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<th>Type of Search</th>
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<tr>
<td><strong>Subject Directory</strong></td>
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<td>Argus Clearinghouse</td>
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<tr>
<td>Education Internet Guide</td>
<td><a href="http://www.library.usyd.edu.au/subjects/education">www.library.usyd.edu.au/subjects/education</a></td>
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<td>Britannica Internet Guide</td>
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From Table 3.4, you can see that there are at least three ways to search the public Internet: subject directories, search engines, and meta-search engines. Which one should you use? This is a good question because the information that you get will differ depending on the search service you use. Also, some of these services are labeled directories and others search engines, which means that the databases they develop to search are created in different ways. However, most of the services offer both search engine and directory information, though they predominantly feature one type of result over another.

The databases that are searched by the search services listed in Table 3.4 consist of web pages and not necessarily scholarly products, such as books and journal articles. So the information that you will receive will differ greatly from that received from a search of ERIC or PsycINFO. Additional information about these search services can be obtained from the following two Internet sites:

1. Search Engine Showdown: www.notess.com. This site provides information on subject directories, search engines, and meta-search engines, including reviews, tips for conducting an Internet search, and statistics on the various search engines.

2. Search Engine Watch: www.searchenginewatch.com. This site list provides a comprehensive list of search tools as well as a brief description of each, search tips, and ratings of the major search engines.
Regardless of whether an Internet search takes place from a directory or a search engine, the process by which each obtains the information in its database is basically the same. Although some of the information in databases is obtained from humans making submissions, most of the information in the databases of Internet search tools is obtained by using a crawler-based search engine. For the listings in a database to be obtained from a crawler-based search engine, three activities have to take place. First, something called a spider visits a web page, reads it, stores the information, and then follows links to other pages within the site that are also read and stored. Next, the information that is read by the spider is brought back and placed in the database or index. The index is like a giant book containing a copy of every web page the spider finds. Each web page that is brought back is analyzed to determine how it will be indexed based on its title, heading, or special fields.

Then, when a user, such as yourself, makes a query by typing in key words such as “date rape,” the search engine you have accessed, such as Google, takes over. The Google search engine sifts through the millions of pages recorded in the index to find matches to the key words you provided and then gives a listing of the best-matching web pages relating to these key words, usually with a short summary that includes the document’s title and some of the text. Your task is to review the indexed web pages and click on the link to the web page that contains the information you desire. Doing so brings up the web page for you to read and review.

Any search of the web using one of these search engines will give you access to many more web pages than you will ever want to visit. In spite of the vast number of web pages provided, none of the search engines has a database that comes close to containing all the available information. This is why, for the most comprehensive search, you must use several search engines; each search engine will have visited different web pages and have a slightly different database.

In an attempt to provide a more comprehensive search of the information on the web, meta-search engines, such as Metacrawler, have been developed. These are search engines that submit your search to several search engine databases at the same time. The results are then blended together into one page.

The public Internet is a vast resource that can provide a wealth of information about almost any topic. Its tremendous advantage is that it is accessible 24 hours a day and can be accessed from the comfort of your own home, apartment, office, or dorm room. However, there are some significant disadvantages to using the public Internet for conducting a literature search. Conducting a literature search is very time consuming because much of the information on the Internet is disorganized. A search will give you links to web pages with any information related to the key words you use for your search. This means that you must sift through a lot of material to try to capture the information you desire. However, the biggest disadvantage of the public Internet is the potential lack of credibility or accuracy of the information received. Anyone can put up a web page with any kind of information. This means that you must judge each website to determine whether the information contained is reliable and accurate. Table 3.5 provides some guidelines to use in evaluating the accuracy of information obtained from the Internet.

The Internet is potentially a valuable resource with access to a wealth of information. The challenge is learning how to mine the Internet and effectively use its vast array of information. As you spend more and more time navigating the Internet, you will become increasingly proficient in locating information and maximizing the tremendous resources that are at your fingertips.
TABLE 3.5  How to Judge the Quality of Internet Resources

The main problem with the public Internet is determining the validity of the information provided because anyone can establish a website. The following criteria can help you differentiate good information from bad.

1. Authority: Authority exists if the web page lists the author and his or her credentials and the address has a preferred domain such as .edu, .org, or .gov. Therefore, to assess the site's authority you should do the following:
   a. Find the source of the document. A URL ending with .edu is from an institution of higher education, .gov is from some branch of the federal government, .org is from some nonprofit organization such as the American Psychological Association, .com is from a commercial vendor, and .net is from anyone who can afford to pay for space on a server.
   b. Identify the qualifications of the publisher of the web document. You can get some of this information from the website itself by reading the “about us,” “mission,” or “Who we are” sections.

