orientation typically associated with qualitative, literary writing. As mentioned earlier, references to themselves and especially how their backgrounds shaped their interpretation were absent.

Similarities and Differences between Quantitative and Qualitative Research

At this point, you may be asking how quantitative research and qualitative research are similar and different. In terms of similarity, both forms of research follow the six steps in the process of research. However, they do have minor differences in the introduction to a study—the research problem section—in that both sections need to establish the importance of the problem. In quantitative research, the research problem section is used to direct the types of questions or hypotheses asked in the study, whereas in qualitative research, the research problem discussion is typically used to establish the importance of the central idea. These differences are apparent in the comparison of the introduction to the quantitative parent involvement study (Deslandes & Bertrand, 2005) and the qualitative mothers' trust in school principals study (Shelden et al., 2010).

Another similarity exists in the data collection procedures. Both quantitative and qualitative data collection may employ similar approaches, such as interviews or observations. However, quantitative approaches use more closed-ended methods in which the researcher identifies set response categories (e.g., strongly agree, strongly disagree, etc.), whereas qualitative approaches use more open-ended methods in which the inquirer asks general questions of participants and the participants shape the response possibilities (e.g., in an interview with a teacher, a qualitative researcher might ask, "What does professional development mean to you?").

There are distinct differences that go beyond the forms of gathering data. In data analysis, the procedures are quite different. In quantitative research, the investigator relies on statistical analysis (mathematical analysis) of the data, which is typically in numeric form. In qualitative research, statistics are not used to analyze the data; instead, the inquirer analyzes words (e.g., transcriptions from interviews) or images (e.g., photographs). Rather than relying on statistical procedures, the qualitative researcher analyzes the words to group them into larger meanings of understanding, such as codes, categories, or themes. The reporting formats are also typically different, with the quantitative structure following the typical introduction, literature review, methods, results, and conclusion sections. In qualitative research, some of these sections may be missing, as in the literature review in the Shelden et al. (2010) study, and the format may be more of a literary opening with a personal vignette or passage, an unfolding story, the use of extensive quotes from participants, and personal reflections from the researcher.

It should also be mentioned that rather than viewing quantitative and qualitative as two end points in a dichotomy, they should be viewed as different points on a continuum. Studies may contain some elements of the characteristics of quantitative research and some elements of qualitative research. However, studies do *tend* to lean toward one approach or the other, and knowing the characteristics associated with each type of research enables a researcher to assess whether a particular study is more quantitative or qualitative in its approach.

How do you choose whether to use a quantitative or a qualitative approach? Three factors are important. First, match your approach to your research problem. Remember that the problems best suited for quantitative research are those in which trends or explanations need to be made. For qualitative research, the problems need to be explored to obtain a deep understanding. Second, your approach needs to fit the audience(s) for the

research report. Educators, counselors, and others in the school system write for several audiences, such as policymakers, faculty and graduate committees, editors and review boards, evaluators of grant proposals, and individuals in schools or educational settings. It is important that the audience(s) be familiar with the approach used in a study. Third, relate your approach to your personal experience and training. A quantitative researcher typically has taken some courses or training in measurement, statistics, and quantitative data collection, such as experiments, correlational designs, or survey techniques. Qualitative researchers need experience in field studies in which they practice gathering information in a setting and learning the skills of observing or interviewing individuals. Course work or experience in analyzing text data is helpful, as is experience in research designs, including grounded theory, ethnography, or narrative research. Some individuals have experience and training in approaches to research that combine both quantitative and qualitative methods, such as mixed methods research or action research.

