CHAPTER ONE

INTRODUCTION TO EDUCATIONAL RESEARCH

Chapter Objectives

After reading this chapter, you should be able to

1. Describe the role of research in the educational accountability movement
2. Describe key aspects of the No Child Left Behind (NCLB) Act, including
   the role of educational research in implementation of the act and
   the potential effects of NCLB on the future of educational research
3. Explain the differences between inductive and deductive reasoning
4. Articulate the key differences between knowledge-oriented philosophical frameworks for educational research (scientific realism and social constructivism) and action-oriented approaches (advocacy or liberatory and pragmatism) and *begin* to define your own framework
5. Explain the differences between and provide a simple example of
   - quantitative and qualitative methods of data collection and
   - basic and applied educational research
6. For each research approach discussed,
   - describe the key elements of that approach and
   - provide an example of a research study using that approach

Educational Research Today

At the beginning of the 21st century, the educational research community is again responding to the call for increased accountability in our nation's schools. This call for accountability comes from both within and outside the educational community. Educators, parents, students, communities, and politicians are hopeful that the new accountability will result in increased achievement for America's students. As discussed in Box 1.1, the No Child Left Behind (NCLB) legislation holds schools accountable for monitoring and reporting student progress based on test scores. Monies for schools are being made available for programs that are "scientific and reliable," although the federal government's definition of scientific research is very narrow (see Neuman, 2002).

Meeting NCLB requirements makes knowledge of educational research an essential component of professional preparation for all educators. However, to promote creative, innovative, yet sound solutions to current educational problems, future educators must become knowledgeable about a multitude of research approaches that reach beyond those techniques defined as "reliable" under the NCLB legislation. It is our hope that this book will enable students to participate in ongoing debates about the status and future of education on both national and local levels. We also hope that you will develop skills and knowledge to take part in a much longer and broader tradition: using scientific research to identify and develop effective educational practices.

Box 1.1 No Child Left Behind Act

Although the current movement for accountability began at the end of the 20th century, the No Child Left Behind (NCLB) legislation passed by the U.S. Congress in 2001 has brought accountability to a new level. NCLB is the reauthorization of the Elementary and Secondary Education Act, passed in 1965, which resulted in large federal expenditures to help improve education for children from disadvantaged communities. According to the U.S. Department of Education (2005b), since 1965 the federal government has spent over $300 billion to educate youth from low-income families. However, the government also reported that only 32 percent of fourth-graders could read at grade level and most of those who could not read were ethnic minorities. Believing that the money spent was not improving education, the Bush administration passed the NCLB legislation as a mechanism to increase accountability of individual schools and states and ultimately reform education.

What this legislation effectively does is to significantly increase the role of the federal government in education and set into place regulations that reach into virtually

all public schools in this country. In short, the legislation requires (U.S. Department of Education, 2005a):

a) *Annual Testing*—By the 2005–06 school year, states must begin testing in grades 3–8 annually in reading and math. By 2007–08 states must develop tests to measure science achievement at least once in elementary school, middle school, and high school. All tests must be aligned with state standards and be reliable and valid measures. Additionally, a sample of the 4th and 8th graders must participate in the National Assessment of Educational Progress testing program every other year in the content areas of reading and math.
b) *Academic Progress*—States are responsible for bringing all students up to a level of proficiency by the 2013–14 academic school year. Each year, every school must demonstrate "adequate yearly progress" toward this goal. If a school fails to meet this goal for two years in a row and receives Title I funding (federal dollars), the state must provide technical assistance, and families must be allowed a choice of other public schools (assuming there is available space and that the other schools are making adequate progress). If a school fails to meet the defined level of proficiency for three years in a row, it must offer students supplemental educational services, which could include tutoring.
c) *Report Cards*—All states must prepare individual school report cards on all schools. These report cards must be made public and must demonstrate progress in reaching the state standards.
d) *Teaching Quality*—Currently, the federal government provides money to states and school districts to improve the quality of their teaching forces. Under the NCLB legislation, the federal government has indicated that it will provide greater flexibility in the spending of that federal money.
e) *Reading First*—NCLB offers new competitive grants called Reading First that will help states and school districts to set up scientific and reliable research-based reading programs for children in kindergarten through grade three. School districts in high poverty areas will be given priority for these grants. According to the U.S. Department of Education (2005a), the key characteristics of reliable research are:

    1) a study that uses the scientific method, which includes a research hypothesis, a treatment group, and a control group,
    2) a study that can be replicated and generalized,
    3) a study that meets rigorous standards in terms of its design, the methods used and the interpretation of the results, and
    4) a study that produces convergent findings, e.g., findings are consistent using various approaches.

