Deciding on an Area of Focus

Deciding on an Area of Focus

This chapter provides guidelines for clarifying a general idea, and an area of focus for action research efforts. Procedures are described for doing reconnaissance and reviewing related literature using online resources such as ERIC, the Internet, university library resources, or articles found in journals published by professional organizations for educators. Finally, this chapter tells how to create an action research plan.

After reading this chapter you should be able to:

1. Select an appropriate area of focus.
2. Do reconnaissance.
3. Review related literature.
4. Write an action plan to guide your work.

Interactive Teen Theater

CATHY MITCHELL

Cathy Mitchell is a substitute teacher who also works with teen theater companies. Her story helps us to see how serendipity can play a role in developing an area of focus. At the beginning of the action research process, Cathy was unsure of her area of focus. As the result of an unexpected "intervention" to her teen theater production, however, when an actor did not turn up for a performance, Cathy decided to systematically investigate the effects of improvisation on audience participation.

For the past 10 years I have directed peer education teen theaters. These companies create and perform original plays based on company members' experiences and ideas. The plays are collections of dramatic scenes, comic sketches, and songs; the topics are current issues of concern to young people, including self-esteem, substance abuse, teen pregnancy, love versus lust, violence, family relationships, and sexually transmitted diseases. We tour extensively, performing for high schools and middle schools as well as at juvenile detention facilities.

Although the company is generally very well received, I have felt that there is something stale in the actor/audience relationship. The audience sits attentively, laughs in recognition, and enjoys the variety in their class day, but remains essentially passive. Question sessions after the show, initially planned to generate discussion about important topics, frequently degenerated into boring adulation questions, such as "How long have you been rehearsing this?" or "Do you want to be an actor when you grow up?"

Two years ago, a few actors had to miss a performance. When we arrived at the high school at which we were scheduled to perform, we realized the opening scene had two small roles that we could not eliminate but didn't have enough actors to fill. I asked two children from the audience to volunteer, taught them their lines backstage while the rest of the scene was going on, and they walked on stage and finished the scene. The audience was instantly galvanized. Even with this very small change we had broken the division between actor and audience.

Thus began my experience with interactive theater. For me, this has meant bringing some of the improvisation techniques that we use to develop material during rehearsals onto the stage and inviting the audience to participate in limited ways. I found that involving the audience changed the dynamics from those of a passive spectator sport to those of a more participatory dialogue.

Through my research I have arrived at a working description for interactive theater: A short scene is played by workshop actors. The audience is asked to look for opportunities to improve the resolution. The scene is played again, and any time anyone wants to intervene and take any character's place to show a better way of handling the situation, they just shout "Stop!" and take over the role. One scene may be played many times. Often no closure is evident, and the scene ends in unresolved issues and heightened emotions. The actors and audience then discuss the issues generated by the scene.

The purpose of my study was to determine how audience interaction with the actors in teen theater productions affected their ability to identify issues and transfer learnings into similar problems in their lives. For example, in the current production of Duct Tape Theater, a company I direct, there is a well-written scene called "Sticks and Stones," which is a collage containing poetry, a song, short monologues, and scenes. It lasts about 20 minutes and confronts issues of prejudice, discrimination, and violence. I decided, as my intervention, to replace this scene with an interactive theater

piece developed with the audience. For three performances we included "Sticks and Stones" (my control groups), and for three other performances we included what became known as the "Violence Improv" audience interaction scene. This gave us six audiences: three control groups and three interactive groups.

Some of my methods of data collection for this project—my personal journal and the actors' journals, which are required for actors receiving credit for the class—were already in place. I also asked each teacher to write me a letter commenting on what they observed during the performance. None of these gave me the data I really wanted but which was most difficult to collect—data from the audience. I decided to have my acting company develop this data collection source with me. The actors and I developed a questionnaire to be filled out directly after the performance and a group interview technique that involved three company members meeting with a small group of audience members for about 15 minutes. The goal was to generate as many responses as possible to the scenes about teen violence and harassment. One actor served as the interviewer, one as the scribe, and one kept a running tally of comments and responses.

The data showed four clear themes:

1. The audience clearly judged the performance containing the "Violence Improv" as more relevant to their lives than the control performance of "Sticks and Stones."
2. More individuals participated in discussing the issues of violence and harassment, with more overall comments and more comments that were considered "right on." This data showed that more audience members were able to both identify issues in the performance and relate these issues to their own lives.
3. The clearest negative response was that the interactive piece made the performance feel "rushed." These data told me that the interactive material threw off the timing of the show. I often wrote in my own journal that I felt exhausted at the end of performances, and teachers wrote to me that we were running into break time and past the end of the period "trying to squeeze everything in."
4. The biggest letdown to me was that there wasn't any significant increase in the number of different issues identified or solutions suggested between the two audiences. Even though the interactive improvisation generated more answers and much more participation, the issues and solutions were pretty much the same.

My action research project confirmed to me that my methods for making teen theater work more meaningful are on the right track. It also became clear, however, that the format I am using is not the best one. I plan to continue working with the teen theater groups, to modify the format I have used in the past, and to monitor the effects of the changes on participants' transfer of learning to their real lives. For me, this is critical work, and the most important result of this project is that I feel renewed energy for my work. Last year at this time I was busily seeking a replacement for myself and announcing to everyone that I wasn't going to direct teens anymore. I didn't even consider that I could examine the problem, address it, and remedy it. It feels really good to expect something to happen in my working life as a result of my own research and reflection.

Not everyone comes to an action research setting with an area of focus in mind. In fact, many teachers initially resist participating in the process. It is not uncommon for teachers and administrators to skeptically claim, "I'm only here because I have to be: No action research—no teaching/administrator license!" In this teen theater example, the "intervention" and "area of focus" emerged quite unexpectedly and led to some important understandings about how to increase audience understanding and participation.

We'll assume, then, that you haven't identified an area of focus. However, you probably do have several interests and concerns: perhaps your content area, a self-contained special education classroom, an at-risk program, an alternative education program, a multi-grade classroom, a single fourth-grade classroom, a reading specialist program, a block-scheduled team teaching program, or even a one-room schoolhouse, to name a few!

Every teacher and administrator who undertakes an action research project starts at the same place: making explicit a question or problem to investigate, or defining an area of focus. Finding an area of focus can be hard work if your action research inquiry is going to be engaging and meaningful for you. Taking time in the beginning to ensure that your topic is important—for you—is a critical step in the action research process. No one should tell you what your area of focus is or ought to be. The following guidelines can help you focus your research question.

Clarifying a General Idea and an Area of Focus

In this **video**, Doug, a teacher researcher, briefly describes the process by which he developed a general idea into an area of focus for an action research project.

In this **video**, Rachelle, a teacher researcher, describes how an observation led to a question and then led to an action research project.

In the beginning of the action research process, you need to clarify the general idea that will be the area of focus. The general idea is a statement that links an idea to an action and refers to a situation one wishes to change or improve on (Elliott, 1991). Here are some examples, phrased in the form of a statement based on an observation and followed by a question about how the situation could be improved:

- *Statement/Observation*: Students do not seem to be engaged during teen theater productions.
- *Question*: How can I improve their engagement?
- *Statement/Observation*: Students take a lot of time to learn problem solving in mathematics, but this process doesn't appear to transfer to their acquisition of other mathematics skills and knowledge.
- *Question*: How can I improve the integration and transfer of problem-solving skills in mathematics?
- *Statement/Observation*: Parents are unhappy with regular parent-teacher conferences.
- *Question*: How can I improve the conferencing process using student-led conferences?

Taking time in the beginning of the action research process to identify what you feel passionate about is critical. For some, this will be a relatively short activity—you may have come to an action research setting with a clear sense of a student-centered, teacher-centered, or parent-driven area of focus. For others, gaining a sense of the general idea will be more problematic. Don't rush it. Take time to talk to colleagues, reflect on your daily classroom life, and carefully consider what nags at you when you prepare for work every day.

Criteria for Selecting a General Idea/Area of Focus

In this **video**, Jureen, a teacher researcher, describes a simple observation of a new classroom setting that led to an idea for an action research project.

There are some important criteria you should keep in mind while identifying your general idea and subsequent area of focus (Creswell, 2008; Elliott, 1991; Sagor, 2000):

- The area of focus should involve teaching and learning and should focus on your own practice.
- The area of focus is something within your locus of control.
- The area of focus is something you feel passionate about.
- The area of focus is something you would like to change or improve.

Applying these criteria early in the process will keep you on track during the early stages of the action research process. They will also remind you of the vital and dynamic dimensions of action research—that it is important work done by teacher researchers for themselves and their students, the results of which will ultimately improve student outcomes. (See Research in Action Checklist 1.)

RESEARCH IN ACTION CHECKLIST 1

Identifying Your Area of Focus

Is your area of focus an issue that
_____ Involves teaching and learning?
_____ Is within your focus of control?
_____ You feel passionate about?
_____ You would like to change or improve?

Reconnaissance

The next important step in the action research process is reconnaissance, or preliminary information gathering. More specifically, reconnaissance is taking time to reflect on your own beliefs and to understand the nature and context of your general idea. Doing reconnaissance takes three forms: self-reflection, description, and explanation.

Gaining Insight into Your Area of Focus Through Self-Reflection

First, try to explore your own understanding of the following:

- The *theories* that impact your practice.
- The *educational values* you hold.
- How your work in schools fits into the *larger context* of schooling and society.
- The *historical* contexts of your *school* and *schooling* and how things got to be the way they are.
- The *historical* contexts of how you arrived at your *beliefs* about *teaching* and *learning* (Kemmis, 1988).

If your general idea for your action research inquiry is the question "How can I improve the integration and transfer of problem-solving skills in mathematics?" you might think about the following:

- Based on my experience teaching mathematics and my reading of the subject, I have been influenced by Van de Walle's (2003) *theory* about teaching and learning mathematics developmentally. In particular, the goal of mathematics is *relational understanding*, which is the connection between *conceptual* and *procedural knowledge* in mathematics. This theory of mathematics directly affects the ways in which I think about teaching mathematics to my students.
- I hold the *educational value* that children ought to be able to transfer problem-solving skills to other areas of mathematics as well as to life outside of school. That is, I am committed to relevancy of curriculum.
- I believe that mathematical problem solving, and problem solving in general, fits the *larger context* of schooling and society by providing children with critical lifelong learning skills that can be transferred to all aspects of their life.
- The *historical context* of mathematics teaching suggests a rote method of memorizing facts and algorithms. Although this approach to teaching mathematics worked for me (as a child and young teacher), it no longer suffices as a teaching method today.

- The historical context of how I came to *believe* in the importance of changing how I teach mathematics to children has grown out of my own frustration with knowing what to do to solve a problem, but not knowing *why* I need to use a particular approach or algorithm.
- Given this self-reflection on an area of focus related to the integration and transfer of problem-solving skills in mathematics, I can now better understand the problem before I implement an intervention that addresses my concern for how to best teach a *relevant* problem-solving curriculum.