Research Designs Associated with Quantitative and Qualitative Research

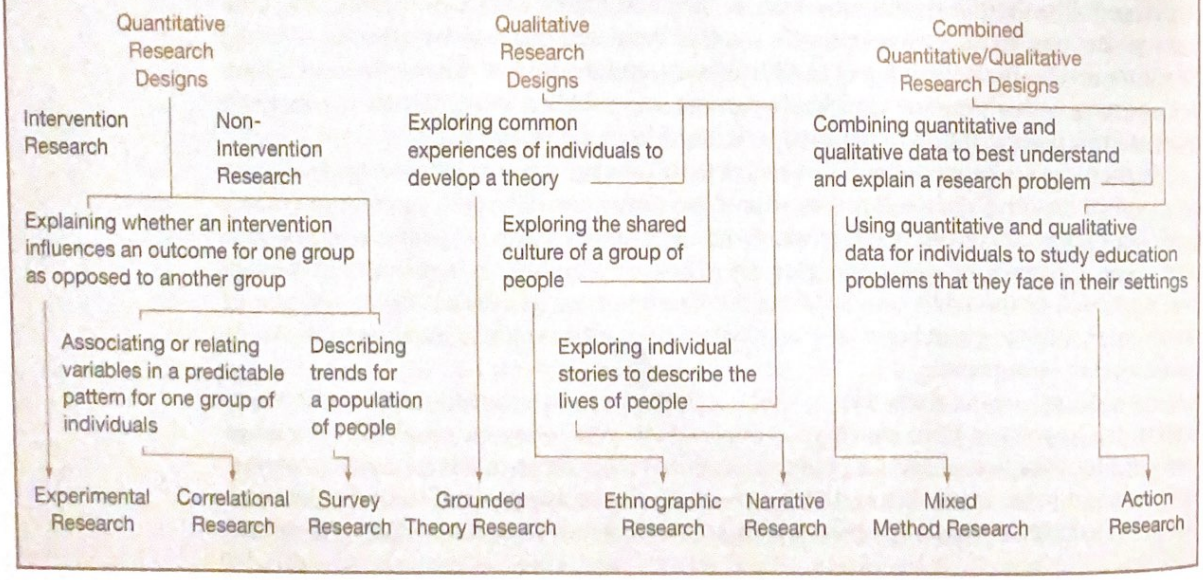
It is not enough to know the steps in the process of research and that quantitative and qualitative procedures differ at each step. This text will also go into detailed procedures involved in quantitative, qualitative, and combined research. **Research designs** are the specific procedures involved in the research process: data collection, data analysis, and report writing. Figure 1.4 illustrates how the steps in the research process relate to quantitative and qualitative research and advances eight different research designs, used by educational researchers, discussed in this book.

Experimental Designs

Some quantitative researchers test whether an educational practice or idea makes a difference for individuals. Experimental research procedures are ideally suited for this study. *Experimental designs* (also called intervention studies or group comparison studies) are procedures in

FIGURE 1.4

Types of Quantitative and Qualitative Research Designs and Their Primary Uses



quantitative research in which the investigator determines whether an activity or materials make a difference in results for participants. You assess this impact by giving one group one set of activities (called an *intervention*) and withholding the set from another group.

Correlational Designs

In some studies, you may be unable to provide an intervention or to assign individuals to groups. Moreover, you focus more on examining the association or relation of one or more variables than in testing the impact of activities or materials. *Correlational designs* are procedures in quantitative research in which investigators measure the degree of association (or relation) between two or more variables using the statistical procedure of correlational analysis. This degree of association, expressed as a number, indicates whether the two variables are related or whether one can predict another. To accomplish this, you study a single group of individuals rather than two or more groups, as in an experiment.

Survey Designs

In another form of quantitative research, you may not want to test an activity or materials or may not be interested in the association among variables. Instead, you seek to describe trends in a large population of individuals. In this case, a survey is a good procedure to use. *Survey designs* are procedures in quantitative research in which you administer a survey or questionnaire to a group of people (called the *sample*) to identify trends in attitudes, opinions, behaviors, or characteristics of a large group of people (called the *population*).

Grounded Theory Designs

Instead of studying a single group, you might examine a number of individuals, all of whom have experienced an action, interaction, or process. *Grounded theory designs* are systematic, qualitative procedures that researchers use to generate a general explanation (grounded in the views of participants, called a *grounded theory*) that explains a process, action, or interaction among people. The procedures for developing this theory include primarily collecting interview data, developing and relating categories (or themes) of information, and composing a figure or visual model that portrays the general explanation. In this way, the explanation is "grounded" in the data from participants. From this explanation, you construct predictive statements about the experiences of individuals.

