CHAPTER 1

EDUCATIONAL PSYCHOLOGY: A TOOL FOR EFFECTIVE TEACHING

I touch the future. I teach.

—Christa McAuliffe
American Educator and Astronaut, 20th Century

Chapter **Outline**

Exploring Educational Psychology 1
- Historical Background
- Teaching: Art and Science

Effective Teaching 2
- Professional Knowledge and Skills
- Commitment, Motivation, and Caring

Research in Educational Psychology 3
- Why Research Is Important
- Research Methods
- Program Evaluation Research, Action Research, and the Teacher-as-Researcher
- Quantitative and Qualitative Research

Learning **Goals**

1. Describe some basic ideas about the field of educational psychology.
2. Identify the attitudes and skills of an effective teacher.
3. Discuss why research is important to effective teaching, and how educational psychologists and teachers can conduct and evaluate research.

Teaching **Stories** Margaret Metzger

Effective teachers know that principles of educational psychology and educational research will help them guide students' learning. Margaret Metzger has been an English teacher at Brookline High School in Massachusetts for more than 25 years. Here is some advice she gave to a student teacher she was supervising that incorporates her understanding of basic principles of educational psychology, such as the importance of teaching how to learn and the need to apply educational research to teaching practice:

> Emphasize *how* to learn, rather than what to learn. Students may never know a particular fact, but they always will need to know how to learn. Teach students how to read with a genuine comprehension, how to shape an idea, how to master difficult material, how to use writing to clarify thinking. A former student, Anastasia Korniaris, wrote to me, "Your class was like a hardware store. All the tools were there. Years later I'm still using that hardware store that's in my head. . . ."
>
> Include students in the process of teaching and learning. Every day ask such basic questions as, "What did you think of this homework? Did it help you learn the material? Was the assignment too long or too short? How can we make the next assignment more interesting? What should the criteria for assessment be?" Remember that we want students to take ownership of their learning. . . .
>
> Useful research has been conducted lately on learning styles and frames of intelligence. Read that research. The basic idea to keep in mind is that students should think for themselves. Your job is to teach them how to think and to give them the necessary tools. Your students will be endlessly amazed at how intelligent they are. You don't need to show them how intelligent you are. . . .
>
> In the early years of teaching you must expect to put in hours and hours of time. You would invest similarly long hours if you were an intern in medical school or an associate in a law firm. Like other professionals, teachers work much longer hours than outsiders know. . . .
>
> You have the potential to be an excellent teacher. My only concern is that you not exhaust yourself before you begin. Naturally, you will want to work very hard as you learn the craft.

(*Source:* Metzger, 1996, pp. 346–351.)

Preview

In the quotation that opens this chapter, twentieth-century teacher and astronaut Christa McAuliffe commented that when she taught, she touched the future. As a teacher, you will touch the future, because children are the future of any society. In this chapter, we explore what the field of educational psychology is all about and how it can help you contribute positively to children's futures.

1 EXPLORING EDUCATIONAL PSYCHOLOGY

Historical Background | Teaching: Art and Science

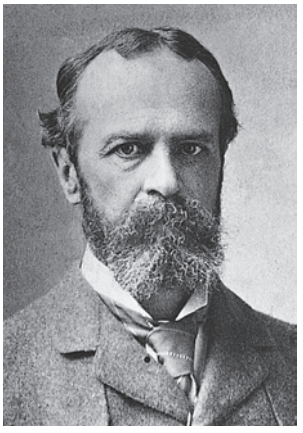
Psychology is the scientific study of behavior and mental processes. **Educational psychology** is the branch of psychology that specializes in understanding teaching and learning in educational settings. Educational psychology is a vast landscape that will take us an entire book to describe.

educational psychology The branch of psychology that specializes in understanding teaching and learning in educational settings.

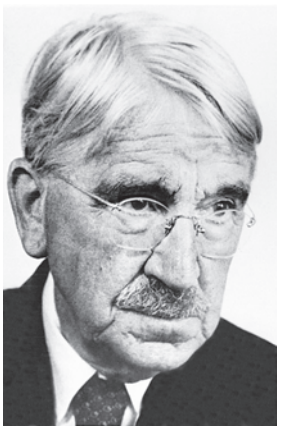
HISTORICAL BACKGROUND

The field of educational psychology was founded by several pioneers in psychology in the late nineteenth century. Three pioneers—William James, John Dewey, and E. L. Thorndike—stand out in the early history of educational psychology.

William James Soon after launching the first psychology textbook, *Principles of Psychology* (1890), William James (1842–1910) gave a series of lectures called "Talks to Teachers" (James, 1899/1993) in which he discussed the applications of psychology to educating children. James argued that laboratory psychology experiments often can't tell us how to effectively teach children. He emphasized the importance of observing teaching and learning in classrooms for improving education. One of his



William James



John Dewey

E. L. Thorndike

James, Dewey, and Thorndike created and shaped the field of educational psychology. *What were their ideas about educational psychology?*

recommendations was to start lessons at a point just beyond the child's level of knowledge and understanding to stretch the child's mind.

John Dewey A second major figure in shaping the field of educational psychology was John Dewey (1859–1952), who became a driving force in the practical application of psychology. Dewey established the first major educational psychology laboratory in the United States, at the University of Chicago in 1894. Later, at Columbia University, he continued his innovative work. We owe many important ideas to John Dewey. First, we owe to him the view of the child as an active learner. Before Dewey, it was believed that children should sit quietly in their seats and passively learn in a rote manner. In contrast, Dewey (1933) argued that children learn best by doing. Second, we owe to Dewey the idea that education should focus on the whole child and emphasize the child's adaptation to the environment. Dewey reasoned that children should not be just narrowly educated in academic topics but should learn how to think and adapt to a world outside school. He especially thought that children should learn how to be reflective problem solvers. Third, we owe to Dewey the belief that all children deserve to have a competent education. This democratic ideal was not in place at the beginning of Dewey's career in the latter part of the nineteenth century, when high-quality education was reserved for a small portion of children, especially boys from wealthy families. Dewey pushed for a competent education for all children—girls and boys, as well as children from different socioeconomic and ethnic groups.

E. L. Thorndike A third pioneer was E. L. Thorndike (1874–1949), who focused on assessment and measurement and promoted the scientific underpinnings of learning. Thorndike argued that one of schooling's most important tasks is to hone children's reasoning skills, and he excelled at doing exacting scientific studies of teaching and learning. Thorndike especially promoted the idea that educational psychology must have a scientific base and should focus strongly on measurement.

Diversity and Early Educational Psychology The most prominent figures in the early history of educational psychology, as in most disciplines, were mainly White males, such as James, Dewey, and Thorndike. Prior to changes in civil rights laws and policies in the 1960s, only a few dedicated non-White individuals obtained the necessary degrees and broke through racial exclusion barriers to take up research in the field (Koppelman & Goodhart, 2011; Spring, 2010).

DIVERSITY

Two pioneering African American psychologists, Mamie and Kenneth Clark, conducted research on African American children's self-conceptions and identity (Clark & Clark, 1939). In 1971 Kenneth Clark became the first African American president of the American Psychological Association. In 1932 Latino psychologist George Sanchez conducted research showing that intelligence tests were culturally biased against ethnic minority children.

Mamie and Kenneth Clark

George Sanchez

Leta Hollingworth

Like other disciplines, educational psychology had few ethnic minority individuals and women involved in its early history. The individuals shown here were among the few from such backgrounds to overcome barriers and contribute to the field.

Like ethnic minorities, women also faced barriers in higher education and so have only gradually become prominent contributors to psychological research. One often overlooked person in the history of educational psychology is Leta Hollingworth. She was the first individual to use the term *gifted* to describe children who scored exceptionally high on intelligence tests (Hollingworth, 1916).

The Behavioral Approach Thorndike's approach to the study of learning guided educational psychology through the first half of the twentieth century. In American psychology, B. F. Skinner's (1938) view, which built on Thorndike's ideas, strongly influenced educational psychology in the middle of the century. Skinner's behavioral approach, which is described in detail in Chapter 7, involved attempts to precisely determine the best conditions for learning. Skinner argued that the mental processes proposed by psychologists such as James and Dewey were not observable and therefore could not be appropriate subject matter for a scientific study of psychology, which he defined as the science of observable behavior and its controlling conditions. In the 1950s, Skinner (1954) developed the concept of *programmed learning,* which involved reinforcing the student's behavior after each of a series of steps until the student reached a learning goal. In an early technological effort, he created a teaching machine to serve as a tutor and reinforce students' behavior for correct answers (Skinner, 1958).

The Cognitive Revolution However, the objectives spelled out in the behavioral approach to learning did not address many of the actual goals and needs of classroom educators (Hilgard, 1996). In reaction, as early as the 1950s, Benjamin Bloom created a taxonomy of cognitive skills that included remembering, comprehending, synthesizing, and evaluating, which he suggested teachers should help students develop. The cognitive revolution in psychology began to take hold by the 1980s and ushered in a great deal of enthusiasm for applying the concepts of cognitive psychology—memory, thinking, reasoning, and so on—to helping students learn. Thus, toward the latter part of the twentieth century, many educational psychologists returned to an emphasis on the cognitive aspects of learning advocated by James and Dewey at the beginning of the century.

