Action Research

Improving Schools and Empowering Educators

fifth edition

Craig A. Mertler

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Fifth Edition

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Arizona State University

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Brief Contents

Detailed Contents

Preface

PURPOSE OF THE TEXT

Most, if not all, graduate students in education—and, in particular, in-service teachers seeking graduate degrees—are required to complete a course in educational research methods. The majority of these methods courses provide a broad overview of educational research methods, designs, and techniques. However, I would argue that graduate-level research methods courses taught to in-service teachers could be more suitable provided the appropriate instructional materials were available to instructors and students, such that they focus on a classroom-based approach to research. Most research methods courses—and, therefore, their appropriate textbooks—follow the description that I offer above, in that they are "survey" courses (i.e., those that provide an overview of a variety of research methods). There are numerous texts on the market that meet this description.

In contrast, there are relatively few books that focus specifically on action research as a methodology, and there are even fewer that do so with the target audience of practicing educators in mind. The purpose of this book is to introduce educators to the process of conducting their own classroom-based or school-based action research. Detailed but practical information describing each step of the cyclical, iterative process is presented in a sequential manner. Educators are provided with an overview of traditional educational research prior to examining action research as a mechanism for designing and conducting their own applied research projects. The focus is not on the theoretical aspects of educational research but rather on the practical facets of conducting applied classroom and/or school research. As presented in this textbook, action research is not simply a means of conducting applied research. It is also a mechanism for engaging educators in reflective practice and customizing professional development opportunities in order to capitalize on the unique interests of individual educators or teams of educators.

The reason behind my desire to write a textbook on this topic is fairly straightforward. I have taught educational research methods for more than 20 years. The vast majority of the students enrolled in this course are in-service teachers seeking master's degrees in various fields, including curriculum, teaching, administration, and counseling. This course is intended to serve as an overview of research methods used to conduct research in the broad field of education, focusing primarily on quantitative methods. The focus is on very formal methodological approaches, such as descriptive, correlational, causal-comparative, experimental, and quasiexperimental research methods. The educators enrolled in a research methods course—especially those who intend on remaining in the K–12 setting—typically experience substantial difficulty in being able to see the application of these formal methodological approaches in their educational settings. The bottom line is that they do not really need to understand the application of these approaches to conducting research, since the majority will likely never design or conduct such formal

methodological procedures. It is my belief that this is the case for many graduate programs in education across the country.

On the other hand, when we reach the topic of *action research,* the discussion typically piques student interest. The students can actually see how *this* methodological approach could be used in their schools, in their classrooms, with their students, and so on. Since action research is conducted by practitioners—yet still incorporates a good degree of rigor—students begin to see themselves designing and carrying out action research studies. By focusing our attention on a broad overview of research methods, I feel that we are doing an injustice to these practicing educators. We are not providing them with the tools necessary to design and conduct research studies that provide meaningful and immediate solutions to local-level problems. In other words, we are not adequately preparing them to investigate problems and seek solutions in their local settings and in a professional manner.

The *practical* nature of the book stems from the fact that it focuses on research methods and procedures that teachers, administrators, counselors, intervention specialists, and so forth, can use in conjunction with their everyday instructional practices and activities in schools and classrooms. Educators are shown how to design and conduct school-based research in order to make their instructional practices more effective. The numerous examples—many of which are supplied by me, while others come from published action research studies—of the principles, procedures, and techniques discussed in the narrative make it easy for students to understand the material in this book. Theoretical aspects of research as well as highly technical concepts and procedures, which are unlikely to be used by practicing educators, are de-emphasized—producing a textbook that provides comprehensive coverage of action research methods for practicing educational professionals without being unnecessarily technical; that is, it is a practical book for educators. This book provides them with the knowledge and skills necessary to design research studies that seek solutions to local-level problems, conduct those studies, and communicate the results to local stakeholders and other interested parties. Although it is based on the research literature, the book takes a very practical approach, never losing sight of its intended audience—the practicing educator.

TEXT TARGETS GRADUATE STUDENTS, EDUCATORS

This book was written with graduate students as the primary target audience. Specifically, this audience includes but of course is not limited to K–12 classroom teachers, administrators, counselors, special educators, and intervention specialists. In all likelihood, this text would be used as the primary book for a graduate course in action research, although it could also serve as a supplemental text for other graduate-level courses not focusing on research methods (e.g., courses in curriculum, supervision). The book is appropriate for educators in all areas of education (e.g., elementary and secondary mathematics, science, social studies, languages, music, art, physical education, special education, administration, counseling, and special education); examples as well as sample articles throughout the book come from a variety of settings and situations.

TEXT ORGANIZED SEQUENTIALLY, LIKE AN ACTION RESEARCH STUDY

The main topics covered in the book pertain most closely to designing and conducting classroom-based applied research. These general topic areas—and the chapters where they are addressed in the book—include the following:

- An overview of educational research (Chapter 1)
- An overview of action research (Chapter 1)
- The characteristics of action research (Chapter 1)
- The action research process (Chapter 2)
- Identifying an area of focus for action research (Chapter 3)
- Reviewing related literature (Chapter 3)
- Designing an action research study (Chapter 4)
- Collecting and analyzing data (Chapters 5 and 6)
- Developing an action plan (Chapter 7)
- Writing an action research report (Chapter 8)
- Sharing the results of an action research study (Chapter 9)
- Reflecting on the process of action research (Chapter 9)

The book is arranged in this manner because it presents, in sequential order, the process of designing and conducting an action research study—beginning with the development of the topic to be investigated, reviewing related research, designing the study, actually carrying out the procedures, developing an action plan, and ultimately sharing the results and reflecting on the process. It is, however, important to note that action research proceeds through this process in a cyclical manner.

PEDAGOGICAL FEATURES AND BENEFITS TO STUDENTS (AS WELL AS INSTRUCTORS)

When compared with other action research books currently on the market, this book provides similar coverage of content. There are, however, several aspects that distinguish it from similar works. These aspects include the following:

- Since the book takes an extremely applied approach, it includes numerous examples—not simple discussions or descriptions—of such things as data collection instruments (e.g., checklists, attitude surveys, interview protocols, and journal prompts) and presentation of research results (e.g., tables and graphs resulting from the analysis of quantitative data; summary tables resulting from the analysis of qualitative data; actual reports of action research).

