1

Research in Education

Chapter Objectives

In this chapter, the reader will

- understand the need for thoughtful, systematic research in education.

- be able to describe the research-to-practice gap.

- identify how research can be used at both the policy, school, and classroom levels.

- distinguish between experimental and descriptive research.

- define important designs related to experimental and descriptive research.

- describe quantitative and qualitative research methods.

- identify the steps of the research process.

The field of education is full of debates on many topics. As Chester Finn (2000) once said,

Phonics or whole language? Calculators or no calculators? Tracked or mixed-ability classrooms? Should teachers lecture or "facilitate"? Ought education be content-centered or child-centered? Do high-stakes exams produce real gains or merely promote "teaching to the test"? Which is the most effective reform: Reducing class size? Expanding pre-school? Inducing competition through vouchers? Paying teachers for performance?

And on and on and on. Within each debate, moreover, we regularly hear each faction citing boatloads of "studies" that supposedly support its position. Just think how often "research shows" is used to introduce a statement that winds up being chiefly about ideology, hunch or preference. (para 1–2)

Conducting Research in Education: Art or Science?

Ideology, hunch, or preference often seems to drive the debates and decisions in education. One reason is that people often disagree about the professionalism of education. Is teaching truly a profession like medicine, where knowledge is built by studying certain phenomena and determining the most effective and efficient ways to deal with them, or is teaching more of a creative vehicle for individuals doing what they think is right? Different groups answer this question in different ways, usually incorporating varying degrees of science and art.

If arguing that teaching is art or craft, then a body of educational knowledge potentially would be developed by individuals through idiosyncratic means. Unfortunately, this concept of teaching creates limits for the profession. That is, if knowledge of teaching and effective practices were only transmitted by individual trial and error and not through data-based inquiry, then it would be very difficult to call teaching a "profession" in the same way we typically talk about law, medicine, engineering, and others. Merriam-Webster defines *profession* as "a calling requiring specialized knowledge and often long and intensive academic preparation" *(Merriam-Webster's Dictionary*, 2018). Thus, for a profession to have specialized knowledge, the facts and ideas related to that field must be validly and reliably documented, generalized, and shared—something that is impossible on any scale using only individual trial and error. That is why science and data-based inquiry are so important to the field of education.

Science is an approach to the development of a consistent, documented system of knowledge, based on rigorous, systematic observations that lead to hypotheses or theories that are then tested and refined in an iterative process (Vaughn & Damman, 2001). To identify effective practices for teaching students, for instance, scientific inquiry or research is essential.

Research, then, is a broad term that usually means the systematic and rigorous process of posing a targeted question, developing a **hypothesis** or focus, testing the hypothesis or focus by collecting and analyzing relevant data, and drawing conclusions. Research methods vary, but the goal of research is almost always the same: to answer a question or group of related questions. The questions may range from "Does A cause B?" to "What is A like?" Researchers answer these questions by using a systematic process of identifying relevant phenomena and evaluating them. Educational research answers questions important to students, teachers, administrators, parents, and other stakeholders. Table 1.1 lists several examples of the uses of educational research.

TABLE 1.1 ● Example Uses of Research in Education		
Level	**Purpose**	**Research Question**
Policy	To develop curriculum guidelines	What components are necessary for effective reading instruction at all grade levels?
	To guide systemic changes	What components of modified block scheduling are most effective for a middle school?
	To address grant proposal criteria	What components are necessary for effective reading instruction?
Classroom	To identify problems	Is Johnny's behavior out of the ordinary?
	To monitor progress	Has Johnny's behavior improved since I moved him away from his best buddy?
	To change instruction or practice	Johnny's behavior has not improved since I moved him. Will it change if I offer an incentive?

The Current Research-to-Practice Gap

More than two decades ago, Carnine (1997) described three main reasons why many educators do not rely on research to inform practice. First, some educational research lacks trustworthiness because of a lack of quality in design and implementation. Second, research often lacks usability; results are not always written clearly, and methods sometimes are not adequately described. Third, it is often quite difficult for practitioners to obtain research information quickly and efficiently. Several years later, Landrum, Cook, Tankersley, and Fitzgerald (2002) asked a group of teachers to rate the trustworthiness, usability, and accessibility of research information from colleagues, workshops or in-services, college courses, and professional journals. As if to underscore at least some of Carnine's reasons, teachers rated information from colleagues and workshops significantly higher on trustworthiness, usability, and accessibility than college courses and professional journals. More recently, and perhaps not surprisingly, Gukert, Mastropieri, and Scruggs (2016) found that the adoption of evidence-based practices among teachers resulted in adapting and modifying practices to meet individual needs rather than implementation with fidelity to practices in original research. Therein lies the gap between what researchers advocate and the actual practices of some educators.