Ethnographic Designs

You may be interested in studying one group of individuals, in examining them in the setting where they live and work, and in developing a portrait of how they interact. An ethnographic study is well suited for this purpose. *Ethnographic designs* are qualitative procedures for describing, analyzing, and interpreting a cultural group's shared patterns of behavior, beliefs, and language that develop over time. In ethnography, the researcher provides a detailed picture of the culture-sharing group, drawing on various sources of information. The ethnographer also describes the group within its setting, explores themes or issues that develop over time as the group interacts, and details a portrait of the group.

Narrative Research Designs

You may not be interested in describing and interpreting group behavior or ideas or in developing an explanation grounded in the experiences of many individuals. Instead, you wish to tell the stories of one or two individuals. *Narrative research designs* are qualitative procedures in which researchers describe the lives of individuals, collect and tell stories about these individuals' lives, and write narratives about their experiences. In education, these stories often relate to school classroom experiences or activities in schools

Mixed Methods Designs

You decide to collect both quantitative data (i.e., quantifiable data) and qualitative data (i.e., text or images). The core argument for a mixed methods design is that the combination of both forms of data provides a better understanding of a research problem than either quantitative or qualitative data alone. *Mixed methods designs* are procedures for collecting, analyzing, and integrating (i.e., mixing) both quantitative and qualitative data in a single study or in a multistage series of studies. In this process, you need to decide on the intent of your study (why "mixing" is important), which form of data you will collect first (concurrent or sequential), how you will integrate the data (merge, connect, build, or embed), and whether you will use theory to guide the study (e.g., advocacy or social science theory).

Action Research Designs

Like mixed methods research, action research designs often utilize both quantitative and qualitative data, but they focus more on procedures useful in addressing practical problems in schools and the classrooms. *Action research designs* are systematic procedures used by teachers (or other individuals in an educational setting) to gather quantitative and qualitative data to address improvements in their educational setting, their teaching, and the learning of their students. In some action research designs, you seek to address and solve local, practical problems, such as a classroom-discipline issue for a teacher. In other studies, your objective might be to empower, transform, and emancipate individuals in educational settings.

MyLab Education Self-Check 1.3

MyLab Education Application Exercise 1.3: Evaluating Research Articles Part 2

MyLab Education Self-Check 1.4

MyLab Education Application Exercise 1.4: Evaluating Research Articles Part 3

IMPORTANT ETHICAL ISSUES IN CONDUCTING RESEARCH

Respect for audiences and the use of nondiscriminatory language are **ethical issues** that Maria must observe. Like Maria, all educational researchers need to be aware of and anticipate ethical issues in their research. Such a need stems from the research horrors of treatment of individuals in Nazi Germany and the inappropriate Tuskegee syphilis studies (Mark & Gamble, 2009). From these and other violations in the treatment of participants, policymakers developed federal guidelines for conducting research as announced in the 1978 National Commission for the Protection of Human Subjects on Biomedical and Behavioral Research and its *Belmont Report* (Department of Health, Education, and Welfare, 1978). The three basic principles of this report involve the beneficence of treatment of participants (maximizing good outcomes and minimizing risk); respect for participants (protecting autonomy and ensuring well-informed, voluntary participation); and justice (a fair distribution of risk and benefits). We also follow principles like maintaining the anonymity of our participants.

Institutional Review Boards

Campus offices developed to monitor adherence to these three principles, and offices of institutional review boards emerged. These offices and boards strive to protect human subjects during research that is conducted. Federal funds could be withheld from

campuses if research conducted on those campuses did not take steps to protect the treatment of participants. Accordingly, on campuses that receive federal funds, educational researchers need to learn about the procedures involved in applying for approval from their institutional review board offices and follow guidelines in developing applications for approval and in designing consent forms for participants to complete that guarantee their protection.

Professional Associations

Ethical standards are also available from professional associations. Examples of professional associations that offer helpful guidelines include the American Educational Research Association (2011), the American Psychological Association (2010a), the American Anthropological Association (2012), the American Counseling Association (2014), and the Joint Committee on Standards for Educational Evaluation (Yarbrough, Shulha, Hopson, & Caruthers, 2011).