- In addition to the various narrative examples that appear throughout the book, two detailed case studies of action research, called "Action Research Portraits," are developed in Chapter 1 and are extended in each subsequent chapter throughout the book. In each chapter, the case study discussions continue from the previous chapter, highlighting the application of content from the particular chapter as integrated into two practically based action research studies, one of which is conducted by an individual teacher (at the elementary level) and the other by a pair of teachers (at the high school level). In addition, a third "Action Research Portrait" appears on the book's accompanying website (edge.sagepub.com/mertler5e).
- Numerous online resources are available for teachers to use in order to learn more about action research, address questions that they may have about the process, or promote dissemination of their action research results. A section titled "Related Websites" is included near the end of each of the nine chapters.
- Special sections, titled "Writing Up Action Research," are also included in Chapters 3 through 7 and Chapter 9. These sections provide annotated excerpts from published or otherwise disseminated action research reports, highlighting specific concepts presented in each particular chapter.
- On the first page of each chapter is a visual organizer for the main contents of that chapter.
- Three appendices follow Chapter 9. The first two include complete written reports of teacher-conducted action research projects. We have also included additional complete written reports of teacher-conducted action research projects on the website (edge.sagepub.com/mertler5e). The third appendix contains developmental templates to guide the novice action researcher. These templates are also included on the website.

Video Clip of Dr. Mertler discussing the new features of the 5th edition.

- Each chapter includes a bulleted "Summary" of the main points included in the chapter.
- Each chapter also includes a final section titled "Questions and Activities" that can be used to extend student knowledge, understanding, and application.
- The text also includes a complete glossary of terms related to action research, a list of references used to compile the book, and a comprehensive subject and author index.

NEW FEATURES IN THE FIFTH EDITION

There are several new features in the fifth edition of Action Research: Improving Schools and Empowering Educators:

- The discussion of rigor in Chapter 1 has been enhanced.
- Social justice advocacy has been added as an important application of action research.
- The discussions of ethics in Chapter 2 and Chapter 3 have been enhanced.

- The "Writing Up Action Research" sections that appear in Chapter 3 to 7 and Chapter 9 have been supplemented with call-out boxes highlighting the important aspects of each excerpt.
- Substantially enhanced presentations of establishing the quality of both qualitative and quantitative data have been added to Chapter 5.
- A discussion of the inclusion of abstracts has been incorporated into Chapter 8.
- The developmental templates shown in Appendix C—in addition to being provided in an interactive, electronic format on the Student Study Site (edge .sagepub.com/mertler5e)—are now also available at TeachersPayTeachers.com, called the *Action Research Mentor Portfolio*.
- Finally, two new complete action research reports have been added as Appendix A and Appendix B. Both reports are new to this edition. The complete written reports of teacher-conducted action research projects from all previous editions are available on the website that accompanies this book (edge.sagepub.com/mertler5e).

ANCILLARY MATERIAL ON THE WEB

Open-Access Student Study Site: edge.sagepub.com/mertler5e

This web-based Student Study Site provides a variety of additional resources to enhance students' understanding of the book's content and take their learning one step further. The site includes the following:

- Interactive PDF **Action Research Developmental Templates** are provided to assist and guide the novice action researcher through many of the steps and decisions in the process of designing and conducting original action research.
- **Video vignettes** of the author and several practitioner-researchers discussing various aspects of conducting action research. These vignettes are integrated with specific chapter content throughout the book.
- **Web quizzes** allow students to independently assess their progress in learning course material.
- **eFlashcards** are study tools to reinforce student understanding and learning of key terms and concepts that are outlined in the chapters.
- Chapter-specific **PowerPoint presentations** offer assistance by highlighting essential content, features, and artwork from the book.
- A ***Learning From SAGE Journal Articles*** feature provides access to recent, relevant full-text articles from SAGE's leading research journals. Each article supports and expands on the concepts presented in the chapter.
- Carefully selected, web-based **video resources** feature relevant content for use in independent and classroom-based exploration of key topics.

- Links to relevant **web resources** direct students to additional tools for further research on important chapter topics.
- ***Sample Action Research Reports*** are also included.

A NOTE ABOUT ACTION RESEARCH PROJECTS

One concern that both instructors and students face is how to fit into one semester both the content coverage of the book and the completion of a student-conducted action research project. My advice is first to reinforce with students who are just learning about action research that the important aspect of an action research project as a course assignment is to become familiar with the process of designing and conducting action research and that they should worry less about the final product of their study. If they can become familiar and comfortable with the process as a whole, they will later be able to design and conduct larger-scale research projects that may require more time.

For a typical 15-week academic term, I might suggest the following week-by-week activities, for both content coverage of the book and the associated action research project:

Week	Content	Project Activity
1	Introduction to the course and to action research	
2	Chapter 1: Overview of research	Brainstorm list of possible research topics
3	Chapter 1: Continued Chapter 2: Overview of action research	Continue brainstorming, discussing possible topics with instructor
4	Chapter 3: Topic refinement	Begin process of narrowing topic
5	Chapter 3: Reviewing related literature	Begin search for related literature
6	Chapter 4: Developing a research plan	Continue reviewing related literature; develop preliminary research design
7	Chapter 5: Data collection	Draft instrumentation, interview guides, etc.
8	Chapter 5: Continued	Revise instrumentation, interview guides with instructor
9	Chapter 6: Data analysis	Begin data collection
10	Chapter 6: Continued	Data collection continues
11	Chapter 7: Developing action plans	Data collection continues; begin data analysis
12	Chapter 8: Writing an action research report	Data analysis continues; draft action plan
13	Chapter 9: Sharing and reflecting	Finalize action plan; begin writing final paper
14	Informal presentations of projects and results	Complete written report
15	Submit final written report	

For a typical 10-week academic term, I might suggest the following week-by-week activities:

Week	Content	Project Activity
1	Introduction to the course and to action research	
2	Chapter 1: Overview of research	Brainstorm list of possible research topics
3	Chapter 2: Overview of action research	Continue brainstorming, discussing possible topics with instructor
4	Chapter 3: Topic refinement and reviewing related literature Chapter 4: Developing a research plan	Begin process of narrowing topic; search for related literature; develop preliminary research design
5	Chapter 5: Data collection	Continue reviewing related literature; draft and revise instrumentation, interview guides, etc.
6	Chapter 6: Data analysis Chapter 7: Developing action plans	Data collection; begin data analysis
7	Chapter 8: Writing an action research report	Draft action plan
8	Chapter 9: Sharing and reflecting	Finalize action plan; begin writing final paper
9	Informal presentations of projects and results	Complete written report
10	Submit final written report	

A FINAL NOTE FOR STUDENTS OF ACTION RESEARCH

I enjoy and value classroom-based/school-based action research because it has the potential to empower educators, to engage them directly in the process of educational improvement, and to provide a mechanism for customizing professional development. I will not mislead you into thinking that this is necessarily an easy road to travel. Learning how to conduct action research studies that will enhance your professional practice does, in fact, take time and practice. However, by gaining familiarity and experience with designing and conducting action research projects, you will, I trust, realize the substantial and positive professional, reflective outcomes of action research discussed repeatedly throughout this book. I sincerely wish you the best of luck in your action research endeavors!