2. Accuracy: Accuracy is highest when the web page lists the author and institution that publishes the page and provides a way of contacting him or her. To assess accuracy, you should do the following:
   a. Look at the credentials of the person who wrote the web page and check for a link or an e-mail address that will permit you to contact this person.
   b. Identify the purpose of the information. Is it a public service announcement, advertisement, sales pitch, news release, or a published research study? The purpose may suggest that a certain bias exists in the information.
   c. Determine if there is an acknowledgment of the limitations of the information, particularly if the information is the report of some study.

3. Objectivity: Objectivity is highest when the web page has little or no advertising and provides accurate and objective information. Therefore, you should do the following:
   a. Identify if there is any evidence of some sort of bias in the information presented.
      i. Is the information traceable to factual information presented in some bibliographic or Internet reference? Such information may be less biased.
      ii. Do the authors express their own opinions? Authors’ opinions suggest bias.

4. Currency: Currency exists when the web page and any links it provides are updated regularly. This means that you should determine the following information:
   a. When the web page was produced.
   b. When the web page was updated and how up-to-date the links (if any) are.

5. Coverage: Coverage is good when you can view the information on the web page without paying fees or having additional software requirements.

3.8  What are the advantages and disadvantages of using the public Internet in conducting a literature search?

3.9  How would you evaluate the validity of information obtained over the Internet?

FEASIBILITY OF THE STUDY

After you have completed your literature review, you are ready to synthesize this wealth of material and not only identify the research problems within the topic area you have selected but also formulate the specific research questions and research hypotheses to be investigated. As you develop your research questions and hypotheses, you must make a decision as to whether the
study you want to conduct is feasible. Every research study that is conducted varies with respect to the amount of time required to gather the data, the type of research participants needed, expense, the expertise of the researcher, and ethical sensitivity. Studies that either are too time consuming, require skills that you might not have, or are too expensive should not be initiated.

For example, if you wanted to investigate the efficacy of a new instructional program for teaching reading to children with attention deficit hyperactivity disorder (ADHD), you would have to have access to a population of children with ADHD and ensure that each child in the study had met the diagnosis of ADHD. Then you would have to obtain the cooperation of the children's parents, the children themselves, the school system, and the teacher or teachers. Even if you had this cooperation, the study would take time because you would be investigating a reading instruction program. Therefore, you would have to be prepared to spend six months to a year in data collection. Finally, conducting such a study would entail some expense in providing the diagnosis of ADHD and obtaining the instructional materials and the assessment instruments. Overall, this would seem to be an ambitious study that would be out of reach of most students.

STATEMENT OF THE RESEARCH PROBLEM

After you have completed the literature review and have read and digested the literature, you should have a good idea of the problems in your topic area that need a solution. These problems represent research problems. Note that there is a difference between a research topic area and a research problem. A research topic is the broad area in which you are interested, such as distance education, mainstreaming, or self-esteem. A research problem is an education issue or problem within the broad topic area. For example, within the topic area of distance learning, there might be issues or problems relating to a lack of student interest or the accuracy of assessment of performance. However, the way in which the research problem is specified will differ somewhat depending on whether you are conducting a quantitative or a qualitative study.

Stating a Quantitative Research Problem

In stating a quantitative research problem, the emphasis is on the need to explain, predict, or describe some outcome or event. Look at this first paragraph of a quantitative study conducted by DeLaPaz (2001, p. 37):

Difficulties with written language production have been well documented among students with learning disabilities (LD). Those students typically lack important knowledge of the writing process and demonstrate limited abilities to generate plans, organize text, or engage in substantive revision (Englert & Raphael, 1998; McCutchen, 1998; Thomas, Englert, & Gregg, 1987). Problems with mechanics, including spelling, capitalization, and punctuation, further interfere with composing. Consequently, the writing of students with LD is less polished, expansive, coherent, and effective than that of their peers (Englert & Raphael, 1998; Graham, 1990; Graham & Harris, 1989; Montague, Graves, & Leavelle, 1991; Newcomer & Barenbaum, 1991; Wong, Wong, & Blenkinsop, 1989).

DeLaPaz introduced the general topic area in the first sentence as being “difficulties with written language production.” She then identified the population in which this was a problem: students with learning disabilities. She continued by identifying the problems these students have, such as their limited ability to generate plans, organize text, and revise material. All of
these are legitimate research problems because they represent educational issues that need a solution. Quantitative studies could be conducted to attempt to explain why the problems exist as well as how to ameliorate them.

