3
EDITION

Introduction to EDUCATIONAL RESEARCH

CRAIG A. MERTLER

INTRODUCTION TO EDUCATIONAL RESEARCH

Third Edition

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Craig A. Mertler

Arizona State University

SAGE

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BRIEF CONTENTS

Preface ix

Acknowledgments xvii

About the Author xix

PART I • INITIAL RESEARCH CONSIDERATIONS

Chapter 1 • What Is Educational Research? 3

Chapter 2 • Overview of the Educational Research Process 21

Chapter 3 • Identifying a Research Problem 33

Chapter 4 • Ethics in Educational Research 51

Chapter 5 • Reviewing Related Research Literature 65

PART II • DESIGNING A RESEARCH STUDY

Chapter 6 • Qualitative Research Methods 89

Chapter 7 • Quantitative Research Methods 107

Chapter 8 • Mixed-Methods Research 139

Chapter 9 • Action Research 155

Chapter 10 • Writing a Research Proposal 173

PART III • COLLECTING AND ANALYZING DATA

Chapter 11 • Qualitative Data Collection and Analysis 191

Chapter 12 • Quantitative Data Collection 219

Chapter 13 • Quantitative Data Analysis 257

PART IV • THE RESEARCH REPORT

Chapter 14 • Writing a Final Research Report 299

Appendix A: Should I Stay or Should I Go? Understanding Teacher Motivation, Job Satisfaction, and Perceptions of Retention Among Arizona Teachers 319

Appendix B: Undocumented and College-Bound: A Case Study of the Supports and Barriers High School Students Encounter in Accessing Higher Education 335

Appendix C: The Impact of Book Reading in the Early Years on Parent–Child Language Interaction 357

Glossary 373

References 385

Index 389

DETAILED CONTENTS

Preface xi

Acknowledgments xvii

About the Author xix

PART I • INITIAL RESEARCH CONSIDERATIONS

Chapter 1 • What Is Educational Research? 3

Finding Answers to Questions 3
The Scientific Method 5
Educational Research—What It Is and What It Is Not 6
Educational Research as a Process 11
Knowing Your Specific Discipline 17
Educators as Researchers 18
• Developmental Activities 19
• Summary 19

Chapter 2 • Overview of the Educational Research Process 21

Identifying and Limiting a Research Topic or Problem 23
Formally Stating and Refining Research Question(s) 23
Reviewing Existing Literature Related to the Problem 24
Writing a Literature Review 24
Developing a Research Plan 24
Implementing the Research Plan and Collecting Data 25
Analyzing the Data 26
Stating Findings, Conclusions, and Recommendations in a Written Research Report 27
The Educational Research Process—A Brief Example 27
• Developmental Activities 30
• Summary 30

Chapter 3 • Identifying a Research Problem 33

Identifying a Research Topic or Problem 33
Preliminary Considerations in Selecting Topics 34
Limiting a Topic 36
Sample Educational Research Topics 37
Necessary Terminology Related to Research 39
Research Questions and Hypotheses 44
• Developmental Activities 49
• Summary 49

Chapter 4 • Ethics in Educational Research 51

Ethical Considerations in the Conduct of Research 51
Ethics in Qualitative Versus Quantitative Studies 57
Institutional Review Boards 57

Formal Preparation for Research With Human Participants 60
• Developmental Activities 63
• Summary 64

Chapter 5 • Reviewing Related Research Literature 65

What Is a Literature Review? 65
Sources for Literature Related to Your Research Topic 68
Searching the ERIC Online Database 71
Searching the Google Scholar Online Database 77
Writing Your Literature Review 80
Not Just for Conducting Research—Valuable Sources for Professional Development 85
• Developmental Activities 85
• Summary 85

PART II • DESIGNING A RESEARCH STUDY

Chapter 6 • Qualitative Research Methods 89

Characteristics of Qualitative Research 89
The Qualitative Research Process 91
Approaches to Conducting Qualitative Research 92
Ethnographic Research 93
Narrative Research 93
Historical Research 93
Grounded Theory Research 94
Phenomenological Research 95
Case Study Research 95
More About Ethnographic Research 96
Topics and Procedures in Ethnographic Research 98
Strengths and Concerns in Ethnographic Research 100
More About Narrative Research 101
Procedures in Narrative Research 102
Strengths and Concerns in Narrative Research 103
• Developmental Activities 103
• Summary 104

Chapter 7 • Quantitative Research Methods 107

Characteristics of Quantitative Research 107
The Quantitative Research Process 109
Nonexperimental Research Designs 110
Descriptive Research 111
Correlational Research 117
Causal-Comparative Research 120
Experimental Research Designs 124
Preexperimental Research 126
Quasi-Experimental Research 127
Experimental Research 130
Single-Subject Research 132
Threats to Validity in Quantitative Designs 134
• Developmental Activities 136
• Summary 137

Chapter 8 • Mixed-Methods Research 139
Characteristics of Mixed-Methods Research 139
The Mixed-Methods Research Process 142
Approaches to Conducting Mixed-Methods Research 144
Mixed-Methods Research Designs 144
Validity in Mixed-Methods Research 150
Strengths and Limitations of Mixed-Methods Research 151
• Developmental Activities 152
• Summary 152

Chapter 9 • Action Research 155
Characteristics of Action Research 155
Approaches to Conducting Action Research 161
The Action Research Process 161
Action Planning and Reflection 165
Validity in Action Research 167
Strengths and Limitations of Action Research 169
• Developmental Activities 170
• Summary 171

Chapter 10 • Writing a Research Proposal 173
Purpose of a Research Proposal 173
General Aspects of a Research Proposal 175
Components of a Quantitative Research Proposal 176
Components of a Qualitative Research Proposal 182
Proposals for Action Research and Mixed-Methods Studies 185
• Developmental Activities 187
• Summary 187

PART III • COLLECTING AND ANALYZING DATA

Chapter 11 • Qualitative Data Collection and Analysis 191
Sampling Techniques in Qualitative Research 191
Qualitative Data Collection Techniques 194
Observations 194
Interviews 197
Journals 202
Existing Documents and Records 202
Characteristics of Qualitative Data: Accuracy, Credibility, and Dependability 203
Qualitative Data Analysis Techniques 206
Inductive Analysis 207
• Developmental Activities 215
• Summary 216

Chapter 12 • Quantitative Data Collection 219
Sampling Techniques in Quantitative Research 219
Probability Sampling Techniques 221
Nonprobability Sampling Techniques 226
Sample Sizes in Quantitative Studies 227
Levels of Measurement 229

Quantitative Data Collection Techniques 231
Surveys, Checklists, and Rating Scales 232
Formative and Summative Classroom Assessments 247
Standardized Test Scores 247
Characteristics of Quantitative Data: Validity and Reliability 249
Validity in Quantitative Research 250
Reliability in Quantitative Research 251
Relationship Between Validity and Reliability 254
• Developmental Activities 254
• Summary 255

Chapter 13 • Quantitative Data Analysis 257
Quantitative Data Analysis Techniques 257
Preparing Data for Analysis 259
Selecting a Statistical Analysis Software Program 261
Descriptive Statistical Analysis 264
Inferential Statistical Analysis 278
Cautions in Using Statistics 290
• Developmental Activities 293
• Summary 293

PART IV • THE RESEARCH REPORT

Chapter 14 • Writing a Final Research Report 299
Importance of the Audience 299
General Guidelines for Writing a Research Report 300
Style Guides 301
Conventions of Academic-Style Writing per APA Style 302
Conventions of Format 307
Practical Guidelines for Writing 314
An Example of a Research Report 317
• Developmental Activities 317
• Summary 317

Appendix A: Should I Stay or Should I Go? Understanding Teacher Motivation, Job Satisfaction, and Perceptions of Retention Among Arizona Teachers 319

Appendix B: Undocumented and College-Bound: A Case Study of the Supports and Barriers High School Students Encounter in Accessing Higher Education 335

Appendix C: The Impact of Book Reading in the Early Years on Parent–Child Language Interaction 357

Glossary 373

References 385

Index 389

PREFACE

PREFACE … TO THE PREFACE

Each new edition of a textbook represents change, of some sort. Although it may not appear so to those who are unfamiliar with its "previous iterations," this text—the second edition of its revitalized form—also represents substantial change from its earlier versions. For seven previous editions, I—along with my coauthor, Dr. Carol M. Charles—produced a textbook by the same name, but with a different publisher. In early 2014, an opportunity arose for SAGE Publications to publish *Introduction to Educational Research*, as a first edition. Having worked on two previous textbook projects with SAGE over the previous 15 years or so, I could not have been more excited and jumped at the opportunity to have the SAGE imprint on this textbook—especially since SAGE is the leading authority when it comes to publishing books on the topic of research methodologies.

This new version of *Introduction to Educational Research* represents a significant revision from its previous rendition. For those adopters who are familiar with the previous editions, I firmly believe that you will find this third edition of the text substantially more beneficial to both you and your students. Content coverage and integrated samples and examples were thoroughly augmented, while the conversational writing style apparent in previous editions was maintained throughout.

PURPOSE OF THE TEXT

This book has two main purposes, designed to simultaneously receive attention. The first is to provide knowledge about educational research sufficient for a clear understanding of the following:

- The exact definition of what educational research is and is not
- The nature of research and the scientific process it employs
- The identification of research problems and formulation of research questions and hypotheses
- The ethical responsibilities that must be adhered to by researchers
- The purposes and processes of conducting a review of related literature
- The various types of research methodologies and designs, along with their purposes, characteristics, strengths, and limitations
- The characteristics, sources, and techniques used in the collection of data
- The procedures for analyzing qualitative and quantitative data
- The procedures for writing research proposals and final research reports

The second purpose of this book—a purpose that has been given preeminence in this edition (in keeping with previous versions)—is to help graduate students conduct their own research. Toward that end, specific guidance is provided in the following areas:

- Identifying appropriate topics for research
- Properly framing research questions and hypotheses
- Identifying possible types of research necessitated by various topics
- Preparing a research proposal for an identified research topic
- Conducting a thorough search for related research literature
- Evaluating various types of research appropriate for investigating selected topics
- Identifying necessary data, sources of those data, and the procedures by which data are collected
- Analyzing data appropriately
- Answering research questions and testing hypotheses
- Stating findings and drawing conclusions
- Preparing research reports

FOCUSED ON THE NEEDS OF EDUCATORS AND GRADUATE STUDENTS

Introduction to Educational Research, the third edition, is designed specifically for educators who are new to research and seeking advanced degrees in graduate studies. Most users will be in-service teachers, administrators, special-education personnel, instructional coaches, and counselors, but the book is also appropriate for graduate students not yet actively teaching. No prior familiarity with the principles, procedures, or terminology of educational research is required to fully benefit from this text.

TEXT ORGANIZED SEQUENTIALLY, LIKE AN EDUCATIONAL RESEARCH STUDY

The text is composed of 14 chapters, three appendices, and a glossary. In keeping with the purposes of helping students organize and undertake research while simultaneously acquiring fundamental knowledge about research, the text is organized into four parts, as follows:

Part I: Initial Research Considerations

Chapter 1: What Is Educational Research?

Chapter 2: Overview of the Educational Research Process

Chapter 3: Identifying a Research Problem

Chapter 4: Ethics in Educational Research

Chapter 5: Reviewing Related Research Literature

Part I clarifies the nature of educational research, explains its characteristics, provides an overview of the entire process of conducting educational research, discusses mechanisms for identifying appropriate research topics or problems, and provides strategies for reviewing related research literature.