Both cognitive and behavioral approaches continue to be a part of educational psychology today (Anderman & Dawson, 2011; Veenman, 2011). We have much more to say about these approaches in Chapters 7 through 11.

More recently, educational psychologists have increasingly focused on the socioemotional aspects of students' lives. For example, they are analyzing the school as a social context and examining the role of culture in education (Campbell, 2010; Spring, 2010). We explore the socioemotional aspects of teaching and learning in many chapters of this book.

RESEARCH

TEACHING: ART AND SCIENCE

How scientific can teachers be in their approach to teaching? Both science and the art of skillful, experienced practice play important roles in a teacher's success. Educational psychology draws much of its knowledge from broader theory and research in psychology (Bonney & Sternberg, 2011; Danielson, 2010). For example, the theories of Jean Piaget and Lev Vygotsky were not created in an effort to inform teachers about ways to educate children, yet in Chapter 2 you will see that both of these theories have

Thinking Back/Thinking Forward

Self-efficacy plays an important role in motivation. Chapter 13, p. 450

many applications that can guide your teaching. The field also draws from theory and research more directly created and conducted by educational psychologists, and from teachers' practical experiences. For example, in Chapter 13 you will read about Dale Schunk's (2008) classroom-oriented research on *self-efficacy* (the belief that one can master a situation and produce positive outcomes). Educational psychologists also recognize that teaching sometimes must depart from scientific recipes, requiring improvisation and spontaneity (Borich, 2011; Parkay & Stanford, 2010).

As a science, educational psychology's aim is to provide you with research knowledge that you can effectively apply to teaching situations and with research skills that will enhance your understanding of what impacts student learning (Alexander & Mayer, 2011; Harris, Graham, & Urdan, 2011). But your teaching will still remain an art. In addition to what you can learn from research, you will also continually make important judgments in the classroom based on your personal skills and experiences, as well as the accumulated wisdom of other teachers (Ryan & Cooper, 2010).

First-grade teacher, Zakia Sims, guiding her students' learning at William Lloyd Elementary School in Washington, D.C. Recognized as an outstanding teacher, Zakia has a master's degree from Howard University and a coveted National Board certificate. *To what extent is her teaching success likely art, and to what extent is it likely science?*

Review, Reflect, and Practice

1 Describe some basic ideas about the field of educational psychology.

REVIEW

- How is educational psychology defined? Who were some key thinkers in the history of educational psychology, and what were their ideas?
- How would you describe the roles of art and science in the practice of teaching?

REFLECT

- John Dewey argued that children should not sit quietly in their seats and learn in a rote manner. Do you agree with Dewey? Why or why not?

PRAXIS™ PRACTICE

1. Mr. Smith believes that all children are entitled to an education and that this education should focus on the whole child. His views are most consistent with those of
   a. Benjamin Bloom.
   b. John Dewey.
   c. B. F. Skinner.
   d. E. L. Thorndike.
2. Four teachers are discussing influences on being an effective teacher. Which of their following four statements is likely to be most accurate?
   a. Applying information from scientific research is the most important factor in being an effective teacher.
   b. You can't beat a teacher's own personal experiences for becoming an effective teacher.
   c. Being an effective teacher is influenced by scientific research knowledge, teaching skills, and personal experiences.
   d. A teacher's innate skills trump all other factors in being an effective teacher.

Please see the answer key at the end of the book.

2 EFFECTIVE TEACHING

Professional Knowledge and Skills | Commitment, Motivation, and Caring

Because of the complexity of teaching and individual variation among students, effective teaching is not "one size fits all." Teachers must master a variety of perspectives and strategies and be flexible in their application. Success requires the following key ingredients: (1) professional knowledge and skills, and (2) commitment, motivation, and caring.

PROFESSIONAL KNOWLEDGE AND SKILLS

Effective teachers have good command of their subject matter and a solid core of teaching skills. They know how to use instructional strategies supported by methods of goal setting, instructional planning, and classroom management. In addition, they understand how to motivate students and how to communicate and work effectively with those of varying skill levels and culturally diverse backgrounds. Effective teachers also employ appropriate levels of technology in the classroom.

Subject-Matter Competence In their wish lists of teacher characteristics, secondary school students increasingly have mentioned "teacher knowledge of their subjects" (NAASP, 1997). Having a thoughtful, flexible, conceptual understanding of subject matter is indispensable for being an effective teacher. Of course, knowledge of subject matter includes more than just facts, terms, and general concepts. It also includes knowledge about organizing ideas, connections among ideas, ways of thinking and arguing, patterns of change within a discipline, beliefs about a discipline, and the ability to carry ideas from one discipline to another. Clearly, having a deep understanding of the subject matter is an important aspect of being a competent teacher (Abruscato & DeRosa, 2010; Eby, Herrell, & Jordan, 2011).

Instructional Strategies At a broad level, two major approaches characterize how teachers teach: constructivist and direct instruction. The constructivist approach was at the center of William James' and John Dewey's philosophies of education. The direct instruction approach has more in common with E. L. Thorndike's view.

The **constructivist approach** is a learner-centered approach that emphasizes the importance of individuals actively constructing their knowledge and understanding with guidance from the teacher. In the constructivist view, teachers should not attempt to simply pour information into children's minds. Rather, children should be encouraged to explore their world, discover knowledge, reflect, and think critically with careful monitoring and meaningful guidance from the teacher (Bonney & Sternberg, 2011; Lawson, 2010). Constructivists argue that for too long children have been required to sit still, be passive learners, and rotely memorize irrelevant as well as relevant information (Gredler, 2009).

Today constructivism may include an emphasis on *collaboration*—children working with each other in their efforts to know and understand (Slavin, 2011; Wentzel & Watkins, 2011). A teacher with a constructivist instructional philosophy would not have children memorize information rotely but would give them opportunities to meaningfully construct knowledge and understand the material while guiding their learning (Johnson, 2010).

By contrast, the **direct instruction approach** is a structured, teacher-centered approach characterized by teacher direction and control, high teacher expectations for students' progress, maximum time spent by students on academic tasks, and efforts by the teacher to keep negative affect to a minimum. An important goal in the direct instruction approach is maximizing student learning time (Estes, Mintz, & Gunter, 2011).

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Some experts in educational psychology emphasize that many effective teachers use both a constructivist *and* a direct instruction approach rather than either exclusively (Darling-Hammond & Bransford, 2005). Further, some circumstances may call more for a constructivist approach, others for a direct instruction approach. For example, experts increasingly recommend an explicit, intellectually engaging direct instruction approach when teaching students with a reading or a writing disability (Berninger, 2006). Whether you teach more from a constructivist approach or more from a direct instruction approach, you can be an effective teacher.

What characterizes constructivist and direct instruction approaches to educating students?

Thinking Skills Effective teachers model and communicate good thinking skills, especially **critical thinking,** which involves thinking reflectively and productively and evaluating the evidence. Getting students to think critically is not easy; many students develop a habit of passively learning material and rotely memorizing concepts rather than thinking deeply and reflectively (Bonney & Sternberg, 2011). Thinking critically also means being open-minded and curious on the one hand, yet being careful to avoid key mistakes in interpretation on the other.

Throughout this book we will encourage you to think critically about topics and issues. At the end of each main section in a chapter, you will be asked "Reflect" questions related to the topic about which you have just read. In Chapter 9 you will read more extensively about critical thinking and other higher-level cognitive processes such as reasoning, decision making, and creative thinking, and you will learn how to encourage critical thinking in your students by building it into your lessons.

Goal Setting and Instructional Planning Whether constructivist or more traditional, effective teachers don't just "wing it" in the classroom. They set high goals for their teaching and organize plans for reaching those goals (Anderman & Dawson, 2011). They also develop specific criteria for success. They spend considerable time in instructional planning, organizing their lessons to maximize students' learning (Burden & Byrd, 2010). As they plan, effective teachers reflect and think about how they can make learning both challenging and interesting. Good planning requires consideration of the kinds of information, demonstrations, models, inquiry opportunities, discussion, and practice students need over time to understand particular concepts and develop particular skills. Although research has found that all of these features can support learning, the process of instructional design requires that teachers figure out which things students should do when, in what order, and how. (Darling-Hammond & others, 2005). Chapter 12 addresses planning in detail.

Thinking Back/Thinking Forward

In planning, teachers need to figure out which things students should do, when, in what order, and how. Chapter 12, p. 399

Developmentally Appropriate Teaching Practices Competent teachers have a good understanding of children's development and know how to create instruction materials appropriate for their developmental levels (Bredekamp, 2011; NAEYC, 2009). U.S. schools are organized by grade and to some degree by age, but these are not always good predictors of children's development.

At any grade level there is usually a two- or three-year span of ages with an even wider span of skills, abilities, and developmental stages. Understanding developmental

DEVELOPMENT

critical thinking Thinking reflectively and productively and evaluating the evidence.

"My mom told me to tell you that I am the educational challenge you were told about in college."

Reprinted by permission of Heiser Zedonek.

Thinking Back/Thinking Forward

The best teachers have very few discipline problems, not because they are great disciplinarians, but because they are great teachers. Chapter 14, p. 490

pathways and progressions is extremely important for teaching in ways that are optimal for each child (Follari, 2011; Marion, 2010).

Throughout this text, we call attention to developmental aspects of educating children and provide examples of teaching and learning that take into account a child's developmental level. Chapters 2 and 3 are devoted exclusively to development.