Stating a Qualitative Research Problem

In a qualitative study, the research problem focuses on exploring some process, event, or phenomenon as illustrated in Otieno’s (2001, p. 3) introduction of her qualitative study of the educational experiences of seven African women:

According to the late Dr. Kweyir Aggrey of Ghana, educate a man and you have educated an individual, educate a woman and you have educated a nation. More than half of the population of Africa is made up of women. While this statement is true, female education in Africa has not developed at the same pace as that of males. There are many recent studies that examine problems African women encounter while attempting to pursue higher education (Yeboah, 1997, 2000; Namuddu, 1992; Lindsay, 1980; Bappa, 1985; and Eshwani, 1983). Most African countries have identified education as a key element in economic development. The linkage between female education and development in general cannot be overemphasized. Moreover, research has found that female education is highly correlated with better use of family planning, low fertility rates, and low infant mortality (Yeboah, 1997, 2000). The recognition by educators in the international community of the fact that female education is essential to national and global development is perhaps one reason why the education of women and girls is now a popular topic for many researchers. Returns on education are significant both for the individual and for society. Education is a particularly powerful achievement for women as it opens up the potential for wider participation in the economy. This increased awareness has raised questions as to what problems the female population face, what factors hold them back, and how these factors can be overcome to enable the majority of women to obtain higher education. It is through full inclusion in the process of obtaining higher education that women can participate fully in the process of the continent’s development.

In this example, Otieno opens with a statement about the value of education, particularly for women, which is the general topic area of the study. She then points out the primary research problem: African women are less likely to receive an education than men are. She continues by pointing out that when women receive an education, many positive effects occur for both the individual and society. This emphasizes the importance of studying this research problem. Otieno then notes that the awareness of the positive effects that result from an educated female population has raised questions regarding the problems these individuals face in getting a higher education. What holds them back from attaining a higher education, and how can these difficulties be overcome? She then states that women can participate in the continent’s development only by exploring the complete process by which women obtain a higher education. This represented Otieno’s statement of her research problem. She then proceeded to conduct a study exploring this process.

STATEMENT OF THE PURPOSE OF THE STUDY

The statement of the purpose of a research study is a statement of the researcher’s intent or objective of the study. This is a statement that logically follows from the identification of one or more research problems. It needs to be made because making it ensures that you have a good grasp of the specific problem you wish to investigate. A specific statement of the purpose of the study also
enables you to communicate your research project to others. Providing a specification of the study purpose at the outset also has the advantage of guiding the research process by, for example, indicating how and by what methods the data will be collected. However, the nature of this statement will differ somewhat depending on whether you are conducting a qualitative or quantitative study.

**Statement of Purpose in a Quantitative Study**

The purpose statement in a quantitative study is a declarative statement that identifies the type of relationship being investigated between a set of variables. This relationship could be causal or descriptive. For example, if you wanted to investigate the causal connection that might exist between a treatment for learning disability and the effect of that treatment on spelling ability, your purpose statement could be stated as follows:

The purpose of this study is to investigate the effect that treatment for a learning disability has on the spelling proficiency of children with a learning disability.

However, if the intent of your study was to describe the relationship between spelling proficiency and the extent of a person’s learning disability, your purpose statement could be stated as follows:

The purpose of this study is to describe the degree of relationship that exists between spelling proficiency and the extent of a person’s learning disability.

Both of these statements of purpose have identified the intent of the study and the variables being investigated. The difference is that one study is attempting to determine whether learning disability is causally related to academic achievement, whereas the other is attempting to describe the relationship that exists between these two variables. These two illustrate the basic and essential characteristics that should exist in a statement of purpose: both identify the variables being investigated and the intent of the study or the way in which these variables will be investigated.

Although these examples illustrate the desired form of a statement of purpose, the actual statement of purpose in research articles frequently differs from the ideal. For example, Burnam and Kafai’s (2001) statement of the purpose of their research study was as follows:

The purpose of this study is to investigate the moral reasoning of children within the unique domain of computer and Internet use (p. 114).

This statement of purpose identifies the variables being investigated in the study—moral reasoning and the computer and Internet—but it does not mention what is being investigated with regard to these two variables. The study could be describing the level of moral reasoning of children who use the computer and Internet, or it could be attempting to determine whether there is a difference between the moral reasoning of children who do and do not use the computer and Internet. There is no way to tell exactly what the researchers are attempting to do in studying these two variables.
A better statement of purpose would have been something like the following:

The purpose of this study is to determine if the level of moral reasoning of children who are frequent computer and Internet users is different from that of children who seldom use the computer and Internet.

