

11

Conducting Teacher Action Research



This chapter describes a process for conducting a teacher action research study. The suggestions offered here have emanated from my reading in the action research literature and my personal experiences and engagement in a variety of collaborative teacher action research studies during the past 40 years. My pedagogical voice permeates the chapter, but I hope it does so in a way that establishes meaningful contact with you the reader. I have tried to capture in this chapter the realities, complexities, and challenges of conducting teacher action research. In several places in the chapter, I emphasize the importance of the critical process that recursion represents in the conduct of action research, particularly as recursion affects research questions and the processes of data collection and analysis. I hope this chapter will be a meaningful resource and foundation for you as you conduct your own research and that it will give you all the rudiments of practice you need to become a lifelong researcher.

❖ MODEST BEGINNINGS

Action research is demanding, complex, and challenging because the researcher not only assumes responsibilities for doing the research but

also for enacting change. Enacting change is not easy—it requires time, patience, and sound planning, communication, and implementation skills. So, in establishing a foundation for conducting action research, I believe that modest beginnings are no disgrace and are in most respects preferable to more ambitious ones. The visibility and impact of early efforts may be small, but it is advisable to consider carefully the relative merits of simple versus more intricate research plans and data analysis procedures. It is likely that by adopting the strategies of a methodological miser, there is more to be gained than lost. In the conduct of action research, just as in the interpretation of its results, the law of parsimony is recommended. Modest beginnings can serve to build step-by-step an action research tradition of dealing with real problems that already have a natural and interested audience.

By selecting and pursuing questions that focus on the immediate and imperative problems of the classroom and the school, teacher action research can attract the greatest attention at the most opportune time (when there is something substantial to report), for the best reason (because some progress has been made, either in terms of increased understanding or approaches to dealing with a problem), and probably for the appropriate audience (those who have a preexisting interest and investment in the problem and its solution). A mounting record of visible accomplishment is an excellent way to dispel the initial anxiety teachers may experience in undertaking action research.

❖ FINDING CRITICAL FRIENDS

As a member of a collaborative action research team, whether pursuing an individual research study or a team study, it is important to engage colleagues in a process of collaborative inquiry to advance the developing research effort. Particular colleagues may be enlisted at the beginning of the research for a variety of reasons—because they are especially sensitive to emerging problems, or are creative and have ideas about how educational issues might be addressed, or are skilled in problem definition, or are greatly interested in a particular issue.

Whatever the reason, it is extremely helpful to have a circle of “critical friends” who will work with you to help define the research problem, formulate the questions, collect and analyze the data, and discuss the data and outcomes of the study (Bambino, 2002; Cushman, 1998). To facilitate critical collegiality, it is helpful to consider the norms developed by the Bay Area Coalition of Essential Schools, which are paraphrased here:

- In collaborating with a group of critical friends, you and the members of the group describe only what you see; you don't try to describe what you don't see; you learn to express what you don't see in the form of questions.
- Together, you resist the urge to work on solutions until you are comfortable with what the data say and don't say.
- The perspectives and experiences of each member of the group are brought to the analysis.
- Everyone seeks to understand differences of perception before trying to resolve them, recognizing that early consensus can inhibit depth and breadth of analysis.
- In this critical process, members raise questions with each other when they don't understand ideas or what the data are saying.
- Members surface assumptions and use data to challenge them, actively searching for both challenges and support for what they believe is true.

This kind of process exemplifies critical collegiality, which is essential in dealing with the complexities and changing circumstances of any action research project.

It is good to remember that action research can be messy. Cook (1998) and Mellor (2001), in writing about the importance of "mess" in action research, discuss the problems and overwhelming amount of data or possible areas that one can examine in doing action research. They describe their personal experiences in conducting classroom action research projects and provide insights into some of the pitfalls, issues, and other concerns you might have before initiating your own action research study. Here again, the need for a circle of critical friends to deal with the "messiness" of action research seems apparent. Critical friends share a commitment to inquiry, offer continuing support throughout the research process, and nurture a community of intellectual and emotional caring.

❖ A FEW PRINCIPLES FOR CONDUCTING ACTION RESEARCH

Action research takes place in a context of discovery and invention as opposed to a context of verification. Discovery and invention, the main business of human science, have little to do with experimental designs. What one does to discover and invent a new way of teaching or a different approach to assessment, for example, is a completely separate activity from the strict procedures of classical experimental design.

Some basic principles for conducting action research can be found in Gregory Bateson's "Rules of Thumb" for doing research:

- Study life in its natural setting, being careful not to destroy the historical and interactional integrity of the whole setting.
- Think aesthetically. Visualize, analogize, compare. Look for patterns, configurations, figures in the rug.
- Live with your data. Be a detective. Mull, contemplate, observe, and inspect. Think about, through, and beyond.
- Don't be controlled by dogmatic formalisms about how to theorize and research. Avoid the dualisms announced and pronounced as maxims by particularizing methodologists and theorists.
- Be as precise as possible, but don't close off possibilities. Keep your explanations as close to your data and experience as possible.
- Aim for catalytic conceptualizations; warm ideas are contagious. (as cited in Bochner, 1981, pp. 76–77)

Identifying the Research Question

By studying life in the natural setting of the school and the classroom, by looking for "patterns in the rug," and by mulling, contemplating, and closely observing authentic events in teaching and learning situations, one can identify a research question that will enlist personal passion and energy. "A teacher researcher, among other things, is a questioner. Her questions propel her forward" (Hansen, 1997, p. 1). Meaningful questions can emerge from: conversations with your colleagues; professional literature; examination of your journal entries and teaching portfolio to identify, for example, patterns of teacher/student behavior or anomalies, paradoxes, and unusual situations; dissonance between your teaching intentions and outcomes; problematic learning situations in your classroom that you want to resolve; a new teaching strategy you are eager to implement; an ambiguous and puzzling classroom management concern; or your curiosity about testing a particular theory in the classroom.