The research-to-practice gap continues to exist in all areas related to education, from early childhood education (Grifenhagen, Barnes, Collins, & Dickinson, 2017)

to special education (Guldberg, 2017), counselor education (Lee, Dewell, & Holmes, 2014), educational administration (Cho, 2016), and residential care (Thompson et al., 2017) as well as within specific disciplines including business education (Glenn, 2015).

How should the research-to-practice gap be bridged? There have been many responses to this question. One was from Boudah, Logan, and Greenwood (2001), who analyzed the results of five research-to-practice projects funded by the US Department of Education. They concluded that successful research-to- practice work required the following:

- An up-front commitment by researchers and school educators, as well as an ongoing, honest relationship

- Intensive work by researchers and teachers

- Extensive, sustained effort

- Building-level (although not necessarily district-level) administrative support

- The involvement of key individuals

- Financial resources and teacher recognition (p. 296)

All of these components add more time and hard work to an already long school day. The overriding purpose, however, is to improve outcomes for students and contribute to professional growth.

Congress has tried to reduce or bridge the research-to-practice gap through legislation. The reauthorization of both the Elementary and Secondary Education Act—better known initially as the No Child Left Behind Act and, more recently, as the Every Student Succeeds Act (ESSA)—and the Individuals with Disabilities Education Act requires that schools be held accountable for student progress and the use of instructional methods derived from scientifically based research. Therefore, it is imperative that education professionals know what research-based instruction is, how to determine if a practice is research-based, how to implement it in schools, and how to document its effectiveness.

The connectedness of research with practice is vital for sustaining and improving specific educational practices. Therefore, the primary purpose of this book is to help you understand, conduct, and share research. The secondary purpose is to aid in the development of practitioners who conduct and use scientific inquiry to better the field of education, whether they be administrators, teachers, guidance counselors, or other educational service providers.

Examples of Research at the Policy and Classroom Levels

Some very practical examples do exist regarding the impact that relevant research can have on instruction at both the policy and classroom levels. For example, in 2000 the National Reading Panel (NICHD) issued a report, *Teaching Children to Read*, which

identified the effective components of early reading instruction. The Panel reviewed *100,000 studies* of reading to determine that

- phonemic awareness can be taught and learned.

- systematic and explicit phonics instruction is more effective than non-systematic or no phonics instruction.

- repeated and monitored oral reading improves reading fluency and overall reading achievement.

- children learn the meanings of most words indirectly, through everyday experiences with oral and written language.

- text comprehension can be improved by instruction that helps readers use specific comprehension strategies.

Thus, programs that do not include the elements of phonemic awareness, phonics instruction, oral reading, vocabulary instruction, and reading comprehension instruction were largely dismissed as ineffective. Combined in a coherent program, these effective components have improved the reading performance of all types of students. These elements have become a critical part of the evaluation of reading programs at many levels, including those that have received grants through the Department of Education.

Careful review of research has given educators many tools for effectively addressing many of the challenges they face in schools. However, it is often difficult for teachers and other educators to give up programs or practices they feel comfortable with, even if the practices do not have the elements identified by the National Reading Panel or the *What Works Clearinghouse* (https://ies.ed.gov/ncee/wwc/PracticeGuides), another government-sponsored outlet for vetted educational practices. This is why thoughtful evaluation of practices and decisions about instructional techniques are needed. This is also why educators and other stakeholders must collect data about student performance as part of professional practice. When evidence indicates students are not improving, educators need to find better alternatives.

Examples at the Classroom Level

Research, then, is not just for the upper levels of education policy making; it can and should be part of everyday classroom events. For example, teachers may begin with statements such as these:

- Johnny is defiant.

- Madeleine can't read at grade level.

- Esmerelda just doesn't "get it" in my class.

The reality is that these statements do not provide anyone with much information. What does it mean to say Johnny is defiant? How often is he defiant? What does he do?

Are there certain times and situations in which Johnny is defiant? Does Johnny's behavior occur in other classrooms or situations? The same is true for the statements about Madeleine and Esmerelda. How would anyone make a decision about instructional solutions based on these statements?