This statement of purpose identifies the exact type of relationship that is being investigated and the variables that are being investigated. This degree of specificity is desired to ensure that an accurate statement of purpose is being communicated.

**Statement of Purpose in a Qualitative Study**

The statement of purpose in a qualitative study should be a statement that the intent of the study is to explore or understand some phenomenon experienced by certain individuals at a specific research site. This means that a qualitative study’s statement of purpose should do the following:

1. Convey a sense of an emerging design by stating that the purpose of the study is to describe, understand, develop, or discover something
2. State and define the central idea that you want to describe, understand, or discover
3. State the method by which you plan to collect and analyze the data by specifying whether you are conducting an ethnographic study, grounded theory study, case study, or phenomenological study
4. State the unit of analysis and/or the research site, such as fourth-grade students participating in a specific program

For example, Drew (1986) stated the following purpose of her study as follows:

The focus of the present study was to explore distressing and nurturing encounters of patients with caregivers and to ascertain the meanings that are engendered by such encounters. The study was conducted on one of the surgical units and the obstetrical/gynecological unit of a 374-bed community hospital. (p. 40)

This purpose statement contains several of the essential ingredients characterizing a qualitative study. It conveys the sense of an emerging design and defines the central idea by stating that the researcher intends to “explore distressing and nurturing encounters.” It also states that the research site will be a specific unit in a community hospital. Although this statement of purpose does not explicitly state the method used to collect and analyze the data, it does contain most of the elements of a statement of purpose for a qualitative study. This example also demonstrates that not every statement of purpose will contain all the fundamental characteristics of a good, qualitative purpose statement. However, good purpose statements will contain most of these characteristics.
STATEMENT OF RESEARCH QUESTIONS

A research question is a statement of the specific question(s) to which the researcher seeks an answer. It is therefore an extension of the statement of the purpose of the study in that it specifies exactly the questions that the researcher will attempt to answer. Although research questions are found in both quantitative and qualitative studies, they differ somewhat in their structure. Quantitative research questions state exactly the relationship being investigated between the target variables. Qualitative research questions are not as specific. Instead, qualitative research questions are more likely to ask a general question about a process or about exploring a particular phenomenon.

Statement of a Quantitative Research Question

A quantitative research question is an interrogative sentence that asks a question about the relationship that exists between two or more variables. Common forms are descriptive, predictive, and causal research questions, as illustrated in Table 3.6. Regardless of the type of research question, you should make sure that you formulate it in very specific terms because a research question that is stated in very specific terms ensures that you have a good understanding of the variables you are investigating. It also aids in the design and conduct of your research study. To drive these points home, consider the difficulties you would encounter if you asked the question “What is the effect of participation in extracurricular activities on academic performance?” This is a good research question in that it asks an important question. However, it is worded so vaguely that it is difficult to pinpoint what is being investigated. What type of extracurricular activity and what type of academic performance? There are many different types of extracurricular activity, and it would be inappropriate to assume that all types would have similar effects. Similarly, academic performance could refer to overall average performance or to performance in specific subject areas.

Now contrast this question with the following question:

What effect does playing football have on students’ overall grade point average during the football season?

This question specifies exactly the variables that are to be investigated: the extracurricular activity of playing football and academic performance as measured by overall grade point average.

As you should be able to see from this example, making a specific statement of the research question helps ensure that you understand the problem you are investigating. It also helps you to make decisions about such factors as who the research participants will be and what materials or measures you will need to conduct the study. A vaguely stated research question gives no such assistance. To drive this point home, go back and reread the two research questions stated above and ask yourself, “What research participants should I use?” and “What outcome measures should I use?”

You might be asking yourself, “How specific should I be in formulating the research questions?” Remember that the purpose of formulating a specific research question is to ensure that you have a good grasp of the variables being investigated and to assist you in designing and completing your research study. If the formulation of your research questions is specific enough to serve these purposes, you have probably been specific enough. If these purposes have not been met, you need to rethink your research question and increase its specificity.
TABLE 3.6 Writing Quantitative Research Questions

<table>
<thead>
<tr>
<th>Type of Question</th>
<th>Script</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Questions</td>
<td>(Descriptive question) Do(es) (participants) (variable being studied) at (research site)?</td>
<td>How frequently do kindergarten children engage in aggressive acts on the playground?</td>
</tr>
<tr>
<td>Predictive Questions</td>
<td>Does (predictor variable) predict (outcome variable) in (setting)?</td>
<td>Does parental educational level predict students' propensity to drop out of high school?</td>
</tr>
<tr>
<td>Causal Questions</td>
<td>Does variation (or change) in the (independent variable) produce changes (e.g., increase, decrease) in (a dependent variable)?</td>
<td>Does variation in amount of homework assigned produce a change in students' test performance?</td>
</tr>
</tbody>
</table>