Cindy Meyers, a teacher of writing, discusses how the process of research in her classroom is clarified and informed by her field notes:

Every year when I start research by keeping field notes, I keep thinking that this is an exercise, and I'm just writing down what's

happening and I'm not getting anything out of it. It seems like a bland kind of thing. But when I keep doing that, all of a sudden I'll hear the kids say something that shows they've changed in some way, and I'll put that down too. And then things start to pull together. It's almost like the field notes that I keep and through what I see happening—out of those field notes—the classroom becomes more alive. (Goswami & Stillman, 1987, p. 3)

Sometimes it helps to use a variety of questions as starting points to identify an issue you would like to research (Caro-Bruce, 2000):

I would like to improve _____

I am perplexed by _____

I am really curious about _____

Something I think would really make a difference is _____

Something I would like to change is _____

What happens to student learning in my classroom when I _____?

How can I implement _____?

How can I improve _____?

Classrooms are complex environments in which teachers engage in as many as 1,000 interpersonal situations during a stretch of 6 hours with as many as 200 or 300 interpersonal exchanges in an hour (Jackson, 1968). An almost infinite number of research questions are inherent in the context of the classroom, the context of teaching, and the context of learning.

Identifying a good research question from these possibilities requires reflection, observation, conversation, and study of the natural life of the classroom. It is important to remember that the first question propelling an action research study may change as the research is under way. The recursive, iterative, and spiraling nature of action research suggests that a research question may change and be refined as new data and issues surface in the research study.

Passion is integral to doing action research and can be a resource for identifying a research question, as indicated by Dana and Yendol-Hoppey (2008, pp. 15–48). After analyzing more than 100 teacher classroom research studies, they identified eight passions as possibilities for finding a research question:

1. Helping an individual child
2. Improving and enriching curriculum
3. Developing content knowledge
4. Improving or experimenting with teaching strategies and techniques
5. Exploring the relationship between your beliefs and classroom practice
6. Exploring the intersection of your personal and professional identities
7. Advocating social justice
8. Understanding the teaching and learning context

Characteristics of Good Research Questions

What constitutes a good teacher research question? (See examples in Table 11.1.) A good classroom action research question should be meaningful, compelling, and important to you as a teacher-researcher. It should engage your passion, energy, and commitment. It has to be important for your personal and professional growth; it should stretch you intellectually and affectively. You should love the question.

A good research question is manageable and within your sphere of influence. It is consonant with your work; you can address it within the confines of your classroom. It is focused and not so ambitious, big, or complex that it requires extraordinary resources, time, and energy.

A good research question should be important for learners. A good research question benefits your students by informing your teaching and the curriculum, by providing new insights about students and their learning, by broadening and deepening your perspectives, or by improving practice.

A good research question leads to taking an action, to trying something out, to improving a teaching/learning situation, to implementing actions that can make a difference in the lives of students. “No action without research—no research without action.” Even in those situations in which the goal of the research is to gain deeper knowledge and understanding of a student, such as in a case study or a descriptive review, it is assumed that the ultimate goal of such acquired knowledge and understanding is the improvement of one’s teaching or the advancement of student learning and/or development.

Table 11.1 Examples of Teacher Action Research Questions

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- What happens to the quality of student writing when we implement peer editing throughout our ninth-grade English classes?
 - How does the use of computers affect the student writing process in our fourth-grade classrooms?
 - What happens to student understanding of specific geometrical concepts when I incorporate exploratory exercises into the teaching of geometry in my classroom?
 - What happens to students' academic performance in our sixth-grade classrooms when we assign heterogeneous groups for cooperative learning activities?
 - How is student time on task affected when I assign middle-school students to co-ed groups in my classroom?
 - How can I use small-group activities and "recorders" to improve attentiveness during the presentation of new information in a class of students with behavioral problems?
 - What happens to my student's academic performance in history when I give daily quizzes on homework assignments?
 - What happens to student behavior in my classroom when I start my class with a short meditation, mind-relaxing activity?
 - What happens to the Massachusetts Comprehensive Assessment System (MCAS) scores of the students in my classroom when I don't teach to the test?
 - What happens to the reading comprehension of the students in our third-grade classrooms when we systematically differentiate instruction?
 - How can I use cooperative learning in my high-school mathematics class to improve student learning?
 - How can we use learning centers to help the children in our second-grade classrooms improve their writing?
 - What happens to student learning in my classroom when I use a project-centered approach to teaching the geography of Egypt?
 - How can we improve students' interpersonal relationships in our classrooms through regularly scheduled small-group meetings?
 - How can I use cooperative learning to increase student translation fluidity in my ninth-grade Latin class?
 - How can I help non-English speakers transition into my classroom of English-speaking kindergartners?
 - How can I help facilitate Tim's expressive language development in my preschool special-needs classroom?
 - How can I construct and use student feedback to improve my instruction in English?
 - What happens to student attitudes about mathematics when we daily emphasize functional math in our classrooms?
 - How can I construct and use student feedback to improve my instruction in English?
 - What strategies can I use to build productive learning relationships in mathematics with the middle-school students in my classroom?
 - What happens to EC's learning of mathematics when I make the Everyday Mathematics program more accessible to her?
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A good research question is authentic—you have to own it. You are not disembodied from the research. That is why I encourage the use of the personal pronouns *I* or *we* and phrases such as “in my classroom” or “our students” in the statement of the research question. When you own the question and acknowledge your subjectivity, you are more likely to invest yourself in the research.

