# Action Research

## A Guide for the Teacher Researcher

Sixth Edition

Geoffrey E. Mills

Pearson

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Pearson

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*For Ernie Mills, Audrey Mills, Dr. Milton H. Brown, and Catherine S. Brown—*
*Your love, support, and spirit live with me always.*

# about the author


Geoffrey Mills

A native of Australia, Geoff moved to the United States in 1986 to undertake doctoral studies at the University of Oregon. After completing his PhD in 1988, Geoff accepted his first teaching position at Southern Oregon State College (now Southern Oregon University). After 12 years of teaching, Geoff moved into university administration where he served as dean and professor of education in the School of Education at Southern Oregon University. Most recently, Geoff has returned to the faculty in the School of Education as a professor of education.

Geoff has traveled extensively and given invited action research presentations in Australia, New Zealand, Greenland, United Kingdom, Canada, Guam, Saipan, Palau, Marshall Islands, American Samoa, U.S. Virgin Islands, and many states in the United States. In addition to *Action Research: A Guide for the Teacher Researcher*, Sixth Edition, Geoff is also the only active author of *Educational Research: Competencies for Analysis and Applications* (2016; with L. R. Gay), now in its eleventh edition.

# preface

## New to This Edition

The sixth edition of *Action Research* has been revised in response to expert reviewer feedback.

The sixth edition includes the following:

- **"Voices from the Field" sections** For the sixth edition, there are new narrative sections that respond to the video vignettes throughout the text and scaffold the content of each chapter.
- **Expanded Coverage of Mixed-Methods Data Collection and Analysis Techniques** Additional coverage of mixed-methods research has been added throughout the text and reflects six new mixed-methods research designs: explanatory sequential, exploratory sequential, convergent parallel, experimental, social justice, and multistage evaluation.
- **Expanded Coverage of Single-Subject Research Designs** In response to reviewers' comments, single-subject research designs have been expanded for the sixth edition.
- **Expanded Coverage of Digital Research Tools for the Twenty-First Century** Additional coverage of digital research tools that can be used by action researchers through each phase of the action research process.
- **Expanded Coverage of Reviewing the Literature** Additional coverage of using technology to search literature databases that takes advantage of university library consortium agreements as well as the power of technology tools to track references and build bibliographies can be found in this updated stand-alone chapter.

## The Role of Action Research in Effecting Educational Change

Action research has the potential to be a powerful agent of educational change. Action research helps to develop teachers and administrators with professional attitudes who embrace action, progress, and reform rather than stability and mediocrity. In addition, the action research process fosters a democratic approach to decision making while, at the same time, empowering individual teachers through participation in a collaborative, socially responsive research activity.

Commitment to action research positions teachers and administrators as learners rather than experts. Those committed to action research will willingly undertake continued professional development because they believe that there is a gap between the real world of their daily teaching practices and their vision of an ideal one.

Incorporating action research into preservice teacher education programs and professional development programs for in-service teachers will help make action research an ongoing component of a professional teacher's practice. Such action will ultimately help teachers incorporate action research alongside other critical components of teaching, such as curriculum development, authentic assessment strategies, classroom management strategies, teaching strategies, and caring for children. Such actions will encourage teachers to embrace change.

It is my hope that this text will, in some small part, help us keep moving forward, even in difficult times. Action research is an invitation to learn, a means to tackle tough questions that face us individually and collectively as teachers, and a method for questioning our daily taken-for-granted assumptions as a way to find hope for the future.

## Conceptual Framework and Organization of the Text

This text has evolved over 25 years based on my experience of doing and teaching action research. During this time, I have had the opportunity to work with some outstanding university faculty, classroom teachers, and principals who were committed to looking systematically at the effects of their programs on children's lives. This text's organization has grown out of these experiences and has been field tested by numerous students and colleagues.

Each chapter opens with an action research vignette that illustrates the content that will follow. These vignettes, most of which have been written by teachers and principals with whom I have worked, show readers what action research looks like in practice and who does it. The order of these chapters roughly matches the action research process, an approach that I have found successful when teaching action research.