This is part of the "mind work" or "mental gymnastics" of action research. It is not an activity that will immediately produce new and exciting curricula and/or teaching materials—things that may follow later in the process when you become clearer about an intervention.

Gaining Insight into Your Area of Focus Through Descriptive Activities

Next, try to describe as fully as possible the situation you want to change or improve by focusing on *who, what, when, where,* and *how*. Grappling with these questions not only will clarify the focus area for your action research efforts but also will prevent you from moving ahead with an investigation that was too murky to begin with. For example, at this stage, you might answer these questions:

- What evidence do you have that this issue (the problem-solving skills of math students) is a problem?
- Which students are not able to transfer problem-solving skills to other mathematics tasks?
- How is problem solving presently taught?
- How often is problem solving taught?
- What is the ratio of time spent teaching problem solving to time spent teaching other mathematics skills?

Gaining Insight into Your Area of Focus Through Explanatory Activities

Once you've adequately described the situation you intend to investigate, try to explain it. Focus on the *why*. Can you account for the critical factors that have an impact on the general idea? In essence, this is the step in which you develop a hypothesis stating the expected relationships between variables in your study (Elliott, 1991).

In this case, you might hypothesize that students are struggling with the transfer of problem-solving skills to other mathematics tasks because they are not getting enough practice, they lack fundamental basic math skills, or they have not had sufficient opportunity to use math manipulatives. Given these possible explanations for why children have not been successfully transferring problem-solving skills to other areas of mathematics, you might develop the following hypotheses:

- A relationship exists between a mathematics curriculum that emphasizes the children's ability to know *what* to do and *why* to do it and children's abilities to transfer problem-solving skills.

- A relationship exists between a mathematics curriculum that emphasizes the use of manipulatives (to help children create meaning) and children's abilities to transfer problem-solving skills.

These reconnaissance activities (self-reflection, description, and explanation) help teacher researchers clarify what they already know about the proposed focus of the study; what they believe to be true about the relationships of the factors, variables, and contexts that make up their work environment; and what they believe can improve the situation. Research in Action Checklist 2 summarizes the critical activities for reconnaissance that you should perform at this point in the action research process.

Review of Related Literature

At this point you should make an initial foray into the professional literature, the formal record of other people's experiences, to try to better understand the problem on which you are focusing. The literature may suggest other ways of looking at your problem and help you to identify potential *promising practices* that you might use in your classroom to correct the problem. To borrow the words of Kemmis (1988), "Can existing research throw any light on your situation and help you see it more clearly?" (p. 55).

Reviewing the literature is a valuable contribution to the action research process that could actually save you time. Often, teacher researchers think that they know what their problem is but become stymied in the process because they weren't really sure what they were asking. Taking time to immerse yourself in the literature allows you to reflect on your own problems through someone else's lens. You can locate yourself within the research literature and find support for what you are doing or be challenged by what other researchers have done and how they have tackled a particular problem.

At the end of the process, you ought to be informed enough about the literature that you could talk to colleagues about the major themes that emerged. Similarly, you should be able to talk about "promising practices" that were discussed.

Sometimes, teacher researchers will claim that they cannot find any published research related to their area of focus. This invariably leads to questions of relevance and importance.

RESEARCH IN ACTION CHECKLIST 2

Critical Activities for Doing Reconnaissance

Self-Reflection:

_____ Reflect on your area of focus in light of your values and beliefs; your understandings about the relationships among theory, practice, school, and society; how things got to be the way they are; and what you believe about teaching and learning.

Description:

_____ Describe the situation you wish to change or improve.

_____ Describe the evidence you have that the area of focus is a problem.

_____ Identify the critical factors that affect your area of focus.

Explanation:

_____ Explain the situation you intend to investigate by hypothesizing how and why the critical factors you've identified affect that situation.

After all, if nobody else has researched the problem, perhaps it is not worthy of investigation! However, as the following personal and serious illustration demonstrates, lack of published research on a topic does not mean that the topic is not important. About 15 years ago my son, who was five years old at the time, inexplicably began to pass blood in his urine—a pretty scary sight for any parent. After many invasive medical tests over a six-month period, we finally opted for a procedure that required general anesthesia in order to determine the cause of the blood. The surgeon emerged from the operating room and pronounced, "I have some good news, and I have some bad news!" The good news was that the surgeon was able to diagnose the cause of the internal bleeding—a rare, benign, and non-life-threatening condition called *trigonitis.* The bad news was that the surgeon was unable to tell us why our son had developed the condition or how to treat it! I was shocked at this revelation from the surgeon, a pediatric urology specialist. How could my son be bleeding internally and there not be a medical explanation? The surgeon responded that, because the condition was rare, benign, and non-life-threatening, it simply did not warrant research! My point here is not to be melodramatic but rather to make a case for the importance of your own research, regardless of whether it has been researched (and published) by other professionals. Just because your area of focus is unique to you does not make it any less important. It is your problem and you own it. Do not be disheartened if your review of the literature fails to provide you with helpful insights.

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 reflects a lack of understanding of the purposes and importance of the review and a feeling of uneasiness on the part of students who are not sure how to report the literature. Nonetheless, the review of related literature is as important as any other component of the research process and can be conducted quite painlessly if approached in an orderly manner. Some researchers even find the process quite enjoyable!

The review of related literature involves the systematic identification, location, and analysis of documents containing information related to the research problem. The term is also used to describe the written component of a research plan or report that discusses the reviewed documents. These documents can include articles, abstracts, reviews, monographs, dissertations, books, other research reports, and electronic media effort. The major purpose of reviewing the literature is to determine what has already been done that relates to your topic. This knowledge not only prevents you from unintentionally duplicating another person's research, but it also gives you the understanding and insight you need to place your topic within a logical framework. Previous studies can provide the rationale for your research hypothesis, and indications of what needs to be done can help you justify the significance of your study. Put simply, the review tells you what has been done and what needs to be done.

Another important purpose of reviewing the literature is to discover research strategies and specific data collection approaches that have or have not been productive in investigations of topics similar to yours. This information will help you avoid other researchers' mistakes and 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 may reveal ten related studies that found no differences in achievement. Several of the studies, however, may suggest that the brand-new method is more effective for certain kinds of students than for others. Thus, you may reformulate your topic to involve the comparative effectiveness of the brand-new method versus the traditional method on the achievement of a subgroup of eighth-grade science students—those with low aptitude.

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 may resolve the conflict.

Beginning researchers often have difficulty determining how broad and comprehensive their literature reviews should be. At times, all the literature will seem directly related to the topic, so it may be difficult to decide when to stop. Determining whether an article is truly relevant to the topic is complicated and requires time. Unfortunately, there is no simple formula to solve the problem. You must decide using your own judgment and the advice of your teachers or advisors.

The following general guidelines can assist you:

- Avoid the temptation to include everything you find in your literature review. Bigger does not mean better. A smaller, well-organized review is definitely preferred to a review containing many studies that are only tangentially related to the problem.
- When investigating a heavily researched area, review only those works that are directly related to your specific problem. You will find plenty of references and should not have to rely on less relevant studies. For example, the role of feedback for verbal and nonverbal learning has been extensively studied in both non-human animals and human beings for a variety of different learning tasks. Focus on those using similar subjects or similar variables—for example, if you were concerned with the relation between frequency of feedback and chemistry achievement, you would probably not have to review feedback studies related to non-human animal learning.
- When investigating a new or little-researched problem area, review any study related in some meaningful way to your problem. Gather enough information to develop a logical framework for the study and a sound rationale for the research hypothesis. For example, suppose you wanted to study the effects of an exam for non–English speaking students on GPA. The students must pass the exam to graduate. Your literature review would probably include any studies that involved English as a second language (ESL) classes and the effects of culture-specific grading practices as well as studies that identified strategies to improve the learning of ESL students. In a few years, 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 among beginning researchers is that the worth of a topic is directly related to the amount of literature available about it. This is not the case. For many new and important areas of research, few studies have been published. 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 a thousand 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, and subtopics that need additional research will be readily identifiable.

Action Research and the Review of Related Literature

Action researchers disagree about the role of the literature review in the research process. Some researchers have argued that reviewing the literature curtails inductive analysis—using induction to determine the direction of the research—and should be avoided at the early stages of

TABLE 1 Conducting a Literature Review

1. Identify and make a list of keywords to guide your literature search.
2. Using your keywords, locate primary and secondary sources that pertain to your research topic.
3. Evaluate your sources for quality.
4. Abstract your sources.
5. Analyze and organize your sources using a literature matrix.
6. Write the literature review.

Source: From *Educational Research: Competencies for Analysis and Application* (10th ed.), by L. R. Gay, G. E. Mills, and P. Airasian, © 2012. Upper Saddle River, NJ: Pearson Education.

the research process (Bogdan & Biklen, 1998). Others suggest that the review of related literature is important early in the action research process because it serves the following functions:

- The literature review demonstrates the underlying assumptions (i.e., propositions) behind the research questions that are central to the research proposal.
- The literature review provides a way for the novice researcher to convince the proposal reviewers that he or she is knowledgeable about the related research and the intellectual traditions that support the proposed study (Marshall & Rossman, 1995).
- The literature review provides the researcher with an opportunity to identify any gaps that may exist in the body of literature and to provide a rationale for how the proposed study may contribute to the existing body of knowledge.
- The literature review helps the researcher to refine the research questions and embed them in guiding hypotheses that provide possible directions the researcher may follow.

Conducting a literature review follows a basic set of steps. Table 1 outlines the basic process you take when reviewing the literature.

Identifying Keywords, and Identifying, Evaluating, and Annotating Sources

Identifying Keywords

Watch as Jureen states her research question. She notes in the **video** that she used library resources to conduct a review of previous research. What sorts of keywords might she have used in a computerized search?

The words you select for your searches will dictate the success of your research. Before you begin your research, make a list of possible keywords to guide your literature search. As you progress through your searching, add keywords and subject headings related to your search. Most of the initial source works you consult will have alphabetical subject indexes to help you locate information about your topic. You can look in these indexes for the keywords you have selected. Databases such as the Education Resources Information Center (ERIC) and Education Full Text provide a list of subject headings or descriptors with the search results.

For example, if your problem concerns the effect of interactive multimedia on the achievement of tenth-grade biology students, the logical keywords would be interactive multimedia and biology. When beginning with a keyword search for interactive multimedia in a database such as ERIC, however, you will see a list of possible subject headings such as multimedia instruction, computer-assisted instruction, multimedia materials, games, or hypermedia.

These subject headings may also be called *descriptors*. It is important that you understand the difference between the keyword search and a subject heading—and perhaps, more importantly, why you want to connect to the subject headings.