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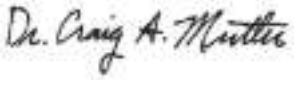

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Craig A. Mertler has been an educator for 30 years, 20 of those in higher education. He is currently an Associate Professor and Director of the EdD Program in Leadership and Innovation at Arizona State University. He teaches doctoral courses focused on the application of action research to promote educator empowerment, school improvement, and job-embedded professional development and also teaches quantitative research methods, introductory statistical analysis, multivariate statistical analysis, and educational assessment methods. He is the author of 20 books, 4 invited book chapters, 18 refereed journal articles, two instructors' manuals, and numerous nonrefereed articles and manuscripts. He has also presented more than 35 research papers at professional meetings around the country as well as internationally. He conducts workshops for in-service educational professionals (at all levels) on classroom-based action research and on the broad topic of classroom assessment. His primary research and consulting interests include classroom-based action research, data-driven educational decision making, professional learning communities, and classroom teachers' assessment literacy. Before teaching and researching at the university level, he taught high school biology and earth science and also coached track and volleyball. In his leisure time, he enjoys traveling with his family and playing golf. Dr. Mertler can be reached at Craig.Mertler@asu.edu or craig.mertler@gmail.com for consulting, professional development, and speaking engagements.

Part I

What Is Action Research?

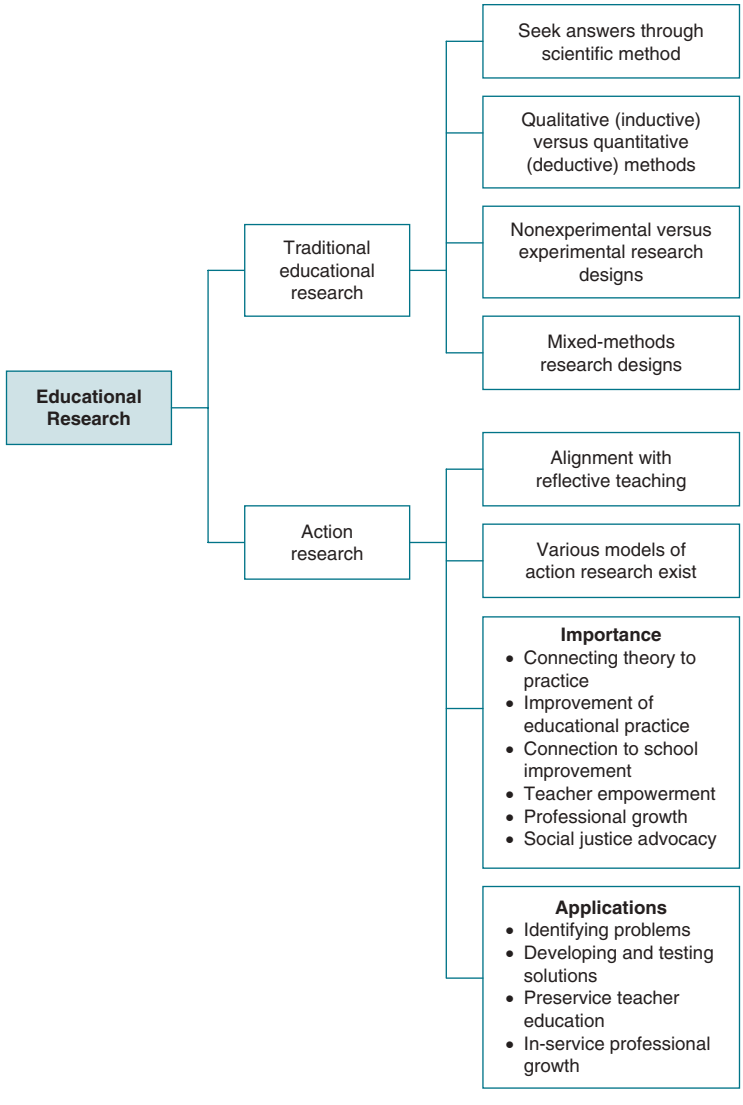
Chapter 1. Introduction to Action Research

Chapter 2. Overview of the Action Research Process

Part I of this book provides an introduction to and overview of action research. In Chapter 1, you will learn what action research is (and is not), how it compares with traditional forms of educational research, why it is important for teachers to become involved in action research, and some examples of its applications. You will also see several models of the process of conducting action research. In Chapter 2, you will learn more about the various steps in the action research cycle and see how it can be conducted within a contextualized example.

Chapter 1

CHAPTER 1 Organizer



Introduction to Action Research

Research—think about it for a few moments. What types of images come to mind? For many people, the term *research* tends to evoke images of scientists in white laboratory coats coaxing mice through a maze, observing their every move, action, and reaction. They closely monitor stopwatches, recording the amount of time that passes as the mice reach each stage of the maze. Further images called to mind might include chemists (yes, also wearing white lab coats!) with beakers, flasks, and Bunsen burners, conducting experiments that involve mixing chemicals in order to make new solutions or to further study the properties of those solutions. Another visualization could involve medical researchers who work with animals or directly with human "subjects" to investigate possible cures for devastating diseases. Still others may envision research as something done by college or university professors as a regular aspect of their work. For quite some time, research has been conducted primarily by professionals whose principal education included training in the conduct of research studies. Admittedly, much research continues to be conducted by professionals, such as those described in the four examples above. However, more and more research is being conducted by *practitioners*—people whose primary education and training is *not* in research methodology. The specific procedures for conducting this type of research are somewhat different from those that serve as the foundation for more formal types of research, but the guiding principles are the same. It is this type of practitioner-based research—known as *action research*—upon which we will focus our attention in this book.

WHAT IS ACTION RESEARCH?

Over the last decade, action research has begun to capture the attention of teachers, administrators, and policymakers around the country (Mills, 2011). Educators at a variety of levels have embraced it as something that makes conducting research a more "manageable" task and that brings about results that are more informative and have immediate and direct application. But just what is action research? What does it look like? What does it purport to accomplish?