A good research question doesn’t lead to a yes or no answer. It is specific but sufficiently open-ended to facilitate meaningful exploration and to provide opportunities for deep and rich understandings of teaching and learning in the classroom. The question needs to be “open-ended enough to allow possibilities to emerge” (Hubbard & Power, 1993, p. 23). Responding to the more open-ended research question will more often than not generate multiple directions and further research questions. On changing questions, Catherine Battaglia (1996), a classroom teacher, offers this advice from her experience with the action research process:

Change questions! The questions I ask regarding my practice keep changing. Action research involves refining questions until you feel you have landed upon the right ones. I now see that the way you frame questions will, inevitably, determine the methodology you plan to study them. Differentiated solutions and subsequent understandings will be generated by the way questions are posed. . . . Action research is so much a matter of “seeing” that it is a good idea, I found, to develop a little intellectual schizophrenia. Be your own arbiter. Wear another hat, use a different lens, try to unpack your thinking in a different way. . . . Don’t fall in love with an idea when it is the only one you have. Have the courage to kiss them goodbye. (p. 91)

And McNiff, Lomax, and Whitehead (2006) make clear that cyclical changes in questions and issues are integral to action research:

People change all the time and their social situations change with them. This is one of the delights of working in action research . . . because you can see how one research question can transform into another and also how one issue can act as grounds for new issues to emerge. Nothing is ever static. We are constantly changing ourselves and our contexts. This kind of transformation of existing issues and questions into new ones can help your ideas and practices as ongoing cycles of action and reflection. (p. 117)

Framing the Research Question

In our eagerness to begin a research study, there is sometimes a tendency to try to state the question as soon as possible. It is advisable not to hurry the question. Identifying and framing the research question should be done carefully after mulling over and contemplating many different angles of the issues confronting you. As you reflect on the teaching and learning situations in your classroom let ideas percolate, brainstorm questions and play around with them, talk about your questions with colleagues, and let the questions emerge over time until you feel ready to frame the question that will guide your inquiry. Begin with “grand tour questions” (Spradley, 1979) such as: What is happening here? What problems are most salient about my teaching situation? What might happen if I change something in my teaching situation?

Once you have narrowed down the question, it should be framed so that the issue you are investigating is clearly and concisely stated. The action or intervention you intend to implement needs to be clearly stated. The question should be free of jargon and value-laden terms. Research questions beginning with *what*, *why*, or *how* are usually broader and get at explanations, relationships, and reasons. In discussing her experiences as a teacher-researcher, Carol Avery (1990) describes how framing her questions with *what*, *how*, and *why* changed her way of seeing children:

As a teacher researcher I became a learner in the classroom concerned with what my students were learning and how they were learning. I experienced the classroom as a collaborative venture and examined not only how I functioned but also how we worked together and why strategies did or did not work. Asking questions of how and why led the way for me to delve into children’s individual learning patterns, to see children in the context of their unique situations, and to understand and value the richness of their differences. I developed a responsive mode of teaching; I became more flexible in dealing with the children. (p. 37)

I recommend that the personal pronoun *I* or the collective personal pronoun *we* appear in the research question, asserting your ownership of the question and your personal agency in addressing the research problem. The use of the personal pronouns *we* or *I* also acknowledges that in all research, “subjectivity is invariably present,” and “researchers should be meaningfully attentive to their own subjectivity” (Peshkin, 1988, p. 17). I cannot emphasize too

much how important I believe it is to put the *I* (or *we*) at the center of the research question. The rationale for the inclusion of the personal pronoun is succinctly and eloquently stated by McNiff, Lomax, and Whitehead (2006):

How do “I” fit into the **research**?

- I am the subject and object of the research.
- I take responsibility for my own actions.
- I own my claims and judgments.
- I am the author of my own research accounts.

How do “I” fit into the **action**?

- by seeing my own practice as the central focus of my research through critical reflection and self-study
- by encouraging others to participate is a negotiated definition of shared practices
- by showing respect for other ways of doing things
- by showing humility and exposing my vulnerability
- by being open to argument
- by being willing to accept that I could be wrong
- by owning my mistakes
- by standing my ground when my principles are at stake. (p. 17)

In framing the research question, it helps to consider the wide range of variables that can affect your study. One of the exercises I ask teachers and teacher-interns to consider is to identify all the variables that could influence teaching and learning in their classrooms. They brainstorm lists of variables, including student variables, teacher variables, classroom variables, schoolwide variables, parent variables, and community variables (see Tables 11.2, 11.3, 11.4, and 11.5). A number of outcomes emerge from this exercise. As they examine and discuss the relevance of the variables to their work, teacher-researchers begin to develop a deeper appreciation of how complex teaching and learning are and a much richer understanding of how contextually circumscribed the classroom is. They also begin to realize that there are many factors over which they have no control in their teaching and in their research; to frame a manageable question, they must focus on those variables they can control. Finally, they begin to value the open-ended question that focuses on their classrooms

(Text continues on page 247)