Every article indexed in a database such as ERIC or Education Full Text is read by a human being who determines what topics are addressed in the article. The topics are listed as subject headings or descriptors in the article citation. Therefore, a subject search is more precise than a keyword search that searches for the words anywhere in the complete record of an article. If the words appear one time in the full text of an article, you will retrieve that article even though it may not be very relevant to your search. Subject headings or descriptors connect you with concepts that you are searching for, not just the words. You may have to mix and match your search terms to retrieve more accurate and relevant results. At times, the keywords and subject headings will be obvious for some searches such as biology.

For others you may have to play detective. Giving a bit of thought to possible keywords and subject headings should facilitate an efficient beginning to an effective search. As you progress through your search, try to identify additional keywords and subject headings that you can use to reformulate a search to produce different and more relevant results.

Identifying Your Sources

For your review, you will examine a range of sources that are pertinent to your topic. To start, it is best to consult educational encyclopedias, handbooks, and annual reviews found in libraries. These resources, some of which were mentioned earlier in the discussion on narrowing your topic, provide summaries of important topics in education and reviews of research on various topics. They allow you to get a picture of your topic in the broader context and help you understand where it fits in the field. You may also find these sources useful for identifying search terms and aspects related to your topic that you may not have considered.

The following are some examples of handbooks, encyclopedias, and reviews relevant to educational research:

- The International Encyclopedia of Education
- Encyclopedia of Curriculum Studies
- Handbook of Research on Teacher Education: Enduring Questions in Changing Contexts
- Handbook of Research on the Education of Young Children
- Handbook of Latinos and Education: Theory, Research, and Practice
- Handbook of Research on Practices and Outcomes in E-Learning: Issues and Trends
- Handbook of Research on the Education of School Leaders
- Handbook of Research on New Media Literacy at the K–12 Level: Issues and Challenges
- Handbook of Education Policy Research
- Handbook of Research on School Choice
- Handbook of Research on Literacy and Diversity
- Handbook of Education Finance and Policy
- Research on the Sociocultural Foundations of Education
- Handbook of Research on Schools, Schooling, and Human Development

It is important to distinguish between two types of sources used by educational researchers: primary and secondary sources. A primary source contains firsthand information, such as an original document or a description of a study written by the person who conducted the study. The data are factual rather than interpretive, so the study is more valued than secondary

research. Research reports, dissertations, experiments, surveys, conference proceedings, letters, and interviews are some examples of primary sources. There is a difference between the opinion of an author and the results of an empirical study. The latter is more valued in a review.

A secondary source is a source that interprets or analyzes the work of others—either a primary source or another secondary source, such as a brief description of a study written by someone other than the person who conducted it. Secondary sources are often used to review what has already been written or studied. Education encyclopedias, handbooks, and other reference works typically contain secondhand information summarizing research studies conducted on a given topic. Secondary sources usually give complete bibliographic information for the references cited, so they can direct you to relevant primary sources, which are preferred over secondary sources.

Searching for Books on Your Topic in the Library

Having identified your keywords and some potential resources, you are ready to make an initial foray into your university library. Because the library will be a second home to you, at least for a while, you should become familiar with it. The time you spend here initially will save more in the long run. You should learn about the references available and where they are located. You should be able to completely navigate your library's website and know how to access resources from any location with a connection to the Internet. Most libraries, especially university libraries, provide help and education in the use of their resources. You should be familiar with services offered by the library as well as the rules and regulations regarding the use of library materials.

Most university libraries have a librarian on duty to help with requests. Typically a university has a librarian who is the liaison to the education department. This librarian has experience in both K–12 and graduate education and is very skilled in helping track down resources. Most libraries offer 24/7 online chat reference to assist you with your research. Librarians usually are very willing to help you, but you should also learn to navigate the library on your own. The librarian is available to work with you, not to do your research. With or without a librarian's help, you can use the library online catalog and browse the stacks to search for books on your topic.

Using Library Catalogs

Although significant technological advances have changed the way research is conducted in the library, individual libraries vary greatly in their ability to capitalize on increasingly available options. In today's academic libraries, card catalogs of previous generations have been replaced with online catalogs that provide access to resources in the library and to collective catalogs accessing materials from other libraries in a consortium within a particular region. For students, getting books through the collective catalog and having them delivered to a particular library is generally free. These electronic catalogs are extremely user friendly and provide a good place to start your search for literature related to your area of focus.

To locate books, video, and other materials such as government documents, you need to conduct a search of the library catalog. To search by topic, begin with a keyword search. In library catalogs, a keyword search will search the entire record of an item that includes the content notes—the chapter headings or titles of essays within a book. If you see a book relevant to your search, check the subject headings that are listed. You may be able to refine your search or find additional materials. For example, to find summaries of research previously

conducted in an area of psychology, you may enter the keywords "handbook" and "psychology," or "encyclopedia" and "psychology." If you search for a particular topic such as transformative learning, enter that term as a keyword search. The keyword search is important when you are looking for books because the search retrieves items with your keywords in the title, subject heading, and content notes. Since the content notes provide a listing of essays and chapter headings within a book, a keyword search could retrieve an essay about transformative learning in a book about adult learning. Always check the subject headings of any relevant item that you locate. You will find the subject headings important for finding similar items and further information. If you know a title of a book, then you can also search for the specific title.

If you are at the beginning of your search for primary sources, add search terms slowly and thoughtfully. Refrain from searching phrases such as developing active learning activities in the classroom. Choose the main concepts from your research question—active learning and activities. Add search terms concept by concept depending on the amount of materials you retrieve and how narrow you want your search to be. If you need a relatively small number of references and a significant amount of research 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 not have a sense of what is available, your best strategy is to start narrow and broaden as necessary. For example, if you find very few references related to the effect of interactive multimedia on the achievement of tenth-grade biology students, you can broaden your search by including all sciences or all secondary students.

A useful way to narrow or broaden a keyword search is to use Boolean operators, words that tell the computer the keywords you want your search results to include or exclude. Common Boolean operators are the words AND, OR, and NOT. Put simply, using the connector AND or NOT between keywords narrows a search, whereas using the connector OR broadens one. Searching "multiple intelligences AND music" will provide a list of references that refer to both multiple intelligences and music. Searching "multiple intelligences NOT music" will retrieve references pertaining to multiple intelligences but will exclude references pertaining to music. A search for "multiple intelligences OR music" retrieves references that relate to either or both concepts. By using various combinations of the AND and OR connectors, you can vary your search strategy as needed. It is also a good idea to check with your library's "education librarian" to determine whether there are additional Boolean operator strategies best suited to your search. Note that it is difficult to develop a search model that can be followed in every library and every catalog or database. You must get acquainted with the unique search strategies and methods that are successful within your library environment.

Browsing the Stacks

With access to online catalogs, many new researchers may not consider an older strategy for locating books: browsing the stacks. This strategy is similar to the kind of activity you undertake at a public library when looking for a new fiction book to read. When the area of the library with books related to your area of focus is located, it can be productive to browse and pull interesting books off the shelves. You may also find leads to related materials if you initiate your search on the computer. Remember, libraries try to organize objects with like objects. Accordingly, when you spot a relevant item on the shelves, always look at the other items nearby.

Steps for Searching Computer Databases

The online catalog found in a library is an example of a database—a sortable, analyzable collection of records maintained on a computer representing books, documents, DVDs, and videos. Other types of subject specific databases also are used in research to search indexes of articles—some of which are full textbooks, abstracts, or other documents. These databases—such as the Education Resources Information Center (ERIC), Education Full Text, PsycINFO, and others—provide an excellent way to identify primary sources and secondary sources.

The steps involved in searching a research database are similar to those involved in a book search, except that it is more critical to identify appropriate subject headings or descriptors to retrieve highly relevant material:

1. Identify keywords related to your topic.
2. Select the appropriate databases—some databases using the same interface may allow you to search multiple databases simultaneously.
3. Initiate a search using your keywords selectively. Some databases will map to subject headings or descriptors, requiring you to build your search term by term. Other databases will provide a list of subject headings or descriptors based on the results of your search. For example, in Figure 1, you can see the results of a keyword search using "cooperative learning" and "student achievement" with a possible 1,761 articles. These initial "hits" will require additional sorting to determine their relevancy for your review of related literature.
4. Reformulate your search using appropriate subject headings or descriptors, combining terms as appropriate. Remember that combining too many terms may result in few or

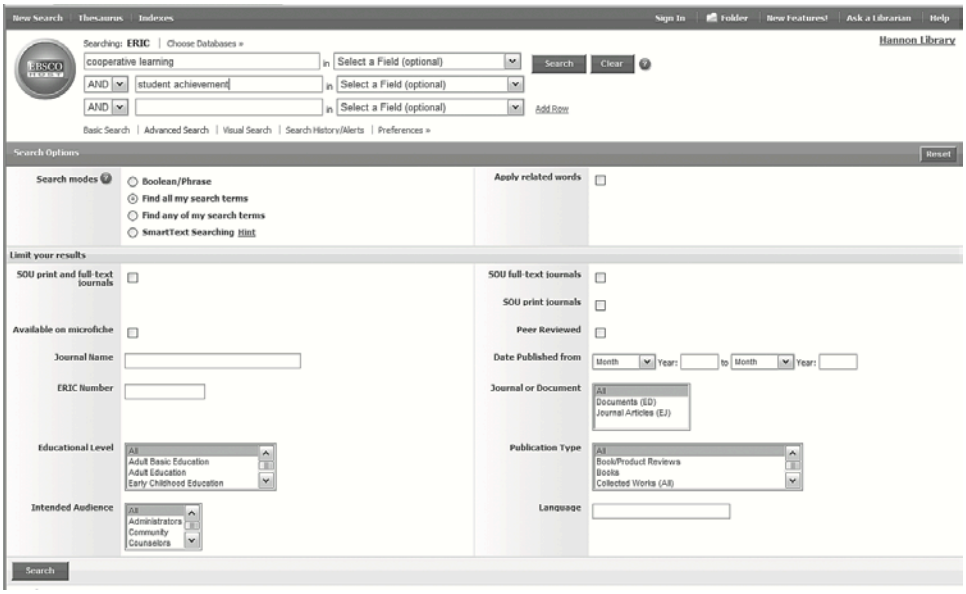

FIGURE 1 ***Sample of EBSCO Keyword Search***

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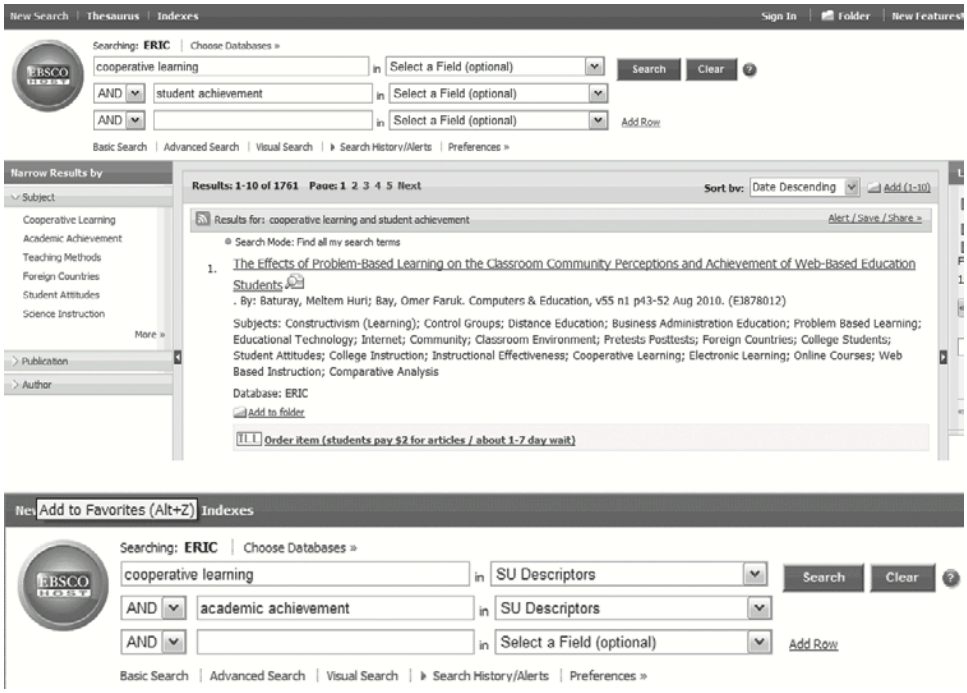

FIGURE 2 ***Sample of ERIC/EBSCO Search: Reformulating with Subject Descriptors***

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no retrieved items. If this occurs, mix and match search terms or broaden the search to produce better results. For example, in Figure 2 student achievement is called academic achievement and results in a more targeted list of references.