Part II: Designing a Research Study

Chapter 6: Qualitative Research Methods

Chapter 7: Quantitative Research Methods

Chapter 8: Mixed-Methods Research

Chapter 9: Action Research

Chapter 10: Writing a Research Proposal

Part II provides detailed descriptions of qualitative research methodologies and quantitative research designs, mixed-methods research designs, the process of conducting action research, and strategies for developing a written research proposal.

Part III: Collecting and Analyzing Data

Chapter 11: Qualitative Data Collection and Analysis

Chapter 12: Quantitative Data Collection

Chapter 13: Quantitative Data Analysis

Part III provides detailed descriptions and examples of data collection and analysis procedures for both qualitative and quantitative research studies.

Part IV: The Research Report

Chapter 14: Writing a Final Research Report

Part IV discusses various aspects of writing a final research report, including the importance of identifying the audience, conventions of academic-style writing and format, and practical guidelines for writing.

Back Matter

The back matter of the text consists of three appendices (i.e., A, B, and C) and the glossary. Appendix A contains a report of a survey research study written by the author of the textbook that has been published in an academic journal. This study is also referred to and provides examples in chapters throughout the text. Appendix B contains a research report resulting from a qualitative research study. Finally, Appendix C contains a report resulting from a quantitative research study. Each of the three research reports was published in a refereed journal and appears in its entirety. The glossary of important terms includes well over 350 terms related to various aspects of educational research.

PEDAGOGICAL FEATURES AND BENEFITS FOR STUDENTS

In keeping with the main purpose of helping users clearly understand and apply research concepts, several pedagogical features are included in the book. Each chapter contains the following features:

- **Student Learning Objectives (or SLOs)**—The SLOs serve several pedagogical purposes. They provide a preview for each chapter, list the four to eight major targeted learning objectives for that chapter, and may also be used as a review on completing study of the chapter.
- **Developmental Activities**—Each chapter includes five developmental activities, located at the end of the chapter. These developmental activities are designed to provide opportunities, at a variety of levels of depth and breadth, for students to apply concepts and skills they have learned throughout the chapter. These may be used effectively as course assignments, in-class activities, or as a basis for class discussions on topics addressed in the chapter.
- **Chapter Summaries**—Thorough and detailed summaries of key concepts, listed in bullet-point format, are included at the end of each chapter and provide focused reviews of chapter contents.

Other pedagogical features include the following:

- **Reprinted Research Reports**—The three appendices contain complete published research articles of different types, including survey research, qualitative research, and quantitative research. Additionally, these have been annotated. These articles can serve as opportunities for students to engage in critiques of published articles, as well as to see different formats and writing styles appropriate for academic journals.
- **Glossary**—A glossary of more than 350 terms important in educational research has been provided for easy student reference. The terms are highlighted in boldface on their first appearance in the text. This is one of the most comprehensive glossaries presented in any educational research textbook.

NEW FEATURES IN THE THIRD EDITION

There are several new features and/or additions in the third edition of *Introduction to Educational Research*:

- Revised discussion of the scientific method to include qualitative approaches (Chapter 1).
- Expanded coverage of stating and refining research questions (Chapter 2).
- A discussion of features and qualities of good research questions was added (Chapter 3).
- Brief discussion of the history of research ethics involving human research participants was added (Chapter 4).

- Tips for completing IRB applications were added (Chapter 4).
- An additional example of a "literature review map" (using the study included in Appendix A) was added (Chapter 5).
- References to collecting qualitative data as part of survey research were added (Chapter 6).
- The integration of qualitative and quantitative methods in mixed-methods research was stressed (Chapter 8).
- Discussions of problems of practice in action research, and using action research as a means to pursue organizational change were added (Chapter 9).
- Discussion of the role of focus statements in qualitative research was added (Chapter 10).
- Presentation of qualitative analysis methods and tools was revised (Chapter 11).
- Discussion of "scales of measurement" was changed to "levels of measurement," to decrease any confusion caused by the use of that terminology (Chapter 12).
- Presentation of statistical analysis packages and software was revised and updated (Chapter 13).
- Discussions of advanced statistical analysis procedures were removed (due to coverage beyond the scope of this textbook), and this is reflected in the decision-making tree included (Chapter 13).
- The discussion of the APA Manual was updated to the new 7th edition (Chapter 14).
- References to Purdue University's Online Writing Lab (OWL) were added (Chapter 14).
- Appendix A was replaced with a more recent publication by the author, and two additional research reports were added as Appendices B and C. All three research articles have been annotated.
- Hyperlinks throughout the book were verified or revised in order to ensure accuracy (at the time of printing).

TEACHING RESOURCES

This text includes an array of instructor teaching materials designed to save you time and to help you keep students engaged. To learn more, visit sagepub.com or contact your SAGE representative at sagepub.com/findmyrep.

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First and foremost, I would like to acknowledge and sincerely thank everyone at SAGE for wholeheartedly and excitedly agreeing to take on this "new" project when it began its "second life" several years ago. I am approaching 20 years of working with SAGE Publishing, and I have been more than thrilled with my working relationships with everyone at SAGE. I also want to graciously thank Leah Fargotstein (acquisitions editor for education). I would also like to thank the following individuals who contributed to the production of this text: Chelsea Neve (content development editor), Elizabeth Cruz (editorial assistant), and Jillian Ragusa (marketing).

As mentioned earlier in the Preface, this book existed previously in seven different editions. I want to respectfully acknowledge and thank my coauthor on those previous editions, Dr. Carol M. Charles, for his diligent work and professional collaboration over the years.

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Craig A Mertler

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Craig A. Mertler is currently an Associate Professor at Arizona State University. He began his career as a high school biology teacher. He has been an educator for 35 years—25 of those in higher education at Bowling Green State University, the University of West Georgia, Lynn University, and Arizona State University, and 12 years as an administrator (department chair, doctoral program director, and education dean). Over his career, he has taught courses focused on the application of action research to promote educator empowerment, school improvement, and job-embedded professional development, as well as classroom assessment, research methods, and statistical analyses. He has served as the research methodology expert on more than 100 doctoral dissertations and master's theses. He is the author of 26 books, 9 invited book chapters, 23 refereed journal articles, and three novels. He has also presented more than 35 research papers at professional meetings around the country, as well as internationally. He conducts workshops for in-service educational professionals (at all levels) on classroom-based action research and on the topics of classroom assessment and assessment literacy, as well as data-driven educational decision-making. His primary research and consulting interests include classroom-based action research, data-driven educational decision-making, professional learning communities, and classroom teachers' assessment literacy. In his leisure time, he enjoys traveling with his family to the beach and writing fiction. Dr. Mertler can be reached at craig.mertler@gmail.com for consulting, professional development, and speaking engagements. Additionally, you can visit his website at www.craigmertler.com.

INITIAL RESEARCH CONSIDERATIONS

PART I

1

WHAT IS EDUCATIONAL RESEARCH?

STUDENT LEARNING OBJECTIVES

After studying Chapter 1, students will be able to do the following:

1. Name and describe four methods that can be used to seek out answers to important questions
2. Describe the scientific method and how it can be applied to educational research topics
3. Summarize characteristics that define what educational research is and is not
4. Identify and define key terms associated with educational research
5. Identify various methods for conducting educational research
6. List and describe the major steps of the educational research process
7. Articulate the importance of exploring research in your specific discipline
8. Evaluate the perceived importance of educators' conducting their own research

Whether we realize it or not, research is—and should always be—central to how we function as a successful and productive society. Whether we consider history, medicine, social group dynamics, or psychology, regardless of our areas of study or interest, research is the key to answering our questions, solving our problems, and fostering creativity, innovations, and advancements. Research in the broad field of education is certainly no exception to this fact.

FINDING ANSWERS TO QUESTIONS

The basic goal in nearly all research studies is to find answers to particular questions. These may be questions about students, teachers, curriculum, attendance, graduation rates, extracurricular activities—the list is seemingly endless. Human nature characteristically prompts us to try to find answers to our questions as quickly as possible. As human beings, however, our general method of thinking tends to be flawed. Tom Kida (2006) identified several common mistakes we tend to make in our thinking:

- *We tend to prefer stories to statistics (and research).* Because we are social beings, we like to feel connected to others, and stories tend to facilitate those kinds of connections.

Even if presented with convincing statistics, we tend to gravitate to someone telling a seemingly sincere story—even if it is not accurate—because it "tugs at our heartstrings."

- *We seek to confirm our ideas, not to question them.* Generally speaking, everyone likes to be right, and few of us like to be wrong. When people search for "evidence" to solve a problem, they tend to focus on information which confirms—not contradicts—their beliefs.
- *We sometimes misperceive the world.* Oftentimes, we see what we want or hope to see, and not that which may actually exist.
- *We tend to oversimplify our thinking.* Our reality—especially as educators—is extremely complex. We constantly need to analyze complex events that we observe in our classrooms and schools. If we do not simplify our observations, we can become overwhelmed trying to make sense of the world around us.
- *Our memories are often inaccurate or distorted.* With all of the factors and variables that we observe on a daily basis, the passage of time reduces our abilities to accurately remember many details of these events.

It follows, then, that the sources we pursue for possible answers are typically those that are most convenient to us. These sources include tradition, authority, and common sense. *Tradition* refers to how we have historically sought answers to our questions. For example, suppose that the Adams School District developed an innovative science curriculum 25 years ago. It was very well received at the time of its inception, both locally and statewide—so much so that several other districts developed similar curricula. However, the topic of revising that curriculum was recently raised in a science committee meeting. During the discussion, several committee members explained how innovative the curriculum was when it was originally developed and so why should they now want to abandon something so innovative. The general consensus of the committee was that the science curriculum was great when it was developed and has been working fine since then—so why change it? This argument may be correct; however, a good deal of time has passed and numerous scientific advances have been made since the curriculum was originally implemented. While it may have been effective for Adams' students in the past, it may not be appropriately meeting their academic needs now. Relying on the "it worked in the past, so why change now" attitude might lead us to inaccurate answers to our questions about the appropriateness of the curriculum.

If tradition fails to provide us with suitable answers to our questions, we next look to *authority*, by seeking answers and opinions from individuals who have substantial expertise in the field and who, we hope, know what is best for us. This source remains very popular in the broad field of education and can be highly effective. However, its effectiveness in terms of answering our questions is not always a certainty. Consider the numerous "bandwagon" movements that schools have jumped on over the years. When it turns out that these are not effective solutions to our school-based problems, schools jump off of them almost as quickly as they jumped on, usually in search of a different "quick fix." To work effectively, authoritative answers to our questions must be "customized" to fit the specific needs of the target school, district, or setting. This approach can certainly prove effective, but it does not routinely occur. In many instances, experts simply try to apply their answers to our questions, regardless of our specific situations, conditions, demographic makeup, and so forth. In these cases, authoritative

answers typically prove ineffective. For example, what might prove an effective solution in the Adams School District might not be as effective in the Brighton School District, and could even be a miserable failure in the Crestview School District.

If traditional and authoritative approaches to answering our school-based questions do not prove to be effective, we might decide to take matters into our own hands. After all, who knows the specific needs of our district, and our students, better than we do? Using the *commonsense* approach of human reasoning—sort of figuring things out on our own—can be highly effective. However, common sense can be effective only if the information on which solutions are developed and decisions are based is reliable and accurate. For example, consider all the advances in medicine and technology over the past decade—and the numerous failures that often preceded those successes. (Please note that I am using the term *failures* very loosely because if we learned something that ultimately benefits us in the long run, then it was not a failure, in the literal sense of the word.)