Table 11.2 Student Variables That Can Affect Student Learning

• Gender, race, and/or ethnicity	• Intellectual impairments
• Prior education	• Intellectual strengths—multiple intelligences
• Prior knowledge and experiences	• Self-concept
• Health	• Hobbies and interests
• Physical disabilities	• Behavioral issues
• Age	• Motivation to learn
• Socioeconomic status	• Level of participation in class
• First language	• Reading comprehension and skills
• Learning styles	• Language skills
• Peer relationships	• Physical appearance
• Special talents	• Attitudes and dispositions
• Emotional health	• Family mobility
• Size and stature	• Single-parent versus two-parent family
• Athletic ability	• Social skills
• Personality	• Values
• Interpersonal skills	• Home life
• Nutrition	• Student culture
• Sleep	• Afterschool activities
• Special needs	

Table 11.3 Classroom Variables That Can Affect Student Learning

• Size and configuration of classroom space	• Availability of computers and other instructional technology
• Light	• Class size: number of students
• Temperature	• Classroom décor: displays of student work, displays of commercial materials, few or no displays
• Seating arrangements	• Carpeting
• Availability of curriculum resources and learning materials	

• Number of adults in the classroom	• Teacher’s desk arrangements and location
• Number of children with special needs	• Configuration and location of student desks or work stations
• Transition times	• Noise levels, acoustics
• Access to manipulatives	• Supportive or nonsupportive learning environment
• Location of classroom in the building	• Student responsibility and leadership in class
• Age-appropriate environment	• Patterns of classroom interactions
• Class schedule of learning activities	• Availability of music and art materials, displays of student art
• Attractiveness and stimulation of physical environment	• Classroom safety
• Classroom pacing	• Modular age-appropriate furniture
• Classroom disruptions	• Ventilation
• Classroom rules (where do they originate and how are they communicated)	• Blackboards and other similar equipment
• Classroom culture	• Emotional and affective climate
• Class climate: student centered or teacher centered?	• Availability of print materials
• Pathways in classroom; traffic flow	• Greeting of students each day
• Classroom routines	• Snack time

Table 11.4 Teacher Variables That Can Affect Student Learning

• Professional preparation	• Personality
• Content knowledge	• Prior experience
• Knowledge and understanding of children	• Classroom management effectiveness
• Philosophy of education	• Collegial and administrative support
• Motivation to teach and commitment to teaching	• Teaching style and specific instructional approaches
• Knowledge of pedagogy	

(Continued)

Table 11.4 (Continued)

• Enthusiasm	• Authenticity
• Gender, race, and/or ethnicity	• Knowledge of and skill in cooperative learning
• Ability and commitment to individualize instruction	• Ability and motivation to team-teach
• Emotional disposition	• Practice of reflection and self-assessment
• Interpersonal and social skills	• Participation in professional development
• Health and energy level	• Sense of identity and integrity
• Expectations and assumptions about student learning	• Physical disabilities
• Patience	• Commitment to diversity and social justice
• Hobbies and interests	• Knowledge of multicultural pedagogy and curriculum
• Level of education	• Involvement and experience in writing individualized educational programs or plans (IEPs)
• Age	• Skills and attitudes about collaboration
• Size and stature	• Teacher culture
• Physical appearance	• Organizational and leadership skills
• Motivation skills	
• Knowledge of curriculum	
• Approaches to assessment	
• Self-concept	
• Attitudes about teaching, learning, and children	
• Professional and personal confidence	

Table 11.5 School Variables That Can Affect Student Learning

• School culture	• Hidden curriculum
• Principal's leadership	• School philosophy of education
• Parental involvement and parent-teacher organization (PTO)	• Organization and structure
• School mission and academic programs	• Size and configuration
• Formal curriculum	• Budget and resources
	• Student culture

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| • Extracurricular activities | • Class sizes |
| • Athletic program | • Heterogeneous or homogeneous grouping |
| • School schedule and traffic patterns | • Elementary, middle school, or high school |
| • Staffing arrangements | • Formal and informal communication systems |
| • Demographic composition of student body | • Public/private/parochial |
| • Physical appearance of the school | • Teacher culture |
| • Resources (learning, curriculum, and technology resources) | • District regulations |
| • Special facilities (library, computer labs, gym, cafeteria) | • Dress code |
| • Philosophy of discipline | • Support programs available (counseling, reading, special education) |
| • Teacher and staff demography | • Commitment to diversity, inclusion, and social justice |
| • Partnerships with other institutions | • Learning priorities |
| • Transitions between classes | • Opportunities for professional development |
| • Student leadership and engagement | • Community support |
| • Student activities, clubs, and organizations | • Teacher leadership |
| • Before- and afterschool programs | • Safe environment |
| • Teacher/student ratio | |
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because they sense they can engage a wide range of variables without compromising the outcome of their inquiry; by such engagement, they can capture in their research the fibrous complexity of teaching and learning.

It is appropriate to close this discussion regarding finding and framing the research question with the words of Denise Dabish (2001), who teaches Spanish at Gilbert High School in Gilbert, Arizona:

In the end, I feel I have learned a great deal more than the answer to my research question. I believe that by becoming a teacher researcher I have rediscovered my desire to teach and my quest for

improving how I teach. When I think about the path I took to become a teacher researcher I am no longer scared of being a teacher who conducts research. I kept wondering how my research was going to take shape. . . . I had to trust what I was doing was going to point me in the right direction. Now I know that simply starting with a question is all the information one needs to embark on an incredible journey of teacher discovery and research. Already I find myself wondering about what intriguing, important questions I will “live” next year as my students and I learn and grow together. (p. 5)

Conducting a Literature Review

Hart (1998, p. 27) suggests that a good literature review serves several purposes in facilitating the inquiry process, including helping the researcher to: distinguish between what has been done and what needs to be done; understand the structure of the problem; discover important variables relevant to the study; identify relationships between ideas and practice; identify areas of controversy in the research; establish and define the social, educational, or cultural context of the problem or question; identify methodologies and research approaches that have been used and could be employed in conducting the research; and place the research within an historical context.