## Contents of This New Edition

Chapter 1, "Understanding Action Research," defines action research and provides historical and theoretical contexts for the rest of the text. The chapter also reviews various models of action research and concludes with the four-step process (identifying an area of focus, collecting data, analyzing and interpreting data, and developing an action plan) and the dialectic model on which this text is based. The remaining chapters mirror these steps.

Chapter 2, "Ethics," provides an expanded discussion of the American Educational Research Association's ethical guidelines and poses an ethical dilemma vignette to spark teacher researchers' thinking about how best to resolve ethical dilemmas if and when they arise. This chapter also provides guidance for seeking and obtaining Institutional Review Board approval.

Chapter 3, "Deciding on an Area of Focus," provides guidelines for selecting an area of focus. The chapter culminates with an action research plan that provides a practical guide for moving teacher researchers through the action research process.

Chapter 4, "Review of Related Literature," offers step-by-step directions for how to do a literature review using many online resources as well as traditional university library resources. The chapter provides an expanded discussion of how to write a literature review.

Chapter 5, "Data Collection Techniques," offers a comprehensive discussion of qualitative data collection that covers the "3 Es" of qualitative data collection: experiencing, enquiring, and examining. It also provides a comprehensive discussion of quantitative data collection techniques that covers collecting data from teacher-made tests, standardized tests, and attitude scales. A section on triangulation covers how to work with multiple sources of data.

Chapter 6, "Data Collection Considerations: Validity, Reliability, and Generalizibility," addresses important data collection considerations to ensure that the data collected will be "trustworthy."

Chapter 7, "Data Analysis and Interpretation," describes selected techniques of data analysis and data interpretation and distinguishes between the goals of the two processes. Included in this chapter is an expanded discussion of data analysis and interpretation with examples of each for qualitative and quantitative data sources.

Chapter 8, "Action Planning for Educational Change," helps teacher researchers take action using a helpful Steps to Action Chart. The chapter also discusses potential obstacles to change and suggests strategies for overcoming these obstacles.

Chapter 9, "Writing Up Action Research," provides practical guidelines for writing up action research and ways that teacher researchers can "get the word out." A reprinted action research article with marginal notations gives researchers an example of the general structure and components of written action research. A self-evaluation rubric helps teacher researchers make sure their write-up is ready for publication. There is also a discussion of using the sixth edition of *Publication Manual of the American Psychological Association* during the writing process.

Finally, Chapter 10, "Evaluating Action Research," is new to this edition and focuses on analyzing and evaluating action research studies. Included in this edition is a new article from an online journal that is analyzed using the new criteria for evaluating action research publications.

Appendix A, "Action Research in Action," contains an extended example of action research through a case study of Curtis Elementary. This case study follows

the process described throughout the text and includes an evaluation of the project on the basis of criteria for evaluating action research presented in Chapter 10. Appendix B, "Standard Deviation and Action Research," contains a brief discussion of standard deviation and how it can be applied to the analysis and interpretation of teacher research. Appendix C, "Displaying Data Visually," presents a variety of examples of visual displays of data—bar graphs, tables, and a concept map—from action research projects. Using these display techniques helps teachers "see" data for better analysis and more effective communication of their findings.

## Instructor Resources

### Online PowerPoint® Slides

To enhance class lectures, Online PowerPoint® slides are available. To access the Online PowerPoint® slides, go to **www.pearsonhighered.com/educator**. Enter the author, title, or ISBN, and click on this text. The PowerPoint® slides are available for download under the "Resources" tab.

## Acknowledgments

I would like to thank the reviewers, who invested a great deal of time and provided critical feedback during the development of this text. These reviewers include: Bill Blubaugh, University of Northern Colorado; Susan D. Flynn, Coastal Carolina University; Catherine Kurkjian, Central Connecticut State University; Hector M. Rios, Rowan University; and Yer Jeff Thao, Portland State University. I would also like to acknowledge the staff at Pearson, without whose guidance (and patience!) this text would not have become a reality. In particular, I thank Kevin Davis, Director & Portfolio Manager, for working with me on a sixth edition of the text so as to build on what we achieved with the previous editions. Kevin has been my friend and mentor since he offered my first textbook contract in 1997, and I am indebted to him for his encouragement and support of my writing. Kevin worked diligently to ensure a quality, user-friendly, academically coherent text and patiently kept me on track in order to meet publication deadlines. His feedback on chapter drafts was insightful and important to the development of this sixth edition. As I approach the end of my tenure at Southern Oregon University (Emeritus Professor is in my not-too-distant future) and at the risk of embarrassing Kevin, I can state with confidence that the past 20 years of my professorial career exceeded all of my expectations because of the opportunities Kevin has given me. Thank you.