Defining problems and conducting classroom-based or high-quality "action research" allows teachers and others to (a) make data-based decisions, (b) monitor student progress, (c) change instruction, and (d) reflect on practice (Crockett, 2004). In addition, school-based educators can implement a systematic process for carrying out Response to Intervention (RTI) (e.g., Deshler, Mellard, Tollefson, & Byrd, 2005), or what is also now referred to as Multi-Tiered System of Supports (McIntosh & Goodman, 2016).

Making Data-Based Decisions. The statements about Johnny, Madeleine, and Esmerelda are probably not based on *data*, but on a teacher's response to events or anecdotes from the classroom. The information collected in an anecdote, among other things, is affected by a teacher's tolerance level, the classroom setting, and the content; however, the information collected from reliable data should not be affected by these factors. When a teacher makes these kinds of statements about students, she is indicating that a student's behavior is somehow standing out in the classroom. Collecting data about how the students stand out will then help the teacher to make more objective and more effective decisions about what to do.

For example, clearer, more data-based statements would be these:

- Johnny shouts out 10 times during 15-minute intervals of teacher instruction in social studies class.

- Madeleine reads 45 words per minute with 5 errors in second-grade text. Her peers (on average) read 75 words per minute with no errors.

- Esmerelda is unable to complete any math problems correctly when directions are given orally.

When data are presented, as in the examples just given, they remove much of the potential misinterpretation or teacher bias in defining student behavior. Many a teacher has been humbled to find that the *defiant* child actually shouted out no more than the *gifted* child. We are all human in our preferences, but when making decisions about students, we, as education professionals, must attempt to create clearer understanding and eliminate bias as best we can.

Monitoring Progress. Once a classroom or school situation has been documented with data, strategies can be put into place to help the student. Are the strategies working? By collecting data similar to that collected when the problem was identified, a teacher would be able to better answer that question. So, to continue with Madeleine, the teacher decides to try repeated readings with her to improve her fluency. After trying this strategy, the teacher assesses Madeleine's reading progress by having her read connected text in a second-grade book for 1-minute intervals. Two weeks later, she is reading at 55 words per minute with 2 errors—still below her peers but making gains.

Changing Instruction. If Madeleine's teacher did not administer timed readings, she may not have a valid way of knowing whether Madeleine's reading was improving. If the teacher knows Madeleine's reading is not improving, however, he or she would know it was time to make an instructional change. In another example, if students must pass an end-of-year writing exam, a teacher can monitor the progress of the students on the appropriate skills by testing periodically and tracking performance. Fuchs and Fuchs (2002) found that teachers who used data to make instructional decisions made more changes to their instruction than those who did not. Their students also showed greater academic gains.

Reflecting on Practice. Data can also come from records that teachers keep about their teaching. These records can be in many forms, but typically teachers compile student grades, test scores, and other information in response to their practice. This allows teachers to document, for example, how instruction went, what disasters may have occurred, and what successes they might want to repeat. In addition to allowing a teacher to review areas of strength and weakness, collecting this type of data allows teachers to compare practices and outcomes across classrooms and students.

Therefore, in an effort to encourage research-based instruction and promote better informed policy and systemic decision-making, many university teacher and administrator education programs as well as school-related programs require graduate students (and sometimes undergraduate students) to conduct research in order to learn its value and to practice the necessary skills. For example, individuals who are working toward Masters of Education, Masters of Teaching, Masters of Science in Administration, Doctors of Education, and similar degrees are typically required to complete a project (sometimes called a "Problem of Practice," thesis, or dissertation) that involves identifying a relevant question, reviewing the literature base for information, developing a research or project plan, collecting and analyzing data, and drawing conclusions. This book is intended to help graduate students and school-based educators who want to engage in research so that they can be systematic and data based in their decision-making. This text provides guidance in the following:

- Developing a research question
- Searching and understanding the literature for the current state of knowledge on a topic
- Developing a research plan
- Collecting and analyzing data
- Drawing conclusions
- Sharing the conclusions with others

It is important to note that it would be impossible to include everything you need to know about research in one book. Therefore, consider this book a handbook, or field guide rather than a standard educational research or statistics textbook. The goal is not to simply teach you about research or research methods, but to help with the step-by-step implementation of a research project in a school or clinic setting.

Research Types, Designs, and Methodologies

Before learning more about how to conduct educational research, it is important to be sure you understand common research types and designs, as well as their uses. It is also important to understand some basic research terminology. Table 1.2 outlines the research types and designs included in this text.