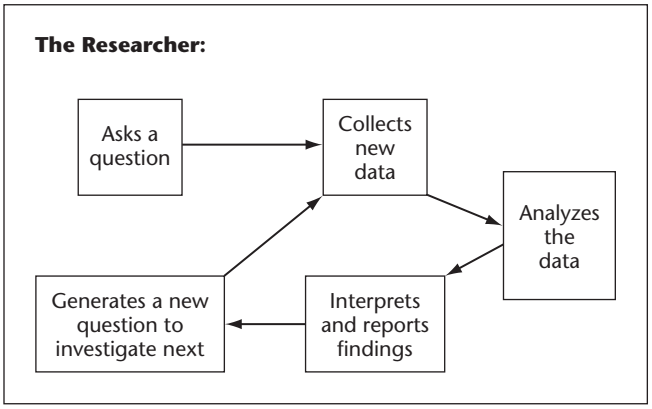
These guidelines have significant implications for the way research is conducted in education. Specifically, the legislation calls for researchers to conduct studies with

scientific rigor. According to Neuman (2002), NCLB's definition of scientific rigor is consistent with **randomized experimental designs,** study designs in which persons are randomly assigned to groups that are treated differently. Randomized studies certainly are one approach for establishing causality but may not be appropriate for all research questions. Almost everyone would agree that research studies should be rigorous and scientific. However, the narrow definition of scientific rigor as randomized experimental studies has the potential for greatly limiting the scope of educational research. Furthermore, according to R. D. Davies (2003), "devoting singular attention to one tool of scientific research jeopardizes inquiry efforts into a range of problems best addressed by other scientific methods" (pp. 4–5).

Educational Research: Using the Scientific Method

The NCLB initiative is certainly not the first effort to apply scientific methods to educational practices. Since the beginning of formalized education, research has been used to help improve education and to determine how education works in a wide range of situations. Through scientific research, educators hope to obtain accurate and reliable information about important issues and problems that face the educational community. Specifically, **scientific educational research** is defined as the application of systematic methods and techniques that help researchers and practitioners to understand and enhance the teaching and learning process. The steps used in the scientific process are shown in Figure 1.1.

FIGURE 1.1 THE SCIENTIFIC PROCESS.



Much like research in other fields, research in education uses two basic types of reasoning: **inductive reasoning** and **deductive reasoning**. Inductive reasoning is often referred to as a "bottom-up" approach to knowing in which the researcher uses particular observations to build an abstraction or to describe a picture of the phenomenon that is being studied. Inductive reasoning usually leads to inductive methods of data collection where the researcher (1) systematically observes the phenomena under investigation, (2) searches for patterns or themes in the observations, and (3) develops a generalization from the analysis of those themes. So the researcher proceeds from specific observations to general statements—a type of discovery approach to knowing.

In contrast, deductive reasoning uses a top-down approach to knowing. Educational researchers use one aspect of deductive reasoning by first making a general statement and then seeking specific evidence that would support or disconfirm that statement. This type of research employs what is known as the **hypothetic-deductive method**, which begins by forming a **hypothesis**: a tentative explanation that can be tested by collecting data. For example, one might hypothesize that small classes would result in a greater amount of student learning than large classes. This hypothesis would be based on a **theory** or a knowledge base composed of the results of previous research studies. A *theory* is a well-developed explanation of how some aspect of the world works using a framework of concepts, principles, and other hypotheses. For example, a humanistic theory of education might emphasize strong teacher-student relationships as part of effective learning. Previous research studies may have shown that such relationships are more common in small classes. Therefore, based on the humanistic theory and these previous studies, the researcher in our example may have hypothesized that small class sizes will result in better student learning based on humanistic theory and previous studies. The next step in the hypothetic-deductive approach is to collect data to see if the hypothesis is true or should be rejected as false. The researcher might compare student learning in classrooms of 15 or fewer students with those of 25 or more students. If students in the smaller classes show a greater amount of learning, the hypothesis would be supported. If the students in the smaller classes do not show a greater learning, then by deductive reasoning, the hypothesis is shown to be false. To summarize, the researcher (1) began with a theory and a knowledge base and used them to form a hypothesis, (2) collected data, and (3) made a decision based on the data to either accept or reject the hypothesis or prediction.

The inductive and hypothetic-deductive approaches to knowing represent two general routes to knowledge used in educational research. Inductive reasoning is most closely associated with **qualitative** approaches to research, which collect and summarize data using primarily narrative or verbal methods: observations, interviews, and document analysis. Qualitative researchers are often said to take inductive approaches to data collection because they formulate hypotheses only

after they begin to make observations, interview people, and analyze documents. These hypotheses are examined and modified by further data collection rather than being accepted or rejected outright. Qualitative researchers believe that full understanding of phenomena is dependent on the context, and so they use theories primarily after data collection to help them interpret the patterns observed. However, ultimately qualitative researchers do attempt to make claims about the truth of a set of hypotheses.