In actuality, both tradition and authority can provide additional information and guidance, should we decide to use a commonsense approach to answer our questions. Personal experiences and expertise provide great insight to help us answer our questions, but those sources of information may be biased or incomplete; they are simply not enough. We still need information—reliable and accurate information—to help guide our approach to seeking out answers to our educational questions. Where do we find this reliable and accurate information that can serve as a basis for answering our questions? This type of information must come from a process that is both systematic and objective—and that reflects a greater level of critical thinking—thus providing us with information that is accurate and meaningful, and not distorted or biased (to the extent possible). This approach is best accomplished through the application and use of the *scientific method*.

THE SCIENTIFIC METHOD

The **scientific method** is a specific strategy used to answer questions and resolve problems. It is very likely that you remember the scientific method from a junior or senior high school science course when you were required to complete some sort of research study in the form of a science fair project. The origins of the scientific method date back to 1938, when American philosopher John Dewey described the process as a procedure for thinking more objectively (meaning that the results or answers are not influenced by personal feelings or opinions when considering and representing facts). The scientific method consists of a systematic, step-by-step set of procedures that are employed to objectively investigate some sort of phenomenon and then to answer specific questions about it. Dewey presented the process in the following steps:

1. Clarify the main question inherent in the problem.
2. State a hypothesis (i.e., a prediction of a possible answer to the question), OR develop an inductive focus (i.e., to help better understand a social problem).
3. Collect, analyze, and interpret information related to the question, such that it allows you to provide an answer to that question.
4. Form conclusions derived from the interpretations of your analyses.
5. Use your conclusions to verify or reject your original hypothesis.

The scientific method is essentially the process used in conducting a vast majority of research studies. However, it is important to realize that this is a "generic" set of steps and that all research studies may not follow these steps to the letter, or necessarily in this order. This is often the case for many types of qualitative research studies. In situations where research studies do not follow the steps exactly, they still share a couple of important concepts in common. First, all research studies clearly specify a research question that serves to guide the conduct of the study, although some studies do not have those questions developed until after the study has begun. Second, all research studies include the collection, analysis, and interpretation of information. Applying the scientific approach to this second set of activities is what enables us to answer our questions more objectively and/or more accurately.

How, then, is the scientific method related to research in the broad field of education? In actuality, there is a great deal of overlap between the two. Simply put, **educational research** involves the application of the scientific method to educational topics, phenomena, or questions. The generic steps in the process of conducting educational research are as follows:

1. Specify the topic where a concern exists.
2. Clarify the specific problem to focus the research.
3. Formulate research questions and/or hypotheses concerning the specific problem or topic.
4. Review existing literature related to the topic or problem.
5. Conduct procedures by which data (a more appropriate term for "information") are collected, analyzed, and interpreted.
6. State the findings that are generated as a result of the analysis of data.
7. Draw conclusions related to the original research questions and/or hypotheses.

Note the similarities between Dewey's steps of the scientific method and the steps involved in conducting educational research. The major, integral components are common to both lists. However, to reiterate, these steps do not always occur in practice as they are presented here, nor do they always follow this particular sequence—especially with respect to specific types of educational research, namely those that use qualitative methods.

EDUCATIONAL RESEARCH—WHAT IT IS AND WHAT IT IS NOT

Although educational research can be a fairly straightforward process, some educators have preconceptions—or, perhaps more appropriately, misconceptions—about exactly what constitutes educational research. To fully appreciate the potential benefits of educational research—both as a researcher and a consumer—it is critical to have a foundational understanding of it. The following list—partially adapted from Leedy and Ormrod (2013)—is an attempt to describe what educational research *is* and what it *is not*.

- *Educational research is scientific.* As a process, educational research is a scientific endeavor. As we previously discussed, educational research closely parallels the scientific method; however, labeling it a "scientific process" goes even further. To say that educational research is scientific is to say that it is characterized by the principles

and methods of science and that it is systematic and methodical. As you see later in this list, educational research is objective and open-minded about the topic being studied. The overall process, when followed appropriately, involves a step-by-step methodology that ensures this high level of systemization and objectivity.

- *Educational research begins with a question or problem that serves as the purpose or goal of a study.* Schools abound with problems that need solving and questions that need answering—just ask any teacher or administrator. The logical starting point for any research study in education is to clearly articulate the question you ultimately want to answer or the problem you ultimately want to address. In turn, this provides a clear direction for the study—everything that follows, in terms of the development of your study, logically relates directly back to the question or problem. Furthermore, by brainstorming various questions and problems to address, we typically identify even more concerns that require our scientific attention. Clearly stating these questions and/or problems is the first formal step to conducting educational research.
- *Educational research requires the formulation of a specific plan for conducting the research.* Once the inherent question or problem has been specified and clarified, one must develop a plan for just how to conduct this research. The data necessary for answering the question or addressing the problem do not miraculously emerge out of thin air for the educational researcher to take and run with. The entire study must be well planned and carefully thought out, prior to its inception. These are the types of decisions and plans that must be made in advance:
  - Who will you study?
  - How many individuals will you need—or do you want—to study?
  - What information will you collect from them?
  - How will you collect those data?
  - When will you collect those data?
  - What will you do with (i.e., how will you analyze) those data once you have them?
  - How do you plan to interpret the results of those analyses?

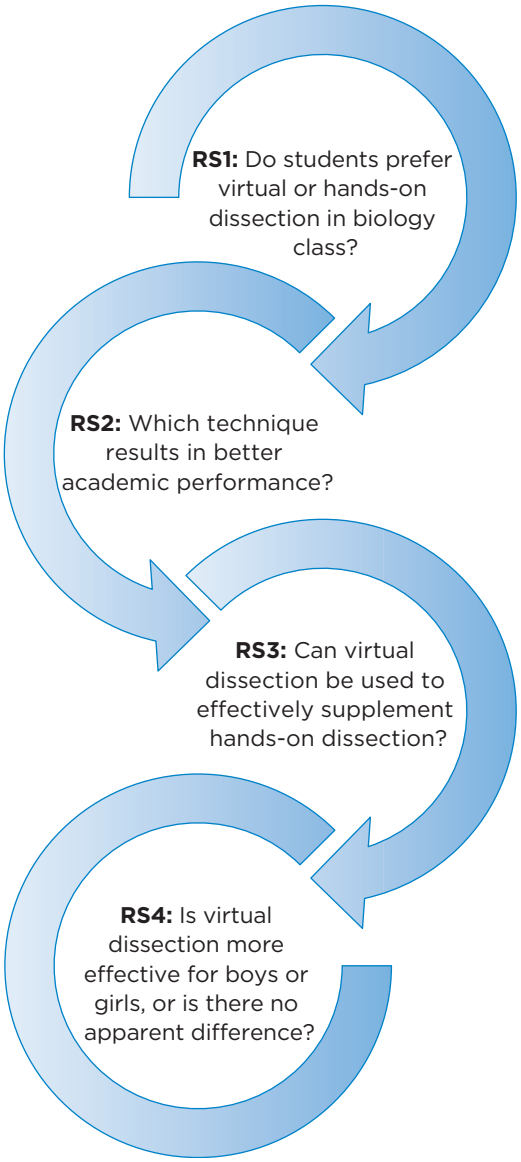
  All these methodological issues must be addressed at the outset of any research study. For reasons we discuss later in this book, these types of decisions simply cannot be made "on the fly," in the midst of the research process.
- *Educational research requires the collection, analysis, and interpretation of data as a means of answering the inherent question or problem under investigation.* For many novice researchers, this part of the process of doing educational research—collecting, analyzing, and interpreting data—often proves to be the most daunting. However, the more attention paid to these steps of the educational research process, the better the quality of the research study's ultimate outcome. In some cases, research studies involve the collection of existing data (e.g., school attendance records or standardized test scores), but they most often require the collection of original, new data (e.g., surveys, interviews, or pre- and posttests) specific to the research questions the study is addressing. Regardless of the source of the data, it still needs to be analyzed (with the perspective of the research question or problem in mind) and interpreted appropriately. This is a commonality across all educational research studies.

- *In most cases, educational research tends to be cyclical or helical, as opposed to linear.* When we look at the specific process of performing educational research in Chapter 2, it appears as if it is a linear process. In other words, Step 1 is followed by Step 2, which is followed by Step 3, and so on until the research concludes. While this is accurate (to a degree), research seldom, if ever, stops at the end of this process. Often, conducting educational research in an effort to answer one or two pressing questions results in the generation of new, additional research questions—and typically a greater number than you started with. Therefore, it is probably best to view educational research as *cyclical* (i.e., with cycles of research studies that explore the same basic topic in subsequent years or classrooms) or even *helical* (i.e., with a spiraling effect, where the original research study spawns additional, follow-up, or extended studies addressing different aspects of the same broad topic). This is, perhaps, one of the most unique aspects of educational research—that it is never truly done and that one can continually investigate educational phenomena.

Figure 1.1 presents a scenario where a science department might want to investigate the benefits of a virtual dissection (e.g., using an iPad app) versus the more traditional, hands-on method. In Research Study 1 (RS1), the question focuses on the students' preferences for the two types of laboratory activities. The next study (RS2) focuses not on opinion or preference but, rather, on academic performance. RS3 investigates the use of the virtual dissection as a means only to supplement, not replace, the hands-on activity. In RS4, the department might now want to know if there is a difference—in terms of both preference and academic performance—between boys and girls in their use of virtual and hands-on dissections. In this scenario, notice (1) how the same broad topic is being investigated in all four studies, but also (2) that different aspects of that topic serve as the focus (i.e., the guiding research question) for each subsequent study.

- *Educational research is, by its very nature, inquisitive, objective, and original.* Because educational research is scientific, it must be approached from the perspective of objectivity. The goal of any research study (regardless of the field of study) is the generation of new knowledge, the gaining of a better understanding of some issue or phenomenon, or the development of some sort of innovation. This simply cannot be accomplished if the researcher is biased or approaches a research study with some degree of subjectivity. That being said, it is critical to note that, as human beings, we all possess certain biases—for example, with respect to our view of the world, toward certain people, and even in our perspective on research. Human nature dictates that we always have some sort of preconceived idea (i.e., *bias*) about what we may find as the result of any given research endeavor; however, the goal when conducting research in education is to *make every effort* to avoid the temptation to let those preconceptions guide how we conduct the study or interpret our results. Building on the previous example, I may honestly think that virtual dissection is preferred by students and results in better academic performance; however, I still collect opinion and performance data from students on both virtual *and* hands-on dissection activities. This, in turn, allows me to objectively answer my guiding research question about which learning activity is better.
- *Educational research should be beneficial, meaningful, and significant.* Topics or questions that are trivial in their nature should not be the focus of educational research

FIGURE 1.1 ■ The Cyclical or Helical Nature of Educational Research



studies. Educational research should be conducted so the results prove beneficial to someone, somewhere, somehow, someday. If you want to study something that will not potentially result in one or more of the aforementioned benefits, then I would strongly advise you to rethink your research topic. Educational research should be done to garner new knowledge and to shed light on the human condition and educational phenomena. It should never be conducted as a means of doing harm to individuals or groups, or to denigrate, cast blame, find fault, deny opportunity, or stifle progress. The goal of the educational researcher is always to increase understanding and, whenever possible, to promote opportunity and advancement for the population at large.

Equally important, educators should understand what educational research *is not*.