Types of Research

For ease of discussion, research is categorized into two major types: experimental and descriptive. If a research project includes both types, it is referred to as mixed method. Within each type, there are varying designs and methodologies.

Experimental Research. Simply stated, the goal of experimental research is to identify cause-and-effect relationships; whether by doing X, the result is Y. Following is an example of an experimental study that includes many important associated terms and ideas presented in bold.

A teacher named Jennifer may want to know if using Technique A will increase the number of words read by second graders in one minute. In this example, Technique A is the **independent variable**—the variable that is manipulated and controlled by the researcher in the hope of causing an effect. The **dependent variable**—the variable that may change because of the independent variable—would be the number of words read by each student in grade-level text in one minute. The students included in the study are the **sample** chosen from a **population** or larger group with certain identifiable characteristics. In experimental research, a researcher usually chooses a **representative sample**, or one that has similar characteristics to the population, so that the results of the experiment can be considered applicable to all individuals in the population. Thus, one related goal of experimental research is to produce results that are **generalizable** to the population and not just results that are applicable to a single sample.

TABLE 1.2 ● Research Types and Designs Included in This Text	
Type of Research	**Research Design**
Experimental/ Quasi-experimental	Group (posttest only, pretest-posttest, comparison group, time-series)
	Single subject (ABA, multiple baseline)
Descriptive	Qualitative (case study, grounded theory)
	Survey
	Correlational
Mixed Methods	Includes one or more designs from Experimental/Quasi-experimental and/or Descriptive types of research

Jennifer develops Technique A for improving reading fluency. She makes sure that Technique A actually focuses on reading fluency or is like a technique that has been proven effective in other studies. In this way, Jennifer is making sure that Technique A has some aspect of **validity.** Jennifer also practices giving the oral reading fluency assessment so that she can use it in the same way with all students in the sample. In this way, Jennifer is making sure her measurement of the dependent variable has **reliability**.

Now that the preparations are completed, Jennifer is ready to conduct the study. She puts the names of all of the second graders in three local elementary schools in a hat and draws them out, one by one, assigning each student to a classroom. In this way, she is **randomly assigning** students to classes, meaning every child has an equal chance to be in any of the classrooms. After the students are assigned, Jennifer trains several teachers to use Technique A and verifies that they can use Technique A with **fidelity**. The students in the classrooms who receive instruction using Technique A are participants in the **experimental group**. The students in the classrooms who do *not* receive instruction using Technique A are participants in the **comparison group**.

Jennifer administers the oral reading fluency assessment before and after teachers use Technique A, and then compares the students' performance. Using statistics, she can determine whether or not there is a **statistically significant** difference between the students' performance before and after, as well as between the experimental and control group. For there to be a statistically significant difference in performance, the change in the number of words read in one minute by the second graders must be greater than a predicted change due to differences that may occur due to chance when the assessment was given (e.g., didn't eat breakfast that morning, fire drill just before assessment, different background knowledge of students, etc.).

In this example, the teacher was able to exert a great deal of control over the implementation of Technique A, *and* she was able to randomly assign students to classrooms. It should be noted that random assignment is often difficult in school settings. When random assignment is problematic or impossible, the research study is then called quasi-experimental (Cook & Campbell, 1979). As with experimental research, a primary goal of quasi-experimental research is to show cause and effect. However, quasi-experimental research recognizes that random assignment (and therefore, control of some related chance variables) is next to impossible in most forms of social science research, including in education, where real-life classroom settings present difficulties in randomly assigning students and techniques. When done well, however, quasi-experimental research results can be generalized broadly, especially when other research studies find similar results.

Descriptive Research. In descriptive research, unlike experimental research, the researcher attempts to report what already exists. Moreover, the researcher's purpose is to understand and report the characteristics of a current or past phenomenon. For example, the results of a study may indicate that 80% of the teachers in elementary classrooms in one state are white females and hold master's degrees. Or, in a survey of seventh graders, 3 out of 10 report having tried alcohol. Or in a review of census data, 25% of Americans over the age of 70 live alone. The purpose of each of these types of studies is *not* to determine cause and effect but to describe what already exists. Following is an example of a descriptive study using survey methods.