According to these guidelines, individuals who participate in a study have certain rights. Before participating in research, they need to know the purpose and aims of the study, how the results will be used, and the likely social consequences the study will have on their lives. They also have the right to refuse to participate in a study and to withdraw at any time. When they participate and provide information, their anonymity is protected and guaranteed by the researcher. Individuals are not to be offered excessive financial inducements to participate in a project. Participants also have the right to gain something from a study. Researchers need to actively look for ways to "give back" (or reciprocate) to participants in a study because the participants have freely provided their time. For example, in one study involving individuals with HIV, the author shared book royalties with the participants in the study. In another study, a researcher volunteered to help supervise lunchroom activities in exchange for information from students in the school.

Ethical Practices throughout the Research Process

In all steps of the research process, you need to engage in ethical practices. Practicing ethics is a complex matter that involves much more than merely following a set of static guidelines, such as those from professional associations, or conforming to guidelines from campus institutional review boards. Ethics has become a more pervasive idea stretching from the origins of a research study to its final completion and distribution. Ethics should be a primary consideration rather than an afterthought and should be at the forefront of the researcher's agenda (Hesse-Bieber & Leavy, 2006). Of all the steps in the research process, it does tend to relate more closely to the data collection and reporting and distribution of reports than to any of the other phases of research. Some of these issues are mentioned here.

Some Ethical Issues in Data Collection

It is important to respect the site in which the research takes place. This respect should be shown by gaining permission before entering a site, by disturbing the site as little as possible during a study, and by viewing oneself as a "guest" at the place of study. Lincoln Public Schools (n.d.) in Lincoln, Nebraska, provides illustrative guidelines to follow for conducting research with minimal disruption to a school district. Their guidelines list several reasons why a project may not be approved. Disapproved projects are those that take away considerable amounts of instructional time; require large amounts of teacher, administrator, or office time (the district may ask to be reimbursed for the costs

of compiling information, staff time, or materials); interfere with district data collection or the work of current research projects; are planned for the first or last month of the school year; or are received too late in the year to be adequately reviewed.

Another strategy for respecting the research site with minimal disruption is to gain access through gatekeepers (or officials). Researchers may need to consult with different gatekeepers at multiple levels in an organization. For example, in a study in one high school classroom, the researcher sought permission from several individuals, including the school board responsible for ensuring that the rights of human participants were protected, the research official in the school district, the principal of the school, the teacher in a government class, and the actual students who participated in the study and their parents.

Other ethical issues arise in data collection and are associated with specific types of research designs. You need to not purposefully deprive some participants of helpful treatments, only publish positive results, or fail to disclose the purpose of the study to participants. It is helpful to involve stakeholders in assessing risk to participants and to not pressure participants into signing consent forms (S. Levy, personal communication, May 3, 2010), to not engage in practices that create power imbalances, and to respect norms of indigenous cultures (Lincoln, 2009).

Some Ethical Issues in Data Reporting

You need to show respect to audiences who read and use information from studies. Data should be reported honestly, without changing or altering the findings to satisfy certain predictions or interest groups. It may, however, be appropriate for the primary investigator to provide those at the research site with a preliminary copy of any publications. In addition, studies completed by others should not be plagiarized, and credit should be given for material quoted from other studies. This credit involves citing the authors and the date of the publication and listing the publication in the reference section of the study. In addition, research should be free of jargon and be understandable to those being studied. As ethical educators, we need to make every effort to communicate the practical significance of our research to the community of researchers and practitioners so that inquiry will be encouraged and used. Educational researchers have an ethical mandate to produce research that is of high quality and to report their results that convey the basic assumptions they are making. This also means that research should not sit unpublished and that researchers should openly share their findings (Brown & Hedges, 2009). Results should be published and disseminated even though they may present findings contrary to accepted standards (S. Levy, personal communication, May 3, 2010).

MyLab Education Self-Check 1.5

MyLab Education Application Exercise 1.5: Understanding Research Ethics

SKILLS NEEDED TO DESIGN AND CONDUCT RESEARCH

As a new researcher, you may wonder whether you have the ability to read, evaluate, and actually conduct research. Knowing the process of research, you may say, does not guarantee an adequate research study. Certainly, Maria, who is new to research, has these concerns.