Action research is defined as any systematic inquiry conducted by teachers, administrators, counselors, or others with a vested interest in the teaching and learning process or environment for the purpose of gathering information about how their particular schools operate, how they teach, and how their students learn (Mills, 2011). More important, action research is characterized as research that is done by teachers for themselves. It is truly a systematic inquiry into one's own practice (Johnson, 2008). Action research allows teachers to study their own classrooms—for example, their own instructional methods, their own students, and their own assessments—in order to better understand them and to be able to improve their quality or effectiveness. It focuses specifically on the unique characteristics of the population with whom a practice is employed or with whom some action must be taken. This in turn results in increased utility and effectiveness for the practitioner (Parsons & Brown, 2002). The basic process of conducting action research consists of four steps:

1. Identifying an area of focus
2. Collecting data
3. Analyzing and interpreting the data
4. Developing a plan of action (Mills, 2011)

You will learn much more about the process of action research later in this chapter and in Chapter 2.

Introduction to Educational Research

As classroom teachers—who are the ultimate, or at least the most likely, consumers of educational research—it is essential to have a basic understanding of several key terms and essential concepts related to the notion of research. Research is simply one of many means by which human beings seek answers to questions. Questions arise constantly throughout a day, whether they be personal or professional in nature. As an example of a personal question in need of an answer, imagine a coworker who asks if you would like to go to lunch this afternoon. You will need to give that person a yes or no answer, but you must factor in some information first—for example, do you already have plans for lunch? Can you afford to give up the time to go to lunch today? Do you have enough money for lunch?

Answers to questions of a professional nature often require much more information; however, human nature prompts us to try to find answers to those questions as quickly as possible. Consider the following scenario: You have a student, Arthur, whom you informally classify as an "unmotivated reader." You approach a colleague and ask about ideas for intervention strategies for motivating Arthur. She provides several strategies that she says have worked for other students, but you are not sure if they will work for Arthur. In addition, you know that there are undoubtedly many more strategies out there, but you need an answer now—the school year is off and running, and you do not want to lose any more valuable time by not encouraging Arthur to read more. But where do you go to find the answers you are looking for?

Mertler and Charles (2011) suggest that we usually consult sources for answers that are most convenient to us and with which we are most comfortable; however, these sources have the potential to be fraught with problems. These sources of information include tradition, authority, and common sense. **Tradition** refers to ways in which we have behaved in the past. Interventions that have worked in the past may in fact still work today, but there is no guarantee. In addition, there may now be newer interventions that will work better than our old standby. **Authority** refers to the use of the opinions of experts, who we assume will know what will work best. However, simply finding someone who has a strong opinion about a given intervention or instructional strategy does not necessarily support the use of that strategy. In fact, it is typically safe to assume that as soon as you find an expert who supports any given technique, you will quickly find another who is willing to denounce it as being inferior. Finally, **common sense** refers to the use of human reasoning as a basis for answering questions. While human reasoning has gotten our global culture far throughout history, it is most reliant on dependable information. If information that we collect in order to help us make commonsense decisions is of substandard quality or accuracy, our commonsense decisions will reflect those various deficiencies.

The main problem with these familiar sources of information is that they have a tendency to provide unreliable information. This is largely because of the fact that answers based on tradition, authority, and common sense use information that is biased to some degree. This bias occurs primarily because the information was collected in an unsystematic and subjective manner. In order for the answers we seek to be accurate and of high quality, we must obtain information that is both valid and reliable. This is best accomplished by using the scientific method. The **scientific method** is a specific strategy used to answer questions and resolve problems. You may recall the scientific method from a junior or senior high school science course when you may have been required to complete some sort of science fair project. What makes the scientific method such a useful strategy is that it is a very systematic, step-by-step set of procedures. In 1938, U.S. philosopher John Dewey described the scientific method as a procedure for thinking more objectively (Mertler & Charles, 2011). He presented the procedure as a series of the following steps:

1. Clarify the main question inherent in the problem.
2. State a hypothesis (a possible answer to the question).
3. Collect, analyze, and interpret information related to the question, such that it will permit you to answer the question.

4. Form conclusions derived from your analyses.
5. Use the conclusions to verify or reject the hypothesis.

It would be misleading to assume that all researchers—and therefore all research studies—follow these steps exactly. For example, it may not be necessary to formally state a hypothesis in some studies. Although not all research studies conduct the procedure exactly as described above, they do have one important thing in common. Collecting, analyzing, and interpreting information (Step 3 above) is always done in research. It is the result of this step that provides the necessary impetus that allows us to answer our initial questions.

How, then, is the scientific method related to research in the broad field of education? There is a great deal of similarity between the two. Simply put, **educational research** involves the application of the scientific method to educational topics, phenomena, or questions in search of answers. Educational research is typically carried out in the following manner:

1. Specify the topic about which a concern exists.
2. Clarify the specific problem on which the research will focus.
3. Formulate research questions and/or hypotheses concerning the main problem.
4. Carry out procedures by which data (a more appropriate term for "information") are collected, analyzed, and interpreted.
5. State the findings determined as a result of the data analysis.
6. Draw conclusions related to the original research questions and/or hypotheses (Mertler & Charles, 2011).

Note the similarities between Dewey's list of steps in the scientific method and those used to conduct educational research. The major components are common to both lists. In either case, it is important to remember that in practice these steps do not always occur as neatly as presented here, nor do they always follow the sequence listed.

Johnson (2008) also reminds us that, as consumers of research as well as potential researchers, we must be aware of the differences between science and pseudoscience. Science—the use of the scientific method for inquiry—uses perceived reality (typically in the form of collected data) to determine beliefs. In other words, data are collected and analyzed in order to determine what is believed:

An example of scientific inquiry is the Trends in International Mathematics and Science Study (or TIMSS). TIMSS resulted from the U.S. education community's need for reliable and timely data on the mathematics and science achievement of our students compared

with that of students in other countries. Since 1995, TIMSS has provided trend data on students' mathematics and science achievement from an international perspective. TIMSS uses standardized achievement tests, administered and scored in identical fashion, as the means of collecting student data. The tests are similar in content, form, and length in order to allow for comparisons. What makes this study "science" is the standardization and objectivity incorporated into the research design.