Classroom Management Skills An important aspect of being an effective teacher is keeping the class as a whole working together and oriented toward classroom tasks. Effective teachers establish and maintain an environment in which learning can occur (Jones & Jones, 2010; Mertler & Charles, 2011). To create this optimal learning environment, teachers need a repertoire of strategies for establishing rules and procedures, organizing groups, monitoring and pacing classroom activities, and handling misbehavior (ASCD, 2009).

Motivational Skills Effective teachers have good strategies for helping students become self-motivated and take responsibility for their learning (Anderman & Dawson, 2011). Educational psychologists increasingly stress that this is best accomplished by providing real-world learning opportunities of optimal difficulty and novelty for each student. Students are motivated when they can make choices in line with their personal interests. Effective teachers give them the opportunity to think creatively and deeply about projects.

In addition to guiding students to become self-motivated learners, teachers need to establish high expectations for students' achievement (Eccles & Roeser, 2009). Too often children are rewarded for inferior or mediocre performance with the result that they do not reach their full potential. When high expectations are created, however, a key aspect of education is to provide children—especially low-achieving children—with effective instruction and support to meet these expectations. Chapter 13 covers the topic of motivation in detail.

Communication Skills Also indispensable to teaching are skills in speaking, listening, overcoming barriers to verbal communication, tuning in to students' nonverbal communication, and constructively resolving conflicts (Hybels & Weaver, 2009). Communication skills are critical not only in teaching but also in interacting with parents (Weiss & others, 2010). Effective teachers use good communication skills when they talk "with" rather than "to" students, parents, administrators, and others; keep criticism at a minimum; and have an assertive rather than aggressive, manipulative, or passive communication style (Stewart, 2009). Effective teachers work to improve students' communication skills as well. Student communication skills are especially important because they have been rated as the skills most sought after by today's employers.

Paying More Than Lip Service to Individual Variations Virtually every teacher knows that it is important to take individual variations into account when teaching, but this is not always easy to do. Your students will have varying levels of intelligence, use different thinking and learning styles, and have different temperaments and personality traits (Martinez, 2010). You also are likely to have some students who are gifted and others with disabilities of various types (Darragh, 2010; Friend, 2011).

Amber Larkin, helping fifth-grade student Miya Kpa improve his academic skills. *What are some strategies for paying more than lip service to individual variation in students?*

Consider Amber Larkin's challenges and experiences as a beginning teacher (Wong Briggs, 2007). Her classroom was a trailer, and her students included children who were homeless, non–English speaking, had disabilities, or were refugees who had never worn shoes or experienced any type of formal education. After four years of teaching, she was named one of *USA Today*'s 2007 National All-Star Teachers. Almost all of her students pass state-mandated No Child Left Behind (NCLB) tests, but she is just as pleased about her students' socioemotional growth. Her principal described her in the following manner: "There's an unspoken aura that great things are going to happen, and that's how she goes about her day" (Wong Briggs, 2007, p. 6D).

Effectively teaching a class of students with such diverse characteristics requires much thought and effort (Rosenberg, Westling, & McLesky, 2011). **Differentiated instruction** addresses this challenge by recognizing individual variations in students' knowledge, readiness, interests, and other characteristics, then taking these differences into account in planning curriculum and engaging in instruction (Tomlinson, 2006). Thus, differentiated instruction aims to tailor assignments to meet students' needs and abilities. It is unlikely that a teacher can generate 20 to 30 different lesson plans to address the needs of each student in a classroom. However, differentiated instruction advocates discovering "zones" or "ball parks" in which students in a classroom cluster, thus providing three or four types/levels of instruction rather than 20 to 30. In Chapters 4 and 6 we provide strategies to help you guide students with different levels of skills and different characteristics to learn effectively.

Working Effectively with Students from Culturally Diverse Backgrounds

DIVERSITY

Today one of every five children in the United States is from an immigrant family, and by 2040 one of every three U.S. children is projected to fit this description. Nearly 80 percent of the new immigrants are people of color from Latin America, Asia, and the Caribbean. Approximately 75 percent of the new immigrants are of Spanish-speaking origin, although children speaking more than 100 different languages are entering U.S. schools.

In this world of increasing intercultural contact, effective teachers must be knowledgeable about people from different cultural backgrounds and sensitive to their needs (Bennett, 2011; Shiraev & Levy, 2010). They should encourage students to have positive personal contact with other students of diverse backgrounds and think of ways to create settings in which such interaction can occur. Effective teachers will guide students in thinking critically about cultural and ethnic issues while taking actions to forestall or reduce student bias and cultivate acceptance. They need to serve as cultural mediators among students as well as, when necessary, between the culture of the school and the culture of the student, especially those who are unsuccessful academically (Darragh, 2010).

What are some strategies effective teachers use regarding diversity issues?

Here are cultural questions for teachers to ask themselves (Pang, 2005):

- Do I recognize the power and complexity of cultural influences on students?
- Are my expectations for my students culturally based or biased?
- Am I doing a good job of seeing life from the perspective of my students who come from different cultures than mine?
- Am I teaching the skills students may need to talk in class if their culture is one in which they have little opportunity to practice "public" talking?

Thinking Back/Thinking Forward

Teachers can follow a number of guidelines for effective multicultural teaching. Chapter 5, p. 162

Assessment Knowledge and Skills Competent teachers also have good assessment knowledge and skills. There are many aspects to effectively using assessment in the classroom (Drummond & Jones, 2010; Popham, 2011). You will need to decide what types of assessments you want to use to document your students' performance after instruction. You also will need to use assessment effectively before and during instruction (Green & Johnson, 2010; Nitko & Brookhart, 2011). For example, before teaching a unit on plate tectonics, you might decide to assess whether your students are familiar with terms like *continent, earthquake,* and *volcano*.

differentiated instruction Involves recognizing individual variations in students' knowledge, readiness, interests, and other characteristics, and taking these differences into account when planning curriculum and engaging in instruction.

Thinking Back/Thinking Forward

An important aspect of assessment is to make it compatible with contemporary views of learning and motivation. Chapter 16, p. 551

During instruction, you might want to use ongoing observation and monitoring to determine whether your instruction is at a level that challenges students and to detect which students need your individual attention (Cizek, 2010; McMillan, 2010). You will need to grade students to provide feedback about their achievement.

Other aspects of assessment involve state-mandated tests to assess students' achievement and teachers' knowledge and skills. The federal government's No Child Left Behind (NCLB) legislation requires states to test students annually in mathematics, English/language arts, and science, and holds states accountable for the success and failure of their students (Webb, Metha, & Jordan, 2010).

Because of NCLB, the extent to which instruction should be tied to standards, or what is called *standards-based instruction,* has become a major issue in educational psychology and U.S. classrooms (Yell & Drasgow, 2009). This issue is all about standards of excellence and what it takes to get students to pass external, large-scale tests. Many educational psychologists stress that the challenge is to teach creatively within the structure imposed by NCLB (McMillan, 2007). Much more information about NCLB is provided in Chapter 15.

Before you become a teacher, your subject-matter knowledge and teaching skills are also likely to be assessed by the state in which you plan to teach. A large majority of states now use the PRAXIS™ test to determine whether prospective teachers are qualified to teach (Shorall, 2009). Because of the increasing use of the PRAXIS™ test, this text includes a number of resources to help you prepare for it.

TECHNOLOGY

Thinking Back/Thinking Forward

Sample ISTE's Profiles for Being a Technology-Literate Student in Prekindergarten–Grade 2, Grades 3–5, Grades 6–8, and Grades 9–12. Chapter 12, p. 423

Technological Skills Technology itself does not necessarily improve students' ability to learn, but it can support learning (Lever-Duffy & McDonald, 2011; Maloy & others, 2011). Conditions that support the effective use of technology in education include vision and support from educational leaders; teachers skilled in using technology for learning; content standards and curriculum resources; assessment of effectiveness of technology for learning; and an emphasis on the child as an active, constructive learner (International Society for Technology in Education, [ISTE], 2007).

There is a profound gap between the technology knowledge and skills most students learn in school and those they need in the twenty-first-century workplace (Partnership for 21st Century Skills, 2008). Students will benefit from teachers who increase their technology knowledge and skills, and integrate computers appropriately into classroom learning (Newby & others, 2011; Roblyer & Doering, 2010). This integration should match up with students' learning needs, including the need to prepare for tomorrow's jobs, many of which will require technological expertise and computer-based skills. In addition, effective teachers are knowledgeable about various assistive devices to support the learning of students with disabilities (Turnbull, Turnbull, & Wehmeyer, 2010).

What are some important aspects of incorporating technology in the classroom?

COMMITMENT, MOTIVATION, AND CARING

Being an effective teacher requires commitment, motivation, and caring, qualities that include having a good attitude.

Beginning teachers often report that the investment of time and effort needed

to be an effective teacher is huge. Some teachers, even experienced ones, say they have "no life" from September to June. Even putting in hours on evenings and weekends, in addition to all of the hours spent in the classroom, might still not be enough to get things done.

In the face of these demands, it is easy to become frustrated or to get into a rut and develop a negative attitude. Commitment and motivation help get effective teachers through the tough moments of teaching. Effective teachers have confidence in their own self-efficacy, don't let negative emotions diminish their motivation, and bring a positive attitude and enthusiasm to the classroom (Meece & Eccles, 2010). These qualities are contagious and help make the classroom a place where students want to be.