You have already learned valuable research skills through your life experiences. These skills include solving puzzles, employing a long attention span, using a library, and, of course, writing out your thoughts.

Solving Puzzles

Researchers look at problems as p
viewed as a series of puzzle piece
solving puzzles. You fit together th
ent (or prospective parent), you en
of different tasks. These are puzzl
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("I will have a busy day at work, so
down ("I need to make a list of w
studies or engage in the process
first working on a research proble
that all of the pieces fit together, a

Lengthening Your Attentio

Although we generally make tin
tainly varies from task to task. T
period of 6 months or more. For
each of these steps requires pati
bring attention spans of varying
tasks we love and the amount o
developed an attention span lon

Learning to Use Library R

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ably began in grade school w
requires spending time with li
puters and Internet connectio
process of research requires
and writing a review of the li
do not already have them. Th
experiences that began early

Writing, Editing, and M

Researchers cannot escape th
As writers, we work through
new drafts. Research involv
and communicating your th
get satisfaction from compl
college already or worked c
In short, you have experien
ideas on paper or in a com
view questions, jotting dow
use someone else's questio
cess of planning and in cor

MyLab Education Self-Chec

MyLab Education Applicatio

Solving Puzzles

Researchers look at problems as puzzles to solve. The steps in the research process are viewed as a series of puzzle pieces that the inquirer assembles. You already have skills in solving puzzles. You fit together the debits and credits to balance your checkbook. As a parent (or prospective parent), you engage in multiple roles during the day that require juggling of different tasks. These are puzzles that we work out by breaking them down into manageable parts ("What will be the demands on my time today?"), setting obtainable objectives ("I will have a busy day at work, so I will focus on my job today"), and possibly writing them down ("I need to make a list of what I must accomplish today"). As you examine research studies or engage in the process of inquiry, assembling these parts of the puzzle—such as first working on a research problem and then specifying a purpose for a study—will require that all of the pieces fit together, as with the many puzzles that we solve in daily living.

Lengthening Your Attention Span

Although we generally make time to complete the tasks we love, our attention span certainly varies from task to task. The process of research involves six steps that may span a period of 6 months or more. For example, reading through a journal article and identifying each of these steps requires patience as well as knowledge about what to look for. All of us bring attention spans of varying lengths to the process of research, but if we consider the tasks we love and the amount of time we devote to them, we can see that we have already developed an attention span long enough to spend considerable time at research.

Learning to Use Library Resources

The step in the research process that requires you to review the literature means spending time using an academic library's resources. For most of us, going to the library probably began in grade school with trips to the school library. Today, engaging in research requires spending time with library resources, a process that is facilitated by home computers and Internet connections to library catalogs and literature databases. However, the process of research requires that you use skills in locating studies, summarizing them, and writing a review of the literature. These skills are developed during research, if you do not already have them. They develop from our comfort level with a library and with experiences that began early in our schooling and continue today.

Writing, Editing, and More Writing

Researchers cannot escape the ever-present aspect of writing as a key facet of research. As writers, we work through numerous drafts, receive reactions from others, and develop new drafts. Research involves writing the study for an audience. Do you enjoy writing and communicating your thoughts? Do you like to write in a journal or a diary? Do you get satisfaction from completing projects? You have probably written several essays in college already or worked on a research report with other students or a faculty member. In short, you have experience in writing. As you know, writing is more than recording ideas on paper or in a computer document. It is also organizing ideas, preparing interview questions, jotting down notes during an observation, and writing for permission to use someone else's questions or articles. Writing exists in all phases of the creative process of planning and in conducting research.

MyLab Education Self-Check 1.6

MyLab Education Application Exercise 1.6: Understanding Research Skills

KEY IDEAS IN THE CHAPTER

The Definition and Importance of Educational Research

Research involves asking a question, collecting data, and analyzing data to determine answer to the question. It helps educators understand problems or issues through the mulation of knowledge. It can assist educators in improving practice, and it focuses atte on important policy issues being discussed and debated by decision makers. In add engaging in research provides valuable conceptual writing and presenting skills for stud

The Six Steps in the Process of Research

Six steps are followed when conducting a research study. The study begins with tifying a research problem or issue of study. It then consists of reviewing the litera advancing direction through research questions and statements, and collecting, an ing, and interpreting the data. This process culminates in a research report prese evaluated, and potentially used by the educational community.