In contrast, pseudoscience uses beliefs to determine perceived reality. One begins with a strong belief and then looks for data to support that belief (Johnson, 2008):

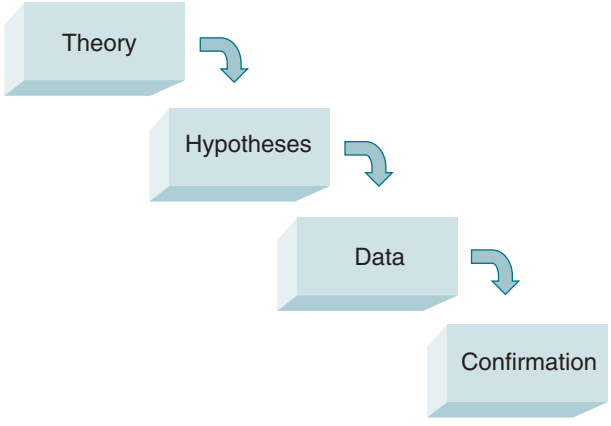
Pseudoscience is often used as a marketing tool by companies to sell products or by groups or individuals in an attempt to demonstrate that their ideas, methods, or products are the best or most effective. Clearly, this approach is not systematic, nor is it objective; it does not utilize the scientific method. Therefore, it is not science, and it is not research.

Overview of Educational Research

Traditional research in education is typically conducted by researchers who are somewhat removed from the environment they are studying. This is not to say that they are not committed to the research study and truly interested in the ultimate results but rather to say that they are studying people, settings, or programs with which they are seldom personally involved (Schmuck, 1997). They may in fact be removed from the actual research site, in many instances. Furthermore, traditional researchers often seek explanations for existing phenomena and try to do so in an objective manner. The primary goal of traditional educational research is "to explain or help understand educational issues, questions, and processes" (Gay & Airasian, 2000, p. 24). In traditional research, different research methods—the specific procedures used to collect and analyze data—provide different views of a given reality. These various research methods tend to be put into two broad categories—quantitative approaches and qualitative approaches—based on different assumptions about how to best understand what is true or what constitutes reality (McMillan, 2004). Generally speaking, quantitative research methodologies require the collection and analysis of numerical data (e.g., test scores, opinion ratings, attitude scales); qualitative research methodologies necessitate the collection and analysis of narrative data (e.g., observation notes, interview transcripts, journal entries).

Quantitative research methodologies utilize a deductive approach to reasoning when attempting to find answers to research questions. **Deductive reasoning** works from the more general to the more specific, in a "top-down" manner (Trochim, 2002a). As depicted in Figure 1.1, the quantitative researcher might begin by thinking up a theory about a given topic of interest.

FIGURE 1.1 Process of Deductive Reasoning as Applied to Research



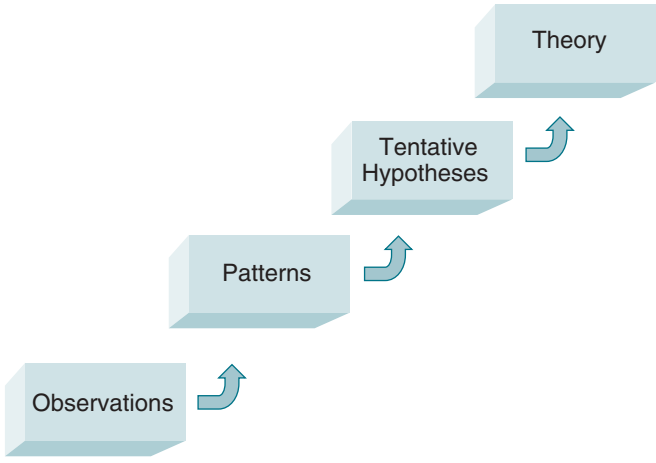
SOURCE: Adapted from Trochim, 2002a.

That topic would then be narrowed down to more specific hypotheses that could be tested. This process of narrowing down goes even further when data are collected in order to address the hypotheses. Finally, the data are analyzed, and conclusions about the hypotheses are drawn—this allows for a confirmation (or not) of the original theory.

On the other hand, qualitative research methods typically use an inductive approach to reasoning. **Inductive reasoning** works in the exact opposite direction when compared with deductive reasoning. Using a "bottom-up" approach (see Figure 1.2), inductive reasoning begins with specific observations and concludes with broader generalizations and theories (Trochim, 2002a). One begins with specific observations (data), notes any patterns in those data, formulates one or more tentative hypotheses, and finally develops general conclusions and theories. It is important to note that, in some cases, the purpose of qualitative research is not to analyze data in order to form hypotheses or theories. Rather, in these cases, the purpose may simply be to provide a "thick description" of what is going on in the particular setting being studied. You will read more about deductive and inductive reasoning, as they relate to data analysis, in Chapter 6.

It is important to note that both quantitative and qualitative approaches to conducting educational research are guided by several sets of philosophical assumptions. These philosophical assumptions are composed primarily of several basic underlying beliefs about the world itself and how best to discover or uncover its true reality. The underlying beliefs held by quantitative researchers differ substantially from those held by qualitative researchers. An understanding of these beliefs is not requisite to understanding or being able to successfully conduct an action research study. This is largely because of the fact that action research, as we will view it throughout this text, typifies a grassroots effort to

FIGURE 1.2 Process of Inductive Reasoning as Applied to Research



SOURCE: Adapted from Trochim, 2002a.

find answers to important questions or to foster change. It is entirely practical—and not necessarily philosophical—in its application. Mills (2011) refers to this as "practical action research" (p. 7), which he contrasts with the more philosophically based critical action research. The focus of this particular textbook is on the former; in-depth discussions of more philosophically based forms of action research are beyond the scope of this book. If the reader is interested in learning more about these various underlying philosophical assumptions and their connection to action research, several excellent resources include Johnson (2008), McMillan (2004), and Mills (2011).

Recall that the goal of quantitative research is to describe or otherwise understand educational phenomena. To accomplish this, researchers collect data by measuring **variables** (factors that may affect the outcome of a study or characteristics that are central to the topic about which the researcher wishes to draw conclusions) and then analyze those data in order to test **hypotheses** (predicted outcomes of the study) or to answer **research questions**. For example, a quantitative research study might involve collecting data on elementary school discipline referrals and absenteeism (numerical variables) in order to answer this question: Are there differences in the rates of disciplinary problems and absenteeism in schools with a K through 8th-grade span versus those with other grade span configurations (e.g., K–5, K–6)?