Superintendent Andre wants to know how teachers in his district feel about their jobs. He asks a group of teachers and administrators to tell him what types of activities make up a teacher's job (e.g., teaching classes, disciplining students, paperwork, etc.). This group of teachers may be called a **focus group**, a small group of individuals with similar characteristics to those under study who give ideas about concepts important to a study. Taking the input from the focus group, Andre creates a survey with several questions about a teacher's job. He asks teachers to rate their satisfaction with each job aspect on a scale of one (very unsatisfied) to five (very satisfied). He also asks for some demographic information such as age, number of years teaching, number of years teaching in the district, and so forth. After piloting and revising it, Andre asks all of the teachers in the district to complete the survey. In this way, he is giving the entire population the opportunity to participate. About 75% of the surveys are returned. Thus, his sample turns out to be a little bit less than the entire population (although it's still a pretty high **return rate**). The results are tabulated, graphed, and reported to school administrators and the school board.

Descriptive research can be accomplished through many research methods, including survey, qualitative, and correlational. Each method uses very different techniques. Following is an example of a descriptive study using qualitative methods.

Tiana wants to describe the instructional actions of five middle school teachers using a new curriculum. All of the teachers have attended a professional development workshop, and they are now beginning to implement the curriculum in their classrooms. Tiana observes each teacher and classroom on many occasions over a number of weeks. She also interviews the teachers several times. She then reviews the new curriculum guides. As Tiana collects the data from observations, interviews, and document reviews, she examines them for themes, commonalities, and theories about instructional actions. Tiana must identify and describe her procedures for collection and analysis of her data in detail so that the study is judged to be trustworthy or completed using appropriate techniques. After completing the study, she will be able to describe these teachers' actions in relation to their beliefs and the curriculum, but because the sample size is so small, it may not be broadly generalizable.

Mixed Methods. Some studies address questions that are best answered using **mixed methods research**. Simply put, mixed methods research either employs experimental and descriptive designs, or more than one type of descriptive research design. For example, mixed methods research could utilize a pretest-posttest comparison design to experimentally investigate group differences in math performance *and* survey teachers and students to describe their thoughts on the math curriculum. A mixed methods project could also use a correlational design to consider the relationship between gender and math performance, while also conducting interviews and focus group sessions to describe what boys and girls and their parents think about the math curriculum and their goals for the future. Designing and conducting mixed methods research will be discussed in more detail in Chapter 7, and analyzing and interpreting mixed methods research will be discussed in more detail in Chapter 11.

In sum, the broad categories of experimental and descriptive research provide an organizing framework for the purposes of research. To determine cause-and-effect relationships, research is either experimental or quasi-experimental. To provide information about what exists, research is descriptive. As presented in the research examples, research also varies by the method used.

Research Methodologies

In addition to dividing research into experimental and descriptive, many educators organize research by the methods used and kinds of data collected. Let's consider two broad categories of methods and data: quantitative and qualitative.

Quantitative Methods. **Quantitative methods** are used in both experimental and quasi-experimental research, as well as some forms of descriptive research. Quantitative methods involve assigning numbers to sequential levels of variables being studied for purposes of statistical analysis. For example, researchers may use test scores (e.g., 86 on a scale of 0 to 100) to indicate reading achievement. Participants may rate their level of exertion during activities (one is no exertion, two is mild exertion, three is moderate exertion, etc.).

Researchers analyze these numbers for a variety of purposes. In experimental or quasi-experimental research, the purpose may be to determine if an independent variable led to a significant change in a dependent variable. For example, consider these possible results from the earlier example of the second-grade reading intervention: "Following intervention, there was a statistically significant difference in the number of words read in one minute by second graders. This difference favored the group that received Technique A." In this example, Technique A was the independent variable, and the number of words read per minute was the dependent variable, measured quantitatively.

Now take a look at the possible outcomes of Superintendent Andre's survey. After analyzing the data, Andre may be able to say that the teachers in the sample have an average age of 40 and, on average, have taught for five years in the district. The average rating of satisfaction with paperwork level is 3.5, in the satisfied range. Andre may also be able to calculate correlations to let him know that the older the teacher, the more satisfied with the level of paperwork. Andre is able to describe quantitatively what exists among the teachers in his district but not to determine cause-and-effect relationships since his research purpose was descriptive and not experimental. Chapters 5 and 9 provide guidance on experimental research, and Chapters 7 and 11 detail descriptive research and methods.

Qualitative Methods. **Qualitative methods** are used in descriptive research. Qualitative researchers analyze language, written or oral, and actions to determine patterns, themes, or theories in order to provide insight into certain situations. Qualitative data might include personal interviews, observations, and document review. The qualitative researcher works at "capturing what actually takes place and what people actually say" (Patton, 2002, p. 26). There are many data analysis techniques available in qualitative inquiry, including naturalistic inquiry, grounded theory, case study analysis, and others. Consider a possible outcome of Tiana's curriculum investigation.