5. Once you have found a relevant article, check the item record for links to additional subject headings or descriptors, author(s), cited references, times cited in the database, or other references for finding additional related items using the features within the database. For example, the record in Figure 3 gives other descriptors used to classify the article and other articles in the database that are written by the same author.
6. Most databases provide a link that will create a citation in various formats, including APA. Although the citations still need to be checked for correctness, they will provide an excellent start to creating your list of references. For example, in Figure 4, ERIC/EBSCO allows you to create an account and to save your references in APA, AMA, Chicago, or MLA formats.
7. Many databases allow you to create an account, so you can log in to save and manage your searches and your relevant research articles. This feature is an important part of using a particular database to not only retrieve relevant research but to manage your sources.

For example, in Figure 5 you can return to your MyEBSCO*host* account at any time to copy your references, which can finally be pasted into your review of related literature document. When you write your review of related literature, you will be very thankful that you have created this account!

Citation

Title:	Replacing Lecture with Peer-Led Workshops Improves *Student Learning*
Author(s):	Preszler, Ralph W.
Source:	CBE - Life Sciences Education, v8 n3 p182-192 Fall 2009. 11 pp. (Peer Reviewed Journal)
ISSN:	1931-7913
Descriptors:	Grades (Scholastic), Workshops, Biology, Lecture Method, Academic Achievement, Cooperative Learning, Introductory Courses, Problem Solving, Scores, Gender Differences, Racial Differences, Disproportionate Representation, Retention (Psychology), Peer Teaching, Science Instruction, College Science, Higher Education, Postsecondary Education
Identifiers:	New Mexico
Abstract:	Peer-facilitated workshops enhanced interactivity in our introductory biology course, which led to increased ***student*** engagement and ***learning***. A majority of ***students*** preferred attending two lectures and a workshop each week over attending three weekly lectures. In the workshops, ***students*** worked in small ***cooperative*** groups as they solved challenging problems, evaluated case studies, and participated in activities designed to improve their general ***learning*** skills. ***Students*** in the workshop version of the course scored higher on exam questions recycled from preworkshop semesters. Grades were higher over three workshop semesters in comparison with the seven preworkshop semesters. Although males and females benefited from workshops, there was a larger improvement of grades and increased retention by female ***students***; although underrepresented minority (URM) and non-URM ***students*** benefited from workshops, there was a larger improvement of grades by URM ***students***. As well as improving ***student*** performance and retention, the addition of interactive workshops also improved the quality of ***student learning***. ***Student*** scores on exam questions that required higher-level thinking increased from preworkshop to workshop semesters. (Contains 7 tables.)

FIGURE 3 ***Sample ERIC/EBSCO: Sample Record***

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The following sections describe some of the commonly used databases for searches of education literature.

Education Resources Information Center (ERIC)

ERIC, the largest digital library of education literature in the world, was established in 1966 by the National Library of Education as part of the United States Department of Education's Office of Educational Research and Improvement and is now sponsored by Institute of

Citation Format

NOTE: Review the instructions at EBSCO Support Site and make any necessary corrections before using. Pay special attention to personal names, capitalization, and dates. Always consult your library resources for the exact formatting and punctuation guidelines.

AMA (American Medical Assoc.)	**Reference List** Preszler R. Replacing Lecture with Peer-Led Workshops Improves Student Learning. *CBE - Life Sciences Education* [serial online]. September 1, 2009;8(3):182-192. Available from: ERIC, Ipswich, MA. Accessed May 21, 2010.
APA (American Psychological Assoc.)	**References** Preszler, R. (2009). Replacing Lecture with Peer-Led Workshops Improves Student Learning. *CBE - Life Sciences Education, 8* (3), 182-192. Retrieved from ERIC database.
Chicago/Turabian: Author-Date	**Reference List** Preszler, Ralph W. 2009. "Replacing Lecture with Peer-Led Workshops Improves Student Learning." *CBE - Life Sciences Education* 8, no. 3: 182-192. *ERIC*, EBSCO*host* (accessed May 21, 2010).
Chicago/Turabian: Humanities	**Bibliography** Preszler, Ralph W. "Replacing Lecture with Peer-Led Workshops Improves Student Learning." *CBE - Life Sciences Education* 8, no. 3 (September 1, 2009): 182-192. *ERIC*, EBSCO*host* (accessed May 21, 2010).
MLA (Modern Language Assoc.)	**Works Cited** Preszler, Ralph W. "Replacing Lecture with Peer-Led Workshops Improves Student Learning." *CBE - Life Sciences Education* 8.3 (2009): 182-192. *ERIC*. EBSCO. Web. 21 May 2010.

FIGURE 4 ***Sample APA Citation***

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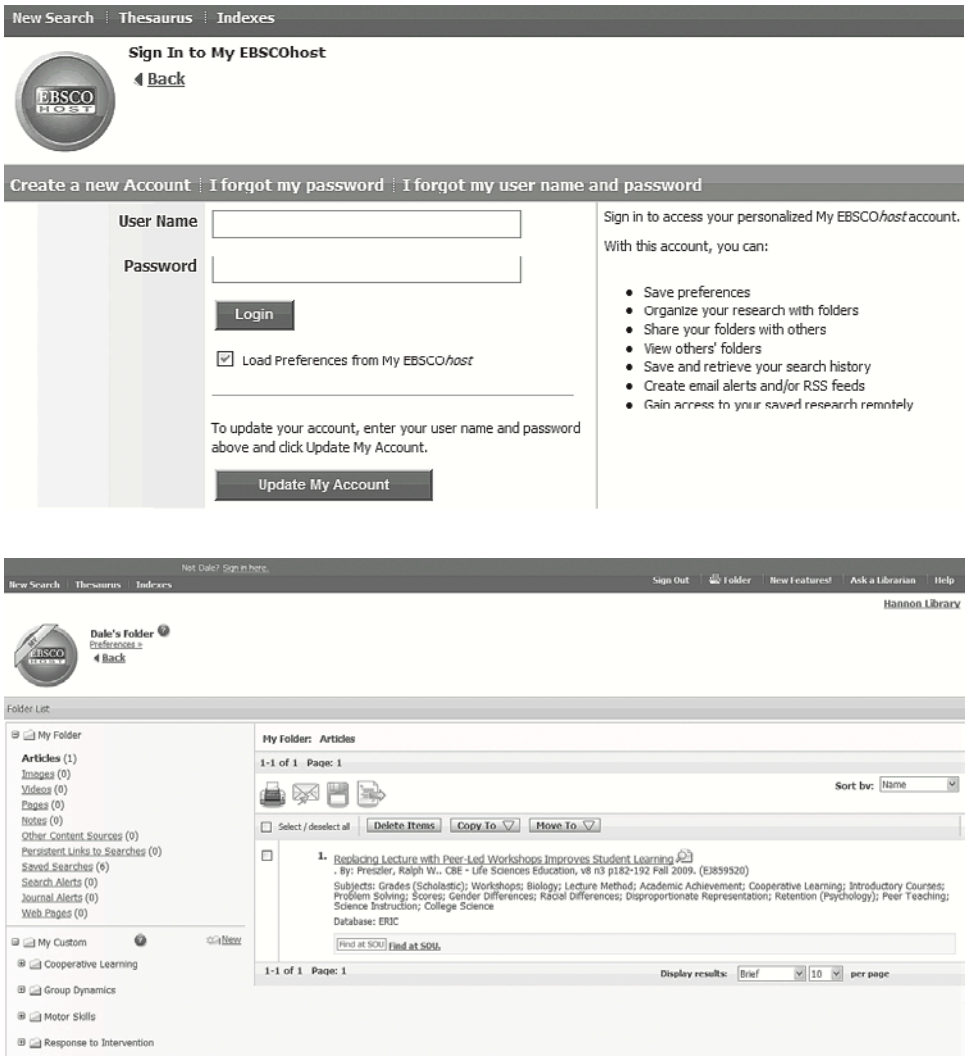

FIGURE 5 ***Managing References in a Database***

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Education Sciences (IES) of the U.S. Department of Education. The online database provides information on subjects ranging from early childhood and elementary education, to education for gifted children and rural and urban education. ERIC is used by more than 500,000 people each year, providing access to more than 1.3 million bibliographic records of journal articles and more than 107,000 full-text non-journal documents.

In 2004 the ERIC system was restructured by the Department of Education. The ERIC database is available at almost every academic library or via the ERIC website at http://www.eric.ed.gov. The website uses the most up-to-date retrieval methods for the ERIC databases, but it is no match for the database interfaces provided by your academic library. Given a

choice, search ERIC via the EBSCO or WilsonWeb interfaces available through your library. Doing so will allow you to automatically link to full-text articles available through your library. Regardless of whether you use your library's database interfaces or the government-sponsored ERIC website, ERIC is a formidable database for searching educational materials that is relatively quick and easy to search.

When you search ERIC, you may notice that documents are categorized with an ED or EJ designation. An ED designation is generally used for unpublished documents, such as reports, studies, and lesson plans. Usually, ED references are available in academic libraries as full-text on-line documents or via microfiche, if they are very old. An EJ designation is used for articles published in professional journals. EJ articles are often available in full text from the ERIC database at an academic library. If you are using the ERIC collection on the Web at http://www.eric.ed.gov/, the full text may not be available and must be tracked down in the periodicals collection of a library or purchased from article reprint companies.

ERIC is the largest computer database for searches of education literature, but it is not the only source available. Other commonly used databases in education are described next.