The Characteristics of Quantitative and Qualitative Research

In quantitative research, the major characteristics are describing a research prob through a description of trends or a need for an explanation of the relationship am variables; providing a major role for the literature through suggesting the research q tions to be asked and justifying the research problem and creating a need for the d tion (purpose statement and research questions or hypotheses) of the study; crea purpose statements, research questions, and hypotheses that are specific, narrow, m surable, and observable; collecting numeric data from a large number of people u instruments with preset questions and responses; analyzing trends, comparing gro or relating variables using statistical analysis and interpreting results by comparing t with prior predictions and past research; and writing the research report using stanc fixed structures and evaluation criteria and taking an objective, unbiased approach.

In qualitative research, we see different major characteristics at each stage of research process: exploring a problem and developing a detailed understanding of a tral phenomenon; having the literature review play a minor role but justify the prob stating the purpose and research questions in a general and broad way so as to inc the participants' experiences; collecting data based on words or images from a s number of individuals so that the participants' views are obtained; analyzing the for description and themes using text analysis and interpreting the larger meaning of findings; writing the report using flexible, emerging structures and evaluative criteria; including the researchers' subjective reflexivity and bias.

Although quantitative and qualitative characteristics need to be seen as points continuum rather than opposites, the choice of research between the two is based matching the approach to a research problem, fitting the approach to your audience, relating the approach to your experiences.

The Types of Research Designs Associated with Quantitative and Qualitative Research

Researchers tend to employ specific procedures for data collection, analysis, and re writing in the quantitative and qualitative approaches. This text emphasizes eight resea designs: experimental, correlational, survey, grounded theory, ethnographic, narra mixed methods, and action research designs.

The Important Ethical Issues

A need for attention to ethical issues arose out of the inhumane treatment of participants in past years. As a result, the federal government issued legislation and reports governing good ethical practices. These guidelines have been supplemented by professional organizational reports. As a result, educational researchers need to anticipate ethical issues throughout the research process, but they are especially important during data collection and in writing and disseminating reports.

The Skills Needed to Design and Conduct Research

Research often mirrors the practices found in everyday life, such as solving puzzles, focusing attention on topics, and practicing good writing and editing. It also involves learning how to use the academic library and to locate useful literature for a study.

Useful Information for Producers of Research

- As you plan and conduct a study, keep in mind that research needs to be valuable to educators. Include comments in your study that convey the value to specific educational audiences.
- Use the general framework of the six steps for thinking about your plans and the conduct of research. These six steps make research manageable, help ensure that you conduct thorough inquiries, and provide a useful strategy for the design and writing of the research.
- As you plan and conduct a study, discuss specifically the characteristics of the quantitative and qualitative approach you are using.
- Recognize that research is neither all quantitative nor all qualitative but tends toward one or the other (on a continuum).
- Be ethical in conducting research. Respect the rights of participants, research sites, and individuals who will be readers of your study.
- Consider the skills that you need to develop to be a researcher. You may already have developed the skills of reading and writing, using library resources, solving puzzles, and focusing in on a topic of interest.

Useful Information for Consumers of Research

- As you examine a study, recognize that authors emphasize different reasons for undertaking their study. Look for suggestions by the author for practical applications of a study.
- Recognize that researchers proceed through a process of research and then construct sections of a study that reflect different steps in this process. For the research problem, examine the "introduction" to a study; for the literature review, explore the "literature review" section. For the data collection discussion, visit the "method" or "procedure" section, and for the data analysis and interpretation, see the "results" or "findings" as well as the "discussion" sections.
- Expect that a quantitative study and a qualitative study will not look the same because they differ in many of the steps of the research process. At the same time, they adhere to the same general steps of the overall research process.
- Look for statements in the study where the researcher discusses ethical issues that arose in the study and how they were addressed.