I would also like to extend my gratitude to the hundreds of students at Southern Oregon University who responded to various drafts of previous editions of this

text and also endured my ramblings about the importance of being reflective practitioners and self-renewing professionals. Their insights into what makes a text user friendly have been greatly appreciated and are reflected in the text. Similarly, I have had the pleasure of working with hundreds of teachers throughout Oregon who taught me what needed to be included in a "helpful" text.

This edition has also benefited greatly from interactions and feedback from colleagues who have used the book for many years and who invite me to "google hangout" with their classes. Specifically, I would like to thank Dr. Andrew Hostetler (Vanderbilt University) and Dr. Todd Hawley (Kent State University) for their feedback on previous editions of the book.

Unanticipated consequences of writing textbooks are the invitations to work with groups of educators from around the world. *Action Research* has taken me to many different parts of the world where I have had the honor of working with teachers and principals who are committed to studying the impact of what they do and how it can improve students' lives. For example, during the shelf life of the fifth edition, I have worked in Greenland (with the University of Greenland and Ministry of Education), Guam, Saipan, Palau, American Samoa, and the U.S. Virgin Islands (with McREL). These experiences working with teachers and principals in different (often challenging) contexts continue to push my thinking about how action research can provide a framework to support important school improvement efforts.

Finally, I appreciate the support and encouragement of my wife, colleague, and best friend, Dr. Donna Mills (Emeritus Professor, Southern Oregon University), who endured my weird travel schedules and writing commitments throughout this lengthy process. And I thank my son Jonathan for pushing my thinking about mixed-methods research and how it might be applied to the National Basketball Association! During the writing of this edition, Jonathan engaged in his own research as part of his honors program at the University of Oregon. His thesis focused on decision making in the National Basketball Association and specifically on the interaction of advanced analytics and traditional evaluation methods. It was fun to watch my son struggle with the challenges of being a neophyte researcher and was a good reminder to me of my audience! My sincere thanks to Donna and Jonathan for their love, patience, and support, which are always appreciated and never taken for granted.

—Geoff Mills

# brief contents

# contents

# 1

# Understanding Action Research

**After reading this chapter you should be able to:**

**1.1** Describe the goal of educational research and the different approaches researchers use.
**1.2** Define action research.
**1.3** Describe the origins of action research.
**1.4** Identify the similarities and differences between critical and practical theories of action research.
**1.5** Describe the goals of and rationale for action research.
**1.6** Describe the justifications for action research and steps you can take to make it part of your daily teaching practice.
**1.7** Describe the four steps of the action research process.

This chapter introduces action research by providing an example of an action research project from a real teacher researcher, an exploration of the historical and theoretical foundations of action research, a discussion of the goals and justification for action research, and an explanation of the action research process.

## What Motivates Unmotivated Students?

### Deborah South

***Deborah South, a teacher in a rural Oregon high school, was a participant in an action research class. She shares the challenges she faced when, owing to a last-minute teaching assignment, she found herself working with a group of "unmotivated" students. Deborah's story illustrates the wide variety of factors that can influence students' learning and a teacher's willingness to critically examine her teaching methods and how they affected the children in her classroom. Although Deborah's interpretation of the results of her study did not validate her practice, it did provide data that Deborah and the school's principal could use to make changes to the existing curriculum for unmotivated students.***

*Teaching students who are unmotivated and apathetic can be a difficult challenge for any teacher to overcome. These students typically can be disruptive and negative and often require an extraordinary amount of teacher time to manage their behavior. My concern with teaching unmotivated students has existed almost since I began teaching 5 years ago. As an educator, one tries all kinds of possible strategies to encourage students to be successful. However, these strategies do not work with unmotivated students who are apathetic and exhibit unacceptable behavior. Eventually the patience runs out and, as ashamed as I am to admit it, I stop trying to find ways to reach these particular students. It soon becomes enough that they stay in their seats, be quiet, and do not disturb anyone.*