Statement of a Qualitative Research Question

A **qualitative research question** is an interrogative sentence that asks a question about some process, issue, or phenomenon that is to be explored. It is a general, open-ended, and overarching question that you would like to answer. From this overarching research question you can frequently narrow the purpose of a study down into more specific questions. It can be helpful to state the general purpose of the study and then state a number of subquestions that break the overall research question into the components that will be investigated. For example, Bodycott, Walker, and Kin (2001) investigated the beliefs that preservice teachers held about their principals. Their statement of purpose was as follows:

The purpose of this study was to explore how the social context of schools and schooling influenced preservice teachers' personal constructs of the principal (p. 15).

The research question that follows from this purpose statement is:

How does the social context of a school influence preservice teachers' beliefs about the principal?
The overall research question, as you can see, is very similar to the statement of purpose and tends to restate the purpose statement in question form. Because the overarching research question is, to a great extent, a restatement of the purpose of the study, many researchers omit it, although it can provide a focus to the statement of the purpose of the study. However, a number of subquestions or more specific questions are typically asked, because these questions break the central research question into the specific topics or processes that are explored in the study. For example, Bodycott et al. (2001) asked the following two subquestions in the form of “aims” of the research:

1. “The first aim of the study was to determine preservice teachers’ beliefs about principals.”
2. “The second aim was to identify what or who influenced these beliefs.” (p. 16)

These two questions provide a specific focus to the study and help ensure that the researcher knows exactly what is being investigated in the study. It also aids in the design and conduct of the study because in a qualitative study, the more specific subquestions will serve as a guide to the type of questions asked of participants. For example, look at the general research question posed in the Bodycott et al. (2001) study cited above. This general research question provides little direction in formulating interview questions that might be asked of preservice teachers. However, the statement of the two “aims” of the research would direct the development of interview questions such as the following:

What is the role of the principal of a school?
What kind of relationship should exist between a teacher and the principal?
Who talks to you about the principal?
Who do you think has the most accurate information about the principal?

FORMULATING HYPOTHESES

In quantitative research, after you have identified a research problem that you want to investigate and you have stated your research purpose and your research question(s), you are ready to formulate your hypothesis. The hypothesis represents the formal statement of the researcher’s prediction of the relationship that exists among the variables under investigation. It logically follows the statement of the research question, because you could not formulate the hypothesis without having first stated, either explicitly or implicitly, the research question. For example, the research question that Butler and Neuman (1995) formulated was as follows:

Will the perceptions and actual help-seeking behaviors of children differ in task (an instructional set that told the children that they would learn to solve puzzles) versus ego-involving (an instructional set that told the children that kids who solve the puzzles are very smart) settings?

From this research question, they hypothesized or predicted the following:

Children in ego-involving settings will be less likely to request help than children in task-involving settings.
Note that this hypothesis took the two variables stated in Butler and Newman's research question—help-seeking behaviors (the dependent variable) and type of setting (the independent variable)—and made a prediction about how help-seeking behaviors would differ depending on the type of setting the children were in. You can use the following script for stating a hypothesis:

(group 1 participants, independent variable) will (differ in some way—increase, decrease, improve, etc.) (dependent variable) —from (group 2 participants, independent variable).

The hypothesis for the Butler and Newman study used this script in the following way:

Group 1, independent variable = children in ego-involving settings
Differ = be less likely to request
Dependent variable = help
Group 2, independent variable = children in task-involving settings

Another example using this script might be as follows:

Learning-disabled children receiving individualized instruction will show greater gains in academic achievement than learning-disabled children receiving group instruction.

This progression from the statement of the research question to the hypothesis should seem logical because the hypothesis merely represents a statement of the predicted relation between the variables stated in the research question. In reading the journal articles that you identify in your literature review, you will probably have difficulty finding a statement of the research question in every study because many authors do not make such an explicit statement. Experienced researchers often have such familiarity with their field that they consider the research question to be self-evident. Their predicted solutions to these problems or their hypotheses are not apparent, however, so they should always be stated.