Education Full Text

The Education Full Text database contains articles historically available within the Wilson Education Index and references articles published in educational periodicals since 1983. The database provides references to many full-text articles that are not available in the ERIC database, so it is important to search both databases for more comprehensive research. In addition to article abstracts, the database includes citations for yearbooks and monograph series, videotapes, motion picture and computer program reviews, and legal cases.

PsycINFO

The PsycINFO database is the online version of Psychological Abstracts, a former print source that presents summaries of completed psychological research studies (see http://www.apa.org/psycinfo; Psychological Abstracts ceased its print publication in December 2006). PsycINFO contains summaries of journal articles, technical reports, book chapters, and books in the field of psychology. It is organized by subject area according to the PsycINFO classification codes for easy browsing. The classification codes can be accessed at http://www.apa.org/psycinfo/training/tips-class-codes.html. These classification codes allow you to retrieve abstracts for studies in a specific category—for example, Developmental Disorders and Autism (3250) or Speech and Language Disorders (3270).

Dissertation Abstracts

Dissertation Abstracts contains bibliographic citations and abstracts from all subject areas for doctoral dissertations and master's theses completed at more than 1,000 accredited colleges and universities worldwide. The database dates back to 1861, with abstracts included from 1980 forward. If after reading an abstract you want to obtain a copy of the complete dissertation, check to see if it is available in your library. If not, speak to a librarian about how to obtain a copy. You can request a dissertation from your library through interlibrary loan. Be aware that there may be charges to get the dissertation from the lending library.

Searching the Internet and the World Wide Web

An abundance of educational materials is available on the Web—from primary research articles and educational theory, to lesson plans and research guides. Currently, a proficient researcher

can access information in a variety of formats such as video, images, multimedia, PowerPoint presentations, screen captures, tutorials, and more. Blogs, RSS feeds, podcasts, wikis, e-mail, and other Web 2.0 tools offer researchers a variety of alternative means for finding information. Also, as search engines develop to include more sophisticated methods for finding research, both "digital natives" and traditional researchers can find primary sources using tools such as Google Scholar, Google Books, Google Unclesam, and more. Even Wikipedia can provide background information to help a researcher understand fundamental concepts and theory that lead to better keywords and strategies for searching. For further discussion of using Google, see the section titled "Digital Research Tools for the 21st Century: Google Searches" later in the chapter.

The resources you can find on the Web are almost limitless. More and more print material is being digitized and new sites are constantly being developed and tested to provide more and more access to information. With just a few clicks, you can access electronic educational journals that provide full-text articles, bibliographic information, and abstracts. You can obtain up-to-the-minute research reports and information about educational research activities undertaken at various research centers, and you can access education sites with links to resources that other researchers have found especially valuable. But be warned—there is little quality control on the Internet, and at times, the sheer volume of information can be overwhelming. Some Internet sites post research articles selected specifically to promote or encourage a particular point of view or even an educational product. Blogs and wikis provide excellent modes of creating and manipulating content to share and communicate ideas and concepts, but they are not always as robust as peer-reviewed academic research. Make sure you understand the strengths and limits of the sources you use.

The following websites are especially useful to educational researchers:

CSTEEP: The Center for the Study of Testing, Evaluation, and Educational Policy (http://www.bc.edu/research/csteep/). The website for this educational research organization contains information on testing, evaluation, and public policy studies on school assessment practices and international comparative research.

National Center for Education Statistics (http://www.nces.ed.gov/). This site contains statistical reports and other information on the condition of U.S. education. It also reports on education activities internationally.

Developing Educational Standards (http://www.edstandards.org/Standards.html). This site contains a wealth of up-to-date information regarding educational standards and curriculum frameworks from all sources (e.g., national, state, local, and other). Information on standards and frameworks can be linked to by subject area, state, governmental agency, or organization. Entire standards and frameworks are available.

U.S. Department of Education (http://www.ed.gov/). This site contains links to the education databases supported by the U.S. government (including ERIC). It also makes available full-text reports on current findings on education and provides links to research offices and organizations as well as research publications and products.

Becoming a Member of Professional Organizations

Another way to find current literature related to your research topic is through membership in professional organizations. The following list gives the names of a few U.S.-based professional organizations that can be valuable resources for research reports and curriculum materials. In

countries other than the United States, similar organizations likely can also be accessed through an Internet search. This list of professional organizations is not intended to be comprehensive, for there are as many professional organizations as there are content areas (e.g., reading, writing, mathematics, science, social studies, music, health, and physical education) and special interest groups (e.g., Montessori education). Search the Education Resource Organizations Directory or browse the About ED – Educational Associations and Organizations site (http://www2.ed.gov/about/contacts/gen/othersites/associations.html) to discover and learn about some of the associations that support teachers and specific disciplines in education.

ASCD: Association for Supervision and Curriculum Development

(http://www.ascd.org/). Boasting 160,000 members in more than 135 countries, ASCD is one of the largest educational organizations in the world. ASCD publishes books, newsletters, audiotapes, videotapes, and some excellent journals that are valuable resources for teacher researchers, including *Educational Leadership* and the *Journal of Curriculum and Supervision*.

Digital Research Tools for the 21st Century: Google Searches

Google Books (http://books.google.com/)

Google Books searches for books and within the content of books in Google's digital book collection. The searchable collection of digitized books contains full-text as well as limited selections, previews, or snippet views of the content—including front cover, table of contents, indexes, and other relevant information like related books, posted reviews, and key terms. As such, Google Books offers an alternative search mechanism to a library catalog for finding and previewing books and information inside books. Google Books searches full-text content, so a search can often retrieve more specific information that a library catalog will not retrieve.

Make no mistake, however: Google Books in most cases does not replace the full text of all the books that it finds, so it is best used in conjunction with a library catalog or the collective catalog from a consortium of libraries. For example, you may search Google Books and find a relevant book. After reviewing information such as the table of contents and the limited preview of the book, you may want to search your library catalog to obtain the book. On the other hand, you may find an item record of a book using your library catalog that does not contain much information about the book; that is, you may not be able to see the table of contents or any information other than the title and the subject headings. As an alternative, you could search the title of the book in Google Books to find a table of contents or even a preview of the contents of the book.

Google Books began in 2004, and as more and more content is digitized into the Google Books database, its usefulness to researchers will continue to expand. You may want to consider limiting the publication date of a search using the advanced feature to retrieve more current materials. The default search is set to relevancy, but the most relevant material may be too old for the research you are doing.

Google Scholar (http://scholar.google.com/)

Google Scholar offers simple and free access to scholarly information. Originally released in a beta version in November 2004, Google Scholar searches for full-text articles, citations, and abstracts. It also searches the Google Books database for books. To take full advantage of Google Scholar, you should click on Scholar Preferences and set the Library Links feature to access your library. This will allow you to obtain the full text of the articles you find through your library and your library databases. You may also want to set your preferences to retrieve only articles. Google Scholar also includes links to other articles that have cited a specific article and related articles.

Again, for finding scholarly and peer-reviewed journal articles, ultimately you will want to use your library's access to the ERIC or Education Full Text databases. Google Scholar, however, often can help you tease out the correct descriptors or subject headings for finding articles in your library databases. This is especially true if you find the full text of an article in a database from your library. Just like Google, searching Google Scholar allows you to find relevant information using the simple and familiar search strategies you use to search the Web. Starting with Google Scholar can lead you to more sophisticated searching in library databases.

Google Uncle Sam (http://www.unclesamsearch.com)

The Google Uncle Sam search engine is a powerful tool for searching United States federal and state government information. For education research, Google Uncle Sam refines a typical Google search by limiting the results to information from federal and state domains. For example, you may search for "standards aligned curriculum" to determine what activities are happening in various states. You can also limit a search to a particular state, such as Oregon, to retrieve information from state-specific sites, such as the Oregon Department of Education. Because so much educational information and decision making can be found on government sites, a Google Uncle Sam search is a good option for finding relevant primary information not found in books and journal articles.

(Gay, Mills, & Airasian, 2012, p. 92)

NCTM: National Council of Teachers of Mathematics

(http://nctm.org). With nearly 100,000 members, NCTM is dedicated to the teaching and learning of mathematics and offers vision and leadership for mathematics educators at all age levels. NCTM provides regional and national professional development opportunities and publishes the following journals: *Teaching Children Mathematics*, *Mathematics Teaching in the Middle School*, *Mathematics Teacher*, *Online Journal for School Mathematics*, and the *Journal for Research in Mathematics Education*.

NCSS: National Council for the Social Studies

(http://www.ncss.org/). The NCSS supports and advocates social studies education. Its resources for educators include the journals *Social Education* and *Social Studies and the Young Learner*.

NEA: National Education Association

(http://www.nea.org/). The mission of the NEA is to advocate for education professionals and fulfill the promise of public education to prepare students to succeed in a diverse and interdependent world.

NSTA: National Science Teachers Association

(http://nsta.org/). The NSTA, with more than 55,000 members, provides many valuable resources for science teachers. It develops the National Science Education Standards and publishes the journals *Science and Children*, *Science Scope*, *The Science Teacher*, and *Journal of College Science Teaching*.

IRA: International Reading Association

(http://www.reading.org/). The IRA provides resources to an international audience of reading teachers through its publication of the journals *The Reading Teacher*, *Journal of Adolescent and Adult Literacy*, and *Reading Research Quarterly*.

About ED – Educational Associations and Organizations

(http://www2.ed.gov/about/contacts/gen/othersites/associations.html). This U.S. Department of Education site lists a variety of educational associations and organizations.

Education Resource Organizations Directory

(http://wdcrobcolp01.ed.gov/Programs/EROD/). The Education Resource Organizations Directory can help you identify and contact a wide range of educational organizations in the discipline.

Evaluating Your Sources

When you have retrieved a list of sources, you will need to evaluate them to determine not only whether these sources are relevant, but also whether they are reliable and legitimate. Good researchers must be able to discern the quality and limitations of a source, so good research requires excellent judgment. The statements in Table 2 can serve as a rubric for evaluating

TABLE 2 Rubric for Evaluating Print and Internet Resources

	Evaluation Criteria				
Dimension	**1 Poor**	**2 Below Average**	**3 Average**	**4 Above Average**	**5 Excellent**
Relevancy	The source does not address the research interests of your study.	The source addresses one of the research interests of your study.	The source addresses most of the research interests of your study.	The source meets all of the research interests of your study.	The source meets all of the research interests of your study and provides a conceptual framework for a study that is replicable.
Author	Unclear who authored the study.	Author name and contact information is provided.	Author name, contact information, and some credentials are included in the article.	Author name, contact information, and full credentials are included in the article.	Author is a well-known researcher in the research area under investigation and provides links to other research related to the current study.
Source	Source is a nonrefereed website and is a summary of the author's opinion.	Source is nonrefereed website and must be closely examined for bias, subjectivity, intent, accuracy, and reliability before inclusion in the review of related literature.	Source is a scholarly or peer-reviewed journal, an education-related magazine, or a popular magazine.	Source is a scholarly or peer-reviewed journal.	Source is a scholarly or peer-reviewed journal with links to related literature by same author/s and ability to download fully online versions of articles.