*However, last term my attitude was forced to change. I was given a study skills group of 20 of the lowest achieving eighth graders in the school. This new class consisted of 16 boys and 4 girls. My task was to somehow take these students and miraculously make them motivated, achieving students. I was trained in a study skills program before the term started and I thought that I was prepared: I had the students, I had the curriculum, and I had the help of an outstanding aide.*

*Within a week, I sensed we were in trouble. My 20 students often showed up with no supplies. Their behavior was atrocious. They called each other names, threw various items around the room, and walked around the classroom when they felt like it. Their attitudes toward me were negative. I became concerned about teaching these students. In part, I felt bad that they were so disillusioned with school and their future; I also felt bad because the thought of teaching in this environment every day for another 14 weeks made me wish summer vacation were here.*

*Given this situation, I decided to do some reading about how other teachers motivate unmotivated students and to formulate some ideas about the variables that contribute to a student's success in school. Variables I investigated included adult approval, peer influence, and success in such subjects as math, science, language arts, and social studies, as well as self-esteem and students' views of their academic abilities.*

*I collected the majority of the data through surveys, interviews, and report card/attendance records in an effort to answer the following questions:*

- *How does attendance affect student performance?*
- *How are students influenced by their friends in completing schoolwork?*
- *How do adults (parents, teachers) affect the success of students?*
- *What levels of self-esteem do these students have?*

*As a result of this investigation, I learned many things. For example, for this group of students attendance does not appear to be a factor—with the exception of one student, school attendance was regular. Not surprisingly, peer groups did affect student performance. Seventy-three percent of my students reported that their friends never encouraged doing homework or putting any effort into homework.*

*Another surprising result was the lack of impact of a teacher's approval on student achievement. Ninety-four percent of my students indicated that they never or*

*seldom do their homework to receive teacher approval. Alternatively, 57 percent indicated that they often or always do their homework so that their families will be proud of them.*

*One of the most interesting findings of this study was the realization that most of my students misbehave out of frustration at their own lack of abilities. They are being obnoxious not to gain attention, but to divert attention from the fact that they do not know how to complete the assigned work.*

*When I looked at report cards and compared grades over three quarters, I noticed a trend. Between the first and second quarters, student performance had increased. That is, most students were doing better than they had during the first quarter. Between the second and third quarters, however, grades dropped dramatically. I tried to determine why that drop occurred, and the only experience these 20 students shared was that they had been moved into my class at the beginning of the third quarter.*

*When I presented my project to the action research class during our end-of-term "celebration," I was convinced that the "cause" of the students' unmotivated behavior was my teaching. I had concluded through my data analysis and interpretation that the one experience these 20 children had in common was participation in my study skills class. This conclusion, however, was not readily accepted by my critical friends and colleagues in the action research class, who urged me to consider other interpretations of the data. For example, perhaps the critical mass of negativity present in one classroom provided the children with a catalyst to act out against the teacher. After all, this was the only class shared exclusively by these 20 students. Afterward, I shared the findings of my study with my school principal. As a result,she decided not to group these students together homogeneously for a study skills class the following year.*

*As you can see, action research is a "wonderfully uncomfortable" (Lytle, 1997) place to be—once we start our journey of investigation, we have no way of knowing in advance where we will end up. Action research, like any other problem-solving process, is an ongoing creative activity that exposes us to surprises along the way. What appears to matter in the planning stages of an action research investigation may provide us with only a hint, a scratching of the surface, of what is really the focus for our investigations. How we deal with the uncertainty of the journey positions us as learners of our own craft, an attitude that is critical to our success. This text attempts to foster an openness in the spirit of inquiry guided by action research.*

## A Brief Overview of Educational Research

When you hear the phrase *scientific research*, you probably think of a scientist in a white lab coat (usually a balding, middle-age man with a pocket full of pens!) mixing chemicals or doing experiments involving white mice. Traditional scientists, like the one pictured in this rather trite image, proceed with their research under

the assumption that "all behaviors and events are orderly" and that all events "have discoverable causes" (Mills & Gay, 2016, p. 5). This traditional belief that natural phenomena can be explained in an orderly way using empirical sciences is sometimes called **positivism**.