Tiana discovers that teachers using the new curriculum talk about its implementation using three general themes: (a) developing materials, (b) managing students, and (c) creating interest. The instructional actions she observed included many mundane tasks, such as teaching students where to find their folders, as well as intriguing discussions based upon character analyses. Chapters 6 and 10 provide more direction on qualitative research and methods.

TECHNOLOGY IN RESEARCH

Technological advances in computers, voice recognition software, phone apps, and the like have made conducting research somewhat easier than in the past. For example, researchers who use qualitative methods used to glue text from interview transcripts to index cards, which they would then sort into different categories. In today's research endeavors, software allows researchers to convert interview recordings to text files, insert the text files into data management programs, and sort and categorize data on their computers. Phone apps allow teachers and others doing research in classrooms to record observations as events occur with little intrusion. Most chapters in this book include Technology in Research, a special feature that gives a brief description of a technology relevant to the chapter's topic. The Technology in Research features are meant to introduce the topic and provide selected resources for more information.

IN THEIR OWN WORDS

It is important to understand the theory or purposes behind conducting research in schools. Understanding how to put the theory into practice, however, is critical to conducting an effective study. In each chapter, you will meet graduate students, teachers, and seasoned researchers who describe how they make research work. Each person will offer comments about successes and failures, as well as provide guidance on some aspect of the topic included in the chapter. The bits of knowledge these researchers provide can help make your research project flow smoothly.
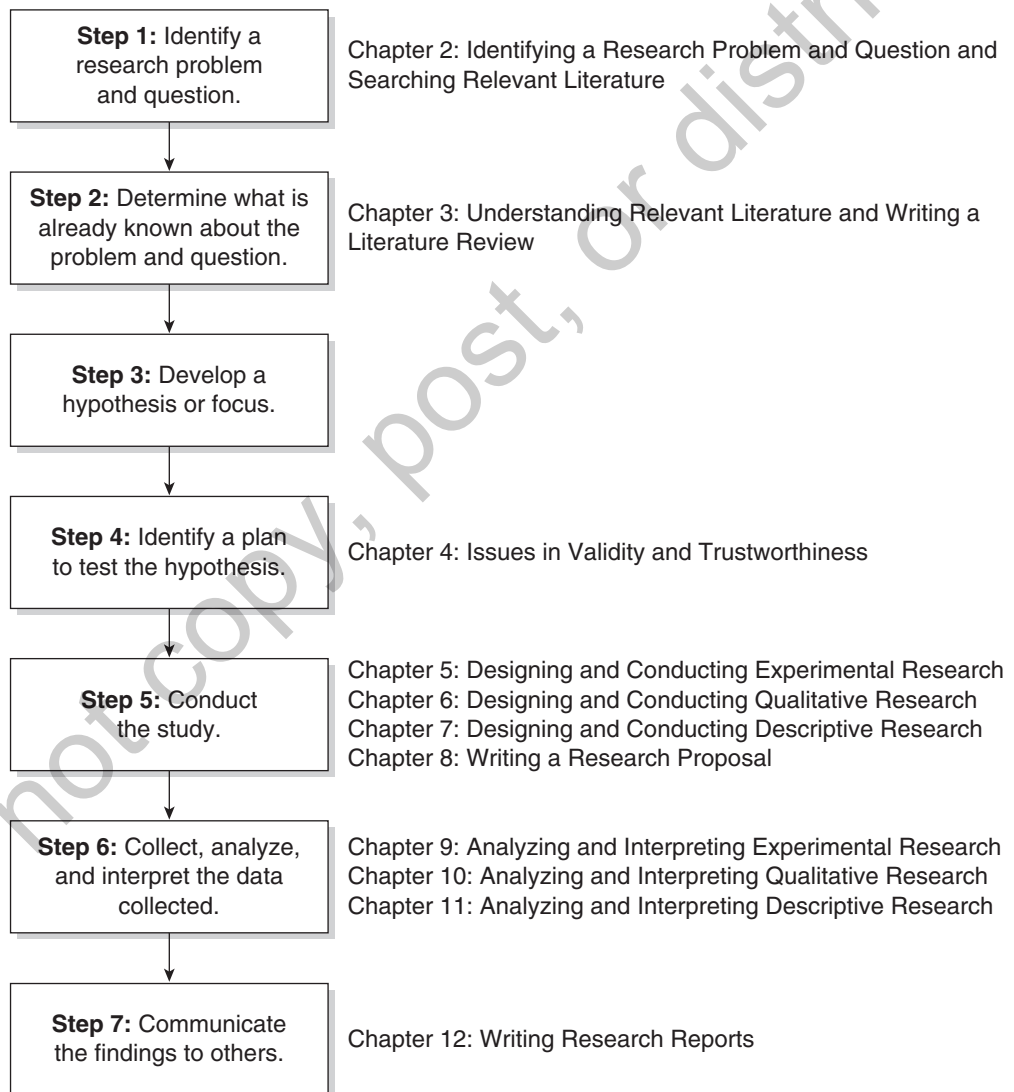
Selected Organizations That Support Research In Education