The stated hypothesis typically emerges from the literature review or from theory. As we stated earlier, one of the functions of theory is to guide research. One of the ways in which a theory accomplishes this function is to make a prediction of the relationship between variables. Similarly, the research literature that you have read might suggest the relationship that should exist between the variables being investigated. However, hypotheses can also come from reasoning based on casual observation of events. For example, you might have noticed that some children get very nervous when they take a test and that these children seem to be the ones who get the poorest grades. From this observation, you might formulate a research question that asks, “How does test anxiety affect performance on a test?” Your hypothesis might be that performance will decrease as test anxiety increases. Regardless of the source of the hypothesis, it must meet one criterion: a hypothesis must be capable of being either confirmed or not confirmed; that is, the hypothesis must be about something for which one set of possible outcomes would be viewed as supporting the hypothesis and the other set of possible outcomes would be viewed as not supporting the hypothesis. A hypothesis that fails to meet this criterion is not testable and removes the question from the realm of empirical research. It is of no use to do empirical research if you plan to claim support for your hypothesis regardless of the outcome.
Hypotheses are important primarily in quantitative studies because their goal and purpose differs from those of qualitative research studies. Quantitative research has the goal of identifying the relationships that exist between sets of variables, whereas qualitative research attempts to discover, explore, or describe a given setting, event, or situation. Therefore, hypothesis formulation is appropriate at the outset of a quantitative research study. In this type of study, we not only specify the variables being investigated but also make a prediction about the relationship that exists between these variables. We then conduct the study to determine whether the relation that we predict among these variables actually exists. In a qualitative study, researchers are more interested in exploring phenomena and generating ideas and particular findings. This exploration is accomplished by asking very general questions that permit a lot of latitude in participants’ responses. From the participants’ responses, additional research questions and even hypotheses might emerge. However, in many studies, the qualitative researcher only poses research questions rather than formulating and testing formal hypotheses.

**REVIEW QUESTIONS**

3.10 What factors should you consider in determining whether it is possible for you to conduct a study?

3.11 How do research problems in qualitative and quantitative research differ?

3.12 How does the statement of the purpose of a study differ in qualitative and quantitative research?

3.13 How do research questions differ in qualitative and quantitative research, and what is their purpose?

3.14 Why should research questions in quantitative research be very specific?

3.15 What is a hypothesis, and what is the one criterion that it must meet?

3.16 Why are hypotheses typically not formulated in qualitative research, and what is typically used instead?

**CONSUMER USE OF THE LITERATURE**

In this book, we attempt to give you detailed information on how to conduct a research study in the field of education. However, the reality of the situation is that most of you will not be engaged in a lifetime of research and might never conduct a formal study. Even if you do not become an educational researcher, courses such as this one are valuable because they make you a better consumer of research. After taking this course, you will have the basic information you need to evaluate a research study to determine whether the conclusions are valid and whether it was conducted correctly. Tables 3.7, 3.8, and 3.9 provide a checklist of elements to consider in evaluating quantitative and qualitative research studies.

To be an effective consumer of research, you should not and must not consider the results of any one study to be conclusive. You need to look across studies to see whether the findings are repeatedly confirmed or replicated. For example, assume that you read a study demonstrating that computer-assisted instruction resulted in better performance than did instruction that did not have the aid of computers. Does this mean that you can definitely conclude that computer-assisted instruction is the superior mode of instruction? Of course not! One study...
CHAPTER 3: REVIEWING THE LITERATURE AND DEVELOPING RESEARCH QUESTIONS

TABLE 3.7  Checklist for Evaluating a Quantitative Study

The following checklist can be used to help in evaluating the quality of a quantitative research study although some of the questions apply only to experimental studies. If you are evaluating a nonexperimental study, you should disregard questions that focus on experimental studies.

Introduction
1. Is the research topic area clearly stated in the first paragraph?
2. Is (are) the research problem(s) clearly stated?
3. Does the literature review accurately convey the past research?
4. Does the literature review suggest and lead to the statement of the research purpose and/or research question(s)?
5. Is the purpose of the research clearly stated?
6. Is each research hypothesis clearly stated, and does it clearly state the expected relationship between the independent and dependent variables?
7. Is the theory from which the hypotheses came clearly explained?

Method
8. Are the demographics of the participants accurately described, and are they appropriate to this study?
9. Was an appropriate method of sampling used, given the purpose of the study?
10. Were enough participants included in the study to test the hypotheses?
11. Are the research instruments that were used reliable and valid for the participants used in the study?
12. For experimental research, do the manipulations of the independent variable represent the constructs (e.g., failure, poverty, self-esteem) being investigated or does the study have construct validity?
13. Do the measurements of the dependent variable represent the phenomenon (e.g., learning, aggression, stress) of interest?
14. For experimental research, were the participants randomly assigned to conditions?
15. Are there elements in the procedure that might have biased the results?
16. Did the researchers take appropriate actions to control for biases?
17. Were the participants treated ethically?