Human beings, however, are very complicated organisms, and compared with chemicals—and mice, for that matter—their behavior can be disorderly and fairly unpredictable. This presents a challenge to educational researchers, who are concerned with gaining insight into human behavior in educational environments such as schools and classrooms.

The goal of traditional educational research is "to explain, predict, and/or control educational phenomena" (Mills & Gay, 2016, p. 5). To do this, researchers try to manipulate and control certain **variables** (the factors that might affect the outcomes of a particular study) to test a **hypothesis** (a statement the researcher makes that predicts what will happen or explains what the outcome of the study will be). Educational researchers focus on the manipulation of an **independent variable** and its impact on the **dependent variable**. An independent variable is a behavior or characteristic under the control of the researcher and believed to influence some other behavior or characteristic. A dependent variable is the change or difference in a behavior or characteristic that occurs as a result of the independent variable. The word *control* is not used here in a negative sense; rather, it describes one of the characteristics of traditional, quantitatively oriented research, in which the researcher must control the environment to be able to draw cause-effect relationship conclusions. This cannot occur unless the researcher is able to control the variables in the study that might affect a causal relationship.

For example, researchers might be interested in studying the effects of a certain phonics program (the independent variable) on the rate at which children learn to read (the dependent variable). The researchers may hypothesize that using this phonics program will shorten the time it takes for students to learn to read. To confirm or reject this hypothesis, they might study the reading progress of one group of children who were taught using the phonics program (the **experimental group**) and compare it with the reading progress of another group of children (the **control group**) who were taught reading without the phonics program. Children would be randomly assigned to either the experimental or the control group as a way to reduce the differences that might exist in naturally occurring groups. At the end of the experiment, the researchers would compare the progress of each group and decide whether the hypothesis could be accepted or rejected with a predetermined level of **statistical significance** (e.g., that the difference between the mean for the control group and the mean for the experimental group is large, compared with the standard error). Finally, the researchers would present the findings of the study at a conference and perhaps publish the results.

This process may sound very straightforward. In classroom and school settings, however, controlling all the factors that affect the outcomes of our teaching without disrupting the natural classroom environment can be difficult. For example,

how do we know that the phonics program is the only variable affecting the rate at which students learn to read? Perhaps some students are read to at home by their parents; perhaps one teacher is more effective than another; perhaps one group of students gets to read more exciting books than the other; perhaps one group of children has difficulty concentrating on their reading because they all skipped breakfast!

Action researchers acknowledge and embrace these complications as a natural part of classroom life and typically use research approaches that do not require them to randomly assign students in their classes to control and experimental groups. Teacher researchers studying their own practices also differ from traditional educational researchers (studying something other than their own practices) because they are committed to *taking action* and *effecting positive educational change* in their own classrooms and schools based on their findings. Traditional educational researchers may not be able to impact the subjects of their studies because they are outside of their locus of control. That is, traditional educational researchers can share the conclusions of their studies, but it is up to the subjects to determine whether they will take action on the findings. Another difference is that whereas educational research has historically been done by university professors, scholars, and graduate students on children, teachers, and principals, action researchers are often the schoolteachers and principals who were formerly the subjects of educational research. As such, they participate in their own inquiries, acting as both teacher and researcher at the same time. We should note, however, that traditional educational researchers can also collaborate with teacher researchers in **collaborative action research** efforts. As Hendricks (2017) states, "The goal of this type of research is to utilize the expertise of the collaborators and to foster sustained dialogue among educational stakeholders in different settings" (p. 7).

Research is also categorized by the methods the researchers use. Simply put, different research problems require different research designs. These designs to educational research are often classified as either quantitative or qualitative research. **Quantitative research** is the collection and analysis of numerical data to describe, explain, predict, or control phenomena of interest. However, a quantitative research approach entails more than just the use of numerical data. At the outset of a study, quantitative researchers state the hypotheses to be examined and specify the research procedures that will be used to carry out the study. They also maintain control over contextual factors that may interfere with the data collection and identify a sample of participants large enough to provide statistically meaningful data. Many quantitative researchers have little personal interaction with the participants they study because they frequently collect data using paper-and-pencil, noninteractive instruments. Underlying quantitative research methods is the philosophical belief or assumption that we inhabit a relatively stable, uniform, and coherent world that we can measure, understand, and generalize about. This view, adopted from the natural sciences, implies that the world and the laws that govern it are somewhat predictable and can be understood by scientific research and examination. In