The hypothetic-deductive method is most closely associated with **quantitative** approaches, which summarize data using numbers. Hypotheses and methods of data collection in quantitative research are created *before* the research begins. Hypotheses or theories are then tested, and when supported, these hypotheses or theories are typically considered to be **generalizable**: applicable to a wide range of similar situations and populations. Quantitative researchers may also use inductive reasoning as they look for similar experiences and results and form new ideas, concepts, or theories.

Philosophical Frameworks for Educational Research

Educational research today is beginning to move away from a hard and fast distinction between qualitative and quantitative research methods. Researchers can, however, be separated into groups based on their philosophical frameworks, identified in terms of the assumptions they make about the nature of the reality being studied, claims about what we can and cannot know, and the ways in which they utilize theories and findings. Each framework also makes assumptions about whether qualitative or quantitative methods are most appropriate for extending our knowledge about education. As a beginning researcher, it is important that you consider which approach best captures your own assumptions about how the world works.

Scientific Realism

Scientific realism is a term applied to the framework used by most researchers who take a purely quantitative approach to research. Quantitative research is characterized by a desire to answer research questions by producing numerical data that represent various **constructs** and **variables**. A construct is a hypothetical concept that is typically developed from a theoretical framework. Although constructs are names for things that cannot be seen (e.g., intelligence, motivation, self-esteem), they are assumed to be real characteristics that influence educational outcomes. When constructs are measured in educational research, they are known

as *variables*. Like the constructs they represent, variables are defined as attributes, qualities, and characteristics of persons, groups, settings, or institutions, such as gender, social skills, socioeconomic status, exclusiveness, or achievement. Scientific realists strive to establish cause-and-effect relationships where possible, using data collection methods such as questionnaires, tests, and observational checklists to produce quantitative data.

The philosophical underpinnings of the scientific realism approach can be found in the positivist arguments developed primarily to describe knowledge generation in the physical sciences. The first assumption made by scientific realists is that there is a real social and psychological world that can be accurately captured through research. In other words, there is an objective reality that research aims to describe. Scientific realists further assume that the social and psychological world can be studied in much the same way as the natural world by breaking complex phenomena and problems into smaller parts (constructs and variables). The major job for the researcher is to identify the most important parts or variables and accurately describe how these are related to each other in the real world. However, because humans are fallible and social scientists study human characteristics, reporting that reality must be done with a certain degree of probability. Scientific realists "see knowledge as conjectural" (Phillips & Burbules, 2000, p. 29) and therefore subject to possible revision. All hypotheses are tested using statistical tests that establish the level of confidence that one can have in the results obtained. Scientific realists do recognize that because educators study human behaviors and characteristics, research may be influenced by the investigator. For an investigator to maintain clear objectivity, he or she must play a **detached role**, where there is little opportunity for interaction with the participants under study. Scientific realists believe that inquiry can be value-free and that a researcher who strives to eliminate any personal bias can reliably determine findings. Although they borrow rigorous scientific techniques from the natural sciences, they recognize that in education and psychology, true scientific experiments are not always possible. Scientific realists concede that different persons might have different perceptions of reality; however, they assume that experiences overlap to a large degree and that a good researcher can take these different perceptions into account in providing the best possible explanation of reality.

Social Constructivism

Traditionally, purely qualitative research is often done by persons who hold a framework referred to as interpretive, constructivist, or naturalistic. (We will use the term **social constructivism** to refer to this approach.) Social constructivists challenge the scientific realist assumption that reality can be reduced to its component parts.

Instead, they argue that phenomena must be understood as complex "wholes" that are inextricably bound up with the historical, socioeconomic, and cultural contexts in which they are embedded. Therefore, they attempt to understand social phenomena from a context-specific perspective.

Social constructivists view scientific inquiry as value-bound and not value-free. According to Lincoln and Guba (1985), this means that the process of inquiry is influenced by the researcher and by the context under study. This philosophical perspective argues that reality is socially constructed by individuals and this social construction leads to multiple meanings. Different persons may bring different conceptual frameworks to a situation based on their experiences, and this will influence what they perceive in a particular situation. In other words, there is no one "true" reality, nor can one assume that the experiences that people have had will overlap to a large degree. Rather, we construct reality in accord with the concepts most appropriate to our personal experiences. Therefore, the researcher must attempt to understand the complex and often multiple realities from the perspectives of the participants. The acceptance of the existence of multiple realities leads social constructivists to insist that a set of initial questions asked in a study will likely change or be modified as these multiple realities are uncovered or reconstructed during the process of conducting research. The only true way to accomplish this understanding is for the researcher to become involved in the reality of the participants and interact with them in deeply meaningful ways. This provides an opportunity for mutual influence and allows the researcher to see the world through the eyes of the participants. "The inquirer and the 'object' of inquiry interact to influence one another; knower and known are inseparable" (Lincoln & Guba, 1985, p. 37). This approach, then, requires that researchers use data collection methods that bring them closer to the participants using techniques such as in-depth observations, life histories, interviews, videos, and pictures.