So, what is likely to nurture your own positive attitudes and continued enthusiasm for teaching? As in all fields, success breeds success. It's important to become aware of times when you've made a difference in an individual student's life. Consider the words of Carlos Diaz (1997), a professor of education at Florida Atlantic University, about Mrs. Oppel, his high school English teacher:

> To this day, whenever I see certain words *(dearth, slake)* I recognize them fondly as some of Mrs. Oppel's vocabulary words. As a teacher, she was very calm and focused. She also was passionate about the power of language and the beauty of literature. I credit her, at least partially, for my determination to try to master the English language and become a professor and writer. I wish I could bottle these characteristics and implant them in all of my students.

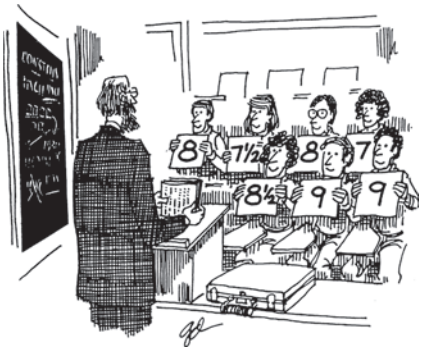
The better teacher you become, the more rewarding your work will be. And the more respect and success you achieve in the eyes of your students, the better you will feel about your commitment to teaching. With that in mind, stop for a moment and think about the images you have of your own former teachers. Some of your teachers likely were outstanding and left you with a very positive image. In a national survey of almost 1,000 students 13 to 17 years of age, having a good sense of humor, making the class interesting, and having knowledge of the subject matter were the characteristics students listed as the most important for teachers to have (NAASP, 1997). Characteristics secondary school students most frequently attributed to their worst teachers were having a boring class, not explaining things clearly, and showing favoritism. These characteristics and others that reflect students' images of their best and worst teachers are shown in Figure 1.1.

THROUGH THE EYES OF STUDENTS

"You Are the Coolest"

I just want to thank you for all the extra time you took to help me. You didn't have to do that but you did and I want to thank you for it. Thanks also for being straight up with me and not beating around the bush and for that you are the coolest. I'm sorry for the hard times I gave you. You take so much junk but through all that you stay calm and you are a great teacher.

Jessica
Seventh-Grade Student
Macon, Georgia
Letter to Chuck Rawls, Her Teacher, at the End of the School Year



Characteristics of best teachers	% Total	Characteristics of worst teachers	% Total
1. Have a sense of humor	79.2	1. Are dull/have a boring class	79.6
2. Make the class interesting	73.7	2. Don't explain things clearly	63.2
3. Have knowledge of their subjects	70.1	3. Show favoritism toward students	52.7
4. Explain things clearly	66.2	4. Have a poor attitude	49.8
5. Spend time to help students	65.8	5. Expect too much from students	49.1
6. Are fair to their students	61.8	6. Don't relate to students	46.2
7. Treat students like adults	54.4	7. Give too much homework	44.2
8. Relate well to students	54.2	8. Are too strict	40.6
9. Are considerate of students' feelings	51.9	9. Don't give help/individual attention	40.5
10. Don't show favoritism toward students	46.6	10. Lack control	39.9

FIGURE **1.1** STUDENTS' IMAGES OF THEIR BEST AND WORST TEACHERS

SELF-ASSESSMENT 1.1

The Best and Worst Characteristics of My Teachers

When you studied Figure 1.1, were you surprised by any of the characteristics listed by students to describe their best and worst teachers? Which of the top five characteristics students listed for the best teachers surprised you the most? Which of the top five characteristics of the worst teachers surprised you the most?

Now think about the top five characteristics of the best and the worst teachers you have had. In generating your lists, don't be constrained by the characteristics described in Figure 1.1. Also, after you have listed each characteristic, write down one or more examples of situations that reflected the characteristic.

FIVE CHARACTERISTICS OF THE BEST TEACHERS I HAVE HAD

Characteristics	Examples of Situations That Reflected the Characteristic
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

FIVE CHARACTERISTICS OF THE WORST TEACHERS I HAVE HAD

Characteristics	Examples of Situations That Reflected the Characteristic
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

THROUGH THE EYES OF STUDENTS

A Good Teacher

Mike, Grade 2:

A good teacher is a teacher that does stuff that catches your interest. Sometimes you start learning and you don't even realize it. A good teacher is a teacher that does stuff that makes you think. (Nikola-Lisa & Burnaford, 1994).

Think about the roles that a good sense of humor and your own genuine enthusiasm are likely to play in your long-term commitment as a teacher. Also, notice other characteristics in Figure 1.1 that relate to the caring nature of outstanding teachers. Effective teachers care for their students, often referring to them as "my students." They really want to be with the students and are dedicated to helping them learn. At the same time, they keep their role as a teacher distinct from student roles. Beyond their own caring, effective teachers also look for ways to help their students consider others' feelings and care about each other.

To think about the best and worst characteristics of the teachers you have had, complete Self-Assessment 1.1. Use the self-assessment to further explore the attitudes behind your commitment to become a teacher.

TEACHING CONNECTIONS: Best Practices

Strategies for Becoming an Effective Teacher

1. *Effective teaching requires teachers to wear many different hats.* It's easy to fall into the trap of thinking that if you have good subject-matter knowledge, excellent teaching will follow, but being an effective teacher requires many diverse skills. In Through the Eyes of Teachers, you can read about how Susan Bradburn, who teaches fourth and sixth grades at West Marian Elementary School in North Carolina, brings many dif-ferent skills to create effective lessons.

THROUGH THE EYES OF TEACHERS

The "Turtle Lady"

Susan Bradburn teaches grades 4 to 6 at West Marian Elementary School in North Carolina. She created a school museum in which students conduct research and create exhibitions. She has put her school-museum concept "on wheels" by having students take carts to other classes and into the community, and she has used award money to spread the use of mobile museums to other North Carolina schools. Nicknamed "the turtle lady" because of her interest in turtles and other animals, Susan takes students on three-day field trips to Edisto Island, South Carolina, to search for fossils and study coastal ecology. Her students sell calendars that contain their original poetry and art, and they use the proceeds to buy portions of a rain forest so it won't be destroyed.

Susan Bradburn *(left)* with several students at West Marian Elementary School.

2. *Engage in perspective taking.* You want to be the very best teacher you can possibly be. Think about what your students need from you to improve their academic and life skills. Also reflect on how you perceive your students and how they perceive you.
3. *Keep the list of characteristics of effective teachers we have discussed in this chapter with you throughout your teaching career.* Looking at the list and thinking about the different areas of effective teaching can benefit you as you go through your student teaching, your days as a beginning teacher, and even your years as an experienced teacher. By consulting this list from time to time, you might realize that you have let one or two areas slip and need to spend time improving yourself.
4. *Stay Committed and Motivated.* Being an effective teacher requires being committed and motivated even in the face of difficult and adverse circumstances. Work through your frustrations and develop good coping skills to face the tough times that come in any career. Remember that a positive attitude and a deep commitment to caring for children are key aspects of becoming a successful teacher.

Review, Reflect, and Practice

2 Identify the attitudes and skills of an effective teacher.

REVIEW

- What professional knowledge and skills are required to be an effective teacher?
- Why is it important for teachers to be committed and motivated?

REFLECT

- What is most likely to make teaching rewarding for you in the long run?

PRAXIS™ PRACTICE

1. Suzanne spends a considerable amount of time writing lesson plans, developing criteria for student success, and organizing materials. Which professional skill is she demonstrating?
   a. classroom management
   b. communication

(continued)

Review, Reflect, and Practice

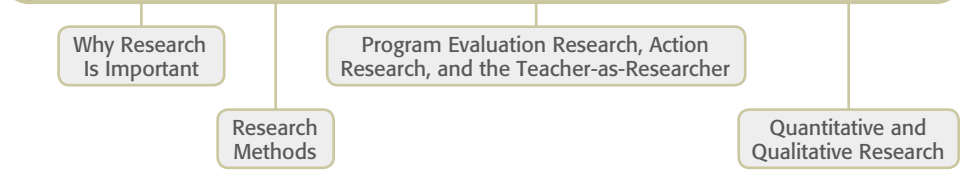
PRAXIS™ PRACTICE (CONTINUED)

c. developmentally appropriate teaching practices
d. goal setting and instructional management

2. Mr. Marcinello, who is midway through his first year of teaching, feels frustrated with his job. He is developing a negative attitude, and it is carrying over in his teaching. Which of the following areas does Mr. Marcinello need to work on the most at this point to become an effective teacher?
   a. classroom management and communication
   b. commitment and motivation
   c. technology and diversity
   d. subject-matter competence and individual variations

Please see the answer key at the end of the book.

3 RESEARCH IN EDUCATIONAL PSYCHOLOGY



Research can be a valuable source of information about teaching. We will explore why research is important and how it is done, including how you can be a teacher-researcher.


RESEARCH

WHY RESEARCH IS IMPORTANT

It sometimes is said that experience is the best teacher. Your own experiences and experiences that other teachers, administrators, and experts share with you will make you a better teacher. However, by providing you with valid information about the best ways to teach children, research also can make you a better teacher (McMillan & Schumacher, 2010).