- *Educational research does not have outcomes that are predetermined.* Following logically from an earlier bullet point, educational research does not pursue questions that either (1) have already been answered or (2) have a predetermined, desirable answer. This is an essential difference between *science* and *pseudoscience* (Johnson, 2008; Mertler, 2020). Science—and inquiry that results from the application of the scientific method—relies on perceived reality (typically in the form of collected data) to determine beliefs. In other words, and as we have seen, data are collected and analyzed to determine what is believed. In contrast, pseudoscience uses beliefs to determine perceived reality. That is, one begins with a strong belief and seeks out data that can be used to support that belief (Johnson, 2008). Pseudoscience is often used as a marketing tool by companies to sell products or by individuals or groups in attempts to demonstrate that their ideas, methods, or products are the most effective. Clearly, this approach is not systematic, nor is it objective, and it does not use the scientific method. Therefore, it is not science…and it is not research (Mertler, 2020).

- *Research is not simply gathering information.* When I was in the eighth grade, I did a research project on UFOs. I spent months reading books and articles with firsthand accounts of alien abductions, taking notes on 3×5 note cards, developing an outline, and then finally writing my research report. I learned a great deal in completing that project—not just about UFOs, but also about organization, time management, and writing skills. It was a great learning experience; however, it was not "research." My overall experience and final report were not very *inquisitive*; I did not have any sort of clear and focused guiding question I was attempting to answer. They certainly were not *original*, since all I was really doing was collecting and organizing previously published stories and accounts. I might even argue that they were not objective, since I "captured" only one side of the story (i.e., information that supported the existence of UFOs). What I did was gather a lot of disparate information from a wide variety of sources and compile it into a cohesive written report—good work, but clearly not research.

- *Educational research is not conclusive.* As we discussed, educational research often generates more questions than were initially intended to be answered. In that sense, educational research is never conclusive. Perhaps more important, however, educational research typically involves the study of human beings and their behavior. The behavior of human beings is constantly in flux, changing in reaction to internal influences (e.g., age, natural growth and development, psychology, physical health, mental health) as well as external stimuli (e.g., technology, peers, family, teachers). What we research and conclude one day could easily change the next day if we study it in a different setting, with different students, teachers, curricula, classrooms, interpersonal relationships, and so forth. Along similar lines, the answers to the questions that guided our research should never be interpreted as right or wrong. Rather, they are answers appropriate for the given time and set of circumstances, including the particular data that were collected and analyzed.

- *Educational research is not trivial.* Over the past several years, there has been increased focus on the implementation of research-based strategies geared toward improved student performance. Research plays a very important role in today's educational climate, as well as in various school reform movements that we observe across our country and around the world. It is critical that educators at all levels see research as having substantial value for their practice, both individually (i.e., in their respective classrooms) and collectively (i.e., for the profession as a whole).

EDUCATIONAL RESEARCH AS A PROCESS

Earlier in this chapter, we discussed that educational research is a process, one that parallels the scientific method. Before we take a look at the specific process, we need to understand some of the guiding principles behind conducting research in education. The primary goal of nearly all educational research studies is "to describe, explain, predict, or control [educational] phenomena" (Gay, Mills, & Airasian, 2009). This is the case regardless of the particular methods used to conduct the research (i.e., the techniques used to collect and analyze data). However, different research methods can produce different views of reality. The various research methods tend to be placed into two broad categories—quantitative approaches and qualitative approaches—based on different assumptions about how best to understand what is true or what constitutes reality (McMillan, 2012). Quantitative research methods require the collection and analysis of *numerical* data (e.g., test scores, attendance records, attitude scales, interest inventories); qualitative research methods require the collection and analysis of *narrative* data (e.g., observation notes, interview transcripts, journal entries).

Quantitative research methods use a deductive approach to reasoning when attempting to find answers to a research question. **Deductive reasoning** works from more general, broad-based ideas, concepts, observations, or experiences to the more specific, in a "top-down" manner (see Figure 1.2). Notice that as one proceeds through the research process, there is a general funneling (i.e., narrowing) effect. As a purely hypothetical example, researchers conduct a survey of 1,500 educators regarding their opinions (i.e., *variety of data*) on the Common Core State Standards (CCSS). Those responses and opinions are aggregated, examined, and evaluated (i.e., *analyses of the data*), and it is determined that 65% of the respondents think that the CCSS standards are beneficial for students and 35% believe that they are not (i.e., *specific conclusions*).

On the other hand, qualitative research methods use an inductive approach to resolving problems and answering research questions. **Inductive reasoning** works in a "bottom-up" manner, opposite to the direction used in deductive reasoning, and involves the development of broad, general conclusions from observations of a very limited number of events or experiences (see Figure 1.3). To build on our hypothetical example, imagine that a team of researchers

FIGURE 1.2 ■ The Process of Deductive Reasoning, as Applied to the Research Process

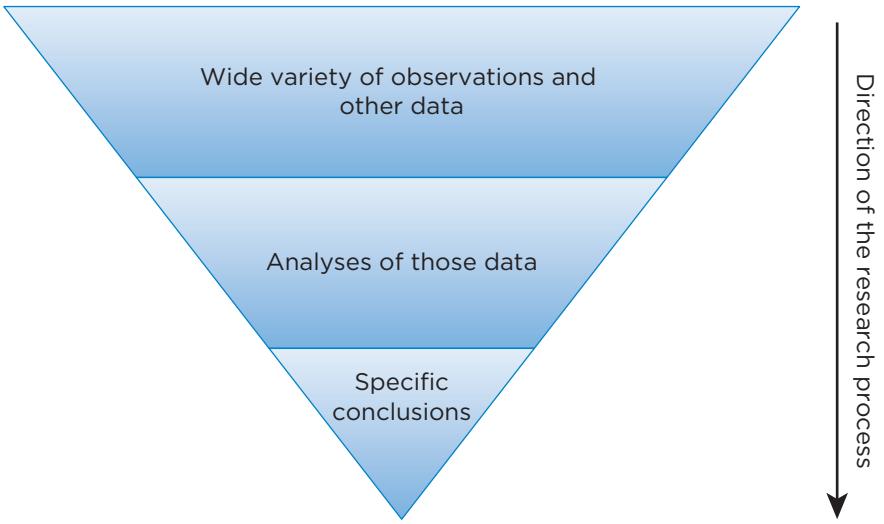
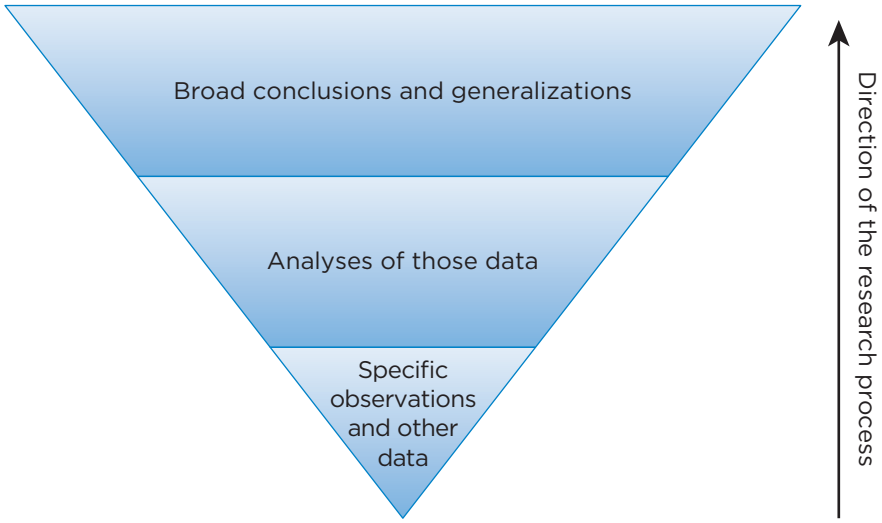


FIGURE 1.3 ■ The Process of Inductive Reasoning, as Applied to the Research Process



observes a small group (i.e., three to four teachers) over the course of two months to see how implementing CCSS has (or has not) changed their instructional practices. Once the researchers compiled their observation notes (i.e., *specific observations*) and examined them for any emergent themes or patterns in behavior (i.e., *analyses of the data*), they develop broad conclusions, hypotheses, or theories about teachers' instructional practices and the influence of CCSS (i.e., *broad conclusions*).

To accomplish the primary goal of a quantitative educational research study, researchers collect data on carefully identified **variables** (i.e., factors that may affect the outcome of a study or characteristics that are central to the topic or problems being addressed). Those data (by the way, the word *data* is always plural) are then analyzed and the results interpreted to test **hypotheses** (i.e., predicted outcomes of the study) or answer **research questions** (i.e., guiding questions that serve as the focus of the study). For example, a quantitative research study might require the collection of data on elementary school discipline referrals and absenteeism (numerical variables) to answer the following research question: Are there differences in the rates of disciplinary problems and absenteeism in schools with a K–8 grade span versus those with other grade span configurations (e.g., K–6, 6–8) (Mertler, 2020)?

The plan that is used by the researcher to carry out the study is referred to as the **research design**. Quantitative research designs are either nonexperimental or experimental. In **nonexperimental research**, the researcher does not have direct control over any variable in the study, either because it has already occurred or because it is not possible (or, perhaps, ethical) for it to be influenced (Mertler, 2020). Another way of saying this is that, in nonexperimental research, variables cannot be controlled or manipulated by the researcher. The previous illustration of a study of school discipline and absenteeism problems is an example of a nonexperimental study, as the type of grade configuration, the number of discipline referrals, and the number of absences cannot be controlled or influenced by the researcher; those things occur naturally or have already occurred. That variables cannot be controlled in nonexperimental studies is an important distinction between nonexperimental research designs and experimental research designs, in particular when it comes to stating specific conclusions at the end of a study. This usually means that the conclusions to nonexperimental studies are able only to

describe variables or the relationships between variables. Some examples of nonexperimental research designs include *descriptive*, *comparative*, *correlational*, and *causal-comparative* research (McMillan, 2012).

Descriptive studies are more basic, in that they simply report information—resulting from the collection of empirical data—about the frequency or amount of something (e.g., what percentage of the time do teachers use performance-based assessments in their classrooms?). **Comparative studies** build on descriptive studies by comparing two or more groups on one or more measured variables (e.g., is there a significant difference between elementary and secondary teachers' use of performance-based assessments?). **Correlational studies** measure the degree and nature of the relationship between two or more variables (e.g., what is the relationship between years of teaching experience and use of performance-based assessments?). Finally, **causal-comparative studies** (also sometimes referred to as ***ex post facto studies***) compare groups—where group membership is determined by something that occurred in the past—on subsequent data on another variable in such a way that it makes it possible to draw potential causal relationships between the two variables (e.g., do teachers who completed a stand-alone preservice course in classroom assessment use performance-based assessment more than teachers who did not complete such a course?). Notice that based on the sample research questions provided, it is quite possible to use any of the various types of nonexperimental research designs to study a given topic—in this case, classroom teachers' use of performance-based assessments (Mertler, 2020). Also, as we previously discussed, it is important to note in the preceding sample research questions the helical nature (i.e., varying research questions/studies on the same general topic) of educational research.

Generally speaking and contrasted with nonexperimental research, in **experimental research**—which also includes **quasi-experimental designs**—the researcher has control over one or more of the variables included in the study that may somehow influence (or cause) a participants' behavior. The variables over which the researcher has control are known as the **independent variables**; these are the variables the researcher manipulates, meaning that the researcher determines which participants in the study will receive which condition (Mertler, 2020). For example, if the effectiveness of a new reading comprehension program (focused on the integration of annotation into the reading process) was being investigated, those students exposed to the *new* program incorporating annotation would constitute the **experimental or treatment group**; their performance would be compared with a **control group** that receives the standard reading instruction (i.e., with no annotation skills being taught, practiced, and reinforced). The ultimate variable of interest (i.e., the "behavior" variable mentioned earlier, perhaps "achievement in reading comprehension" in our example) is referred to as the **dependent variable** (since its value *depends* on the value, or group membership, of the independent variable).