Advocacy or Liberatory Framework

Researchers taking an **advocacy** or **liberatory** framework for research also assume that there are multiple possible realities that are dependent on social, political, and economic contexts. However, they go beyond the social constructivist claim that researchers' values can influence research by insisting that moral values should form the impetus for research and that research should seek to improve the lives of persons who have little social power and have been marginalized by more powerful groups in their societies. In essence, the goal of advocacy or liberatory researchers is liberation through knowledge gathering. Paulo Freire (1921–1997), a literacy worker from South America and author of *Pedagogy of the Oppressed*, based his philosophy of research on these principles and argued that re-

search should provide freedom from oppression and debilitating living environments. Working on literacy skills with poor and oppressed Chilean workers in the 1960s and 1970s, Freire asserted that research should be conducted in a collaborative manner with community members participating in the selection and analysis of themes during data analysis. This collaboration requires that the researcher engage in respectful dialogue with the study participants and understand reality from the perspectives of the community. According to Freire and other advocacy-liberatory investigators, research should not only use inductive processes to gather information but engage in research as a form of social advocacy. Whereas this type of research usually uses qualitative methods of data collection, it might use quantitative methods constructed in collaboration with participants if these data will help the people achieve social changes in their society. The type of data collected is less dependent on philosophical assumptions than by their potential to illuminate experiences and facilitate action to achieve a better life. In other words, research should be used not only to educate and produce knowledge but also to empower people to take political action and use their political voice to change and improve their place in society.

Pragmatism

Pragmatism is the framework that has been most developed by American philosophers. Unlike the other frameworks, pragmatism is not concerned with whether research is describing either a real or socially constructed world. Instead, for pragmatists, research simply helps us to identify what works. Of course, we might ask our pragmatists what they mean by what works. They are likely to reply that knowledge arises from examining problems and determining what works in a particular situation. It does not matter if there is a single reality or multiple realities as long as we discover answers that help us do things that we want to do. A pragmatist might insist that a good theory is one that helps us accomplish a specific goal (or set of goals) or one that reduces our doubt about the outcome of a given action. Most pragmatic researchers use a **mixed-methods approach** to research; for example, they use both qualitative and quantitative methods to answer their research questions. Pragmatic researchers propose that even within the same study, quantitative and qualitative methods can be combined in creative ways to more fully answer research questions. Campbell and Fiske (1959) are often thought to be among the first researchers to introduce the notion of using both qualitative and quantitative techniques to study the same phenomena. In current research, pragmatic frameworks are used by both professional researchers and researchers who are primarily practitioners (e.g., teachers, counselors, administrators, school psychologists).

The assumptions underlying the philosophical frameworks described above are summarized in Table 1.1. We turn next to a discussion of the specific research approaches used in education.

Types of Approaches Used in Educational Research

Philosophical frameworks describe the assumptions that underlie research. To some extent, your philosophical framework will guide your selection of the type of research approach you will use. The specific approaches used in educational research can be further classified according to (1) the extent to which the findings are applicable to educational settings (e.g., basic vs. applied research), (2) the methods used to design the study and to collect data (e.g., qualitative vs. quantitative approaches), and (3) how the information is shared (e.g., the dissemination of the findings).

Basic Versus Applied Research Approaches

The goal of **basic research** is to design studies that can test, refine, modify, or develop theories. As an example of basic research, Marcia's (1966) research on adolescent identity led to a refinement of one stage of Erik Erikson's psychosocial theory of development. Marcia's goal was not to create a program to address practical ways to help adolescents but, rather, to extend and support the theory. **Applied research** studies examine the effectiveness and usefulness of particular educational practices. Here the goal is to determine the applicability of educational theory and principles by testing hypotheses within specific settings. For example, Schmitt-Rodermund and Vondracek (1998) examined whether parenting behaviors predicted the amount of adolescent identity exploration as described by Marcia.

Both basic and applied methods of research have their place in the educational research field. To some degree, the approach selected depends on whether the findings are utilized and result in a change in practice. In basic research, the overarching goal is to develop and modify theory. These theory-based studies, while critical to the formulation of applied research, often have low utilization and do not result in systemwide change. Whereas the goal of applied research is to demonstrate the usefulness of theories in practice, the reality is that applied research studies often take many years to stimulate change, even though the findings are disseminated to large groups of individuals through applied research journals. Two approaches that do result in more immediate change are program evaluation and action research, which are discussed below.