(*Continued*)

TABLE 2 (*Continued*)

	Evaluation Criteria				
Dimension	**1 Poor**	**2 Below Average**	**3 Average**	**4 Above Average**	**5 Excellent**
Methodology	It is not possible to determine from the description of the study whether or not an appropriate methodology was used to investigate the research problem.	The description of the methodology does not include sufficient information to determine if the sample size was acceptable given the research problem.	The source includes a full description of the research problem and the appropriateness of the methodology to investigate the problem.	The source includes a full description of the research problem and the appropriateness of the methodology to investigate the problem. The results are presented objectively and can be connected to the data presented in the study.	The source includes a full description of the research problem and the appropriateness of the methodology to investigate the problem. Issues of validity and reliability are discussed along with limitations of the study. There is sufficient information in the source to enable a replication of the study.
Date	No date of publication is included in the source.	Date of publication is included but is too old to be helpful for the current research problem.	Current date of publication.	Current date of publication with a list of references consulted by the author.	Current date of publication with a list of references consulted by the author including links to fully online articles.

Source: From *Educational Research: Competencies for Analysis and Applications* (10th ed.), by L. R. Gay, G. E. Mills, and P. W. Airasian.

your sources regardless of whether those sources are from scholarly journals, magazines, or websites. A note of caution: Anyone can post a "professional" looking website on the Internet. Do not be fooled by looks. Apply the same criteria for evaluating Web-based materials that you would use for print materials. Critically evaluating your sources will save you time and energy reading and annotating sources that may contribute little to your understanding of a research topic. This section includes an evaluation rubric using the categories of relevancy, author, source, methodology, date, validity, and references.

Relevancy

- What was the purpose or problem statement of the study? Obviously, the first thing to do is to determine whether the source really applies to your research topic and qualifies to be included in a review of related literature. Does the title of the source reflect research related to your work? Is there a well-refined question or statement of purpose? The problem statement is often found in the abstract and will allow you to determine the relevance of the research to your own research.

Author

- Who was the author? What are the qualifications, reputation, and status of the author? In most databases, the name of the author links to any other published works in the database. Is the subject matter a primary interest in the published works of the author? Is the author affiliated with any institution or organization? Most importantly, can you contact the author? Does the author have a personal website with vitae?

Source

- Where was the source published? Does the information come from a scholarly or peer-reviewed journal, an education-related magazine, or a popular magazine? Is the information personal opinion or the result of a research study? Clearly, sources of different types merit different weight in your review. For instance, did you find your source in a refereed or a nonrefereed journal? In a refereed journal, articles are reviewed by a panel of experts in the field and are more scholarly and trustworthy than articles from nonrefereed or popular journals. Research articles in refereed journals are required to comply with strict guidelines regarding format and research procedures. Special care and caution must also be taken when evaluating websites because anyone can post information on the Internet. Websites must be closely examined for bias, subjectivity, intent, accuracy, and reliability. These important quality-control questions will help you determine whether or not a source is worthy of inclusion in your review of related literature.

Methodology

- How was the study conducted? It is important to verify that the information presented in a particular source is objective and impartial. What methodology was used to investigate the problem or test the hypothesis? Was an appropriate method used? Can the research be replicated by others? Was the sample size suitable for the research? Does the source add to the information you have already gathered about your topic? Is the information presented in the source accurate? It is important to verify that the information presented in a particular source is objective and impartial. Does the author present evidence that supports the interpretations? Does the content of the article consist mainly of opinion, or does it contain appropriately collected and analyzed data? How accurate are the discussion and conclusions of the findings? Do the findings present any contrary data or assumptions?

Date

- When was the research conducted? The date of publication is of primary importance in evaluating a source. Look at the copyright date of books and the dates when articles were published. Websites should always include a reference to the last updated or revised date. Research in areas of current interest and continuing development generally requires recent, up-to-date references. Searching for recent references does not mean disregarding older research. Oftentimes, older research as opposed to out-of-date research is pertinent to your worldview as an educator and is still relevant.
- What other sources were referenced? Check the bibliography of a source to help determine the quality of the research. Do the references reflect current, scholarly, or peer-reviewed research? Are they robust enough for the subject matter? Do they reflect

original sources and alternative perspectives? Who are the authors? The list of references can yield an abundance of information when evaluating the quality of a source. Remember, the quality of your research will also be judged by the references you choose, so you should be careful to select the best research to support your work.

Conducting effective library and Internet searches will yield an abundance of useful information about your topic. By using multiple search methods and strategies, you will collect information that is current, accurate, and comprehensive. As you become more experienced, you will learn to conduct more efficient and effective searches, identifying better sources that focus on your topic and accurately represent the information needed for your research.

Annotating Your Sources

After you have identified the primary references related to your topic, you are ready to move on to the next phase of a review of related literature—annotating the references. Many databases include an abstract or summary of a study that describes the hypotheses, procedures, and conclusions. An abstract is descriptive in nature and does not assess the value or intent of the source. An annotation assesses the quality, relevance, and accuracy of a source. Additionally, the annotation describes how the source relates to the topic and its relative importance. Basically, annotating involves reviewing, summarizing, and classifying your references. Students sometimes ask why it is necessary to read and annotate original, complete articles or reports if they already have perfectly good abstracts. By assessing the quality and usefulness of a source, annotations articulate your response to a source and why the source is important to your research. After completing annotations, many students discover that they contributed heavily to the writing of their review of related literature.

To begin the annotation process, arrange your articles and other sources in reverse chronological order. Beginning with the latest references is a good research strategy because the most recent research is likely to have profited from previous research. Also, recent references may cite preceding studies that you may not have identified. For each reference, complete the following steps:

1. If the article has an abstract or a summary, as most do, read it to determine the relevance of the article to your problem.
2. Skim the entire article, making mental notes of the main points of the study.
3. On an index card or in a Word document, write a complete bibliographic reference for the work. Include the library call number if the source work is a book. This step can be tedious but is important. You would spend much more time trying to find the complete bibliographic information for an article or book that you failed to annotate completely than you will spend annotating it in the first place. If you know that your final report must follow a particular editorial style, such as that described in the *Publication Manual* of the American Psychological Association (APA), put your bibliographic reference in that form. Remember, most databases put the citation of a source in a citation style. For example, an APA-style reference for a journal article looks like this:

   Snurd, B. J. (2007). The use of white versus yellow chalk in the teaching of advanced calculus. *Journal of Useless Findings, 11,* 1–99.

   In this example, "2007" is the date of publication, "11" is the volume number of the journal, and "1–99" are the page numbers. A style manual provides reference formats for all types of sources. Whatever format you select, use it consistently and be sure your

bibliographic references are accurate. You never know when you may have to go back and get additional information from an article.

4. Classify and code the article according to some system, then add the code to the annotation in a conspicuous place, such as an upper corner. The code should be one that can be easily accessed when you want to sort your notes into the categories you devise. Any coding system that makes sense to you will facilitate your task later when you have to sort, organize, analyze, synthesize, and write your review of the literature. You may use abbreviations to code variables relevant to your study (e.g., "SA" in the upper corner of your abstract to signify that the article is about student achievement). Coding and keeping track of articles is key for organization. Computer software such as RefWorks, EndNote, and others can help you manage, organize, and create bibliographic citations. Database vendors such as EBSCO and WilsonWeb allow you to create an account to store references from the ERIC and Education Full Text databases. MyEBSCO and MyWilsonWeb require you to create a profile account that allows you to save individual citation records, create folders to organize citations, save searches, request RSS feeds, and employ search alerts to automatically retrieve newer articles that meet your search criteria.
5. Annotate the source by summarizing the central theme and scope of the reference, why the source is useful, strengths and limitations, the author's conclusions, and your overall reaction to the work. If the work is an opinion article, write the main points of the author's position—for example, "Jones believes parent volunteers should be used because [list the reasons]." If it is a study, state the problem, the procedures (including a description of participants and instruments), and the major conclusions. Make special note of any particularly interesting or unique aspect of the study, such as use of a new measuring instrument. Double-check the reference to make sure you have not omitted any pertinent information. If an abstract provided at the beginning of an article contains all the essential information (and that is a big if), by all means use it.
6. Indicate any thoughts that come to your mind, such as points on which you disagree (e.g., mark them with an X) or components that you do not understand (e.g., mark with a ?). For example, if an author states that he or she used a double-blind procedure and you are unfamiliar with that technique, you can put a question mark next to that statement in your database entry, on your index card, or on a photocopy of the page. Later, you can find out what it is.
7. Indicate any statements that are direct quotations or personal reactions. Plagiarism, intentional or not, is an absolute no-no with the direst of consequences. Put quotation marks around direct quotations, or you may not remember later which statements are direct quotations. You must also record the exact page number of the quotation in case you use it later in your paper. You will need the page number when citing the source in your paper. Direct quotations should be kept to a minimum in your research plan and report. Use your own words, not those of other researchers. Occasionally, a direct quotation may be quite appropriate and useful.

Whatever approach you use, guard your notes and digital records carefully. Save more than one copy so that you will not lose your work. Also, when your annotations are complete, save the information for future reference and future studies (nobody can do just one!).

Literature Matrix

A helpful way to keep track of your annotations is to record them, by author and date, on a matrix (see Figures 6 and 7). The matrix is a powerful organizer when you are committing your

Author/s	Year	Variables Considered in the Study					

FIGURE 6 ***Literature Matrix***

thoughts to text. Along the Y-axis list the authors' names and year of publication. Along the X-axis list the kinds of variables/themes/issues addressed by the studies. The matrix will provide you with a mental map of what you are reading and what the studies share in common.

Analyzing, Organizing, and Reporting the Literature

For beginning researchers, the hardest part of writing the literature review for a plan or report is thinking about how hard it is going to be to write the literature review. More time is spent worrying about doing it than actually doing it. This hesitancy stems mostly from a lack of experience with the type of writing needed in a literature review—a technical form of writing unlike most of the writing we do. In technical writing, facts must be documented and opinions substantiated. For example, if you say that the high school dropout percentage in Ohio has increased in the last 10 years, you must provide a source for this information. Technical writing is precise, requiring clarity of definitions and consistency in the use of terms. If the term *achievement* is important in your review, for example, you must indicate what you mean by it and be consistent in using that meaning throughout the written review. Figure 8 summarizes these and other important technical writing guidelines useful in a literature review.

If you have efficiently annotated the literature related to your problem, and if you approach the task in an equally systematic manner, then analyzing, organizing, and reporting the literature will be relatively painless. To get warmed up, you should read quickly through your annotations and notes to refresh your memory and identify references that no longer seem sufficiently related to your topic. Do not force references into your review that do not really fit; the review forms the background and rationale for your hypothesis and should contain only references that serve this purpose. The following guidelines—based on experience acquired the hard way—should be helpful to you.