**table 1–1 ■ Overview of Qualitative and Quantitative Research Characteristics**

| | Quantitative Research | Qualitative Research |
|---|---|---|
| **Type of data collected** | Numerical data | Nonnumerical narrative and visual data |
| **Research problem** | Hypothesis and research procedures stated before beginning the study | Research problems and methods evolve as understanding of topic deepens |
| **Manipulation of context** | Yes | No |
| **Sample size** | Larger | Smaller |
| **Research procedures** | Relies on statistical procedures | Relies on categorizing and organizing data into patterns to produce a descriptive, narrative synthesis |
| **Participant interaction** | Little interaction | Extensive interaction |
| **Underlying belief** | We live in a stable and predictable world that we can measure, understand, and generalize about. | Meaning is situated in a particular perspective or context that is different for people and groups; therefore, the world has many meanings. |

Source: Gay, Lorraine R., Mills, Geoffrey E.; Airasian, Peter W., *Educational Research: Competencies for analysis and applications,* loose-leaf version, 10th Ed., © 2012. Reprinted and electronically reproduced by permission of Pearson Education, Inc., New York, NY.

this quantitative perspective, claims about the world are not considered meaningful unless they can be verified through direct observation. By comparison, **qualitative research** uses narrative, descriptive approaches to data collection to understand the way things are and what the research means from the perspectives of the participants in the study. Qualitative approaches might include, for example, conducting face-to-face interviews, making observations, and video recording interactions.

Table 1–1 provides an overview of quantitative and qualitative research characteristics. Despite the differences between quantitative and qualitative research, you should not consider them to be oppositional. Taken together, they represent the full range of educational research methods.

Although quantitative and qualitative research designs need not be considered mutually exclusive, a study might incorporate both quantitative *and* qualitative techniques. Studies that combine the collection of quantitative and qualitative data in a single study are called **mixed-methods research designs**. Mixed-methods research designs combine quantitative and qualitative approaches by including both quantitative and qualitative data in a single study. The purpose of mixed-methods

research is to build on the synergy and strength that exist between quantitative and qualitative research methods to understand a phenomenon more fully than is possible using either method alone. Although this approach to research may appear obvious (i.e., of course we want a complete understanding of any phenomenon worthy of investigation), it requires a thorough understanding of both quantitative and qualitative research. Table 1–2 provides a summary of the key characteristics of mixed-methods research and an example of how it might be applied to an action research study.

**table 1–2 ■ Mixed-Methods Research Summary**

| | |
|---|---|
| Definition | *Mixed-methods research* combines quantitative and qualitative approaches by including both quantitative and qualitative data in a single study. The purpose of mixed-methods research is to build on the synergy and strength that exist between quantitative and qualitative research methods to understand a phenomenon more fully than is possible using either quantitative or qualitative methods alone. |
| Design(s) | There are three common, basic types of mixed-methods research design:<br>■ Explanatory sequential (also known as the QUAN–>qual) design<br>■ Exploratory sequential (also known as the QUAL–>quan) design<br>■ Convergent parallel (also known as the QUAN+QUAL) design<br>The method in uppercase letters is weighted more heavily than that in lowercase, and when both methods are in uppercase, they are in balance. Three advanced types of mixed-methods research designs are also frequently used:<br>■ Experimental design<br>■ Social justice design<br>■ Multistage evaluation design |
| Types of appropriate research questions | Questions that involve quantitative and qualitative approaches in order to better understand the phenomenon under investigation. |
| Key characteristics | The differences among the basic designs are related to the priority given to the following areas:<br>■ The weight given to the type of data collected (i.e., qualitative and quantitative data are of equal weight, or one type of data has greater weight than the other)<br>■ The sequence of data collection (i.e., both types of data are collected during the same time period, or one type of data is collected in each sequential phase of the project)<br>■ The analysis techniques (i.e., either an analysis that combines the data or one that keeps the two types of data separate) |

(*Continued*)