Experimental research designs come in a wide variety, which we discuss later in Chapter 7. However, a concrete illustration of an experimental research study might prove beneficial, at this point. Suppose a history teacher wants to determine whether students perform better when taught American history using the more traditional forward (i.e., past-to-present) approach versus a backward (i.e., present-to-past) approach (Mertler, 2020). She randomly assigns half of her class periods to be taught using the forward approach and the other half to be taught using the backward approach. The independent variable for her study is "the type of instruction." There are two *levels* to this variable (these two levels essentially "define" the two groups): The experimental group receives the innovative backward approach to instruction; the comparison group receives the more traditional forward approach. Finally, the academic performance (dependent variable) of all students is measured using the same instrument (e.g., a final exam)

for both groups. The aspect that makes this study experimental in nature is that the teacher herself determines which group receives which version of the treatment (i.e., instruction); in other words, she is *manipulating* or *controlling* the independent variable.

Data collected during quantitative research studies are numerical and are therefore analyzed statistically. Statistical analyses may include the use of descriptive statistics, inferential statistics, or both. **Descriptive statistics** enable researchers to summarize, organize, and simplify data. Some specific techniques include statistics, such as the mean, median, mode, range, standard deviation, correlations, and standardized scores. **Inferential statistics** are more complex and permit researchers to test the statistical significance of the difference between two or more groups, or the degree of relationship between two variables. **Statistical significance** refers to a decision made from the results of statistical procedures that enable researchers to conclude that the findings of a given study (e.g., the size of the difference between two groups or the strength of the relationship between two variables) are large enough in the sample studied to represent a meaningful difference or relationship in the **population** from which the **sample** was drawn (Mertler, 2020). You learn much more about statistical analyses in Chapter 13.

While quantitative research studies focus on a small number of variables, qualitative research studies use a more holistic approach to data collection. Qualitative research designs make use of systematic observation to gain knowledge, reach understanding, and answer research questions. In qualitative research studies, there is no attempt to control or manipulate any variable; researchers simply take the world as it exists and as they find it (Johnson, 2008). Qualitative research tends to emphasize the importance of multiple measures and observations. Therefore, the research questions—and/or associated problems that guide qualitative research—tend to be broad and open-ended. This allows the researcher to collect a wide variety of data for the purpose of getting a more holistic picture of the phenomenon under investigation, and allows for triangulation.

Triangulation is a process of relating multiple sources of data to establish their trustworthiness or verify the consistency of the facts while trying to account for their inherent biases (Bogdan & Biklen, 2007; Glesne, 2006). It is important to note that conducting triangulation does not necessarily mean that the researcher is using three (as in *tri-*) sources of data; it simply means that there is more than one source of data. Perhaps a more appropriate term would be *polyangulation* (since the prefix *poly* is defined as "more than one or many"; Mertler, 2020). This process of relating various sources of qualitative data enables the researcher to try to get a better handle on what is happening in reality and to have greater confidence in research findings (Glesne, 2006). For example, in a qualitative study, one might collect data through firsthand observations, videotaped observations, and interviews. Triangulating different sets of data from these sources requires them to be examined to determine, for example, if the behaviors exhibited and comments made by participants are consistent regardless of the type of data representing them. In other words, did a specific person act the *same way he said he acted*, or did he *verbally portray his behavior differently* from his actual behavior?

Similar to quantitative research, there are a variety of qualitative research designs, including phenomenology, ethnography, grounded theory, and case studies (McMillan, 2012; Mertler, 2020). **Phenomenological studies** engage the researcher in a—sometimes lengthy—process of individual interviews in an attempt to fully understand a particular phenomenon (e.g., what characteristics do teachers need to be viewed as compassionate by their students?). **Ethnographic research** describes social interactions between people in group settings (e.g., what meaning does the teachers' lounge have for the staff at Main Street Elementary School?). **Grounded theory research** attempts to discover a theory that relates to a particular environment (e.g., what types

of personal and school characteristics serve to motivate teachers?). Finally, **case studies** are in-depth studies of specifically identified programs, activities, people, or groups (e.g., what is the nature of the school culture at Washington Middle School?).

The data collected during a qualitative research study may be quite diverse. Recall that qualitative data are typically narrative and consist primarily of observations, interviews, and existing documents and reports (McMillan, 2012). Resulting qualitative data are analyzed by means of a process known as **logico-inductive analysis**, a thought process that uses logic to make sense of patterns and trends in the data (learn more about this analytical process in Chapter 11).

While quantitative and qualitative approaches to conducting research are quite different on a variety of levels, they should not necessarily be considered mutually exclusive. It is not uncommon to see research studies, particularly in educational settings, that employ both types of research data. These types of studies are referred to as **mixed-methods research designs**. The combination of both qualitative and quantitative data tends to provide a better understanding of a given research problem rather than using one type of data in isolation. Perhaps the most appropriate way to think about mixed-methods designs is that these types of studies capitalize on the relative strengths of *both* quantitative and qualitative data. Creswell (2005) considers mixed-methods designs and **action research studies** to be very similar to each other, since they both often use quantitative and qualitative data. The only real difference between the two is the underlying purpose for the research. The main goal of mixed-methods studies is more traditional (i.e., to better understand and explain a research problem); the main goal of action research is to address local-level problems with the anticipation of finding immediate solutions. You learn more about mixed-methods designs and action research in Chapters 8 and 9, respectively.

Now that we have a better grasp on some of the foundational aspects of educational research, consider a concrete example of the process of conducting an actual study. Remember that educational research is typically carried out as a process—that parallels the scientific method—using the following steps.

Step 1: Identification of an Existing Problem

An educational concern is identified for which there is no obvious answer. The concern may have arisen because of an identified need, an interest, a requirement, or a commissioned work, and may have been present for a long time or surfaced unexpectedly. For example, teachers in the Adams School District recently identified a disturbing pattern of academic achievement in their schools—students from certain cultural and racial groups seem to progress more rapidly than others, despite the educators' efforts to provide equal educational opportunity for all. Initially, they can offer no substantive explanation for the occurrence, nor are they sure about which groups are performing differently.

Step 2: Clarification of the Specific Problem

Simply knowing that some student groups perform differently than others in some academic areas is not focused enough to guide a research study. The initial concern must be clarified and stated more succinctly, after which it becomes known as the **research problem**. In the case of the Adams School District, and on closer examination of existing data, teachers and administrators determine that there is a noticeable difference in academic performance in Algebra I courses, although they still are unsure as to why the difference exists. They decide to formally state their research problem as follows: *There is a differential level of academic achievement, as evidenced by scores on the state's end-of-course (EOC) exam in Algebra I, between various racial groups of students*.

Step 3: Formulation of the Research Question(s)

Now that the problem has been clearly identified, one or more research questions must be formally stated to provide specific direction for conducting the research study. In other words, the goal of this study is to answer that research question. In the case of student performance in Algebra I, the educator-researchers in the Adams School District state their research question as follows: *Is there a significant difference in Algebra I EOC scores based on students' racial classifications? If so, which racial groups outperform others?*

Step 4: Review Existing Research Literature Related to the Topic

The educators acknowledge that there must exist some previously conducted research on this topic. In order to learn more about what was researched, how it was researched, and what was concluded from those studies, they conduct an extensive review of existing research literature related to their topic of racial differences in Algebra I content and skills mastery. To learn more about their topic, they decide to broaden their search for literature to include various demographic group differences found in relation to student performance in mathematics.

Step 5: Development of Procedures for Data Collection

When developing procedures for the collection of data, care must be taken to ensure that the data collected will "match" or "align with" the research question(s). If this does not occur, then it is difficult, if not impossible, to accurately answer the research question at the end of the study. At the risk of oversimplifying our sample study, the research question necessitates collecting data on (1) students' racial categorization and (2) EOC test scores.

Step 6: Specification of Procedures for Data Analysis

Similarly, alignment between data analysis techniques and the original research questions must be ensured. Otherwise, you have results of your data analysis, but it does not provide answers to your question, which defeats the purpose of the research in the first place. Since our teachers and administrators are looking to compare students based on racial groupings, they can use a data analysis technique that focuses on group comparisons, for example a *t*-test or ANOVA (you learn more about these techniques in Chapter 13).

Step 7: Statement of the Findings Resulting from the Analyses

Once the results of data analysis are obtained, the most straightforward way to state the findings is to use the results to provide a specific answer to the research question. Teachers and administrators in the Adams School District are able to use the results of their data analyses to determine that there is, in fact, a difference in Algebra I EOC performance based on racial classification. They also can determine which racial groups scored higher than others. In other words, they have successfully answered their research question as a result of conducting the study.

Step 8: Development of Conclusions/Recommendations Related to Question(s)

Once the research question has been answered, educator-researchers must then use that information to draw conclusions about the original problem that was identified and make recommendations about what to do in the future. This is the step that typically leads to the development or generation of additional research questions that build on the results of the current research study. Returning to our example, the Adams School District may now want to seek answers to one or more of the following questions (among many other possibilities):

- What impacts on instructional methods result from some students outperforming others in the Algebra I EOC test?
- Are some students or sections of Algebra I taught differently?

- Are different teachers presenting the content and reinforcing mathematical skills differently?
- To what degree is this differential level of performance based on whether the Algebra I class takes place in the morning versus the afternoon?

In summary, the educational research process typically includes the following activities:

- Identifying an existing problem
- Clarifying and specifying the problem
- Formulating research questions concerning the central problem
- Reviewing existing research literature related to the topic
- Determining and carrying out procedures for data collection and analysis
- Stating the findings as determined through data analyses
- Developing conclusions and recommendations related to the original research question

KNOWING YOUR SPECIFIC DISCIPLINE

One of the best things you can do to begin preparing yourself to become both a researcher and a critical consumer of research is to familiarize yourself with your own specific discipline(s). Regardless of whether you plan to become a practitioner or a researcher in the future, knowledge and understanding of the research process, research methods, and appropriate ways to collect and analyze different types of data are essential *and critical* skills for keeping up with advances in your field (Leedy & Ormrod, 2013). These skills are crucial in guiding your ability to make accurate, well-informed decisions in your practice as a professional educator. Failure to gain *and* master these skills can only result in professional decisions based on faulty data, inappropriate interpretations and conclusions, or unsupported personal intuitions (Leedy & Ormrod, 2013).

One important way for you to become knowledgeable about your field is to read articles and other publications relevant to your academic discipline. As an educator, your "academic discipline" can be defined in many ways. You might read articles related to the subject matter you teach, or to the age or grade level you teach; perhaps you read articles about education in general; you might also read articles that address education policy or educational leadership—the list goes on and on and on. Along those lines, finding such articles and publications is not as difficult as you might think. A logical starting point is with your professors, who can suggest journals that are particularly relevant to your field of study. Once you have a list of such journals, simply begin by browsing their tables of contents for articles that might grab your attention.

One additional piece of advice as you begin to explore research in your field is that you must be able to discern the general quality of the articles or publications you choose to read. One way to do this is by focusing your attention on research studies that have been refereed. A **refereed research report** is one that has been subjected to a review by colleagues and experts in a particular field. For the report to be published, it must be deemed by experts in that particular field to be of reasonable quality. This is not to say that nonrefereed reports or articles cannot be beneficial or meaningful to you in your practice as a professional educator; the difference is that nonrefereed reports are not subjected to this level of review. All research is and should be subject

to critical review. Refereed articles have undergone this process, whereas nonrefereed articles leave that judgment purely to the reader's discretion.