TABLE 1.1 FRAMEWORKS AND ASSUMPTIONS UNDERLYING EDUCATIONAL RESEARCH.

	Scientific Realism	Social Constructivism
Knowledge-oriented approaches	• Research aims to describe an objective reality that most or all people would agree is real • Educational settings and problems can be studied by empirical analysis of component parts • Research should be value-free • Researchers should be detached from participants and strive to be objective • Theories and hypotheses are formed and then confirmed or disconfirmed through collection of data	• Reality is historically and culturally constructed so there are multiple possible realities • Educational settings and problems must be understood as complex wholes • Researchers must continually strive to be aware of and control their values • Researchers should become actively involved with participants in order to understand their perspectives • Theories and hypotheses are generated during data collection and achieve meaning through human interactions
	Advocacy-Liberatory	**Pragmatism**
Action-oriented approaches	• Reality is socially constructed and influenced by social, political, and cultural inequalities • Although qualitative methods are preferred, educational settings and problems can be studied using any methods that truly represent the experiences of the participants • Research must be based in values and should empower marginalized groups to improve their lives • Researchers should collaborate with participants as equal partners • Theories and hypotheses should provide action plans to achieve a better life	• The immediate reality of solving educational problems should be the focus of educational research • Educational settings and problems can be studied using any method that accurately describes or solves a problem • Research should strive to find ways to make education better • Researchers should collaborate with participants to fully understand what works • Theories and hypotheses are useful tools in helping to improve education

Quantitative Research Approaches

All quantitative research approaches summarize results numerically. However, the approaches differ in their goals and the procedures used to collect data.

Descriptive Survey Research. *Descriptive survey research* aims to describe behaviors and to gather people's perceptions, opinions, attitudes, and beliefs about a current issue in education. These descriptions are then summarized by reporting the number or percentage of persons reporting each response. The survey is the primary method used to gather such data or information from people. Although more and more technology and Web-based surveys are being used in research, the long-standing paper-pencil survey continues to be the main mode of data collection. A commonly held misconception is that descriptive survey research is an easy method, requiring simple questions and answers. This just is not so. Good descriptive survey research requires thoughtful and careful planning. Like experimental research, this approach is quantitative, and surveys are typically administered to a random sample of the population to which the researcher wants to generalize the survey results; however, in contrast to experimental research, there is no manipulation of variables, and data are not gathered to test a hypothesis. Therefore, descriptive survey is considered a nonexperimental approach. Rather, demographic items (designed to obtain background information on participants) and survey questions are developed through an extensive review of the literature in the area of study, and conclusions are drawn based on participant responses. Items are subjected to a series of preliminary tests, or piloting, which is essential in order to "work the kinks out" of the survey. Descriptive survey research is the most widely used method of research in education, with an estimated 70% of research falling into this category.

Experimental Research. The goal of experimental research is to test hypotheses to establish cause-and-effect relationships. For decades, experimental research has been a major approach used in quantitative research, and indeed, the manner in which NCLB defines "reliable research" may result in an increased use of this method. Often when people think about research and what research is, they commonly associate it with characteristics typical of experimental research. The overarching purpose of experimental research is to determine whether a particular approach or way of doing something is "better" than the "older" or more traditional approach that has served as the standard practice. (Keep in mind that sometimes experimental research is conducted with hopes that no difference will be found between the two methods or approaches under investigation.) So experimental research is about studying the effect or the impact of an approach under

stringent and controlled conditions to make statements of causality. Sometimes, these conditions involve **random selection** of study participants from a larger group known as the **population**. The population is the larger group to which the researcher would like the results of a study to be generalizable (e.g., fourth graders or high school girls). Random selection is a procedure where each and every person in the population has an equal and independent chance of being selected for the study. The randomly selected participants constitute the **sample**. People in the sample are then assigned to one of two or more groups that are treated (**manipulated**) with regard to a specific educational approach or practice or are exposed to different treatments at different points in time. These differential treatment conditions are called the **independent variable**, which precedes and is assumed to cause a change in behavior referred to as the **dependent variable**. For example, a researcher might ask, "Does instructional strategy in reading (phonics or whole language) affect reading achievement of fourth graders?" In this study, reading achievement would be the dependent variable, and instructional strategy would be the independent variable. The sample would be a group of fourth graders randomly selected from the population to which the researcher wants to generalize the study results (e.g., fourth graders in an entire school district). Students would be randomly assigned to receive either phonics or whole language, and reading achievement would be measured. The final component of an experimental study is to control **extraneous variables**. An *extraneous variable* is any variable, other than the independent variable, that might influence the dependent variable. In any experimental study, there are many possible extraneous variables. In the study of phonics versus whole language, one would need to consider if the teachers for each class were equally good teachers. The amount of time spent on reading instruction might also be an extraneous variable. Differences in student abilities before the instruction begins are an extraneous variable that is controlled through random assignment. Many other ways to control extraneous variables are discussed in Chapter Eight.