**table 1–2 ■ (*Continued*)**

| | |
|---|---|
| Steps in the process | 1. Identify the purpose of the research.<br>2. State research questions that require both quantitative and qualitative data collection strategies.<br>3. Determine the priority to be given to the type of data collected.<br>4. Determine the sequence of data collection (and hence the appropriate mixed-methods design).<br>5. Data collection.<br>6. Conduct data analysis that combines both kinds of data.<br>7. Write a report that is balanced in terms of qualitative and quantitative approaches. |
| Potential challenges | ■ Few researchers possess all the knowledge and skills to master the full range of research techniques encompassed in quantitative and qualitative research approaches.<br>■ Researchers who undertake a mixed-methods study must have the considerable time and resources needed to implement such a comprehensive approach to research.<br>■ Analyzing quantitative and qualitative data sources concurrently or in sequence and attempting to find points of intersection as well as discrepancies requires a high level of skill. |
| Example | Nguyen (2007) investigated the factors that support Black male students' achievement in the Madison Metropolitan School District (MMSD). Nguyen's study used MMSD databases for information about the success rates of high school Black males and discovered interesting patterns about minority student achievement. Based on these quantitative patterns, Nguyen followed up with interviews of a sample of young Black men whose standardized test scores indicated potential for academic success. Nguyen's mixed-methods action research resulted in the identification of strategies teachers can use to be more intentional in their efforts to connect with their Black male students. |

Source: Mills, Geoffrey E.; Gay, Lorraine R., *Educational Research: Competencies for Analysis and Applications,* Loose-Leaf Version, 11th Ed., © 2016. Reprinted and electronically reproduced by permission of Pearson Education, Inc., New York, NY.

Quantitative research designs also include; survey research, correlational research, causal-comparative research, experimental research, and single-subject experimental research (Mills & Gay, 2016). In the field of special education, it is common for action researchers to utilize a **single-subject experimental research design**. Single-subject experimental research designs (also referred to as single-case experimental designs) are designs that can be applied when the sample size is one or when a number of individuals are considered as one group. These designs are typically used to study the behavior change an individual exhibits as a result of some treatment. In single-subject designs, each participant serves as his or her own control.

In general, the participant is exposed to a nontreatment and a treatment phase, and performance is measured during each phase. The nontreatment phase is symbolized as A, and the treatment phase is symbolized as B. For example, if we (1) observed and recorded a student's out-of-seat behavior on five occasions, (2) applied a behavior modification procedure and observed behavior on five more occasions, and (3) stopped the behavior modification procedure and observed behavior five more times, our design would be symbolized as A-B-A. Although single-subject designs have their roots in clinical psychology and psychiatry, they are useful in many educational settings, particularly those involving studies of students with disabilities. Table 1–3 provides a summary of the key characteristics of single-subject experimental research designs and an example of how it might be applied to an action research study.

**table 1–3 ■ Single-Subject Experimental Research Summary**

| | |
|---|---|
| Definition | *Single-subject experimental research designs are designs* that can be applied when the sample size is one or when a number of individuals are considered as one group. |
| Design(s) | Single-subject designs are classified into three major categories: A-B-A withdrawal, multiple-baseline, and alternating treatment designs. |
| Types of appropriate research questions | These designs are typically used to study the behavior change an individual exhibits as a result of some treatment. Although single-subject designs have their roots in clinical psychology and psychiatry, they are useful in many educational settings, particularly those involving studies of students with disabilities. |
| Key characteristics | ■ Study includes a sample size of one, or the study considers a number of individuals as one group.<br>■ In single-subject designs, each participant serves as his or her own control.<br>■ In general, the participant is exposed to a nontreatment and treatment phase, and performance is measured during each phase.<br>■ Single-subject designs are applied most frequently in clinical settings where the primary emphasis is on therapeutic impact, not contribution to a research base. |
| Steps in the process | **1.** Select and define a problem.<br>**2.** Select participants and measuring instruments.<br>**3.** Prepare a research plan, including selection of the appropriate single-subject research design (A-B-A withdrawal, multiple-baseline, and alternating treatment).<br>**4.** Execute procedures.<br>**5.** Analyze the data.<br>**6.** Formulate conclusions. |

(*Continued*)