Results
18. Are appropriate statistical tests and calculations of effect sizes used to analyze the data?
19. Are the results presented clearly?
20. Is any part of the data being ignored, such as some participants being dropped?
21. Can the results be generalized to the populations and settings the researcher desires?

Discussion
22. Do the researchers clearly explain the results of the study?
23. Have the findings of the study been discussed in relation to the theoretical framework with which they began?
24. Have alternative explanations for the study results been examined?
25. Do the results conflict with prior research? If they do, has an explanation been provided for the conflicting data?
26. Have any limitations of the study been discussed?
27. Are future directions for research suggested?

does not produce a conclusive finding on which you can rely. For a study to be reliable, the results must be replicated by other researchers on other populations in other locations because the phenomena that educational researchers investigate are too complex to be explained by a single study and the ability to control the research environment, the research participant sample, and the procedures used varies considerably from study to study. Therefore, many studies will be conducted on a given phenomenon, and each study will be conducted in a slightly different way on a slightly different participant sample. The results will vary slightly from study to study, and you must somehow integrate them.

The technique that is used for summarizing the results of multiple quantitative studies of a given phenomenon is called meta-analysis. **Meta-analysis** is a term introduced by Glass (1976) to describe a quantitative approach that is used to integrate and describe the results of a large number of studies.
number of studies. Meta-analysis gets around the problem of making subjective judgments and preferences in summarizing the research literature because it involves the use of a variety of quantitative techniques to analyze the results of studies conducted on a given topic. Therefore, when you are conducting your literature review and trying to reach some conclusion about a given phenomenon, pay particular attention to literature summaries that have made use of meta-analysis because the results of these summaries are more accurate in the conclusions reached.

To illustrate the use of meta-analysis, let us look at the meta-analysis conducted by Forness and Kavale (1996) on studies that investigated the efficacy of a social skills training program for children with learning disabilities. Fifty-three studies were identified from abstract and citation archives, reference lists from prior literature reviews, and bibliographies of research reports. Forness and Kavale applied standard meta-analytic statistical procedures to the results of these 53 studies to provide an overall integration and description of their findings. This analysis revealed that the social skills training programs that were applied to children with learning deficits had a very small but positive effect. This is the primary conclusion that you should retain from the currently available literature. If you looked at individual studies, you might find some that indicated that social skills training programs were totally ineffective and others that indicated that they were very effective. Without the benefit of a meta-analysis, you might be influenced more by one or several of these studies and reach an inappropriate conclusion. Meta-analysis eliminates this type of bias and provides an overall synopsis of the available literature.

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TABLE 3.8 Checklist for Evaluating a Qualitative Study

The following checklist can be used to help in evaluating the quality of a qualitative research study.

**Introduction**

1. Is the research topic specified at the outset of the article?
2. Is (have) the research problem(s) (been) clearly identified?
3. Is there a sufficient review of the relevant research literature?
4. Is the purpose of the research clearly stated?
5. Are specific research questions identified and stated clearly?

**Method**

6. Have the characteristics of the participants, the research site, and the context been accurately described?
7. Are the participants appropriate for the purpose of the study?
8. Is the number of participants large enough?
9. Were adequate data collected to address the research question?
10. Were triangulation and other validity-enhancing strategies used to help produce trustworthy evidence?
11. Were the participants treated ethically?

**Results**

12. Are the findings presented clearly?
13. Are any potentially important data ignored by the researcher(s)?
14. Is sufficient evidence provided to convince you of the trustworthiness of the findings?

**Discussion**

15. Are the results discussed in relation to other research in this area?
16. Are the limitations of the study discussed?
17. Have the researchers examined alternative explanations for their findings?
18. Have suggestions for future research been provided?
SUMMARY

The first step in conducting a research study is identifying a research topic and then identifying a research problem in need of a solution. Although the beginning researcher might have difficulty in identifying a research problem, the field of education has numerous problems that are in need of solutions. To identify a research problem, you need to develop an inquisitive attitude and ask questions. Once you develop this mental set, then problem identification is relatively easy. Use of the research literature is especially helpful for identifying researchable problems.

Educational research problems arise from several traditional sources, such as theories, practical issues, and past research. Additionally, in education, we have our own experience to draw on, because educational research is concerned with the field of education, and we have all had experience with this field. Many problems dealing with moral, ethical, and religious issues
cannot be resolved through empirical research, even though there are some significant issues of this sort that must be dealt with in education.