We all get a great deal of knowledge from personal experience. We generalize from what we observe and frequently turn memorable encounters into lifetime "truths." But how valid are these conclusions? Sometimes we err in making these personal observations, misinterpreting what we see and hear. Chances are, you can think of many situations in which you thought other people read you the wrong way, just as they might have felt that you misread them. When we base information only on personal experiences, we also aren't always totally objective because we sometimes make judgments that protect our ego and self-esteem (McMillan & Wergin, 2010).

We get information not only from personal experiences but also from authorities or experts. In your teaching career, you will hear many authorities and experts spell out a "best way" to educate students. The authorities and experts, however, don't always agree, do they? You might hear one expert one week tell you about a reading method that is absolutely the best, yet the next week hear another expert tout a different method. One experienced teacher might tell you to do one thing with your students, while another experienced teacher tells you to do the opposite. How can

you tell which one to believe? One way to clarify the situation is to look closely at research on the topic.

RESEARCH METHODS

Collecting information (or data) is an important aspect of research. When educational psychology researchers want to find out, for example, whether regularly playing video games detracts from student learning, eating a nutritious breakfast improves alertness in class, or getting more recess time decreases absenteeism, they can choose from many methods of gathering research information (Plano Clark & Creswell, 2010).

The three basic methods used to gather information in educational psychology are descriptive, correlational, and experimental.

Descriptive Research Descriptive research has the purpose of observing and recording behavior. For example, an educational psychologist might observe the extent to which children are aggressive in a classroom or interview teachers about their attitudes toward a particular type of teaching strategy. By itself, descriptive research cannot prove what causes some phenomenon, but it can reveal important information about people's behavior and attitudes (Stake, 2010).

Observation We look at things all the time. Casually watching two students interacting, however, is not the same as the type of observation used in scientific studies. Scientific observation is highly systematic. It requires knowing what you are looking for, conducting observations in an unbiased manner, accurately recording and categorizing what you see, and effectively communicating your observations (Langston, 2011; McBurney & White, 2010).

A common way to record observations is to write them down, often using shorthand or symbols. In addition, tape recorders, video cameras, special coding sheets, one-way mirrors, and computers increasingly are being used to make observation more accurate, reliable, and efficient.

Observations can be made in laboratories or in naturalistic settings (Babbie, 2011). A **laboratory** is a controlled setting from which many of the complex factors of the real world have been removed (Graziano & Raulin, 2010). Some educational psychologists conduct research in laboratories at the colleges or universities where they work and teach. Although laboratories often help researchers gain more control in their studies, they have been criticized as being artificial.

In **naturalistic observation,** behavior is observed out in the real world. Educational psychologists conduct naturalistic observations of children in classrooms, at museums, on playgrounds, in homes, in neighborhoods, and in other settings. Naturalistic observation was used in one study that focused on conversations in a children's science museum (Crowley & others, 2001). Parents were three times as likely to engage boys as girls in explanatory talk while visiting different exhibits at the science museum (see Figure 1.2). In another study, Mexican American parents who had completed high school used more explanations with their children as they were observed at a science museum than Mexican American parents who had not completed high school (Tennebaum & others, 2002).

Participant observation occurs when the observer-researcher is actively involved as a participant in the activity or setting (McMillan & Wergin, 2010). The participant observer will often participate in a context and observe awhile, then take notes on what she or he has viewed. The observer usually makes these observations and writes down notes over a period of days, weeks, or months and looks for patterns in the observations. For example, to study a student who is doing poorly in the class without apparent reason, the teacher might develop a plan to observe the student from time to time and record observations of the student's behavior and what is going on in the classroom at the time.

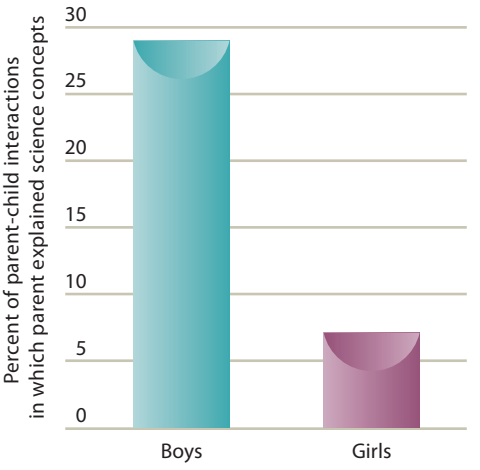


FIGURE 1.2 PARENTS' EXPLANATIONS OF SCIENCE TO SONS AND DAUGHTERS AT SCIENCE MUSEUM

In a naturalistic observation study at a children's science museum, parents were three times more likely to explain science to boys than girls (Crowley & others, 2001). The gender difference occurred regardless of whether the father, the mother, or both parents were with the child, although the gender difference was greatest for fathers' science explanations to sons and daughters.

laboratory A controlled setting from which many of the complex factors of the real world have been removed.

naturalistic observation Observation in the real world rather than a laboratory.

participant observation Observation conducted at the same time the teacher-researcher is actively involved as a participant in the activity or setting.

Following are strategies recommended by teachers at different grade levels regarding how they use participant observation in their classroom:

EARLY CHILDHOOD We take notes, observe, and record the activities of our young children throughout the day. Taking notes on children at the preschool level can be challenging because when children first notice that you are intently watching and taking notes, they may become curious and ask many questions, or become overly anxious and say things like, "Look at me!" to the teacher. As the year goes by, however, children get used to the recordings, and the questions are less frequent, allowing for a more accurate assessment of a child's needs.

—**Valarie Gorham,** *Kiddie Quarters, Inc.*

ELEMENTARY SCHOOL: GRADES K–5 I meet with leveled reading groups, typically ranging from three to five students. Materials and texts that are at the group's instructional level are used. As the lesson and activities are carried out, I take quick notes as I see the group or individuals grasping concepts, struggling in any way, or if a "teachable moment" presents itself. These notes help me later in my planning to make decisions about whether to reteach a certain lesson/concept, move on to new concepts/materials, or go to something other than originally planned because of a teachable moment or connection that has been discovered.

—**Susan Froelich,** *Clinton Elementary School*

MIDDLE SCHOOL: GRADES 6–8 I once had a student who often came to class unprepared and late. Over time, I observed the student, took notes, and created a chart for myself that listed the times the student did not come to class prepared or on time. Because I kept good records, I was able to find out that when the student had a physical education class just before my class, he was late. I then worked with the student and phys. ed. teacher to come up with a solution so that the student had time to get to my class with the necessary classroom materials.

—**Casey Maass,** *Edison Middle School*

HIGH SCHOOL: GRADES 9–12 In the lab portion of my class, I have a chart that identifies when students are off-task and a notation for what they are doing instead of the task, such as listening to an iPod, talking to their friends, and so on. After a pattern develops, I talk with the student and show them their pattern on the chart. High school students tend to understand graphs and data better than being reminded while they are being off-task. For me, charting provides a more positive environment than an interruption or reprimand.

—**Sandy Swanson,** *Menomonee Falls High School*

Interviews and Questionnaires Sometimes the quickest and best way to get information about students and teachers is to ask them for it. Educational psychologists use interviews and questionnaires (surveys) to find out about children's and teachers' experiences, beliefs, and feelings. Most interviews take place face-to-face, although they can be done in other ways, such as over the phone or the Internet. Questionnaires usually are given to individuals in written form. They, too, can be transmitted in many ways, such as directly by hand, by mail, or via the Internet.

Good interviews and surveys involve concrete, specific, and unambiguous questions and some means of checking the authenticity of the respondents' replies. Interviews and surveys, however, are not without problems. One crucial limitation is that many individuals give socially desirable answers, responding in a way they think

is most socially acceptable and desirable rather than how they truly think or feel. Skilled interviewing techniques and questions that increase forthright responses are crucial to obtaining accurate information (Babbie, 2011). Another problem with interviews and surveys is that the respondents sometimes simply are untruthful.

Standardized Tests In **standardized tests,** uniform procedures are used for administration and scoring. They assess students' aptitudes or skills in different domains. Many standardized tests allow a student's performance to be compared with the performance of other students at the same age or grade level, in many cases on a national basis (Drummond & Jones, 2010). Students might take a number of standardized tests, including tests that assess their intelligence, achievement, personality, career interests, and other skills (Bart & Peterson, 2008). These tests can provide outcome measures for research studies, information that helps psychologists and educators make decisions about an individual student, and comparisons of students' performance across schools, states, and countries.

Standardized tests also play an important role in a major contemporary educational psychology issue—*accountability,* which involves holding teachers and students responsible for student performance. As we indicated earlier, both students and teachers increasingly are being given standardized tests in the accountability effort. The U.S. Government's NCLB Act is at the centerpiece of accountability; it mandated that in 2005 every state had to give standardized tests to students in grades 3 through 8 in language arts and math, with testing for science achievement added in 2007.

Brandi Binder is evidence of the brain's hemispheric flexibility and resilience. Despite having the right side of her cortex removed because of a severe case of epilepsy, Brandi at the age of 17 engaged in many activities often portrayed as only "right-brain" activities. She loved music and art and is shown here working on one of her paintings.