Author/s	Year	Variables Considered in the Study									
		Academic Achievement	Military Personnel	Social Adjustment	Attitude to Change	Discontinuous Education	Caravan Parks	S.E.S.	I.Q.	School Counsellors	Solutions Provided
Cramer, W., & Dorsey, S.	1970	●	●								
Bourke, S. F., & Naylor, D.R.	1971	●	●								
Collins, R. J., & Coulter, F.	1974	●	●	●							
Mackay L. D., & Spicer, B. J.	1975	●	●	●							
Lacey, C., & Blare, D.	1979	●				●					
Parker, L.	1979	●				●	●				
Parker, L.	1981	●		●			●	●			
Bell, D. P.	1962	●					●				
Smith, T. S., Husbands, L. T., & Street, D.	1969	●							●		
Whalen, T. C., & Fried, M. A.	1973	●						●	●		
Black, F. S., & Bargar, R. R.	1975	●									
Goodman, T. L.	1975	●									
Splete, H., & Rasmussen, J.	1977									●	●
de Noose, D. A., & Wells, R. M.	1981	●		●						●	●
Allan, J., & Bardsley, P.	1983									●	●
King, M.	1984	●						●			●
Thomas, B. D.	1978	●				●					●
Rahmani, Z.	1987		●								●
Mills, G. E.	1989	●		●		●					●

FIGURE 7 ***Sample Literature Matrix***

1. *Document facts and substantiate opinions.* Cite references to support your facts and opinions. Note that facts are usually based on empirical data, whereas opinions are not. In the hierarchy of persuasiveness, facts are more persuasive than opinions. Differentiate between facts and opinions in the review.
2. *Define terms clearly, and be consistent in your use of terms.*
3. *Organize content logically.*
4. *Direct your writing to a particular audience.* Usually the literature review is aimed at a relatively naïve reader, one who has some basic understanding of the topic but requires additional education to understand the topic or issue. Do not assume your audience knows as much as you do about the topic and literature! They don't, so you have to write to educate them.
5. *Follow an accepted manual of style.* The manual indicates the style in which chapter headings are set up, how tables must be constructed, how footnotes and bibliographies must be prepared, and the like. Commonly used manuals and their current editions are *Publication Manual of the American Psychological Association*, Sixth Edition, and *The Chicago Manual of Style*, Sixteenth Edition.
6. *Evade affected verbiage and eschew obscuration of the obvious.* In other words, limit big words and avoid jargon.
7. *Start each major section with a brief overview of the section.* The overview may begin like this: "In this section, three main issues are examined. The first is. . . ."
8. *End each major section with a summary of the main ideas.*

FIGURE 8 ***Guidelines for Technical Writing***

Source: From *Educational Research: Competencies for Analysis and Applications* (10th ed.), by L. R. Gay, G. E. Mills, and P. W. Airasian.

Make an Outline

Don't groan; your eighth-grade teacher was right about the virtues of an outline. However you construct it, an outline will save you time and effort in the long run and will increase the probability of having an organized review. The outline does not have to be excessively detailed. Begin by identifying the main topics and the order in which they should be presented. For example, the outline of the review for the problem concerned with salaried paraprofessionals versus parent volunteers may begin with these headings: "Literature on Salaried Paraprofessionals," "Literature on Parent Volunteers," and "Literature Comparing the Two." You can always add or remove topics in the outline as your work progresses. The next step is to differentiate each major heading into logical subheadings. The need for further differentiation will be determined by your topic; the more complex it is, the more subheadings you will require. When you have completed your outline, you will invariably need to rearrange, add, and delete topics. It is much easier, however, to reorganize an outline than it is to reorganize a document written in paragraph form.

Analyze Each Reference in Terms of Your Outline

In other words, determine the subheading under which each reference fits. Then sort your references into appropriate piles. If you end up with references without a home, there are three logical possibilities: (1) something is wrong with your outline, (2) the references do not belong in your review and should be discarded, or (3) the references do not belong in your review but do belong somewhere else in your research plan and report introduction. Opinion articles or reports of descriptive research often are useful in the introduction, whereas formal research studies are most useful in the review of related literature.

Analyze the References under Each Subheading for Similarities and Differences

If three references say essentially the same thing, you will not need to describe each one; it is much better to make one summary statement and cite the three sources, as in this example:

Several studies have found white chalk to be more effective than yellow chalk in the teaching of advanced mathematics (Snurd, 1995; Trivia, 1994; Ziggy, 1984).

Give a Meaningful Overview of Past Research

Don't present a series of abstracts or a mere list of findings (Jones found A, Smith found B, and Brown found C). Your task is to organize and summarize the references in a meaningful way. Do not ignore studies that are contradictory to most other studies or to your personal bias. Analyze and evaluate contradictory studies and try to determine a possible explanation. For example:

Contrary to these studies is the work of Rottenstudee (1998), who found yellow chalk to be more effective than white chalk in the teaching of trigonometry. However, the size of the treatment groups (two students per group) and the duration of the study (one class period) may have seriously affected the results.

Discuss the References Least Related to Your Problem First and Those Most Related to Your Problem Just Before the Statement of the Hypothesis

Think of a big V. At the bottom of the V is your guiding hypothesis; directly above your hypothesis are the studies most directly related to it, and so forth. The idea is to organize and present your literature in such a way that it leads logically to a tentative, testable conclusion, namely, your hypothesis. Highlight or summarize important aspects of the review to help readers identify them. If your problem has more than one major aspect, you may have two Vs or one V that logically leads to two tentative, testable conclusions.

Conclude the Review with a Brief Summary of the Literature and Its Implications

The length of this summary depends on the length of the review. It should be detailed enough to clearly show the chain of logic you have followed in arriving at your implications and tentative conclusions.

The Action Research Plan

Ideally, your investment of time and energy in the reconnaissance and literature review stages will allow you to synthesize the related literature so that you can see your project more clearly. In addition, it may have helped you identify promising practices that can become an integral part of your ongoing action research efforts.

At this stage of the action research process, you should create an action plan. An action plan summarizes your action research thoughts in a plan that will guide you through your action research work and includes the following nine steps (Elliott, 1991; Kemmis, 1988):

1. Write an area-of-focus statement.
2. Define the variables.
3. Develop research questions.
4. Describe the intervention or innovations.
5. Describe the membership of the action research group.
6. Describe negotiations that need to be undertaken.
7. Develop a timeline.

8. Develop a statement of resources.
9. Develop data collection ideas.

Write an Area-of-Focus Statement

An area of focus identifies the purpose of your study. To start, write a statement that completes the following sentence: "The purpose of this study is to. . . ". For example:

- The purpose of this study is to describe the effects of an integrated problem-solving mathematics curriculum on student transfer of problem-solving skills and the retention of basic math facts and functions.
- The purpose of this study is to describe the impact of bringing audience members into an interactive relationship with teen theater productions on participants' abilities to identify issues and incorporate solutions to similar problems in their own lives.
- The purpose of this study is to describe the effects of student-led conferences on parent and student satisfaction with the conferencing process.

In this **video**, Jureen describes working with peers to establish reliable definitions for the variables in her action research study.

Define the Variables

As part of the area-of-focus statement construction process, write definitions of what you will focus on in the study. These definitions should accurately represent what the factors, contexts, and variables *mean to you*. A variable is a characteristic of your study that is subject to change. That is, it might be the way you are going to change how you teach, the curriculum you use, and student outcomes. Definitions may also emerge from the literature, but it is important that you own whatever you are defining and communicate that ownership with others. In the preceding examples, the researchers would define what they mean by transfer of solutions to life's situations, an integrated problem-solving curriculum, transfer of problem-solving skills, the retention of math facts and functions, interactive participation in teen theater, student-led conferences, and parent and student satisfaction with the conferencing processes. If you are clear about what you are examining, it will be easy to determine how you will know it when you see it! That is, your data collection ideas will flow more freely and there will be no confusion when you communicate with your action research collaborators about your purpose.

Jeannette conducted a study to evaluate the content of the basal reader system used in her district. She did not study children in the classroom at all. Reflect on the research questions she presents in this **video**. Why is her project considered action research?

In this **video**, Doug presents the questions that guided his review of the literature in his area of interest. Note that the first of these questions is a different sort of question than the others—he can answer it based on his review of the literature. For the others, he will need to collect data to help provide an answer. These last three research questions form the basis of his action research project.

Develop Research Questions

Develop questions that breathe life into the area-of-focus statement and help provide a focus for your data collection plan. These questions will also help you validate that you have a workable way to proceed with your investigation. For example:

- What is the effect of teen theater audience participation strategies on audience comprehension of issues?
- How does the "Violence Improv" affect the audience's understanding of the issues of violence and harassment?
- What is the effect of incorporating math manipulatives into problem-solving activities on student performance on open-ended problem-solving tests?

- In what ways do students transfer problem-solving skills to other areas of mathematics?
- How do students incorporate problem-solving skills into other curriculum areas?
- How do students transfer problem-solving skills to their life outside of school?

Describe the Intervention or Innovation

Describe what you are going to do to improve the situation you have described; for example, "I will implement a standards-based, integrated problem-solving mathematics curriculum," "I will include audience improvisation as part of the teen theater performances I direct," and "I will incorporate student participation in student-parent-teacher conferences." Remember, this is simply a statement about what you will do in your classroom or school to address the teaching/learning issue you have identified.

Describe the Membership of the Action Research Group

Jureen, in this **video**, identifies her action research group, which includes both the colleagues working with her and the students in her classroom. In action research, it is important to think of the students as active participants in the research, not just subjects to be observed.

Describe the membership of your action research group and discuss why its members are important. Will you be working with a site council team? A parent group? If so, what will be the roles and responsibilities of the group's participants? For example:

> I will be working with seven other high school math teachers who are all members of the math department. Although we all have different teaching responsibilities within the department, as a group we have decided on problem solving as an area of focus for the department. Each of us will be responsible for implementing curriculum and teaching strategies that reflect the new emphasis on problem solving and for collecting the kinds of data that we decide will help us monitor the effects of our teaching. The department chair will be responsible for keeping the principal informed about our work and securing any necessary resources we need to complete the research. The chair will also write a description of our work to be included in the school newsletter (sent home to all parents), thus informing children and parents of our focus for the year.

Describe Negotiations That Need to Be Undertaken

As she describes in this **video**, Rachelle collected data in classes other than her own. What negotiations would you expect that Rachelle needed to undertake, prior to beginning?

Describe any negotiations that you will have to undertake with others before implementing your plan. Do you need permission from an administrator? Parents? Students? Colleagues? All this assumes that you control the focus of the study and that you undertake the process of negotiation to head off any potential obstacles to implementation of the action plan. It is very frustrating to get immersed in the action research process only to have the project quashed by uncooperative colleagues or administrators.