In doing a literature review, it is critical that the teacher-researcher be mindful of the potential limitations of a review. Onwuegbuzie and Leech (2005) and Wolf (1986) cite a number of factors that limit the appropriateness, comprehensiveness, and representativeness of material included in a review:

- Selective inclusion of studies, often based on the reviewer’s own subjective assessment of the quality of the underlying studies
- Failure to examine the characteristics and attributes of the studies as potential explanations for consistent and contradictory findings across studies
- Failure to consider the context under which each of the studies took place
- Differential subjective weighting of studies in the interpretation of a set of results
- Misleading interpretations of study results
- Confirmation bias

- Overreliance on findings from either qualitative or quantitative studies
- Failure to examine moderating or mediating variables in the underlying relationships

Among teacher-action-researchers, I have found there are mixed feelings and attitudes about the role and the timing of the literature review in conducting classroom or school research. Some teacher-researchers have told me that they have found themselves unconsciously bowing to the “expertise of the printed word,” deferring to the authority of the printed text, and becoming unduly influenced in an unproductive way and intellectually deflected from their work by research approaches, conceptual frameworks, and theories generated mainly by university faculty. Consequently, they begin to doubt and lose trust in their own thinking and work. Other teacher-researchers have expressed concern that, in conducting a local classroom-based study, a review of the literature is not worth the time and energy required to do it; they point out that many published teacher research studies do not include literature reviews. Other teacher-researchers have demonstrated their skepticism and resistance to “truth coming down from on high,” whether from research institutes, think tanks, universities, or what they perceive as arcane research publications; they have no trouble designing studies to address their classroom issues without a literature review.

However, based on my experience in working with classroom teachers and teacher-interns doing action research studies, I believe that a review of the relevant research literature is essential. (Indeed, this book is a case study of a literature review writ large.) A good literature review can help in focusing your research question, developing your research methodology and data collection procedures, identifying a conceptual framework for your research, making you more critical about your assumptions, situating your inquiry within context, identifying gaps in previous studies, identifying flawed methodologies or theoretical approaches, and identifying controversies in the research literature. A literature review also provides a check for testing your findings and conclusions and helps you to make meaning out of your findings.

Because of the recursive, iterative, spiraling, and cyclical nature of action research, it is imperative to recognize that, as new questions and issues emerge, you may find that you are reading a different literature than the one you had anticipated at the beginning of your

study. Often, the relevant literature is identified by emerging data and your interpretation of the data. In action research, then, the literature review can be considered not a static collection of literature but rather an evolving, shifting, and changing body of work that is in a reciprocal relationship with the dynamics of the action research process. The iterative and recursive nature of the research affects the literature review, and the changing literature review affects the conduct and direction of the research.

Based on their experience in working with action researchers over the years, Holly, Arhar, and Kasten (2005) suggest several ideas for consideration in doing a literature review:

- Read broadly and generally, at first, then read more narrowly.
- When you are researching a novel topic that seems to have few resources, look for related topics and then synthesize them.
- Consult primary resources where possible. . . . The rule of thumb is use as many primary resources as is possible and feasible, and to check secondary sources to make sure that the information quoted is accurate.
- Ask for help. A few well placed questions to a librarian, media specialist, and colleagues can be helpful.
- Read enough to get started, but not so much that you become too exhausted to conduct your study.
- Read with a critical eye. . . . What are the theories, assumptions, and frameworks of the researchers? Are they plausible? Are they consistent with what you know? What is explained? What is left for interpretation? (pp. 114–115)

The information sources for conducting a literature review are varied and many, including books; professional journals; official government publications; research reports issued by foundations, professional organizations, and government agencies; theses and dissertations; and Internet resources such as blogs, podcasts, wikis, and Web sites. (For additional information about using the Internet as a teaching and information resource, see Green, Brown, & Robinson, 2008; Nelson, 2008; Richardson, 2006.) Appendix B provides an annotated list of teacher action research Web sites, and Appendix C lists the Web sites of leading professional educational and research organizations—rich resources for searching and finding information to support a literature review.

Identifying Data Sources

The biggest challenge in conducting action research is to collect and analyze data while you are in the midst of taking an action. As you are implementing an intervention to improve student learning or to make a change in your teaching practice, you have to be mindful of the details that will make the intervention successful while at the same time remembering to carefully collect and analyze data that will determine the degree of success or the need to modify the intervention.

Data are everywhere. An abundance of data can be found in classrooms, schools, and communities; data are all around the educational environment. Data collection should be a thoughtful, planned, and purposeful process. A good data collection plan will help participants think through important questions for data gathering, facilitate coordination of resources and timelines so that data are gathered by design rather than by chance, and bring clarity so that data are collected right the first time. A good data collection plan addresses the following questions:

- Why are we collecting the data?
- How are the data related to the research question?
- What will the data tell us about the research problem?
- What kind of data will yield the best information? What counts as data?
- What data will we collect? How much data will we collect? Will data be easy or difficult to collect?
- Who will be using the data? Who will be seeing the data?
- What data sources will we use to collect information?
- When will the data be collected?
- Who will collect the data?
- How will the data be collected and analyzed? How systematic will data collection be?
- How will the data be organized? How will the data be displayed?
- What criteria will be used to analyze the data?
- How will the data be recorded and shared?
- Where will the data be housed?