Case Studies A **case study** is an in-depth look at an individual. Case studies often are used when unique circumstances in a person's life cannot be duplicated, for either practical or ethical reasons. For example, consider the case study of Brandi Binder (Nash, 1997). She developed such severe epilepsy that surgeons had to remove the right side of her brain's cerebral cortex when she was 6 years old. Brandi lost virtually all control over muscles on the left side of her body, the side controlled by the right side of her brain. At age 17, however, after years of therapy ranging from leg lifts to mathematics and music training, Brandi was an A student. Interestingly, she loved music and art, which usually are associated with the right side of the brain, the site of her surgery. Her recuperation was not 100 percent—for example, she did not regain the use of her left arm—but her case study shows that if there is a way to compensate, the human brain will find it. Brandi's remarkable recovery also provides evidence against the stereotype that the left side (hemisphere) of the brain is solely the source of logical thinking and the right hemisphere exclusively the source of creativity. Brains are not that neatly split in terms of most functioning, as Brandi's case illustrates.

Although case studies provide dramatic, in-depth portrayals of people's lives, we need to exercise caution when interpreting them (Leary, 2008). The subject of a case study is unique, with a genetic makeup and set of experiences that no one else shares. For these reasons, the findings do not always lend themselves to statistical analysis and may not generalize to other people.

Ethnographic Studies An **ethnographic study** consists of in-depth description and interpretation of behavior in an ethnic or a cultural group that includes direct involvement with the participants (Plano Clark & Creswell, 2010). This type of study might include observations in naturalistic settings as well as interviews. Many ethnographic studies are long-term projects.

In one ethnographic study, the purpose was to examine the extent to which schools were enacting educational reforms for language minority students (U.S. Office of Education, 1998). In-depth observations and interviews were conducted in a number of schools to determine if they were establishing high standards and restructuring the way education was being delivered. Several schools were selected for intensive evaluation, including Las Palmas Elementary School in San Clemente,

standardized tests Tests with uniform procedures for administration and scoring. They assess students' performance in different domains and allow a student's performance to be compared with the performance of other students at the same age or grade level on a national basis.

case study An in-depth look at an individual.

ethnographic study In-depth description and interpretation of behavior in an ethnic or a cultural group that includes direct involvement with the participants.

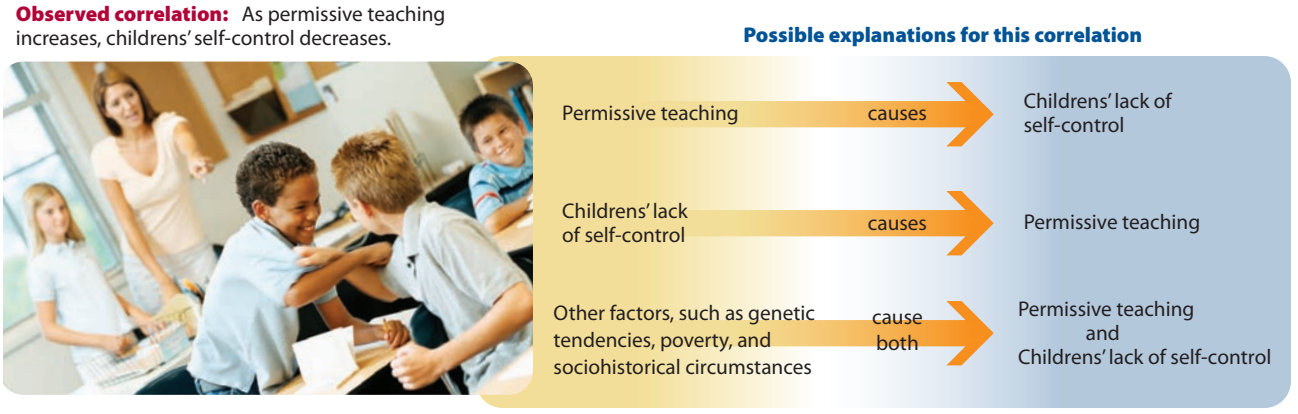


FIGURE 1.3 POSSIBLE EXPLANATIONS FOR CORRELATIONAL DATA

An observed correlation between two events cannot be used to conclude that one event caused the other. Some possibilities are that the second event caused the first event or that a third, unknown event caused the correlation between the first two events.

California. The study concluded that this school, at least, was making the necessary reforms for improving the education of language minority students.

Focus Groups In *focus groups* people are interviewed in a group setting, usually to obtain information about a particular topic or issue (Given, 2008). These groups typically consist of five to nine people in which a group facilitator asks a series of open-ended questions. Focus groups can be used to assess the value of a product, service, or program, such as a newly developed school Web site or the benefits of a recently instituted after-school program for middle school students.

Personal Journals and Diaries Individuals may be asked to keep personal journals or diaries to document quantitative aspects of their activities (such as how frequently the individual uses the Internet) or qualitative aspects of their lives (such as their attitudes and beliefs about a particular topic or issue) (Given, 2008). Increasingly, researchers are providing digital audio or video recorders to participants in a study rather than have them write entries in a personal journal or diary.

Correlational Research

In **correlational research,** the goal is to describe the strength of the relation between two or more events or characteristics. Correlational research is useful because the more strongly two events are correlated (related or associated), the more effectively we can predict one from the other (Howell, 2010; Levin & Fox, 2011). For example, if researchers find that low-involved, permissive teaching is correlated with a student's lack of self-control, it suggests that low-involved, permissive teaching might be one source of the lack of self-control.

Correlation by itself, however, does not equal causation (Caldwell, 2010). The correlational finding just mentioned does not mean that permissive teaching necessarily causes low student self-control. It could mean that, but it also could mean that the student's lack of self-control caused the teachers to throw up their arms in despair and give up trying to control the out-of-control class. It also could be that other factors, such as heredity, poverty, or inadequate parenting, caused the correlation between permissive teaching and low student self-control. Figure 1.3 illustrates these possible interpretations of correlational data.

correlational research Research that describes the strength of the relation between two or more events or characteristics.

experimental research Research that allows the determination of the causes of behavior; involves conducting an experiment, which is a carefully regulated procedure in which one or more of the factors believed to influence the behavior being studied is manipulated and all others are held constant.

Experimental Research

Experimental research allows educational psychologists to determine the causes of behavior. Educational psychologists accomplish this

task by performing an *experiment,* a carefully regulated procedure in which one or more of the factors believed to influence the behavior being studied is manipulated and all other factors are held constant. If the behavior under study changes when a factor is manipulated, we say that the manipulated factor causes the behavior to change. *Cause* is the event that is being manipulated. *Effect* is the behavior that changes because of the manipulation. Experimental research is the only truly reliable method of establishing cause and effect (Jackson, 2011). Because correlational research does not involve manipulation of factors, it is not a dependable way to isolate cause (Mitchell & Jolley, 2010).

Experiments involve at least one independent variable and one dependent variable. The **independent variable** is the manipulated, influential, experimental factor. The label *independent* indicates that this variable can be changed independently of any other factors. For example, suppose we want to design an experiment to study the effects of peer tutoring on student achievement. In this example, the amount and type of peer tutoring could be an independent variable.

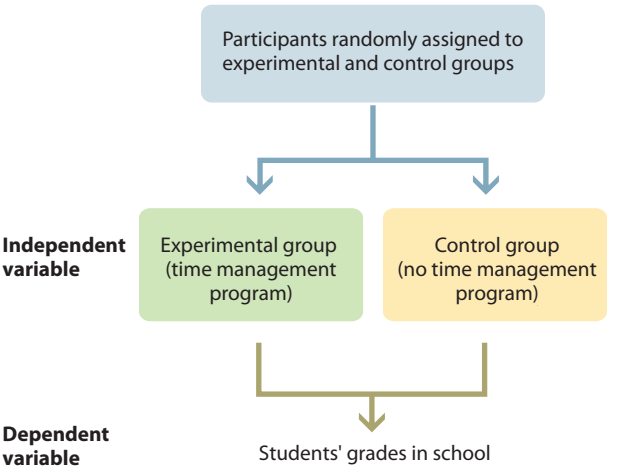


FIGURE 1.4 EXPERIMENTAL RESEARCH STRATEGY APPLIED TO STUDY OF EFFECTS OF TIME MANAGEMENT ON STUDENTS' GRADES

The **dependent variable** is the factor that is measured in an experiment. It can change as the independent variable is manipulated. The label *dependent* is used because the values of this variable depend on what happens to the participants in the experiment as the independent variable is manipulated. In the peer tutoring study, achievement is the dependent variable. This might be assessed in a number of ways. Let's say in this study it is measured by scores on a nationally standardized achievement test.

In experiments, the independent variable consists of differing experiences given to one or more experimental groups and one or more control groups. An **experimental group** is a group whose experience is manipulated. A **control group** is a comparison group that is treated in every way like the experimental group except for the manipulated factor. The control group serves as the baseline against which the effects of the manipulated condition can be compared. In the peer tutoring study, we need to have one group of students who get peer tutoring (experimental group) and one group of students who don't (control group).

Another important principle of experimental research is **random assignment,** in which researchers assign participants to experimental and control groups by chance. This practice reduces the likelihood that the experiment's results will be due to any preexisting differences between the groups (Stangor, 2011). In our study of peer tutoring, random assignment greatly reduces the probability that the two groups will differ on such factors as age, family status, initial achievement, intelligence, personality, health, and alertness.