Develop a Timeline

In developing a timeline, you will need to decide who will be doing *what* and *when*. Although not part of a timeline in the strictest sense, you can also use this stage to anticipate *where* and *how* your inquiry will take place. For example:

- Phase 1 (August–October). Identify area of focus, review related literature, develop research questions, reconnaissance.

- Phase 2 (November–December). Collect initial data. Analyze video recordings of lessons, do first interviews with children, administer first problem-solving probe.
- Phase 3 (January–May). Modify curriculum and instruction as necessary. Continue ongoing data collection. Schedule two team meetings to discuss early analysis of data.
- Phase 4 (May–June). Review statewide assessment test data and complete analysis of all data. Develop presentation for faculty. Schedule team meeting to discuss and plan action based on the findings of the study. Assign tasks to be completed prior to year 2 of the study.

Develop a Statement of Resources

Briefly describe what resources you will need to enact your plan. This is akin to listing materials in a lesson plan. There is nothing worse than starting to teach and finding that you don't have all the manipulatives you need to achieve your objectives. For example, to participate in the study of math problem-solving skills, the team determines that it will need teacher release time for planning the project, reviewing related literature, and completing other tasks; funds to purchase classroom sets of manipulatives; and a small budget for copying and printing curriculum materials. After all, there is no sense in developing a study that investigates the impact of a new math problem-solving curriculum if you don't have the financial resources to purchase the curriculum.

Develop Data Collection Ideas

Give a preliminary statement of the kinds of data that you think will provide evidence for your reflections on the general idea you are investigating. For example, brainstorm about the kind of intuitive, naturally occurring data that you find in your classroom or school, such as test scores, attendance records, portfolios, and anecdotal records. As you learn more about other types of data that can be collected, this list will grow. In the early stages, however, you should think about what you already have easy access to and then be prepared to supplement it with interviews, surveys, questionnaires, video and audio recordings, maps, photos, and observations as the area of focus dictates.

These activities can be undertaken whether you are working individually, in a small group, or as part of a schoolwide action research effort. The resolution of these issues early in the action research process will ensure that you do not waste valuable time backtracking (or even apologizing) once you are well down the action research path. The process of developing an action plan is summarized in the Research in Action Checklist 3.

RESEARCH IN ACTION CHECKLIST 3

Developing an Action Plan
_____ Write an area-of-focus statement.
_____ Define the variables.
_____ Develop research questions.
_____ Describe the intervention or innovation.
_____ Describe the membership of the action research group.
_____ Describe negotiations that need to be undertaken.
_____ Develop a timeline.
_____ Develop a statement of resources.
_____ Develop data collection ideas.

Put the Action Plan into Action

Kemmis (1988) provides the following conclusion to the process of developing a plan:

> Your plan orients you for action, of course; but it is also a reference point for reflection later on, and it is something which you can modify and develop in later plans. Since you have done so much hard thinking to put your plan together, don't skimp when it comes to drafting and redrafting it before you go into action. It represents the fruits of one round of reconnaissance and thinking ahead—it provides you with a benchmark for later reflection and replanning. (p. 77)

With the plan complete, it's time to determine what information (data) you can collect that will increase your understanding about your own practice and its impact on your students. You are now ready to decide how you will monitor the effects of the innovation or intervention you are going to implement and to develop your data collection techniques.

Summary

Clarifying a General Idea and an Area of Focus

1. In the beginning of the action research process, you need to clarify the general idea that will be the area of focus of your study.
2. The general idea is a statement that links an idea to an action and refers to a situation one wishes to change or improve on.
3. Taking time in the beginning of the action research process to identify what you feel passionate about is critical.
4. The area of focus should involve teaching and learning and should focus on your own practice.
5. The area of focus is something within your locus of control.
6. The area of focus is something you feel passionate about.
7. The area of focus is something you would like to change or improve.

Reconnaissance

8. Reconnaissance is taking time to reflect on your own beliefs and to understand the nature and context of your general idea. Doing reconnaissance takes three forms: self-reflection, description, and explanation.
9. Try to explore your own understanding of:
    a. The theories that impact your practice.
    b. The educational values you hold.
    c. How your work in schools fits into the larger context of schooling and society.
    d. The historical contexts of your school and schooling and how things got to be the way they are.
    e. The historical contexts of how you arrived at your beliefs about teaching and learning.
10. Try to describe as fully as possible the situation you want to change or improve by focusing on the who, what, when, where, and how questions.

11. Try to explain the situation you intend to investigate by hypothesizing how and why the critical factors that you have identified affect the situation.

Review of Related Literature

12. The review of related literature involves systematically identifying, locating, and analyzing documents pertaining to the research topic.
13. The major purpose of reviewing the literature is to identify information that already exists about your topic.
14. The literature review can point out research strategies, procedures, and instruments that have and have not been found to be productive in investigating your topic.
15. A smaller, well-organized review is preferred to a review containing many studies that are less related to the problem.
16. Heavily researched areas usually provide enough references directly related to a topic to eliminate the need for reporting less related or secondary studies. Little-researched topics usually require review of any study related in some meaningful way so that the researcher may develop a logical framework and rationale for the study.

Action Research and the Review of Related Literature

17. Action researchers disagree about the role of the literature review in the research process. Some researchers have argued that reviewing the literature curtails inductive analysis—using induction to determine the direction of the research—and should be avoided at the early stages of the research process.
18. Others suggest that the review of related literature is important early in the action research process because it helps action researchers identify underlying assumptions behind their research questions and helps the researcher refine research questions and embed them in guiding hypotheses that provide possible directions to follow.

Identifying Keywords

19. Most sources have alphabetical subject indexes to help you locate information on your topic. A list of keywords should guide your literature search.

Identifying Your Sources

20. A good way to start a review of related literature is with a narrow search of pertinent educational encyclopedias, handbooks, and annual reviews found in libraries. These resources provide broad overviews of issues in various subject areas.
21. An article or report written by the person who conducted the study is a primary source; a brief description of a study written by someone other than the original researcher is a secondary source. Primary sources are preferred in reviews.

Searching for Books on Your Topic in the Library

22. Most libraries use an online catalog system as well as collective catalogs to access materials from other libraries. You should familiarize yourself with your library, the library website, and the resources available within and beyond your library.

23. A keyword search uses terms or phrases pertinent to your topic to search for and identify potentially useful sources.
24. Keyword searches can be focused by using the Boolean operators AND, OR, and NOT. Using AND or NOT narrows a search and reduces the number of sources identified; using OR broadens the search and increases the number of sources. It is often best to start with a narrow search.

Steps for Searching Computer Databases

25. Identify keywords related to your topic.
26. Select the appropriate databases—some databases using the same interface may allow you to search multiple databases simultaneously.
27. Initiate a search using your keywords selectively.
28. Reformulate your search using appropriate subject headings or descriptors combining terms as is appropriate.
29. Once you have found a relevant article, check the item record for links to additional subject heading or descriptors, author(s), cited references, times cited in database, or other references for finding additional related items using the features within the database.

Searching the Internet and the World Wide Web

30. The Internet links organizations and individuals all over the world. The World Wide Web is on the Internet.
31. To access the Internet, you need a computer with a modem or Ethernet/cable line and a browser that connects to the Web.
32. The available resources on the World Wide Web are almost limitless, so the best way to become familiar with its use is to "surf" in your spare time.
33. The Web contains a variety of sites relevant to an educational researcher. Each site is reached through its Internet address. Addresses containing "ed" or ending in ".edu" are related to educational institutions, those ending in ".com" are related to commercial enterprises, those ending in ".org" refer to organizations (including professional organizations), and those ending in ".gov" link to government sites.
34. Search engines have established subcategories and also allow keyword searches to review large portions of the World Wide Web quickly.

Becoming a Member of Professional Organizations

35. The websites for professional organizations maintain links to current research in a particular discipline.
36. Popular professional organizations include Association for Supervision and Curriculum Development, National Council of Teachers of Mathematics, National Council for the Social Studies, National Science Teachers Association, and the International Reading Association.

Evaluating Your Sources

37. It is important to evaluate all literature sources by asking the following questions: What was the problem statement of the study? Is the study relevant given your research interests? Who was studied? Where was the source published? When was the study conducted? and How was the study conducted?

Annotating Your Sources

38. Annotating your sources involves creating summaries by locating, reviewing, summarizing, and classifying your references. Annotations assess the quality, relevance, and accuracy of a source; articulate your response to a source; and indicate why the source is important to your research.
39. The main advantage of beginning with the latest references on your topic is that the most recent studies are likely to have profited from previous research. References in recent studies often contain references to previous studies that you have not yet identified.
40. For each source work, list the complete bibliographic record, including author's name, date of publication, title, journal name or book title, volume number, issue number, page numbers, and library call number. Briefly list main ideas. Put quotation marks around quotes taken from the source and include page numbers. Keep all references in the citation format required for research reports or dissertations.
41. Make a copy of your references and put it in a safe place.
42. A helpful way to keep track of the literature is to use a matrix.

Analyzing, Organizing, and Reporting the Literature

43. Describing and reporting research call for a specialized style of writing. Technical writing requires documenting facts and substantiating opinions, clarifying definitions and using them consistently, using an accepted style manual, and starting sections with an introduction and ending them with a brief summary.
44. When organizing a review, make an outline; sort references by topic; analyze the similarities and differences between references in a given subheading; give a meaningful overview in which you discuss references least related to the problem first; and conclude with a brief summary of the literature and its implications.

The Action Research Plan

45. Ideally, your investment of time and energy in the reconnaissance and literature review stages allows you to synthesize the related literature so that you can see your project more clearly. In addition, it may help you identify promising practices that can become an integral part of your ongoing action research efforts.
46. At this stage of the action research process you should create an action research plan that summarizes your action research thoughts in a plan that will guide you through your action research work. It should include the following nine steps:
    1. Write an area-of-focus statement.
    2. Define the variables.
    3. Develop research questions.
    4. Describe the intervention or innovations.
    5. Describe the membership of the action research group.
    6. Describe negotiations that need to be undertaken.
    7. Develop a timeline.
    8. Develop a statement of resources.
    9. Develop data collection ideas.

Tasks

1. Complete an action plan that includes an area-of-focus statement, definitions, research questions, a description of the intervention, membership of the action research group, negotiations to be undertaken, a timeline, the necessary resources for the project, and data collection ideas.
2. Identify ten to fifteen good references (sources) that directly relate to your area of focus. The references should include a variety of source types (e.g., books, articles, Internet reports, etc.).
3. Evaluate and abstract those references.
4. Write a review of related literature.

References

Bogdan, R. C., & Biklen, S. K. (1998). *Qualitative research for education: An introduction to theories and methods* (5th ed.). Needham Heights, MA: Allyn and Bacon.

Creswell, J. W. (2008). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Marshall, C., & Rossman, G. B. (1995). *Designing qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.

Sagor, R. (2000). *Guiding school improvement with action research.* Alexandria, VA: ASCD.

Van de Walle, J. A. (2003). *Elementary school mathematics: Teaching developmentally.* New York: Longman.