Causal-Comparative Research. *Causal-comparative research,* or ex–post facto research, is a research approach that seeks to explain differences between groups by examining differences in their experiences. Like experimental research, it examines the effect of an independent variable (the past experience) on a dependent variable while also trying to control extraneous variables. However, unlike experimental research, the independent variable (the past experience) has either already occurred or it would be unethical to manipulate. For example, let us say that you are interested in what causes the differences in the readiness skills of kindergarten students. After reading past research studies, you decide to examine preschool attendance as an independent variable that might have "caused" a difference in

kindergarten readiness (the dependent variable). Preschool attendance has already occurred or happened; as a researcher, you cannot control or manipulate it. If you were to conduct such a study, you will simply identify two groups, one group that attended preschool and one group that did not, and then measure and compare school readiness scores. If the groups differ on their readiness scores, the researcher infers that preschool attendance caused the readiness scores to differ. However, caution is warranted. Because no random assignment occurred, the two groups being studied could be very different to begin with, which might mean that other factors and not preschool attendance caused the difference in readiness scores. For example, there may be differences in family income or parental levels of education (or both). Therefore, making sure that the two comparison groups are as similar as possible on all other extraneous variables (other than the independent variable) is a critical part of designing a causal-comparative study.

Correlational Research. *Correlational research* is a quantitative method designed to show the relationships between two or more variables. Correlational research is similar to descriptive survey in that it is nonexperimental, consisting of only one group of individuals (e.g., fifth-grade students) and two or more variables that are not manipulated or controlled by the researcher (e.g., reading scores and IQ). The variables are examined to determine if they are related and, if so, the direction and magnitude of that relationship. Simple correlational research does not seek to show causality (that one variable is causing a change to occur in another). Rather, the main purpose of correlational research is to determine, through application of a quantitative statistical analysis, whether a relationship exists between the variables under investigation. One might make predictions based on these relationships, but not statements of causality. For example, if such a relationship does exist, the strength and the direction of the relationship are reported numerically in what is referred to as a **correlation coefficient**. Scores from this analysis fall somewhere along the correlation coefficient's range of negative 1.00 to positive 1.00. Note that negative and positive do not have any "moral value" attached to them in this context. A highly negative relationship is not a relationship that is bad but one that results from scores on two variables moving in *opposite* directions: an increase in one variable is accompanied by a decrease in the other variable being studied. For example, as absentee rates increase, student achievement decreases.

Meta-Analysis. Research studies using meta-analysis tend to pose a dilemma for students new to the area of research. This may be because when it comes right down to it, this type of research statistically summarizes the results of other studies. Now perhaps you see why so many consider it to be confusing. The purpose

of a meta-analysis is to ask a research question and use past quantitative studies as data to answer the question. The data from these studies are reanalyzed using an appropriate statistical analysis, and a typical result, usually referred to as an effect size, across all studies is reported.

Qualitative Research Approaches

Qualitative research approaches collect data through observations, interviews, and document analysis and summarize the findings primarily through narrative or verbal means.

Case Study. *Case study* is one of the most common qualitative approaches. Although they are wide ranging in their scope and sequence, case studies typically focus on small groups or individuals within a group and document that group's or individual's experience in a specific setting (see next section on ethnographic research). In addition, the gathering of this information or data through multiple sources and perspectives is another key characteristic of the case study approach. For example, on the topic of parental involvement, a researcher could do a case study on a family or several families who are non-native-English speakers and determine how they are working with the school district and the teacher to help improve their child's academic performance. Some interesting questions the researcher might think about exploring as she or he approaches the study are how do the parents (who are not proficient in English themselves) interface with the school in supporting and working with their child? Do they feel that the school is assisting them, or do they view the school as an obstacle? How do teachers perceive the parents' efforts to help their child? Researchers working in case studies tend to use interview, observation, and document analysis as their primary tools.