Before the close of this chapter, I must note that there are many professional organizations and groups in education. The organizations that focus on research in education can provide valuable support and resources to beginning researchers. Some of these groups have members from all aspects of education, and others serve subsections of education professionals. Appendix A provides information about some of these organizations, including their mission statements and goals, how they support researchers, their sources of support (including funding), and how to locate or contact them for more information. It was impossible to highlight all the groups that support educational research, so groups were chosen based upon their commitment to research, their accessibility, and the reputation they have attained in education.

Putting It All Together

Given the variety of questions and designs, there is no single way to conduct research in educational settings. What you will read over and over again in this book is that the research design and methods must be appropriate to explore the initial research

FIGURE 1.1 ● Steps in the Research Process

Step 1: Identify a research problem and question.	Chapter 2: Identifying a Research Problem and Question and Searching Relevant Literature
Step 2: Determine what is already known about the problem and question.	Chapter 3: Understanding Relevant Literature and Writing a Literature Review
Step 3: Develop a hypothesis or focus.	
Step 4: Identify a plan to test the hypothesis.	Chapter 4: Issues in Validity and Trustworthiness
Step 5: Conduct the study.	Chapter 5: Designing and Conducting Experimental Research Chapter 6: Designing and Conducting Qualitative Research Chapter 7: Designing and Conducting Descriptive Research Chapter 8: Writing a Research Proposal
Step 6: Collect, analyze, and interpret the data collected.	Chapter 9: Analyzing and Interpreting Experimental Research Chapter 10: Analyzing and Interpreting Qualitative Research Chapter 11: Analyzing and Interpreting Descriptive Research
Step 7: Communicate the findings to others.	Chapter 12: Writing Research Reports

question. In other words, you should not say, "I am a qualitative researcher," or "I am a quantitative researcher." The reality is that different types of research may work together coherently to achieve better understanding of a research question or educational situation. The balance of this book begins with guidance in developing and focusing research questions so that the most appropriate research type and design will be apparent. Once you choose a type of research to answer a specific research question, you can begin the task of designing the study using appropriate methods.

Steps in the Research Process

As noted at the beginning of this chapter, research is the intentional process of posing a question, developing a hypothesis or focus, and designing a study to test the hypothesis by collecting and analyzing relevant data. This definition leads to an outline for the research process that is broken down into seven important steps:

1. Identify a **research problem** and **research question**.

2. Determine what is already known about the problem or question.

3. Develop a hypothesis or focus.

4. Identify a plan to test the hypothesis.

5. Put the plan into place (conduct the study).

6. Collect, analyze, and interpret the data collected.

7. Communicate the findings to others.

These steps are explained in detail in subsequent chapters. (See Figure 1.1 for the alignment of steps and chapters.) It is important again to emphasize that this book is a guide for the completion of research projects, not a book that identifies and describes every aspect of educational research. It will provide information both practical and helpful to anyone completing a graduate-level research study in education.

Summary

The purpose of this text is to guide your completion of a master's degree or some doctoral-level research studies. In addition, this book can guide practitioners and clinicians in conducting research in practice. The current research-to-practice gap has contributed to too few educators accessing and relying on proven, effective practices as they work with students and in schools. Therefore, one of the important related purposes of this book is to help administrators, teachers, and related service providers develop and use scientific inquiry in their practice. This chapter identified two primary types of research, experimental and descriptive, and highlighted quantitative and qualitative methods. It also introduced a number of important terms and concepts commonly used in research, including the following:

Research

Independent variable

Dependent variable

Sample

Population

Representative sample

Generalize

Validity

Fidelity

Reliability

Random assignment

Experimental group

Control group

Statistically significant

Quasi-experimental design

Survey research methods

Focus group

Trustworthy

Qualitative research methods

Quantitative research methods

Please refer to the glossary at the end of the text for specific definitions.