The type of **research design** employed by the researcher refers to the plan that will be used to carry out the study. Research designs may be either nonexperimental or experimental. In **nonexperimental research**, the researcher has no direct control over any variable in the study, either because it has already occurred or because it is not

possible for it to be influenced. In other words, in nonexperimental research, variables cannot be controlled or manipulated by the researcher. The previous illustration of a study of school discipline and absenteeism problems is an example of a nonexperimental study, as the type of grade configuration, the number of discipline referrals, and the number of absences cannot be controlled or influenced by the researcher. The fact that variables cannot be controlled in nonexperimental studies is an important distinction between nonexperimental research and experimental research, especially when it comes to drawing conclusions at the end of a study. This usually means that conclusions to nonexperimental studies can describe only variables or relationships between variables. Some examples of nonexperimental research designs include *descriptive*, *comparative*, *correlational*, and *causal-comparative* research (McMillan, 2004). *Descriptive* studies simply report information about the frequency or amount of something (e.g., What percentage of the time do teachers use performance-based assessments in their classrooms?). *Comparative* studies characteristically build on descriptive studies by comparing two or more groups on that which is measured (e.g., Is there a significant difference between elementary and secondary teachers' use of performance-based assessments?). *Correlational* studies measure the degree to which a relationship exists between two or more variables (e.g., What is the relationship between years of teaching experience and use of performance-based assessments?). Finally, *causal-comparative* studies (also sometimes referred to as ex post facto studies) compare groups—where group membership is determined by something that occurred in the past—on subsequent data on another variable in such a way that it makes possible drawing potential causal relationships between the two variables (e.g., Do teachers who completed a stand-alone preservice course in classroom assessment use performance-based assessment more than teachers who did not complete such a course?). Notice that based on the sample research questions provided it is quite possible to use any of the various types of nonexperimental research designs to study a given topic—in this case, classroom teachers' use of performance-based assessments.

In **experimental research**, the researcher has control over one or more of the variables included in the study that may somehow influence (or cause) the participants' behavior. The variables over which the researcher has control are known as the **independent variables**; these are the variables that are manipulated by the researcher, meaning that the researcher determines which subjects will receive which condition. For example, if the effectiveness of a new math program was being investigated, those students exposed to the new program would constitute the **experimental** or **treatment group**; their performance would be compared with that of a **control group** that receives the standard math instruction. The ultimate variable of interest (i.e., the "behavior" variable mentioned above, perhaps "math achievement" in our example) is referred to as the **dependent variable** (since its value depends on the value, or group membership, of the independent variable).

There are a wide variety of experimental research designs, the discussion of which is beyond the scope of this book. However, an illustration of experimental research is likely in order. Suppose a history teacher wanted to determine whether students performed better when taught U.S. history using the more traditional forward (i.e., past to present) approach versus a backward (i.e., present to past) approach. She randomly assigns half of her classes

to be taught using the forward approach and the other half to be taught using the backward approach. The independent variable for her study is the type of instruction. There are two levels to this variable that "define" the two groups—the experimental group receives the innovative backward approach to instruction; the control group receives the more traditional forward approach. Finally, the academic performance (dependent variable) of all students is measured using the same instrument (e.g., a final exam) for both groups. The aspect that makes this study experimental in nature is that the teacher herself determines which group will receive which version of the treatment (i.e., instruction); in other words, she is manipulating or controlling the independent variable.

Data collected as part of quantitative research studies are numerical and therefore naturally analyzed statistically. Analyses may include descriptive statistics, inferential statistics, or both. **Descriptive statistics** allow researchers to summarize, organize, and simplify data. Specific techniques include such statistics as the mean, median, mode, range, standard deviation, correlations, and standardized scores. **Inferential statistics** are more complex and permit researchers to test the statistical significance of the difference between two or more groups or to test the degree of correlation between two variables. **Statistical significance** refers to a decision made from the results of statistical procedures that enables researchers to conclude that the findings of a given study (e.g., the size of the difference between two groups or the strength of the relationship between two variables) are large enough in the sample studied in order to represent a meaningful difference or relationship in the **population** from which the sample was drawn.

Whereas quantitative research studies focus on a relatively small number of variables, qualitative research studies utilize a much broader, more holistic approach to data collection. Qualitative research designs use systematic observation in order to gain knowledge, reach understanding, and answer research questions. There is no attempt to control or manipulate any variable in a qualitative study; researchers simply take the world as it exists and as they find it (Johnson, 2008). Qualitative research tends to emphasize the importance of multiple measures and observations (Trochim, 2002b). Therefore, guiding research questions tend to be more broad and open-ended. This allows the researcher to collect a wide variety of data for the purpose of getting a more holistic picture of the phenomenon under investigation. This also permits the researcher to engage in triangulation. **Triangulation** is a process of relating multiple sources of data in order to establish their trustworthiness or verification of the consistency of the facts while trying to account for their inherent biases (Bogdan & Biklen, 2007; Glesne, 2006). It is important to note that "triangulation" does not necessarily mean that the researcher is using three (as in *tri-*) sources of data; it simply means that there is more than one source of data—perhaps, a more appropriate term would be "*polyangulation*" (since the prefix *poly-* is defined as "more than one or many"). Ultimately, this enables the researcher to try to get a better handle on what is happening in reality and to have greater confidence in research findings (Glesne, 2006). For example, in a qualitative study, one might collect data through firsthand observations, videotaped observations, and interviews. Triangulating these sources of data would involve examination in order to determine, for example, if the behaviors exhibited and comments made by participants are consistent regardless of the type of data representing them. In other words, did a specific person act the same way he said he acted, or did he verbally portray his behavior differently from his actual behavior?

Similar to quantitative research, there are a variety of qualitative research designs. These include *phenomenology*, *ethnography*, *grounded theory*, and *case studies* (McMillan, 2004). **Phenomenological studies** engage the researcher in a long process of individual interviews in an attempt to fully understand a phenomenon (e.g., What characteristics of teachers are needed in order for them to be viewed as compassionate by their students?). **Ethnographic studies** attempt to describe social interactions between people in group settings (e.g., What meaning does the teachers' lounge have for the staff at Main Street Elementary School?). **Grounded theory** research studies attempt to discover a theory that relates to a particular environment (e.g., What types of personal and school characteristics serve to motivate teachers?). Finally, **case studies** are in-depth studies of individual programs, activities, people, or groups (e.g., What is the nature of the school culture at Washington Middle School?).

Data collected during a qualitative research study may be quite diverse. Recall that qualitative data are typically narrative and consist primarily of observations, interviews, and existing documents and reports (McMillan, 2004). Resulting qualitative data are analyzed by means of a process known as **logico-inductive analysis**, a thought process that uses logic to make sense of patterns and trends in the data (Mertler & Charles, 2011).