To summarize the experimental study of peer tutoring and student achievement: (1) each student is randomly assigned to one of two groups, (2) one group (the experimental group) is given peer tutoring and the other (the control group) is not, (3) the independent variable consists of the differing experiences (tutoring or no tutoring) that the experimental and control groups receive, and (4) after the peer tutoring is completed, the students are given a nationally standardized achievement test (dependent variable). Figure 1.4 illustrates the experimental research method applied to time management and students' grades.

independent variable The manipulated, influential, experimental factor in an experiment.

dependent variable The factor that is measured in an experiment.

experimental group The group whose experience is manipulated in an experiment.

control group The group whose experience is treated in every way like the experimental group except for the manipulated factor.

random assignment In experimental research, the assignment of participants to experimental and control groups by chance.

PROGRAM EVALUATION RESEARCH, ACTION RESEARCH, AND THE TEACHER-AS-RESEARCHER

In discussing research methods so far, we have referred mainly to methods used to improve our knowledge and understanding of general educational practices. The same methods also can be applied to research whose aim is more specific, such as determining how well a particular educational strategy or program is working

(Plano-Clark & Creswell, 2010). This more narrowly targeted work often includes program evaluation research, action research, and the teacher-as-researcher.

Program Evaluation Research Research designed to make decisions about the effectiveness of a particular program is called **program evaluation research.** (McMillan & Schumacher, 2010). It usually focuses on a specific school or school system, in which case its results are not intended to be generalized to other settings. A program evaluation researcher might ask questions like these:

- Has a gifted program started two years ago had positive effects on students' creative thinking and academic achievement?
- Has a technology program in place for one year improved students' attitudes toward school?
- Which of two reading programs being used in this school system has improved students' reading skills the most?

Action Research Research used to solve a specific classroom or school problem, improve teaching and other educational strategies, or make a decision at a specific location is called **action research** (Johnson, Mims-Cox, & Doyle-Nichols, 2010; Mills, 2011). The goal of action research is to improve educational practices immediately in one or two classrooms, at one school, or at several schools. Action research is carried out by teachers and administrators rather than educational psychology researchers. The practitioners, however, might follow many of the guidelines of scientific research described earlier, such as trying to make the research and observations as systematic as possible to avoid bias and misinterpretation. Action research can be carried out school-wide or in more limited settings by a smaller group of teachers and administrators; it can even be accomplished in a single classroom by an individual teacher (Hendricks, 2009).

program evaluation research Research designed to make decisions about the effectiveness of a particular program.

action research Research used to solve a specific classroom or school problem, improve teaching and other educational strategies, or make a decision at a specific level.

TEACHING CONNECTIONS: Best Practices

Strategies for Becoming an Effective Teacher-Researcher

1. *Collect many types of data in your classroom.* Students give us a wealth of data if we are willing to record it. Observation data, assessment data, and interview data might be particularly useful. You might enlist the aid of another teacher or assistant to help you record observation data. Keep the data organized. Electronic spreadsheets are particularly useful for organizing assessment data in a way that allows easy analysis.
2. *As you plan your lessons, think about the data you have collected.* Is one student struggling? Does another seem bored? Is the entire class having difficulty with a concept? You can use the data you collected to confirm or refute your impressions.
3. *Make your instructional decisions based on data.* If the student who seems bored is also achieving at a high level, you might consider differentiating instruction. If the assessment data indicate that the student who seems to be struggling is falling behind, s/he might benefit from differentiated instruction also. You might want to know if a different approach to teaching the concept the class mentioned above is struggling to understand would enhance learning. You can conduct an experiment to determine if a different strategy would be helpful to this particular group of students.
4. *Use the library or Internet resources to learn more about teacher-researcher skills.* This might include locating information about how to be a skilled clinical interviewer and a systematic, unbiased observer.
5. *Take a course in educational research methods.* This can improve your understanding of how research is conducted.

The Teacher-as-Researcher The concept of **teacher-as-researcher** (also called teacher-researcher) is the idea that classroom teachers can conduct their own studies to improve their teaching practices (Plano Clark & Creswell, 2010). To obtain information, the teacher-researcher uses methods such as participant observation, interviews, and case studies. One widely used technique is the clinical interview, in which the teacher makes the student feel comfortable, shares beliefs and expectations, and asks questions in a nonthreatening manner. Before conducting a clinical interview with a student, the teacher usually will put together a targeted set of questions to ask. Clinical interviews not only can help you obtain information about a particular issue or problem but also can provide you with a sense of how children think and feel.

In addition to participant observation, the teacher might conduct several clinical interviews with a student, discuss the student's situation with the child's parents, and consult with a school psychologist about the student's behavior. Based on this work as teacher-researcher, the teacher may be able to create an intervention strategy that improves the student's behavior.

Thus, learning about educational research methods not only can help you understand the research that educational psychologists conduct but also has another practical benefit: the more knowledge you have about research in educational psychology, the more effective you will be in the increasingly popular teacher-researcher role (Thomas, 2005).

QUANTITATIVE AND QUALITATIVE RESEARCH

Now that we have described a wide range of research methods, let's look at an increasingly common way of categorizing these methods: quantitative research and qualitative research (McMillan & Wergin, 2010; Plano Clark & Creswell, 2010). **Quantitative research** employs numerical calculations in an effort to discover information about a particular topic. Experimental and correlational research designs reflect quantitative research. So do many of the descriptive measures that were described earlier, such as observations, interviews, surveys, and standardized tests, when statistics are used to analyze the data collected. **Qualitative research** involves obtaining information using descriptive measures such as interviews, case studies, ethnographic studies, focus groups, and personal journals and diaries, but not statistically analyzing the information (Stake, 2010).

Recently there has been a push in educational psychology to conduct **mixed methods research,** which involves research that blends different research designs and/or methods (McMillan & Wergin, 2010; Plano Clark & Creswell, 2010). One combination of methods that can be adopted consists of using both quantitative and qualitative research designs. Thus, a researcher might use both a quantitative measure, such as an experimental design and statistically analyze the data, and also use a qualitative measure, such as a focus group or case study to obtain greater breadth and depth of information about a particular topic.

Now that we have explored many aspects of research designs and measures, let's examine how research might influence the strategies teachers use in the classroom. To find out, I asked the following teachers at different grade levels how their teaching had been influenced by research:

EARLY CHILDHOOD Brain research has demonstrated the amazing amount of learning that takes place during the early years of life, in addition to the significant impact of high-quality early childhood education and care on the academic and long-term success of a child. Given the age of the children at our center—toddlers through pre–K—I find this research extremely motivating.

—Heidi Kaufman, *MetroWest YMCA Child Care and Educational Program*

teacher-as-resesarcher Also called teacher-researcher, this concept involves classroom teachers conducting their own studies to improve their teaching practice.

quantitative research Employs numerical calculations in an effort to discover information about a particular topic.

qualitative research Involves obtaining information using descriptive measures such as interviews, case studies, personal journals and diaries, and focus groups but not statistically analyzing the information.

mixed methods research Involves research that blends different research designs and/or methods.

ELEMENTARY SCHOOL: GRADES K–5 When adopting our new kindergarten reading curriculum, we conducted local assessments and collected data, read relevant research of best practices, and worked cooperatively to come up with the policies and practices that will work in collaboration with our state expectations as well as our school vision and mission.

—**Heather Zoldak,** *Ridge Wood Elementary School*

MIDDLE SCHOOL: GRADES 6–8 I attend Learning and the Brain conferences, and read associated research papers and books. These materials have helped me understand brain development in middle school children, especially the considerable changes in early adolescence. This understanding has influenced my classroom management, enabled me to provide differentiated instruction, and helped me to appreciate and work with a range of students' learning styles and needs.

—**Keren Abra,** *Convent of the Sacred Heart School*

HIGH SCHOOL: GRADES 9–12 The person who has most influenced my teaching is Nancie Atwell, a teacher who teaches teachers about teaching. Her lessons on how to get students to love reading are pragmatic and simple, yet extremely effective: Read what the students are reading, "sell" the books by talking about them to students, let students see you reading, read when they read, give time in class to read, make books easily available to students, and be excited and energetic when discussing new books in class. At the beginning of the year, nonreaders (who comprise the majority of the class) groan and roll their eyes when I say it is reading time. However, in just a few short weeks, students beg for daily reading time.

—**Jennifer Heiter,** *Bremen High School*

TEACHING CONNECTIONS: Best Practices

Strategies for Being a Wise Consumer of Educational Research

1. *Go to the original source.* We often hear blurbs regarding research on the radio or TV news or read about them in teacher magazines. These sources often give only general or sensationalized versions of the actual results. Try to find the original source of the research.
2. *Consider the source.* Where are you finding the research? Is the source reliable? The gold standard for published research is that published in peer-reviewed journals by experts.
3. *Who funded the research?* Although this should certainly not be the case, the reported results of the research may be biased toward the funding source.
4. *Look at the sample.* A large sample is more likely to yield results that can be generalized than a small sample. To what degree does the sample match the population of children you are teaching? If you are teaching in an urban U.S. school, can the results of a study of rural Chilean students be generalized to your population?
5. *How was the research conducted?* Earlier we discussed several ways in which research can be conducted. Each has its advantages and disadvantages. Make certain that causation is not being inferred where it should not be (for instance from correlational data).
6. *Have other studies yielded similar results?* Once a ground-breaking result has been obtained, it is important that it is replicated. If several studies indicate the same conclusion, then we may begin to think about implementing in practice.