As an educational researcher myself—and, perhaps more important, as a professional educator—I strongly believe that you owe it to yourself, and to your practice as a professional educator, to be educated in your profession.

EDUCATORS AS RESEARCHERS

The act of studying and learning about the educational research process is valuable to your professional life as an educator, regardless of your work setting. It is vitally important for educators, at all levels, to have a sound understanding of research methods for two basic reasons. First, at some point in your professional career, it may be highly beneficial for you to design and conduct, or otherwise become involved in, some sort of research study, as we discuss momentarily. Second, having a foundational understanding of the research process enables you to be a more discriminating consumer of published research studies. This is important when it comes to identifying a particular study's strengths and weaknesses and determining the extent to which its findings may, or may not, apply to you and your setting.

Additionally, there are several common purposes—or *practical applications*, if you will—for studying educational research. These are just a few of the more common ways studying educational research can inform your professional practice:

- Writing grant proposals (including their evaluation components)
- Completing theses and dissertations
- Reading primary and secondary sources more critically
- Reviewing professional literature as a means of thinking more critically, and possibly more reflectively, about issues and problems related to your setting (e.g., your classroom, your students, your subject matter)
- Conducting more formal research projects

You may be wondering, in light of the required steps and processes considered so far, whether genuine research can be carried out by educators and, if so, whether such research can truly shed light on topics of educational concern. Rest assured that educators can, even while busy on the job, do research of quality and importance. For some time now, practical inquiry undertaken by educators is considered more likely to lead to classroom change than formal research conducted by research specialists (Richardson, 1994). Radebaugh (1994) contends that educational research should not be left to experts, but should more extensively involve educators; educator-conducted research is especially powerful in shedding light on topics, such as educators' personal and professional lives and the problems educators regularly encounter in their work (Fleischer, 1994; Goodson, 1994). I am a firm believer in the fact that educator-led research can be an extremely empowering professional activity.

Thus, be assured that not only can you involve yourself successfully in meaningful educational research, but any investigation you conduct likely is more beneficial than formal research to your work in education, and probably more beneficial to other educators as well. You may even wish to involve your students as coresearchers in your investigations, which would logically invite them to take more responsibility for their own learning.

Developmental Activities

1. List and briefly describe at least five things within your classroom, school, or other educational setting that interest you and that you might want to pursue further. These might be problems you have become aware of, aspects of your practice you want to improve, or issues that concern you as a professional educator.
2. Based on what you learned in this chapter about educational research, for each of the problems or issues you generated earlier, judge the extent to which you believe that each might be appropriate for an educational research study.
3. Based on your new knowledge, briefly discuss how you believe that educational research can prove to be personally and professionally beneficial to you. What concerns do you have about its potential shortcomings?
4. Sit with one or two educational colleagues (preferably ones who are not in this course with you) and discuss educational research. Are their opinions toward research similar to or different from yours? Do they believe that educational research can benefit them, either personally or professionally (or both)? What concerns about educational research do they express to you?
5. Do you believe that educational research can benefit your students, or students in general? Why or why not?

Summary

- Research, in general, is important to how we function as a successful and productive society.
- The primary goal of virtually any research study is to find answers to our questions.
  - Typical sources for answering our questions (i.e., tradition, authority, and common sense) usually fall short in helping us find those answers.
- The scientific method is a systematic, step-by-step strategy used to answer questions and resolve problems.
- The main steps in the scientific method are as follows:
  - Clarify the main question inherent in the problem.
  - State a hypothesis.
  - Collect, analyze, and interpret information (i.e., data) related to the question.
  - Form conclusions derived from the interpretations of the analyses.
  - Use the conclusions to verify or reject your hypothesis.
- Educational research is a process that involves applying the scientific method to educational problems and phenomena.
- As a process, all educational research studies share the following characteristics:
  - Are scientific
  - Begin with a question or problem that serves as the purpose or goal of the study
  - Require the formulation of a specific plan for conducting the actual research
  - Require the collection, analysis, and interpretation of data to answer the question under investigation
  - Tend to be cyclical, or helical, as opposed to linear
  - Are inquisitive, objective, and original
  - Should be beneficial, meaningful, and significant
  - Do not have predetermined outcomes
  - Do not involve simply the gathering of information
  - Are not conclusive
  - Are not trivial
- Educational research relies on either deductive or inductive reasoning.
  - Deductive reasoning works in a top-down manner from more general, broad ideas and observations to the more specific; it is commonly used in quantitative research studies.
  - Inductive reasoning works from specific observations toward the development of much broader conclusions or generalizations; it is commonly used with qualitative research studies.
- Data are collected on variables, and those data are analyzed to test hypotheses or answer research questions.
- Research designs describe the plan to be used by the researcher to carry out the actual study.

- Quantitative research designs can be either experimental or nonexperimental.
  - Nonexperimental designs include studies that are descriptive, comparative, correlational, or causal-comparative.
  - Experimental designs allow the researcher to have some degree of control over some variables; they involve the identification of independent and dependent variables, as well as experimental and control groups of participants.
- Qualitative research designs involve a broader, more holistic approach to collecting and analyzing data.
  - Triangulation, or polyangulation, is a process of relating multiple sources of data to verify their trustworthiness, accuracy, and consistency.
  - Qualitative designs include phenomenological, ethnographic, grounded theory, and case-study research.
- Mixed-methods research designs, along with action research, typically involve the collection and analysis of both quantitative and qualitative data.

- The main steps in the process of conducting educational research are as follows:
  - Identification of an existing problem
  - Clarification of the specific problem
  - Formulation of research question(s)
  - Review of related literature
  - Development of data collection procedures
  - Specification of data analysis procedures
  - Statement of the findings resulting from data analysis
  - Development of conclusions and recommendations related to the question(s)
- Becoming familiar with your field of study by reading research articles is one of the best ways to begin your future as an educational researcher or consumer of research.
- Some of the most meaningful and beneficial research in education results from studies conducted by practicing educators.

Key Terms

Action research studies 15
Case studies 15
Causal-comparative studies 13
Comparative studies 13
Control group 13
Correlational studies 13
Deductive reasoning 11
Dependent variable 13
Descriptive statistics 14
Descriptive studies 13
Educational research 6
Ethnographic research 14
Ex post facto studies 13
Experimental or treatment group 13
Experimental research 13
Grounded theory research 14
Hypotheses 12
Independent variables 13
Inductive reasoning 11
Inferential statistics 14
Logico-inductive analysis 15
Mixed-methods research designs 15
Nonexperimental research 12
Phenomenological studies 14
Population 14
Quasi-experimental designs 13
Refereed research report 17
Research design 12
Research problem 15
Research questions 12
Sample 14
Scientific method 5
Statistical significance 14
Triangulation 14
Variables 12

2

OVERVIEW OF THE EDUCATIONAL RESEARCH PROCESS

STUDENT LEARNING OBJECTIVES

After studying Chapter 2, students will be able to do the following:

1. Summarize various activities that must be conducted during each step of the educational research process
2. Evaluate why specification of a research problem is so critical
3. Describe the importance of carefully stating the research question
4. List various reasons for conducting a review of related research
5. Identify various issues that must be addressed when developing a research plan
6. List and describe examples of techniques for collecting qualitative and quantitative data
7. Describe how and when data analysis occurs in qualitative and quantitative research
8. Describe the importance of results, conclusions, and recommendations in a research study

In Chapter 1, we looked briefly at the general process of conducting an educational research study. We outlined the main steps as follows:

- Identifying an existing problem
- Clarifying and specifying the problem
- Formulating research questions concerning the central problem
- Reviewing related literature
- Determining and carrying out procedures for data collection and analysis
- Stating the findings as determined through data analyses
- Developing conclusions and recommendations related to the original research question

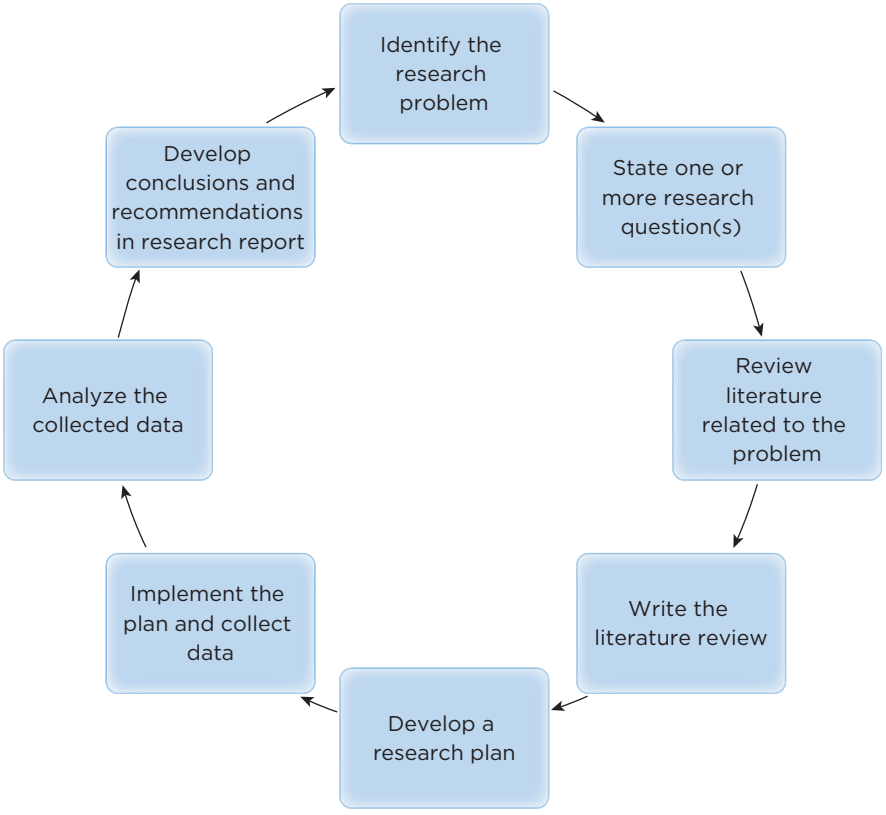
However, it is critical at this time that we begin to examine these steps more *specifically*, as each step contains particular subcomponents. The focus of this chapter is to introduce the steps

necessary in conducting educational research. The steps in the process are listed, followed by the corresponding chapters of this book that address the topic:

1. Identifying and limiting a research topic or problem (Chapter 3)
2. Formally stating and refining research question(s) (Chapter 3)
3. Reviewing existing literature related to the problem (Chapter 5)
4. Writing a literature review (Chapter 5)
5. Developing a research plan (Chapters 6–10)
6. Implementing the research plan and collecting data (Chapters 11 and 12)
7. Analyzing those data (Chapters 11 and 13)
8. Stating findings, conclusions, and recommendations in a written research report (Chapter 14)

This process is depicted in Figure 2.1. It is important to note, once again, the cyclical nature of educational research. Notice how the outcomes or results of one study can logically and informatively lead into the next phase of educational research. This figure is certainly not meant to imply that educational research is a linear process. As you read in Chapter 1—and, specifically, saw depicted in Figure 1.1—aspects of one study (e.g., conclusions, methods, literature reviews) may influence and guide subsequent studies.

FIGURE 2.1 ■ The Educational Research Process



IDENTIFYING AND LIMITING A RESEARCH TOPIC OR PROBLEM

The first—and arguably most critical—decision for any educational research study is exactly *what* to study. Often, personal and professional experiences lend themselves to the identification of educational research topics. For those of us who conduct educational research studies, we typically choose topics we have some previous experience with or exposure to. Topics for educational research studies should hold a good deal of personal interest for the researcher. If for no other reason, you are going to spend several months, if not years, researching the topic—so it most definitely should pique your interest. Personal interest, therefore, is a huge factor in deciding on an initial topic for educational research.