Schools include innumerable data sources; data can be found in every classroom. An exercise I ask of teachers and students who are

involved in designing and conducting action research studies is to gather in small groups and brainstorm as many data sources as they can. When the groups come together to share their work and develop a common master list of data sources, the large number of resources available for generating data to address their research questions often surprises them. Table 11.6 is a list of more than 50 different sources for gathering data that was brainstormed by one group of teacher-researchers. These data sources can be grouped into three categories:

Existing archival sources are those items currently available in the files or archives of the school or of individual staff members. The collection of data from these sources requires little effort and time. Data include: student grades, attendance patterns, number of referrals, retentions, number/percentage of students in special programs, standardized test results, school mission statements, staff development plans, meeting agendas, discipline records, counseling service referrals.

Conventional sources are items that require communication, observation, or follow-up with members of the population and that often require instrumentation to standardize the information collected. Conventional sources include simple interviews, surveys, number of books read, writing samples, variety of materials used, observations, and journals.

Inventive sources are usually more creative, complex, and deep. We use these sources when we want deeper or qualitatively different information than we can gain from existing and conventional sources. Inventive sources include authentic assessment, performance assessment, exhibits, portfolios, expositions, videotapes, photography, and children's drawings.

Whatever data sources are used, it is important to collect data as you go along. As one teacher-researcher, Phillip White (1998), a third-grade teacher at McElwain Elementary School in Denver, Colorado, advises:

I cannot stress too strongly the need to make sure that you are gathering all the data at the moment it is there. When I went back to check my field notes on the class time that I described in this essay, I discovered to my chagrin that I had not documented what I had written on the dry erase board. After the

Table 11.6 Data Sources for Classroom/School Research

<ul style="list-style-type: none"> • Physical configuration of classroom • Running records • Individual Educational Plans • Formal teacher evaluations • Curriculum materials • Lesson plans • Classroom tests and quizzes • Formal assessments • School mission and goals statement • School and district organizational and informational materials • Local community newspaper • School, school district, and teacher association newsletters • Reviews of professional literature • Class sociograms • Student progress reports • Student assessment of teaching • Pre- and posttesting of students • Fieldnotes • Teacher planning materials/teacher plan book • Professional journals • Observational checklists • Views and opinions of before- and afterschool providers • Standardized tests • Student work samples • Professional development plan 	<ul style="list-style-type: none"> • School-community demographic data • Shadowing of students • Meeting agendas • Handouts from curriculum and professional development workshops • Exhibits • State assessment testing data • Student suspension, expulsion, and dropout rates • Student autobiographies • Teacher and student journals • Surveys of parents, teachers, and students • Interviews with parents, teachers, and students • Focus group interviews with parents, students, and colleagues • Photographs • Video- and audiotape recordings • Informal feedback and informal assessments • Observations of teaching by teacher and/or colleagues • Tally sheets/checklists to record specific behaviors • Student and teacher portfolios • Student self-assessment • Conferences with teachers and parents • Report cards
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(Continued)

Table 11.6 (Continued)

• Collaborative dialogue sessions with colleagues and specialists	• Number and percentage of students in special programs
• Curriculum-based assessments	• Student referrals to counseling
• Records of attendance and student participation	• Student discipline and retention records
• Student cumulative records	• Expositions
• Self-evaluations of teaching	• Norm-referenced testing data
• Student drawings and artwork	• Teacher/student ratios
• Internet sites for action research and education	• Teacher attendance rates
• Student writing and stories	• Blogs

class left, I was tired and the next class was coming through the door, along with the instructor. I looked at the board, at all that was written, and thought, "I don't need to write that down. I'll remember." But, I didn't. Happily, when I began writing this essay I was able to contact members of the class and use their class notes for documentation. But, I've learned my lesson. Save as much documentation as possible. It will be valuable in the future. (p. 6)

Collecting and Analyzing Data

Power (1996); Stainback and Stainback (1988); MacLean and Mohr (1999); Shea, Murray, and Harlin (2005); and the Madison Metropolitan School District Web site, *Classroom Action Research* (<http://www.madison.k12.wi.us/sod/car/carhomepage.html>) recommend several ways teacher-researchers can analyze the data they have collected. Their recommendations serve as "rules of thumb" and are not meant to be construed as prescriptions. Always keep in mind, as you proceed with the analysis of data, that action research is a recursive, dynamic, and cyclical process of inquiry.

Inquiry cycles are messy and are not necessarily discrete or linear. They can move much more fluidly, double back on themselves,

and take unpredictable routes. Moving from fog to clarity, and back to fog can be part of the process. Just because the inquiry is making less sense does not necessarily mean you are going in the wrong direction. (Ladkin, 2004, p. 125)

These rules of thumb are not meant to be viewed as linear steps to be followed in a sequential manner. For example, as you begin to collect data, you may find that your analysis of the data suggests a significant modification in your research question. When you modify the question, it then may lead to collecting new data. This is the process of recursion.

1. Triangulate the data (see Table 11.7). Study the research question from at least three separate pieces of data and three points of view. I usually advise teachers and teacher-interns, in constructing their action research studies, to use mixed research methods, a combination of quantitative and qualitative approaches, for purposes of triangulation. I encourage them to identify five different data sources. For example, those five data sources might be your journal observations, recorded comments by a student or students, survey data collected from parents, student test data, observations and feedback from colleagues, and samples of student work. As you collect your data, ask yourself if the research question still fits the data that are emerging from the study.