Finally, the chapter described the seven steps necessary in completing a research project:

1. Identify a research problem or question.

2. Determine what is already known about the problem or question.

3. Develop a hypothesis or focus.

4. Identify a plan to test the hypothesis.

5. Put the plan into place (conduct the study).

6. Collect, analyze, and interpret the data collected.

7. Communicate the findings to others.

Activity

Fill in the blanks with the appropriate term(s).

1. _____ methods are often used in experimental, quasi-experimental, and descriptive research; methods involve assigning numbers to sequential levels of variables being studied for purposes of statistical analysis.

2. _____ is a broad term that usually means the systematic and rigorous process of posing a focused question, developing a hypothesis or focus, testing the hypothesis or focus by collecting and analyzing relevant data, and drawing conclusions.

3. The _____ _____ is the variable that the researcher manipulates and controls in the hope of causing an effect.

4. _____ is a term associated with a study that does what it claims to do.

5. The _____ _____ is the group that receives the independent variable or treatment.

6. _____ methods are often used in descriptive research; these include personal interviews, observations, and document review.

7. _____ is a term associated with study methods that can occur similarly across participants and time.

8. The _____ _____ is the variable that may change because of the independent variable.

9. _____ is a term associated with experimental procedures in a study that are done as intended.

10. The _____ _____ is the group that does not receive the independent variable or treatment.

11. _____ is a term associated with qualitative procedures in a study that were completed using appropriate techniques.

Answers can be found on page 18.

Provide an example of the following research methods:

12. Quantitative research methods

_____

_____

13. Qualitative research methods

_____

_____

14. Quasi-experimental research methods

_____

_____

Your Research Project in Action

At this point in your reading, you should be thinking about how research fits into your practice. As you consider this, you will be able to determine an area of focus that will be useful in developing your research study. Start by thinking about the following questions:

- Where do I go to find information about educational practices?

  _____

  _____

- Where do I look for research articles or to find out if a practice has a research base?

  _____

  _____

- Why would it be important for me to conduct research in my school/district/ practice or to be guided by research findings?

  _____

  _____

- In what ways do I use anecdotal evidence instead of data-based evidence? How can I change this?

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Further Reading

Cook, T. D., & Campbell, D. T. (1979). Quasi-*experimentation: Design and analysis issues for field settings*. Boston: Houghton Mifflin.

This classic research book is an excellent reference for finding examples of real-world application research studies. This book also provides examples of problems previous researchers have experienced and describes how to avoid those difficulties in one's own research. This book provides an excellent discussion of the advantages and limitations of using quasi-experiment research methodologies. Knowing the advantages and limitations helps researchers focus on what exactly they are hoping to find, achieve, or resolve and how this particular methodology will facilitate that process.

Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

This book is written to benefit a wide variety of audiences. Students, researchers, and even practitioners can find this book beneficial to their research. This book focuses on qualitative research methods and addresses the main concepts of problem identification, participant inclusion and observation, interviewing and note taking, decoding of messages, data analysis, and reporting of results. Included are interview

guides and questions that researchers can reference when conducting their own studies. In addition, Patton provides personal narratives of his own experiences and struggles with research studies.

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What Works Clearinghouse (https://ies.ed.gov/ncee/wwc/PracticeGuides)

Activity Answers

1. Quantitative methods are often used in experimental, quasi-experimental, and descriptive research; methods involve assigning numbers to sequential levels of variables being studied for purposes of statistical analysis.

2. Research is a broad term that usually means the systematic and rigorous process of posing a focused question, developing a hypothesis or focus, testing the hypothesis or focus by collecting and analyzing relevant data, and drawing conclusions.

3. The independent variable is the variable that the researcher manipulates and controls in the hope of causing an effect.

4. Validity is a term associated with a study that does what it claims to do.

5. The experimental group is the group that receives the independent variable or treatment.

6. Qualitative methods are often used in descriptive research; these include personal interviews, observations, and document review.

7. Reliable is a term associated with study methods that can occur similarly across participants and time.

8. The dependent variable is the variable that may change because of the independent variable.

9. Fidelity is a term associated with experimental procedures in a study that are done as intended.

10. The comparison group is the group that does not receive the independent variable or treatment.

11. Trustworthy is a term associated with qualitative procedures in a study that was completed using appropriate techniques.