That being said, of course, there is likely nothing more important in terms of identifying an initial topic for research than an existing need. If a need is determined, then there is an audience interested in the results of a given research study. A need for research on a particular topic may stem from prior research conducted on that topic. It may also arise from the various experiences of practitioners in the field related to the topic. Therefore, current and future research, as driven by this identified need, should likely make a contribution to the body of research in a particular field of study.

Another key factor in identifying a topic for a research study is verification that the potential topic is, in fact, a genuine problem. In other words, the researcher has a responsibility to provide a rationale for why this particular topic or problem is worthy of being studied. Arguably, the majority of the evidence for this justification and rationale is in the body of related research literature. The literature review should have a strong influence on the identification, specification, and articulation of the research problem. Similarly, specification of a particular research problem in subsequent cycles of research may be guided by various aspects of previously conducted research studies.

Other important factors include manageability and time. When conducting educational research studies, it is important to keep the ultimate goal in mind. Remember, the basic goal of nearly all research studies is to find answers to questions, or to help explain and understand some educational phenomenon. For example, if you are planning to conduct a research study and know that you must have it completed in roughly four to six months, knowledge of that fact contributes a great deal to decisions about the specific topic you wish to research. Similarly, exposure to and familiarity with various research designs can be a great benefit when trying to gauge the manageability of researching a particular topic. Suggestions for identifying and narrowing the focus of educational research studies, along with other initial considerations, are discussed more extensively in Chapter 3.

FORMALLY STATING AND REFINING RESEARCH QUESTION(S)

Once the research topic or problem is clearly identified, the next step is to formally state one or more research questions. Research questions should be (relatively) concise and stated in a very clear and focused manner. Carefully wording a research question is a critical aspect of conducting educational research because the research question is what guides the remainder of the study. For example, it guides the data that are collected, the strategies for data analysis, and the ultimate conclusions and recommendations at the end of the study. In addition, care must be taken to ensure that the question is actually answerable by data the researcher is able to collect. Failure to do so may result in the collection of inaccurate data, or perhaps data that do not

parallel or align with the research question. In cases like these, unfortunately, you do not find out about the misalignment until the end of the study—when it is too late to restate your research question. Further discussions related to formally stating research questions and how to refine those questions so that they accurately "fit" with the rest of a given study—including sample research questions—appear in Chapter 3.

REVIEWING EXISTING LITERATURE RELATED TO THE PROBLEM

Examining existing research studies can provide a great deal of background information and guidance to the identified problem that is the focus of the research study. "Related literature" can be loosely defined as any existing source of information that sheds light on the topic under investigation. These sources might include publications, such as professional books, research journals, or unpublished research reports. Although there is really no limit to what can be used as background information on a given research topic, care must be taken to evaluate the existing literature against several criteria. These criteria include, but are not limited to, the following: the objectivity of the published research (and/or the extent to which an author has clearly identified and explained any potential bias); the specification of limitations inherent in the study; whether the research constitutes a *primary* (i.e., written by the individual who actually conducted the research) or *secondary* (i.e., someone's interpretation of another's research) source; whether the research is *empirical* or opinion-based; and whether it was subject to a process of peer review.

Reviewing related literature is a critical part of any research study because it can inform so many aspects, including the specification of the problem, development of the research questions, and determination of research designs and methodologies. Suggestions and techniques for reviewing related literature are presented in Chapter 5.

WRITING A LITERATURE REVIEW

For many researchers, one of the more challenging aspects of conducting a research study—and writing a research report—is writing a formal review of related literature. Compiling and synthesizing literature related to a given topic is not always as straightforward as it might seem. Adding to that challenge is the fact that every topic is different, especially in terms of the existing body of literature. Further, there is no "magical formula" that anyone can share with you regarding how to develop and formally write a review of literature. That being said, however, guidance regarding the development of a literature review can still be provided to the novice researcher. Suggestions and recommendations for writing a formal literature review are discussed in Chapter 5.

DEVELOPING A RESEARCH PLAN

Specification of the research problem, development of research questions, and a thorough review of the existing body of literature provide the necessary groundwork to begin developing a plan to conduct an educational research study. The next step in the process is to specify exactly *how* a study is to be conducted by answering several key questions related to the research plan, also known as the **research methods**:

- What data will be collected?
- Will those data be qualitative, quantitative, or both?

- Do the data already exist, or will original data be required?
- Will it be necessary to develop instrumentation (e.g., a survey or rating scale) or interview protocols?
- How and when will the data be collected?
- How will the quality of the data be ensured?
- If the data need to be collected from human participants, from whom will they be collected?
- How many participants will be necessary?
- What techniques will be used to analyze those data?
- Do all of the above align well with the research question(s)?

Additionally, care must be taken to ensure that all participants in your study are being treated ethically (see Chapter 4). Much more information regarding various research designs and the decisions related to a specific methodology are discussed in Chapters 6 (qualitative methods), 7 (quantitative methods), and 8 (mixed methods).

IMPLEMENTING THE RESEARCH PLAN AND COLLECTING DATA

Once the plethora of decisions outlined in the previous section are made—and aligned appropriately with the research question—it is time to implement the research plan and physically collect data. Fraenkel and Wallen (2003) suggest three broad categories of data collection techniques. First, data can be collected through the *observation* of participants in the study. These participants might include students, teachers, parents, administrators, or any combination of those groups of individuals. Observational data can be collected through the use of field notes, journals, or even videotaping.

A second category of data collection techniques involves collection of data by means of *interviews* with any of those groups of individuals involved in the educational process. Granted, when we think of interviews, we typically think of an oral question-and-answer exchange between participants in a study. However, interview data may also be collected through a pencil-and-paper—or even electronic—format. *Questionnaires* and *surveys* can be used to ask individuals about their personal opinions or perspectives on some aspect of the educational process under investigation.

The third category of data collection techniques involves examination of *existing documents* or *records*. Often, collection of existing data requires the least amount of time, since they have already been collected; it is the job of the researcher merely to *locate* those data. However, this process is not always so simple. Often, it may be difficult to physically locate these data, especially if a good deal of time has elapsed since their occurrence. Examples of existing documents might include attendance records, minutes of faculty meetings, policy manuals, and student portfolios—the list of existing data in schools is seemingly endless.

I typically add a fourth category of data collection techniques, composed primarily of quantitative measures, such as checklists, rating scales, tests, and other formal assessments that are routinely administered in schools. Often, if we want to look at the effectiveness of instruction, for example, we may want to look at assessments administered to students.

Of course, within this category, we would also include scores resulting from the administration of standardized tests. It is important to recognize that the reader may see some overlap with the previous category of existing documents. This is certainly a reasonable perspective, as many quantitative measures that exist in schools naturally occur as part of the educational process. However, these are certainly realistic—as well as important and meaningful—sources of educational research data.

More specific information regarding various data collection techniques, instruments, and examples is provided in Chapters 11 (qualitative data collection techniques) and 12 (quantitative data collection techniques).

ANALYZING THE DATA

Analysis of data occurs at different points in the process, depending on whether the study uses quantitative, qualitative, or mixed-methods designs and techniques. In quantitative research studies, data analysis typically occurs following the completion of *all* data collection. Once all data are collected and organized appropriately (i.e., to correspond to the research questions and the intended analytical techniques), those data are then subjected to appropriate analyses through the use of some statistical analysis software program (e.g., SPSS, Excel, StatCrunch). Quantitative analysis of data is a very objective process; since the analysis is actually being done by computer software, the subjectivity and potential biases of the researcher do not impact the results. In other words, regardless of who analyzes the data, the results will be identical—although it is important to realize that there may still be a good deal of subjectivity when it comes to *interpretation* of the statistical results.

In contrast, during qualitative research studies, data analysis typically begins *during* data collection, continues throughout the *remainder* of the process of collecting data, and is completed *following* data collection. It is common for initial rounds of qualitative data analysis to necessitate the collection of additional or different qualitative data, to help fully answer the research question(s). The analysis of qualitative data is, by definition and design, a highly subjective process. In contrast to quantitative analyses, qualitative analyses are not conducted via a computerized (i.e., "nonhuman") process. Of course, computer software is available for *assisting* with coding in the transcription process; however, qualitative analyses are conducted exclusively by the human mind. Generally speaking, this technique consists of categorization based on logical analysis. The practice of *polyangulation* is critical during this analytical process. The researcher must read, reread, organize, condense, and synthesize all the qualitative data in an attempt to identify themes, categories, or patterns that emerge from those data. It is not uncommon—in fact, it is quite typical—for multiple researchers to arrive at very different results and conclusions after analyzing even a small set of qualitative data.

In essence, the analysis of data in mixed-methods research studies capitalizes on the best of both of the "data analysis worlds." While the techniques for analyzing quantitative data and those for analyzing qualitative data within a mixed-methods study are the same as described earlier, the researcher must engage in a different sort of polyangulation to "merge" both kinds of data. By engaging in this process, the researcher gains a better understanding of how qualitative data and subsequent analyses can inform quantitative data analyses, and vice versa.

Discussion and examples of various data analysis techniques and procedures are provided in Chapters 11 (qualitative data analysis techniques) and 13 (quantitative data analysis techniques).

STATING FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS IN A WRITTEN RESEARCH REPORT

Once data analysis has been completed, the researcher has the responsibility of formally and succinctly stating the *results*, also known as *findings*, as well as *conclusions* and *recommendations* resulting from the study. This is the point in the study where the researcher actually provides answers to the originally stated research questions. However, this step in the process is not quite as simple as that. The researcher must then take the answers to research questions and contextualize them with respect to the broader field of education, the context of the study, the setting of the study, and so forth. In other words,

- What do the findings *mean* to the field of education?
- What are the *implications* for practicing educators?
- What *impact* might they have on students and parents?

Further,

- What *recommendations* for practice can be made?
- What *recommendations*, if any, regarding educational theory can be made?

With respect to a final written research report, this section potentially carries the most weight. Most readers of educational research reports look to the substantive meaning of the researchers' final conclusions and recommendations drawn from the study. Although they read the entire written report, this is a situation somewhat similar to when a person skips ahead to the last chapter of a novel to see how the story ends.

One additional—and vitally important—aspect of developing conclusions and recommendations is that they *must* follow logically from the research questions, the data that were collected, and the results of the analyses of those data. In other words, care must be taken so that conclusions and recommendations do not become so global that they extend beyond the parameters of the particular study. Recommendations and advice for developing a final written report on completion of an educational research study are provided in Chapter 14.

THE EDUCATIONAL RESEARCH PROCESS—A BRIEF EXAMPLE

Now that we concisely examined each of the eight steps involved in conducting an educational research study, let us consider the following example (adapted from Mertler, 2020), where each step of a fictitious research study is briefly described. Our example begins with two researchers from the local university—one of whom specializes in social studies education and the other in research methodology. The social studies expert has noticed for some time that high school students across the state are not performing well in the state-mandated American history course. The course has always been taught in a traditional manner—with the content coverage beginning prior to the American Revolution and ending with more recent events. The social studies expert believes that there may be some merit in examining a "backward" approach to

teaching history (i.e., beginning with current events and proceeding back through time to end at the American Revolution). He wants to investigate these two different instructional approaches and decides to enlist the help of a research methods colleague; she willingly agrees.