2. Sift through and put into order everything you have collected, making notes as you go. As you examine the data, continually compare the data that were collected earlier in the study with data collected later in the study. Use different bases for comparison. For example, if you have conducted a study on the impact of student learning centers on reading comprehension, you might compare what the students did in October with what they did in May or June, or you might try comparing students' written work with their oral work or a combination of both.

3. Design a systematic approach to analyze your data. This may develop as you become more comfortable with what you are learning. Categorize and clarify the data and determine how to arrange the data findings, organizing the data chronologically, by importance, and by frequency (how often an incident occurs), for example. Organize the data based on what you are really learning from the

Table 11.7 Triangulation Matrix

<i>Research Question</i>	<i>Data Source 1</i>	<i>Data Source 2</i>	<i>Data Source 3</i>	<i>Data Source 4</i>	<i>Data Source 5</i>
1. What happens to my students' learning when I introduce primary sources into our history curriculum?	Daily teacher journal entries	Student narrative feedback	Samples of student work	Records of student grades, teacher assessments, and attendance	Supervisor feedback
2. How do the various assessment strategies of a new science curriculum and those that I design meet the learning and emotional needs of my students?	Surveys of students	Test scores from three different tests	Student journals	Small group-focused interviews of students	Individual interviews of students
3. What happens to my students' behavioral engagement in class when I use a variety of strategies to teach English?	Teacher journal entries and classroom observations	Student self-assessments	Teacher and student surveys	Student grades	Student attendance
4. How can I use student feedback to improve my instruction?	Student questionnaire	Informal and formal assessments	"Exit tickets" at the end of each lesson to gather student feedback	Observations of other teachers and interns	Performance on essays and quizzes
5. What happens to my second-grade students' reading comprehension abilities when I use drama activities to interpret texts?	Teacher journal entries	Student artifacts and classroom work	Running records	Developmental Reading Assessments (DRA)	Video recordings
6. What happens to kindergarten students' learning of sight word vocabulary when I use guided reading with a balanced literacy approach?	Marie Clay letter identification assessment and the Marie Clay word vocabulary dictation	Ohio Word Test	Student interviews	Home survey concerning literacy habits	Samples of student work

data, not on any assumptions you brought with you to your analysis. Develop charts, columns, outlines, and ways of counting occurrences. Coding your findings will help categorize the data. You can make up different categories that fit the teaching situation(s) or use categories developed by another researcher. Watch for ways that the data develop into categories different from what you expected, and explore those differences.

4. Review your information after it is coded to determine if there is a frequency of certain phenomena or powerful, unusual comments, events, or behaviors that particularly interest you. One occurrence may give you a new insight while another may be most important in helping you to reframe your research question.

5. Let the data influence you. Do not be afraid to let the data influence what you are learning as you go deeper with your analysis. Look for what doesn't fit the assumptions or theories of other researchers, and note what stands out or goes against the grain. Don't censor the data, even if you don't like what you are learning.

As a human you cannot help but be influenced by the data you collect. It is common, therefore, to change a particular teaching strategy, the sources of data, or even the focus of the study as you are collecting data. This is acceptable as long as you let the reader know what you did and why you did it. (Johnson, 2008, p. 63)

Include data that don't necessarily reflect change or growth. Jot down ideas for actions you will take as a result of what you are learning. As you study the data keep in mind the reciprocal relationship between context and action—where action is a product of context, and context is a product of action.

6. Examine and study your data several times. New ideas will occur to you with a fresh perspective. Speculate. Identify repetitive words, phrases, ideas, beliefs, or values, as well as similarities and differences. Identify points that occur more frequently and are more powerful. Look for themes and conceptual and attitudinal patterns to emerge. Key words and phrases can trigger themes. Determine these themes by scanning the data, not by relying on your preconceived ideas of what you think the categories are. Narrow the themes down to something manageable. Look for those unique ideas that you had not considered; they might influence your thinking. Some ideas may fit into more than one theme. Create subgroups under each theme. Insights emerge unexpectedly.

Data we anticipate being very rich and illuminating may be less so than other sources of information and the importance of remaining open to our data collection methods is crucial. . . . It is important to avoid premature closure and pre-emptive judgments. (James, 1999, p. 88)

Try out different hunches about what the data mean. Look to see if there are any factors or variables that might cause you to distrust the data. Make an educated guess and then see if it is supported by the data. Don't stick rigidly to an assumption or hypothesis that was originally held.

7. Write continuously to document actions and ideas as they take place. Writing can reveal meaning and significance to you in the act of writing itself. As you proceed through the action research process, make notes. Jot down what you are seeing, what questions are emerging, and what you are learning. Keep notes on those new ideas that are unanticipated. These may be findings or surprises you had not planned. Rewrite the question several times, modifying or changing it when necessary to fit what's important from the data that have been collected. What is it that you really want to figure out? Sometimes, you will want to make the question more global, whereas sometimes, the question may become more tightly focused.

8. Create a visual representation for what you have collected. Look for patterns related to time and sequence as well as patterns related to differences in other factors. A grid, an idea map, a chart, or some visual metaphor—these are all possibilities to help make sense of the data and display a powerful presentation of your ideas. Map out your data; draw it all on one page. Sketch the metaphors that come to mind when thinking of the data and what it all means. Use colors and shapes to separate ideas. Think about creating visual images of what you are learning using diagrams, sketches of things, people, and happenings to show different ideas and groupings. (See Depka, 2006.)