Ethnographic Study. *Ethnographic studies* are often included in the same category as case studies, and for good reason. Where case study researchers focus their energies on the interactions of individuals or small groups in specific settings, ethnographic researchers tend to investigate how interactions in a cultural group are influenced by the larger society. Like cases, ethnographic studies also gather information about the phenomena being investigated from multiple perspectives. However, in addition to gathering data, ethnographic researchers "filter" or assess the information gathered through the setting, recognizing that the setting itself has a role and a function in the study. Ethnographic studies also require that the researcher gain the perspective of the participants, to some degree, by becoming part of the group being studied. For example, an ethnographic researcher decides to examine a school building within a large urban district and document

how the school is trying to deal with issues of diversity. Specifically, the school has been working to increase student awareness of diversity, to heighten student tolerance toward individual differences, to create a learning community, and to infuse multicultural issues into the curriculum. A researcher who clearly knows the setting and culture and the participants in the setting gathers this information by using interviews, observations, and some document analyses. However, the researcher also recognizes that she or he has to be aware of alternative settings or issues that need to be considered (e.g., diversity of curriculum mandated by the school; interaction between minority students, the police, and the larger community; the interaction between the religious community and the school; and legislation). Whereas the researcher is examining only one building, the larger school district, the community, and possibly the state and nation may play a role in describing "the overall picture."

Grounded Theory. In grounded theory research, the researcher uses data gathered through qualitative techniques to develop a theory based on the data. In essence, the researcher builds a theory from the "ground" or from the narrative data produced in the study. Taking the example just used for ethnographic research, a grounded-theory researcher might take the findings of the study and develop a theory of how schools in general might effectively deal with issues of diversity. Let us say that the data suggested that there were four basic components essential to an effective diversity program: developing identity, tolerance training, understanding differences, and building learning communities. The theory then could be based on these principles, and from these principles the researcher would begin to develop a theoretical framework. As the theory begins to emerge, the researcher returns to collect more data to either confirm or challenge the initial findings. In some ways, the grounded theory researcher is attempting to use the findings generated in a particular context and develop a theory that could be generalized to other contexts.

Phenomenological Study. Like case studies, phenomenological studies are also a common qualitative approach. Phenomenological studies attempt to capture the "essence" of the human experience. Like other qualitative researchers, phenomenologists are interested in recording the individual perspectives of the participants in the study. However, phenomenology stresses the importance of each individual and his or her respective view of reality. To encourage these perspectives to emerge, phenomenologists use open-ended interviews as their primary data collection tool. The phenomenologist's role is to "give voice" to those perspectives. Consider the following: Take a look at the person sitting next to you in class. You both are sitting in the same course, at the same college, with the same

professor; yet, the way you perceive the reality of this graduate experience is quite different. You each bring a history of personal experiences, attitudes, behaviors, and emotions, all of which will influence how you view this shared experience. For an example of a published study that used phenomenological methods to study the experiences of women in dance therapy, see Mills and Daniluk (2002).

Research Approaches Using Qualitative or Quantitative Approaches (or Both)

Several approaches to research are more flexible in their use of quantitative and qualitative methods. Two of these, program evaluation and action research, may use either qualitative or quantitative approaches or use both in a single study. Mixed-methods approaches, by definition, use both quantitative and qualitative methods.

Mixed-Methods Research. Mixed-methods research collects both quantitative and qualitative data because these researchers believe that a combination of approaches results in a more complete understanding of educational problems. Although one approach might be emphasized more than the other, both types of data are considered essential to the study. One type of data may be collected first, followed by the other, or both quantitative and qualitative data may be collected simultaneously.

For example, Jones and Kafetsios (2005) studied the effect of war on the psychological well-being of adolescents by collecting quantitative data from a trauma questionnaire and qualitative data through in-depth interviews. The use of two types of data enabled the researchers to better understand both the degree of trauma and the meaning of the wartime experiences to their youth. Widespread use of mixed-methods research is relatively new, and several designs (described in Chapter Twelve) have been developed.

Action Research. Action research is designed to enhance and improve current practice within a specific classroom, school, or district. Typically, it is a type of research undertaken by practitioners who have identified problems they wish to solve or who would simply like to find ways to enhance their own teaching or student learning, or both. For example, Pasko (2004) studied her own third-grade classroom to see how the students connected mathematical concepts to literature that they read independently. Her results provided support that her interdisciplinary approach to teaching was working for her students and suggested new ideas that she might try to improve her approach.

In general, there are two types of action research, **critical action** and **practical action** research. Critical action research, as described by Freire (1970)

is research that is collaborative and is implemented to improve the lives of those who are being studied. Practical action research is conducted in classroom or school settings and provides practitioners the opportunity to identify and solve their own educational problems.

Whichever type of action research is pursued, all action research generally includes a three-step process: (1) identification of the problem(s) through careful observation and reflection, (2) planning and taking appropriate action (the study), and (3) using the findings to improve teaching and learning. This type of research continues to grow in use because educational practitioners find it an empowering and collaborative activity.