Review, Reflect, and Practice

3 Discuss why research is important to effective teaching, and how educational psychologists and teachers can conduct and evaluate research.

REVIEW

- Why is research important in educational psychology?
- What are some types of research? What is the difference between correlational research and experimental research?
- What are some kinds of research that relate directly to effective classroom practices? What tools might a teacher use to do classroom research?
- What characterizes quantitative and qualitative research?

REFLECT

- In your own K–12 education, can you remember a time when one of your teachers might have benefited from conducting action research regarding the effectiveness of his or her own teaching methods? What action research questions and methods might have been useful to the teacher?

PRAXIS™ PRACTICE

1. Which of the following is more scientific?
   a. systematic observation
   b. personal experience
   c. a person's opinion
   d. a book written by a journalist
2. Mr. McMahon wants to know how much time his students spend off-task each day. To determine this, he carefully watches the students in class, keeping a record of off-task behavior. Which research approach has he used?
   a. case study
   b. experiment
   c. laboratory experiment
   d. naturalistic observation
3. Ms. Simon has been hired to determine how effective a school's health education program has been in reducing adolescent pregnancies. Which type of research will she conduct?
   a. action research
   b. experimental research
   c. program evaluation
   d. teacher-as-researcher
4. Mr. Nugerian wants to use qualitative research to discover why students are slacking off in their homework. Which of the following measures is he likely to use to obtain information about this problem?
   a. experimental research
   b. correlational research
   c. ethnographic study
   d. observation with statistical analysis of the data

Please see the answer key at the end of the book.

Connecting with the Classroom: Crack the Case

The Classroom Decision

Ms. Huang teaches fourth grade at King Elementary School. Her class is comprised of 26 students, 16 girls and 10 boys. They are an ethnically and economically diverse group. They are also diverse in terms of their achievement levels. She has two students who have been identified as being gifted and three students with diagnosed learning disabilities. Overall, they are a cooperative group with a desire to learn.

Ms. Huang's school district recently purchased a new math curriculum that emphasizes conceptual understanding and application of mathematical principles to real-life situations. While Ms. Huang appreciates this, she also has some concerns. Many of her students have not yet mastered their basic math facts. She fears that without knowing their basic math facts very well, understanding mathematical principles will be useless to her students, and they still won't be able to work on application of these principles. She also worries that this will cause her students undue frustration and may decrease their interest and motivation in math.

In the past, Ms. Huang has had her students work on developing mastery of math facts using drill-and-practice methods such as flashcards, worksheets filled with fact problems, and a computer game that is essentially an electronic version of flashcards with graphics. She is comfortable with this method and says that it has helped prior students to develop the mastery she believes they need.

She voices her concern to her principal, who responds that the publisher's representative provided the district with evidence that the new program also helps students to develop mastery of basic facts. However, Ms. Huang is still skeptical. She wants to do the right thing for her students, but she isn't sure what that is. She decides that she needs to conduct some classroom research to determine which will benefit her students more—the new curricular approach or her more traditional approach.

1. What issues would need to be considered in conducting such a study?
2. What type of research would be most appropriate?
   a. case study
   b. correlational research
   c. experimental research
   d. naturalistic observation
3. Why?
4. If she compared the two different curricula and their outcomes, what would the independent variable be?
   a. student achievement relative to basic math facts
   b. the control group
   c. the experimental group
   d. which curricular approach was used
5. If Ms. Huang decided to conduct an experimental study in which she compared the two different curricula and their outcomes, what would the dependent variable be?
   a. student achievement relative to basic math facts
   b. the control group
   c. the experimental group
   d. which curricular approach was used
6. How should Ms. Huang go about conducting her study?

Educational Psychology: A Tool for Effective Teaching

1 EXPLORING EDUCATIONAL PSYCHOLOGY: Describe some basic ideas about the field of educational psychology.

Historical Background

Educational psychology is the branch of psychology that specializes in understanding teaching and learning in educational settings. William James and John Dewey were important pioneers in educational psychology, as was E. L. Thorndike. William James emphasized the importance of classroom observation to improve education. Among the important ideas in educational psychology that we owe to Dewey are these: the child as an active learner, education of the whole child, emphasis on the child's adaptation to the environment, and the democratic ideal that all children deserve a competent education. E. L. Thorndike, a proponent of the scientific foundation of learning, argued that schools should sharpen children's reasoning skills. There were few individuals from ethnic minority groups and few women in the early history of educational psychology because of ethnic and gender barriers. Further historical developments included Skinner's behaviorism in the mid–twentieth century and the cognitive revolution that had taken hold by the 1980s. Also in recent years, there has been expanded interest in the socioemotional aspects of children's lives, including cultural contexts.

Teaching: Art and Science

Teaching is linked to both science and art. In terms of art, skillful, experienced practice contributes to effective teaching. In terms of science, information from psychological research can provide valuable ideas.

2 EFFECTIVE TEACHING: Identify the attitudes and skills of an effective teacher.

Professional Knowledge and Skills

Effective teachers have subject-matter competence, use effective instructional strategies, engage in good thinking skills and guide students in developing these thinking skills, pay more than lip service to individual variations, work with diverse ethnic and cultural groups, and have skills in the following areas: goal setting and planning, developmentally appropriate teaching practices, classroom management, motivation, communication, assessment, and technology.

Commitment, Motivation, and Caring

Being an effective teacher also requires commitment and motivation. This includes having a good attitude and caring about students. It is easy for teachers to get into a rut and develop a negative attitude, but students pick up on this, and it can harm their learning.

3 RESEARCH IN EDUCATIONAL PSYCHOLOGY: Discuss why research is important to effective teaching, and how educational psychologists and teachers can conduct and evaluate research.

Why Research Is Important

Personal experiences and information from experts can help you become an effective teacher. The information you obtain from research also is extremely important. It will help you sort through various strategies and determine which are most and least effective.

continued

Research helps to eliminate errors in judgment that result from relying exclusively on personal experiences.

Research Methods

Numerous methods can be used to obtain information about various aspects of educational psychology. Research data-gathering methods can be classified as descriptive, correlational, and experimental. Descriptive methods include observation, interviews and questionnaires, standardized tests, case studies, ethnographic studies, focus groups, and personal journals and diaries. In correlational research, the goal is to describe the strength of the relation between two or more events or characteristics. An important research principle is that correlation does not equal causation. Experimental research allows the causes of behavior to be determined and is the only truly reliable method of establishing cause and effect. Conducting an experiment involves examining the influence of at least one independent variable (the manipulated, influential, experimental factor) on one or more dependent variables (the measured factor). Experiments involve the random assignment of participants to one or more experimental groups (the groups whose experience is being manipulated) and one or more control groups (comparison groups treated in every way like the experimental group except for the manipulated factor).

Program Evaluation Research, Action Research, and the Teacher-as-Researcher

Program evaluation research is research designed to make decisions about the effectiveness of a particular program. Action research is used to solve a specific classroom or social problem, improve teaching strategies, or make a decision about a specific location. The teacher-as-researcher (teacher-researcher) conducts classroom studies to improve his or her educational practices.

Quantitative and Qualitative Research

Quantitative research employs numerical calculations in an effort to discover information about a particular topic. Experimental and correlational research designs reflect quantitative research. Qualitative research involves obtaining information using descriptive measures such as interviews, case studies, and ethnographic studies but not statistically analyzing the data. Mixed methods research blends different research designs and/or methods.

KEY TERMS

educational psychology 2
constructivist approach 6
direct instruction approach 6
critical thinking 7
differentiated instruction 9
laboratory 15
naturalistic observation 15
participant observation 15
standardized tests 17
case study 17
ethnographic study 17
correlational research 18
experimental research 18
independent variable 19
dependent variable 19
experimental group 19
control group 19
random assignment 19
program evaluation research 20
action research 20
teacher-as-researcher 21
quantitative research 21
qualitative research 21
mixed methods research 21

PORTFOLIO ACTIVITIES

1. At the beginning of the chapter, you read teacher-astronaut Christa McAuliffe's quote: "I touch the future. I teach." Don your creative-thinking hat and come up with one or more brief statements that describe positive aspects of teaching.
2. After some thinking, write a personal statement about the following: What kind of teacher do you want to become? What strengths do you want to have? What kinds of potential weaknesses might you need to overcome? Either place the statement in your portfolio or seal it in an envelope that you will open after your first month or two of teaching.
3. Think about the grade level you are planning to teach. Consider at least one way your classroom at that grade level is likely to be challenging. Write about how you will cope with this.
4. Information about educational psychology appears in research journals and in magazines and newspapers. Find an article in a research or professional journal (such as *Contemporary*

Educational Psychologist, Educational Psychologist, Educational Psychology Review, Journal of Educational Psychology, or *Phi Delta Kappan*) and an article in a newspaper or magazine on the same topic. How does the research/professional article differ from the newspaper or magazine account? What can you learn from this comparison? Write down your conclusions and keep copies of the articles.

Go to the Online Learning Center for downloadable portfolio templates.

STUDY, PRACTICE, AND SUCCEED

Visit **www.mhhe.com/santrockep5e** to review the chapter with self-grading quizzes and self-assessments, to apply the chapter material to two more Crack the Case studies, and for suggested activities to develop your teaching portfolio.