9. Abstract and distill. State the core of your findings as if you had to summarize and encapsulate the essence of your study in an abstract of 50 words or less. What matters most in these data? Think about writing an abstract that would be part of a conference program. What story do you see emerging from the data?

10. Consult with and involve your students. Ask your students what they think about what you are observing and writing about. They may offer new ideas about their learning or validate what you are finding. Students may become coresearchers, but be careful of compromising confidentiality.

11. Take a break away from the study. Sometimes, it helps to take a break from the research process to clear your mind and give yourself a rest. Coming back to the process with a refreshed outlook will often lead to new understandings and perspectives.

12. Confer with colleagues—with your critical friends group. Share your findings with your research group, your critical friends. Discuss the research approach you used. Explain the data interpretations. Do they see the same things? Consider their different interpretations and use them to clarify, broaden, and otherwise validate the findings. Do new questions emerge from this discussion? State your theories. You build your ideas about teaching as you try out new strategies. Theories emerge from and are grounded in practice. Ask your research group to help you look at your data from multiple lenses and data sources, to help you interpret your findings, and to draw conclusions and implications for future teaching.

Drawing Conclusions: Finding Meaning

From the data analysis, one needs to develop the conclusions and implications of the research for teaching and learning. Data don't stand alone. It is the meanings we apply to the data that are critical. However, it is important not to make any inferences from the data that the data will not support or to generalize the findings of the research beyond the study's parameters as defined in the research question. Engage in dialogue with your critical friends to unearth the meanings and conclusions of your study and their implications for practice. What story or stories do the data tell? What meanings can be found as a result of the data analysis? What have you learned about your teaching practices? About student learning? What effect has the research had on you as an educator and person? What changes have you made in your teaching approaches? Does the data analysis confirm or disconfirm the effectiveness of the action or intervention you planned and implemented to

improve student learning? Has your research question been answered, or have more questions emerged? What are the implications of your study for improving the teaching practices of colleagues? Were there unexpected findings? What new questions would you ask for future action research studies?

This phase of the action research process should bring the research together, providing an interpretation of the data, a summary of critical conclusions, and recommendations for further research. The conclusion section is important because it offers the last opportunity to communicate the significance and meaning of your research. The conclusions should be solidly anchored in the findings of the study. If there are significant differences between what the data say about the research question and what you expected, then these differences should be explored and viewed as rich opportunities for learning. Such differences can catalyze new perspectives and questions. In discussing the conclusions of your study, it is imperative that you delineate the limitations of your findings and of the research study. You do not want to inadvertently overgeneralize the findings or add an opinion that is not supported by the data.

Evaluating Your Action Research Study

As you proceed in completing your research study, it is important that you assess its development and outcomes. Waterman, Tillen, Dickson, and De Koning (2001) suggest helpful guidelines, which I have modified to include the present and past verb tenses in some instances to capture the fluidity and dynamics of your study in assessing it as you progress through various stages:

1. Is/was there a clear statement of the aims and objectives of each stage of the study?
2. Is/was the action research relevant to the participants in the study? Relevant to their issues, goals, and experiences?
3. Are/were the different phases of the study clearly outlined? Did recursion and iteration occur? For what reason?
4. Are/were the participants and the stakeholders and the process of their selection and involvement in the study clearly described?

5. Is/was the context of the research fully described?
6. Is/was the relationship between you and participants adequately considered?
7. Is/was there a clear discussion of the actions taken and how they may have been adjusted in response to local events, participants, and evolving data? Have you described how and why the action intervention was identified?
8. Are/were ethical issues encountered, and if so, how are/were they addressed?
9. Is/was the length and the timetable of the study realistic?
10. Are/were data collected in a way to address the research questions? What data are being/were collected and how are/were they collected?
11. What steps were taken to advance the rigor of the findings? To what degree was triangulation employed?
12. Are/were data analyses sufficiently rigorous? How valid and reliable are the data?
13. Is/was the study design flexible and responsive? To what extent was the study recursive and iterative in its process? Were any changes made reflecting recursion and iteration generated by changes in the data or interpretation of the data?
14. Are/were there clear statements of the findings and outcomes for each phase of the study?
15. Do/did you link the data and the findings to your own commentary and interpretation?
16. Is/was the connection to an existing body of knowledge made clear?
17. Are/were the findings transferable to other contexts and settings?
18. Are/were your biases, assumptions, and autobiographical stances clearly stated?

19. How has the research study affected your students? What impact did your action intervention have on student learning?
20. How has the research study affected you and your teaching?

❖ SUMMARY

In this chapter, I have offered a number of suggestions for conducting an action research study. Major points to remember include the following:

- Conducting action research is challenging because the researcher not only conducts research but simultaneously enacts change in implementing an intervention.
- Initially, a modest research study is preferable to a more ambitious undertaking.
- It is important to identify and engage colleagues as critical friends who will work with you throughout the action research process.
- Identifying and clearly stating the research question is one of the most critical steps in doing action research.
- A good research question engages your energy, passion, and commitment; is manageable and consonant with your work; benefits students; is authentic and owned by you the researcher(s); and is sufficiently open-ended to facilitate meaningful and deep exploration of teaching and learning.
- The research question should be carefully framed and include the action or intervention that will be implemented and the intended outcome of the study.
- A good literature review helps to define the social, historical, theoretical, educational, or cultural context of the research problem or question.
- The literature review is in a reciprocal relationship with the action research process and evolves, shifts, and changes over the life of the research.
- Sources for conducting a literature search include books, journals, Internet resources, government publications, research reports, theses, and dissertations.