Step 1: Identifying and Limiting a Research Topic or Problem

The two researchers meet on a couple of occasions over the summer to identify the specific topic they hope to address through the examination and trial of this alternative instructional approach. Based on previous research and knowledge, they believe that students struggle most in making connections between seemingly unrelated historical events. The social studies expert argues that perhaps this backward approach (i.e., beginning with more recent historical events that students are more familiar with) will have a positive impact on how well they are able to make these types of connections. The researchers decide to focus their attention on any differences in academic performance, as well as students' attitudes, related to the two instructional approaches.

Step 2: Formally Stating and Refining the Research Question(s)

Now that they narrowed the focus of their study, the researchers must formally state the research question that will guide them. They identify the key variables in their study as follows:

- Independent variable: instructional technique (i.e., forward vs. backward instruction)
- Dependent variables: performance on the state's end-of-course exam; students' attitudes and perceptions

Based on the identified problem, as well as the key variables in the study, the researchers state the following research questions to guide their study:

1. Is there a difference in students' academic performance, dependent on the type of instruction received in an American history course? If so, what is the direction and size of that difference?
2. What are the students' attitudes toward and perceptions of these two types of instruction?

Step 3: Reviewing Existing Literature Related to the Problem

Although they are somewhat familiar with research in this area, the researchers decide to collect related, published research focused on the effectiveness of backward approaches to teaching historical, chronological events; how other history teachers implemented this type of instruction; and any problems they encountered. They decide to split the tasks, with the social studies expert identifying and reviewing published research studies on the topic and the methodologist identifying and reviewing studies that examined differential instructional methods. After reviewing their respective bodies of literature, the two researchers revisit the research questions to determine if they are still appropriate or should be revised, as potentially influenced by the existing body of research.

Step 4: Writing a Literature Review

After a few months of identifying, collecting, reading, and synthesizing existing research on the topic, the researchers pool their resources and collaboratively draft a comprehensive literature review. Their formal review of related literature includes the following subtopics:

- Instructional methods
- Methods of teaching history

- Chronological methods of teaching history
- Differential effects of chronological teaching methods
- Student opinions of chronological teaching methods

Step 5: Developing a Research Plan

Following the review of published literature, the researchers have ample background evidence and support for the focus of their proposed study (i.e., the backward approach to instruction can be effective), although they also found some contradictory evidence (i.e., this approach is less or at least no more effective than the traditional approach). The researchers decide that the most appropriate design for their study is a comparative-type design, since the goal is to compare academic performance and attitudes of students taught using the forward approach with those of students taught using the backward approach. More specifically, they decide to use a mixed-methods design, where academic performance (i.e., Research Question #1) is measured quantitatively and student attitudes (i.e., Research Question #2) is measured qualitatively.

Step 6: Implementing the Research Plan and Collecting Data

Next, the researchers need to identify a couple of schools and several American history teachers in each. Several of those teachers will serve as the "comparison" group (i.e., they will teach their classes using the typical forward chronological method), whereas another set of teachers will serve as the "treatment" group (i.e., they will teach their classes using the backward approach). Further, they decide that the study will span an entire academic year, with the majority of data collection occurring near the end of the school year. The end-of-course exam in American history is administered in April; they will also survey the students at about the same time. They will use the school year to check in periodically with the teachers and to develop the qualitative attitude survey—containing open-ended questions—for students.

By the end of May, the student scores on the American history exam have been received from the state department of education. The researchers have also surveyed all the students involved in both groups of the study.

Step 7: Analyzing the Data

Immediately following the end of the school year, the researchers begin their data analysis. Test scores resulting from the administration of the end-of-course achievement test are statistically compared for the two groups (i.e., the backward group vs. the forward group). Upon interpreting the results of the analysis, it is determined that the test scores of the students who were taught using the backward instructional approach are significantly higher than those of the students taught in the more traditional manner.

The analysis of student perception data—and subsequent qualitative comparisons between the two groups—reveals some interesting results. Generally speaking, the students taught using the backward approach liked it, but they identified that this was largely because it was something different from what they were used to in a history course. They felt that they had a hard time adjusting to the different approach to studying history. Those taught using the forward approach liked the idea of being taught in the alternative manner but were apprehensive because they thought the material would be more difficult to grasp.

Step 8: Stating Findings, Conclusions, and Recommendations in a Written Research Report

With their findings in hand, the researchers develop conclusions and recommendations as part of a final written research report. They conclude that, while the backward instructional approach resulted in better academic performance, the students seemed very uncomfortable with the alternative method. They agree—and formally recommend—that it is imperative to

continue studying the effectiveness of this approach in subsequent academic years, perhaps with a larger number of schools, teachers, and students. An additional recommendation includes the collection of data from teachers (i.e., what were their experiences and perceptions of the different teaching method?). Similar findings in the coming years could provide a much stronger case for permanently changing the approach to teaching American history—if, in fact, future data supported that recommendation.

Developmental Activities

1. In your opinion, which of the eight steps of the educational research process do you believe is most difficult to carry out, in general and/or for you personally? Why?
2. In the Chapter 1 Developmental Activities, you brainstormed several possible topics for educational research studies. Select one of these topics and *briefly* outline how you would conduct this educational research study, corresponding to the eight steps presented in this chapter.
3. Revisit the sample study presented in the chapter. What questions or concerns came to mind as you read that example? Which of the eight steps concerned you or raised the most questions in your mind? Explain your answer.
4. The sample study presented in the chapter was done collaboratively between two researchers. Develop a list of pros and cons for conducting collaborative educational research.
5. Imagine that your school is experiencing problems related to its student dress code. Students are ignoring the code and, in some cases, are becoming extremely disruptive to the educational process as a result. How might you use the process of conducting educational research to investigate alternative solutions to the problem? What specific problems or research questions might you address? What sorts of data would you collect?

Summary

- The main steps in the process of conducting educational research are as follows:
  - Identifying and limiting a research topic or problem
  - Formally stating and refining research questions
  - Reviewing existing literature related to the problem
  - Writing a literature review
  - Developing a research plan
  - Implementing the plan and collecting data
  - Analyzing the collected data
  - Stating findings, conclusions, and recommendations
- Identification of the focus of the study is one of the most critical decisions in the process of conducting educational research.
  - The topic should be of personal interest to you and should be manageable.
- Care must be taken in formally stating research questions, as they guide the remainder of the study.
- Reviewing existing literature and writing a literature review can provide a great deal of guidance to a research study.
  - Related literature can inform specification of the problem, development of research questions, and determination of research designs and analyses.
- *How* the research study is actually conducted is known as the research method.
  - Many critical decisions about the research method must be made, including those related to data, participants, instrumentation, timeframe, research ethics, and data analysis.
- Methods used to collect data can be quite diverse.
  - Categories of techniques include observational techniques, interviews, existing data, and data collected through standard educational processes.

- Quantitative data analysis involves statistical techniques and is typically accomplished using statistical analysis software.
- Qualitative data analysis is an inductive process that must be facilitated in the mind of the researcher.
- Analysis of data collected in mixed-methods studies involves both kinds of data analysis and essentially merges the results.
- Findings, conclusions, and recommendations should be stated so they follow logically from all that has preceded in the study.
- The purpose behind stating conclusions and recommendations is to take the answers to the research questions and contextualize them with respect to the broader field of education.
- Extreme caution must be used so that conclusions and recommendations are not stated so globally that they extend beyond the parameters of the study.
- It is important to keep in mind that there is not a single way to research any given topic. Different approaches, methodologies, and data can be used to investigate the same or similar research topics.

Key Term

Research methods 25

3

IDENTIFYING A RESEARCH PROBLEM

STUDENT LEARNING OBJECTIVES

After studying Chapter 3, students will be able to do the following:

1. Identify and appropriately focus the scope of a research problem or topic
2. Recall and apply definitions of terminology necessary in conducting educational research studies
3. Apply these necessary terms when engaging in the preliminary development of an educational research topic
4. Translate a research problem statement into a guiding research question, following guidelines for both qualitative and quantitative research questions

The initial steps in any research study involve clarifying the topic to be researched as well as exploring the existing literature on that topic. These two broad steps and sets of skills are our focus in this chapter and the next. As previously mentioned, decisions about these early steps of the process can be crucial to the success of a research study. Failure to clarify the focus of the project and inadequate examination of what has been done and is known about the topic may ultimately lead to an unsuccessful research study. Researchers must be mindful of these facts during the developmental stages of their research studies.

IDENTIFYING A RESEARCH TOPIC OR PROBLEM

I cannot reiterate strongly enough that careful identification of a research topic is one of the most important steps in the overall process. Nothing shapes the remainder of the study as much as the potential research topic or problem and the research questions that follow. If a research topic is too narrow, it may not be possible to collect adequate data to answer the research questions or solve the research problem. On the other hand, if the research topic is too broad, the researcher may become overwhelmed with too many possibilities (e.g., too many possible research designs, too much data, too many sources of data, too little time to complete such a broad study).

As educators—and I use this term to include all individuals who work in educational settings at any level—we all have concerns about educational matters, just as we all want to find the answers to our many questions. For example, educators may want to know the ways multiculturalism can influence the teaching and learning process. They might want to learn more

about the possible positive and negative effects of tablets and smartphones on student learning and engagement. Educators might be interested in learning more about how common standards will better prepare students for college and careers. University residence-life staff may want to learn about student satisfaction levels with various housing models. You might notice that, in this handful of examples, there is one commonality: The educators highlighted all seem to have some sort of a personal interest in the topic they propose to investigate. Having a personal interest in the topic that you will spend time exploring is critically important; however, interest is not the only factor in the decision.

Personal interest is a great starting point, but it is certainly not the only mechanism for identifying possible research topics. There are other excellent sources as well. For example, browsing almost any educational journal (in your university library or online) likely generates ideas for potential research topics. National newspapers, which often report on issues and stories of an educational nature, can also be fruitful sources. Of course, simply talking with other educators very likely results in a discussion of possible research topics. Regardless of the role you play or the position you hold in education—in K–12 schools, these roles include classroom teacher, administrator, teacher leader, counselor, psychologist, librarian, reading specialist, and intervention specialist; in institutions of higher education, they include faculty, student affairs staff, residence-life staff, counselors, and academic support staff—there are literally hundreds of topics that warrant investigation in our educational institutions. Regardless of your position, you will potentially find many of those topics appealing.

Preliminary Considerations in Selecting Topics

Because selecting a topic is so crucial to the success of a research study, researchers should evaluate a potential topic against several preliminary considerations. While it is not necessary to meet all these "requirements," care should be taken to balance these considerations and to make appropriate adjustments to a particular topic as necessary (Mertler & Charles, 2011).

1. *You should have a **personal interest** in the topic you select to study.* Your level of interest in a topic often stems from its association with some sort of positive experience or unpleasant concern. In other words, you are not indifferent to the given topic—whether initially positive or negative, it has some sort of meaning to you. Additionally, I often stress to students who are new to research methods that they consider the amount of time they will devote to thinking about, doing, and writing about this particular topic. Keep in mind that research studies in education may last anywhere from a couple of months to an entire school year, or beyond. Now consider how laborious the process may become if you do not really have a genuine interest in your topic—those several months could feel as though they are dragging on forever.

2. *Your potential topic should be **important** and likely to make a difference in some aspect of education.* As we have already mentioned, research studies in education should not focus on trivial ideas and concepts. If you really do not believe that investigation of your potential topic will result in a meaningful difference, I would argue that you should not conduct your research on that topic. Rather, the results of an educational research study *should* make some sort of difference—or should at least have the *potential* to make a difference—in a given aspect of education. That means the difference could be felt or experienced by students, teachers, administrators, or another group. From a research perspective, our general hope is that by conducting