Program Evaluation. The field of education is filled with programs designed to improve both learning and teaching. Examples of these programs include a reading-intervention program designed to help struggling readers or a teacher-training program designed to help teachers integrate technology into lessons. Program evaluation is designed to attempt to determine the level of success or failure of such educational programs and to make decisions about such programs. Although program evaluation uses quantitative and qualitative methods, its overall purpose is different from most other types of research. Whereas quantitative and qualitative researchers certainly study programs, findings from such studies typically are slow to change or improve the programs themselves. In program evaluation, however, findings are often used for ongoing or short-term decision-making purposes, and programs can be changed or "improved" based on the results of a single evaluation. In some extreme cases, a program might even be eliminated based on such evidence. Most program evaluation approaches use two types of feedback loops for reporting findings: **formative feedback** and **summative feedback**.

Formative data are collected and provided to program developers as the program is occurring, with the hope that such evidence will support the needed changes. For example, if one is evaluating a new reading program and the instruction is not being delivered according to the program's specific goals, the evaluator would provide this information to the program director so that the instruction could be improved. Although some quantitative researchers use formative feedback loops, *it is the potential for action to be taken on the feedback* that makes program evaluation distinct from quantitative approaches. For example, experimental or quasi-experimental researchers would not dream of altering the program or treatment (the independent variable) as it was being studied. After all, if the study showed an increase in student performance, to what could the results be attributed? The program before the improvements? The program after the improvements? A combination of the two? In addition to collecting and providing formative feedback, program evaluation researchers attempt to collect summative

data. Summative data focus on determining whether a program's goals were met. Examples of summative data are changes in students' reading scores, number of people served by the program, and job satisfaction ratings. Program evaluators tend to use both formative and summative information in identifying areas in need of improvement and in determining a program's success or failure.

Chapter Summary

Despite the narrow definition of "reliable" research embodied in the NCLB legislation, you can now see that multiple methods are available for investigating issues in education. Whereas NCLB focuses on quantitative research using experimental study designs (designs in which persons are randomly assigned to groups that are treated differently with regard to variables of interest), in this chapter we have discussed a number of other research approaches, which fall into the broad categories of quantitative and qualitative research. These approaches have grown out of differing philosophical views, but all focus on systematically endeavoring to answer questions about what works in education, and therefore, we would argue, all have value in the ongoing debate about how to go about improving education. The research approaches we have described have evolved out of philosophical frameworks that demonstrate widely divergent views on: the nature of reality, how we come to know that reality, and even if we need to concern ourselves with such ponderings as long as we can figure out what works and what does not! The philosophical viewpoint to which you personally subscribe will, in many ways, determine what research you are willing to undertake or accept as meaningful.

Despite whatever the current accountability environment might be, as a professional in the field of education you will be challenged on a daily basis to create and sustain an effective learning environment for yourself and your students. An understanding of educational research and its philosophical underpinnings is vital to making informed decisions about what research you will use to support your everyday practice.

Key Concepts

randomized experimental designs

scientific educational research

inductive reasoning

deductive reasoning
hypothetic-deductive method
hypothesis
theory
scientific realism
social constructivism
advocacy or liberatory
pragmatism
qualitative
quantitative
generalizable
constructs
variables
social constructivism
mixed-methods approach
basic research
applied research
random selection
sample
independent variable
dependent variable
extraneous variable
nonexperimental research
correlational research
causal-comparative research
correlation coefficient
ethnographic research
case study
grounded theory
phenomenological research
mixed methods research
critical action research

practical action research
program evaluation
formative feedback
summative feedback

Discussion Questions or Activities

1. NCLB and the accountability movement emphasize testing students and setting required benchmarks for student progress. Explore the tests and benchmarks used in your state or school district and discuss the factors that might influence whether schools meet their mandated goals.
2. Pick a philosophical framework that is closest to your personal belief about how knowledge is generated, and find a student in your class whose preferred framework is different from yours. Debate the pros and cons of each framework as a guide to research.
3. Pick an educational problem or topic, and discuss how it could be explored using one quantitative and one qualitative approach.

Suggested Readings

Onwuegbuzie, A. J. (2000). *Positivists, post-positivists, post-structuralists, and post-modernists: Why can't we all get along! Towards a framework for unifying research paradigms.* Paper presented at the annual meeting of the Association for the Advancement of Educational Research, Ponte Vedra, FL.

Peterson, P. E., & West, M. R. (Eds.). (2003). *No child left behind? The politics and practice of school accountability.* Washington, DC: Brookings Institute.

Popham, J. W. (2004). *America's "failing" schools: How parents and teachers can cope with No Child Left Behind.* New York: RoutledgeFalmer.