Although quantitative and qualitative approaches to conducting research are quite different on a variety of levels, they need not be considered mutually exclusive. It is not uncommon to see research studies that employ both types of research data. These types of studies are often referred to as **mixed-methods research designs**. The combination of both types of data tends to provide a better understanding of a research problem than one type of data in isolation. In other words, these types of studies capitalize on the relative strengths of both quantitative and qualitative data. Creswell (2005) considers action research studies to be most similar to mixed-methods designs, since they often utilize both quantitative and qualitative data. The only real difference between the two is the underlying purpose for the research. The main goal of mixed-methods studies is more traditional (i.e., to better understand and explain a research problem); the main goal of action research is to address local-level problems with the anticipation of finding immediate solutions.

Overview of Action Research

For decades, there has been pressure from both public and governmental sources for improvement in our schools. The public, fueled by the mass media, has criticized schools for low levels of achievement in math, science, reading, writing, and history (Schmuck, 1997). Business leaders fault schools for not preparing students for the workforce. Although teachers are on the receiving end of the brunt of this criticism, it is my firm belief that teachers in the United States have been doing—and continue to do—an outstanding job in the classroom. However, that being said, true school improvement must begin from within the proverbial "four walls of the classroom." Teachers must be able and willing to critically examine their own practice as well as how students (both collectively and individually) learn best.

Often, school improvement leaders look toward the enormous body of educational research literature as a means of guiding their improvement efforts. However, many practitioners do not find that either formal or applied academic research is very helpful (Anderson, 2002). This is largely due to the fact that traditional educational researchers have a tendency to impose abstract research findings on schools and teachers with little

or no attention paid to local variation (i.e., not all schools are the same) and required adaptations (i.e., the extent to which research findings generalize across entire populations; Metz & Page, 2002). I believe that, because of this continued imposition of more traditional research findings, there is a real need for the increased practice of teacher-initiated, classroom-based action research.

Schmuck (1997) defines action research as an attempt to "study a real school situation with a view to improve the quality of actions and results within it" (p. 28). Its purpose is also to improve one's own professional judgment and to give insight into better, more effective means of achieving desirable educational outcomes. McMillan (2004) describes action research as being focused on solving a specific classroom or school problem, improving practice, or helping make a decision at a single local site. Action research offers a process by which current practice can be changed toward better practice. The overarching goal of action research is to improve practice immediately within one or a few classrooms or schools (McMillan, 2004).

Because of the fact that action research is largely about examining one's own practice (McLean, 1995), reflection is an integral part of the action research process. **Reflection** can be defined as the act of critically exploring what you are doing, why you decided to do it, and what its effects have been. In order for teachers to be effective, they must become active participants in their classrooms as well as active observers of the learning process; they must analyze and interpret classroom information—that has been collected in a systematic manner—and then use that information as a basis for future planning and decision making (Parsons & Brown, 2002). **Reflective teaching** is a process of developing lessons or assessing student learning with thoughtful consideration of educational theory, existing research, and practical experience, along with the analysis of the lesson's effect on student learning (Parsons & Brown, 2002). This process of systematically collecting information followed by active reflection—all with the anticipation of improving the teaching process—is at the core of action research.

Accordingly, action research is also largely about developing the professional disposition of teachers and the teaching profession (Mills, 2011). Through action research, teachers are encouraged to become continuous, lifelong learners in their classrooms with respect to their practice. This notion is central to the very nature of education—action research encourages teachers to examine the dynamics of their classrooms, critically think about the actions and interactions of students, confirm and/or challenge existing ideas or practices, and take risks in the process (Mills, 2011). A goal of every classroom teacher should be to improve her or his professional practice as well as student outcomes. Action research is an effective means by which this can be accomplished.

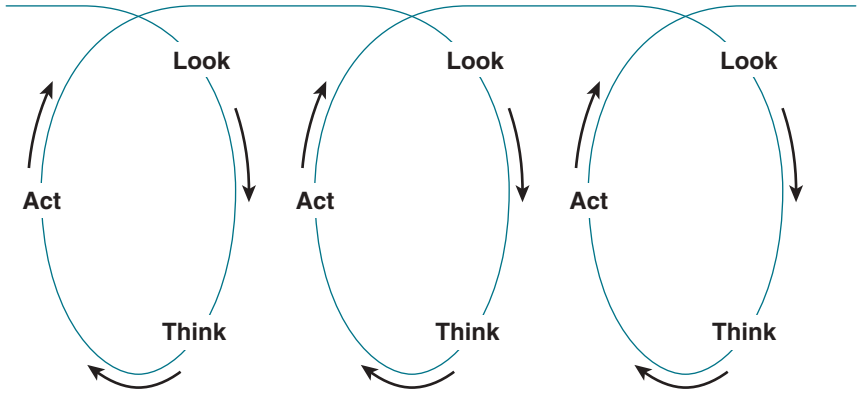
Models of Action Research

Numerous authors and researchers have proposed models for the action research process. Because this process is somewhat dynamic, various models look a bit different from one another but possess numerous common elements. Action research models begin with a central problem or topic. They involve some observation or monitoring of current practice, followed by the collection and synthesis of information and data. Finally, some sort of

action is taken, which then serves as the basis for the next stage of action research (Mills, 2011). In addition, some models are simple in their design, while others appear relatively complex. This range of complexity—from simpler to more complex—can be seen in the following examples:

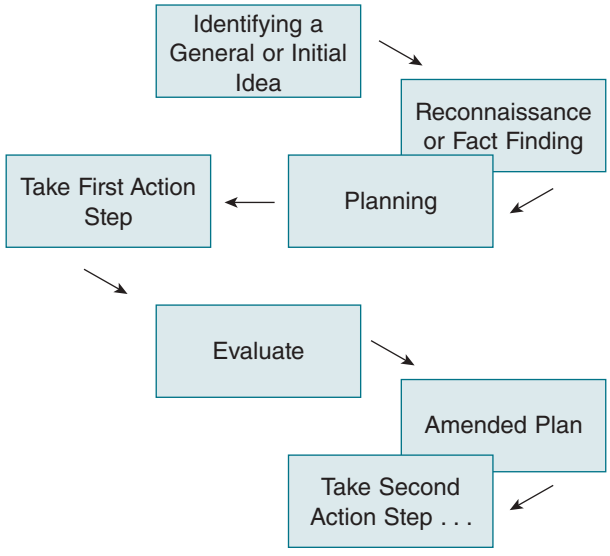
- Stringer (2007), in his action research interacting spiral, describes action research as a "simple, yet powerful framework" consisting of a "look, think, and act" routine (p. 8). During each stage, participants observe, reflect, and then take some sort of action. This action leads them into the next stage (see Figure 1.3).
- Kurt Lewin (Smith, 2007)—who, by the way, is credited with coining the term "action research"—also depicts an action research spiral, which includes fact finding, planning, taking action, evaluating, and amending the plan before moving into a second action step (see Figure 1.4).
- Bachman's (2001) action research spiral continues this notion of the cyclical nature of action research (see Figure 1.5). His downward spiral suggests that participants gather information; plan actions; observe and evaluate those actions; and then reflect and plan for a new cycle of the spiral, based on the insights that were gained in the previous cycle.
- Riel's (2007) progressive problem solving through action research model takes the participant through four steps in each cycle: planning, taking action, collecting evidence, and reflecting (see Figure 1.6).