Once a research problem has been identified, you must conduct a comprehensive literature search. This literature will reveal the current state of knowledge about your selected topic, suggest more specific ways in which you can investigate the problem, and point out related methodological issues. However, if you are conducting a qualitative research study rather than a quantitative study, you might want to just familiarize yourself with the literature to make sure that the study you want to conduct has not been done. This approach assumes that the lack of knowledge of prior literature enables the researcher to take a fresh and uncontaminated perspective and develop a novel set of constructs, relationships, and theory from the data.

In conducting the formal literature review, the most efficient means is to make use of one of the various information retrieval systems available through your library, such as EBSCO, which has access to databases that have information relevant to educational research (e.g., ERIC, PsycINFO, and SocINDEX). Additionally, there is a wealth of information on the public Internet; we provided a set of guidelines that need to be followed for evaluating information found on the public Internet and separating useful information from useless information. For example, it is important to consider the motivation of the organization, company, or person providing the information.

After you have conducted the literature review, you must determine whether the study you want to conduct is feasible. This means that you must make an assessment of the amount of time, research participant population, expertise, and expense requirements, as well as the ethical sensitivity of the study. If this indicates that a study will be feasible to conduct, then you must identify the research problem or problems that need to be explained, described, or predicted in quantitative studies and explored in qualitative studies. After stating the research problems in the topic area, you should state the purpose of the study. In a qualitative study, the purpose statement should express the language and methodology of a qualitative paradigm. If you were conducting a quantitative study, you would formulate your purpose statement in a way that identifies the intent of the study. A statement of the research question(s) should follow the purpose statement, although it frequently does not. In qualitative studies, the purpose statement is more frequently followed by a statement of aims or a series of subquestions that specify the components of the study that will be conducted.

In quantitative studies, the research question is a statement asking whether a relationship exists between two or more variables. This relationship must be capable of being empirically tested. The statement must also be specific enough to assist you in making decisions about such factors as participants, apparatus, and the general design of the research study. The research question is then followed by a hypothesis, typically derived from past research, that makes a prediction about the relationship that exists between the variables being investigated. If the hypothesis is confirmed, the results not only answer the question asked but also provide additional support to the literature that suggests the hypothesis. There is one criterion that any hypothesis must meet: it must be stated so that it is capable of being either “confirmed” or “not confirmed.” Remember also that hypotheses are used most frequently and are most important in quantitative research. Hypotheses frequently are not formulated in qualitative studies. Instead, qualitative studies focus on posing questions, some of which might emerge as the exploratory study progresses.
CHAPTER 3: REVIEWING THE LITERATURE AND DEVELOPING RESEARCH QUESTIONS

KEY TERMS

Educational Resources Information Center (ERIC) (p. 68)
hypothesis (p. 80)
Internet (p. 69)
meta-analysis (p. 83)
PsycINFO (p. 68)
purpose of a research study (p. 75)
qualitative research question (p. 79)
quantitative research question (p. 79)
research problem (p. 74)
research topic (p. 63)
SocINDEX (p. 68)
theory (p. 63)

DISCUSSION QUESTIONS

1. In this chapter, we have listed several sources of research ideas.
   a. Which of these sources would produce the most ideas for research studies in education?
   b. If you had to produce an idea for a research study, which source would you use, and why would you use this source?

2. What is the best use of a literature review? Is it best to use it to assist in specifying the research question and hypothesis and designing the study, as is done in quantitative studies, or should the literature review be used only after much of the data have been collected to integrate the study findings with prior research as some qualitative researchers recommend?

3. We constantly hear and read about the results of studies from television, radio, and newspaper reports. When you read the results of studies from these sources, what questions should you ask, and how should you evaluate the research reported?

EDUCATIONAL RESEARCH ON THE WEB

Log on to the web-based student study site at http://www.sagepub.com/bjohnsonstudy for additional web sources and study resources.

RESEARCH EXERCISES

1. Develop a quantitative research question by answering the following:
   a. My topic area is _________.
   b. The research problems within this topic area are _________.
   c. The purpose of my study is _________.
   d. My research question is _________.
   e. My hypothesis is _________.

2. For the quantitative research question you identified in Exercise 1, make use of ERIC, and conduct a mini literature review by finding three research studies related to your research question and supplying the following information for each study.
   a. Title
   b. Author
   c. Journal with volume and page number
   d. Abstract
RELEVANT INTERNET SITES

Information about searching and evaluating information on the World Wide Web
http://libweb.uoregon.edu/guides/searchweb/evaluating.html

Checklist of things to do when evaluating a website
http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html

How to find relevant information on psychological topics in outlets ranging from newspaper articles to scientific journals
and links to information about PsycINFO, PsycArticles, PsycBOOKS, etc.
www.apa.org/science/lib.html

RECOMMENDED READING