FIGURE 1.3 Stringer's Action Research Interacting Spiral



SOURCE: Adapted from *Action Research* (p. 9), by Ernest T. Stringer, 2007, Thousand Oaks, CA: Sage. Copyright 2007 by Sage. Reprinted with permission of the publisher. All rights reserved.

FIGURE 1.4 Lewin's Action Research Spiral



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Which model should you follow? Personally, I do not think it really matters, as I see them essentially as variations on the same theme (as evidenced by their shared elements). Generally speaking, my version of the action research process is composed of a four-stage procedure (Mertler & Charles, 2011), which will be expanded in more detail in the next chapter. For the time being, these four stages are as follows:

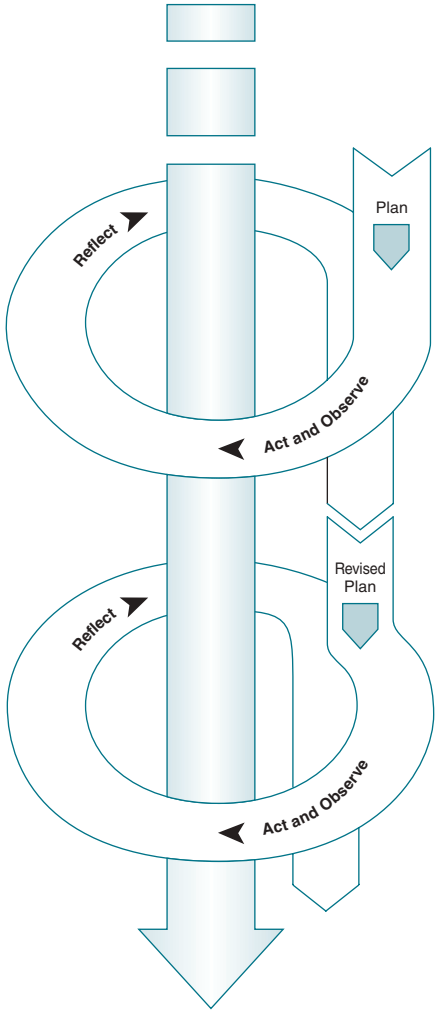
1. The planning stage
2. The acting stage
3. The developing stage
4. The reflecting stage

Within this framework—and as you saw earlier in the various models presented—action research is a recursive, cyclical process that typically does not proceed in a linear fashion (Johnson, 2008). Practitioner-researchers engaged in action research often find themselves repeating some of the steps several times or perhaps doing them in a different order.

Depending on the nature of a given action research project, there may never be a clear end to the study—teachers may continue to go through subsequent cycles of planning,

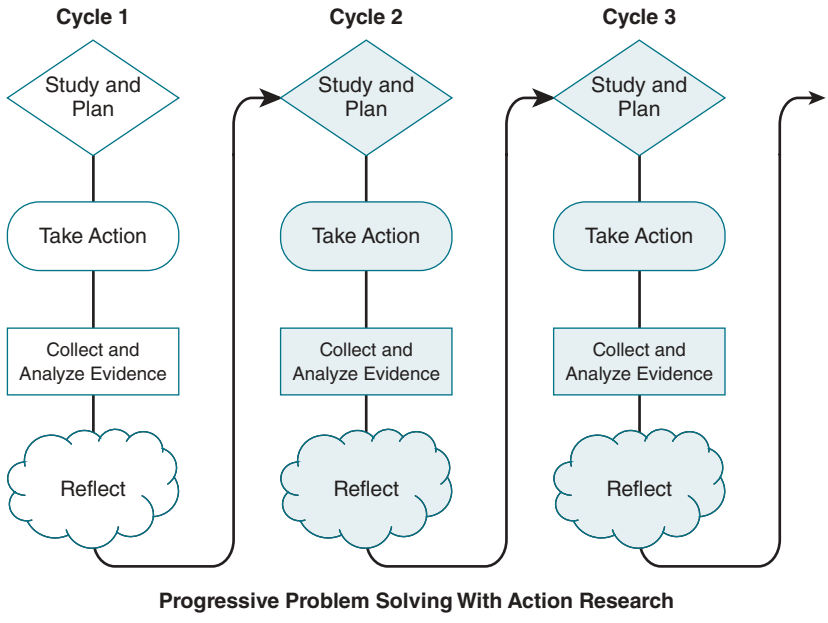
acting and observing, developing a new plan, and reflecting, which seemingly spiral from one year into the next (Mertler & Charles, 2011). You will learn more about the specific steps in conducting action research in Chapter 2.

FIGURE 1.5 Bachman's Action Research Spiral



SOURCE: Adapted from "Review of the Agricultural Knowledge System in Fiji: Opportunities and Limitations of Participatory Methods and Platforms to Promote Innovation Development" (unpublished dissertation), by Lorenz Bachman, 2001, Berlin, Germany: Humboldt University of Berlin. Copyright 2001. Retrieved January 17, 2008, from http://edoc.hu-berlin.de/dissertationen/bachmann-lorenz-b-r-2000–12–21/HTML/bachmann-ch3.html. Reprinted with permission of the author.

FIGURE 1.6 Riel's Action Research Model



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Characteristics of Action Research: What It Is and What It Is Not

Although action research can be a fairly straightforward process, it is sometimes misunderstood by educational practitioners (Mertler & Charles, 2011). There are many aspects of this methodology that characterize its uniqueness as an approach to conducting educational research. It is imperative for educators to have a sound, foundational understanding of just what action research is and is not. The following list, compiled from several sources (Johnson, 2008; Mertler & Charles, 2011; Mills, 2011; Schmuck, 1997), is an attempt to describe what action research is:

- Action research is a process that improves education, in general, by incorporating change.
- Action research is a process involving educators working together to improve their own practices.
- Action research is persuasive and authoritative, since it is done by teachers for teachers.